

KANANGRA-BOYD NATIONAL PARK

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

April 2001

This plan of management was adopted by the Minister for the Environment on 5th April 2001.

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FOREWORD

Kanangra-Boyd National Park comprises 68,661 ha of mostly rugged terrain on the eastern fall of the Great Dividing Range. The park is located about 130 km west from Sydney and is accessible by vehicle from the Oberon plateau.

Kanangra-Boyd National Park, together with Blue Mountains, Wollemi, Gardens of Stone, Nattai, Thirlmere Lakes and Yengo National Parks and Jenolan Karst Conservation Reserve, has been recently inscribed on the World Heritage List as the Greater Blue Mountains World Heritage Area.

The park exhibits natural values which are significant on a local, regional and continental basis and important to our understanding of long-term evolutionary and climatic processes. In particular, the park protects important ecological refugia, including: the plateau escarpments, where protection from fire and drought enables remnant rainforest communities to occur, a sub-alpine refuge consisting of snowgum communities, sub-alpine swamps and bogs and karst areas which demonstrate geomorphological processes typical of limestone.

The park also includes the headwaters of the Kowmung, Kanangra and Jenolan River systems which supply potable water to Sydney's major water storage at Lake Burragorang (Warragamba Dam).

Kanangra-Boyd National Park is a major wilderness and scenic resource. Although most visitors are day users, a significant proportion are attracted by wilderness bushwalking, adventure caving, canyoning and camping opportunities.

The plan of management recognises the close relationships between Kanangra-Boyd National Park and the adjoining Blue Mountains National Park. The two parks are a continuous ecological entity.

This plan of management establishes the scheme of operations for Kanangra-Boyd National Park. In accordance with section 75 of the National Parks and Wildlife Act, this plan of management is hereby adopted.

Bob Debus
Minister for the Environment

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1. INTRODUCTION

The *National Parks and Wildlife Act 1974*, requires that a plan of management be prepared for each national park. A plan of management is a legal document 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.
- * The Minister may adopt the plan after considering the comments of the Advisory Council or may refer the plan back to the Director-General and Council for further consideration before adoption.

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

This plan of management applies to lands reserved as Kanangra-Boyd National Park. In the event of any other areas being added to the park, they will be managed in accordance with the management principles outlined in this plan and consistent with the adjacent recreation setting. An amendment to this plan will be placed on public exhibition if significant management changes are proposed, including a change to the recreation setting.

For additional information Kanangra-Boyd National Park or this plan of management, please contact the Service's Oberon Office at 38 Ross Street, Oberon (telephone: 02 6336 1972) or the Blackheath Office at the Blue Mountains Heritage Centre, Govetts Leap Road, Blackheath (telephone: 02 4787 8877).

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.

The *National Parks and Wildlife Act 1974* defines national parks as "spacious areas containing unique or outstanding scenery or natural phenomena" (Section 8(2)(a)), and specifies matters to be considered in the preparation of a plan of management for a national park (Section 72(4)). The *Wilderness Act 1987* specifies the objects of the Act in relation to the protection, management and promotion of wilderness and the principles to be observed in the management of wilderness areas.

For the purpose of preparing plans of management, the NSW National Parks and Wildlife Service has also adopted the International Union for the Conservation of Nature and Natural Resources definition of a national park:

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

National parks are part of the regional pattern of land use. Many land uses throughout the region, for example forestry, mining and agriculture, require substantial modification of the natural environment. Management of national parks, however, aims at minimising disturbances to the natural and cultural environment. Therefore national parks provide for only a limited part of the range of land uses in any region.

2.2 WORLD HERITAGE

The International Convention for the Protection of the World Cultural and Natural Heritage was adopted by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1972, and ratified by Australia in 1974. The Convention provides a framework for international cooperation and the collective protection of cultural and natural heritage of outstanding universal value.

The Greater Blue Mountains Area was formally nominated by the Australian Government for inscription on the World Heritage List in June 1998, on the grounds of both natural and cultural criteria (NPWS and Environment Australia, 1998). In November 2000 the nominated area of over one million hectares, which includes the whole of Kanangra-Boyd, Blue Mountains, Gardens of Stone, Wollemi, Nattai, Yengo and Thirlmere Lakes National Parks and the Jenolan Caves Karst Conservation Reserve, was inscribed on the World Heritage List.

The Greater Blue Mountains Area was inscribed on the World Heritage List because it satisfies the following criteria for natural values of outstanding universal significance. It contains:

- * outstanding examples of significant ongoing ecological and biological processes in the evolution and development of ecosystems and communities of plants and animals (*criterion II*), particularly eucalypt-dominated ecosystems; and
- * important and significant natural habitats for in-situ conservation of biological diversity (*criterion IV*), including the eucalypts and eucalypt-dominated communities, primitive species with Gondwanan affinities such as the Wollemi Pine, and a diversity of rare or threatened plants and animals of conservation significance.

This plan has been prepared in accordance with the Convention for the Protection of the World Cultural and Natural Heritage. In accordance with the Convention, this park will be managed to identify, protect, conserve, present and transmit to future generations, the World Heritage Values of the property.

2.3 KANANGRA-BOYD NATIONAL PARK

2.3.1 Location, History of Dedication and Regional Context

Kanangra-Boyd National Park comprises over 68,000 ha of mostly rugged wilderness landscape. It is located about 130 km from the outskirts of the Sydney metropolitan area with access via Katoomba, Jenolan Caves or Oberon.

The first small step towards the creation of the park occurred in 1891, when a Reserve for Public Recreation was created at Kanangra Walls. The area now embraced by the Kanangra-Boyd National Park formed part of Myles Dunphy's plan, conceived in the 1920s, for a Greater Blue Mountains National Park. A significant step towards this vision was taken in 1937, with the creation of a large Reserve for the Protection of Flora and Fauna in the southern Blue Mountains. Nearly 40,000 hectares in size, the reserve protected, at least in theory, large parts of the current Kanangra-Boyd and Blue Mountains National Parks.

Kanangra-Boyd National Park was created in 1969. The initial area of nearly 40,000 hectares excluded an area at Mt Armour where limestone mining was proposed and most of the Boyd Plateau which was reserved as Konangaroo State Forest. Community conservation campaigns led to the abandonment of both the mining proposal and the planting of exotic pine plantations on the Boyd Plateau, and both areas were subsequently added to the park.

The park is bordered to the east, south and partially to the west by Blue Mountains National Park. The park encompasses an extensive plateau and a deeply dissected valley system embracing a network of creeks and rivers. The high plateau is an outlier of the Central Tablelands and reaches an altitude of 1334m at Mt Emperor. The lowest altitude in the park is reached on the Coxs River at 160m.

The park includes the catchments of the Kanangra, Jenolan and Kowmung rivers which form part of the catchment area of Lake Burrorang. Lake Burrorang is the main

source of Sydney's water supply. A major section of Kanangra-Boyd National Park, and of the adjoining Blue Mountains National Park, is co-operatively managed by the Service and the Sydney Catchment Authority (ie Warragamba Joint Management Area). The maintenance of water quality is therefore an important factor in park management. In addition the Sydney Catchment Authority and its predecessors have played a major role in the protection of this land since its declaration of the Warragamba Special Area in the 1940s.

To the west is Jenolan Caves and the associated 2,422 hectare karst conservation reserve. The park also lies to the east of the extensive Oberon plateau rural landscape which includes several economically important softwood plantations.

The relatively remote and unmodified condition of the park is increasingly sought by the community. The park provides significant opportunities for wilderness recreation and adventure activities which complement the scenic tourism opportunities in Blue Mountains National Park.

The park is affected by several planning instruments including the Hawkesbury-Nepean Regional Environmental Plan No. 20, Oberon Council Local Environmental Plan (LEP) and Wollondilly Council LEP. The park is generally zoned 8(a) National Park under the above LEPs. Management and development activities within the park are affected by these instruments in addition to the National Parks and Wildlife Act 1974. State Environmental Planning Policy No. 4 and State Environmental Planning Policy No. 58 (Protecting Sydney's Drinking Water Supplies) are also relevant in terms of development control within the park. In addition the Sydney Water Catchment Management (Transitional Arrangements) Regulation 1999 places controls on certain activities being undertaken within the Special Area.

The Special Areas Strategic Plan of Management jointly prepared by the Sydney Catchment Authority and the Service overlays the management of the Warragamba Special Area, which covers part of Kanangra-Boyd National Park. This gives the Sydney Catchment Authority management control over water quality, and issues and activities likely to affect water quality in this part of the park. Nothing in this plan affects the statutory powers of the Sydney Catchment Authority and those powers have been taken into account in the development of this plan.

The Service has prepared a plan of management for the adjacent Blue Mountains National Park concurrently with this plan.

This plan has been developed to ensure consistency with these other plans and planning instruments.

2.3.2 Importance of Kanangra-Boyd National Park

Our recent understanding of the evolution of south-eastern Australia of which the Kanangra region is part, is largely based upon studies of the biogeography of Australian plants, animals and of continental plate tectonics. The species, communities

and ecosystems of Kanangra-Boyd National Park illustrate many important aspects of these evolutionary processes.

The geology and geomorphology of the park provide significant evidence of the processes that operated in the park dating back to the early Palaeozoic Period (400 million years ago). Much of the Australian continent was then located at higher latitudes than today and was an integral part of a larger "super continent"; Gondwana. Sections of what is now south-eastern Australia were then part of the Gondwana shelf. In the deeper troughs, Ordovician, Silurian and Devonian sediments were deposited. These deposits now form the outcropping bedrock of much of the park.

Over the following 300 million years, the southern seaboard was subject to mountain building, volcanic activity, land mass slumping and the initial uplift of the Lachlan Fold Belt. During the early part of this period the Kanangra granites and the Permian and Triassic sediments evolved. These now form the higher areas of the Boyd, Kanangra Walls and Ti Willa plateaux.

During the latter part of this evolution, tectonic events associated with the opening of the Tasman and Coral Seas resulted in the uplift of eastern Australia; forming the steep seaward slopes now recognised as the Great Escarpment (Ollier, 1982). These features dominate the topographic landscape of Kanangra-Boyd National Park and provide excellent opportunities for research, education and aesthetic enjoyment.

The park also contains a number of limestone deposits which are of great scientific interest. They were laid down as coral reefs in shallow waters of the Lachlan Fold Belt during the Ordovician and Silurian periods. Several outstanding karst sites are present within the park, they include:

- * Tuglow caves which are unusual in the Australian context being a long and active stream cave system containing a large stream and waterfall;
- * Colong caves, which are a large ramified cave system with about 6,000 m of passages. It also exhibits significant volcanic dykes and contains important bat roosting sites; and
- * Billy Creek caves which illustrate significant palaeo-karst that contribute to our understanding of karst forming processes.

Many aspects of the evolution of the eastern Australian vegetation since the early Tertiary Period also occur in the park. Our contemporary understanding of this long term history suggests that these communities are the product of climatic changes and evolutionary isolation. This occurred as the Australian continent separated from the Gondwana supercontinent and drifted north to its current location.

Following the separation of Australia from Antarctica, some 45 million years ago, perhaps the earliest change in the Australian flora was the differentiation of warm / cool and moist / dry forms of rainforest. Also becoming widely spread during this period were the sclerophyllous communities which were adapting to the increasing incidence of fire, seasonality of climate and low fertility soils.

The past 2 million years have seen a succession of major ice ages either directly or indirectly affecting the entire globe. Australia was no exception and the tablelands along the eastern margin were decidedly cooler than at present and supported an alpine or sub-alpine flora. The continent has been warming since about 17,000 years ago and these vegetation communities have all but disappeared from the lower tablelands. They remain, however as disjunct remnants on the higher massifs of New South Wales such as Gibraltar Range, Ebor / Point Lookout, Barrington Tops, the Boyd Plateau and throughout the Australian Alps.

Today the natural landscape of the south-eastern Australian tablelands is dominated by dry forests and woodlands, predominantly the dry sclerophyll eucalyptus communities. The broad-leafed rainforests and sub-alpine forests of the tablelands now only occur in fire and drought resistant refugia and karst systems, usually associated with rugged mountainous terrain such as that in Kanangra-Boyd National Park and other montane regions of the eastern escarpment. The small relict areas therefore exhibit a variety of both Gondwana and post Gondwana elements of Australia's geological, climatic and biological evolution.

The sub-alpine refugia provide habitat for the majority of the park's rare plant and animal species. At least nine rare species have been identified, several being representative of restricted or isolated populations e.g. *Boronia deanei* (3VCa) and *Eucalyptus macarthurii* (2RCi) (Briggs & Leigh, 1995).

The diversity of forest types provides opportunities for species hybridization such as that documented between *Eucalyptus dalrympleana* sub. spp. *dalrympleana* and *Eucalyptus viminalis*. Such biological processes are important to the long term conservation of genetic diversity in the eucalyptus genus. The moist montane and snowgum forests have now been largely cleared from the central tablelands. Regionally important examples of these communities are conserved in Kanangra-Boyd National Park.

Karst areas in the park provide unique environments for some uniquely adapted and rare animals. These species have evolved so that they spend at least some of their life cycles in the twilight zones of cave passages.

Aboriginal sites and places through the tableland areas indicate a long and diverse association with the environments of the Blue Mountains. The western slopes and coastal areas adjoining the Great Escarpment have shown evidence of Aboriginal prehistory dating back approximately 20,000 years.

The Kanangra-Boyd and southern Blue Mountain National Parks are relatively unmodified and have retained large, natural landscapes. The rugged and remote nature and the generally low-nutrient soils of the Blue Mountains largely precluded their use for European agriculture and settlement. The park's importance as part of the Kanangra Wilderness, the second largest in New South Wales, is well recognised. Additionally, streams and rivers within the park are recognised as having wild and scenic qualities.

The isolation of Kanangra-Boyd National Park from major thoroughfares has dictated that recreation in the area has been relatively unsophisticated, until recently. The growing popularity of adventure recreation, recreational vehicle access and our increasing leisure time has led to new levels of demand and accessibility for park visitors.

The importance of Kanangra-Boyd National Park can be summarised as follows. The park:

- contains geological structures and rock types which demonstrate the tectonic evolution of Australia during the Palaeozoic era;
- provides refugia for temperate and dry rainforest communities which evolved during the Tertiary Period and sub-alpine and swamp communities which evolved during the Quaternary Period. They are important for understanding climatic change on the Australian continent since it drifted clear of Gondwana;
- is part of a system of protected lands in the Sydney Basin which extend from Brisbane Water National Park across several reserves linking to Wollemi National Park down to include Blue Mountains and Nattai National Parks which are linked to Royal and Heathcote National Parks and Illawarra State Recreation Area in the south-east of the region. Together they constitute the largest conservation area in New South Wales and encompass a significant area of natural biodiversity with habitats representative of the coastal margins, the central tablelands and the western slopes;
- as part of this system of protected lands, provides opportunities for evolution and shifts in species ranges in response to climatic variations because of its considerable spatial and latitudinal expanse;
- includes cavernous karst environments which provide a significant geomorphological resource and habitats for a diversity of cave dwelling fauna, including important bat roosting sites;
- provides habitat for at least eight threatened animals and a further ten rare species of invertebrates;
- provides habitat for at least nine rare or threatened plant species and over twenty other plant species which are uncommon;
- encompasses a large tract of land which, in conjunction with Blue Mountains National Park, is recognised as having high wilderness value. The isolated Kowmung valley provides unique opportunities to experience a wild river system in a wilderness setting;
- is a major catchment for the Warragamba Dam, providing one of the largest unpolluted sources of water for Sydney's water supply. The Kowmung River is one of the few undeveloped river catchments in New South Wales;
- was part of the land inhabited by the Gundangarra people and possibly by the Wiradjuri people;
- contains significant Aboriginal art sites;

- contains Aboriginal heritage which is an important part of present day Aboriginal culture;
- potentially contains important Aboriginal habitation and ceremonial sites;
- potentially contains evidence of early non-Aboriginal exploration and settlement of the plateau;
- provides extensive opportunities for self-reliant and low-impact recreation in natural and wilderness settings, within day travel distance of Sydney; and
- provides outstanding scenic opportunities including vistas of the Kowmung valley and Kanangra-Boyd Wilderness. These values are highlighted by massive geophysical features associated with the Bindook, Werong and Boyd plateaux.

3. OBJECTIVES OF MANAGEMENT

3.1 GENERAL OBJECTIVES FOR NATIONAL PARKS

The following general objectives derived from the *National Parks and Wildlife Act 1974* apply to the management of national parks in New South Wales:

- The protection and preservation of scenic and natural features;
- The conservation of wildlife and natural biodiversity;
- The maintenance of natural processes as far as possible;
- The preservation of Aboriginal and historic sites, features and places;
- The provision of appropriate recreation opportunities; and
- The encouragement of appropriate scientific and educational inquiry.

3.2 SPECIFIC OBJECTIVES FOR KANANGRA-BOYD NATIONAL PARK

In addition to the general objectives of management, the following specific objectives shall apply to the management of Kanangra- Boyd National Park:

- management of Kanangra-Boyd National Park as a part of Greater Blue Mountains World Heritage Area to conserve the natural biodiversity and to maintain natural processes;
- protection of the sub-alpine and rainforest communities;
- protection of water quality;
- protection and, where necessary, restoration of wilderness areas;
- protection of the geological and biological values of karst areas in the park;
- protection of significant historical evidence of exploration and landuse;.
- management of recreation and tourism within the park to minimise the impacts on the park's natural and cultural features and maintain opportunities for a diverse range of recreational experiences consistent with environmental protection; and
- promotion of public awareness of the park with emphasis on its world heritage significance and wilderness values as they relate to the park.

These specific objectives will be implemented as part of a co-ordinated management strategy with the adjoining Blue Mountains National Park.

3.3 OVERALL STRATEGY

Given the regional context of the park, there will be two major management emphases for Kanangra-Boyd National Park during the life of this plan:

- implementation of a co-ordinated management strategy with adjacent conservation reserves to enhance their ecological integrity as the largest natural area in eastern New South Wales and to protect their wilderness values; and
- promotion of appropriate land use planning and management amongst relevant land management authorities to ensure the protection of the park's outstanding natural and cultural values from adverse external impacts.

Emphasis will also be given to the following specific management strategies:

- ongoing monitoring and improved management of recreation activities which have the potential for adverse impacts on the park's natural and cultural features, particularly its wilderness areas;
- monitoring and regulation of commercial tourism and recreation to minimise potential adverse impacts and enhance opportunities for visitor appreciation and understanding;
- survey and monitoring of the park's natural heritage to contribute to better understanding of biodiversity and to assist in development of management programs; and
- co-operative programs with the local community, particularly neighbours of the park, to raise awareness of the importance and purpose of management programs and increase the effectiveness of programs for control of fire, weeds and introduced animals.

The remainder of this plan outlines the policies and actions required to achieve the above objectives and strategies.

4. POLICIES AND FRAMEWORK FOR MANAGEMENT

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

- natural heritage;
- cultural heritage; and
- use of the area.

The policies established in this plan of management will provide the framework for management consistent with anticipated resources available to the Service and anticipated community trends for the next 5 to 10 years. Management will also be in accordance with the Service's Field Management Policies (NPWS, 1988) which are not repeated in the plan. Other management actions may be developed over the life span of this plan consistent with the policies set out in the plan.

4.1 CONSERVATION OF NATURAL HERITAGE

4.1.1 Geology, Landforms and Soils

Kanangra-Boyd National Park embraces a significant geological boundary between the Lachlan Fold Belt and the Sydney Basin. The deeply dissected topography has exposed a range of rock types notably the folded and partially metamorphosed Silurian and Devonian sandstones, limestones, shales and siltstones. The steeply dipping limestone lenses have been eroded to form extensive karst landscapes which include several cave systems of importance to science, conservation and recreation. Other strata include the Carboniferous granites and Permian sediments. Many of these rocks occur as relict outcrops such as the Permian conglomerates at Kanangra Walls, the granites near the Jenolan River and the Tertiary basalt flows at Budthingeroo.

Active erosion of the Great Escarpment has resulted in spectacular cliffs and waterfalls. The most popular of these include the dramatic wilderness vistas at Kanangra Walls and Morong Creek and the deeply eroded Coxs and Kowmung valleys. The result is a landscape of dramatic relief and a large altitudinal range (almost 1200m) which attracts a wide range of visitation.

The park encompasses the head-waters of three important river systems. High orographic rainfall and the natural condition of the stream catchments contribute to the value of the park as a resource for water supply. The north easterly flowing Kowmung, Jenolan and Kanangra Rivers provide the largest source of high quality water to Lake Burrangorang, Sydney's major water storage system.

Policies

- * The Service will minimise the impacts of visitor use, management activities and adjacent land uses on geological, geomorphological and hydrological processes

within the park by imposing conditions of use on activities within the park and through liaison with determining authorities and neighbours outside the park.

- * No new development or activity will be permitted within the park which significantly impairs:
 - scenic viewscales and the natural skyline within the park; or
 - important geological or geomorphological features particularly the aesthetic values of cavernous karst and karst related features and cave environments and cave forming processes.
- * The Service will seek to prevent, through liaison with determining authorities and neighbours, any proposed new development or activity external to the park which significantly impacts the natural skyline or viewscape as seen from within the park.
- * All relevant management activities in the park will utilise soil erosion and sedimentation control standards and practices as developed co-operatively with the Department of Land and Water Conservation and the Sydney Catchment Authority.
- * The water quality of catchments will be maintained and all practical steps taken to limit the entry of pollutants into catchments. Pristine catchments will be protected.
- * The Service will encourage the co-operative management of catchment areas affecting the park by involvement with appropriate Catchment Management Boards.
- * The Sydney Catchment Authority will be consulted in regard to management of the Special Area, and in regard to any activities on the park which may affect water quality.
- * The extraction of sand, clay, rock, gravel or any like substance will be prohibited, except for an essential management work where no practical/prudent alternative is available and where environmental impact is considered acceptable.
- * The Service will include objectives and actions for minimising erosion arising from prescribed and wildfires in its fire planning and management programs (see also section 4.1.5 Fire Management).

Actions

- * Disturbed sites not required for public or management use or to be protected for their historic value will be progressively rehabilitated using locally indigenous species collected from or near to that location. Restoration works will only use geologically compatible soil and gravel.
- * The Service will liaise with local councils and other relevant management agencies to minimise the impacts of adjacent developments on the scenic values of the park, with particular emphasis on wilderness viewscales.
- * The Service will develop maintenance standards and maintenance priorities for public access roads, management trails and walking tracks to minimise erosion and impacts on the park (see also section 4.3.3 Vehicle Access, 4.3.5 Walking Tracks and Bushwalking and 4.3.12 Management Facilities and Operations).

4.1.2 Native Plants and Animals

The park protects a large diversity of special environments, communities and habitats that occur in the area as a result of unique edaphic, climatic, topographic and geological interactions. These include heathlands, cavernous karst systems, rock outcrops, swamps, rainforest, wet sclerophyll and dry sclerophyll forests.

Animals

The native animals of the park have not been studied or surveyed in any detail, however in the wider regional context, the vast undisturbed natural areas within the park are expected to support relatively large and widespread populations of native animal species.

The park provides habitat for at least eight animal species that are listed under the Threatened Species Conservation Act, 1995 as either endangered or vulnerable. The wet forests of the plateau provide habitat for a large number of arboreal mammals, including the vulnerable brush-tailed phascogale (*Phascogale tapoatafa*). The protection of native fish species which occur within park streams is the responsibility of NSW Fisheries.

The seven karst areas in the park provide unique habitat. Seven species of bat have been recorded, one of which, the vulnerable little bent-wing bat (*Miniopterus australis*), has one of only five known nursery sites at Church Creek caves. Also associated with caves is the vulnerable brush tailed rock wallaby *Petrogale penicillata*, which inhabits rocky outcrops at the Jenolan River and Church Creek caves. A range of invertebrates inhabit the caves and although poorly studied, several species such as the cave cricket (*Orthoptera rhabdophoridae*), a spider (*Pholcidae physocylus*) and the guano mite (*Urobovella coprophila*), are of scientific and conservation significance.

The particular topographical context of Kanangra-Boyd National Park has provided habitat for some animals which are at the edge of their natural range such as the rare Fletchers frog, (*Lechriodus fletcheri*) and a montane lizard (*Leiolopisma entrecasteauxii*).

A number of regionally disjunct mammal populations are conserved in the park. They include the common dunnart (*Sminthopsis murina*), the vulnerable squirrel glider (*Petaurus norfolcensis*) and tiger quoll (*Dasyurus maculatus*).

Although little study has been undertaken, several rare reptiles, amphibians and invertebrates have been recorded in the park. One species, *Peripatus sp.*, is an ancestral life form exhibiting both annelid and arthropod characteristics, which is believed to pre-date continental isolation, and therefore is of scientific interest.

A native winged insect species, the phasmid, has been known to occasionally breed to plague proportions in the wet sclerophyll forests of the Boyd Plateau. Outbreaks have been known to occur on a cyclical basis and result in the severe defoliation of selected

forest communities. The effects however, are usually confined to small areas of the plateau and have not resulted in any known long term impacts.

Plants

The park vegetation is predominantly composed of moist montane forests on the higher plateaux and sheltered slopes and dry sclerophyll forests on the Devonian siltstone and shales at lower altitudes. Rainforest occurs in valleys incising the plateau escarpments of Bindook, Werong and Boyd, where there has been long-term refuge from fire and aridity. Relict sub-alpine swamp and snow gum communities occur where cool air drains into plateau depressions such as at Morong and Whalania.

Although many of the park's vegetation communities are found elsewhere on the eastern tablelands, some are botanically unique to the park such as the Boyd River bogs, the montane heath areas atop Kanangra Walls and the "Kowmung Dry Rainforest" and "Kowmung Wilderness Complex" (after Fisher, Ryan and Lembit, 1995).

At some sites, local geology has a particular influence on the vegetation communities and provides special habitats which include rare, uncommon and disjunct plant populations. They include the granite woodlands near Jenolan River, the residual sandstone woodlands at Kanangra Walls, the distinctive vegetation assemblages of the karst areas at Tuglow, Colong, Billys Creek and Church Creek and the Black Range scrub near Jenolan Caves.

Unique micro-habitats, such as ledges on the cliff-faces, occur within the broad habitats of the park and these often support unusual species and communities.

There are nine Rare or Threatened Australian Plants (ROTAP after Briggs and Leigh, 1995) which have been identified within the park. Some of the rarest species include those which are also listed under the Threatened Species Conservation Act 1995 including *Boronia deanei*, *Acacia clunies-rossiae* (both listed as vulnerable) and the endangered *Hakea sp. B Kowmung River*. A further twenty plant species have been identified as being potentially uncommon.

Policies

- * The Service will seek to maintain plant and animal diversity and distribution through the maintenance of natural processes, the mitigation of human impacts and through specific conservation programs where necessary.
- * The Service will develop specific conservation programs where required for native plant species, populations and communities that are:
 - threatened with extinction, destruction or loss of diversity and productivity in the park (but not necessarily listed under the TSC Act);
 - endemic to the park;
 - at the limits of their geographic distribution;
 - restricted in their distribution;
 - of particular scientific interest;
 - of other specific conservation value; and

- subject to specific impacts or disturbances.
- * Specific conservation programs will be developed and applied to native animal species and populations where their conservation status and potentially threatening processes indicate active management is required to ensure their long term conservation within the park. Particular attention will be given to the following habitats or components of habitat:
 - seasonal food sources;
 - sheltered topographical aspects;
 - the habitats of rare or threatened species, endangered populations and endangered ecological communities;
 - critical habitats;
 - riparian communities;
 - swamps, heaths, tall open forests and rainforests; and
 - sites of particular scientific interest particularly karst systems.
- * Priority for development and implementation of conservation programs will be given to threatened species, endangered populations and endangered ecological communities and their habitats.
- * The Service will ensure during rehabilitation of disturbed areas that material which is foreign to the site or area and introduced species with potential to survive or spread are not introduced (see also section 4.1.3 Introduced Plants and Animals).
- * Research programs will be encouraged into the distribution, habitat requirements and threats to native plants and animals, with priority to threatened species, endangered populations and endangered ecological communities (see also section 4.3.11 Research).

Actions

- * The Service will progressively assess the conservation status of plant and animal species, populations and communities in the park, identify any threatening processes and make recommendations to the Scientific Committee to update listings under the Threatened Species Conservation Act as required.
- * Recovery plans will be prepared and implemented for species listed under the Threatened Species Conservation Act and which occur within the park in accordance with state-wide priorities.

4.1.3. Introduced Plants and Animals

Introduced plants and animals are those species which are not native to the Australian continent or are not endemic to the park. Some of these species are detrimental to the park because they directly compete with or prey upon native species, they provide habitat for or host other introduced species and/or they affect soil and water and the recreational, cultural, aesthetic and scientific values of the park.

Introduced species vary widely in their abundance, impact, state of naturalisation and ability to spread to and from neighbouring lands.. Economic and environmental impacts may result if these species are not managed to acceptable levels.

A large portion of the park is undisturbed wilderness and subsequently has resisted the invasion of many of the introduced plant and animal species that are prevalent in adjoining areas. Currently there are eight introduced animals and nine introduced plants of concern in the park. Because of the occurrence of introduced species across tenures and the major sources that lie beyond the park boundary, control programs must be carried out in a co-ordinated and co-operative manner with other agencies, park neighbours and the community to achieve maximum success.

Introduced plants

Because of its largely undisturbed wilderness condition, the majority of the park is free from high densities of introduced plants. Localised occurrences of concern are associated with disturbed sites such as old logging camps at Budthingeroo, the extensive vehicular trail system, former agricultural properties such as at Whalania Heights, zones with highly altered fire regimes, park boundaries adjoining agricultural and forestry areas and areas with high populations of introduced animals.

Introduced plants, such as blackberry (*Rubus fruticosus*), have dispersed along waterways from disturbed sites, notably the upper Kowmung River. Vehicle use, horse riding and other human activities may also contribute to the spread of weeds into or within the park. Other introduced plants of concern include serrated tussock (*Nassella trichotoma*) and scotch broom (*Cytisus scoparius*). Broom is aggressively invasive and has a high potential to spread within the park. Willow trees (*Salix babylonica*) have also spread down the Kowmung River from a variety of sources.

Introduced plant occurrences of concern occur at:

- * Boyd Plateau. Former cleared grazing lands, logging roads and camps are affected by blackberry, Scotch broom and willows.
- * Kowmung River. North western slopes of the lower altitude country along the Kowmung River have patchy but consistent occurrences of prickly pear (*Opuntia stricta*) and tiger pear (*Opuntia aurantiaca*). Blackberry and willow have patchy but consistent distribution along the main watercourse and larger secondary drainage lines.
- * Jenolan River. Lower slopes of the river and the upper slopes of some tributaries have patches of tutsan (*Hypericum androsaemum*). A co-operative program with the Sydney Catchment Authority and Jenolan Caves Reserve Trust to control this invasive weed is proposed.

Areas to the west of the park have mixed land use including grazing, forestry and rural residential. Scotch broom, radiata pine (*Pinus radiata*), blackberry and serrated

tussock occur in these areas. All of these species pose a significant long term threat to the park.

There is good information on weed control, weed distribution and abundance in the park. Control programs are in place for:

- * Blackberry. Blackberries within areas of the park that have good vehicle access have been largely controlled by chemical methods. Biological control utilising golden leaf rust has been extremely successful in reducing the vigour and spread of blackberry on the Boyd Plateau. This has been due to the rust favouring cool high rainfall areas. The rust is most successful when high summer rainfalls occur.
- * Scotch broom. A limited outbreak of scotch broom on the Boyd Plateau has been successfully controlled. The area is monitored annually with fewer seedlings being encountered on each inspection. This program will need to be carried out for the next 15 years. Scotch broom on neighbouring grazing country associated with the head waters of the Hollanders River is a major concern as it poses a threat to the Kowmung River and Boyd Plateau areas.
- * Willows. Willows have been controlled by chemical injection on parts of the Boyd Plateau and the Kowmung River. The program is a co-operative one involving bushwalkers, bush regenerators and park staff.
- * Radiata pine. Pine wildlings are predominantly establishing themselves within the park in areas adjacent to forestry plantations. Due to the low fire frequency of the area, pines have the potential to grow to a height where they are not killed by flame scorch. Some control is currently underway.
- * Serrated tussock and tree of heaven (*Ailanthus altissima*). These plants have occurred in localised areas of the park. Both have been successfully controlled and monitoring is in place. Serrated tussock occurrences to the west and south of the park are of a major concern. Liaison and support to external agencies and land holders is occurring and is essential to keep these species under control.

Introduced animals

Introduced animals within the park such as the feral pig, wild rabbit, feral goat, feral cattle, feral horse, feral dog, feral cat, red fox and the European honey bee may cause significant impacts on native wildlife and the environment and can also adversely affect recreational values.

Introduced grazing animals impair the regeneration of native vegetation, accelerate soil erosion, create environments favourable for colonisation by introduced plants and aid in their spread. Introduced predators such as the fox (*Vulpes vulpes*) and feral cat (*Felis catus*) are believed to have had the most impact on native animal populations as they both prey upon native fauna and compete with native predators. European bees compete with and displace many native pollinators and have been found to interfere with the reproductive process of many native plants. There are no current beekeeping licences in the park. The impacts of introduced fish in the park, including brown trout (*Salmo trutta*) and rainbow trout (*Salmo gairdneri*) are poorly researched. The Service does not have legislative control over fish within the park but can seek to influence the release of trout into park streams.

There is good information on the distribution and abundance of introduced animals within the park.

Introduced animal occurrences of concern are:

- * Feral pig. Feral pigs (*Sus scrofa*) are well established within the park. Those areas with richer soils such as basalt, shale or river alluvium support the highest populations. The Boyd Plateau and Kowmung River are the most affected areas.

A co-operative control program is well established, involving the Service, Sydney Catchment Authority, adjoining neighbours, Rural Lands Protection Boards and State Forests of NSW. NSW Agriculture oversees the coordination. New management techniques such as Judas collaring are being trialed for remote area pig control and are being incorporated into standard culling methods such as trapping and baiting

- * Feral cattle and horses. Remnant populations from past grazing practices within the park occur along the Kowmung River. Cattle and horses may roam beyond inholdings and neighbouring properties, leading to the establishment of wild populations and expansion of the existing gene pool. Ongoing eradication of the remaining numbers of wild stock within the park and liaison with owners of straying stock have greatly reduced stock numbers in recent years.

Eradication of all wild populations of stock from the park will be an achievable objective within the life of this plan.

- * Wild dogs. Wild dogs occur within the park, with neighbouring sheep stations to the south and west of the park reporting an average of one dog related sheep incident per year. The Service follows a policy of co-operative baiting of wild dogs in perimeter areas of the park. A joint management program is well established, co-ordinated by NSW Agriculture through the Oberon Pig and Dog Board. (For management purposes, the feral dog (*Canis familiaris familiaris*) cannot be differentiated from the dingo (*Canis familiaris dingo*) and both sub-species are referred to as "wild dogs".)

Neighbouring land owners experiencing dog attacks are assisted as soon as is practically possible. Ground baiting is the preferred practice as it reduces impacts on non target species and enables accurate data to be accumulated on baiting success.

- * Goats, foxes, cats and rabbits. Small scale recurrent programs have been undertaken to target these animals in recent years, mainly in response to specific problem occurrences rather than a systematic control program.

Policies

- * Introduced species will be eradicated from the park wherever possible, with emphasis on those with a high invasive potential.
- * Where eradication is not possible or practical, introduced species will be contained or controlled to minimise their impacts on the park and neighbouring land uses.
- * Introduced species control programs will be developed based on the following priorities:

Introduced plants

- Species classified as noxious weeds under the Noxious Weeds Act 1993 which have the potential to spread to neighbouring properties, e.g. serrated tussock;
- Programs identified within a species recovery plan or threat abatement plan;
- Occurrences which pose a significant threat to a population of a threatened or rare native species;
- Species which threaten the conservation, water quality or recreational value of an area, e.g. willow;
- Species which must be controlled/contained to allow another high priority management program to be effective;
- Species of limited distribution, but known to be an important problem in other parks, e.g. scotch broom;
- Species that the community has identified as a high priority;
- Species for which continued management is necessary to maintain benefits gained from previous control programs; and
- Occurrences for which a window of opportunity occurs, e.g. an effective biocontrol agent becomes available;

Introduced animals

- Species for which a national emergency control program has been declared;
 - Programs identified within a species recovery plan or threat abatement plan;
 - Species which pose a significant threat to a population of a threatened or rare native species, e.g. feral goats or foxes in rock wallaby habitat;
 - Species which threaten the conservation value of an area, e.g. pigs throughout the park;
 - Species which must be contained to allow another high priority management program to be effective;
 - Species declared noxious under the Rural Lands Protection Act or for which a local order has been proclaimed, and identified by neighbours as requiring high priority for control action, e.g. pigs, rabbits and wild dogs;
 - Species which have an impact on water quality;
 - Species that the community has identified as a high priority for action; and
 - Species for which continued management is necessary to maintain benefits gained from previous control programs.
- * The Service will continue to monitor and assess existing programs and to research and develop new control methods for introduced species in order to maximise efficiency and minimise non-target impacts.
 - * The Service will seek to implement all programs on a co-operative basis with other management agencies, landholders and relevant community groups so that the benefits of control programs to both the park and park neighbours are maximised.
 - * No European bee hives will be permitted within the park.
 - * Because of their impacts on the park's natural and recreation values, stock will be excluded from the park except:
 - during necessary transport by vehicle on declared public roads;
 - during transport by vehicle to and from inholdings; and

- for horses and other pack animals being used for authorised activities.
- * The Service will continue to seek to limit the introduction or spread of introduced species from outside the park through liaison with other management agencies and park neighbours. The upper catchment of the Kowmung River is of particular concern with regard to several plant species and feral pigs.

Actions

- * An introduced species management plan will be prepared and will include the above policies.
- * Pending adoption of the introduced species management plan, the following control programs will be undertaken as a priority:

Introduced plants

- Radiata pine, particularly in boundary areas adjoining plantation forests;
- Willows, particularly on the Boyd Plateau and Kowmung River;
- Blackberry, particularly on the Boyd Plateau and along the Kowmung, Hollanders and Tuglow Rivers;
- Broom, especially on the Boyd Plateau; and
- New outbreaks or occurrences.

Introduced animals

- Feral pigs, particularly in remote areas;
 - Feral goats, particularly in the Jenolan River area;
 - Feral cattle and horses, particularly in the Kowmung River; and
 - Wild dogs, particularly in the Boyd Plateau and Kowmung boundary areas.
- * An introduced species management information system will be developed in conjunction with other agencies, landholders and relevant community groups. Further survey work will be carried out as necessary to determine and monitor population abundance, distribution, dynamics and impacts of introduced species.

4.1.4 Fire Management

Fire has always been a major factor in the Australian environment, with fires originating from both natural and human sources. Fire regimes, comprising frequency, intensity, season of occurrence and spatial variability, have been influenced by humans since long before European settlement. Fire was used by Aboriginal people to clear the undergrowth and make travelling easier, for hunting and to increase the abundance of certain types of plant food. Mosaic patterns of vegetation of different ages were created over some areas as a consequence of this regular and systematic burning.

When traditional Aboriginal burning ceased, those environments which had been modified by their activities changed again but there is no scientific consensus on the type and extent of those changes. There is very little quantitative information on the pre-European and historic fire patterns of the Blue Mountains, and the dynamics of fire in the Australian environment are still under scientific debate. In recent times in the Blue

Mountains the majority of fires have been of human origin, with most starting adjacent to roads and trails. The predominant natural cause of wildfires is lightning strikes.

Fire has a considerable effect on the cultural, natural and recreational values of the park. Fire regimes are a major determinant of the distribution and abundance of plants and animals in the park. They also affect nutrient cycles, erosion patterns and hydrological regimes. Fire regimes are the result of the dynamic interaction of human, physical, biological, spatial and temporal factors. These interactions are complex and as yet are not fully understood.

Little information is known about fires in the Kanangra area before 1957. In that year most of the area, except the south eastern escarpments of the Boyd Plateau, were burnt by a single wildfire. This fire developed from several remote wildfires which escalated under severe fire weather conditions. Only four substantial fires have occurred in the 38 years since 1957. Two occurred in the Morong Swamps area of the Boyd Plateau and two on the drier slopes in the lower Kowmung Valley and the Tonalli River catchment. The two lower Kowmung fires burnt relatively large areas. Historically, most fires affecting the park commence within the park and remain within the park. Some fires have originated outside the park and burnt into the park and even fewer have originated in the park and spread out to adjoining lands.

Fires ignited by lightning strikes will always be a feature of the park but most are either quickly contained or naturally extinguished by rain that accompanies the electrical storms. The other main cause of fires has been from campfires, most of which have been contained to areas immediately surrounding the campsites. Campfire ignition of wildfires is an increasing risk with the increasing recreational use of the park, particularly in remote areas.

The park is not historically a high fire risk area with predominantly low fuel levels and a low incidence of fires from the park impacting on adjoining lands. However the park's important values for nature conservation, wilderness protection, threatened species protection and as a major recreational precinct demand protection through effective fire management. Particular fire regimes, including very frequent fire or very long intervals between fire, can be detrimental to the long term protection of the park's natural biodiversity. Other threatening processes such as weed incursion, deteriorating water quality and accelerated erosion can be enhanced through inappropriate fire regimes. The park is at some risk from fires which may originate in the developed lands to the west.

Methods used for fire suppression and the maintenance of artificial fire advantages such as fire trails and control lines can also impact on the park's natural and cultural values. There is a need to ensure that the environmental effects of damaging strategies are understood and that they are both necessary and as effective as possible. Both within and adjacent to the park, fire needs to be managed in terms of its potential impact on life and property in addition to its use in the management of natural heritage.

Management trails can be useful in certain circumstances for the management of both prescribed fire and wildfire, if well located, constructed and maintained. Some existing

trails are not of significant benefit. All management trails have high maintenance costs and cause significant ongoing impacts on the park environment. The scale of the impact and the cost of maintenance varies according to location, substrate, steepness, construction standard and levels of use and maintenance. The management benefit of each trail needs to be well demonstrated to justify the continuing impacts and the significant financial costs of maintenance. Ongoing assessment of the management trail system is required to ensure only essential trails are retained, their impacts are minimised and maximum benefit is obtained from resources applied.

Under the Rural Fires Act 1997, the Service is a fire authority and has a statutory responsibility for taking all notifiable steps (if any) and any other practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of spread of a bush fire on or from the park. The Service is required to implement fire management programs (ie notifiable steps) as prescribed within a bush fire management plan which has been approved and adopted in accordance with Sections 58 or 59 of the Rural Fires Act.

The Service fulfils these responsibilities by undertaking fire mitigation, prevention and suppression strategies within the park. In this the Service is assisted by other local resources, especially volunteer rural fire brigades. The Service also assists with the control and suppression of fires adjacent to the park where necessary. The Service regards co-operative fire management combined with community involvement as critical to the achievement of both life and property protection as well as the heritage management objectives in the park. The Service plays a major role in bush fire management committees as the key mechanism for local co-ordination of fire management.

The Service undertakes a range of co-operative and consultative fire planning processes as a key aspect of meeting its objectives. The preparation of bush fire plans of operation and bush fire risk management plans are required under Section 52 (1) of the Rural Fires Act and the Service contributes to these processes through participation on bush fire management committees. The Service is committed to completing reserve fire management plans for all Service areas. The Kanangra-Boyd National Park Draft Fire Management Plan is in preparation and will be released for public comment.

When produced the Kanangra-Boyd National Park Fire Management Plan will complement the NPWS Blue Mountains Region Fire Operations Plan. The latter is an operational plan which is updated annually and contains information on Service policies and procedures for fire response within the Region. Both of these documents are integrated into the plans prepared for local government areas under Section 51 (1) of the Rural Fires Act 1997. The proximity of rural land and forestry plantations to the west of the park requires that a high priority in fire management in these areas be assigned to the protection of life and property.

The Service's fire management is aimed at mitigating the negative impacts of major fire events as well as protecting and conserving the natural, cultural, scenic and recreational values of the park. The Service has played a leading role in the development of fire

management strategies, tools and techniques for the region which effectively balance these differing requirements. The ability to rapidly suppress wildfires in the region has improved significantly in recent decades with the increasing sophistication and co-ordination of local fire fighting resources and the continuing development of aerial techniques for managing fires in remote locations.

Fire regimes have been developed where fire frequency, fire intensity, season of burning and the spatial variability of fire within the landscape are manipulated in order to achieve nature conservation and property protection objectives. Fire management prescriptions are identified using a fire management zoning approach, which takes into account the identified priority management objectives for specific areas. The zones, objectives, strategies and performance indicators will be identified during the preparation of the reserve fire management plan for the park, until then the policies and actions identified below will be adopted.

Policies

- * Fire in the park will be managed in accordance with the following objectives:
 - to reduce the risk of bushfire damage to life and property both within and adjacent to the park;
 - to effectively manage fire for the protection and conservation of the natural, cultural, scenic and recreational features of the park; and
 - to promote effective and efficient utilisation of local bushfire fighting resources through planning and operational arrangements.
- * Fire management will be in accordance with the Kanangra-Boyd National Park Fire Management Plan and will be fully integrated with other park management programs and the management of adjoining lands. The Fire Management Plan will detail the objectives, strategies and performance indicators for each identified zone within the park and the criteria used to develop those prescriptions.
- * The Fire Management Plan will incorporate the following provisions, which will also apply to fire management in the park until the Fire Management Plan is adopted:
 - Whenever possible all wildfires will be managed and contained within the park;
 - Fire management practices will utilise effective fire suppression methods which have the least adverse environmental impact;
 - Unless otherwise specified within an adopted species recovery plan, conservation plan, reserve fire management plan or Section 52 (1) plan, fire will be excluded if possible from the following areas:
 - the habitat of rare or threatened species known or believed to be fire sensitive;
 - areas of low fire risk;
 - areas of naturally low fuel loads;
 - heath communities, sub-alpine swamps, wet sclerophyll forests and rainforests;
 - karst environments;

- the south-eastern escarpments of the Boyd Plateau;
- cliff edge and escarpment vegetation; and
- areas with high erosion potential.
- As far as possible prescribed burning will be implemented in late summer.
- Prescribed fires will be utilised in wilderness areas where essential for wildfire suppression or to achieve specific conservation objectives.
- An effective management trail system will be identified, maintained and kept under review within the park to facilitate essential fire management programs. No new permanent management trails will be constructed for fire management purposes and non-essential trails will be rehabilitated.
- Temporary tracks and firebreaks associated with fire management within the park will be rehabilitated after use.
- * The Service's involvement in the local bush fire committees will be maintained and the Service will continue to develop co-operative management arrangements with other authorities and landholders.
- * The Service will contribute to the preparation of Section 52 (1) bush fire management plans.
- * The Service will continue to plan and implement annual bushfire management works aimed at protecting life and property and protecting and managing natural and cultural heritage, in accordance with the Section 52 (1) bush fire management plan. Research into fire behaviour and into the effects of fire regimes on individual plant and animal species, vegetation communities and biodiversity will be encouraged and where appropriate the results of the research will be incorporated into the park's fire management programs.
- * Information concerning fire management within the park, including strategies to reduce unplanned ignitions, will be incorporated where appropriate in park information and interpretation material.
- * The existing fire danger / park closure public warning system will be retained.
- * During periods of very high to extreme bushfire danger, or when bushfires are burning within the park:
 - appropriate risk management strategies such as Park Fire Bans or park closure will be initiated;
 - recreational use of the park will be regulated to minimise further risk of wildfires and associated threats to visitor safety; and
 - co-operative arrangements with neighbours and other fire authorities for bushfire detection and monitoring will be implemented.
- * The Service will continue to upgrade its fire fighting capability and advance fire fighting techniques and technologies.

Actions

- * A draft Fire Management Plan for Kanangra-Boyd National Park will be prepared as a high priority. It will be made available for public comment prior to adoption and implementation.

- * The Service will continue to maintain and update fire history data for the park and adjacent areas and incorporate this information into fire management planning.
- * The use of camp and cooking fires within the park will be reviewed in consultation with visitor groups with the objective of reducing the risk of wildfire ignitions from this source.
- * A regular review of all existing fire trails within the park will be established as part of the Section 52 (1) bush fire management planning process. Unnecessary trails will be closed and rehabilitated (see also section 4.3.12 Management Facilities and Operations).

4.1.5 Wilderness

A wilderness is a large natural area where plant and animal communities are relatively undisturbed and which provides opportunities for solitude and self reliant recreation. The retention of such areas is becoming increasingly important to conservation in New South Wales.

Kanangra-Boyd National Park contains a substantial area that has been declared as wilderness under the Wilderness Act 1987 (NPWS, 1996). This area was assessed and found to satisfy the criteria for identification of wilderness, viz:

- the area is, together with its plant and animal communities in a state that has not been substantially modified by humans and their works or is capable of being restored to such a state;
- the area is of sufficient size to make its maintenance in such a state feasible; and
- the area is capable of providing opportunities for solitude and appropriate self-reliant recreation.

The Kanangra-Boyd Wilderness (72,500 ha) comprises the rugged gullies and ridges of the Kowmung River, Kanangra Creek and Jenolan River and embraces most of the park as well as extending into the adjoining Blue Mountains National Park. The rugged nature of the area has generally precluded development and hence the area's natural, unmodified qualities have been retained. In addition, the Kowmung River, Kanangra Creek and Jenolan River continue to exhibit wild and scenic river qualities.

A wide variety of recreational activities are considered appropriate for wilderness including bushwalking, camping, caving, fishing, liloing, canyoning, rafting, canoeing, abseiling and climbing. Some of these activities require consent for safety reasons (see section 4.3), for protection of significant sites and to ensure that wilderness qualities are not impaired for other users (ie. group activities which may reduce opportunities for solitude).

The wilderness does not affect the Boyd River camping and picnic area, the Dingo Dell and Morong Creek camping areas, or the Kanangra Walls facility which is in the public road reserve. It also does not affect a number of inholdings and access routes to inholdings which are excluded from the declared wilderness.

Other lands within (and adjoining) Kanangra-Boyd National Park may be declared as wilderness in future, in accordance with the Director-General's assessment and identification of wilderness and determination by the Minister.

The wilderness qualities of the area may be compromised by aircraft movements associated with nearby airports such as Camden and the proposed Badgerys Creek airport. The "Fly Neighbourly" program was established in parts of Australia recently as a voluntary code for the minimisation of aircraft impacts on the environment.

The following policies and actions relate specifically to wilderness declaration and assessment. Provisions relevant to the protection of wilderness nature conservation values are given in sections 4.1 (Natural Heritage), 4.2.2 (Historic Heritage) and 4.3 (Use of the Park). These provisions may also act to protect wilderness recreation values. Provisions aimed specifically at protecting the recreation values of wilderness are given in sections 4.3.2 to 4.3.10. It should also be noted that use of wilderness that lies within the Special Area is also subject to the Sydney Water Catchment Management (Transitional Arrangements) Regulation 1999.

Policies

- * The declared wilderness will be managed in accordance with Section 9 of the Wilderness Act, 1987. That is:
 - to restore (if applicable) and to protect the unmodified state of the area and its plant and animal communities;
 - to preserve the capacity of the area to evolve in the absence of significant human interference; and
 - to permit opportunities for solitude and appropriate self-reliant recreation.
- * Vehicular trails in or through the wilderness will be closed and rehabilitated except where required for essential management purposes or where required for access to private property, subject to the policies below.
- * Temporary tracks and trails created in the wilderness for management purposes (eg wildfire suppression) will be immediately rehabilitated in accordance with sections 4.1.1 and 4.1.2 of this plan.
- * Vehicular and horse access along defined access routes within the wilderness will only be provided under the following circumstances and will be subject to the prior consent of the NPWS Regional Manager (and Sydney Catchment Authority for lands within the Special Area):
 - Access to cultural sites (eg. Aboriginal grave sites) may be permitted under special circumstances and particularly where the activity can be linked to essential management requirements;
 - Access may be permitted for emergency management purposes such as wildfire suppression and search and rescue operations;
 - Access may be provided for the undertaking of essential management programs aimed at protecting the wilderness condition (eg. wildlife

management or pest species control programs, infrastructure maintenance, prescribed burning programs) or for protecting and conserving important cultural sites; and

- Access will be permitted to private property within the wilderness where no reasonable alternative exists, where the environmental impact of use is acceptable, where the proposed use is consistent with past use patterns and where the access route is also required for essential park management purposes.
- * Access corridors to inholdings through the wilderness are excluded from the wilderness. These corridors will be managed as wilderness in all respects other than permitting authorised vehicular or horse access for owners of the inholdings in accordance with a formal agreement with the Service (and Sydney Catchment Authority where appropriate).
- * Existing walking tracks on the Kanangra Tops within the wilderness (as indicated on the map on the central pages of this plan) will be retained and managed to minimise impacts on natural values.
- * Other walking tracks and routes within the wilderness will be allowed to overgrow unless required for essential park management or property access purposes and will not be signposted or described in detail in Service track notes or other Service publications.
- * The co-operation of authors of track notes and other publications referring to the wilderness will be sought to ensure impacts on the wilderness are minimised.
- * The use of seeing eye dogs and hearing dogs for disabled persons within the wilderness will be permitted only under special circumstances with the prior approval of the NPWS Regional Manager.
- * Recreational use of the wilderness will be restricted to those activities which are essentially self-reliant and of minimal impact and in accordance with Service policies.
- * Where permitted under the National Parks and Wildlife Act, commercial recreational activities within the wilderness will only be approved where the activities are essentially self-reliant, consistent with existing patterns of recreational use, of minimal impact and do not otherwise compromise wilderness qualities.
- * Structures will not be permitted within the wilderness unless for essential wilderness management purposes and will be removed provided that they are not of cultural significance.
- * Within wilderness, management priority will be given to park protection and species conservation programs.
- * Sections of the Kowmung River, Kanangra Creek and Jenolan River and their major tributaries within the park wilderness area may be declared and managed as wild and scenic rivers under Section 61 of the National Parks and Wildlife Act.
- * Public awareness of the values and of appropriate use of wilderness and wild and scenic rivers within the park, including minimal impact practices, will be promoted.

- * After consultation with relevant interest groups, access to the whole or part of the wilderness may be temporarily restricted if visitor use is causing environmental impact in conflict with the preservation of ecological integrity of the wilderness.
- * The Service will continue to acquire freehold properties within the wilderness based on acquisition priorities, the Service reaching agreement with the landowner and as funds become available.
- * The Service will condition any approvals issued for activities within the wilderness to minimise impact and user conflicts.

Actions

- * The boundaries of the wilderness will be signposted on tracks and trails and other areas where appropriate to highlight their location.
- * The following management trails (also refer to map, centre pages) which are in the wilderness within Kanangra-Boyd National Park will be managed and maintained for essential park management purposes (subject to section 4.3.12 Management Facilities and Operations):
 - Moorara Boss;
 - Whalans;
 - Mount Warlock;
 - Mount Thurat;
 - Baldy Bill;
 - King Pin;
 - Queen Pin; and
 - the access trail to the inholding on Bulls Creek.
- * Other trails within the wilderness will be allowed to overgrow or will be actively rehabilitated.
- * Access consents will be negotiated and finalised for all inholdings within the wilderness.
- * The Service will seek the co-operation of the flight industry, the Civil Aviation Authority and the Department of Defence to minimise the impacts of aircraft use over the wilderness.
- * A brochure will be prepared which identifies the wilderness and which contains a minimal impact code of conduct for recreational activities within the wilderness. The information will seek to encourage visitors to use fuel stoves and to remove all waste.
- * Interpretive signposting will be installed at appropriate access points to the wilderness to provide information on wilderness values and minimal impact camping.

4.2 CONSERVATION OF CULTURAL HERITAGE

Under the National Parks and Wildlife Act, 1974, the Service is required to give regard to the preservation of historic features and Aboriginal sites within national parks. The Service is guided by the provisions of the Australian ICOMOS Charter for the conservation of places of historic heritage significance (ie the Burra Charter; ICOMOS 1988) and the views of local Aboriginal communities in the management of Aboriginal heritage sites within the park.

Important cultural features occur in many areas of the park and provide a record of human activities related to the natural features of the park. These features may be affected by the impacts of recreational activities, research, introduced species and management operations, as well as by natural deterioration resulting from erosion and regeneration. Cultural sites are non-renewable and may require intervention by management to ensure their conservation. In some cases the protection of cultural heritage may be inconsistent with the protection of natural heritage.

4.2.1 Aboriginal Heritage

Understanding of Aboriginal prehistory in the park is presently based upon extrapolation from sites and places adjacent to the park. From our knowledge of the western slopes and coastal areas adjoining the Great Escarpment there is evidence that Aboriginal occupation of the area dates back approximately 20,000 years.

Important evidence has been derived from the early European records in the Burraborang Valley and the more recent archaeological investigations in the upper and lower Blue Mountains. These studies suggest the Kanangra region was inhabited by the Gundangarra language group and possibly the Wiradjuri of the south western slopes.

Kanangra-Boyd National Park has not been systematically surveyed for Aboriginal sites and places. There are approximately forty recorded sites and places in the park, primarily art and grinding groove sites, including some important sites in the Kanangra Walls area.

In addition to these, the park is likely to contain hundreds of as yet unrecorded sites and places. Campsites are likely to be found along the main watercourses and additional grinding grooves, shelter occupation sites and engravings are also likely to be found.

Of the known sites and places in the park, several are particularly important for understanding Aboriginal occupation. There is evidence to suggest that the park has spiritual significance to the Gundangarra people. Features such as Coxs River, Kowmung River and Jenolan Caves are believed to figure strongly in their beliefs.

Kanangra-Boyd National Park lies within the areas of the Wiradjuri Local Aboriginal Land Council, the Gandangara Local Aboriginal Land Council and Gundangarra Tribal Council. These and other relevant groups will be consulted regarding the management of Aboriginal sites in the park.

Policies

- * The Service will seek to involve the Aboriginal community in the management and interpretation of the park's Aboriginal heritage, including significance assessment, conservation planning, protection, interpretation and promotion.
- * The park will be surveyed to locate and record Aboriginal sites and places as resources permit, with priority to areas most threatened with human impact or natural deterioration.
- * Conservation policies will be prepared and implemented for significant sites and places under threat with priority to those at greatest risk and of greatest Aboriginal, cultural or scientific importance.
- * Management activities with the potential to damage Aboriginal sites or places will be preceded by site survey and heritage impact assessment. Works will be modified or relocated to protect sites and places of cultural significance.

Actions

- * An Aboriginal heritage management group will be established to facilitate Aboriginal participation in Aboriginal site and place management. Priority tasks will include:
 - identifying priorities for site surveys and research;
 - identifying priorities for site conservation and protection works; and
 - preparing guidelines for the promotion and interpretation of Aboriginal sites and places.
- * The Blue Mountains Aboriginal sites register will be progressively updated and data incorporated into geographic information systems for park planning.
- * Conservation policies will be prepared and implemented for the sites and places at Kanangra Walls.

4.2.2 Historic Heritage

There has been no systematic survey for historic places in Kanangra-Boyd National Park. Some of the very first attempts by Europeans to cross and settle the mountain ranges were made in the Kanangra region and the park contains historic places associated with these activities dating from the first half of the nineteenth century. The Burratorang Valley was then one of the most promising routes to the west. Attempts included those by adventurer George Bass in 1796, who made it as far as the Blue Breaks and Ensign Francis Barrallier of the New South Wales Corps who in 1802 penetrated the Kowmung Valley returning just short of the Kanangra plateau.

After the Blaxland crossing to the north in 1813, Kanangra was largely ignored by explorers until the colonials developed a better understanding of the Blue Mountains topography. Subsequently, the explorers White and Govett in 1833 were the first to comprehensively explore the lower Kowmung River.

With the discovery of precious metals at Yerranderie in 1871 came an influx of part time explorers and graziers who established many of the present day patterns of access. The flooding of Lake Burratorang in the 1950s, for Sydney's water supply, effectively isolated Kanangra once again from the coast.

Other historical sites in the park include roads for cedar logging and stock routes, such as the Oberon to Colong stock route. Shale oil and coal mining sites occur on escarpments and evidence remains of the mining in the Colong caves in the 1930s for the phosphates in the bat dropping deposits.

A dance floor installed under a large rock overhang at Kanangra Walls in 1891 by the Oberon community was often used as a gathering point for local pastoralists. The cave became known as the Dance Floor Cave and, although no trace of the floor now remains, the cave is historically significant.

Many of the park's outstanding scenic and recreational opportunities gained widespread recognition in the mid 1800s and early 1900s. The reservation of some of the most outstanding sites at the nearby Jenolan Caves occurred in 1866 and in the

Kanangra Walls area in 1923. Kanangra Walls grew as a popular attraction to the visitors based at Jenolan Caves and Oberon.

The emerging conservation concern and recognition of community needs for recreation became important issues in the 1960s and 1970s. At that time two significant land use issues involving the future of the Boyd Plateau forests and the mining of the Church Creek limestone became major conservation controversies. As a result, both areas were protected within Kanangra-Boyd National Park and these outcomes promoted the maturation of the conservation ethic in Australian society and set the scene for the Greater Blue Mountains system of parks; now a major conservation, recreational and scientific resource in Australia.

Policies

- * Historic heritage within the park will be managed in accordance with the provisions of the Burra Charter (ICOMOS 1988).
- * Historic places will be protected from natural threatening processes, where possible, and from impacts arising from management and use of the park until their significance has been established and long term conservation policies have been developed to guide management.
- * Historic places will be assessed on a priority basis as resources permit to determine their significance, condition, impact on other park values, threats to their conservation and suitability for interpretation or other use.
- * Conservation policies will be developed and implemented for significant places under threat based on the above assessment. Management options may include passive management and periodic monitoring, stabilisation, adaptation, restoration, interpretation or other use, or recording and removal.
- * Natural decay will generally be preferred to removal, except where there is no effective alternative for reasons of public safety or environmental impact.
- * Management activities that have the potential to damage historic places will be preceded by site survey and heritage impact assessment. Works will be modified or relocated to protect sites of cultural significance.

Actions

- * A heritage survey of historic places in the park will be progressively undertaken as resources become available. This information will be used to update the Blue Mountains Region historic places register.
- * A monitoring program will be developed and implemented for significant historic places.
- * Appropriate information on the European history of the Kanangra Walls area, in particular the dance floor cave and the cattle stock route, will be provided for park visitors and incorporated in park brochures.

4.3 USE OF THE PARK

It is important to ensure that the use of the park, whether by the general public, special interest groups, Service managers or other authorities, is "appropriate", ie., it is consistent with the Act and the management objectives and strategies in 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, and the conservation of natural and cultural resources;
- certain types of recreation;
- scientific research; and
- management operations by the Service and other authorities with statutory responsibilities in the area.

The extent to which these categories of use are appropriate to Kanangra-Boyd National Park is indicated below.

4.3.1 Education, Interpretation and Promotion of the Park

Kanangra-Boyd National Park has been promoted as part of the Greater Blue Mountains park system but visitors primarily become aware of the park by word of mouth or whilst visiting adjacent attractions such as Jenolan Caves.

Provision of information for park visitors is centred on the Kanangra Walls precinct as this area attracts the majority of visitors to the park. Recently interpretative displays have been upgraded in this location to cater for increased visitation. It is proposed to modify these displays to include more information on the Kanangra-Boyd Wilderness.

A guidebook has also been prepared for the park to supplement the original park brochure. It is available through all NPWS offices and tourist information centres in the Blue Mountains

Policies

- * The interpretation and promotion of the park will be enhanced by emphasising its special features and regional context through an integrated information/interpretation program for the regional park system.
- * Two major themes are recognised as important to the promotion, interpretation and understanding of the park:
 - the outstanding biophysical landscape incorporating a large wilderness and the opportunities this resource offers for self-reliant recreation activities;

- the sub-alpine environments of the Boyd Plateau and their importance to our understanding of long-term climatic and evolutionary process.
- * The promotion of the park will include static displays in the park and will be directed to park neighbours, local communities and visitors including overnight campers, adventure groups and recreational vehicle users. Interpretive displays will be located at major visitor destinations and other key locations.
- * The Service will continue to liaise with the local tourism industry, especially Oberon Plateau Tourism Association, Blue Mountains Regional Tourism Organisation and Jenolan Caves Reserve Trust, to more effectively manage tourism in the park with the objective of meeting tourism needs without compromising the natural and cultural values of the park.
- * Information and interpretative displays will continue to be provided at the Jenolan entrance to the park and at Kanangra Walls.
- * The off-park promotion will primarily be in the form of brochures, local newspaper articles, mail-outs to neighbours and stakeholders and involvement with local communities.
- * The off-park promotion will primarily be provided through the Service's office at Oberon, other Service offices in the region and the Jenolan Caves Reserve Trust offices at Bathurst and Jenolan Caves.

Actions

- * The park booklet will be kept under review to provide up to date information on wilderness, access, camping, scenic locations and park resources.
- * Brochures on specific park resources and recreation opportunities will also include information on minimal impact recreational use of the park. This information will also be provided at visitor centres and on interpretive displays in the park.
- * The Service will continue to develop its *Discovery* interpretive program, including investigation of options for improving the quality, quantity and geographic spread of activities offered. The emphasis will continue to be on environmental interpretation and education and away from hard adventure.
- * Directional signs will be provided to assist vehicular access to destinations such as camping areas, day use sites, scenic locations and track heads.

4.3.2 Recreation Opportunities

Estimates based upon surveys and visitor monitoring have indicated that over 40,000 people visit the park each year. Surveys have also indicated that visitors are largely attracted by the extensive natural landscape, scenic sites and self reliant recreation opportunities.

A variety of recreational activities are popular. They include short walks, extended bushwalking in remote and trackless regions, sightseeing, overnight car based camping, vehicle touring, adventure activities such as caving and canyoning and water-based activities such as fishing.

Kanangra-Boyd National Park is an important part of a regional pattern of outdoor recreation which includes the adjoining intensively used, high profile areas of the Blue Mountains National Park as well as the State Forests and rural recreation opportunities provided in the Oberon district.

As part of the park's role in providing recreation opportunities and conserving the natural and cultural values of state and national significance in the region, two recreational settings are recognised:

Wilderness: involves a large, substantially unmodified area that represents an ecologically viable system containing many of the significant park features and processes. The area also provides many outstanding opportunities for solitude and self-reliant recreation. This area includes the rugged mountainous areas of the Kowmung, Kanangra and Jenolan Rivers and sections of the Boyd Plateau.

Natural: includes sections of the Boyd Plateau which have been partially modified by roads and agriculture but still retain many natural and cultural values of importance and significance complementary to the adjacent wilderness areas. A public vehicular system provides access to a number of visitor destinations.

Recreation activities within the Warragamba Special Area are also controlled by the Sydney Water Catchment (Transitional Arrangements) Regulation 1999 due to water supply protection requirements.

Policies

- * The provision of recreation opportunities will be consistent with the objectives and policies relating to the protection of natural and cultural resources outlined in this plan. This will emphasise opportunities to experience the scenic and recreational qualities of the Kanangra-Boyd Wilderness and the low-intensity facilities provided in the sub-alpine environments of the Boyd Plateau.
- * Recreation management in wilderness areas will:
 - be consistent with the Wilderness Act 1987;
 - protect opportunities for isolation, solitude and self-reliance;
 - involve regulation of use where recreational impact on wilderness values is approaching unacceptable levels (ie limits on party size and prior approval being sought for various activities in wilderness areas);
 - involve the provision of facilities essential for the protection and management of degraded areas where there are no practicable alternatives;
 - be consistent with the Sydney Water Catchment (Transitional Arrangements) Regulation 1999; and
 - encourage visitors to practice minimal impact bushwalking, caving, rock climbing and canyoning techniques.
- * Recreation management in natural areas will :

- include the maintenance of existing visitor facilities such as public access roads, walking tracks, camping, picnic and scenic sites;
 - promote the natural values and scenic qualities of both the wilderness and the natural settings;
 - provide various walking opportunities in proximity to major camping areas, primarily for access by family groups;
 - provide access for disabled persons where possible and appropriate to the site and recreation setting;
 - protect public safety through the provision of appropriate structures, visitor information, on-site signposting and/or off-site promotional programs, consistent with the recreation setting;
 - minimise visitor conflicts and impacts on parks resources by regulating recreation activities where necessary;
 - encourage visitors to minimise their impact on the park by removing their own rubbish and using alternatives to wood fires, in conjunction with other minimal impact camping and bushwalking techniques.
- * Prior approval from the Regional Manager will be required for the following activities:
- school and other educational group activities;
 - military training exercises;
 - organised instructional activities and all commercial recreational activities;
 - all competitive activities, including orienteering and rogaining; and
 - group activities in which more than 20 people camp overnight or venture more than 300m from a public access road.

Approval will be dependent upon the activity being consistent with existing recreational use patterns and of minimal impact.

- * Competitive activities including rogaining and orienteering will not be permitted in the wilderness. Campsites and the start and finish of events will only be permitted on park where the impact on the environment and other visitors is minimal. Organisers will be required to monitor, assess and report on impacts (refer also section 4.3.10).
- * Group size will be limited to 8 people within the wilderness setting to ensure that environmental impacts are minimised and opportunities for solitude are not compromised. Prior approval may be given by the Regional Manager in exceptional circumstances for larger parties. This limit may be revised if ongoing monitoring indicates that larger or smaller party sizes are acceptable or necessary to achieve wilderness management objectives.
- * Group size limits will be implemented initially via educational and promotional programs in consultation with relevant interest groups. A permit system may be developed if these programs are not effective.

Actions

- * Interpretive displays will be constructed at appropriate track heads emphasising themes of wilderness values and minimal impact bushwalking.
- * A review of warning signs at Kanangra Walls near the main lookout will be undertaken.

- * A visitor use monitoring program will be established and maintained, in co-operation with relevant interest groups, with the following objectives:
 - to determine the pattern of recreation use in the park including locations, types of use, number of visitors and seasonal distribution of use;
 - to identify visitor needs;
 - to identify and, where possible, quantify visitor impacts on the park's natural and cultural heritage and on other park visitors, to provide a more objective basis for future management of recreation in the park.

4.3.3 Vehicle Access

Access to the park is primarily by the Kanangra Walls Road which provides high grade unsealed vehicular access through the centre of the Boyd Plateau to Kanangra Walls. This road is a declared public road and tourist road, and is maintained by Oberon Council.

Few vehicular routes occur in the more rugged locations off the Boyd Plateau apart from several short trails created during past fire operations.

Recreational use of trails is generally light and infrequent with the exception of the Kowmung River road, which is a popular recreational vehicle route from the Kanangra Walls road across the Kowmung River through to the southern Blue Mountains National Park and Yerranderie.

The growth in popularity of four wheel drive vehicles has resulted in a broader awareness of the park and hence a steady increase in park visitors and demand for vehicle access to remote recreation sites. Increased use has contributed to intensified pressure on some popular destinations such as the Boyd River and Dingo Dell camping areas, the Kowmung River crossing and along the Kowmung River road, resulting in impacts which have required restorative action.

Policies

- * Public vehicular access will be provided to recreational facilities and some trackheads within the Natural setting.
- * The Service will continue to liaise with Oberon Council on the maintenance of the Kanangra Walls Road, with the objective of maintaining a good quality medium speed two wheel drive standard.
- * The following roads will be maintained by the Service for public access within the Natural setting of the park (see park map):
 - Kowmung River road from Kanangra Walls Road, across the Kowmung River to Dingo Dell and the adjoining Blue Mountains National Park (four wheel drive standard past Boss Mountain); and
 - Morong Creek trail from the Kowmung River road across Morong Creek to Kanangra Walls Road (four wheel drive standard).

Actions

- * Roads and trails not required for public access (see above), management purposes or for walking tracks will be rehabilitated or allowed to revegetate.
- * A regular review of public access roads will be established to ensure that their use is necessary for access to features of recreation or tourism significance and that they are managed within acceptable environmental and financial limits, user conflicts are minimised and appropriate levels of public safety are provided.
- * The Service will continue to liaise with Oberon Council to ensure that up to date and appropriate information on public access roads is available for park visitors and that warning signs are erected where necessary to promote visitor safety and minimise environmental impacts.

4.3.4 Day Use and Camping

Day-use is most popular at Kanangra Walls and along vehicular trails between the Boyd Plateau and the adjoining Blue Mountains National Park.

Camping with vehicle access in the park occurs at a small number of popular sites some of which have subsequently become degraded. Areas of coarse and infertile granite soil are highly vulnerable to devegetation and erosion. At the Kowmung River, camping and vehicle impacts have resulted in the loss of vegetation, scouring and severe erosion. These impacts have the ability to compromise the natural, aesthetic and water catchment values of the site.

At the Boyd River camp site, vehicular impacts have similarly resulted in the loss of ground cover with some areas suffering from the effects of soil erosion. This site is one of only a few in the park that provides habitat for the rare tree *Eucalyptus macarthurii*. Adjacent to the Boyd River site is an Aboriginal occupation site which is in need of conservation. There is a need to re-assess the use of this facility to protect these important values.

Policies

- * The provision of day-use and camping facilities will focus on the Boyd River, Kanangra Walls, Morong Creek and Dingo Dell areas within the Natural setting. This will include a number of sites which provide for appropriate vehicular access, camping and day-use.
- * Kanangra Walls will be the primary location for interpretation, promotion and access to wilderness in the park. Facilities will include an interpretive display, sightseeing opportunities and walking tracks to the perimeter of the wilderness.
- * Camp sites will be provided on Morong Creek and the Kowmung River to cater for visitors who wish a greater degree of camping solitude and isolation. The Kowmung River camp site will be a walk-in camp site.
- * Day-use picnicking opportunities will be provided in the Boyd River area and at Kanangra Walls.

- * Facilities will be designed to provide for use by the disabled and aged where feasible.
- * Bush camping (ie, camping away from developed sites) will be permitted at least 300 metres away from and out of sight from any road, constructed walking track or any other visitor facility, provided that no damage to existing vegetation or other natural features will be caused.
- * Camping will not be permitted on karst areas. Karst areas are identified on the park map.
- * Unless otherwise approved by the Regional Manager, camping will be limited to a maximum period of one week at any site, both to protect the park's natural and cultural heritage and to provide more people with the opportunity to camp in the park.
- * Minimum impact camping techniques will be promoted in association with relevant interest groups.
- * Fuel stove only areas may be declared where wood fires are having an unacceptable environmental impact and/or pose a high fire risk.
- * More sophisticated, high impact accommodation facilities such as lodges, cabins, huts and caravan parks will not be permitted in the park.

Actions

- * Facilities will be provided as follows:
 - **Boyd River area.** A camping and picnic area will continue to be provided in the vicinity of the Boyd River crossing on the Kanangra Walls Road. Other potential sites in the immediate area will be assessed and an alternative site with similar facilities provided subject to a favourable environmental assessment.
 - **Kanangra Walls.** The Kanangra Walls scenic site will be managed as a location for day use, wilderness interpretation, scenic viewing and walking access. The existing toilets and picnic tables will be maintained but fires will not be permitted due to the fire danger at this site. Constructed walking tracks to the lookout (disabled standard), Kalang Falls and Kanangra Plateau will be maintained.
 - **Kowmung River Crossing.** To enable bushwalking and fishing access to the river, a walk-in camp site will be provided. A car-park for up to 4 vehicles will be provided at the walking track head.
 - **Dingo Dell.** To provide an alternative site to the Kowmung River crossing, a car-based camping area will be developed nearby at Dingo Dell which will enable reasonable day-use access to Tuglow caves and the Kowmung River. Up to 10 vehicle camping sites with toilets, an information shelter and fireplaces will be provided.
 - **Morong Creek.** This site is a popular and attractive camping location. The site also exhibits several important natural values which include rare plant species. The soils and ground cover are fragile and prone to erosion. To conserve both the natural and recreational values of this site a

small camping area will be formalised including vehicle barriers, a parking area, toilets and fireplaces.

(**Note:** A camping area is located at **Batsh Camp** in the adjoining Blue Mountains National Park primarily for cavers using karst areas south of the Kowmung River in Kanangra-Boyd National Park).

- * The degraded areas at the Kowmung River crossing and the Boyd River camping area will be systematically closed for rehabilitation works. Once rehabilitation has been achieved at Boyd River, camping sites may be rotated to control future degradation.
- * Appropriate signage will be erected where necessary to advise cavers not to camp on karst areas. Advice to this effect will also be included in brochures, interpretative displays and on cave permit application forms.
- * The Service will review its system for the collection of park-use fees within the park, in line with government policy and in consultation where necessary with industry and peak user groups.

4.3.5 Walking Tracks and Bushwalking

The popularity of walking in remote mountainous areas around Sydney was initially promoted through the travels of Myles Dunphy and other members of the early bushwalking fraternity. Since that time, several major walking routes have developed. They now include links between the Boyd Plateau and the Coxs and Kowmung Rivers along the Gangerang, Krungle Bungle and Uni Rover routes.

Other walking tracks trace old cattle and timber getting routes such as the Gingra Range track. Many additional walking opportunities exist along former forestry roads on the Boyd Plateau.

Constructed walking tracks are limited in the park to the Kanangra Walls precinct. The walking track to Kanangra Walls lookout is the only track which has been specifically designed for high visitation and to cater for a variety of visitor abilities. Other tracks outside this precinct are generally unmarked and unformed, consisting in most cases of little more than a single footpad developed through use. There is a large network of unconstructed footpads which trace major bushwalking routes, especially into the Kowmung River, and access routes to the popular canyon descents in the head of Kanangra Gorge and Christys Creek. Some footpads on major ridgelines are well established.

On plateau sections of the Kanangra Plateau and Uni Rover tracks, wet conditions and high levels of use have in some locations resulted in track deterioration. Track conditions have also declined on the steep, eroded sections of the Acetylene Spur leading to Colong Caves and the Kanangra Plateau track. Restorative work may be required in these locations.

The park is a popular area for weekend bushwalking, being relatively close to Sydney. Levels of use are increasing in some areas, especially on well-known walking routes

and associated with an increase in the popularity of canyoning. The resulting degradation of existing footpads and formation of new footpads in the wilderness area is of concern. Formal construction techniques can only be applied to a limited extent within wilderness areas if the recreation setting is to be maintained.

The Service is developing a Walking Track Management Strategy. The draft will be publicly exhibited for comment. This will provide a methodology for future management of walking tracks. Two major projects have been completed and will provide input to the strategy. A project to develop a "limits of acceptable change" methodology has provided initial data on track usage, visitor expectations and environmental impacts, and provides the basis for ongoing monitoring. A heritage study has assessed the heritage values of the track system.

Policies

- * Walking tracks will be provided in the Natural setting and walking routes will be managed in the Wilderness setting to provide opportunities for:
 - short walks to the major destinations and local features of particular interest, which will cater for a range of walking abilities;
 - day and overnight walking within wilderness areas and other remote sections of the park.
- * New walking tracks will only be constructed if:
 - relocation of an existing track is necessary to avoid or minimise environmental impact or improve visitor safety;
 - they are required as part of the design of another visitor facility and they are consistent with the recreation setting.
- * Track head information/interpretive facilities and small carparks will be provided within the Natural setting at the beginning of walking tracks.
- * Existing walking tracks will be classified and managed according to a comprehensive walking track strategy (see actions below).
- * Any further deterioration of unconstructed walking routes will be minimised through regulation and/or public awareness/education programs.
- * The use of minimal impact bushwalking techniques will be promoted in co-operation with relevant interest groups.
- * Information provided by the Service on unconstructed wilderness walking routes will be limited to general advice on conditions, minimal impact techniques and safety.
- * In accordance with Section 4.3.2 Recreation Opportunities, group size for bushwalking will be limited to a maximum of 8 people in the wilderness setting, and groups larger than 20 people who venture more than 300m from a public access road will require the prior approval of the Regional Manager (see 4.3.2 for details).

Actions

- * A Blue Mountains walking track management strategy (incorporating Kanangra-Boyd, Blue Mountains and Wollemi National Parks) will be developed in consultation with relevant interest groups. The strategy will include:

- a classification system;
 - an inventory of all walking tracks and routes including information on their location, management objectives, recreation setting, environmental impact, level of use, classification and construction standard, cultural value, current condition, safety factors, maintenance requirements and costs and interpretative potential;
 - priorities for maintenance and reconstruction
 - provision for establishment of a walking track monitoring programme to provide basic information on levels and patterns of use and associated visitor impacts. Ongoing walking track monitoring will be undertaken in accordance with recommendations arising from the pilot project which commenced in 1996.
- * Pending the adoption of the walking track management strategy, the following track management works will be undertaken as a priority:
- the track to Kanangra Walls lookout will be maintained to the existing disabled (wheelchair) standard;
 - access to Kalang Falls will be upgraded to provide a high standard walking track to the top of the falls;
 - the track to Kanangra Plateau will be maintained to the existing standard;
 - braided routes across the Kanangra Plateau will be rehabilitated;
 - no further extension of track construction works will be undertaken on the Kanangra Plateau;
 - walking opportunities along disused vehicular tracks will be promoted and will be managed so as to permit the roads to substantially rehabilitate.
- * A public forum on management of remote bushwalking within the Blue Mountains (incorporating Kanangra-Boyd, Blue Mountains and Wollemi National Parks) will be held, with a view to developing appropriate guidelines for management of unconstructed walking routes, particularly within declared or proposed wilderness areas, and minimising associated impacts. Strategies for the regulation of use as well as maintenance standards appropriate to wilderness areas will be considered, consistent with the Service's Wilderness Management Policy.
- * Track head facilities including small carparks and information/interpretive displays will be provided within the Natural setting at the beginning of the following walking routes: Uni Rover, King Pin, Boyd Hill swamp, Moorara Boss, Black Range, Sally Camp Creek.

4.3.6 Horse Riding

Horse riding is a recreation which may be appropriate in limited parts of the park, subject to monitoring of its impacts. Horse riding is also conducted for essential park management purposes. Horse riding is prohibited under the Sydney Water Catchment (Transitional Arrangements) Regulation in those parts of the park which are within the Warragamba Special Area. Service policy prohibits horse riding in wilderness.

Although horse riding was once the main means of travel through the remote areas of the Blue Mountains, use has traditionally been limited to several through-routes and in association with the movement of domestic stock.

Horses can have unacceptable impacts in certain circumstances including erosion of soils and tracks; the introduction of weeds and plant species not native to the area; and conflict with other recreational uses.

Policies

- * Horse riding within the park will only be permitted on public access roads, or in exceptional circumstances with the prior consent of the NPWS Regional Manager (refer section 4.1.5 for horse riding access to inholdings within wilderness and 4.3.12 for horse riding for essential management purposes).
- * Over night horse camps will not be permitted within the park unless for essential management purposes with the prior approval of the NPWS Regional Manager.
- * Roads and trails may be temporarily or permanently closed at any time to riders depending on trail conditions or other management requirements.

Actions

- * The impact of horse riding within the park will be monitored by the Service.
- * A Horse Riding Minimal Impact Code will be promoted to horse riders, clubs and other relevant organisations.

4.3.7 Cycling

Cycling is an increasingly popular recreational activity within the park. However, by comparison to bushwalking the incidence of this activity is low. At present cycling activity is mainly restricted to the public roads and management trails on the Boyd Plateau.

Cycling is prohibited under the Sydney Water Catchment (Transitional Arrangements) Regulation in those parts of the park which are within the Warragamba Special Area.

Walking tracks in the park are generally unsuitable for cycling due to their unformed nature and the extremely rugged steep terrain they traverse.

Policies

- * Cycling will be permitted on all public access roads and all management trails not within the wilderness. Cycling will not be permitted on walking tracks in the park.
- * Cycling within the Kanangra-Boyd Wilderness will only be permitted on those management trails north and east of Kanangra Walls Road which will continue to be maintained following the review of trails provided that the activity will not degrade

wilderness values or threaten the ability of the Service to meet its obligations under the Wilderness Act.

- * Maximum group size for cycling is 12 unless otherwise approved by the NPWS Regional Manager for specific single events.
- * The Service will promote minimal impact cycling within the park.

Action

- * The environmental effects and safety of cycling will be monitored and where necessary restrictions on access to certain trails or other management responses may be applied.

4.3.8 Adventure Recreation

Abseil canyoning activities are becoming increasingly popular. They are also concentrated in the vicinity of Kanangra Walls and to a lesser extent Sally Camp Creek, Christys Creek and other precipitous tributaries of the Kowmung River. The multiple waterfall abseiling opportunities are unique within the Blue Mountains region. Impacts from these activities in the park are considered to be low but increasing. Increased popularity of canyoning has led to the formation of new footpads in recent years. Continued monitoring of these activities will be required to ensure impacts are effectively managed in time.

Other water-based activities such as liloing are also increasing, generally in relation to a few accessible sites such as the Kowmung River crossing.

Abseiling not associated with canyoning occasionally occurs on Kanangra Walls. Rockclimbing has not yet emerged as a significant activity in the park. Caving is covered in the following section (section 4.3.9.)

The National Parks and Wildlife (Land Management) Regulation 1995 prohibits persons from undertaking adventure activities in the park without the consent of the Service. Consent can be provided in a number of formats and it is neither desirable nor practical for specific consent to be required for every instance of persons undertaking these activities in the park. The Regulation can be applied to exclude activities which are inappropriate in the park or at particular locations.

Policies

- * The management of adventure activities will be directed towards:
 - the control of environmental impacts;
 - the protection of appropriate nature-based adventure opportunities;
 - the minimisation of visitor conflicts;
 - promotion of safety;
 - the protection of other park visitors; and
 - the protection of scenic and wilderness qualities.

- * Safe practices will be promoted by the Service through visitor education in preference to direct regulation. Participants will be encouraged to manage their own safety in unmodified environments.
- * The management of environmental impacts, visitor conflicts and non-participant safety issues will be achieved by a combination of promotion/education of appropriate practices and direct regulation, according to the most effective means for each activity or location and in consultation with relevant interest groups.
- * Abseiling, rockclimbing, canyoning and river activities are approved in the park provided that activities are undertaken in accordance with:
 - the provisions of this plan;
 - any code of conduct promoted by the Service; and
 - any other restrictions, exclusions or closures which may from time to time be introduced by the Service.
- * Persons who wish to undertake any other activities in the park which may involve risking the safety of the person or the safety of other persons will require prior written approval from the Regional Manager under the National Parks and Wildlife (Land Management) Regulation 1995. Bungy jumping and hang gliding will not be permitted. Parachuting may only be permitted subject to strict conditions for the protection of public safety, the park environment and scenic values.
- * The Service will liaise with writers and publishers of books and other material on adventure activities in the park to encourage appropriate emphasis on environmental protection and safety.
- * Group sizes will be limited in order to reduce impacts and site crowding as follows:
 - 4 persons per roped party on individual rock climbs;
 - 8 persons for abseiling and canyons involving abseiling;
 - 12 persons (8 in wilderness) for canyons not involving abseiling.

Actions

- * A detailed strategy for the management of adventure activities in the Blue Mountains parks, based on the provisions of this and other plans of management, will be developed in consultation with user groups, implemented and kept under review. The management strategy will incorporate codes of conduct for abseiling, rock climbing and canyoning in the park, and include:
 - minimal impact techniques;
 - limits to group size;
 - recommended safe practices;
 - recognition of approved canyons;
 - the exclusion of new bolts from canyons and wilderness areas, except where the NPWS Regional Manager approves the replacement of existing bolts; and
 - exclusion of damage to vegetation and rock features, route marking, track development and other environmental modifications.
- * The need for a canyon permit system to regulate group size limits or to manage environmental and safety issues at particular sites will be assessed, implemented as necessary and kept under review.

4.3.9 Caving

There are a number of cavernous karst areas in the park, some of which are located in the Kanangra-Boyd Wilderness. The unmodified setting of the Kanangra caves is complemented by the nearby Jenolan cave system which is highly regarded for its tourist show caves.

Caving in the Kanangra area has been a popular recreational activity since the discovery of Colong caves last century. The proximity of the caves to the Sydney metropolitan area also contributes to Kanangra being a relatively accessible and popular adventure caving area.

A permit system for the use of all caves has been applied in the park. It enables staff to contact and obtain feedback from cave users, to monitor impacts upon sensitive features and to restrict the use of any cave system if unacceptable impact is found to be occurring.

The cave permit system has been supported by caving groups and valuable information, important to the management of cave systems, has been fed back to the Service from trip reports and contact with cavers. Because the caves themselves are seen by many as distinct destinations a concentration of specific management issues have occurred at these locations.

Caves are particularly sensitive environments which have evolved in specific conditions of humidity, light and moisture. Accordingly, the caves and their fauna have limited capacity to absorb many impacts. It may be necessary to mark routes or restrict levels of use to protect cave environments.

Some of the karst areas in the park also provide a unique habitat for particular threatened species including the sooty owl and the brush-tailed rock wallaby.

A direct relationship exists between surface and subsurface karst which may affect cave conditions. Camping and the use of vehicles in particular have been found to result in unacceptable impacts in karst environments.

Policies

- * A range of management strategies are recognised as appropriate for the conservation of the natural features and processes of caves as well as for their use for recreation and scientific investigation. Management will in all cases, give precedence to the maintenance of the natural condition of the caves.
- * Caving opportunities and use of caves will continue to be regulated to conserve the natural features and processes and to provide an appropriate level of equality of opportunity between scientific and recreational uses.
- * The need for interpretive displays on karst areas to advise cavers of regulations pertaining to use of these areas and the need for cave protection (ie. gating) will be investigated.

- * Camping and the use of vehicles will not be permitted on any karst area.

Actions

- * Cave access will continue to be managed through a permit system.
- * Caves may be gated, where appropriate, to protect the cave resources.
- * Camping will not be permitted in caves, their entrances or on any karst area.
- * A brochure will be prepared on the karst areas and include information on karst resources, the permit system, caving, equipment and visitor safety.

4.3.10 Commercial Recreation

Guided tours and commercial recreation form a small but significant and growing component of public use of the park, and are an important sector of the tourism industry based in the Blue Mountains and Sydney. Activities include guided walks, tours by conventional and four wheel drive vehicle, wildlife viewing, photographic instruction, abseiling and canyoning, and they range in duration in the park from less than an hour to several days. These tours and guided activities increase the opportunity for public participation in nature-based activities and provide opportunities for professional instruction in the safety and minimal impact aspects of various recreational pursuits. Guided activities also have potential to interpret and promote the natural and cultural values of the park.

The positive role of guided tours and commercial activities needs to be balanced against the protection of the park's natural and cultural resources and the overall high demand for recreational use of the park. Commercial recreation can contribute to an unacceptable level of impact at certain sites and has in the past been a direct cause of specific impacts including damage to rock faces. Commercial recreation may conflict with other recreational uses of the park and increase crowding at some sites. Commercial recreation needs to be managed as a component of all recreation in the park to ensure that it is carried out in a sustainable manner and that all impacts are within acceptable limits. Commercial activities in the park are required by legislation to be licensed. Licensing provides the mechanism for ensuring that activities, levels of use and behaviour are appropriate for the park and specific locations and compatible with general recreational use. The levels of some commercial activities, such as canyoning, are approaching the limits identified by the Service and there may be a need for limiting the number or scale of commercial licences provided by the Service.

It is appropriate that industries and operators who utilise the park's public resources for commercial purposes make a financial contribution to park management and display the highest standards of behaviour towards the park and its protection.

Policies

- * Guided activities, commercial recreational and environmental education activities will only be considered within the park by the NPWS Regional Manager where:

- the operator and guides demonstrate skills, knowledge and experience which are appropriate to the activity, the recreation setting and the needs of clients (eg. have appropriate industry accreditation);
 - the activity is financially viable and is able to cover all Service costs related to managing the activity within the park and preferably has flow-on benefits to local economies;
 - the activity is ecologically sustainable, has a minimal impact on the environment and is consistent with park management objectives;
 - the operator has consulted with neighbours, local Aboriginal community groups and other operators as required by the NPWS Regional Manager;
 - if previously licensed, the operator has a good record and has complied with licence conditions; and
 - the activity promotes natural and/or cultural heritage conservation and minimal impact use.
- * Management of guided activities and commercial recreation will be directed towards:
- protection of the special recreational experiences available in the park;
 - protection of non-commercial recreation opportunities;
 - control of environmental impacts;
 - promotion of safety and accountability;
 - encouragement of professionalism in the industry;
 - provision of quality recreational experiences;
 - maximisation of educational benefits; and
 - recovery of appropriate commercial returns to the Service.
- * All management policies and actions will be developed and implemented in consultation with the commercial recreation industry and other stakeholders.
- * All commercial recreation activities in the park require a licence. Licences will prescribe the approved activities, location and frequency of activities, maximum group sizes and minimum guide ratios for each activity, guide standards, appropriate behaviour, fees and other special provisions to ensure the long term protection of the park, park visitors and recreation opportunities. Licence conditions will be kept under review and amended as necessary.
- * Commercial recreation activities will be required to conform to any group size limits imposed for various activities within the park, including those specified in this plan (see sections 4.3.2 to 4.3.8).
- * Fees will be applied to all commercial use of the park. Fees will be set at or above the minimum level of recovering the costs of managing the activities and the licensing system. Fees for individual operators will be commensurate with their level of use of the park. Both the structure and quantum of fees will be kept under review on the basis of the consumer price index, management costs and impacts of the activities.
- * Commercial recreation activities will not be granted any rights of access which are exclusive of the public or which exceed normal public rights within the term of this plan.
- * Commercial operators whose activities may encroach on or utilise any Aboriginal site or place, must consult with local Aboriginal community groups.

- * Maximum levels of total commercial recreational use in the park will be set for particular activities and particular locations according to precautionary principles. The effectiveness of limits will be kept under review.
- * Where there are competing commercial demands or conflicts between general recreational use of the park and commercial activities, commercial activities will not be permitted to exceed a small proportion of the total use of any setting or location.
- * Where the level of demand for particular commercial activities or locations exceeds the limits applied by the Service, the commercial opportunities will be distributed in a manner consistent with the principles of equity and the objectives for commercial recreation management.
- * Some commercial activities which might normally be regarded as appropriate in a national park setting but which have a high impact may be excluded from the park.
- * Commercial operators will not be permitted to carry out any environmental modifications in the park without approval. Subject to the provisions of this plan, low-key minor facilities to support commercial as well as general recreational activities may be considered provided they are financially assisted by the commercial recreation industry independent of licence fees, do not restrict other recreation opportunities, are of minimal impact and serve to protect the environment or enhance safety.
- * The requirement for commercial activity guides to hold formal qualifications as a condition of licensing will be kept under review and progressively implemented when appropriate.
- * The Service will seek to expand its liaison with commercial operators through improved communication and involvement in conservation training for tour guides.

Actions

- * Unlicensed commercial operators will be excluded wherever possible from the park through monitoring and enforcement.
- * The Blue Mountains District commercial recreation strategy currently in force will be subject to ongoing consultative review and improvement.
- * All licensed commercial operators and activities will be monitored with respect to impacts, safety requirements and compliance with licence conditions.

4.3.11 Research

A substantial amount of research was initially undertaken in the park during the debate on conservation landuse issues in the mid-1960s. Since that time research has been infrequent and mostly directed at particular plant and animal species of scientific or other interest on the Boyd Plateau.

Current scientific research includes investigation of lizards, insects, invertebrates, swamp ecology, and some rare plant species. Little of this information however is of immediate use in understanding the broad ecology of the park or readily applicable to

its day to day management. Redirection of most of the research done on the park into topics relevant to management objectives is essential.

Policies

- * Scientific investigation will be encouraged which will provide information relevant to the management objectives of the park.
- * Research which involves interference with the park's natural or cultural heritage will be licensed in accordance with Service policy and procedures.
- * Research activities within the park will be restricted to those which are non-destructive and cannot be undertaken elsewhere, unless there is an overriding management need.
- * Destructive research may only be undertaken where there is no feasible alternative and the benefits to conservation outweigh any adverse impacts.
- * The following specific research topics will be encouraged:
 - vegetation mapping of the Kanangra wilderness;
 - research into the ecology of the park's vegetation communities;
 - investigation of plant indicator species and plant life cycles important to understanding fire management regimes;
 - karst features and processes;
 - introduced species management;
 - systematic survey for cultural sites and places;
 - building a profile of park visitors and park visitation; and
 - the environmental effects of pit toilets and alternative toilet systems.

4.3.12 Management Facilities and Operations, Alien Uses, Leases and Licences

The park is relatively free of facilities required for park management programs. A number of government organisations however, currently occupy land in the park or have influence on the park due to the proximity of their works, such as the Kanangra Walls road. This includes several disused quarry sites adjacent to the Kanangra Walls road. Of particular concern due to its impact on the values of the park is the quarrying activity within the easement of the Kanangra Walls road.

The Service will be upgrading the quality of visitor access on selected routes in accordance with this plan. They include both roads and some walking tracks. It is important that quarry material used at these locations is compatible with the parent material to minimise the introduction of minerals not otherwise present and to minimise the introduction of foreign plant and animal species into the park.

In some park locations there is no suitable off-park road gravel source economically available. The creation or maintenance of a gravel pit on the park may, in some cases, be the only practical alternative.

The extraction of gravel will be limited to that required for the Service's own use on the park. This activity will be undertaken only when the material is necessary to achieve

approved management objectives and practices and the program of extraction is subject to a review of environmental factors or environmental impact statement.

Policies

- * No new permanent depots or park management installations will be constructed on the park.
- * In the event that any existing built structures are incorporated into the park as the result of an addition to the park, the structures will be considered for Service use, disposal, lease, demolition or other options following a detailed assessment of cultural heritage values, environmental impact, construction standards, statutory requirements, maintenance costs, operational needs and management priorities.
- * The extraction of gravel will be limited to that required for the Service's own use. Gravel will be extracted in accordance with an approved extraction program which will be subject to a publicly exhibited review of environmental factors or environmental impact statement, as appropriate.
- * Disused quarry sites in the park will be progressively rehabilitated using local soils and plants from local genetic stock, where possible.
- * The Service will liaise with organisations and individuals occupying or using lands reserved as Kanangra-Boyd National Park to assess the nature, authority, impact and necessity for their presence.
- * The Service will formalise and update agreements for all essential works, facilities and operations by other organisations (eg transmission lines, water pipelines and radio towers) and authorised access to inholdings (other than via public access roads) within the park in accordance with the Act and Service policy, with the specific aim of minimising adverse impacts on the park.
- * New works, facilities or operations proposed by any organisation or individual will not be permitted within the park unless they are consistent with the purpose of reservation of the park and the provisions of this plan and, for lands included in Warragamba Special Area, the provisions of the jointly sponsored Special Areas Strategic Plan of Management.
- * A system of management tracks, as shown on the map included in the plan and listed in section 4.1.5, will be maintained for fire management, pest species management and other essential park operations.
- * No additional park management access routes will be constructed except in the following situations:
 - re-alignment of an existing route to a more environmentally acceptable location, combined with rehabilitation of the old route;
 - protection of specific natural and cultural heritage values, property or life where such protection is more important than the impact of the trail;
 - temporary trails in emergency situations (eg wildfire control) where there is no prudent alternative and the trail is rehabilitated as soon as possible after the incident.
- * Horse riding and overnight horse camps (including within wilderness) may be approved by the NPWS Regional Manager for essential management purposes

where there is a clear management benefit and no practical and environmentally acceptable alternative. Prior approval of the Sydney Catchment Authority will also be required if these activities are to be undertaken within the Special Area.

- * No commercial building developments will be permitted in the park.
- * Further opportunities for the use of volunteers and community organisations to assist priority park management programs, such as weed control and flora/fauna survey, may be developed in accordance with Service policy.
- * The Service will consult with the Sydney Catchment Authority prior to the approval of any leases or licences within the Special Area.

Actions

- * Management tracks, public access routes and helipad sites which are essential for the management of the park will be maintained. Disused access routes will be closed and rehabilitated.
- * An extraction operations management plan and appropriate environmental assessment will be prepared and will include a program for the progressive restoration of disused quarry sites.
- * The Service will establish and maintain a register of all alien uses, leases and licences in the park.
- * The Service will seek to formalise or renegotiate all alien tenure licences within the park over the next four years.

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 Corporate Strategy, field management policies, established conservation and recreation philosophies and strategic planning at regional and directorate levels.

The orderly implementation of this plan will be undertaken within the annual programs of the Service's Blue Mountains Region. Priorities determined in the context of regional strategic planning will be subject to the availability of the necessary staff and funds and to any special requirements of the Director-General or Minister.

Regional programs are subject to on-going review, within which, works and other activities carried out at Kanangra Boyd National Park are evaluated in relation to the objectives laid out in this plan.

The environmental impact of all development proposals will continue to be assessed at all stages of 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 the Kanangra-Boyd National Park except in accordance with the plan. However if after adequate investigation operations not included in the plan are found to be justified, this plan may be amended in accordance with Section 76(6) of the Act.

As a guide to the orderly implementation of this plan relative priorities for identified activities are summarised in Table 2 below.

These priorities have been assigned as follows:

- High** Imperative to achieve the plan's stated objectives;
- Medium** Very important to achieve the plan's stated objectives but subject to the availability of resources;
- Low** Desirable but will be undertaken only if the necessary resources are available; and
- Ongoing** Already underway, to be continued.

TABLE 2: IMPLEMENTATION OF ACTIONS SPECIFIED IN THE PLAN.

PROGRAMS	PRIORITY	PLAN REFERENCE
Liaise to minimise impacts of adjacent developments on park	High	4.1.1
Regulate access to bat nursery and wintering caves	High	4.1.2
Undertake high priority introduced species control programs	High	4.1.3
Prepare introduced species management plan	High	4.1.3
Develop introduced species database	High	4.1.3
Prepare draft park fire management plan	High	4.1.4
Install wilderness interpretative signposting	High	4.1.5
Develop access consents for inholdings within the wilderness	High	4.1.5
Assess alternatives to visitor facilities at Boyd River and implement if appropriate	High	4.3.4
Close and rehabilitate degraded areas at Kowmung River crossing and Boyd River camping area	High	4.3.4
Develop walking track management strategy	High	4.3.5
Upgrade Kalang Falls Walking Track	High	4.3.5
Hold public forum on remote bushwalking	High	4.3.5
Prevent camping in caves and on karst areas	High	4.3.9
Review use of camp/cooking fires	Medium	4.1.4
Prepare wilderness brochure	Medium	4.1.5
Seek to minimise aircraft impacts over wilderness	Medium	4.1.5
Establish Aboriginal Heritage Management Group	Medium	4.2.1
Prepare and implement conservation policies for the Kanangra Walls Aboriginal sites	Medium	4.2.1

PROGRAMS (continued)	PRIORITY	PLAN REFERENCE
Promote minimal impact practices	Medium	4.3.1
Provide directional signs	Medium	4.3.1
Review/update park booklet	Medium	4.3.1
Establish visitor use monitoring program	Medium	4.3.2
Review warning signs at Kanangra Walls	Medium	4.3.2
Establish regular review of all public access roads	Medium	4.3.3
Liaise with Oberon Council on information and signposting	Medium	4.3.3
Review systems for collection of park use fees	Medium	4.3.4
Provide walk-in campsites and carpark at Kowmung River crossing	Medium	4.3.4
Develop a camping area at Morong Creek	Medium	4.3.4
Upgrade car-based camping area at Dingo Dell	Medium	4.3.4
Promote appropriate disused vehicular tracks as part of the walking track system	Medium	4.3.5
Provide limited trackhead facilities in the natural setting at the beginning of walking routes	Medium	4.3.5
Promote horse-riding code	Medium	4.3.6
Develop adventure activity management strategy	Medium	4.3.8
Assess need for canyon permit system	Medium	4.3.8
Prepare a brochure on karst areas and caving	Medium	4.3.9
Prepare a road gravel extraction management plan	Medium	4.3.12
Establish and maintain register of alien uses, leases and licences	Medium	4.3.12
Seek to formalise or renegotiate alien tenure licences	Medium	4.3.12

PROGRAMS (continued)	PRIORITY	PLAN REFERENCE
Develop a conservation program for rainforest communities	Low	4.1.2
Liaise with NSW Agriculture and Fisheries to ensure the integrity of aquatic species	Low	4.1.2
Provide visitor information on European history of Kanangra Walls area	Low	4.2.2
Establish monitoring program for significant historic places	Low	4.2.2
Rehabilitate disused vehicle tracks	Low	4.3.7
Document distribution of threatened species	Ongoing	4.1.2
Review fire trails regularly	Ongoing	4.1.4
Maintain fire history data	Ongoing	4.1.4
Signpost wilderness boundaries	Ongoing	4.1.5
Maintain cultural sites register	Ongoing	4.2
Survey European cultural heritage progressively and systematically	Ongoing	4.2.2
Maintain public access roads	Ongoing	4.3.3
Maintain visitor facilities at Kanangra Walls to existing standard	Ongoing	4.3.4
Monitor horse-riding impacts	Ongoing	4.3.6
Monitor cycling impacts	Ongoing	4.3.7
Continue caving permit system	Ongoing	4.3.9
Review district commercial recreation strategy	Ongoing	4.3.10
Exclude unlicensed commercial operators from park	Ongoing	4.3.10
Monitor commercial activities	Ongoing	4.3.10
Maintain identified management tracks and helipad sites	Ongoing	4.3.12

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