

**THIRLMERE LAKES NATIONAL PARK  
NEW PLAN OF MANAGEMENT**

**NSW National Parks and Wildlife Service  
November 1997**

**Acknowledgements:** This plan of management has been prepared by staff of the Nattai Sub-district of the South Metropolitan District of the National Parks and Wildlife Service with assistance from staff of Head Office of the Service.

The assistance of staff of the Sydney Water Corporation Limited in the preparation of this plan is also gratefully acknowledged.

**Crown Copyright 1997:** Use permitted with appropriate acknowledgment

**ISBN 0 7310 7619 2**

## FOREWORD

Thirlmere Lakes National Park is located 90 kilometres south west of Sydney and about 10 kilometres south west of Picton, west of the Hume Highway. The park is located within the Warragamba Special Area declared under the Sydney Water Board (Corporatisation) Act 1994 to protect Sydney's water supply catchment.

The five lakes of Thirlmere Lakes National Park lie within a deeply entrenched valley meander which is "perched" above the Burragorang Valley to the west and the Cumberland Basin to the east. The biological significance of the lakes arises because only a small percentage of lakes reach this age without undergoing evolution to dry land and terrestrial ecosystems. The great age and geomorphic stability of Thirlmere Lakes have therefore enabled many aquatic organisms to evolve in isolation. The probability that the lakes are around 15 million years old makes Thirlmere Lakes an outdoor laboratory of considerable scientific importance.

The aquatic habitats within Thirlmere Lakes National Park therefore support many organisms which are restricted or almost restricted to this one lake system.

The promotion of public use of the national park will emphasise its suitability for environmental education and low impact recreation activities and will be limited to day-use only. Camping will not be provided for in the park.

Between 1979 and 1995, power boating was permitted in Thirlmere Lakes National Park on the basis that it be restricted to Lake Werri-Berri and limited to a maximum of thirty operator's licences, twenty of which were issued to members of a local powerboat club. Power boating on such a small, environmentally important lake as Lake Werri Berri in a national park is now considered unacceptable for environmental, social and legal reasons. It is proposed in this new plan of management to maintain the prohibition of waterskiing and power boating in Thirlmere Lakes National Park. Alternative water skiing opportunities exist within the region on the Nepean River, Lake Illawarra and, in the near future, the Penrith Lakes Scheme.

The management of Thirlmere Lakes National Park will be co-ordinated with the adjoining Nattai National Park and Bargo, Burragorang, Nattai and Yerranderie State Recreation Areas as well as Kanangra-Boyd and Blue Mountains National Parks.

This plan of management establishes the scheme of operations for Thirlmere Lakes 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.

PAM ALLAN

Minister for  
the Environment

## CONTENTS

### FOREWORD

<b>1.</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2.</b>	<b>MANAGEMENT CONTEXT</b>	<b>3</b>
2.1	NATIONAL PARKS IN NEW SOUTH WALES	3
2.2	THIRLMERE LAKES NATIONAL PARK	3
	2.2.1 Location and Regional Setting	3
	2.2.2 Importance of Thirlmere Lakes National Park	4
<b>3.</b>	<b>MANAGEMENT OBJECTIVES</b>	<b>7</b>
3.1	GENERAL OBJECTIVES FOR NATIONAL PARKS	7
3.2	SPECIFIC OBJECTIVES FOR THIRLMERE LAKES	7
3.3	OVERALL STRATEGY	8
<b>4.</b>	<b>POLICIES AND FRAMEWORK FOR MANAGEMENT</b>	<b>9</b>
4.1	NATURE CONSERVATION	9
	4.1.1 Geology, Hydrology and Landforms	9
	4.1.2 Native and Introduced Plants	10
	4.1.3 Native and Introduced Animals	11
	4.1.4 Fire Management	12
4.2	CULTURAL HERITAGE	16
	4.2.1 Aboriginal Heritage	16
	4.2.2 Historic Heritage	17
4.3	USE OF AREA	20
	4.3.1 Promotion of the Park	21
	4.3.2 Recreation Opportunities	21
	4.3.3 Scientific Research	24
	4.3.4 Management Operations	25
<b>5.</b>	<b>PLAN IMPLEMENTATION</b>	<b>26</b>
<b>6.</b>	<b>SELECTED BIBLIOGRAPHY</b>	<b>28</b>

## 1. INTRODUCTION

The National Parks and Wildlife Act, 1974 requires that a plan of management shall be prepared for each national park. A plan of management is a legal document which outlines how the area will be managed.

The procedure for the adoption of a plan of management is specified in the Act and involves five stages, namely:

- \* 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 make representations about the plan.
- \* 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 of management together with any comments and suggestions of the Council to the Minister for the Environment.
- \* The Minister may adopt the plan with or without amendment after considering the comments of the Advisory Council or may refer the plan back to the Director-General and Council for further consideration before adoption.

A draft new plan of management for Thirlmere Lakes National Park was placed on public exhibition for four months from mid December 1995 till early April 1996. The plan of management attracted fifty two representations covering twelve issues.

Thirlmere Lakes National Park lies within the Warragamba Catchment Special Area, declared under the Water Board (Corporatisation) Act 1994 and which is the responsibility of the Sydney Water Corporation. The Corporation's interest in protection of the catchment, which supplies most of Sydney's water, remains undiminished and is ensured under Section 185 of the National Parks and Wildlife Act 1974 which states that nothing in that Act affects the Corporation's operations in so far as those operations relate to catchment areas or special areas.

A plan of management for the Warragamba Special Area which includes all of Thirlmere Lakes National Park, has been prepared jointly by the Sydney Water Corporation and the NSW National Parks and Wildlife Service in accordance with section 81(6) of the Water Board (Corporatisation) Act, 1994. The need to ensure the continued safekeeping of Sydney's major water supply and to integrate this responsibility with the Service's obligations to protect the natural and cultural heritage of Thirlmere Lakes National park has been a major consideration in the preparation of both this plan of management and that prepared by the Sydney Water Corporation for the Warragamba Special Area.

In accordance with Section 74 of the National Parks and Wildlife Act this plan of management has been referred to the Sydney Water Corporation and the Department of Land and Water Conservation for their information and any comments, and the Minister has before adopting this plan of management, considered any comments made by the Corporation and the Department about the plan of management.

This document is a new plan of management for Thirlmere Lakes National Park and has been prepared in accordance with the Act by the National Parks and Wildlife Service. The plan of management for Thirlmere Lakes National Park adopted in 1979 has been cancelled in accordance with Section 75 (7) (b) of the Act and this new plan substituted in lieu thereof.

For additional information or enquiries on any aspect of the management of Thirlmere Lakes National Park, please contact:

The Sub-District Manager  
Nattai Sub-District  
PO Box 99  
**PICTON 2571**

Telephone enquiries about the management of Thirlmere Lakes National Park can be made during office hours by contacting the Sub-District Office on (02) 4668 4089.

## 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) defines a national park as a:

"natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations, (b) exclude exploitation or occupation inimical to the purposes of designation of the area, and (c) provide a foundation for spiritual, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible" (IUCN, 1994).

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 resources. Other land uses (e.g. 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 any region.

### 2.2. THIRLMERE LAKES NATIONAL PARK

#### 2.2.1 Location and Regional Setting

Thirlmere Lakes National Park is located 90 kilometres south west of Sydney and about 10 kilometres south west of Picton, west of the Hume Highway (see map page 4). The park was initially reserved as a state park in March 1972 under the National Parks and Wildlife Act, 1967. It was redesignated a national park in 1974 under the National Parks and Wildlife Act, 1974.

Thirlmere Lakes National Park belongs to a large group of sandstone national parks and reserves in the Sydney region. Other parks in this group include the extensive wilderness areas of Nattai, Yengo, Wollemi, Blue Mountains and Morton National Parks, and important high visitor use parks surrounding metropolitan Sydney such as Royal, Heathcote, Brisbane Water, Ku-ring-gai Chase, Marra Marra, Dharug and Bouddi National Parks. There are also a number of important state recreation areas within and adjacent to the Sydney metropolitan area which complement these national parks.

Thirlmere Lakes National Park comprises 630 hectares and adjoins the eastern boundary of Nattai National Park. It is one of six contiguous national parks and state recreation areas which are considered to be closely related, the others being Nattai National Park and Bargo, Burragorang, Nattai and Yerranderie State Recreation Areas, collectively called the Nattai Reserves. This plan of management seeks to integrate programmes of natural and cultural heritage conservation as well as those for recreation management and other use for Thirlmere Lakes National Park with those of the Nattai System of Reserves.

Thirlmere Lakes National Park is located within the Warragamba Dam Catchment Area and the Warragamba Special Area declared under the Sydney Water Board (Corporatisation) Act to protect Sydney's water supply. The protection of water quality is therefore an important consideration of management within Thirlmere Lakes National Park.

### 2.2.2 Importance of Thirlmere Lakes National Park

Thirlmere Lakes National Park was established to protect a small system of five perennial freshwater lakes of considerable geomorphological and biological significance.

Freshwater lakes or river overflows are poorly conserved around Sydney. Thirlmere Lakes, and Marley Lagoon in Royal National Park, are some of the few surviving and relatively unpolluted examples of this ecological system which provide habitat for freshwater plants such as floating herbs, rushes and waterlilies. Mountain Lagoon in the Blue Mountains is a further example of this landform and biological system but is unprotected. Farm dams and riverine backwaters may also support freshwater plants, but pollution and infilling with sediments has destroyed much of this habitat in the Sydney region.

The park's five lakes lie within a deeply entrenched valley meander which is "perched" above the Burratorang Valley to the west and the Cumberland Basin to the east. It is believed that the drainage pattern of the original river was disrupted through the downwarping of the surrounding countryside approximately 15 million years ago. Small lakes and wetlands, under normal conditions, will steadily evolve towards dry land by infilling with sediments. In the case of the Thirlmere Lakes the combination of size and configuration of the lakes catchment area has slowed the aging process.

The biological significance of the lakes arises because only a small percentage of lakes reach this age without undergoing evolution to dry land and terrestrial ecosystems. The great age and geomorphic stability of Thirlmere Lakes have therefore enabled many aquatic organisms to evolve in isolation. The probability that the lakes are 15 million years old makes Thirlmere Lakes an outdoor laboratory of considerable scientific importance.

Accordingly, the aquatic habitats within Thirlmere Lakes National Park support many organisms which are restricted or almost restricted to this one lake system. There are a number of planktonic and bottom-dwelling protozoans (single celled animals or colonies of single celled animals) present, both along the shores and in the limnetic zone (the top layer of open lake waters which is penetrated by light). Crustaceans are an important part of the bottom-dwelling fauna and are an integral part of the lake ecology.

A freshwater sponge *Radiospongilla sceptroides* present in the lakes is thought to be found only within the Warragamba Catchment Area. This sponge is of particular ecological significance because it produces its own green pigment, and reflects the perennial status of the lakes by the absence of gemules (a process of asexual reproduction by the budding off of cells). Nowhere else in Australia has any species of sponge been found which abstains from gemmulation, which is necessary for adapting to the changing conditions normally associated with the ageing process of lakes. Thus the absence of this process of reproduction in the sponges is an indicator of the very slow geomorphic and ecological development of the lakes.

Other significant organisms found in Thirlmere Lakes include true worms, a mussel and various microscopic organisms. Perhaps the most striking feature of the lakes is the occurrence of extremely large numbers of planktonic midge larvae belonging to the genus *Chaevorous* which are known to occur only in a few other lakes in Australia.

The lakes and their margins provide examples of relatively undisturbed aquatic and fringing plant communities now considered rare in New South Wales. The tall sedge *Lepironia articulata* reaches the southern limit of its range in Thirlmere Lakes and the



rare relative of the water-lily *Brasenia schreberi*, though uncommon in the Sydney region, is well established at Thirlmere Lakes.

In addition to its remarkable biodiversity, the significance of the lake fauna is notable because of the absence of some animals usually associated with lentic (or still water as opposed to lotic or running water) environments. Trematodes are one species that is absent from the lake sediments.

The terrestrial ecosystems of Thirlmere Lakes National Park include relatively undisturbed plant communities and provide important refuges for many species of native animals. Protected communities of vegetation on alluvial soils are not common in the Sydney Basin and not well represented in Sydney's national parks. A small yet significant population of river peppermint *Eucalyptus elata* occurs at the southern end of the park. This tree normally grows only along large rivers such as the Nattai, Nepean and Colo.

Above the alluvial deposits the slopes and ridges support eucalypt woodlands dominated by Sydney peppermint *Eucalyptus piperita* and red bloodwood *Corymbia gummifera*. The most common plant community is dominated by rough-barked apple *Angophora floribunda* and is characterised by xeromorphic shrubs typically associated with Sydney Sandstone.

The terrestrial and aquatic plant communities within the park provide important habitation and breeding opportunities for a wide range of fauna including more than 140 bird species, seven mammal species and a number of reptiles and frogs.

The Australasian bittern *Botaurus poiciloptilus* is classified vulnerable under Schedule 2 of the Threatened Species Conservation Act and has been recorded within the park. Seldom seen, this bird is active largely at night and reliant upon densely vegetated wetland habitats for nesting and foraging. The paucity of this habitat type within the Sydney region adds to the importance of Thirlmere Lakes for this species.

The Japanese snipe *Gallinago hardwickii* is a species listed under the Agreement Between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment. This species has been recorded foraging at Thirlmere Lakes in times of low water levels when the muddy shores of the lakes are exposed.

The D'harawal and Gundangurra Aboriginal people inhabited the area now reserved as the Nattai Reserves System as well as Thirlmere Lakes National Park. There are many Aboriginal sites within the park.

Thirlmere Lakes National Park also contains an historic railway pumphouse and associated facilities. The Couridjah pumphouse, located adjacent to Lake Couridjah, was constructed in 1867 to supply water from the lakes to the steam engines which used the southern railway to Mittagong until 1964.

The close proximity of the three important growth centres of Camden, Campbelltown and Appin suggest that the demand for outdoor recreation in the region is likely to increase. While acknowledging the attraction of the Thirlmere Lakes for recreation it is recognised that the scientific importance and fragile nature of the lake environment, its location within Sydney's water catchment area and the need to protect other significant native plant and animal communities must not be compromised by increasing recreational forces. The reservation of nearby land as Bargo State Recreation Area, together with the adjoining Nattai National Park will enable the Service to provide further complementary recreational opportunities within the region.

The significance of Thirlmere Lakes National Park can be summarised:

**National Significance:** Thirlmere Lakes National Park:

- is part of a suite of reserved lands that together constitute one of the largest conservation areas in Australia. These conservation areas protect Sydney Basin landforms and geological features that provide some of the most spectacular scenery in Australia; and
- protects a stable and unpolluted lake system that may be 15 million years old and which is consequently an outdoor laboratory of considerable scientific importance. The great age and geomorphic stability of Thirlmere Lakes have enabled many aquatic organisms to evolve in isolation.

**State and Regional Significance:** Thirlmere Lakes National Park:

- provides habitat for the Australasian bittern, a bird listed as vulnerable under schedule 2 of the NSW Threatened Species Conservation Act 1995;
- provides a refuge for the Japanese snipe, a wading bird listed in the agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment;
- sustains extremely large numbers of planktonic midge larvae belonging to the genus *Chaevorous* which are generally associated with unpolluted fresh waterbodies and known from few other locations within Australia;
- sustains the freshwater sponge *Radiospongilla sceptroides* which is unique to the lakes and other restricted locations within the Warragamba Catchment Area; and
- supports significant plant species such as the tall sedge *Lepironia articulata* which is at the southern end of its range and the water-lily relative *Brasenia schreberi* considered rare in NSW.

**Local significance:** Thirlmere Lakes National Park:

- protects plant communities growing on alluvial soils which are otherwise poorly conserved in the Sydney basin;
- contains an historic railway pumphouse, holding tanks and a pipeline which were constructed in 1867 and represent an important stage of the history of railways within the local area;
- is within the Warragamba Catchment Special Area; and
- provides opportunities for low impact recreation in natural settings for the growth centres of the Cambelltown-Camden areas and adjacent regions and which are complementary to those provided in adjacent state recreation areas and national parks.

### 3. MANAGEMENT OBJECTIVES

#### 3.1 GENERAL OBJECTIVES

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 and historic features.
- \* Provision of appropriate recreation opportunities.
- \* Encouragement of scientific and educational inquiry into environmental features and processes, prehistoric and historic features and park use patterns.

#### 3.2 SPECIFIC OBJECTIVES FOR THIRLMERE LAKES NATIONAL PARK

In addition to the above general objectives, the following specific objectives apply to the management of Thirlmere Lakes National Park:

- \* Protection of Thirlmere Lakes National Park as part of a system of national parks and other protected lands of the Sydney Basin, with emphasis on maintenance of the ecological relationships between the park and the adjacent protected areas.
- \* Protection of the lakes in a stable and unpolluted condition to protect the scientifically important physical and ecological features of the ancient freshwater lake system.
- \* Preservation of the park as a water catchment area and protection of watercourses that flow through the park into Lake Burragorang, which is Sydney's major water supply.
- \* Promotion of public awareness and appreciation of the park with emphasis on:
  - its importance as part of the reserve system of conservation areas in the Sydney basin;
  - the geomorphological and biological significance of the lakes system; and
  - appropriate use of the lake system.
- \* Promotion of the park for environmental education purposes.
- \* Encouragement of low impact recreation activities consistent with its status as a national park.
- \* Promotion within the local community, particularly amongst park neighbours, of the importance and purpose of management programs necessary for the protection of natural features and the control of fire, weeds and feral animals.

### **3.3 OVERALL STRATEGY**

These specific objectives will be implemented as part of a co-ordinated management strategy with the adjoining Nattai National Park and Bargo, Burragorang, Nattai and Yerranderie State Recreation Areas as well as Kanangra-Boyd and Blue Mountains National Parks.

The emphasis of management in Thirlmere Lakes National Park for the lifetime of this plan will be on the protection of the area and on programs necessary for the maintenance of natural features and processes.

## 4.0 POLICIES AND FRAMEWORK FOR MANAGEMENT

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

Nature Conservation;  
Cultural Heritage; and  
Use of the Park.

The policies in this plan of management provide the framework for management consistent with anticipated resources available to the Service and with anticipated community trends for the next five to ten years.

The actions identified are those to which priority is to be given in the foreseeable future. Other management actions may be developed over the life span of this plan consistent with policies set out in the plan.

### 4.1 NATURE CONSERVATION

#### 4.1.1 Geology, Hydrology and Landforms.

The Thirlmere Lakes are situated within an entrenched valley meander of what was once a well-developed water course. It is believed that the drainage pattern of the original river was disrupted when the surrounding countryside was lowered by tectonic downwarping, thus elevating the meander relative to the surrounding land surface. Such warping was probably associated with the formation of the Lapstone Monocline, which extends into the region. Bishop et al. (1982) suggests that the monocline and thus the lakes may be at least 15 million years old.

A small lake system developed in the elevated basin-like structure of the entrenched meander, which only occasionally overflows to the west down Blue Gum Creek. The geomorphology and the hydrology of the lake system is therefore surprisingly stable. The limited catchment of the lakes and the nature of the adjacent sandstone have probably been important factors in the low rate of siltation that appears to have taken place. Only a small percentage of lakes ever reach this age as they are usually infilled with sediments.

The catchment area consists of rugged sandstone slopes and ridges with associated features of minor cliff lines, colluvial slopes and alluvial fans. Weakly developed soils are found on the debris slopes and fan surfaces whilst residual soils are found on the sandstone ridgetops.

The hydrology of the park includes Blue Gum Creek which drains westward from the lakes into the Little River within Nattai National Park. Fluctuations of water level within Blue Gum Creek and the Thirlmere Lakes themselves correspond to variations in the annual average rainfall. The outlet at Blue Gum Creek limits the height of the lakes. In May 1974 the outlet was open, recording the highest water levels since 1874. It appears that between these peak periods Thirlmere Lakes is probably a closed basin. Studies have shown that on occasions water levels have dropped by four metres below the maximum. The influence of ground water on the lakes is not well understood. No studies on the flow of water through the lakes have been undertaken.

Thirlmere Lakes National Park lies within the Warragamba Catchment Area and Thirlmere Lakes and Blue Gum Creek provide an important source of clean water to Lake Burragorang, Sydney's major water storage system. The Catchment Management Act 1989 provides for Total Catchment Management which aims for

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

- \* Geomorphological and pedological sites, processes and features will be protected.
- \* The Service will oppose any proposed development or activity which may compromise the natural features or threaten to impact upon the natural resources of the park.
- \* All earthworks undertaken in the park will implement soil erosion and sedimentation control measures to standards established by the Department of Land and Water Conservation.
- \* The Service will continue to participate in and support Total Catchment Management committees and apply Total Catchment Management principles in managing Thirlmere Lakes National Park.
- \* The water quality of the catchment will be maintained and all practical measures will be undertaken to prevent the entry of pollutants into the lake system.
- \* Sydney Water Corporation will be consulted where use or management of the national park may affect water quality.

#### 4.1.2 Native and Introduced Plants

The native vegetation within the park can be broadly divided into three major types according to growth form and habit:

**The lentic environment** supports many species of hydrophyte including the rare water-lily relative *Brasenia schreberi* and the tall sedge *Lepironia articulata* which is at the southern extremity of its range.

**The lake margins and colluvial/alluvial flats** support a diverse array of littoral/riparian species including the paperbark *Melaleuca linariifolia* as well as the locally significant river peppermint *Eucalyptus elata*.

**The ridge tops and slopes** are characterised by a sclerophyllous understorey and eucalypt woodland dominated by rough-barked apple *Angophora floribunda*, Sydney peppermint *E. piperita*, red bloodwood *Corymbia gummifera* and yellow bloodwood *C. eximia*.

In all, over 400 species from approximately 250 genera are known to occur within the park. Of these species 13 are non-endemic.

Introduced plant species occur in the park, but are mostly confined to roadsides, boundaries with neighbours, creeks and other areas which have suffered disturbance. Some declared noxious species occur within the park including blackberry *Rubus* spp. Blackberry is widespread although infestations are limited in extent.

In 1984 an infestation of the noxious water fern *Salvinia molesta* was discovered in Lake Couridjah. Lake Couridjah is used for swimming. It was eradicated shortly after

its discovery. The Noxious Weeds Act 1993 took effect from 1 July 1993. The Act places an obligation upon public authorities to control noxious weeds on land that it occupies to the extent necessary to prevent such weeds spreading to adjoining lands.

## Policies

- \* Surveys of native plants will be encouraged to promote a better understanding of the vegetation species and communities within the area.
- \* Priority for control of introduced species will be determined by assessment of their potential:
  - impact on catchment values;
  - threat to significant natural values;
  - threat to neighbouring lands;
  - capacity for dispersal; and
  - new occurrences.
- \* Sydney Water Corporation will be notified in the event of future outbreaks of *Salvinia* or any other aquatic weed species.

## Actions

- \* Management plans may be developed for rare or threatened plant species.
- \* Where appropriate, and particularly in the case of aquatic weed control, the Service and Sydney Water Corporation will develop and implement joint non-native plant control programs.
- \* A Pest Species Management Plan will be prepared for the park.

### 4.1.3 Native and Introduced Animals

Comprehensive faunal surveys have not been undertaken for the area. However from the information that is available it is apparent that native animals which inhabit Thirlmere Lakes National Park include a wide array of terrestrial and aquatic species.

Over 140 species of bush and water birds occur within the park. Species of significance include the Japanese snipe *Gallinago hardwickii*, a species covered by the Japan Australia Migratory Birds Agreement. In addition the Australasian bittern *Botaurus poiciloptilus*, listed as vulnerable under the Threatened Species Conservation Act is known to occur in the park although its resident status and abundance has not yet been established.

Mammals within the park include two species of macropod: the eastern grey kangaroo *Macropus giganteus* and the swamp wallaby *Wallabia bicolor*. Other terrestrial mammals include the forest wombat *Vombatus ursinus* and the short beaked echidna *Tachyglossus aculeatus*. Arboreal mammals known to occur in the park include the greater glider *Petauroides volans*, the sugar glider *Petaurus breviceps* and two species of possum; the brush-tailed possum *Trichosurus vulpecula* and ring-tailed possum *Pseudocheirus peregrinus*.

Reptile species of the park include the red bellied black snake *Pseudechis porphyriacus* and the lace monitor *Varanus varius*. Many frog species are also represented, including the Blue Mountains tree frog *Litoria citropa*, the common eastern froglet *Crinia signifera* and the brown striped frog *Lymnodynastes peroni*.

Introduced predators include the red fox *Vulpes vulpes* and the domestic cat *Felis catus*. Domestic dogs have also been reported hunting native wildlife such as macropods in areas adjacent to the park. Other introduced species include the European rabbit *Oryctolagus cuniculus* and five species of bird. In addition mosquito fish *Gambusia affinis* and silver perch *Bidyanus bidyanus* have been introduced to the lake system and are now very common.

### **Policies**

- \* Research into the conservation requirements of native animal species which are threatened or protected by international agreements will be encouraged.
- \* Introduced animal species will be controlled or eradicated wherever practical.
- \* Control programs for introduced animals will be undertaken; in conjunction with neighbours where appropriate.

### **Actions**

- \* A survey of native animals in the park will be undertaken.
- \* The distribution and abundance of rare and endangered fauna will be recorded.
- \* A pest species management plan will be prepared. The pest species management plan will address the control of both introduced plants and animals.

#### **4.1.4 Fire Management**

Fire has been an important factor influencing the environment of Thirlmere Lakes National Park for many tens of thousands of years. Fire is regarded by the National Parks and Wildlife Service as a natural phenomenon, one of the established physical factors of the Australian environment to which native plant and animal communities have become adapted. The proper management of fire is essential to avoid the extinction of native plant and animal species while protecting people and their property.

The National Parks and Wildlife Service has as its primary aims in fire management:

- to reduce the risk of fire damage to human life and property both within and immediately adjacent to areas where the Service has a statutory responsibility for the control of fire;
- to effectively manage fire for the protection and conservation of the natural, cultural, scenic and recreational features of Service areas; and
- to co-operate with other organisations in fire management planning and implementation within any given area.

The Service has limited documented information on fire regimes within Thirlmere Lakes National Park other than for recent times, but the area appears to have an extensive fire history. Fire records show the most frequent pattern of fire spread is for fires to enter the park from the west. In 1965 the park was completely burnt by wildfire. In October 1972 one third of the park was extensively burnt and 95% of the park was burnt in 1977. Although fires have occasionally started from within the park, the principal threat of fire has been from the catchment areas to the west (now the Nattai Reserves System) and from nearby private property. Wildfire from the west also poses a threat to the villages east of Thirlmere Lakes National Park and Bargo State Recreation Area and to neighbours situated close to the park boundaries.



Both the long term and short term effects of fire on native plant and animal species, including the biota of the surface and sub-surface soil zone, are largely dependent upon fire regimes which consist of three factors; the frequency of fire, the intensity of fire and its seasonality.

The intensity at which a fire burns is directly related to the quantity of accumulated dry litter and other plant material. It is also directly related to ground slope and wind speed. The following features characterise fires in the sandstone areas surrounding Sydney:

- High intensity fires may result from the combination of extreme weather conditions at certain times of the year and the high fuel loads which vegetation of the Sydney sandstone area has the potential to rapidly develop.
- They may threaten human lives, property and heritage valued by the community.
- Fire at frequent intervals may reduce the diversity of habitats and possibly the diversity of species within natural areas.
- Fires that burn large areas may also reduce the diversity of habitats and possibly the diversity of species. In some circumstances frequent and extensive fires may lead to the local extinction of species.
- Many of the animal species and communities within the park are fire sensitive and rely on recolonisation from surrounding areas following fire. The opportunities for such recolonisation in Thirlmere Lakes National Park are high because of the large areas of protected land to the west of the park.

Fires resulting from human activity may be reduced in frequency by effective public awareness and education campaigns.

Thirlmere Lakes National Park is a small area of protected land bounded on the west by the extensive Nattai Reserves System. The management of fire in the national park will be integrated into the overall management of fire in the Nattai Reserves System by means of one comprehensive fire management plan for all areas.

Contemporary ecological research in fire prone ecosystems, such as those which are represented in Thirlmere Lakes National Park, has established broad principles about the fire regimes needed to avoid the extinction of native plant and animal species and thus conserve biodiversity:

- Groups of plant and animal species which constitute an ecosystem respond similarly to fire according to the characteristics of their life-history. It is not necessary to specify fire regimes for the conservation of every species. Rather fire regimes for groups of species need to be defined.
- A diversity of fire regimes is needed to maintain natural diversity. Accordingly the management of fire should aim to provide a pattern of fires of high, moderate and low intensity, frequency and extent. Extinctions are most likely when fire regimes of relatively fixed intensity, frequency and extent prevail without variation.

Scientific understanding of the fire requirements for plant communities is generally more advanced than for animal communities, although recent published research demonstrates that the conservation of many animal species also depends upon a mix of fire regimes including occasional high intensity fires. Over reliance on regular and low intensity fires has an unacceptable impact on critical habitat requirements for native animals.

With these general principles as a basis, fire management guidelines are being developed for native plant communities such as those found on Thirlmere Lakes National Park and the Nattai Reserves System to the west. These define fire regime thresholds for major groups of plant communities. If these thresholds are exceeded either way the decline and extinction of plant species can be expected.

The following significant fire frequency thresholds have been identified for the management of fire in forest and woodland communities such as those found in Thirlmere Lakes National Park:

- The **tall moist eucalypt forests** are a critical wildlife refuge in fire. It is essential to protect moist eucalypt forests against too frequent fire.

Loss of species of woody plants will occur in these forests:

- . if the frequency of fires exceeds two fires in quick succession each twenty years;
  - . if two or more high intensity fires with complete scorch of the tree canopy occur within one hundred years; or
  - . if no high intensity fire occurs for between one hundred and two hundred years.
- Loss of species of woody plants within **open forest** or **woodland communities** may occur where the frequency of fires:
    - . exceeds two fires in quick succession each five years; or
    - . is less than one fire every thirty years.

In addition, the Service, like other land owners and managers in NSW, is bound by the Bush Fires Act, 1949, as well as the National Parks and Wildlife Act, 1974, and Service fire policy.

The National Parks and Wildlife Service is a designated fire authority under the Bush Fires Act 1949 and has a responsibility to control the outbreak of fire on its reserves and to mitigate damage to neighbouring properties. The Service may also assist with the control and suppression of fires adjacent to its reserves. In meeting its responsibilities the Service is obliged to undertake hazard management work which may involve clearing and or burning of vegetation.

The Wollondilly District Fire Protection Committee has been established under Section 41A of the Bush Fires Act 1949 to develop and co-ordinate co-operative fire management between fire authorities. The National Parks and Wildlife Service is a member of this committee which is responsible for both the development of co-operative fire fighting and programmes for the reduction of bush fire hazards. This responsibility includes the preparation and implementation of a Section 41AB Fire Management Plan under the Bush Fires Act.

A district-wide computerised Geographic Information System is in place and increasingly will provide information on native plants and animals of relevance to park fire planning.

To give effect to the collection, storage and use of information relevant to the effective management of fire, a record of the history of fire in Thirlmere Lakes and the Nattai Reserves System; its occurrence, frequency and extent is kept. An important function of

research into fire within the six areas is to ensure that the information thus gained is used to improve fire management.

The populations of a number of indicator species of native plants and animals will be monitored and an evaluation made of the performance of the guidelines outlined in the proposed fire regime thresholds for the several communities of native plants and animals. The threshold guidelines may be modified in the light of new scientific information.

Thirlmere Lakes National Park is protected from fire by the comparatively well developed system of roads in the catchment area to the west. Notwithstanding, the maintenance of adequate fire breaks such as M.E. Middleton Memorial Drive, the management track which serves the power line and the north-eastern fire trail helps to mitigate risk of wildfire. Hazard reduction burns along the boundaries of the park and other strategic areas are used to protect neighbours.

### **Policies**

- \* Liaison will be maintained and co-operative strategies developed with bushfire brigades, local government and neighbours to ensure co-ordination in fire management in Thirlmere Lakes National Park, the Nattai Reserves System and on adjoining lands.
- \* Fire in Thirlmere Lakes National Park and the Nattai Reserves System will be managed in accordance with the Section 41AB Plan prepared by the Wollondilly District Fire Protection Committee, the Fire Management Plan for Thirlmere Lakes and the Nattai Reserves System and this plan of management.
- \* The co-operation of all relevant authorities, neighbours and visitors will be sought in eliminating unplanned fires.
- \* The co-operation of all relevant authorities, neighbours and visitors will continue to be sought in achieving an ecologically and socially responsible fire management regime for Thirlmere Lakes National Park.
- \* Measures to lift the level of community understanding of the role and management of fire within Service areas will be undertaken.
- \* All wildfires will be managed and controlled as far as possible within the national park.
- \* Preference will be given to effective fire suppression methods which have the least environmental impact.
- \* Priority will be given to treatment of areas of the reserve adjoining property where there is a high fire risk.
- \* Research into the effects of fire on the natural environment will be undertaken and encouraged.
- \* The Sub-District will maintain a fire management information system to assist in the identification of high fire risk areas and trends in fire occurrence.
- \* Fire management in Thirlmere Lakes and the adjoining Nattai Reserves System will aim to:
  - protect human life and property within the national park and adjacent lands;

- maintain species habitat and diversity, avoid local extinctions of native plant and animal species and enhance the conservation of rare and endangered native plant and animal species; and
- protect structures, objects and places of cultural heritage significance.

## **Actions**

- \* A Fire Management Plan will be prepared for Thirlmere Lakes National Park and the Nattai Reserves System.
- \* The fire management plan for Thirlmere Lakes National Park and the Nattai Reserves System will be reviewed before the commencement of the fire season each year.
- \* The ecological consequences of fire regimes will be reviewed each year against criteria for measuring the fire regime thresholds. The results of such review will be used to derive fire management programmes for the subsequent year or years.
- \* The Service will participate in the preparation and implementation of district co-operative fire management plans under Section 41AB of the Bushfires Act.
- \* Liaison with councils, other land use authorities and neighbouring landholders will be continued to maintain quick response, co-operative fire management arrangements.
- \* Records of fire occurrence will be maintained with particular emphasis on mapping and recording of the area, frequency, seasonality and intensity of fire.
- \* Information on fuel characteristics and fire hazard will be maintained and upgraded.
- \* Existing fire trails will be maintained and use restricted to authorised vehicles only.
- \* No new permanent trails will be constructed for the purposes of fire management and all temporary trails and fire breaks will be rehabilitated after the immediate need for them has passed.
- \* High priority will be given to enforcement of the Bush Fires Act relating to the fire permit system and arson.

## **4.2. CULTURAL HERITAGE**

### **4.2.1 Aboriginal heritage**

The area of the Nattai System of Reserves and Thirlmere Lakes National Park was the traditional home of the D'harawal and Gundangarra Aboriginal people. The Gundangarra Aboriginal people were probably the first inhabitants of the land surrounding Thirlmere Lakes. The Nattai Reserves System and Thirlmere Lakes National Park falls within the area of the D'harawal Land Council.

The Aboriginal name for the area adjacent to the lakes was "Couridjah", believed to mean honey and refer to the nectar of the banksia flowers which are a feature of the park. The explorer and botanist George Caley noted in his diary that the natives collected the nectar by washing the flowers in their water filled coolamons. The early

European name of the area was "Coradgery" a derivative of Couridjah and the lakes were originally known as "Coradgery Lagoons".

The D'harawal and Gundangurra were among the earliest Aboriginal people to feel the impact of European invasion; through the spread of diseases such as smallpox, measles and influenza and by European occupation of their lands. Following massacres of the D'harawal people of Gwaigl near Appin in 1816 and the destruction of the Burragorang people through disease, the eastern Gundangarra moved into the Wollondilly and Burragorang Valleys and Cowpastures areas.

A Register of Aboriginal sites has been established for the whole of the South Metropolitan District of the Service which extends from the Nattai area east to the Illawarra and Royal National Park, however there are few records on this register relevant to the Nattai and Thirlmere Lakes area. It is proposed to establish a separate Register of Aboriginal Sites specifically for the Nattai Reserves System, Thirlmere Lakes National Park and immediate surrounds.

Notwithstanding the absence of formal records, this large area contains numerous Aboriginal sites including axe grinding grooves, engravings, cave art, shelter caves and artefacts. Aboriginal art sites occur in Thirlmere Lakes National Park within shallow sandstone overhangs.

#### **4.2.2 Historic heritage**

The earliest known record of European discovery of the Thirlmere Lakes was an entry in the diary of the second Wilson expedition on 14 March, 1798. The entry reads (sic) "We crosst three deep vallies, with the large ponds of water in each of the vallies. We also crosst one deep gully, we then came to for the night".

John Wilson was an ex-convict and almost certainly the first white man to have visited what is now the Bargo area. Following his release from servitude Wilson chose to wander in the bush with the Aborigines rather than work in the settlement. Wilson was, however, sent on two official expeditions in Sydney's south west during 1798 and it was during the second trip that the Thirlmere Lakes were discovered.

In December 1802 George Caley, who was following the tracks of the explorer Francis Barrallier, became disoriented and headed southward; coming upon the lakes. He believed that he was the first white man to discover them as the diaries of Wilson's expedition had been taken back to England with Governor Hunter. Caley named the largest lake Scirpus Mere (reedy lake) and made reference to the native flora. Caley wrongly concluded that the lakes were the source of the Bargo River.

The area was at this time part of the reserve for the government owned "wild cattle of the cow pastures". The superintendents of the wild cattle may have also been some of the earliest visitors to the lakes.

On 24 September 1867 the Governor, Sir John Young, appointed a Commission to inquire into the best method of supplying Sydney with water. This Commission investigated the potential of the "Couridjah Lagoons" together with a number of other catchments but eventually, in 1869 recommended the Upper Nepean System to the east of Bargo and Appin.

In November of 1867 the Herald reported the visit of "His Excellency the Governor, the Ministers and several influential personages" to Couridjah. During February 1873 Henry Parkes, then Premier and Chief Secretary of New South Wales, selected "Coradgery Lagoons" as the site of the final entertainment for the touring 150 to 200 ladies and gentlemen who accompanied delegates from New Zealand and various

Australian Colonies. The excursion was designed to promote good will and harmony and to encourage emulation for progress amongst the colonies. The Town and Country Journal report called the lakes the Picton Lagoons. It was reports about these influential visits that helped popularise the picnic areas beside the lakes during the early years of the railway.

The history of Thirlmere Lakes is tied to the history of railways on the Southern Tablelands during the late nineteenth century and early this century. When the main southern railway line was extended to Mittagong in 1867 a pumping station was established above the third lake and channels were constructed to connect the various lakes. The Couridjah pumphouse located adjacent to Lake Couridjah was constructed at that time to supply water from the lakes to the steam engines which used the southern railway to Mittagong until 1964.

Built from rough rectangular sandstone blocks, the pumphouse forms a structure 6.8 metres long and 4.8 metres wide. It was originally fitted with a slate roof, which has since been replaced with corrugated iron. The original boiler was found to be unsafe in 1875 and replaced with a boiler out of a No. 5 locomotive. In 1934 the engine, pump and boiler were all replaced. By 1975 the boiler and associated machinery had been removed leaving only the pump's mounting block.

A conservation plan to include fabric conservation and possible adaption of the structure for further use has been identified as a prerequisite for the preservation of this important cultural heritage item.

The railway station served by the pumphouse was initially named "Couridjah" but later changed to Picton Lakes. This station served the Bargo district until the township of Thirlmere grew large enough to acquire a store, bakery and a hotel of its own. The Railways Department name change from Redbank to Thirlmere Siding was probably influenced by the fact that Thirlmere in England supplies part of the water for Manchester.

At one time there was a proposal that Picton and its extensive railway depot obtain water from Thirlmere Lakes and sufficient 10cm water pipes were accumulated to extend a water line along the railway track to Picton. However the town of Picton was incorporated as a municipality in 1895 and a water supply was brought from a small reservoir on the Bargo river. It was thought that the lakes would not have been a reliable source of supply as it had been reported that they were nearly dry in the 1902 drought. The lakes were said to again be almost completely dry in the drought of 1928 and evidence from recent research indicates that the lake levels have sometime in the past been at least 4 metres lower than present levels.

Picton Municipal Council persuaded the Railways Department to change the name of Picton Lakes Station back to Couridjah and, in 1960, the name of the lakes changed from Picton Lakes to Thirlmere Lakes.

During the early decades of this century, and after considerable agitation from local residents, Wollondilly Shire Council built an unsealed access road through the park and named it W.E. Middleton Drive after the father of the then shire president, R.E. Middleton. A fourteen kilometre extension to this road was proposed by way of either a road or a rail link to the Burragorang Valley via Blue Gum Creek. A number of surveys were completed and a start was actually made to the road during the depression of the 1930s under relief work schemes, but the nature of the terrain led to washouts and landslides and the work was abandoned.

During the mid to late 1950s the aquatic plants around the lake margins and the channels between the lakes were cleared and poisoned to improve conditions for power boating and water skiing.

The Nepean Acclimatisation Society stocked the lakes with trout fingerlings in the mid 1960s and although limited success was recorded, a second introduction of 250 silver perch two years later has resulted in the acclimatisation of this species.

Since this time the lakes have functioned as an important teaching venue for Sydney students. Research into the hydrobiology and geomorphological origins of the lakes has more recently been carried out by a number of scientists and the unique character of the lakes makes their value as an educational resource considerable.

### **Policies**

- \* The provisions of the Burra Charter (Australia ICOMOS) for the conservation of places of cultural significance will guide management decisions regarding the park's cultural heritage.
- \* All Aboriginal sites will be recorded and conserved with the participation of the D'harawal Aboriginal Land Council.
- \* Non-destructive research into Aboriginal sites through joint programmes with the D'harawal Aboriginal Land Council or other Aboriginal community groups will be encouraged.
- \* All European cultural sites will be recorded and where appropriate researched and conserved.
- \* Non-destructive research into non-Aboriginal sites will be encouraged.
- \* The Aboriginal and non-Aboriginal cultural heritage of the park will be promoted by providing information to visitors.

### **Actions**

- \* A register of all Aboriginal sites found in the park will be maintained.
- \* A register of all non-Aboriginal sites found in the park will be maintained.
- \* A conservation plan will be prepared for the Couridjah pumphouse.

### 4.3 USE OF THE AREA

It is an important aspect of the management of Thirlmere Lakes National Park to ensure that its use - whether by the general public, special interest groups, Service managers or other authorities - is appropriate, that is in conformity with the National Parks and Wildlife Act and the management objectives and management strategy of this plan of management.

The major categories of use that can be appropriate, to varying degrees, on Service areas are:

- education and promotion of the area, the Service and the conservation of the natural and cultural heritage;
- certain types of recreation;
- research; and
- management operations carried out by the Service and other authorities with statutory responsibilities in the area.

#### 4.3.1 Promotion of the Park

Thirlmere Lakes National Park is to be promoted in association with the Nattai Reserves System with emphasis on the following:

- as part of the system of conservation areas in the Sydney Basin;
- the importance and purpose of protecting Sydney's major water catchment;
- as a natural area with unique geomorphological and hydrological qualities;
- its cultural heritage, particularly that relating to Aboriginal occupation of the area, early European exploration and settlement and its association with the development of railways on the Southern Tablelands;
- for environmental education; and
- for low impact recreation in a bushland setting.

Residents of the local government areas of Wollondilly and Wingecarribee are the most important user group in Thirlmere Lakes National Park at present. However population growth within the expanding urban areas of Sydney's south west, such as Appin, Camden and Campbelltown, indicate that the Nattai Reserves System and Thirlmere Lakes National Park will receive increased numbers of visitors from these centres. Promotion of the Nattai Reserves System and Thirlmere Lakes National Park will be primarily directed at these groups.

The importance and purpose of management programs necessary for the protection of natural features and the control of fire, weeds and feral animals on the park will be emphasised within the local community, particularly amongst park neighbours.

#### Policies

- \* Thirlmere Lakes National Park is to be promoted in association with the Nattai Reserves System:



- as a natural area with unique geomorphological and hydrological qualities; and
  - for its cultural heritage, particularly that relating to Aboriginal occupation of the area, early European exploration and settlement, and its association with the development of railways on the Southern Tablelands.
- \* Promotion of the park will emphasise the importance and purpose of protecting Sydney's major water catchment.
  - \* The use of the park for environmental education programmes by school and other educational groups or institutions will be encouraged.
  - \* Thirlmere Lakes National Park will be promoted for low impact recreation in a bushland setting.
  - \* Promotion of the park will be undertaken through the media, local councils, tourist information outlets, community groups and field study centres.

#### **4.3.2 Recreation Opportunities**

Thirlmere Lakes National Park is part of a regional system of protected and other lands which cater for outdoor recreation near the major growth centres south west of Sydney. In addition to Thirlmere Lakes National Park, areas managed by the National Parks and Wildlife Service within the region include Burragorang, Bargo, Nattai and Yerranderie State Recreation Areas and Nattai and Blue Mountains National Parks. Other day-use areas in the region include Burragorang Lookout within Burragorang State Recreation Area, those managed by the Sydney Water Corporation at Warragamba, Cordeaux, Avon, Cataract and Nepean Dams, the Mount Annan Botanical Gardens, Warrimbirra Sanctuary and a number of reserves managed by local government.

Important considerations affecting the management of recreation in Thirlmere Lakes National Park include:

- its very limited size;
- the need to conserve and protect the significant values of the park;
- the need to protect the Warragamba Special Area under the Regulations of Sydney Water Board Act;
- extensive but low impact bushwalking and bush camping is catered for in the Nattai Reserves System immediately adjacent to Thirlmere Lakes National Park; and
- the need to minimise wherever possible, conflict between park user groups.

Road reserves within the external boundaries of the park are excluded from the park, although the actual road alignment in some cases is not on the road reserve and the roads have been constructed on park land. Vehicle access within the park is via the WE Middleton Memorial Drive, a public road excluded from the park which has been constructed around the outside curve of the lake system.

The road system within Thirlmere Lakes National Park is outlined on the map, centre pages.

The following will apply to the management of recreation activities and facilities in Thirlmere Lakes National park:

**Day use** within the park occurs around Lakes Werri-Berri and Couridjah, where basic facilities such as pit toilets, barbecues and picnic tables are provided. Access is via the W.E. Middleton Memorial Drive. These day use facilities will be maintained.

**Bushwalking** within the park largely occurs on tracks located on the alluvial flat lands surrounding Lakes Gandangarra, Werri-Berri and Couridjah. Because of the level topography and their proximity to the main picnic areas, these tracks are suitable for most classes of walker.

In contrast, most bushwalking routes in the adjoining Nattai Reserves System are unformed and unmarked, and consequently more suitable for experienced walkers.

The walking track system within Thirlmere Lakes National Park is outlined on the map, centre pages.

**Camping** is not catered for within Thirlmere Lakes National Park because of the park's limited size and because alternative opportunities for bush camping are provided within parts of the Nattai Reserve System immediately to the west.

Caravan parks and camping grounds with facilities are available in the nearby centres of Bargo, Mittagong, Oakdale and Camden.

**Horseriding** is permitted on public roads and the management track known as Dry Lakes Road.

**Waterskiing** occurred on Thirlmere Lakes prior to the park's reservation as a state park in 1972. The Service gave a commitment to Wollondilly Shire Council in 1972 that the continued use of the park by local boat owners would be permitted as long as scientific and educational values were not compromised.

The 1979 plan of management for Thirlmere Lakes National Park permitted power boating only on Lake Werri-Berri and limited use to a maximum of thirty operator licences, twenty of which are issued to members of the Thirlmere Lakes Power Boat and Aquatic Club. The plan identified a number of concerns with power boating and noted:

- a decrease in waterfowl numbers which occurred in the mid 1950s;
- a decline in or the local extinction of platypus in the lakes between the 1950s and 1960s;
- habitat modification; and
- siltation in the lakes

could wholly or in part be attributed to increased recreation on the lakes, particularly power boating.

Motor boat activities have been banned or restricted in many areas in New South Wales as a result of increased noise levels, bank erosion or because they affect the safety or enjoyment of other users of the waterways. Although research within Australia is limited, overseas studies have shown that powerboats can cause significant environmental damage by:

- the emission of exhaust products into the water;
- leakage of oil and fuel into the water;
- mixing of sediments and overlying waters; and
- causing bank erosion.

The unique aquatic organisms found in the lakes, the significant aquatic and fringing plant communities and the importance of the lakes for scientific research make any disturbance of the natural environment of Thirlmere Lakes a major concern.

In addition, under the Maritime Services Act 1935 (Third Water Traffic Regulations) the operation of vessels for the purpose of water skiing is illegal on inland waters as small and narrow as Thirlmere Lakes.

The Lakes fall within the Warragamba Catchment Special Area. Sydney Water Corporation is the Authority responsible under the Sydney Water Board (Corporatisation) Act 1994 to regulate certain conduct within specified special areas. Prohibited conduct within these areas includes power boating without the approval of Sydney Water Corporation. Sydney Water Corporation has not approved power boating on Thirlmere Lakes and supports its prohibition.

Finally, the amenities at Lake Werri-Berri are provided for all visitors and the experience of the non-boating public is de-valued by the noise associated with powerboats. The confined nature of the valley system surrounded on all sides by high ridges tends to amplify rather than disperse sound and as a result the noise from high performance outboards intrudes to all areas of the park. Alternative water skiing opportunities exist within the region on the Nepean River and at Lake Illawarra. In the near future, the Penrith Lakes Scheme will provide substantial new facilities for waterskiing and power boating on one of the lakes of that development.

The use of powerboats within Thirlmere Lakes National Park is therefore inconsistent with the protection of the lake ecosystems and with the enjoyment of the park by other visitors. The issue of licences for this purpose was discontinued in 1995. Consequently, facilities for power boating will be removed from the park.

## **Policies**

- \* Picnic facilities will continue to be provided around Lakes Werri-Berri and Couridjah.
- \* Car based camping or bush camping will not be permitted within Thirlmere Lakes National Park.
- \* Horseriding will be permitted on public roads and the management track known as Dry Lakes Road. The swimming of horses in any water body in the park is not permitted.
- \* Non-motorised craft are permitted within Thirlmere Lakes National Park.
- \* Facilities for motorised craft of any kind will not be permitted in the park.

- \* Motorised boats and jet skis will not be permitted to use the water bodies contained within Thirlmere Lakes National Park.

\*

### **Actions**

- \* Walking tracks will be promoted in visitor information leaflets.
- \* Track markers and signs will be provided where appropriate.
- \* Signs restricting horseriding activities to roads will be prominently displayed within the park.
- \* Horseriding policies will be explained in visitor information leaflets.
- \* The existing boat launching ramp at Lake Werri-Berri will be removed and the site rehabilitated.

### **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.

Scientific research within the park has largely been undertaken by Sydney Water Corporation, the Service and tertiary institutions. Projects include water quality monitoring, vegetation surveys and the compilation of faunal species lists, all of which are aimed at improving current understanding of the park's natural and cultural resources.

The Service does not presently have the resources to undertake much of the long term research needed for the management of Thirlmere Lakes National Park. A prospectus will be prepared as the basis for the involvement of other organisations and students in research in Thirlmere Lakes National Park and the Nattai Reserves System.

### **Policies**

- \* Research institutions will be encouraged to undertake research within Thirlmere Lakes National Park where it can be shown to be of benefit to the management of the park.
- \* Priority will be given to research on:
  - identification and survey of the park's hydrological biota;
  - conservation strategies for endangered or threatened species or species of significance;
  - detailed mapping of the parks terrestrial fauna and flora at the species and community levels; and
  - preparation of species profiles including management options for significant vertebrate and invertebrate species.

**Action**

- \* A prospectus will be prepared as a guide to priority research objectives.

**4.3.4 Management Operations**

The internal public road system is jointly maintained by the Service and Wollondilly Shire Council. These roads provide access for visitors and neighbours as well as for Sydney Water Corporation and Service officers. Additionally, two other management trails in the north east and south west of the park are used by Service officers and, when necessary for fire management purposes, local fire brigades.

The #39 transmission line maintained by Pacific Power crosses the western section of the park from south to north. Access to this power line is via the management track in the south-west corner of the park.

The management track system within Thirlmere Lakes National Park is outlined on the map, centre pages.

**Policies**

- \* All works, facilities and operations by other organisations will be subject to appropriate environment assessment and authorisations and/or agreements in accordance with Service policy.
- \* Vehicular trails required only for management purposes will remain closed to public vehicular access.

## 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 orderly implementation of this plan will be undertaken within the annual programmes of the Service's Nattai Sub-District in South 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.

The environmental impact of all development proposals will continue to be assessed at all stages of their 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 this plan of management. However, if after adequate investigation, operations not included in this plan are found to be justified, it may be amended in accordance with section 76 (6) of the Act.

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

<b>Program</b>	<b>Plan Ref.</b>
<b>High Priority</b>	
Control introduced plants and animals	4.1.2 & 4.1.3
Prepare fire management plan for Thirlmere Lakes National Park and Nattai Group of Reserves	4.1.4
Maintain fire trails	4.1.4
Maintain fire records	4.1.4
Establish indicator species to monitor fire regime thresholds	4.1.4
Remove the boat ramp at Lake Werri-Berri	4.3.2
Encourage survey of hydrobiological communities	4.3.3
Prepare conservation plan for the Couridjah pumphouse	4.2.2
<b>Moderate Priority</b>	
Survey and map terrestrial plants and animals	4.1.2 & 4.1.3
Prepare prospectus for preferred scientific research projects	4.3.3
Establish track marker signs	4.3.2

Promote horseriding policies by information leaflets 4.3.2

Establish signs regulating horseriding 4.3.2

**Low Priority**

Establish and maintain Aboriginal sites register  
for Sub-District 4.2.2

Establish and maintain non-Aboriginal sites register  
for Sub-District 4.2.2

Establish scientific research prospectus 4.3.3

Promote walking tracks in information leaflets 4.3.2

## SELECTED BIBLIOGRAPHY

- Akkersdyk, P. (1993) **Flora of Thirlmere Lakes National Park**. unpublished.
- Bishop, P., Hunt, P. and Schmidt, W. (1982) **Limits to the Age of the Lapstone Monocline - A Paleomagnetic Study**. J Geol. Soc. Aust.
- Briggs, J.D. and Leigh, J. (1988) **Rare or Threatened Australian Plants**. Australian National Parks and Wildlife Service
- Fairley, A., and Moore, P. (1989) **Native Plants of the Sydney District**
- Grant, T.R. (1988) **The Biology and Management of the Platypus species report number 5** Unpublished Report to the National Parks and Wildlife Service.
- Horsfall, L. (1984) **The Impact of Motorboating Activities on Thirlmere Lakes National Park**. Unpublished Report to the National Parks and Wildlife Service.
- Jackivicz Jr. T.P. and Kuzminski L.N. (1973) **A Review of Outboard Motor Effects on the Acquatic Environment**.
- National Parks and Wildlife Service (1979) **Thirlmere Lakes National Park Plan of Management**.
- Rankin, B. (1979) **Couridjah Water Supply**.
- Sydney Water Supply Report 1869 Commission Appointed to Inquire Into The Supply Of Water To Sydney and Suburbs**. Government Printers