

BRISBANE WATER NATIONAL PARK

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

October 1992

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## FOREWORD

Brisbane Water National Park is located north of Broken Bay and is readily accessible from both Gosford-Wyong and the northern suburbs of Sydney. It is one of the Broken Bay group of national parks and nature reserves which protects the important scenic and natural heritage of the waterways of Broken Bay including Pittwater and Brisbane Water. This group of conservation areas, which comprises Ku-ring-gai Chase, Dharug and Marramarra National Parks, Muogamarra Nature Reserve and a number of island nature reserves, forms a green belt which separates metropolitan Sydney from the growth centres of Gosford and Wyong.

This plan of management maintains the moderate density walking and picnicking opportunities in a natural setting provided for the population of the Gosford-Wyong area. Three locations are proposed to be redeveloped for picnicking in the park at Girrakool, Somersby Falls and Pearl Beach. This plan of management also provides for limited pack camping, particularly along the route of the Great North Walk.

This contrasts with the dispersed walking and low key camping in Dharug and Marramarra National Parks and car touring, sightseeing, high density picnicking and boating in Ku-ring-gai Chase National Park. The Broken Bay group of national parks, in turn, provides different recreational settings to other parks in the Hawkesbury River and Central Coast sub-regions such as wilderness in Yengo National Park and coastal recreation in Bouddi National Park and Munmorah State Conservation Park.

Brisbane Water National Park is hemmed in on two sides by urban, industrial and intensive agricultural development. Most of the larger streams of the park have their headwaters outside the park and this gives rise to major difficulties of park management; particularly with respect to the maintenance of natural processes within the park. Promoting the formation of Catchment Management Committees is recognised as an important initiative to be taken by the Service to reduce the impacts that may arise from human activities both within and outside the park.

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

CHRIS HARTCHER

Minister for  
the Environment

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## 1. INTRODUCTION

The National Parks and Wildlife Act, 1984, requires that a plan of management be prepared for each national park. A plan of management is a legal document that outlines how the area will be managed in the years ahead.

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

- \* The Director 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 make representations about the plan.
- \* The plan and copies of all the representations are referred to the National Parks and Wildlife Advisory Council for consideration.
- \* The Director submits the plan together with any comments and suggestions of the Council to the Minister.
- \* The Minister may adopt the plan after considering the comments of the Advisory Council or he may refer the plan back to the Director and Council for further consideration before adoption.

Once a plan of management 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 Brisbane Water National Park was placed on public exhibition for a period of three months during November and December 1990 and January 1991. During this period the plan attracted 133 representations covering 21 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, which for reasons of document size, has not been included in the plan. For additional information or enquiries on the management of Brisbane Water National Park, please contact:

Central Coast District,  
National Parks and Wildlife Service,  
207 Albany Street North,  
Gosford.

Phone (043) 24 4911

## 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, only seven years after the world's first national park was created at Yellowstone in the United States of America.

For the purpose of preparing plans of management, the 1978 International Union for the Conservation of Nature and Natural Resources (IUCN) definition of a national park has been adopted in New South Wales.

A national park is a relatively large area;  
(1) where one or several ecosystems are not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educative and recreative interest or which contain natural landscapes of great beauty; and (2) where the highest competent authority of the country has taken steps to prevent or to eliminate as soon as possible exploitation or occupation of the whole area and to enforce effectively the respect of ecological, geomorphological or aesthetic features which have led to its establishment; and (3) where visitors are allowed to enter, under special conditions, for inspirational, educative, cultural and recreative purposes.

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

### 2.2 BRISBANE WATER NATIONAL PARK

#### 2.2.1 Location and Regional Context

Brisbane Water National Park is located north of the Hawkesbury River some 50 km from Sydney. The park lies to the west of the townships of Pearl Beach, Umina, Woy Woy, Koolewong, Tascott and Point Clare and to the south of Kariong. These settlements are part of the Gosford-Wyong regional growth centre which has a residential population of 100 000 people.

It is one of the oldest national parks in New South Wales. The initial dedication of 6 060 hectares was made in 1959 as a Reserve for Public Recreation under Section 24 of the Crown Lands Consolidation Act, 1913. It was also one of the twelve areas originally reserved as a national park by the National Parks and Wildlife Act, 1967. Subsequent additions enlarged the park to 11 369 ha and included the western fall and northern headwaters of Mooney Mooney Creek.

There are a number of closely located national parks, state conservation parks and state forests on the Central Coast which complement the recreation opportunities provided by Brisbane Water National Park.

#### 2.2.2 Significance of Brisbane Water National Park

Brisbane Water National Park lies on the sub-coastal margin of the Sydney-Bowen Basin, a major structural unit of New South Wales. This unit extends over the whole central-eastern section of the State from north of the Hunter Valley to south of Ulladulla and includes the Central Tablelands west of Sydney. The Sydney-Bowen Basin is of Permian and Triassic age (270-180 million years old).

The park is predominantly composed of the Hawkesbury Series of massive cross bedded quartz sandstone overlying the Narrabeen Group of lithic sandstone, conglomerates, and grey and red shales.

Brisbane Water National Park is one of a large group of sandstone parks and reserves surrounding Sydney. Other parks in this group include the extensive areas of Wollemi National Park (486 536 ha), Blue Mountains National Park (236 932 ha), Yengo National Park (139 861 ha) and Parr State Conservation Park (38 000 ha) and important smaller national parks surrounding metropolitan Sydney such as Royal (15 014 ha), Heathcote (2 251 ha), Ku-ring-gai Chase (14 597 ha), Marramarra (11 613 ha), Dharug (14 801 ha) and Bouddi (1 165 ha).

A number of other national parks, state conservation parks and nature reserves are also located in this sandstone region. Large tracts of protected natural areas which include State forests, the Metropolitan Water Catchment Area and the Mangrove Creek Catchment Area lie adjacent to and complement the national park system. Kanangra-Boyd National Park lies immediately to the south-west of this system of parks and is contiguous with them, but is not a park which is primarily composed of sandstone landscapes.

These extensive areas are needed as "living space" for plant and animal communities to adapt and migrate in the face of climatic change. Their continuity provides the necessary opportunity for such adjustment to the north-west, west and south. Presumably if the Central Coast is to become warmer and moister this is the optimum configuration for such biological adjustment.

Brisbane Water National Park demonstrates a number of erosion cycles which have produced distinctive peneplained surfaces. Mount Kariong is a prominent flat topped residual representing a major erosion event during the Miocene Period.

A second major erosion cycle, following uplift of the entire region, planed the land surface to produce the predominant topography of the park. It lies at a general altitude of 100 metres.

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

The scenically attractive entrance to the recreationally important Broken Bay waterway is protected by a group of closely located parks which includes Brisbane Water National Park. Other areas in this group are Dharug, Ku-ring-gai, Marra Marra, and Bouddi National Parks, Muogamarra Nature Reserve and the Broken Bay island nature reserves.

The Hawkesbury Sandstone of Brisbane Water National Park provided excellent material for Aboriginal Rock art. There are a number of Aboriginal sites in the park typical of sites in the Sydney Basin. The style of sites on Hawkesbury sandstone is unique in Australia.

The significance of Brisbane Water National Park is summarised below:

#### State And Regional Landscape Conservation Value

The park is part of a system of reserves which protects the State and regionally significant waterways of the lower Hawkesbury River, Broken Bay, Pittwater and Brisbane Waters.

#### Regional Biological Conservation Value

Brisbane Water National Park, is one of five national parks and several nature reserves in the lower Hawkesbury River basin. It extends the representation of coastal habitats and communities typical of the Sydney region.

#### Local Ecological Value

The park is large enough to provide critical nesting and breeding sites for species whose territories range over surrounding rural and urban areas. A number of rare and restricted species have been recorded.



#### Cultural Heritage Value

The park provides protection for a large number of Aboriginal sites and extends the representation of Sydney Basin rock art in the national park system.

#### Local Recreation Value

The walking tracks and picnic areas of Brisbane Water National Park offer important outdoor recreation opportunities for the population of Gosford and Wyong and the northern Sydney metropolitan area.

#### Local Environmental Education Value

The park's proximity to the Gosford-Wyong growth centre makes it locally significant for environmental education purposes.

### 3. OBJECTIVES OF MANAGEMENT

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

- \* To protect scenic and natural features.
- \* To conserve wildlife.
- \* To maintain natural processes as far as is possible.
- \* To protect Aboriginal and historic heritage.
- \* To promote the appropriate use, understanding and enjoyment of national parks.

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

- \* To manage Brisbane Water National Park as part of a system of national parks, state conservation parks and nature reserves which together:

protect the scenic amenity of the lower Hawkesbury River, Broken Bay, Pittwater and Brisbane Water; and

conserve the physical and biological features and processes of the lower Hawkesbury River system.

- \* To promote the use of the park for environmental education purposes.
- \* To promote the outdoor recreational use of the park among the Gosford-Wyong community.
- \* To provide car based recreational facilities at Somersby Falls, Girrakool and Pearl Beach.
- \* To provide bushwalking and pack camping opportunities throughout the park.

#### 4. POLICIES AND FRAMEWORK FOR MANAGEMENT

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

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

The policies established in this plan of management provide the framework for management consistent with anticipated resources available to the Service and anticipated community trends over the next five to ten years. The actions identified are those immediate proposals which are to be undertaken in the next five years. Other management actions may be developed over the life span of this plan of management consistent with the policies set out in the plan.

##### 4.1 NATURAL HERITAGE

###### 4.1.1 Geology, Landforms, Hydrology and Soils

Brisbane Water National Park consists of Hawkesbury Sandstone overlying Narrabeen Group sediments. Tertiary basaltic diatremes intrude the sandstone in the Dillons Crater area.

The park comprises parts only of the catchments of two prominent streams that flow into Broken Bay; Patonga Creek, and Mooney Mooney Creek. The entire catchment of Mullet Creek, a third major stream, lies within the external boundaries of the national park. Mooney Mooney Creek is the largest of the three and has excavated a deep valley which constitutes the western half of the park. The other two catchments, in the eastern section of the park, are comparatively less deeply entrenched and therefore retain extensive areas of the ancient land surfaces of the plateau. The major catchments of the park are shown on Map 1.

The plateau is dissected by a number of tributaries, often flowing along joint lines in the sandstone, giving this section of the park its moderate relief. Soils have mostly developed in situ and, where formed on sandstone, are highly erodible and infertile. Soils formed on basalt are less erodible and relatively more fertile.

Accelerated erosion from lands adjacent to the park on the Somersby and Kariong Plateaux within the catchment of Mooney Mooney Creek has contributed to siltation of Piles Creek in particular, with adverse impacts on water quality and aquatic resources. Accelerated soil erosion and sedimentation is also evident along the Sydney to Newcastle Freeway.



The plateau land was easily settled. The area originally reserved as national park was limited to a remnant area of Crown land on the plateau in the catchments of Mooney Mooney, Patonga and Mullet Creeks. Because of its ruggedness, the lower and middle reaches of Mooney Mooney Creek remained relatively inaccessible for permanent settlement, apart from a number of portions on the creek foreshores. There are still inholdings on the plateau sections of the park and along Mooney Mooney Creek.

Brisbane Water National Park is therefore, hemmed in on two sides by urban, industrial and intensive agricultural development. Mooney Mooney Creek, the largest stream that flows through the park has its headwaters outside the park and this gives rise to major difficulties of park management; particularly with respect to the maintenance of natural processes. This problem is increasing with the development of small rural and urban sub-divisions on the Somersby and Kariong plateaux within the headwaters of Mooney Mooney Creek. The Patonga Creek catchment contains Dillons Farm and the Woy Woy refuse tip at its northern end; these are both inholdings in the park.

Fertilizers and leached runoff from these developments have long term detrimental consequences for aquatic plant communities. Weeds spread down creek lines from agricultural and urban lands. Future Service activities to control and suppress fire or provide access and facilities, must also be designed and located to minimise any potential effects on the soil and catchment values of the park.

The Catchment Management Act came into effect in 1989. Total Catchment Management provides an umbrella framework to aim for amongst other matters, cleaner water, less soil erosion, improved vegetation cover, the maintenance of ecological processes and a balanced and healthier environment. It also provides a focus to balance conservation needs and development pressures and encourages a more aware and involved community. An important means of achieving these aims is the formation and support of Catchment Management Committees at a local level.

#### Policies

\* The catchment of Mullet Creek, which lies within the external boundaries of the park, will be protected from disturbance.

\* The Service will promote the formation of Catchment Management Committees for areas adjacent to and within the park so as to reduce the impacts on the catchments of Mooney Mooney Creek and Patonga Creek that may arise from human activities both within inholdings and outside the park.

\* All land management and development within Brisbane Water National Park will incorporate effective soil erosion and sedimentation control principles and practices.

#### 4.1.2 Native and Introduced Plants

Brisbane Water National Park provides an excellent example of vegetation typical of coastal areas of the Sydney Region. The vegetation of the park was surveyed by the Royal Botanic Gardens and the National Herbarium (Benson, 1981). The survey identified fifteen plant communities and recorded a total of 657 plant species. The diversity of floristic and structural types reflects variations in geology, soils, hydrology, aspect, and fire history.

The spring floral display, which includes a waratah community, attracts large numbers of visitors between mid-July and mid-October.

A number of small isolated areas contain some rare and endangered native plants. It is probable these demonstrate the way in which environmental conditions, particularly climate, have changed over the past few thousand years. In some cases these plants are remnants of once extensive areas now cleared for urban and agricultural uses.

The vegetation pattern is mainly low open forest, low open woodland and open woodland with either a dry or moist understory on the exposed ridges and slopes of the Hawkesbury Sandstone. The more restricted closed forest (rainforest) occurs in the valleys and along streams on the Narrabeen group strata.

Ten of the recorded plant species are considered to be rare or at risk and several other species are uncommon and/or restricted in their distribution. Rare and restricted species include *Melaleuca deanei*, *Eucalyptus multicaulis*, *E. luehmanniana*, *Leucopogon margarodes*, *Boronia fraseri*, *Alannia endlicheri*, *Blechnum ambiguum*, *Lindsaea dimorpha*, *Darwinia glaucophylla*, *D. procera*, *Grevillea shiressii*, *G. diffusa* ssp. *filipendula*, *G. oldei* and *Styphelia laeta* var *latifolia*.

Weeds are not a significant problem in the park. This reflects, among other things, the effects of infertile and shallow soils which inhibit weed invasion. However it is probable that the combination of eroding soils and increased transport of sediments and nutrients into the park will create favourable conditions for the establishment of weeds.

Trail bike access to the park, although regulated, is difficult to control. These bikes physically damage plants and soils. Their access to the park is often along private roads to the inholdings in the park.

#### Policies

\* Visitor and/or management facilities will be located outside areas of sensitive vegetation communities and the habitats of rare or endangered plant species.

\* The occurrence of weeds in the park will be monitored and, where practicable, eliminated using techniques which have minimal environmental impact.

#### Actions

\* Scientific enquiry into the occurrence and distribution of plant communities and species will be encouraged.

\* Programmes to control the invasion and spread of non-native plants within the park will be developed with the cooperation of adjacent landholders.

#### 4.1.3 Native and Introduced Animals

Only limited information is available on the native animals of the park. From the information that is available the following is evident (Broadbent and Cranwell, 1979):

- Twenty-six native mammal species are known to occur in the park;

- The fawn-footed mosaic-tailed rat (*Melomys cervinipes*) is at its most southerly geographic limit;

- The koala (*Phascolarctos cinereus*), which is now restricted in distribution on the Central Coast, occurs as a small colony in the Pearl Beach section of the park;
- The yellow-bellied glider (*Petaurus australis*), the least common of the gliders in the Sydney region, is found in the Piles Creek area of the park;
- Thirty species of frog, representing nine of the continent's twenty-seven genera or twenty percent of all species, occur in the park;
- About fifty species of reptiles, approximately one-third of the continent's reptile genera or ten percent of all species of reptiles, are found in the park. The rare, broad-headed snake (*Hoplocephalus bungaroides*) has been recorded, but little is known of the status of the local population.

Over one hundred and fifty species of birds have been recorded in the park. These include the following which are considered rare in the Sydney Region because of habitat destruction:

- collared sparrowhawk (*Accipiter cirrhocephalus*)
- white-breasted sea-eagle (*Haliaeetus leucogaster*)
- Pacific or crested baza (*Aviceda subcristata*)
- Lewins rail (*Rallus pectoralis*)
- buff-banded rail (*Rallus philippensis*)
- yellow-tailed black cockatoo (*Calyptorhynchus funereus*)
- glossy black cockatoo (*Calyptorhynchus lathami*)
- gang gang cockatoo (*Callocephalon fimbriatum*)
- powerful owl (*Ninox strenua*)
- masked owl (*Tyto novaehollandiae*)
- red-browed tree-creeper (*Climacteris erythroptis*)

The Australian Museum Ecological Unit is presently conducting a study of birds and their habitats in the Warrah Trig area of the park. Interim results indicate heathlands are especially important for honeyeaters which move from the southern elevated forest lands in the autumn to the nectar rich heathlands for winter. Specific management practices may be developed for the protection of particular species and habitats as information from the study becomes available.

The park provides essential breeding and nesting sites for species which roam outside the park boundaries. In many cases the park provides the only secure areas where species can find seclusion and their habitat requirements such as hollow trees.

Introduced animals of particular concern include foxes, dogs and cats. The last two species are particularly prevalent because of the location of the park within an area of highly urbanised land-use. There are no licenced apiary sites within the park.

#### Policies

\* Conservation of animal populations will concentrate on the protection of habitats.

\* Introduced animals will be controlled and where possible eliminated. Preference will be given to control techniques which have minimal environmental impact.

\* Control programmes will be undertaken in conjunction with neighbours where appropriate.

\* Priority for control of introduced species will be given to those which:

- conflict with significant natural heritage;
- are damaging cultural heritage;
- are or may affect neighbouring lands;
- may be a threat because of disease;
- have a high capacity for dispersal;
- are new isolated occurrences;
- have the potential to be spread along roads and management tracks

\* Priority for research will be given in the following areas:

- biological control methods;
- assessment of the distribution, abundance and impact of introduced species on natural heritage.

\* Dogs, domestic stock and other introduced animals will not be permitted in the park with the exception of guide dogs for the blind.

#### Actions

\* Scientific enquiry into the occurrence and distribution of native animals in the park will be encouraged.

\* The known occurrence, distribution and density of introduced species causing significant environmental damage will be mapped.

\* Control of dogs, cats and foxes will be undertaken as a priority.

\* Any straying domestic stock found on the park will be removed or impounded as soon as possible.

\* No European bee hives will be permitted in the park.

\* Environments currently free of introduced animals will be monitored.

#### 4.1.4 Fire Management

The Service regards fire as a natural phenomenon, one of the established physical factors of the Australian environment. Brisbane Water National Park is subject to a high frequency of fires. This high frequency is primarily due to arson.

The District has a Bushfire Management Plan which provides the following statements in reference to Brisbane Water National Park:

- Wildfire, wildfire suppression (wherever possible), and hazard reduction operations will be excluded from;

. Open forest with moist understorey containing *Grevillea shiressii*. This community occurs on alluvial soils derived from Narrabeen sandstone, and is found in the upper reaches of Mullet Creek and Mooney Mooney Creek.

. Low open woodland with a dry shrubby understorey containing *Darwinia procera*. The only known location within Brisbane Water National Park is in the Piles Creek area.



. Low woodland to low open woodland containing *Leucopogon amplexicaulis*. This community occurs on Hawkesbury sandstone, and the only known location within Brisbane Water National Park occurs in the Mount Kariong Trig area.

. Closed forest, low closed forest and mangrove communities.

- Wildfire, wildfire suppression (wherever possible), and hazard reduction operations will be minimised in:

. Low open forest - plateau tops containing *Telopea speciosissima*. This community occurs on deeper, more fertile soils near Warrah Trig in the south, Kariong and north of the Somersby Falls. When the rare event of seedling recruitment occurs, fire must be excluded for 15 to 20 years to allow the plants to develop lignotubers.

. Low scrub - coastal and low open forest communities within the Pearl Beach area.

- Unless otherwise stated, the minimum interval between fire events for all vegetation communities will be at least ten years.

The Fire Management Plan also incorporates the following general principles with respect to fire management.

- The impact of hazard reduction and wildfire suppression activities on road and trail verges and prominent landscapes will be minimised.

- At least 50% of each vegetation community within the national park will be maintained in an as old an age class as is possible.

- Prescribed burning will be undertaken to;

. Reduce the risk of high intensity wildfire within 100 metres of any adjoining property, fire trail or other wildfire control line.

. Protect fire sensitive catchments and soils.

. Promote a diversity of age classes within vegetation communities.

. Promote rare or threatened species.

. Ensure the long-term survival of all species native to the area.

. Protect cultural heritage items.

. Protect management facilities.

- Prescribed burning will, preferably, be carried out during the autumn-winter period. In special circumstances, spring burning will be carried out when weather conditions preclude hazard reduction in autumn or winter. Fires will be of moderate to high intensity.

- Research programmes which provide information on fire behaviour and ecological effects will be encouraged.

The plateau between Mooney Mooney Creek and Mullet Creek is a relatively isolated area and can therefore be managed primarily for the protection of natural communities. Accordingly a more natural fire regime is possible and prescribed burning can be minimised. The protection of old age plant communities is a realistic objective in this area.

Controlled burning will be used as a fuel reducing method where this does not conflict with the nature conservation objectives of the park. Other fuel reducing methods including the use of mechanical equipment to construct cleared or mown fire breaks will be used where burning is not appropriate as identified in the District Fire Management Plan.

The Service will co-operate with the Gosford District Fire Protection Committee and liaise with adjoining land owners to prevent and suppress fire in and adjacent to Brisbane Water National Park. In this regard the Service will review the Central Coast District Bushfire Management Plan in accordance with the policies outlined below.

Public education programmes about fire protection plans and strategies are important tools to obtain the co-operation of the public and will be developed. These programs will be undertaken in consultation with other authorities as necessary.

#### Policies

\* The management of fire in Brisbane Water National Park will be in accordance with the District Fire Management Plan.

\* Fire management in Brisbane Water National Park will aim to:

- protect human life and property;
- maintain species and habitat diversity;
- protect closed forest from fire;
- protect specific habitats;
- protect cultural heritage and recreation facilities;
- control public use of fires;
- attain the co-operation of council, other land use authorities, neighbouring landholders, and the park user; and
- encourage research into fire particularly with respect to the impact of fire on native animal communities.

#### Actions

\* Review the District Bushfire Management Plan in accordance with the policies in this plan of management.

\* Develop a fire prediction model and update the fire management plan on a continuing basis.

\* Progressively incorporate into the District Fire Management Plan practices for the management of the habitat of native plants and animals in the light of new and relevant information.

\* Undertake fire hazard reduction by burning or mechanical means as determined by an annual hazard/risk assessment.

\* Liaise with council, other land use authorities and neighbouring landholders to develop quick response, co-operative fire management arrangements.

\* Develop public education programmes on fire prevention in consultation with other relevant agencies.

#### 4.2 CULTURAL HERITAGE

Artifacts of Aboriginal culture and occupation, including aesthetic, scientific, educational, and cultural items and places of value, are featured throughout the park. Some are vulnerable to disturbances from recreational activities and management programmes or subject to erosion from wind and water.

Aboriginal sites on Hawkesbury sandstone have a distinctive style of engraving which is unique in Australia. The sites in Brisbane Water are representative of this style.

Two Aboriginal tribal groups, the Dharruk and the Darkinjung, occupied parts of the area now included in the park for at least 11 000 years. Evidence of habitation is abundant and varied and includes occupation deposits in sandstone shelters, foreshore middens, rock engravings, stone arrangements, paintings and axe grinding grooves.

Rock engraving is the predominant art form in the park. The flat, exposed areas of Hawkesbury sandstone which occur in this region provided an ideal "canvas" for the Aboriginal artist.

Several hundred Sydney rock engraving sites are known to exist in the park. The age of the engravings are unknown although some must be recent (less than 200 years old) because they depict European objects such as ships.

Often sites without physical evidence of occupation have significant cultural values for the Aboriginal people. These may be sacred sites associated with geographical features such as mountains, streams or rock formations, or historic places such as massacre sites.

The management of the Aboriginal cultural heritage in the varied natural environment of the park is an important component of the Service's statewide objective to conserve a representative sample of the Aboriginal heritage.

Exploration of the Central Coast area began soon after the arrival of the First Fleet. In 1788-89, Brisbane Water, Mullet Creek and Mooney Mooney Creek were explored. Settlement along the Hawkesbury River began about 1794. In the early 1820's the area between the Hawkesbury and Hunter Rivers became available for settlement.

A number of historic places are associated with the Sydney to Newcastle rail link, which was completed in 1889. Other sites are related to minor agricultural operations, quarrying for stone and mining for ochre pigments.

An historic resources review has been prepared for Central Coast District which identifies 30 sites in Brisbane Water National Park.

#### Policies

\* The provisions of the Burra Charter (ICOMOS revised 1987) for the conservation of places of cultural significance will guide management decisions for the park's historic places.

\* Prior to any works being undertaken, a survey for Aboriginal sites and historic places will be undertaken. Where sites or places of cultural significance are found, the works will be modified or relocated.

\* Aboriginal sites and places will be recorded, conserved and protected in consultation with the Darkinjung Land Council.

\* In consultation with the local Land Council, identify Aboriginal sites to be interpreted to the public.

\* Historic places will be researched, recorded, protected and, where appropriate, interpreted for the public.

## Actions

- \* The register of Aboriginal sites will be maintained and updated.
- \* The impact on Aboriginal sites from proposed works and management practices will be assessed. Where appropriate:
  - . natural degradation of sites will be retarded; and
  - . sites will be protected from user impacts;
- \* Bulgandry Aboriginal Site will continue to be interpreted for park visitors. If and when the impact of visitor use is unacceptable, the site will be closed to the public.
- \* The park's historic place register will be maintained and updated.
- \* The history of the railway link through the park will be interpreted.

## 4.3 USE OF THE AREA

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

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

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

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

### 4.3.1 Promotion of the Park

The inhabitants of the Central Coast region are the predominant users of Brisbane Water National Park. In this regard the park could demonstrate the wider principles of nature conservation and recreation in a natural setting, indicative of all national parks, to a large number of family day use groups.

The park also has a long tradition of use for field studies by two Sport and Recreation Centres and the Warrah Field Studies Centre.

Information and data sheets on the resources of the park will assist visitors to understand and appreciate its values and may shape their behaviour and conduct in this and other parks they visit. Similarly, guided walks by park staff stimulate interest and respect for park resources and management practices.

## Policy

- \* The use of the park will be promoted among the local community for both formal and informal environmental education purposes.

## Action

- \* An interpretation programme will be developed to include:

- natural and cultural heritage information sheets, brochures, and booklets;
- displays at GIRRAKOOL picnic area; and
- ranger-guided walks.

#### 4.3.2 Recreation Opportunities

Brisbane Water National Park is located north of Broken Bay and west of the large conurbation of Gosford-Woy Woy. The Sydney to Newcastle Freeway, Pacific Highway and Mt. White-Calga Road form part of the western boundary. The freeway and highway provide access from Sydney.

Brisbane Water National Park is readily accessible to a populous sub-region which includes the local government areas of Gosford, Wyong, Hornsby, Baulkham Hills and Ku-ring-gai. The public use strategy for Brisbane Water National Park is to provide complementary recreational opportunities in this sub-region which includes Ku-ring-gai Chase, Dharug and Marra Marra National Parks.

The eastern half of Brisbane Water National Park emphasises moderate density walking and picnic facilities with limited pack camping opportunities in a natural setting. This contrasts with dispersed walking and low key camping in Dharug and Marra Marra National Parks and car touring, sightseeing, high density picnicking and boating at Ku-ring-gai Chase National Park. These latter parks, in turn, provide different recreational settings to other national parks in the Hawkesbury River and Central Coast sub-regions such as wilderness in Yengo National Park and coastal recreation in Bouddi National Park and Munmorah State Conservation Park.

The western sections of the park, including much of the the Mooney Mooney Valley and the plateau between Mooney Mooney Creek and Mullet Creek has remained undeveloped for recreation and provides opportunities for low key outdoor recreation activities that require few or no facilities. Recreation facilities in this area will be limited to walking tracks and small scale pack campsites.

Two local roads, the Kariiong-Umina Road and Patonga Road, pass through the park. The Somersby Falls Road provides access to Somersby Falls on the north-eastern edge of the park.

The pattern of vehicle access is clearly defined. Access to the eastern or plateau section of the park where user pressure is greatest, is via the Pacific Highway, the Kariiong-Umina Road and the Patonga Road. Access is restricted in the western or Mooney Mooney Creek section of the park by the freeway, the highway and fringing freehold land.

Three picnic areas are provided in the park at GIRRAKOOL, Somersby Falls and Pearl Beach. The Pearl Beach picnic area will be re-developed as the primary day use area in the south-east of the park. GIRRAKOOL was initially developed as the main facility area in the park and is accessible from the Pacific Highway. With the completion of the Sydney to Newcastle Freeway, most traffic now by-passes GIRRAKOOL. As a result WARRAH TRIG and Pearl Beach are attracting increased visitor use.

There is an extensive walking track system, which includes management tracks, in the south-eastern section of the park. These tracks are interconnected with road-side stops, look-outs, camping and picnicking facilities. The northern section of the park (the area generally north of the freeway) has a limited system of walking tracks.

The continuation of the walking track at Somersby Falls into a loop is a logical extension of the project completed in 1990. This will provide visitors with access to other features in the Somersby Falls area and, on days of high visitor numbers will help avoid overcrowding on the path. It is estimated that the loop track would be about a one hour walk.

A longer term project to re-open walking tracks and routes in the Somersby Falls/Mooney Mooney Creek/Floods Creek area is also proposed. Many of the pathways already exist but are overgrown in places. The proposal is seen as a network of tracks where walkers will have a range of alternative routes and habitats (valley bottoms, ridges and sandstone re-entrants). The longer walks are about 15 km in length and would be of one day duration.

The walking track system from Patonga to Somersby Falls is part of the Great North Walk, a 250 km walk linking Newcastle, the Hunter Valley and Sydney. The walk provides access to a large tract of country and a range of magnificent natural and man-made attractions. The Great North Walk was an important Bicentennial Year project.

There are no camping areas currently provided within the park; however there is widespread informal camping which creates a number of management problems. There are very few sites within the park suitable for development as formal camping sites because of problems with water supply, firewood and management access.

The predicted increased popularity of the Great North Walk is expected to cause increasing demand for pack campsites hence increasing impact on the park. The level of this use and its impact on the park does not yet however, warrant the construction of formal campsites.

Accordingly, this plan provides for the monitoring of pack camping and if necessary, for the development of pack camping areas in the vicinity of:

- Wondabyne Trig and/or van Dahls between the Girrakool link trail and Patonga;
- Wondabyne between the Girrakool link trail and Wondabyne Railway Station; and
- Mooney Mooney Creek and/or Piles Creek between the Girrakool link trail and the northern exit of the Great North Walk from the park near Somersby Falls.

There are a number of hotels, motels, camping and caravan parks nearby in Gosford-Woy Woy which adequately cater for any demand for more sophisticated accommodation.

#### Policies

\* Additional bushwalking and picnicking opportunities will be provided in Brisbane Water National Park and maintained at current moderate density levels.

\* The Mooney Mooney Creek Valley and the plateau between Mooney Mooney Creek and Mullet Creek will be managed to provide opportunities for low key outdoor recreation activities that require few or no facilities. Facilities in this area will be limited to walking tracks and small scale pack campsites.

\* Pack camping along the route of the Great North Walk will be monitored. If unacceptable impacts arise through overuse of the existing informal pack camp sites formal pack camping areas may be provided.

\* Conditions on recreation activities (e.g. limits on numbers, times and locations) may be instituted where necessary to protect the park's natural and cultural heritage.

\* All or part of camping sites or areas showing evidence of overuse may be closed permanently or temporarily to allow for their restoration.

\* The Code of Minimum Impact Bushwalking will be promoted amongst park visitors.

#### Actions

\* The picnic area at Pearl Beach will be redeveloped as the primary facility area in the south-east section of the park.

\* The picnic area at Somersby Falls will be upgraded as the primary facility area in the northern section of the park.

\* The Somersby Falls walking track will be extended to complete a one way loop walk of moderate walking duration.

\* The loop walking track at Girrakool will be upgraded.

\* The information and interpretive displays at Girrakool will be redeveloped.

\* The car park at Warrah Trig will be redeveloped.

\* Walking tracks and routes in the Somersby Falls/Mooney Mooney Creek/Floods Creek area may be re-opened to provide longer walks of about 15 km in length and of one day duration.

#### 4.3.3 Scientific Research

The purpose of scientific study in the park is to improve the understanding of its natural and cultural heritage and the processes which affect them. Research will also establish the requirements for the management of particular species. Data and findings from research studies and surveys will be utilised in park management.

The eastern and northern sections of Brisbane Water National Park lie adjacent to lands which are urbanised or intensively developed for agriculture. This creates major management problems, particularly in the field of natural heritage conservation, which are potentially important subjects for scientific research.

The relatively undisturbed western valley and plateau sections of the park and its southern foreshores offer opportunities for study of natural systems similar to the now largely modified sub-coastal parts of the Somersby Plateau.

There have been 12 scientific licences granted for research in Brisbane Water National Park in recent years. The range of topics covered include the ecology of honeyeaters, value of native plants for horticultural purposes, the collection of mosses and ferns for taxonomical classification, study of the rare plant *Eucalyptus camfieldii*, the impact of human activities in the Lower Hawkesbury Valley over the past 2 000 years and studies into heathlands, songbirds and spiders.

The Service does not presently have the resources to undertake any long term research in the park. There is one institution in the district which may use the park for research purposes; the Cromelin Research Station. As part of the proposed Central Region Nature Conservation Strategy a prospectus will be



prepared as the basis for the involvement of such organisations in research in Brisbane Water National Park.

The new Rumbelara Field Study Centre may increasingly use the park for environmental education purposes, mainly for school aged children.

#### Policies

\* Priority will be given to research into:

- the ecology, status and distribution of plant and animal species and communities;

- comparative studies of Brisbane Water National Park and the other major and contiguous conservation areas in the Central Coast, Hunter and Blue Mountains region; and

- the impact of management on the ecology of the park.

\* Service conducted research will aim to provide information on the natural and cultural heritage, and on human use to facilitate management of the park.

\* All research will be subject to Service policy and procedures for the granting of permits, conduct of research and the production of results.

\* Research applications will only be granted where;

- the research has the potential to facilitate the better management of the park;

- the research does not conflict with the objectives of park management; and

- the research cannot be reasonably be undertaken elsewhere.

#### Actions

\* A prospectus will be prepared as a guide to preferred research projects in the park. Preferred topics will be those of direct relevance to management and will include;

- additional surveys of native animals;

- the protection of rare plants;

- the impact of fire on the native plants and animals of the park;

- the changing incidence of fire in the park arising from changes to landuse in surrounding areas;

- the control of non-native plants and animals;

- pollution of streams;

- the significance of the park/adjacent lands boundary in the occurrence and distribution of species of special interest such as the koala and tiger quoll; and

- the impact of visitors on the park.

#### 4.3.4 Management Operations

Brisbane Water National Park is one of the oldest national parks in New South Wales and is located adjacent to a large and rapidly expanding urban area. At Girrakool, the centre of park management, the Service has its District workshop and an on-park ranger residence.

The plateau section of the park contains a network of management tracks used for fire control along the settled eastern boundary of the park. The management track system also provides access to leased and licensed installations constructed and operated by other authorities. The management track system is shown on the map, centre pages.

A small quarry west of Staples Lookout is managed by the Service and is used to extract material for the maintenance of the management track system.

There are fifteen occupancies within the park granted under the National Parks and Wildlife Act to authorities which have facilities and/or works on the park. These include Gosford City Council, the Roads and Traffic Authority, Department of Public Works, Sydney County Council and Telecom. A lease or licence is proposed to be granted to Kevin Dillon for access to property which lies within the park.

The Kariong Rifle Range, a major inholding of the park, is an inappropriate land use to have within or adjacent to this regionally important national park.

## Policies

- \* Extractive operations for the purpose of obtaining construction material will be limited to that required for the Service's own use on the park. The programme of extraction will be subject to a review of environmental factors or environmental impact statement.
- \* Gravel will be extracted in accordance with an approved extraction programme. Rehabilitation of worked areas will use local soils and plants propagated from local genetic stock.
- \* It is a long term aim of the Service to reduce, and if possible eliminate, the number of non-park power lines and other utilities (including roads used for their maintenance) held under lease or license within the park. To this end such occupancies will be kept under regular review and where warranted the facility, including associated roads, will be relocated and or closed and the site rehabilitated.
- \* Proposals for the occupation of areas within the park for purposes inconsistent with the National Parks and Wildlife Act or this plan of management will be opposed by the Service.
- \* Review existing licensed and leased facilities and, where no longer required, close and rehabilitate the site.
- \* Only permit authorised use of the management track system.
- \* The Kariong Rifle Range is an inappropriate land use to have within or adjacent to Brisbane Water National Park. The Service will continue to negotiate with the relevant authorities to acquire these lands for addition to the park. In the short term, measures will be taken, in conjunction with the relevant authorities and organisations, to minimise any hazards or risks to visitors to the park.

## Actions

- \* The operation of the Service quarry will be reviewed each five years.
- \* Management tracks will be upgraded to Service design standards.
- \* Signpost and bar all management tracks to stop unauthorised use.

## 5. PLAN IMPLEMENTATION

This plan of management is part of the system of management developed by the National Parks and Wildlife Service. The system includes the National Parks and Wildlife Act, the Service's Corporate Strategy, management policies and established conservation and recreation philosophy. It also includes regional and district strategic planning.

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

District programmes are subject to on-going review within which works and any other activities carried out at Brisbane Water National Park will be evaluated in relation to objectives laid down in this plan.

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

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

The management proposals outlined in the plan have been summarised in the following table:

Action	Plan Reference
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### High Priority

Develop co-operative catchment management strategies.	4.1.1
Review the Central Coast District Bushfire Management Plan.	4.1.4
Develop public education programmes on fire prevention in consultation with other relevant agencies.	4.1.4
Undertake weed and pest animal control programmes	4.1.2/3
Maintain the register of Aboriginal sites.	4.2
Assess the impact on Aboriginal sites of proposed works and management practices.	4.2
Maintain the historic place register.	4.2
Upgrade management tracks to Service design standards.	4.3.3

Signpost and bar all management tracks 4.3.3  
to stop unauthorised use.

Moderate Priority

Encourage scientific enquiry into the habitat 4.1.3  
requirements of native animals.

Encourage scientific enquiry into plant 4.1.2  
communities and species distribution.

Develop a fire prediction model. 4.1.4

Redevelop the picnic area at Pearl Beach 4.3.2

Extend the loop walking track at Somersby Falls 4.3.2

Redevelop the information and interpretive 4.3.1  
displays at GIRRAKOOL picnic area.

Redevelop the car park at WARRAH TRIG. 4.3.2

Low Priority

Review natural and cultural resource 4.3.1  
information sheets, brochures and booklets.

Upgrade the existing picnic area at 4.3.2  
Somersby Falls.

Upgrade the existing walking track at GIRRAKOOL. 4.3.2

Redevelop the walking tracks and routes 4.3.2  
in the Somersby Falls/Mooney Mooney Creek/Floods  
Creek area

Interpret the history of the railway in the park. 4.2

## 6. SELECTED REFERENCES

- Beadle, Evans and Carolin; (Revised Edition 1982) Flora of the Sydney Region Reed.
- Benson, J.S. and Fallding, H. (1981) Vegetation Survey Of Brisbane Water National Park And Environs. *Cunninghamia* 1(1): 79-113.
- Blakers, M., Davies, S.J.J.F. and Reilly, P.N. (1984) The Atlas of Australian Birds Royal Australian Ornithologists Union. Melbourne University Press.
- Broadbent, J. and Cranwell, I. (1979) Faunal Studies for the Proposed Mount White-Kariong-Ourimbah Sections of the Sydney-Newcastle Freeway (No. 3). Environmental and Urban Studies Report No. 45, Macquarie University, December, 1979.
- Harden, G.J. (1991) Flora of New South Wales Royal Botanic Gardens. University of New South Wales Press.
- International Council of Monuments and Sites (ICOMOS) (1965) Statutes adopted by the Constituent Assembly. Warsaw.
- Leigh, J., Boden, R. and Briggs, J. (1984) Extinct and Endangered Plants of Australia Sun.
- NSW Landcare Working Party (1991) Decade of Land Care, Draft Plan for NSW. Catchment Management Coordinating Committee
- NSW Landcare Working Party (1991) TCM Coordinating Natural Resource Management in NSW: A Discussion Paper. Catchment Management Coordinating Committee
- Pyke, G.H. (1983) Seasonal Pattern of Abundance of Honeyeaters and Their Resources in Heathland Areas Near Sydney. *Australian Journal of Ecology* 8: 217-233.
- Pyke, G.H. (1983) Relationships Between Time Since the Last Fire and Flowering in *Telopea speciosissima* R. Br. and *Lambertia formosa*. *Australian Journal of Botany* 31: 293-6.
- Pyke, G.H. (1987) Pollination Biology of *Telopia speciosissima*. In J.A. Armstrong (Ed.). *Waratahs - Their Biology, Cultivation and Conservation*. Australian National Botanic Gardens Occasional Publication No. 9.
- Scheibner, E. (1976) Explanatory Notes on the Tectonic Map of New South Wales. Geological Survey of New South Wales.
- Strahan, R. (1983) Complete Book of Australian Mammals The Australian Museum. Angus and Robertson