

Namadgi

Namadgi National Park

PLAN OF MANAGEMENT 2010





NAMADGI NATIONAL PARK PLAN OF MANAGEMENT 2010





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- members of the former Interim Namadgi Advisory Board
- ACTEW
- members of the ACT Natural Resource Management Advisory Committee
- members of the United Ngunnawal Elders Council.

Thanks are also due to organisations and individuals who made submissions on the draft management plan and contributed to the earlier discussion paper, workshops, meetings and discussions. A wide range of staff also contributed to the preparation of the plan.

The final plan was prepared by the Land Management and Planning Division, Department of Territory and Municipal Services, with the assistance of Dr Kevin Frawley.



Ministerial foreword

Namadgi National Park is the largest conservation reserve in the ACT covering 46% of the Territory. Namadgi protects the Cotter River Catchment (including the Bimberi Wilderness) which is a major source of water for Canberra. The park is at the northern end of the 1.6 million hectare network of reserves known as the Australian Alps national parks.

Namadgi is important for protecting biodiversity, and the snow gum woodlands, subalpine fens and bogs, grasslands and montane forest communities provide habitat for a diverse range of species. Fire management is an important component in maintaining biodiversity.

Namadgi has a rich heritage of human history with remnants of homesteads, huts and fences from early pastoral settlers and the remains of the space tracking stations which operated from the 1960s to the early 1980s. There is much evidence of Aboriginal use including quarry sites, ceremonial stone arrangements and rock art, and the plan has been developed in consultation with local Aboriginal people.

Many people value Namadgi as a destination for low key recreation including for bushwalking, camping, cycling, rock climbing and abseiling. In addition, the Bimberi Wilderness provides a place of solitude for inspiration and wellbeing. ACT residents are privileged to have Namadgi providing a scenic backdrop for the national capital.

The Namadgi National Park Plan of Management has been prepared under Part 10.4 of the *Planning and Development Act 2007* as required for management of Public Land. The policies and actions outlined aim to protect the values of Namadgi for the life of the plan.

Namadgi is an important place for many people and the plan is the result of extensive community consultation including community workshops, liaison with neighbours and other key stakeholders, and a draft plan released in 2005. The Legislative Assembly Standing Committee on Planning and Environment conducted an inquiry into the revised draft plan in 2008 and the Committee recommendations have been considered in the preparation of this final plan.

I am delighted that the plan is now completed and ready for implementation.

A handwritten signature in black ink, appearing to read 'Jon Stanhope'.

Jon Stanhope, MLA
Minister for Territory and Municipal Services

Executive Summary

Namadgi National Park embraces the rugged mountain ranges and associated valleys in the western and southern parts of the ACT. Declared in 1984, the park covers 46% of the ACT. It is of special significance to Territory residents as well as being part of the network of reserved areas known as the Australian Alps national parks. Namadgi protects Canberra's main water supply catchment and its mountain ranges form a distinctive backdrop to the city. The park conserves a wide variety of ecosystems and contributes to regional ecological connectivity through its links to reserves in New South Wales. Past and current connections of people to the area now forming the park give it social value and cultural heritage significance. Fire management in Namadgi is a key part of this management plan, as the park recovers from the major fire of 2003. Namadgi is the focus of many recreational activities, for which the plan sets out policies in relation to other park values, especially water supply, and natural and cultural heritage.

The *Namadgi National Park Plan of Management 2010* has been prepared under the *Planning and Development Act 2007* and policies in the *Territory Plan* (ACT) and the *National Capital Plan* (Commonwealth). A draft of the plan released in 2005 attracted 175 submissions from organisations and individuals. The final plan incorporates changes to structure and content derived from analysis of those comments. As the foundation for its objectives and policies, the plan contains a Statement of Significance that sets out the values of the park. These are summarised as: water supply, natural heritage, Aboriginal and European cultural heritage, scenic beauty, wilderness and remoteness, recreation, and education and research. Delineation of these values provides the basis for establishing the primary management objectives for the park. The plan identifies the significance of Namadgi for Aboriginal people. Ultimately, the plan aims to protect in perpetuity the natural and cultural values (including hydrological values) of the park from a range of pressures that have the potential to impact adversely on those values.

A consistent structure has been applied to the management plan. Each of the values forms a 'theme' for a chapter, which sets out the primary management objective(s), briefly outlines background material, and discusses management considerations, before prescribing more specific objectives, policies and actions. Supporting this is a zoning system that expresses management objectives for particular areas, related to park values. The park is divided into three primary management zones that provide a gradation from wilderness/catchment protection with the most restrictive access policies, to areas of general vehicle access with more 'developed' recreational opportunities.

Pressures on the park are identified in each of the theme chapters. They include impacts associated with: climate change; bushfires and fire management infrastructure; pest plants and animals; and recreational use and recreation management infrastructure.

Given the importance of the Cotter Catchment for Canberra's water supply, the plan gives high priority to water resource management. This is in accordance with legislative requirements for catchment management in the ACT. The Cotter Catchment is in recovery from the 2003 bushfire—a process that will occur through the life of this management plan. The main effects of having a water supply catchment in the park are the need for restrictive policies regarding access, types of recreation permitted, and the need for controls over activities that might adversely affect water quality in the catchment.

Though discussed separately, the management plan recognises that natural and cultural heritage values may be related, sometimes difficult to separate, and may not be seen as separate. These values are pivotal to the national park concept. With regard to natural heritage, Namadgi is part of the Australian Alps bioregion, conserving environments from the higher altitude alpine and subalpine mountain peaks to relatively low elevation grassy valleys. The plan contains objectives and policies for the conservation of significant landscapes and native flora and fauna; management of pest species; ecological restoration; and management of the wilderness area in the park. With regard to cultural heritage, the plan briefly outlines Aboriginal and European connections with the area and the means to identify, protect, manage and interpret the cultural heritage of the park.

The western parts of the ACT and adjacent land in NSW have, historically, been the source of bushfires that move in an easterly direction towards Canberra. Fire management in Namadgi is an important issue, in particular, as to how interventionist fire management should be, with regard to fuel hazard reduction, suppression, and the number and size of fire trails. The plan outlines the history of fire and fire management in the Brindabella Ranges and adjacent areas, the legislative basis for fire management in the ACT, and identifies adaptive management as an appropriate approach to fire management given the uncertainties. Objectives and policies in the plan aim to integrate asset protection, protection of the water supply catchment, and biodiversity conservation.

A wide range of outdoor recreational activities are undertaken in Namadgi, from wilderness bushwalking to recreational driving. The focus of recreational planning is primarily towards low-key recreational activities that are based on the natural and cultural values of the park, and do not require extensive infrastructure. Vehicle based camping and bush camping are provided for in the plan. There is no built accommodation and this remains the policy (except for the possible adaptive reuse of the former Gudgenby Homestead). The plan contains policies in relation to commercial recreation activities, group and special events. Varying restrictions apply to recreational activities to lessen the potential for conflict with other activities or to protect key values e.g. the water supply catchment.

The potential of Namadgi for environmental education and the importance of interpretation to communicate the natural and cultural heritage values of the park is addressed. There is support for survey, monitoring and research that is relevant to management issues and expands knowledge about park values. The plan also contains policies with regard to community involvement in management and cooperative relationships with neighbours. Management operations in the park have the potential to impact on park values. The plan contains policies on operational management (e.g. waste management and chemical use) and protection of the park environment (e.g. noise, domestic animals, firewood collection).

As the means of achieving management objectives, the plan contains a large number of policies and actions. These, with priorities attached, are collated in a table in Appendix 8. Park management must be able to cope with uncertainty, as there will never be a complete understanding of the environment or conditions in the future. The plan aims to set a policy framework that can accommodate new knowledge and changing circumstances to achieve the objectives outlined.

Preface

The *Namadgi National Park Plan of Management 2010* supersedes the 1986 *Namadgi National Park Management Plan* that was prepared under Commonwealth legislation (ACT Parks & Conservation Service 1986). The Ginini Flats Wetlands within Namadgi National Park have a specific management plan (*Ginini Flats Wetlands Ramsar Site Plan of Management 2001* (ACT Government 2001)) that was prepared as part of a government commitment to the Convention on Wetlands (Ramsar, Iran, 1971)—the *Ramsar Convention*. Ginini Flats Wetlands is included in the List of Wetlands of International Importance in recognition of its significant ecological characteristics. Its management plan remains relevant and is supported with additional management actions in this plan to reflect changed circumstances since the 2003 bushfire.

Since the development of the 1986 *Namadgi National Park Management Plan* there have been a number of significant changes to political, social and environmental settings relevant to the management of the park, including:

- introduction of self-government to the ACT (1989)
- expansion of the area of Namadgi National Park in 1991 (extending the park in the north-west from Mt Aggie to Mt Coree and Mt Blundell)
- ACT Government commitment to pursuing cooperative management of Namadgi National Park with the Aboriginal community
- ACT endorsement of a range of international and national environmental agreements including the inclusion of Namadgi National Park within the Memorandum of Understanding for Co-operative Management of the Australian Alps national parks
- advances in natural and cultural resource management including a shift towards adopting a regional and holistic perspective to land management
- implications of the January 2003 bushfire, especially water supply issues. This includes the reorientation of land use in the lower Cotter Catchment adjoining the north-eastern boundary of the park from mainly pine plantation to a primary purpose of water supply and re-vegetation with native species (ACT Government 2006)
- inclusion on the Commonwealth Government National Heritage List as part of the Australian Alps national parks
- being named as one of Tourism Australia's National Landscapes as part of the Australian Alps national parks
- new knowledge about park values and their conservation requirements
- the increased recreational use of the park in terms of both visitor numbers and the range of activities taking place.

This plan aims to take account of these developments and provide a comprehensive guide to the management of Namadgi National Park.

The Australian Alps national parks

Alpine and subalpine environments of mainland Australia stretch from the Brindabella Range in the ACT, through the Snowy Mountains of NSW and along the Great Dividing Range in Victoria. This mountainous region, snow capped in winter, is a unique part of the predominately dry and flat Australian continent.

The Australian Alps national parks comprise over 1.6 million hectares of protected areas including eleven parks and reserves. The major national parks (Kosciuszko, Namadgi, Alpine, Mt Buffalo and Baw Baw) are well known to communities in south-eastern Australia. Brindabella National Park (NSW), Tidbinbilla (ACT), Bimberi and Scabby Range nature reserves (NSW), and the Avon Wilderness (Victoria) are also becoming better known.

The Australian Alps national parks are of great significance for all Australians, present and future. They contain:

- mainland Australia's highest peaks and most spectacular mountain scenery
- flora and fauna, ecological processes and communities which are unique to Australian alpine and subalpine environments
- a range of sites, places and landscapes which are valued by the community, including those with a rich and diverse cultural heritage belonging to Aboriginal and non-Aboriginal people
- a significant outdoor recreation and tourism resource for Australians and international visitors
- the headwaters of major river systems which supply snowmelt waters vital for the maintenance of ecological communities and ecosystem processes, domestic water supply, industry, irrigation and hydro-electric production.

The Australian Alps Cooperative Management Program

In 1986, with the signing of the first Memorandum of Understanding (MOU), NSW, Victoria, the ACT and the Australian Government formally agreed to cooperatively manage the Australian Alps national parks. This MOU was re-signed in 2003. More details on the MOU are contained in Chapter 2.

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1

Introduction

A vision for the future



1.1 Vision statement

Namadgi is a place where the natural variety of plants and animals flourish and continue to evolve; where water flows with the seasons, providing for wildlife and human needs; and where the history of peoples and their cultures is reflected in the landscapes. It is a place of beauty and a source of inspiration that enriches our understanding and enjoyment of nature and its role in our lives.

1.2 Background

Namadgi National Park covers 106 095 ha in the western half of the Australian Capital Territory (ACT). This is 90% of all Public Land reserved for environmental conservation in the ACT. The park contains a variety of landscapes shaped by natural and cultural influences.

The forested ranges of the Brindabellas and the massif of Blue Gum Hill, Booroomba Rocks and Mt Tennent, strewn with the granitic outcrops are a distinctive feature of the park. Elevations in the mountains range from 1 240 m (Piccadilly Circus) to over 1 900 m (Bimberi Peak 1 911 m). The western ACT border connects a series of peaks from Mt Coree (1 421 m) in the north to Mt Murray (1 845 m) in the south. Snow covers the ranges for short periods during winter and most Canberra residents encounter a view of these ranges on a daily basis. At lower elevations (900–1 100 m), broad grassy valleys formed in ‘frost hollows’ are a feature of the park.

Namadgi has a rich heritage of human history:

- Aboriginal people were living in the region during the last ice-age 21 000 years ago.
- Pastoralists settled in the upper valleys of the Cotter, Gudgenby, Orroral, Naas and Tidbinbilla rivers from the 1830s.
- Timber extraction began in the Brindabellas in the 1930s.
- Recreational skiing began in the Brindabella Range with the formation of the Canberra Alpine Club in 1934.
- Space tracking stations operated at Honeysuckle Creek and in the Orroral Valley from the 1960s to the 1980s.

For seventy years following the establishment of the Australian Capital Territory, water supply was the main recognised use of the Cotter Catchment. However, as Canberra grew so did interest in the area for recreation. Together with nature conservation this formed the basis for proposals after the Second World War to establish a national park. Namadgi National Park was gazetted in 1984 after a twenty-four year campaign by the National Parks Association of the ACT for a ‘national park for the national capital’ and followed the gazettal in 1979 of the Gudgenby Nature Reserve (Esau 1984; NPA (ACT) 2000). In 1991 the park was expanded near Mt Tennant and Mt Coree, and Bushfold Flat was added in 1994. The current visitor centre, near the village of Tharwa and on the boundary of the park, opened in 1990 replacing the small visitor centre located further south on the Gudgenby River.

The park is of special significance to the residents of the ACT. Contained within it are the water storages of the Cotter Catchment, the mountain peaks that provide a prominent backdrop to the city of Canberra, a diversity of landscape, habitats, flora and fauna, and sites that are a testimony to its human past. Except for the water storages, the park is generally free of large scale or obtrusive developments and is highly valued for its nature based recreational opportunities relatively close to the city. In April 2001, the park took on a new role as part of reconciliation between Aboriginal and non-Aboriginal Australians. At that time, traditional Aboriginal association with land in the ACT region was recognised when the ACT Government entered into an agreement to cooperatively manage the park with the Ngannawal people.

1.3 Regional setting

Namadgi National Park forms an integral part of the national park and reserve network in south-eastern Australia. Management of the park must also be related to its setting within a range of other, mainly rural, land uses, as well as its close proximity to urban Canberra. The long-term protection of park values requires the consideration of land management by park neighbours (including the objectives and responsibilities of government and private landholders) and the effects of park management activities in Namadgi on neighbours.

Namadgi National Park lies within the upper Murrumbidgee River Catchment. The western and southern boundaries of both the ACT and Namadgi are defined by the catchments of the Cotter and Gudgenby river systems, which drain eastward into the Murrumbidgee River at Casuarina Sands and Tharwa respectively. Along the park's eastern periphery, the Murrumbidgee River forms a prominent topographical and ecological transition between the rolling plains of the Southern Tablelands and Monaro—with their dry woodland and grassland communities—through to the steep ranges, montane and subalpine forests that mark the northern extremity of the Australian Alps.

At 1 200 m to 1 900 m elevation, the Brindabella Range forms a prominent northern rampart to the Alps, extending north-south along the western boundary of the ACT connecting with Brindabella National Park to the north and Kosciuszko National Park to the west and south. The Brindabella Range effectively represents the northernmost limit of subalpine habitat in Australia (only small, isolated pockets occur further north at Barrington Tops and Ebor). The Brindabella subalpine communities are also isolated from those within the heart of Kosciuszko National Park due to deep river valleys that act as a divide from the northern frost plains of Kosciuszko at 1 300–1 400 m elevation. There are strong ecological and geomorphological relationships between Namadgi and other subalpine areas. Given the span of its terrain, Namadgi includes a significant overlap of subalpine, tableland and even coastal escarpment woodland communities.

1.4 Statement of Significance

The natural and cultural values of Namadgi National Park endow it with special significance in environmental, social and economic terms as summarised below.

Table 1.1 Namadgi National Park: Statement of Significance

Values	Statement of Significance
Summary	Namadgi National Park (Namadgi) is an outstanding mountain landscape and distinctive component of the natural and cultural environment of south-eastern Australia.
Key relationships within the region	Namadgi is part of the Australian Alps bioregion and is a significant element of the Australian Alps national parks. The park is at the northern range of subalpine and montane ecological communities that extend across NSW and Victoria. Other important relationships exist with the woodland communities of the coastal escarpment and communities of the Murrumbidgee Catchment. The park makes a significant contribution to regional ecological connectivity. Namadgi's rivers are an important source of water feeding the Murrumbidgee River system. The Cotter River Catchment is a major source of Canberra's domestic water supply. Namadgi's landscapes are linked to traditional Aboriginal use of the Alps, to historic land uses and contemporary park management within the Alps, and to the establishment and ongoing presence of the National Capital and its community. As part of the Australian Alps national parks management agreement, Namadgi is part of a cross-border collaboration of ACT, NSW, Victorian and Commonwealth Governments which aim to achieve best practice management for part of Australia's nature conservation estate. The Australian Alps national parks and reserves are identified on the National Heritage List.

Water supply (See Chapter 4)	Namadgi includes the primary water supply catchment for Canberra. The potential for water supply from the forested mountain catchment of the Cotter River was recognised in choosing the site for the National Capital. Formal protection of the catchment was initiated in 1914 and the Cotter Dam was completed in 1915. The vegetated catchment has historically provided high quality raw water requiring minimal treatment for domestic water supply.
Ecological integrity and ecosystem processes including fire (See Chapters 5 & 7)	Namadgi is an outstanding natural landscape, of national significance for its geomorphological features (landform, geological, hydrological) and the high level of integrity and diversity of its ecological communities and ecosystem processes. The park is important for its contribution to habitat connectivity, a critical component of biodiversity conservation. Specific natural attributes of national significance include: • <i>Subalpine wetlands</i>. The internationally significant Ginini Flats wetland (a Ramsar site) and 11 other nationally significant wetlands are of ecological and hydrological importance. They provide important hydrological services and habitat for specialist wetland species and a range of other aquatic and terrestrial species. • <i>The Cotter Catchment ecological benchmark</i>. The outstanding pre-European integrity of the upper Cotter Catchment has been used since the 1950s as a benchmark to assess the level of environmental disturbance and progress of ecological recovery within other Alps national parks. The middle Cotter Catchment is now also an important ecological benchmark. The Cotter Catchment includes a variety of vegetation types such as wet forests, wetlands and heath communities, as well as periglacial and hydrological features. • <i>Biogeographical setting</i>. Namadgi falls within two bioregions—the Australian Alps and the South-Eastern Highlands—sharing its environmental characteristics with surrounding NSW and parts of Victoria. The park contains species from the south, east, west and north that are at their limits of distribution resulting in a complex ecological assemblage of high biodiversity value. • <i>Fire</i> is a major ecosystem process and an important component of the Namadgi environment. Of most significance ecologically is the ‘fire regime’—the history and characteristics of fire events. Namadgi has a history of large fires and is in the recovery phase from the 2003 fire that burnt 91% of the park.
Archaeological fabric Aboriginal and European cultural heritage (See Chapter 6)	Namadgi is of regional significance to the broader community for its evidence of both past Aboriginal and European occupation and use. Knowledge of Aboriginal occupation is based on the results of archaeological surveys, observations of the region’s first European settlers, and continuing oral tradition. Almost 400 Aboriginal sites have been recorded from Namadgi and occupation may have extended over 20 000 years. Resources of the river valleys, woodlands and grasslands, and the high peaks (bogong moths) were important to the Aboriginal economy of the region. Unlike many parts of Australia, it appears that in the high altitude areas, Aboriginal people rarely, if ever, used fire for resource and landscape manipulation. Fires were infrequent and derived from lightning strikes. European settlement and land use of the ACT since the early 19th century is linked to nationally significant historical themes and the settlement patterns across the Australian Alps. Pastoralism is the main theme in the area. It was pivotal to the initial exploration and settlement of the Alps during the 19th century and was the mainstay of economic and social development into the 20th century. It is demonstrated within Namadgi where grassed valleys were cleared to varying degrees for farming. There are also homesteads, huts and other structures; introduced plantings; grave sites; and the sites of over 50 permanently occupied rural homes built between 1880 and 1916, which no longer remain. Other evidence of the pastoral past exists in the presence of many weed species found in grassland areas of the upper Cotter Catchment. The Namadgi area also contained a route to the Kiandra Goldfields along which stock were moved. Fire research shows frequent burning at higher altitudes from the mid 1800s.

	The Cotter Catchment was protected early in the 20th century for water supply. Pine plantations were planted across much of the lower Cotter Catchment, on hillslopes west of the Murrumbidgee River (not in the national park) and in the Gudgenby Valley. Other key historic themes within Namadgi include: • <i>Communications and transport</i>—centred on the 20th century development and use of NASA facilities for space exploration and communications. • <i>Extraction of natural resources</i>—centred on 20th century harvesting of water from the Cotter River for domestic use and early 20th century hardwood forestry operations. • <i>Recreation</i>—specifically the mid-20th century development of club-based recreational skiing in Australia and bushwalking (much also club based). • <i>Survey and exploration</i>—specifically linked to the formation and survey of the ACT in the early 20th century. • <i>Research and conservation</i>—centred on the 20th century development of natural resource assessment and management practices.
Scenic and aesthetic values (See Chapters 5 & 8)	Namadgi is significant for its outstanding landscape aesthetic qualities. The mountains provide a seasonally dynamic scenic backdrop for the national capital. The distinctive Namadgi landscape is of granite rock that results in rocky summits, boulder stacks and projecting tors on rugged outcrops and forested ridges. Namadgi's landscapes provide an inspirational, natural setting offering a contrast to city life.
Wilderness and remoteness (See Chapters 5 & 8)	Dissected mountainous terrain, native vegetation cover, limited vehicle access and lack of intrusive developments mean that Namadgi is able to provide a remote or 'wilderness' experience and a sense of isolation from the features of modern society. The Bimberi Wilderness in Namadgi connects to similar areas in NSW in Kosciuszko National Park, Scabby Range Nature Reserve and Bimberi Nature Reserve.
Recreation (See Chapter 8)	Namadgi is of regional significance as a place of outdoor recreation, predominantly for the local community, within one hour's travel from the Canberra Central Business District. The focus for Namadgi is 'low-key' recreational use based on the area's natural and cultural values. The park gives visitors the opportunity to enjoy a peaceful bush setting, to interact with nature and encounter wildlife in its natural habitat.
Research value (See Chapter 9)	Namadgi provides broad opportunities for further research in a range of scientific and social disciplines, with the potential to enhance decision-making and community awareness.

1.4.1 Namadgi is a source of water

The park incorporates the upper catchments of the Cotter, Paddys, Gudgenby and Naas rivers. The western and southern perimeter forms both the park and Territory boundary, reflecting the conscious decision of 1908 to secure a substantial water supply for the National Capital. The waters of the Cotter River are currently impounded at two dams within the park (Corin and Bendora) and one dam downstream of the park (Cotter).

Canberra's population has always enjoyed the high quality water that flows from the mountain catchments. To ensure that future generations can also benefit from a safe and clean water supply, the protection of water resources is one of the highest priorities for management of the park.

1.4.2 Namadgi is a place of nature

The geographical location of the park at the northern end of the Australian Alps and adjoining coastal, inland and northern bioregions has resulted in a rich diversity of plants and animals including over forty rare and fifteen threatened species. Extensive subalpine and montane wet forests occupy the steep ranges throughout the park. Rocky heaths and subalpine herbfields grow on the higher western and southern ranges, and grassland communities occur in enclosed

valleys in the eastern areas of the park. Subalpine wetlands form an important hydrological and ecological resource, storing and filtering water while providing habitat for species especially adapted to this habitat such as the northern corroboree frog *Pseudophryne pengilleyi* and the migratory wader, Latham's snipe *Gallinago hardwickii*.

Protecting, understanding and managing the habitats of the park will provide a secure place for species to survive, flourish and evolve.

1.4.3 Namadgi is a place of past and present meaning

Humans have been part of the ecosystems that comprise the present Namadgi National Park for over 20 000 years, predominantly through the occupation and use of the land by Aboriginal people. The park was part of the 'country' or homeland of a permanent Aboriginal society, as well as the focus of seasonal visits for groups across south-eastern NSW, evident in the broad distribution and diversity of Aboriginal places across the park.

Evidence of low-intensity land uses from the 19th century and early 20th century is found throughout the park: pastoral homesteads, huts and stockyards, brumby yards, forestry places (e.g. arboreta) and the sites of two major NASA Tracking Stations used for space exploration. Dams and pipelines signify past resource management and are part of the ongoing history of the park. The evidence and associations of both Aboriginal and European use of the landscape that is now Namadgi National Park are interwoven into the landscape, and proud descendants of past occupants are present within regional communities today.

The preservation of the tangible and intangible elements of Namadgi's history helps us to understand and appreciate the past. Working with people who are passionate about the history of the park and who know the stories, culture, myths and songs that accompany the landscapes and special places, can assist in understanding the cultural heritage of Namadgi.

1.4.4 Namadgi is a place of fire

Fire is part of the Australian bush. Namadgi's landscapes, plant and animal communities have been influenced and shaped over millennia by past fire regimes. Fires also affect the cultural heritage of the park. The major bushfire of 2003 exposed a large number of Aboriginal sites and destroyed many European sites. The challenge for managers is to learn how to work with fire to conserve the flora and fauna of the park, protect important natural resources such as water, and protect cultural heritage places. Fire protection measures must also focus on assets within the park, on rural land and the urban areas beyond the park boundaries. An active fire management program is essential. It needs to be underpinned by a scientifically based research and monitoring program that will provide the basis to improve management strategies over time.

1.4.5 Namadgi is a place for community wellbeing

While much of the park is considered to be remote, the accessible edges of the remote areas are within an easy drive of Canberra city. Many residents appreciate the proximity of this large natural area. Even people who do not regularly visit the park enjoy seeing the dramatic backdrop to the city provided by the mountains and the cloud patterns associated with the passage of weather systems over the mountains from the west.

Namadgi is free of townships, resorts and most other developments, and this sets it apart from many Australian Alps national parks. The plan recognises that the close proximity of the park to Canberra makes it an ideal destination for day trips by residents, while the remote areas are attractive for overnight bushwalking and other adventure pursuits. The plan considers recreational opportunities in a regional context, including the role of adjacent national parks and reserves. Namadgi has the potential to contribute to tourism in the ACT within the context of the values outlined in this plan, and the generally 'low-key' nature of recreational activities in the park.

The management plan aims to provide for positive visitor experiences that are in keeping with the conservation of Namadgi's special values.

1.4.6 Namadgi is a place for learning

Namadgi has tremendous potential for education and research, and interpretation programs are a way to enrich the experience of visitors to the park. In close proximity to the Canberra urban area, visitors can experience a diversity of landscapes, ecological communities and Aboriginal and historical heritage. This provides the opportunity to learn about the local and regional environment and history, as well as to relate this to more general principles and wider understanding. Communication and research in all its forms is important for increasing community awareness about Namadgi's wildlife, landscapes, culture and history, and encouraging the community to enjoy and actively care for the park.

1.4.7 Namadgi is a place with community

Community participation is an integral component of protected area management. Community pressure was an important factor in the establishment of the Namadgi National Park. Since its inception many groups and individuals have been involved in its management and have formed a strong attachment to the park. Volunteers and community groups seek meaningful and ongoing involvement in management activities. Neighbours and park managers will achieve mutually beneficial outcomes through collaborative programs that address cross-tenure land management issues.

1.5 Primary management objectives

The *Planning and Development Act 2007* prescribes management objectives for Wilderness and National Park (s. 317, Schedule 3). It sets a priority for management by ascribing a hierarchy to the objectives where conservation takes precedence over all other uses. Within the broad management objectives prescribed for 'Wilderness area' and 'National park' under the Act, and objectives and policies in both the *National Capital Plan* and the *Territory Plan* (see s. 2.1), the following primary management objectives are defined in relation to (a) the values of Namadgi National Park (s. 1.4) and (b) operational management.

1.5.1 Water

- The ecological and hydrological condition of water catchments is maintained and, where desirable and feasible, improved, to ensure a continuing high quality and cost-effective water supply for the ACT.

1.5.2 Natural Heritage: protecting landscapes, ecological systems and biodiversity

- The biodiversity¹ and geodiversity² of Namadgi National Park is conserved³.
- Ecosystems are managed so that they can continue to function and evolve naturally, and the integrity of landscapes and scenery is maintained.

1.5.3 Cultural heritage

- Cultural heritage within Namadgi is identified, conserved⁴, and where appropriate interpreted and promoted to retain and foster community associations and an appreciation of the past.

1, 2: see Glossary

3: see Conservation: Natural Heritage in Glossary

4: see Conservation: Cultural Heritage in Glossary

1.5.4 Fire

- Fire management strategies integrate fire protection, water supply and conservation objectives and, to provide guidance for management, are supported by an effective research and monitoring program.
- Fire management strategies create a mosaic of areas across the park with differing fire histories and a consequent diversity of vegetation age-classes and fuel loads.

1.5.5 Recreation

- Namadgi provides a variety of sustainable recreation opportunities that are consistent with the protection of the park's natural and cultural heritage values and water supply catchments.

1.5.6 Education and research

- Opportunities are provided for the community to acquire knowledge of, and to understand and enjoy Namadgi's natural and cultural heritage, and to actively participate in protecting the values of the park.
- Survey, monitoring and research programs in Namadgi provide knowledge and understanding that underpin park management.

1.5.7 Community partnerships

- Partnerships and collaborative programs are fostered to effectively involve park neighbours and the community in a range of park management activities and cross-border issues.

1.5.8 Operational management

- Systems for operational management are developed to best practice standards to provide efficient, effective and informed management.

1.6 Key principles for management

The management objectives, policies and actions contained in this management plan incorporate the following principles, which provide a guide to managers in changing circumstances and as new issues arise:

Precautionary principle: Planning and management decisions need to be made in line with the precautionary approach. In other words, where there are threats of *serious* or *irreversible* environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Inter-generational and intra-generational equity: The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. Decisions affecting current generations should be socially equitable.

Environmental stewardship: This is the recognition and acceptance that responsibility for protecting the values of the park extends beyond the managing agency to include public and private agencies with responsibilities in the park, visitors, neighbours and the general community.

Limits of acceptable disturbance: This is the acknowledgement that all human activities and uses of the park result in some degree of impact, and of the need to manage such disturbances within physical and social impact thresholds (though these may be difficult to determine). It is important to separate inconsequential or trivial impacts from those that are serious, irreversible or cumulative, and where necessary devise means to assist such determination e.g. by monitoring.

Adaptive/experimental management: Research, monitoring, new knowledge and the outcomes of performance evaluation should continually inform management, with policies adjusted accordingly.

Best practice: Knowledge, skills and management practices are continually improved by keeping up-to-date with new technology and ideas.

Community participation: This is the recognition that the public has a right to participate in the decision-making processes concerning the park and that partnerships and collaborative programs that support the management plan should be fostered.

Education: This is the recognition that education is essential to promote an understanding and appreciation of the park's values and encourages individuals to take personal responsibility for protecting those values. Interpretation is an important component of education.

Levels of significance: This is the understanding that park values have varying levels of significance and this will also vary throughout the park. This will need to be taken into account when making decisions.

Transparency and accountability: This is the recognition that decision-making processes, and the environmental and organisational performance of land managers and other authorities are open to public scrutiny.

1.7 Cooperative management of Namadgi National Park

Aboriginal Australians have had a long association with the area we now call Namadgi National Park. Since European colonisation, however, their association with the land has been disrupted and constrained.

In the spirit of reconciliation between Aboriginal and non-Aboriginal Australians, members of the Ngunnawal Aboriginal community entered into an Agreement¹ with the ACT Government that provides for the cooperative management of Namadgi National Park by the parties to the agreement. The agreement sets out the interim arrangements that apply while negotiations on the detailed terms and conditions for permanent arrangements are determined. Under these interim arrangements, the Aboriginal parties to the agreement have the right to:

- be acknowledged as people with an historical association with the area that is now Namadgi National Park
- participate in the management of Namadgi
- be consulted on specific regional cultural issues
- be consulted on the development of any legislation that will affect Namadgi National Park.

1.7.1 Interim Namadgi Advisory Board

The Interim Namadgi Advisory Board operated from 2001 to August 2006 and members actively contributed to the development of this plan.

The board comprised five Aboriginal members (nominated by the Aboriginal parties to the Agreement) and five non-Aboriginal members (appointed in an individual capacity because of their specific expertise).

The board was established to provide advice to the Conservator of Flora and Fauna on:

- the preparation of a new draft Plan of Management for Namadgi under the *Land (Planning and Environment) Act 1991* (now repealed)
- decisions about activities in Namadgi National Park under section 67 of the *Nature Conservation Act 1980*
- issues related to the management and protection of Namadgi.

The ACT Government is committed to Aboriginal involvement in land management and negotiations are continuing on the most appropriate arrangements to facilitate this outcome.

¹ Agreement between the Territory and ACT Native Title Claim Groups, April 2001.

1.7.2 The significance of Namadgi to Aboriginal people

Ngunnawal people today, as traditional custodians, have obligations to both their ancestors and their descendents to participate in the management of this area. The occupation of Aboriginal lands by European settlers damaged the Aboriginal people's connection to their country, however their participation in the management of Namadgi will allow them to restore a connection to the land. Cooperative management aims to facilitate a spirit of cooperation, partnership and reconciliation. Ngunnawal people do not seek exclusive use of Namadgi; rather, they welcome others onto their land, as they have always done during their long struggle for the recognition of their rights. They ask, simply, that others respect the cultural protocols that they have developed for Namadgi.

1.7.3 Ngunnawal cultural protocols

The Ngunnawal people have developed the following cultural protocols in relation to their traditional land:

- The Ngunnawal people are the traditional peoples of the clans of all land and waters of the Ngunnawal nation.
- Aboriginal law requires respect for their cultural authority as the traditional peoples.
- Ngunnawal people speak for all Ngunnawal country—other traditional peoples speak for their traditional lands.
- We all have a mutual obligation to care for our country with our neighbours.
- Ngunnawal people expect visitors to be aware of Ngunnawal cultural traditions and to respect and acknowledge Ngunnawal laws and customs when they visit Ngunnawal country.
- Visitors have the right to be treated with respect and understanding.
- All visitors are responsible for their behaviour and should respect Ngunnawal country.

1.7.4 Cooperative management of Namadgi into the future

The Aboriginal signatories to the Agreement identified the following matters to be considered for future cooperative arrangements:

Recognition of Aboriginal society—past, present and future

- Acknowledgement by government of the occupation and land use of the region by Aboriginal peoples before and after colonisation.
- Enhanced community awareness of and respect for Aboriginal culture.
- Cross-cultural awareness training for non-Indigenous people working in cooperative management.
- Empowerment of Aboriginal people in decision-making that affects their culture and their community.

Restoration of tradition and community identity

- Social and archaeological research into Aboriginal land use and culture to restore knowledge lost over the last 150 years.
- Re-connection of Aboriginal people to their country through work, events and recreation.
- Establishment of sites within Namadgi for Aboriginal cultural camps, including development of protocols for the operation of the camps.
- Traditional use of parts of Namadgi for hunting, food gathering and ceremonial purposes as part of cultural camps, including development of protocols that address issues such as public safety, impact on threatened species and water supply protection.
- Re-introduction of Aboriginal place names and language into park interpretation.
- Ownership and control of Ngunnawal cultural and intellectual property.

Community development

- Education of Aboriginal youth in their tradition and culture.
- Building the capacity of the Ngunnawal community to work in partnership with government agencies.
- Employment and training within the park for Aboriginal people and in related environmental management disciplines.
- Pursuing commercial and self-employment opportunities—research, art and entertainment, cultural tourism (interpretation, recreation, hospitality services).

2

Legislative, planning and policy framework



2.1 Management plan: purpose and scope

This management plan has been prepared for Namadgi National Park, which is Public Land under the *Planning and Development Act 2007*. Public Land is defined in the *Territory Plan* (ACTPLA 2008). Management objectives for the different categories of Public Land are set out in the *Planning and Development Act 2007* (s. 317, Schedule 3).

Namadgi National Park comprises two categories of Public Land, namely 'Wilderness area' and 'National park'. The prescribed management objectives are:

- Wilderness area**
1. To conserve the natural environment in a manner ensuring that disturbance to that environment is minimal.
 2. To provide for the use of the area (other than by vehicles or other mechanised equipment) for recreation by limited numbers of people, so as to ensure that opportunities for solitude are provided.
- National park**
1. To conserve the natural environment.
 2. To provide for public use of the area for recreation, education and research.

The Act prescribes that where there is an inconsistency in the application of the above prescribed management objectives; the first mentioned objective takes precedence. The legislation therefore recognises conservation of the natural environment as the primary purpose of the park. 'Natural environment' is defined in the Act (s. 317) to mean 'all biological, physical and visual elements of the earth and its atmosphere, whether natural or modified'.

The *Planning and Development Act 2007* requires each area of reserved Public Land, including national parks, to have a management plan. The Act prescribes that an area of Public Land shall be managed in accordance with the legislatively defined management objectives as outlined above, and the plan of management. A management plan may contain additional but secondary management objectives. A management plan is required to describe the area of Public Land to which it applies and to include the manner in which the prescribed management objectives are to be implemented or promoted. Through the Act, the policies and strategies contained within a management plan are legally binding upon both the Government and community.

The provisions of this management plan apply to the reserve area of Namadgi National Park as defined in the *Territory Plan*. This plan supersedes the original management plan for Namadgi published in 1986. Building upon the initial planning work and experience gained in its implementation, the plan considers current environmental, social and economic conditions in providing guidance for park managers and the community in how the park should be managed to protect its values.

The plan has been structured to:

- describe park values as they are currently perceived by the community
- define the broad management approach that should be followed
- define objectives, policies and management strategies to be applied in managing a range of specific issues.

2.2 ACT planning framework

All the land in Namadgi National Park is Territory Land as defined by the *Australian Capital Territory (Planning and Land Management) Act 1988* (Commonwealth). Its management is the responsibility of the ACT Government, however, it is still subject to the policies of the *National Capital Plan* (NCA 2007) as well as those of the *Territory Plan* (ACTPLA 2008).

2.2.1 National Capital Plan

Namadgi is included in the *Mountains and Bushlands* land use category of the National Capital Open Space System (NCOSS). The latter is defined in the *National Capital Plan* and involves a

linked system of 'open space' areas aimed at protecting the natural setting of the National Capital. It ranges from the symbolic and monumental landscapes of the National Capital to the rugged wilderness of Namadgi. The Plan contains principles and policies for both NCOSS and *Mountains and Bushlands*. Appendix G of the Plan also sets out *Special Requirements* for Namadgi National Park and Adjacent Areas.

The Plan (Appendix G) states the following key objectives:

- To protect the resources and environmental qualities of Namadgi National Park and adjacent areas of the Cotter and Gudgenby catchments in the interests of Canberra's water supply and nature conservation. Plantation timber in the north of the Policy area, recreation and scientific study are secondary objectives.

Policy statements are set out for: water supply; nature conservation; recreation; education; scientific study and research; timber production; heritage; access; and non-permissible activities.

2.2.2 Territory Plan

The *Territory Plan* is established under the *Planning and Development Act 2007*. The *Namadgi National Park Plan of Management* must be consistent with the provisions of the Territory Plan:

- Namadgi is identified as **Non-Urban Zone 5 (NUZ5) Mountains and Bushland** and the zone objectives are for the protection of non-urban mountains and bushland for water supply, biodiversity conservation, appropriate recreation, natural and cultural heritage conservation, visual character, research and education. The **Non-Urban Zones Development Code** provides additional planning, design and environmental controls including restrictions on use.
- The *Territory Plan* categorises ACT water catchments according to their primary value. The Cotter River from its headwaters to Cotter Dam is Water Supply Catchment for which the primary value is domestic water supply. Water Supply Catchment policies are identified in the **Water Use and Catchment General Code** (see Appendix 1) including those related to water quality, protection of stream-flow, protection of stream environs and protection of ground water.

2.3 Legislation, agreements and policy

The management of Namadgi National Park is underpinned or influenced by a number of international and national agreements, Commonwealth and Territory legislation, and ACT Government policies and strategies. Each defines objectives, policies or actions relevant to the management of specific places, attributes or values. This management plan aims to integrate these legislative obligations, agreements and guidelines in a holistic manner to ensure the values of the park are duly conserved. The legislation listed may be amended or replaced with other Acts during the life of this plan.

2.3.1 International agreements

International agreements related to migratory birds, wetland conservation and cultural heritage (Burra Charter) are relevant to management of the park.

Migratory birds

Australia is a signatory to bilateral agreements with the governments of Japan, China and Korea for the protection of migratory birds. These are the Migratory Bird Agreement between Japan and Australia (JAMBA), the Migratory Bird Agreement between the People's Republic of China and Australia (CAMBA), and the Migratory Bird Agreement between the Republic of Korea and Australia (KAMBA).

Latham's Snipe *Gallinago hardwickii*, a species protected under these agreements, uses sub-alpine wetlands on a seasonal basis, therefore the agreements must be considered in undertaking any development or management activities that could potentially affect the species or its habitat. The presence of listed species potentially invokes the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (see below).

Wetlands

The Convention on Wetlands (Ramsar, Iran, 1971) is an intergovernmental treaty aimed at achieving the conservation and wise use of wetlands by national action and international cooperation. The main objectives of the Ramsar Convention are to halt the worldwide loss of wetlands and to conserve those that remain (ACT Government 2001). Ginini Flats Wetlands is included in the List of Wetlands of International Importance in recognition of its significant ecological characteristics and is the only Ramsar Wetland in the ACT (Environment Australia 2001). The wetlands have a specific management plan *Ginini Flats Wetlands Ramsar Site Plan of Management 2001* (ACT Government 2001) that was prepared as part of a government commitment to the Ramsar Convention. (Note: the plan is under review.)

Cultural heritage

The Burra Charter provides guidance for the conservation and management of places of cultural heritage significance in Australia. The current Burra Charter is the revision adopted in 1999 by the Australian National Committee of ICOMOS (International Council on Monuments and Sites) (Australia ICOMOS 1999).

2.3.2 Australian Alps National Parks Agreement

The cooperative management of the Australian Alps national parks by the Commonwealth, ACT, NSW and Victorian governments is defined through the provisions of a Memorandum of Understanding (MOU) first endorsed by the respective ministers in 1986 and re-signed most recently in 2003. The MOU acknowledges the fundamental values and responsibilities and defines a collaborative management framework to:

- pursue the growth and enhancement of inter-governmental cooperative management to protect the important natural and cultural values of the Australian Alps national parks
- cooperate in the determination and implementation of best-practice management of the listed reserves to achieve
 - protection of the unique mountain landscapes
 - protection of the natural and cultural values of the Australian Alps
 - provision of an appropriate range of outdoor recreation and tourism opportunities that encourage the enjoyment, education, understanding and conservation of the natural and cultural value
 - protection of mountain catchments.

The aim of the MOU is to achieve a consistent approach to management of the protected areas through the adoption of common planning and management strategies. The Australian Alps Liaison Committee coordinates programs that foster and support the cooperative arrangement. Responsibility for the day-to-day management of the Australian Alps national parks listed on the MOU remains vested with the respective park management agencies. The majority of works undertaken by agencies are in accordance with statutory management plans and approved strategies within their jurisdictions, such as this management plan for Namadgi National Park.

The MOU incorporates terms and working arrangements for cooperative management of the Australian Alps. Key aspects are:

- **Promotion of holistic land management**—broadening perspectives of land managers and the community to acknowledge, and work cooperatively upon, land management issues that extend beyond administrative boundaries.
- **Development of consistent policy and standards**—through collaboration on the development of regulations, management plans, conservation and education programs.
- **Development of knowledge management within agencies**—through staff networking and information exchange, collaborative research and staff development programs.

At the re-signing of the MOU in 2003, ministers agreed to a range of strategic initiatives for the Australian Alps national parks to be pursued over the following years. These include:

- the adoption of Alps-wide fire management principles and insistence on close cooperation between agencies and fire authorities to ensure that there is a coherent and strategic approach to fire management across the Australian Alps protected area system
- the establishment of an Alps-wide scientific reference panel to provide advice on issues relating to the natural and cultural values of the Alps, with an initial focus on recovery responses to the 2003 bushfire
- the adoption, where possible, of a common terminology, objectives, zoning scheme and style within management plans for reserves covered by the MOU.

2.3.3 Commonwealth legislation agreements and policy

Australian Capital Territory (Planning and Land Management) Act 1988

This legislation establishes a planning framework for the ACT, involving considerations of national capital significance (*The National Capital Plan* (NCA 2007)) and planning for the needs of ACT residents (*Territory Plan* (ACTPLA 2008)). Specific provisions of the *National Capital Plan* related to Namadgi National Park are briefly outlined in s. 2.2.1.

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

This Act is the primary Commonwealth legislation for environment protection. Under the EPBC Act, an action will require approval from the (Commonwealth) Environment Minister if the action has, will have, or is likely to have a significant impact on a matter of national environmental significance and it is not subject to certain exceptions. Exceptions include actions taken in accordance with Commonwealth accredited management plans. The Act also has a focus on conservation of biodiversity. Matters relevant to this plan include heritage places listed on the National Heritage List, Ramsar wetlands, nationally listed threatened species and ecological communities, listed migratory species and provisions for biosphere reserves.

InterGovernmental Agreement on the Environment (1992)

Commonwealth, state and territory governments, and the Australian Local Government Association are signatories to this agreement, which is the foundation for many government strategic and policy documents. It provides guidance on land use decision and approval processes to ensure development is ecologically sustainable.

National Strategy for Ecologically Sustainable Development (1992)

This defines the goal of Ecologically Sustainable Development (ESD) as 'development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends' (Commonwealth of Australia 1992).

2.3.4 ACT Legislation, strategies and plans

Legislation

Planning and Development Act 2007: The primary authority in the ACT for land planning and administration and establishes *The Territory Plan*, which defines Public Land including national parks and wilderness areas (see s. 2.1).

Nature Conservation Act 1980: Provides for the protection and conservation of native plants and animals, and provides management authority for areas reserved for conservation of the natural environment. The Act establishes the Conservator of Flora and Fauna, the ACT Parks and Conservation Service and the Flora and Fauna Committee. It provides for the declaration of threatened species and ecological communities in the Territory.

Emergencies Act 2004: The primary object of this Act is to preserve life, property and the environment. The Act requires the preparation of a Strategic Bushfire Management Plan for the ACT. The Act sets out the land management requirements for the prevention of and preparedness for bushfire, and requires the preparation of operational plans for the mitigation of bushfire risk. It empowers the ACT Rural Fire Service to undertake the suppression of bushfire in rural areas, the definition of which includes Namadgi National Park. This legislation replaced the *Bushfire Act 1936*.

Water Resources Act 2007: The objects of this Act are to ensure that management and use of the water resources of the Territory sustain the physical, economic and social wellbeing of the people of the ACT while protecting the ecosystems that depend on those resources; to protect aquatic ecosystems and aquifers from damage and, where practicable, to reverse damage that has already happened; and to ensure that the water resources are able to meet the reasonable needs of future generations.

Environment Protection Act 1997: Provides for environmental protection through a range of measures aimed principally at activities that could harm the environment. The Act recognises the duty of individual members of the community in caring for environmental quality. The Act sets water quality standards.

Heritage Act 2004: Establishes a system for the recognition, registration and conservation of natural and cultural heritage places and objects including Aboriginal places and objects. A list of these places is maintained on the ACT Heritage Register (see s. 6.3).

Crimes Act 1900: Consolidates the statutes relating to criminal law. Offences relating to property are of particular relevance to Namadgi. Additional offences dealing with arson and lighting bushfires are found in the Criminal Code 2002.

Domestic Animals Act 2000: Provides for the identification and registration of certain animals including dogs, and the duties of owners, carers and keepers.

Firearms Act 1996: Provides for the use of firearms by park personnel.

Fisheries Act 2000: Provides for the conservation of native fish species and their habitats; the sustainable management of fisheries; the provision of high quality and viable recreational fishing opportunities; and cooperation with other Australian jurisdictions in relation to protecting native fish species.

Litter Act 2004: Provides for the control and regulation of litter including illegal dumping of litter.

Animal Diseases Act 2005: Provides for the control of endemic and exotic diseases of animals, and for related purposes.

Pest Plants and Animals Act 2005: Provides for the declaration and management of pest plants and animals.

Plant Diseases Act 2002: Provides for the regulation of plant diseases issues.

Public Health Act 1997: Provides for the protection of the public from public health risks.

Roads and Public Places Act 1937: Provides for temporary roads, temporary closure of roads and use of public places.

Stock Act 2005: Contains regulations for the control of stock and ruminants.

Trespass on Territory Land Act 1932: Provides for the regulation of straying stock, illegal camping, and unauthorised occupation of public or private land.

Hawkers Act 2003: Provides for the regulation of the activities of hawkers in public places.

Strategies and plans

ACT Nature Conservation Strategy 1998: Establishes a policy framework for conservation of biodiversity in the ACT. It is prepared under the provisions of the *Nature Conservation Act 1980*.

The ACT Climate Change Strategy 2007-2025: Provides an overview of climate change science, the predicted impacts on the ACT, and the ACT Government's vision and direction for responding to climate change. The *Climate Change Action Plan 1 2007-2011* sets out measures to reduce emissions and a range of associated actions.

ACT Lowland Woodland Conservation Strategy (Action Plan No. 27): Focuses on lowland woodland in the ACT in the approximate altitudinal range of 600-1000 m. It includes the threatened Yellow Box – Red Gum Grassy Woodland and threatened species associated with woodland habitat. There is some occurrence of this ecological community in the southern part of Namadgi where it intergrades with woodland on dry hill slopes and mountain foothills. Four ACT threatened woodland bird species are recorded from Namadgi.

ACT Aquatic Species and Riparian Zone Conservation Strategy (Action Plan No. 29): Focuses on the rivers and larger tributary creeks and their riparian zones in the ACT that support threatened species. The Cotter and Gudgenby–Naas rivers are included in the strategy. Three ACT threatened fish species are found in Namadgi.

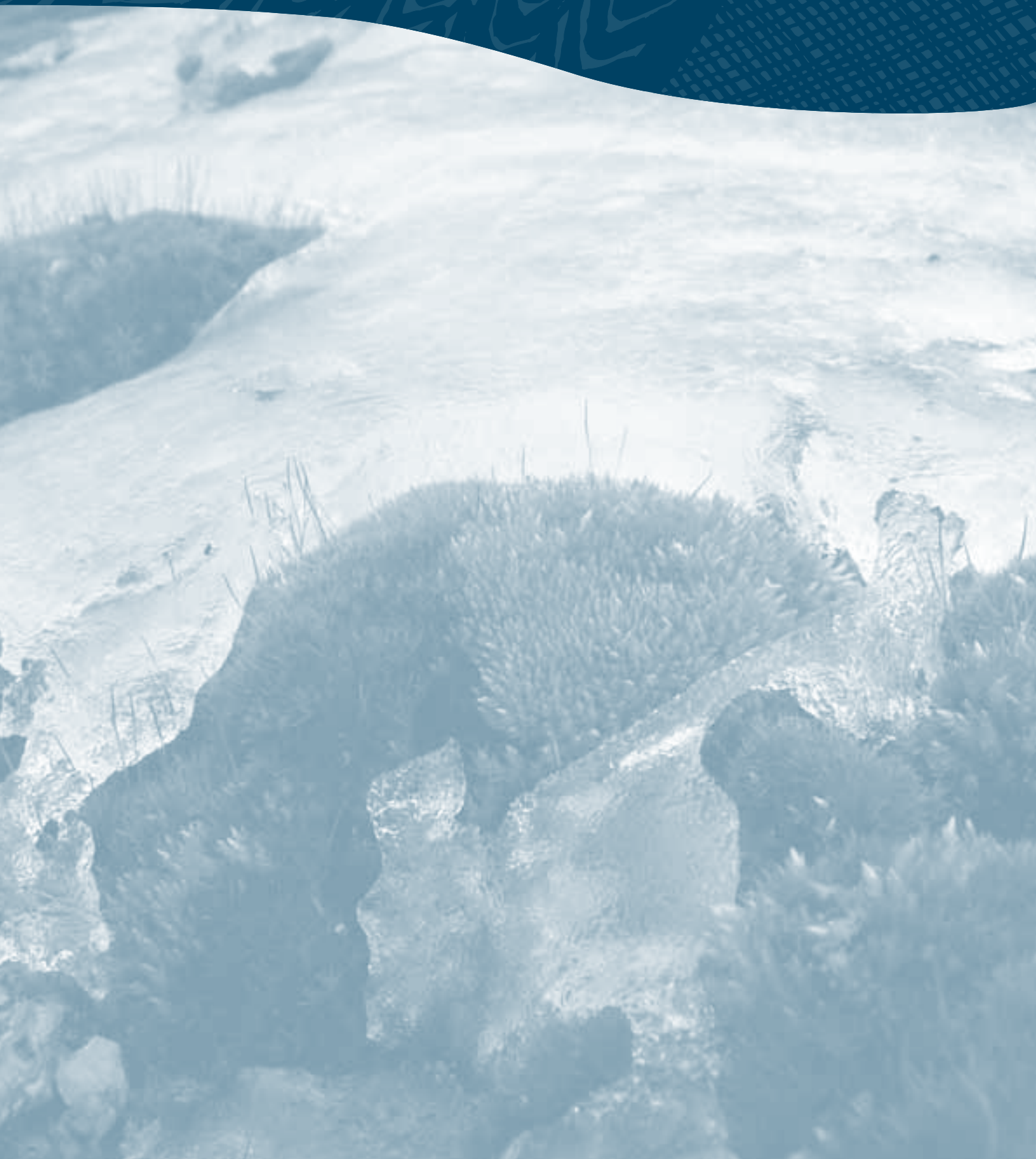
ACT Weeds Strategy 2009–2019: Aims to reduce the impact of weeds on the environment, the economy, human health and amenity. It recognises that weed management is an integral component of sustainable management of natural resources and the environment. The Strategy outlines a Terms of Reference for the ACT Land Managers Working Advisory Group which oversees the implementation of the ACT Weeds Strategy.

ACT Vertebrate Pest Management Strategy: Sets out the steps in a strategic approach to developing and implementing a vertebrate pest management program.

Strategic Bushfire Management Plan for the ACT Version 2 (2009): The plan builds on the *Strategic Bushfire Management Plan – Version 1 (2005)* and includes consideration of the most recent fire behaviour science and information on education and awareness. The structure of the plan adopts the nationally recognised elements of contemporary bushfire management: research, information and analysis, preparedness, prevention, response and recovery.

3

Park zoning



3.1 Purpose of zoning

Zoning is a system of defining areas within a reserve based on the values that management aims to protect and the types of activities that will be permitted. It is a means of expressing management priorities for particular areas related to management objectives. Zoning categories and the boundaries of management zones are determined by the spatial arrangement of key park values such as wilderness, water supply, biodiversity, cultural heritage and scenic quality. However, the main purpose of park zoning is to specify the appropriate levels and forms of human access (particularly for recreation), and associated facilities and management requirements (NSW NPWS 2006). Common management and recreation policies are applied to each of the zones.

An integrated zoning system has been developed for Namadgi based on the natural and cultural heritage values of the park and taking into consideration the following:

- The park contains urban water supply catchments in which protection of raw water supply from contamination is a high priority.
- The park contains areas that are highly significant ecologically, where threatened species, ecological communities and geological features occur that are sensitive to disturbance.
- The protection of biodiversity, ecological processes, cultural heritage and scenic landscapes are important management functions throughout the park.
- 'Wilderness' and 'remote area' values are key attributes of the park warranting a high priority in management.
- The ACT legislative and planning framework must be applied to the park.

The park is divided into three primary management zones, two of which are further subdivided (see Table 3.1 and Map 3). The zones provide a gradation from wilderness/catchment protection with the most restrictive access policies, to areas of general vehicle access and more 'developed' recreational opportunities. The zoning system for Namadgi closely aligns with that for Kosciuszko National Park with adjustments made to accommodate values that are specific to Namadgi, for example, the urban water supply catchment of the Cotter.

The zoning system is an integrated composition of particular park values and general management policies that can be applied to each area. While key values are identified for each of the management zones, therefore indicating priorities for management, the primary management objectives outlined in s. 1.5 apply to the park as a whole. Particular high value attributes such as sensitive ecological communities or significant cultural heritage places can occur anywhere in the park, and require appropriate protection and management whether or not they are identified as a key value for the zone in which they occur.

Table 3.1 Summary of Namadgi National Park management zones (to be read with reference to Map 3 inside back cover)

Zone	Attributes	Divisions	Key values
Zone 1	Remote Area (Core Conservation and Catchment Area)	Zone 1A 28 150 ha	Key values are water supply (Corin Dam/Upper Cotter Catchment), wilderness (Bimberi Wilderness) and biodiversity (including the Upper Cotter ecological benchmark (Chapter 5)). Other values are recreation (wilderness and remote area), cultural heritage, scenic, aesthetic and scientific.
	49 828 ha 47% of the park	Zone 1B 21 678 ha	Key values are water supply (Bendora Dam/Middle Cotter Catchment) and biodiversity (including Ginini Flats Wetlands). Other values are cultural heritage, scenic, aesthetic and scientific.
Zone 2	Semi-Remote Area (Conservation and Recreation Area) 51 219 ha 49% of the park	Zone 2A 11 400 ha	Significant remote landscapes that are free from roads, including the Booth Range and the biodiversity-rich Blue Gum Creek area. Key values are biodiversity and cultural heritage. Other values are scenic, aesthetic and scientific.

		Zone 2B 39 819 ha	Buffer areas to wilderness and wild semi-remote areas. Includes areas with significant natural and cultural values. Accessible for a range of recreation opportunities. Key values are biodiversity, cultural heritage and recreation. Other values are scenic, aesthetic and scientific.
Zone 3	Roaded Natural Recreation Area 5 095 ha 5% of the park	Zone 3 5 095 ha	Areas with public road corridors, including areas where visitor facilities are concentrated. The key value is recreation. Other values are biodiversity, cultural heritage, scenic and aesthetic.

Note: Categories of park values are based on the outline in Table 1.1.

The characteristics of each of these zones are described in s. 3.2 and specific management policies are outlined in Table 3.2. The zones are shown in Map 3 inside the back cover of the plan. Recreation policies for the defined management zones are outlined in Table 8.2.

3.2 Descriptions of management zones

3.2.1 Zone 1 Remote Area

(Core Conservation and Catchment Area): Upper and Middle Cotter Catchment, Lower Cotter Catchment (part), Gudgenby-Naas Catchment (part)

This zone covers the catchments of Corin and Bendora dams, part of the catchment of the Cotter Dam, and upper parts of tributaries of the Orroral, Gudgenby and Naas rivers.

The zone extends from the southern border of the ACT near the Sentry Box peak to the Bendora Road and the north-eastern park boundary in the Hardy Range. This area warrants special management attention to protect urban water supply, wilderness and biodiversity values including sensitive subalpine ecosystems. Recreation in Zone 1 is limited to low-impact activities.

Zone 1A: Bimberi Wilderness Area including Upper Cotter Catchment (part), Upper Gudgenby-Naas Catchment (part)

Zone 1A is defined by the boundaries of the Bimberi Wilderness Area. It includes most of the upper Cotter Catchment and upper parts of tributaries of the Orroral, Gudgenby and Naas rivers (Sawpit, Nursery, Rendezvous, Middle, Bogong and Naas creeks). The upper Cotter Catchment supplies water to Corin Dam, the most significant water reservoir in the ACT. There is congruence between the management of this catchment for protection of both wilderness values and water supply in that restrictions on the type and level of access are appropriate to both.

Management of the gazetted wilderness area has specific legislative requirements in terms of conservation priorities and compatible use. The *Planning and Development Act 2007* (s. 317, Schedule 3) specifies management objectives for a wilderness area (outlined in s. 2.1). Consistent with the second objective, cycling is not permitted in the wilderness area.

Access to the upper Cotter Catchment for overnight walking and dispersed camping is subject to a permit system (a continuation of existing policy). Numbers of walkers are limited to protect urban water supply and provide a sense of remoteness for those visiting the area. The *Nature Conservation Act 1980* specifies that new tracks are not permitted in wilderness areas.

Zone 1B: Middle Cotter Catchment, Lower Cotter Catchment (part), Corin Dam Area

Zone 1B includes the middle Cotter Catchment (catchment for Bendora Dam), Corin Dam and adjacent areas, the area north-west of Bendora Dam to the Bendora Road (lower Cotter Catchment), and the north-eastern ranges (Hardy Range, Tidbinbilla Range) (lower Cotter Catchment).

This sub-zone includes sensitive subalpine and montane vegetation communities. The eastern portion of the middle Cotter (western slopes of the Tidbinbilla Range) is an unstable landscape consisting of loose sedimentary rock that is erosion-prone and requires special management consideration. For the security of Bendora reservoir and to protect water quality, only day-use activities are permitted. Cycling is permitted on formed roads. Camping is not allowed.

3.2.2 Zone 2 Semi-Remote Area (Conservation and Recreation Area)

Zone 2 contains important biodiversity, cultural heritage and recreational values. The zone includes the Orroral, Gudgenby, Boboyan and Naas valleys, which contain a high density of Aboriginal and European cultural heritage sites. The biodiversity value of this zone is very high, with some areas, such as the Mt Tennent/Blue Gum area, exhibiting an unusual and rich assemblage of species. Knowledge about the biodiversity of much of this zone, particularly the Naas Catchment, is limited. Zone 2B forms a buffer to the Bimberi Wilderness (Zone 1A) and the Wild Semi-Remote areas of Zone 2A. Management of the area needs to take cognisance of its potential to provide urban water supply (see s. 4.5.6).

Zone 2A: Wild Semi-Remote

Zone 2A comprises the Booth Range and Blue Gum Creek areas. These are core areas of Zone 2 comprising hilly to mountainous country that does not contain public roads. The Blue Gum area is particularly important as it contains unusual and diverse vegetation including many species that are at the limits of their distribution or are uncommon in the ACT.

The Booth Range is valuable for its integrity as a landscape without roads. It is a location for recreational activities that require a remote setting but are not compatible with the values of the Cotter Catchment and wilderness area. The area may be used for future urban water supply. Information about the biodiversity and cultural heritage values of the Booth Range is limited. A precautionary approach is therefore appropriate with regard to recreational use.

Zone 2B: Conservation and Recreation

This zone includes valleys and hills with high natural and cultural heritage value. A high concentration of European and Aboriginal cultural sites exists in the broad open valleys. The zone contains a network of management trails and walking tracks that provide access for a range of low-key recreational pursuits consistent with its possible future role in providing urban water supply (see s. 4.5.6).

3.2.3 Zone 3 Roded Natural Recreation Area

Roded Natural Areas and Road Corridors

Zone 3 comprises the public roads in the park, and the northern part of the park (north of Bendora Road along the Brindabella Range to Mt Coree and Mt Blundell). This area contains an extensive minor road network linked to adjoining NSW reserve areas and ACT land managed as pine plantations before the 2003 bushfire.

The concept of corridors is that roads, trails and roadside facilities cater for more highly concentrated, mainly vehicle-based recreation for which demand and impact does not extend far into the neighbouring area. Turning bays, vehicle parking, lookouts, picnic areas and a medium to high level of interpretive signage will be accommodated within this zone. The zone extends for a distance of 40 m either side of the centre-line of each road except where a variation in the corridor boundary is required for the incorporation of visitor nodes and facilities such as campgrounds and picnic areas.

The network of minor roads that are open for public use in the northern section of the park is a popular place for on-road four wheel driving and links with the area previously managed as a pine plantation and the Brindabella National Park (NSW) that are also available for this activity.

Visitor Service Nodes

Within the Roded Natural Recreation Area, visitor service nodes are located at points of interest where a concentration of visitor information for recreation, education and interpretation can be provided.

Table 3.2 Management policies for defined management zones

Policy Item	Zone 1 Remote Area		Zone 2 Semi-Remote Area Conservation and Recreation Area		Zone 3 Roaded Natural Recreation Area
	Core Conservation and Catchment Area	Remote Area	2A Wild Semi-Remote Booth Range and Blue Gum Creek Area	2B Conservation and Recreation	Roaded Natural Areas and Road Corridors
Access	1A Bimberi Wilderness including Upper Cotter Catchment Access on foot. Motorised or mechanised access strictly controlled and only for management purposes.	1B Middle Cotter Catchment and Adjacent Areas Vehicle access to track heads around periphery of zone. No motorised access except for management purposes. Tour cycling can occur on formed roads and fire trails north of Ginini car park.	Vehicle access to track heads around periphery of zone. Motorised access limited to management vehicles.	Vehicle access to track heads around periphery of zone. Motorised access for management purposes, for special circumstances and licensed operators. Tour cycling on formed roads. Horse riding on designated formed roads.	Access via 2WD roads to periphery of other zones. All roads in Zone 3 are public roads.
Management (vehicle) Trails	No new management trails. Management trails may be redesigned and constructed to improved standards.	No new management trails unless there is a demonstrated need for fire or catchment protection purposes. Management trails may be redesigned and constructed to improved standards.	No new management trails unless there is a demonstrated need for fire protection purposes. Management trails may be redesigned and constructed to improved standards.	No new management trails unless there is a demonstrated need for fire protection purposes. Management trails may be redesigned and constructed to improved standards.	No new management trails unless there is a demonstrated need for fire protection purposes. Management trails may be redesigned and constructed to improved standards.
Facilities	Public facilities rarely found and only for natural and cultural heritage protection.	Public facilities rarely found and only for natural and cultural heritage protection.	Public facilities rarely found and only for natural and cultural heritage protection.	Low-key facilities consistent with existing network of historic huts, toilets and interpretive trails. Dispersed camping. On-site interpretation. Toilets to be provided in high-use areas.	Low-key facilities at picnic areas e.g. tables, BBQs, toilets and visitor interpretation. Campgrounds with limited facilities and opportunities for remote style bush camping. Toilets to be provided in high-use areas.
Aboriginal Cultural Camps	Subject to negotiation and protocols.	Subject to negotiation and protocols.	Permitted subject to protocols.	Permitted subject to protocols.	Permitted subject to protocols.
Disabled Access and Facilities	N/A	All new facilities to provide for disabled access as far as practicable.	N/A	All new facilities to provide for disabled access as far as practicable.	All new facilities to provide for disabled access as far as practicable.

	Zone 1 Remote Area		Zone 2 Semi-Remote Area		Zone 3 Roaded Natural Recreation Area
	Core Conservation and Catchment Area	Remote Area	Conservation and Recreation Area	Roaded Natural Recreation Area	
Policy Item	1A Bimberi Wilderness Including Upper Cotter Catchment	1B Middle Cotter Catchment and Adjacent Areas	2A Wild Semi-Remote Booth Range and Blue Gum Creek Area	2B Conservation and Recreation	Roaded Natural Areas and Road Corridors
Social Interaction	Extremely low level of interaction with other users. Predominant perception of isolation and remoteness from urban centres. Restriction on group size and overall numbers at any one time.	Low level of interaction with other users.	Generally a low level of interaction with other users.	Low to medium level of interaction. Medium opportunity to escape the urban environment, enjoy solitude or participate in group events.	Relatively frequent interaction with other visitors. Perception of travelling a road through a remote area.
Walking Tracks	No new overnight walking tracks. Existing routes may be redefined for better environmental outcomes.	No overnight walking tracks. Has potential for new walking tracks for day walks.	No new walking tracks.	Potential for new walking tracks, particularly to link to existing walking tracks to create circular routes.	Potential for new walking tracks particularly short circular routes suitable for all abilities.
Campground	No designated campgrounds. Dispersed camping only.	No designated campgrounds or dispersed camping.	No designated campgrounds. Dispersed camping only.	Designated bush camps on overnight walking tracks permitted. Dispersed camping permitted provided environmental and cultural heritage impacts remain low.	Camping in designated campgrounds only.
Management Structures	Only if demonstrated as essential to meeting management objectives for the zone.	Only if demonstrated as essential to meeting management objectives for the zone.	Only if demonstrated as essential to meeting management objectives for the zone.	Permitted as required for research and monitoring and protection of natural and cultural heritage assets.	Permitted as required for research and monitoring and protection of natural and cultural heritage assets.
Utility Structures	Only if demonstrated as essential to meeting management objectives for the zone.	Only if demonstrated as essential to meeting management objectives for the zone.	Only if demonstrated as essential to meeting management objectives for the zone.	Utility structures to be kept to a minimum.	Utility structures to be kept to a minimum.
Built Accom- modation	No overnight accommodation. Cotter Hut to be used strictly for management purposes.	No overnight accommodation.	No overnight accommodation.	No overnight accommodation. Staff residences permitted.	Overnight accommodation at Gudgenby Homestead Precinct. Staff residences permitted.

	Zone 1 Remote Area		Zone 2 Semi-Remote Area		Zone 3 Roaded Natural Recreation Area
	Core Conservation and Catchment Area		Conservation and Recreation Area		
Policy Item	1A Bimberi Wilderness including Upper Cotter Catchment	1B Middle Cotter Catchment and Adjacent Areas	2A Wild Semi-Remote Booth Range and Blue Gum Creek Area	2B Conservation and Recreation	Roaded Natural Areas and Road Corridors
Management Intervention	As required for natural and cultural heritage protection, and water resource management.	As required for natural and cultural heritage protection, and water resource management.	As required for natural and cultural heritage protection.	Moderate level for natural and cultural heritage protection.	High level for environment protection purposes.
Signs	Strictly for management and environmental protection purposes.	Strictly for management and environmental protection purposes.	Yes, particularly in high use areas and for walking tracks.	Yes, particularly in high use areas and for walking tracks.	Yes. Moderate level of directional and interpretive signage.
Interpretation	No permanent free-standing interpretation structures.	Low level of interpretation.	Moderate level of interpretation.	Moderate level of interpretation.	Moderate to high level of interpretation.
Memorial Plaques	Only in accordance with the ACT Government Memorials Policy.	Only in accordance with the ACT Government Memorials Policy.	Only in accordance with the ACT Government Memorials Policy.	Only in accordance with the ACT Government Memorials Policy.	Only in accordance with the ACT Government Memorials Policy. This zone is the most appropriate for any approved memorials, and/or the Visitor Information Centre.

* See Chapter 8 and Table 8.2 for recreation policies for the defined management zones.

4

A place of water Water resource management



4.1 Primary management objective

The ecological and hydrological condition of water catchments is maintained and, where desirable and feasible, improved, to ensure a continuing high quality and cost-effective water supply for the ACT.

4.2 Background

In December 1909, agreement was reached between the Commonwealth and NSW governments on the boundaries of the new Federal Capital Territory (later Australian Capital Territory), which included the mountain catchments of the Cotter, Gudgenby and Naas rivers. Inclusion of this area, as the main source of water for the future national capital was fundamental to early negotiations on the site of the Territory.

In anticipation of its use for water supply, grazing leases within the Cotter Catchment reverted to twelve month issue from 1908, and were terminated outright in 1911. Resumption of freehold land within the Cotter Valley was completed by 1913. The catchment, with its natural forest cover in the middle and upper reaches, has been protected since that time to ensure a safe and secure water supply for Canberra. The Cotter Dam, Canberra's only water supply storage for over forty years, was constructed between 1912 and 1917. Construction of Bendora Dam was completed in 1961 and Corin Dam in 1967.

Protection of the catchment was initiated in 1914 with a 'restricted use' policy under the *Cotter River Ordinance 1914* (now repealed). This forbade camping and picnicking within the catchment, however, other activities and land uses could be permitted at the discretion of the Commonwealth. This was evident in the later issuing of leases for ski lodges and the harvesting of timber. Livestock were permitted to pass through and stop just one night along stock routes whilst *en route* to snow leases in neighbouring NSW, a practice that continued until the cessation of NSW snow leases in 1969.

For seventy years, the Commonwealth Department of the Interior retained control of the Cotter Catchment with operational management being vested in its forestry agency. To enforce the ordinance, a ranger was appointed and based in the Cotter Homestead from 1927. Horseback travel was fundamental to monitoring the catchment. Key duties included overseeing the passage of stock through the catchment each spring and autumn, enforcing recreational restrictions, undertaking fire management and controlling pests. The isolated location and independence of the ranger position suited persons with a high-country pastoral background and attracted long tenures—only three people occupied the position in its fifty-nine year existence.

Timber was being extracted from the Brindabella Ranges by the early 1930s, supplying a mill in Queanbeyan. From 1934 to 1938, a saw mill operated at Lees Creek, below Piccadilly Circus, to service selective logging higher in the catchment. More intensive forestry operations proceeded in the Uriarra and Pierces Creek areas with large areas of pine planting.

In 1963 the National Parks Association of the ACT developed and presented a submission to the Department of the Interior—'A Proposal for a National Park in the Australian Capital Territory' that centred on Mt Kelly. However, it was not until 1979 and after the completion of master planning for the ACT, that Gudgenby Nature Reserve was gazetted (Esau 1984). It included the Naas and Gudgenby catchments but not the Cotter Catchment. Namadgi National Park was gazetted in 1984. It consolidated the Gudgenby Nature Reserve and the middle and upper Cotter catchments into a park of 96 000 ha under the *Nature Conservation Ordinance 1980*. In 1989 most of the upper Cotter Catchment was declared the Bimberi Wilderness under the *Nature Conservation Act 1980*. In 1991, Namadgi National Park was expanded in size to its present 106 095 ha which included, among other areas, a large section of the lower Cotter Catchment extending from Bendora Dam to Mt Coree.

4.3 Water supply

Namadgi National Park protects all of the upper and middle sections of the Cotter Catchment and 65% of the lower Cotter Catchment. The part of the lower Cotter Catchment that is outside the Namadgi boundary is land that was previously managed as a pine plantation before the 2003 fire (30%) and the Brindabella National Park in NSW (5%).

The Cotter Catchment supplies three water storage reservoirs: Corin, Bendora and Cotter. With their relatively reliable rainfall, the upper and middle sub-catchments, which supply Corin and Bendora reservoirs, have provided approximately 85% of annual water consumption in the ACT since the early 1980s, with the remaining supply being drawn from Googong reservoir.

Most of the upper Cotter Catchment is classified as wilderness and the middle catchment (Bendora) is located in rugged mountainous country that has limited access. The stream system in these areas is valuable both for its natural ecological function and for its high yield and good quality water. Historically, water from Bendora has required minimal treatment for use as potable water. This economically valuable characteristic derives from the largely intact native vegetation cover of the catchment and the long-term management presence to control access and manage disturbance. This is not to suggest, however, that the catchment has not been disturbed in the past. Evidence for this exists in the vegetation of the upper Cotter Catchment that contains many weed species mostly derived from earlier pastoral use (Helman *et al.* 1988). Similarly, dendrochronological studies indicate much more frequent burning at higher altitudes after European advance into the area from the 1850s, which influenced vegetation structure and composition and its susceptibility to further fire (Banks 1989).

Restrictive management of the Cotter Catchment does not guarantee that water quality issues may not arise in the future. Major disturbances, such as the 1983 and 2003 fires in Namadgi, can compromise water quality. During storms after the 2003 fire, the highly erodible western slopes of the Tidbinbilla Range shed massive quantities of sediment into streams and then to Bendora Dam. The water quality of the dam suffered as a result, demonstrating that even a minimally disturbed catchment will not always deliver pure, clean water. The relationships between vegetation cover, catchment yield and fire in the Cotter Catchment were the subject of studies by the Forest Research Institute and CSIRO from the 1960s to the 1980s (see s. 4.5.4).

Lower Cotter Catchment – outside Namadgi National Park

Following the construction of the Corin and Bendora dams in the 1960s the Cotter Dam was no longer used to provide water to Canberra. However, since 2004, water has again been drawn from the dam and added to the Canberra domestic water supply. This has been possible due to the level of treatment provided by a new Mt Stromlo water treatment plant.

In 2007 the ACT Government announced that the Cotter Dam would be enlarged as one of a number of the projects implemented to provide water security for the ACT region. The area of the lower Cotter Catchment that was previously managed as a pine plantation (outside the boundary of Namadgi National Park) has had a higher level of disturbance and the *Lower Cotter Catchment Strategic Management Plan* (ACT Government 2007a) has been prepared outlining work to be undertaken to support the water values including: decommissioning roads; improved road drainage and stabilisation works; creation of sediment basins and wetlands; vegetation planting and additional monitoring and scientific studies.

Other values

As well as water supply, stream systems in Namadgi possess a range of other values, including biodiversity associated with stream and riparian ecosystems, habitat for threatened and uncommon species including fish, crayfish and frogs, maintenance of important wetlands, and recreational amenity.

4.4 Legislative requirements for catchment management in the ACT

The legal framework for planning and land management in the ACT is set out in s. 2.2 and s. 2.3. The *National Capital Plan* and the *Territory Plan* provide the planning and land use policy framework for the Territory. They recognise the competing and sometimes, conflicting demands made on water supply catchments, and to assist managers in resolving such conflicts, identify primary and secondary use categories. The management objectives in this management plan aim to ensure that uses (other than water supply) of the catchment areas within the national park do not conflict with the water supply policies of these overarching plans. A summary of relevant *National Capital Plan* and *Territory Plan* objectives and policies is contained in Appendix 1.

Provisions of the *Water Resources Act 2007* are also relevant to management of the catchments in Namadgi (s. 2.3.4).

4.5 Water supply: management considerations

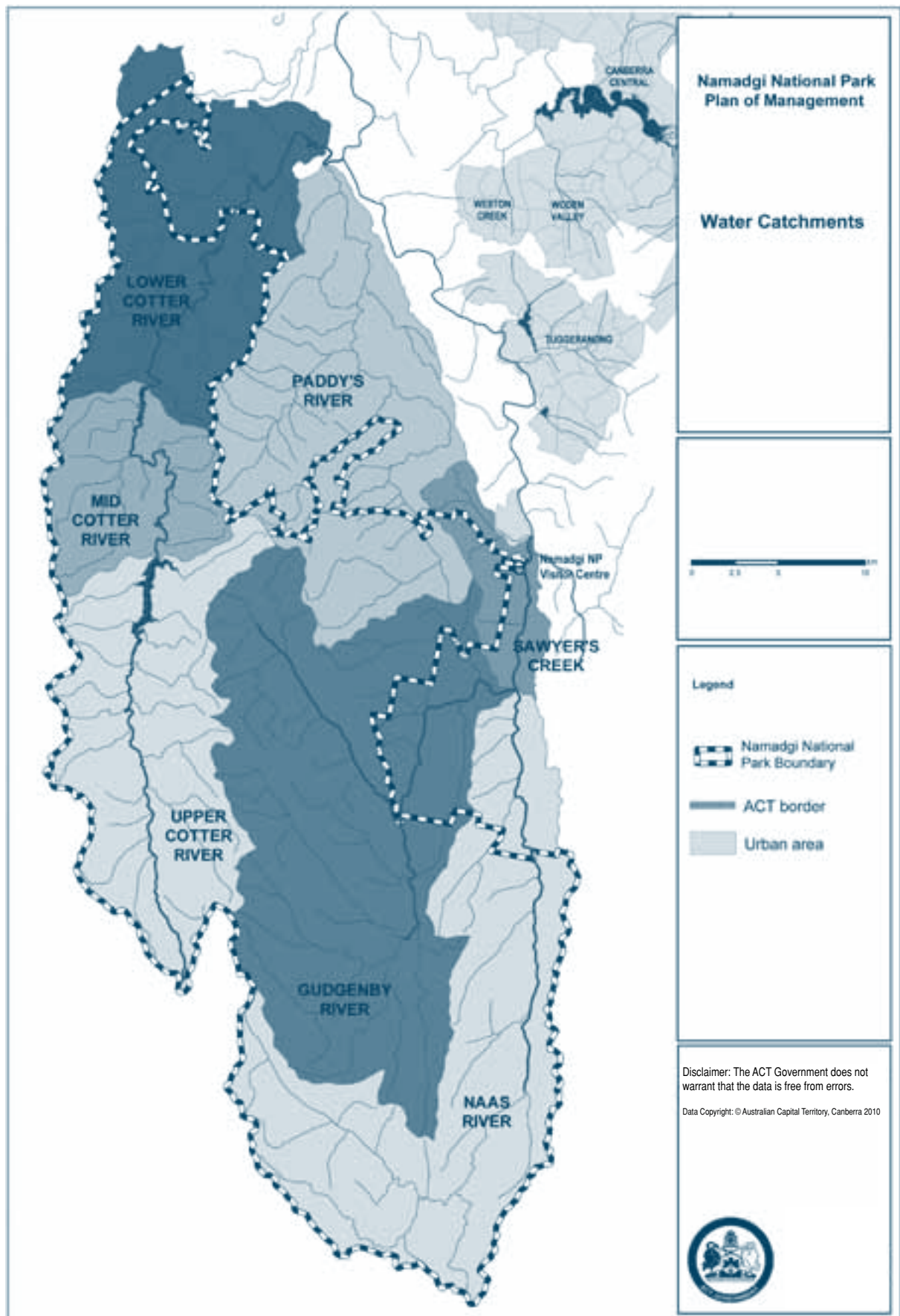
4.5.1 Maintaining water quality and yield

The major bushfire of 2003 caused severe disturbance in the Cotter Catchment and a resultant need to upgrade water treatment facilities. A new water treatment plant installed at the Stromlo Water Treatment Facility will help ensure that water from the upper and middle Cotter Catchment is suitable for consumption, both in the short-to-medium term while the catchment recovers from the fire, and into the future with water also being extracted from the more disturbed lower Cotter Catchment (ACT Government 2006).

The effects of fire and other landscape disturbances have the potential for major hydrological impacts:

- Landscape disturbance affects stream flow. Changed land use—for example, an expanded road network, high levels of use of vehicle tracks, and changed fire regimes that affect the status of *Sphagnum* bog swamps and allied *Carex* fens or valley floor alluvial aquifers—can affect runoff and groundwater regimes. Landscape management must consider potential impacts on the hydrological regime and be responsive to growing understanding of the landscape factors that influence water yield.
- Severe fire damage in 2003 to tributary headwater *Sphagnum* bog systems will impact on river flows for the foreseeable future. Restoration work on the bogs is ongoing. Monitoring to measure the effectiveness of restoration strategies will need to continue for some years.
- Fire management policies must take into account of the importance of catchment stability and implications for water yield and water quality. However, the relationships between these variables are complex, not well understood, and generally highly contentious (see Chapter 7).
- As the Cotter Catchment recovers from the 2003 fire, vigorous regrowth of vegetation is expected to result in reduced water yield to reservoirs for some years, as water is taken up by growing plants.
- The implications of climate change for water supply are uncertain. Current predictions suggest that the climate will become warmer and drier with the possibility of more frequent extreme events. Bushfires may be more frequent and wetlands may contract. The results of these changes may be reductions in catchment yield and a decline in water quality.
- The activities of pest animals can cause soil erosion and pollute waterways (see Chapter 5).

Map 2 Water catchments



4.5.2 Recreational use and management infrastructure

Recreational use of water supply catchments and reservoirs is often prohibited or restricted in Australia as it potentially impacts on water quality. The most effective means of assuring drinking water quality and protection of public health is through adoption of a preventive management approach that encompasses all steps in water production from the catchment to the consumer. The key aspect of this approach is the establishment of measures to prevent contamination of water in the form of multiple barriers. These barriers may be grouped into those that operate prior to extraction of the water (catchment management and source water protection, detention in protected reservoirs or storages) and those in place from the point of extraction (extraction management, treatment, distribution). The strength of this approach is that a failure of one barrier may be compensated by the effective operation of the remaining barriers (NHMRC 2004, Chapter 3).

The Australian Drinking Water Guidelines (NHMRC 2004) recognise that '*an active catchment protection program should be maintained*' in order to prevent drinking water contamination by pathogenic organisms. In accordance with this principle, the ACT provides a high level of protection to the upper and middle Cotter catchments by applying stringent controls on recreational use and access. The aim of limiting access is to:

- prevent contamination of water by human waste
- reduce the occurrence of accidental or deliberate human-ignited wildfire
- provide a high level of security for water supply
- minimise operational management requirements
- minimise water treatment requirements
- provide a safe and cost-effective water supply.

Recreational access to water supply catchments involves trade-offs between public amenity and public safety and requires an appropriate risk management strategy. The following considerations are relevant to the relationship between recreational use and maintenance of water quality in the Cotter Catchment:

- Limited information is available about the impacts of recreational use on water quality in natural environments. Research in Britain suggests that human waste is likely to pose the greatest risk. It was found that bacteria such as *Salmonella* in buried faeces can survive for fifty-one weeks in a montane environment and that animal and human urine can be a source of pathogens such as *Giardia* and *Cryptosporidium* (Bryan 2004). Animals can also disperse pathogens and the control of feral pigs and other introduced species may be an important management strategy for reducing the spread of pathogens into watercourses. In general, studies relating to the effects of wilderness recreation on water quality are inconclusive, but they suggest that the more people using a given area, the higher the risk of water contamination by pathogens in faecal waste (Cilimburg et al. 2000). Given the controls on access and camping and the low levels of visitation in the middle and upper Cotter catchments, the risk of water borne diseases affecting the water supply is low.
- The number of day users in any part of the Cotter Catchment is not regulated. However, day use is effectively limited by the distance of the catchment from Canberra and by the policy of allowing only permit based, walk-in recreational access in the upper Cotter Catchment (wilderness area) for overnight camping. Water quality records, as well as field surveys, suggests that recreational impacts in the upper Cotter Catchment are minimal. This plan retains the policy of a limit of twenty-four camping permits at any one time in the area.
- Any increase in recreational use or development within the catchment may present risks to water quality and lead to an increased, ongoing water treatment requirement and the need for more intensive land management. This would markedly increase the cost of catchment management and water treatment and therefore the cost of water to consumers (see s. 4.5.5 below).

- An important aspect of managing recreational use in a water supply catchment is making users aware of that purpose and the need to adjust their behaviour accordingly.
- Park staff working in the catchment require an adequate level of training in relation to catchment management and maintenance of water quality.

4.5.3 Managing water resources within a wilderness area

The objectives for managing Namadgi National Park as defined in the *Planning and Development Act 2007* are, in most instances, compatible with the objectives for managing the water resource catchments. The *Territory Plan* (Appendix 1) defines domestic water supply as the predominant water use for those catchments. However, conflict can arise in relation to vehicle access and infrastructure provision. In managing the wilderness area for recreation, a key objective is to provide opportunities for solitude through the exclusion of mechanical access and to avoid, where possible, installation of intrusive infrastructure. The logistics of conducting catchment management activities, such as research and monitoring may mean that there are times when a relatively high level of vehicle access to the area is required and certain infrastructure, both temporary and permanent may be required. Park managers and organisations with responsibilities in the wilderness area should endeavour to minimise vehicular access, as well as carefully considering the need for and siting of infrastructure, in order to meet the prescribed objectives for a wilderness area.

4.5.4 Research and monitoring

Research and monitoring are important foundations for sound conservation planning and the results form the basis for an adaptive management framework for Namadgi.

Studies of the relationships between vegetation cover, catchment hydrology and fire are of particular relevance to the water supply catchments in the park. A research program examining these relationships was undertaken between 1964 and 1985 in the lower Cotter Catchment (for details, see s. 9.6.1). The doubling of base flow in one catchment for a two year period after a high intensity fire was documented. The much wider scale 2003 bushfire in Namadgi have provided an opportunity to systematically study the effects of a major landscape disturbance on the ecological and hydrological systems in the park, over the life of the management plan.

The following considerations are relevant:

- During the January 2003 bushfire, most of the Cotter Catchment was burnt. The fire was of high to very high severity. This has created a range of water quality, yield and soil stability issues that will require continued monitoring and potentially, remediation works over many years, depending on the hydrological sensitivity of the landscape unit.
- The 2003 fire has presented opportunities for research to improve understanding of the impact of fire on water resources, the response of species to fire, and the establishment of appropriate fire management practices to manage fire better in the catchment (see Chapters 7 and 9).
- Information on the relationships between fire regimes, catchment disturbance due to extreme events (such as the 2003 bushfire), vegetation impacts and recovery, and catchment impacts and rehabilitation requirements may be gained from similar landscapes in south-eastern Australia and previous research.
- Climatic, fire, geomorphic, and vegetation histories are the subjects of a range of research projects being supported by ACTEW Corporation, the ACT Government, tertiary institutions and other research organisations to help understand the hydrological and landscape functions of Namadgi National Park. Other collaborative research includes evaluation of the value of environmental flow releases to stream ecosystems, relationships between water yield and water quality, and sediment and stratigraphic surveys of the Corin Dam delta (sediment deposits).
- Collaborative research initiatives at a regional level to monitor the effects of climate change will provide information and an analysis of how natural systems are responding to change and assist with the formulation of appropriate management strategies (see Chapter 9).

4.5.5 Economic value

An understanding of the economic value of a protected area and the environmental characteristics that contribute to that value provides important information for cost/benefit analyses of management strategies and development proposals. It can also inform the community of the public benefit that is derived from protected areas. Water from the Cotter Catchment at the domestic tap is a highly valuable resource in the ACT. Namadgi is also of significant economic value in terms of its biodiversity resources, provision of recreational opportunities, and its use for research and education.

4.5.6 Future options for water supply – Tennent Dam site

A number of options for augmentation of Territory water supplies have been investigated by ACTEW including the construction of a dam near Mt Tennent on the Gudgenby River. In their report *Water Security for the ACT and Region - Recommendations to the ACT Government* (ACTEW Corporation 2007) ACTEW notes that the proposed dam has a number of complexities that would need further assessment including:

- the Naas Valley has an existing community of rural lessees who would need to be relocated if a dam was built
- the site has an existing road linking Tharwa with the Boboyan Road, which would need to be entirely relocated
- the site has areas of Yellow Box Grassy Woodlands, which has national significance and is also home to several threatened species of birds
- the site has a number of European and Aboriginal heritage sites that would need to be considered
- uncertainty about the flows in the Gudgenby River system.

The report recommends that the Tennent Dam site be retained as an option for future water supply to Canberra. Environmental conservation objectives for Namadgi generally complement protection required for possible future water supply.

4.5.7 Integrated catchment management

Since the 2003 bushfire it has become apparent that a more coordinated approach to management of the Cotter Catchment is required in order to protect water quality and water resources into the future. An integrated approach to planning and management for the Cotter Catchment both within and outside the park is being adopted by the ACT Government to ensure that coordinated and systematic management for the whole landscape is undertaken. The *Lower Cotter Catchment Strategic Management Plan* (ACT Government 2007a) has been prepared for the lower Cotter Catchment, outside of Namadgi, where water supply has been identified as the most valuable resource following the substantial loss of pine plantations in the 2003 bushfire.

4.5.8 Maintaining environmental flows

Stream flows in the Cotter River have been modified by the water storages of Corin, Bendora and Cotter dams. Corin and Bendora dams lie within Namadgi National Park. In accordance with the provisions in the *Water Resources Act 2007*, the Environment Protection Authority establishes a water release regime (environmental flows) from reservoirs to protect the health of downstream aquatic ecosystems. Research on environmental flows is essential given their crucial role in maintaining river health, including meeting the conservation requirements of threatened fish species (see, for example, CRCFE 2004; Lintermans 2001, 2005).

4.6 Water supply: objectives, policies and actions

Consistent with the *Integrated Catchment Management Framework for the ACT* (ACT Government 2000), the management objectives, policies and actions for catchments in Namadgi address the five building blocks identified in the framework as essential elements of integrated catchment management. These are:

- legislative and planning instruments
- management coordination mechanisms
- effective resource use
- appropriate knowledge and skills
- an effective partnership between the community and government.

4.6.1 Legislative and planning instruments

OBJECTIVE

Catchment management activities satisfy statutory requirements, are consistent with strategies and plans for the protection of water supply, maintenance of environmental flows and conservation of the natural environment. They reflect best-practice.

POLICY

- Recreation, research and other activities in the catchments will be managed consistent with the provisions of the *National Capital Plan*, the *Territory Plan* and relevant legislation.

ACTION

- 1 Ensure that subsidiary plans, such as weed and feral animal control strategies, recreation strategies, fire management plans and operational procedures, address legislative requirements for catchment management.

4.6.2 Management coordination mechanisms

OBJECTIVE

Integrated catchment management is established by developing and participating in effective planning, coordination and consultation arrangements.

POLICIES

- Managers of Namadgi National Park shall work collaboratively across Government and with key stakeholders to ensure that consistent and coordinated management policies and practices are adopted for the whole of the Cotter Catchment.
- Where appropriate, agreements (memoranda of understanding) will be developed with organisations that have ongoing investment in the catchments to formalise arrangements relating to access, research and operational matters.

4.6.3 Effective resource management

Protection of water quality

OBJECTIVE

Water bodies in the park are protected through the implementation of management strategies aimed at identifying and minimising threats to water quality.

EROSION AND SEDIMENTATION

POLICY

- Catchments will be managed with the aim of maintaining levels of water quality that conform to the relevant ACT standards. Particular considerations are minimising catchment disturbance to limit contamination of runoff, and minimising damage to hydrologically sensitive landscape elements such as swamps and stream bank environs.

ACTIONS

- 2 Protect water quality in all streams by minimising the impact of erosion caused by management infrastructure and use (such as fire trails, road works and creek crossings). This means applying a high standard of soil erosion control measures and keeping any new works to an absolute minimum.
- 3 Ensure that any road and track maintenance, and the construction of new tracks or containment lines are undertaken by personnel who are competent in techniques that minimise the potential for sedimentation of watercourses.
- 4 Where necessary, rehabilitate areas subject to human-induced erosion and ensure that revegetation material is sourced from locally occurring species.
- 5 Identify sediment/contaminant loads in streams and water storages as a result of fire impacts and develop strategies to minimise further contamination.
- 6 Identify threats to catchment hydrology and develop strategies to minimise risks to stream ecosystems and the integrity of stored water.
- 7 Evaluate closing and rehabilitating vehicle trails that are not necessary for management purposes or recreational access, and are likely sources of sedimentation in water supply catchments (e.g. the network of vehicle trails in the northern part of the park near Mt Coree).

POLLUTION

POLICY

- The use of harmful chemicals for fire suppression, and pest plant and animal control will be minimised and use of fire suppression chemicals in hydrologically sensitive areas will be avoided (see s. 7.4.5, s. 11.2.6).

ACTIONS

- 8 Identify pollutant sources and prepare pollution control strategies within the catchments, as required.
- 9 Ensure that fuel and chemical storage and disposal of depot wastes are managed to prevent ground water and stream contamination (see s. 11.2.6).

FIRE

POLICIES

- The impacts of planned and unplanned fire on the catchment will be minimised by carefully considering the potential impacts of fire on hydrology and water quality (see Chapter 7).
- The impacts of planned and unplanned activities relating to fire management (including suppression) will be minimised by taking into account the impacts on hydrology and aquatic ecology. This includes localised water abstraction from small streams and construction of small dams.

SANITATION

POLICIES

- Where practicable, toilets will be provided in areas that receive a high level of visitor use. Appropriate 'closed' or 'sealed' toilet systems will be used for all new or replacement toilets, in order to prevent ground water and stream contamination.
- The construction of sewage treatment plants in the Cotter Catchment will not be permitted.

FERAL ANIMALS

POLICIES

- The impact of feral animals, such as pigs, horses, deer and rabbits, on water quality will be minimised by conducting effective management programs (see Chapter 5).

Environmental flows**OBJECTIVE**

Environmental flows are managed and monitored in accordance with the *Water Resources Act 2007* to ensure that sufficient flows are maintained for healthy aquatic ecosystems and to meet the needs of threatened species. (Water supply catchment specific release and monitoring conditions are contained in the ACTEW Licence to Take Water).

ACTION

- 10 Monitor the application of environmental flows where there is modification of the flow regime due to diversion.

Recreational Use**OBJECTIVE**

Water quality in the catchment and in reservoirs is protected and managed by controls on recreational use and by maintenance of assets to a high standard.

POLICIES

- Water quality will be protected by only allowing recreational activities and facilities within the catchments that are consistent with the urban water supply function of the catchments (see Chapters 3 and 8).
- Where general public access is permitted (e.g. Bendora and Corin Dams), low-key day use such as picnicking, short walks and interpretation will be allowed within the vicinity of dam walls.

ACTIONS

- 11 Enforce the regulation of activities that cause soil erosion—such as illegal off-road four wheel driving, horse riding, and off-road mountain biking.
- 12 Prohibit camping in the middle and lower Cotter Catchment and around the reservoirs. Limit camping in the upper Cotter Catchment (Bimberi Wilderness) by use of a permit system (see s. 3.2, s. 8.6).
- 13 Manage and protect dam infrastructure and reservoirs by prohibiting watercraft on Corin and Bendora Dams, except for management, research or monitoring purposes. Maintain safe access to the dams for management purposes.
- 14 Monitor and, as far as practicable, minimise vehicular access for management purposes to the wilderness area.

4.6.4 Knowledge and skills

Monitoring and research

OBJECTIVE

A high level of knowledge relating to catchment condition in Namadgi is established and maintained through the implementation of cooperative programs that inform and support adaptive management.

RESEARCH

POLICIES

- Research projects, undertaken through research institutions, relating to catchment and water resource management, climate change and fire will be encouraged and supported (see s. 9.8).
- Monitoring and reporting programs related to catchment condition and water resource management will be established to inform future management decisions (see Chapters 7 and 9).
- Information on catchment condition, and catchment and water resource management will be stored and maintained so that it is accessible to field managers, stakeholders and the community, as part of a central repository of research relating to Namadgi (s. 9.8).
- Research into the economic value of the ecosystem services provided by catchments in Namadgi, particularly in relation to water supply, will be encouraged and supported, in order to establish the costs and benefits of protected water supply catchments.

ACTION

- 15 Work on a regional level and with other Australian Alps management agencies to gather and analyse information on catchment management, particularly with regard to measuring impacts of climate change on water resources.

MONITORING

ACTIONS

- 16 Plan and implement a structured, ongoing water quality monitoring program for the park based on best practice models and standards to measure water quality for:
 - maintenance of aquatic ecosystem health
 - supply of safe drinking water
 - impacts of development
 - impacts of management activities
 - effects of recreation and natural events on ground water, streams and water bodies
 - impacts of toilets on ground water and streams.
- 17 Liaise with the EPA, ACTEW and ACT Health regarding water quality issues, as required.

Staff skills and knowledge

OBJECTIVE

Staff are provided with opportunities for training to increase knowledge and skills about best practice water resource management.

ACTIONS

- 18 Provide training in best practice catchment management for policy and operational staff.
- 19 Participate in local, regional and national scientific and natural resource management forums on catchment and water resource management.

4.6.5 Effective partnerships between the community and government

OBJECTIVE

Effective partnerships within government and between the government and the community are established in relation to catchment and water resource management.

POLICY

- Integrated works programs aimed at protecting the Cotter Catchment and water supply will be established between park managers and ACTEW.

ACTIONS

- 20 Work across departments within government to establish cooperative and knowledge sharing arrangements to achieve catchment management outcomes.
- 21 Work with community groups, institutions and professional organisations to establish cooperative involvement in catchment monitoring programs, in particular programs relating to measuring water quality and post-fire impacts and regeneration.
- 22 Assist the Southern ACT Catchment Group, and other community groups working within Namadgi, to implement sub-catchment plans.
- 23 Work with rural lessees in the Gudgenby/Naas Catchment to protect water quality.

5

A place of nature Landscape and biodiversity protection



5.1 Primary management objectives

- **The biodiversity¹ and geodiversity² of Namadgi National Park is conserved³.**
- **Ecosystems are managed so that they can continue to function and evolve naturally and the integrity of landscapes and scenery is protected.**

5.2 Background

This chapter is focused on the identification, protection and management of the natural heritage of Namadgi. In s. 1.4 the natural and cultural values of the park were outlined. Though discussed separately in this plan, natural heritage values and cultural heritage values may be related and sometimes difficult to separate. Some people, including many Indigenous people, do not see them as separate (AHC 2002a). Conservation of the natural environment is the primary management objective identified for a 'National park' and for a 'Wilderness area' under ACT legislation (*Planning and Development Act 2007*) (s. 2.1). This nature conservation objective and the complementary objective of provision of domestic water supply, in the water supply catchments of the park, are identified in the policies of both the *National Capital Plan* and the *Territory Plan* (s. 2.2).

Basing management on sound ecological knowledge is the key to the sustainable management of Namadgi's landscapes and to protecting its biodiversity. Over thousands of years Aboriginal people learned to live sustainably on the Southern Tablelands, including on land that is now in Namadgi National Park. The life and economy of Aboriginal people was closely integrated into the ecosystems that sustained them. European colonisation displaced Aboriginal peoples from their traditional lands and the long period of separation that followed resulted in much of their traditional knowledge being lost. Consequently, opportunities to apply traditional knowledge to land management practices are limited in this region today.

European settlement and economic systems have been applied to the Australian landscape with little understanding or recognition of ecosystem functioning. In recent years, the concept of *ecosystem services* has been developed referring to the 'products of natural systems that benefit people' (PMSEIC 2002). These products include goods (e.g. timber), ecological processes (e.g. pollination, storage and release of water), and those that are life-fulfilling (e.g. recreation). Few ecosystem services have been valued economically and most are unrecognised and under-priced (PMSEIC 2002). One of the most readily identifiable ecosystem services in Namadgi is the provision of high quality water for urban water supply.

Scientific knowledge about the natural environment of Namadgi can be related to the broader development of scientific understanding of Australia's alpine and subalpine areas. Three stages have been identified in alpine scientific studies: an early 'exploration' science largely by individuals (19th century), a problem oriented institutional science (to 1940), and a 'conservation science' in the period since 1940 (Griffiths and Robin 1994; Macdonald and Haiblen 2001). Mostly, scientific interest was focused in the Snowy Mountains of NSW and the Victorian Alps. The first scientific botanical study of the Namadgi area was made in 1911 by R. H. Cabbage, in the Gudgenby and upper Cotter catchments. Almost thirty years later Lindsay Pryor's more detailed studies began to reveal the complexity and diversity of vegetation contained within Namadgi's mountain landscapes. Pryor was also a pioneer in the use of dendrochronological techniques to draw some conclusions about the frequency of fires before and after European advance into the area around 1860 (Banks 1989; Pryor 1939a, 1939b).

1, 2: see Glossary

3: see Conservation: Natural Heritage in Glossary

Over the last twenty years especially, the biodiversity and geodiversity of the area now in the park has been the subject of many surveys, monitoring and research projects. These projects have been supported by government agencies, universities and conservation organisations. This work in Namadgi often links to or is part of similar work in other Australian Alps parks. Scientific research in the Australian Alps parks forms the basis of a number of publications (e.g. Good 1989; Green and Osborne 1994) and is summarised in publications of the Australian Alps Liaison Committee (Coyne 2001; Macdonald and Haiblen 2001; Macdonald and Murray 2004). There is still much to be learnt, however, about the biology and ecology of many individual species, about how ecosystems function and respond to environmental change, and how species and ecosystems recover following major disturbances.

5.2.1 Climate Change

A major consideration for the management of Namadgi and other parks in the Australian Alps network is climate change. The effects of global warming are likely to be most evident in the higher altitude areas where conditions are already marginal for some ecological communities e.g. Montane and Subalpine Fen, Montane and Subalpine Bog (the 'mountain mires' described by Hope 2003).

Weathering the Change – the ACT Climate Change Strategy 2007-2025 (ACT Government 2007c) notes that aquatic ecosystems are likely to be stressed. Local land ecosystems will be affected by decreasing water availability, increased bushfires and changes in the distribution and number of pests. Many alpine and subalpine species are likely to suffer and eventually become extinct.

The potential effects of climate change on the biota of Kosciuszko National Park have been outlined in NSW NPWS (2006). Similar considerations apply to Namadgi and include:

- the possible extinction of plant and animal species whose climatic ranges are already limited to the mountain-tops
- the uphill migration of biota from lower elevations
- changes in the distribution and composition of plant communities, with consequent effects on habitat
- a likely increase in the diversity, abundance and distribution of weed species and uphill extensions in the range of feral animal species
- an increase in the incidence of bushfires
- alterations to catchment hydrology and geomorphological processes.

An objective of the *National Biodiversity and Climate Change Action Plan 2004-2007* is to 'factor the impacts of climate change on biodiversity into natural resource management and land-use planning' (Objective 7) (Natural Resource Management Ministerial Council 2004). The considerable uncertainties regarding the local effects of climate change mean that development of precise management responses is not possible. However, with regard to management policies, appropriate responses include:

- incorporating available knowledge about climate change in the assessment of the potential effects of management actions, monitoring of high risk species and ecological communities, and encouraging research into the effects of climate change on the biota of the park
- minimising threats other than climate change that place stress on species and ecological communities
- evaluating ways in which the effects on high risk species and ecological communities may be minimised
- informing visitors of the potential implications of climate change for park values, especially where visitor use may be impacting on those values.

5.2.2 Conservation of biodiversity and geodiversity

Conservation of the biodiversity and geodiversity of Namadgi is a central focus for management, as well as being intrinsically important it underpins the other values of the park such as water supply, recreation, wilderness and landscape aesthetics (s. 1.4). Namadgi is part of a network of protected areas in southern Australia in a landscape where the legacy of broad-scale clearing is widespread land degradation and loss of biodiversity (Commonwealth of Australia 2002b).

Core components of biodiversity conservation for Namadgi are:

- maintenance of viable populations of species
- maintenance of representative ecosystems
- maintenance of key ecological processes (including natural disturbance regimes)
- maintenance of the evolutionary potential of species. (Based on Grumbine 1994, in Lindenmayer and Burgman 2005.)

The following attributes of Namadgi are significant for biodiversity conservation, in the context of the park being a protected area under legislation and in planning policy. They are key considerations in relation to the primary management objectives (s. 5.1) and the core components of biodiversity conservation defined above.

- **Bioregional context:** The location of the area at the overlap of two bioregions and on the divide between drier western and moister coastal environments.
- **Connectivity:** Maintenance and enhancement of ecological connectivity is very important for biodiversity conservation. Namadgi stretches from the northern to the southern border of the ACT and connects to reserved areas and other habitats to the east (e.g. river corridors) and west (NSW national parks and forest areas). Ecological connectivity is likely to be a significant attribute for organisms adjusting to climate change.
- **Core areas:** The presence of a large core area (Cotter Catchment) and smaller areas (Blue Gum Creek, Booth Range) containing ecosystems that retain a high level of natural integrity. This is complemented by the presence of buffer areas with low-intensity land uses.
- **Representativeness:** Namadgi covers an altitude range from below 750 m to above 1 900 m. Of the thirty vegetation communities identified for the ACT, twenty occur in the park (Sharp *et al.* 2007).

5.3 The Australian Alps bioregion

Namadgi is part of the Australian Alps Bioregion, one of the smallest bioregions in Australia (DEH 2006a). Most of the bioregion is protected in the Australian Alps national parks; a 1.6 million hectare chain of conservation areas which include alpine, subalpine and montane landscapes extending through the ACT, NSW and Victoria. True alpine habitats (above the tree line) in Australia are extremely limited, accounting for only about 793 818 ha or 0.01% of the continent. Subalpine areas cover 0.07%.

Through the Australian Alps National Parks Memorandum of Understanding (s. 2.3.2) national park agencies of Victoria, NSW and the ACT work closely together to achieve a cooperative and consistent approach to protecting and managing the Australian Alps. Working at a bioregional scale also facilitates more integrated approaches to biodiversity conservation and dealing with issues that are common to all jurisdictions (e.g. feral animal control).

Namadgi National Park, at the northern end of the bioregion, is a significant component of the Alps. The park includes landscapes and ecological communities, where alpine, coastal, tableland and inland communities merge. It incorporates almost the entire catchments of four significant rivers and their tributaries, and covers an area that is of sufficient size to allow natural processes to function unimpeded, provided that ecological threats are managed adequately and landscape integrity is retained.

The most significant natural attributes of Namadgi are listed below:

- **Regional representativeness:** The park contains representation of a diverse range of regional ecological communities within a contiguous area that links to other protected areas.
- **Biogeographical importance:** Namadgi contains a wide range of alpine and subalpine communities at the interface of coastal woodland and tableland communities. Many of these are at the limits of their distribution.
- **Wetlands:** Namadgi contains the internationally important Ginini Flats Ramsar site and eleven other nationally important wetlands that are of ecological and hydrological significance. These sites provide important habitat for migratory birds, terrestrial and aquatic species.
- **Biodiversity value:** More than 700 species of plants and 222 species of vertebrate animals have been recorded to date, with fifteen threatened species and over forty rare or uncommon species.
- **Upper Cotter ecological benchmark:** Although grazing and greater fire frequency occurred after European settlement, the landscape and ecological integrity of the upper Cotter Catchment is considered to be outstanding due to its protection since the early 20th century for urban water supply purposes. Since the 1950s the area has been used as a benchmark to assess the level of environmental disturbance and progress of ecological recovery within other Alps national parks. It includes a range of individually significant forest, wetland and grassland communities, periglacial and hydrological features.
- **National Capital Open Space System (NCOSS):** Namadgi forms a substantial and important part of NCOSS as defined in the *National Capital Plan*. It is the most significant component of the Mountains and Bushlands land use category of NCOSS (s. 2.2.1).

5.4 Landscapes

The mountains of Namadgi rise from the 'Limestone Plains' of the ACT, creating a beautiful natural setting for Canberra and other nearby urban communities. The highest mountains in the ACT are found in Namadgi, the highest being Mt Bimberi (1911 m). Like much of the Australian Alps, these mountains have been eroding for millions of years forming round, bald, rocky summits where the hardiest of plants and animals find shelter from the harsh climate. Granite boulder tors and stacks, rocky slopes and magnificent cliffs create dramatic sentinels.

Landscapes are dynamic, constantly undergoing change. These changes are related to broader environmental conditions and interactions, including the frequency of disturbances and the occurrence of high magnitude events that play a major role in defining the landscape. Following the extensive 2003 fire and subsequent storm rains, large-scale erosion has occurred in parts of the Cotter Catchment. Geomorphological research in Namadgi indicates that this erosion is not unique and a much larger erosion event may have occurred as recently as approximately 400 years ago (Worthy 2006).

It is evident that the 2003 fire has precipitated change in Namadgi that is likely to result in some landscapes and ecosystems being different from those that existed before the fire. Some will go through extensive successional changes over time to return to an approximation of their original form. The scale of sheet and gully erosion throughout the Cotter Catchment is extensive. High altitude *Sphagnum* bogs are one ecosystem that was severely damaged by the fire (see s. 5.8 for restoration work).

Human use of Namadgi is embedded in its landscapes. Grazing, clearing, the use of fire and modification of natural systems by other means by European settlers can be detected by investigating the history of land use and land use practices, as well as applying specialised scientific techniques that allow the dating of past changes in the landscape with varying levels of confidence. However, it is often difficult to measure with certainty, the changes that have occurred to ecological systems as a result of human use. All of Namadgi has been affected by humans in some way, but to varying degrees; depending upon the intensity of use, the type of use and the ability of different systems to absorb change.

Human-induced change is most evident in the broad open valleys of the Gudgenby, Boboyan, Orroral and Naas rivers in the southeast of the park. Fertile soils and reliable rainfall attracted European settlers who established grazing properties there. Woodlands and forests were cleared to extend the natural grasslands in the valleys for livestock grazing (Ingwersen 2001). These modified grassy valley floors are one of the more significant legacies of European occupation. Despite the removal of grazing, recolonisation by woody vegetation has not occurred to the extent expected. This is probably due to the prevalence of frosts in these low lying areas throughout much of the year and grazing by rabbits and kangaroos. Issues relating to altered valley landscapes are discussed in s. 5.7.

5.4.1 Geology and geomorphology

Namadgi lies within the southern part of the Palaeozoic Lachlan Fold Belt, which is the oldest rock province in south-eastern Australia (Abell 2006). The landscapes of the park are often referred to as uplands—areas at altitudes above 800 m. They consist of river systems established along fault lines, with mountain ranges on either side, generally running in a north-south direction.

The Cotter and Goodradigbee valleys are formed by a central north-south ridge with short spurs dropping steeply on either side to a fault in the valley floors where there are major streams. The Mt Kelly Upland includes the Scabby and Yaouk ranges and the Orroral River, Rendezvous Creek and Naas River valleys. Here the more gentle gradients of tributaries have led to the development of distinctive perched valleys with highland fens. Many of the Mt Kelly Upland river valleys contain deep sediment and partially filled valley floors, creating broad river flats.

Much of Namadgi is underlain by resistant sedimentary rock created 450–500 million years ago, when the area was under the sea. These are the oldest rocks, consisting of fine-grained greywackes, slates and claystones. The slightly younger and highly erodible Tidbinbilla Quartzite (sandstone, quartzite, thin limestone and slate) is prevalent on the western slopes of the Tidbinbilla Range. During the Devonian Period (350–400 million years ago), magmatic activity created faults and a huge body of granodiorites (granites) that eventually became exposed as the prominent boulder piles and massive convex slopes and cliffs, which are a feature of Namadgi's landscapes today.

Significant geological and geomorphological sites of Namadgi include:

- examples of graptolite shale, with exposures of deep oceanic sedimentary deposits on the western slopes of the Tidbinbilla Range
- collective features in the upper Cotter Valley demonstrating periglacial morphology. These features are blockstreams on the Mt Kelly Spur and north of Mt Namadgi, scree slopes, and snow-moved rocks on Mt Namadgi
- waterfalls and river flats with meandering streams
- an example of McKeahnie Admellite—elongate tors up to 10 m long on Mt Gingera.

Geological history is closely linked with the geomorphology, soils, vegetation and particular habitats that are present in Namadgi today. Management implications of the soil types in the park are described in s. 5.4.3.

5.4.2 Hydrology

Water is pervasive in natural systems, influencing landforms and ecosystems and their responses to fire and other forms of disturbance. Creeks, rivers, wetlands, bogs, drainage channels, soils, vegetation, surface water and ground water are all part of a hydrological system. They require special management attention in order to maintain the ecological integrity of the area and protect Canberra's drinking water supply.

The hydrology of the Cotter Catchment has been modified by the construction of Corin, Bendora and Cotter dams. The Environment Protection Authority regulates to maintain an environmental flow regime according to provisions of the *Water Resources Act 2007* to allow sufficient water to be released from the dams for the health of aquatic ecosystems downstream.

An important hydrological feature of the Cotter Catchment is the groundwater-fed, subalpine *Sphagnum* bogs and wet heaths that grow on well-developed peat soils, up to two metres deep.

Both *Sphagnum* and underlying peat have the ability to absorb water, creating natural reservoirs that release water slowly during the year.

Snow cover on the ranges also provides a significant winter storage that is released as the snow melts. Snowmelt may be an important factor in maintaining the hydrological conditions that support *Sphagnum* (see also s. 5.8).

Table 5.1 outlines essential landscape elements of the Cotter hydrological system that are important for the delivery of clean water to streams which are of intrinsic ecological importance and are key elements of Canberra's water supply. These elements require special consideration for the management of the Cotter Catchment. The protected reservoirs on the Cotter are themselves an important element in the protection of raw water quality, being part of the multiple barrier approach (s. 4.5.2). These impoundments capture sediment inputs of silt, clay and organic matter and sequester phosphorous, nitrogen, manganese, iron, sulphur and arsenic.

Table 5.1 Key landscape elements that protect hydrological values

Landscape element	Function
Riparian vegetation	Protects stream banks, intercepts and filters particulate matter and enhances in-stream processes.
Groundcover (under canopy shrubs, forbs and grasses) and leaf litter	Provides soil stability, intercepts particulate matter, pathogens and nutrients. Reasonable litter levels are important in minimising erosion and preventing export of soil that causes high turbidity levels in waterbodies.
Valley floor communities (fire sensitive Black Sally and fire tolerant <i>Poa</i> species)	Provide an important filtration function and promote infiltration and recharge of valley floor aquifers.
Alpine Ash, Mountain Gum, Peppermint and Brown Barrel communities on east-facing and south-facing sub-catchments and allied groundwater systems	Demonstrated to have the highest specific water yield, contributing the bulk of interflow and groundwater discharge. These are also important in terms of maintaining perennial streams i.e. providing landscape water storage and providing flow under drought conditions.
Upper slope and ridgeline Snow Gum woodland	Maintains soil stability and increases effective yield by interception of snow and cloud droplets.
Dry sclerophyll forest and woodland	Maintains soil and slope stability, particularly on the west and north-west facing slopes.
<i>Sphagnum</i> bogs and swamps	Provide water storage in upper catchment areas smoothing storm runoff, as a wetted surface increase effective net storm runoff, promote carbon storage, and provide valuable water filtration and affect retention of pathogens, iron and manganese.

Table modified from Wade and White 2004, Wade and Whiteway 2002.

5.4.3 Soils

The early conservation history of the Australian Alps grew from the understanding that soil retention is fundamental for healthy landscapes and ecosystems. Helms, in 1893, reported on the soil erosion in the Snowy Mountains resulting from burning off by graziers, an observation made by others in subsequent years (Macdonald and Haiblen 2001). Grazing, mining, timber harvesting, road-building and increased fire frequency have all contributed to soil erosion and soil compaction throughout alpine and subalpine areas.

Considerable information including soil maps is available for the Cotter Catchment and the Mt Tennent area. The soil landscapes of the Mt Clear and Booth Ranges have been documented and mapped by the Department of Conservation and Land Management (NSW) (Jenkins 1993). This provides detailed soil descriptions and profiles, and assesses soil erodibility (based on soil properties) and erosion hazard (susceptibility of an area to erosion according to climate, topography, soil erodibility and landscape use).

An overview of soils in the Cotter Catchment is included in a report by the Department of Forestry (Australian National University) (Resource and Environment Consultant Group 1973). The report broadly describes soil types in the catchment and key characteristics that need to be taken into account for management. The study included investigations into the effects of controlled burning on soils and soil erodibility.

The ACT Government commissioned a report *Erosion Potential Mapping* (URS 2009) to assist in fire management. The report maps soils across the ACT (on seventeen mapsheets), provides erosion and fuel management assessments across the ACT and recommends mitigation strategies.

5.5 Landscapes: management considerations

The landscapes of Namadgi are visually and aesthetically significant for the setting of the National Capital, while the individual elements of geology, geomorphology, hydrology and soils are also important in their relationship to the values of the park and management requirements.

The following considerations are relevant with regard to the landscapes of Namadgi:

- The key principle for the Mountains and Bushlands land use category in the *National Capital Plan* is that the 'area is to be maintained as an important visual background to the National Capital'. New developments in the park, such as fire trails, lookouts and management facilities, need to avoid intrusions in the landscape that are highly visible from Canberra and its surrounds or from key vantage points and thoroughfares in the park.
- Mapping of significant and/or fragile geological and geomorphological features would be useful for management and interpretation.
- Landscape elements identified as important to the maintenance of hydrological conditions require management strategies to safeguard their recovery from the 2003 fire and to provide natural landscape stability.
- The 2003 bushfire has accelerated the rate of landscape change. This has had short-term and, potentially, long-term impacts on water quality and drinking water supply. However, the scope of landscape change is beyond management intervention with the exception of minor work where practicable, to prevent further stream incision. Extensive engineering solutions are not considered to be appropriate and would lead to high cost, long-term maintenance issues.
- Continued monitoring will help managers understand how natural systems respond to landscape scale events such as the effects of the 2003 fire. More importantly, monitoring will provide managers with a means to identify cumulative impacts caused by 'human-induced' factors, such as recreational use and introduced species, and help formulate effective strategies to prevent irreversible environmental decline. A systematic monitoring program is required to check the health of streams and wetlands and for water quality (see Chapters 4 and 11).
- Fire management activities need to take into account soil characteristics, hydrology, significant geological features and soil erosion potential (see Chapter 7).
- Management practices and planning for infrastructure and development within the park need to address the suitability of landscapes and likely impacts on soils.
- Monitoring soil condition and soil recovery following the 2003 bushfire will assist in predicting the impact of fire on soils.

5.6 Landscapes: objective, policies and actions

OBJECTIVE

Significant landscape elements, scenic values and ecosystem services are identified and protected through systematic monitoring and a management regime that limits induced change to acceptable levels.

POLICIES

- The visual impacts on natural landscapes will be included in environmental impact assessments for proposed developments (of whatever scale or status).
- Economically and environmentally sustainable management strategies will be implemented that maintain the integrity of identified elements of hydrological systems to ensure that hydrological services are maintained.
- Using the best available knowledge, safeguard the ecological function and integrity of hydrological systems. Of particular importance is monitoring the effects of fire management strategies (see Chapter 7).
- Monitoring programs will be developed as required in relation to maintaining the natural integrity of significant landscape elements (e.g. measuring human impacts on such elements, measuring impacts of climate change).

ACTIONS

- 24 Conduct a visual impact analysis and develop a strategy to protect the scenic vistas and landscape integrity of the park by identifying areas that should remain free of developments, such as park facilities and infrastructure.
- 25 Assess and, where feasible, remove, relocate, or replace facilities that, due to poor location or design, significantly impact on natural landscape quality.
- 26 Identify and map significant geological and geomorphological features. Prohibit developments (e.g. park facilities and infrastructure) where there is likely to be significant impact on these values.
- 27 Ensure that park management activities and recreational use are consistent with the protection of important landscape values and features (see Chapter 8).

5.7 Native vegetation

Namadgi contains a diverse range of plant species and vegetation communities (Fraser and McJannett 1991, 1994; Helman and Gilmour 1985; Helman *et al.* 1988; Hope 2003; Ingwersen 2001, 2006; Resource and Environment Consultant Group 1973). A revised classification of vegetation communities in the ACT contains thirty communities of which twenty occur in Namadgi (Sharp *et al.* 2007) (Appendix 2). These are:

- **Grasslands (three communities):** Montane Dry Tussock Grassland, Montane Wet-Tussock Grassland, Subalpine Tussock Grassland.
- **Forbland - Sedgeland - Mossland Complex (three communities):** Subalpine Herbfield, Montane and Subalpine Fen, Montane and Subalpine Bog.
- **Shrublands - Heathland Complex (three communities):** Montane Shrubland, Montane and Subalpine Moist Shrubland, Subalpine Dry Shrubland.
- **Wetlands Complex (one community):** Montane and Subalpine Wetlands.
- **Woodlands (three communities):** Broad-leaved Peppermint - Apple Box Tableland Woodland, Snow Gum Montane Woodland, Snow Gum Subalpine Woodland.
- **Forests (seven communities):** Red Stringybark - Scribbly Gum Tableland Forest, Broad-leaved Peppermint - Candlebark Montane Dry Forest, Black Cypress Pine Tableland Open Forest, Mountain Gum Montane Forest, Narrow-leaved Peppermint - Ribbon Gum Montane Forest, Brown Barrel Montane Forest, Alpine Ash Montane Tall Forest.

Altitude, aspect, drainage and site conditions are key variables determining the distribution of vegetation communities:

- **Low elevations (900–1 300 m):** Tussock Grasslands and some areas of Montane Fen and Montane Bog are found at lower elevations such as the valley floors of the Orroral, Gudgenby, Naas and upper Cotter rivers. Woodland and open forest (Broad-leaved Peppermint – Apple Box Tableland Woodland, Red Stringybark – Scribbly Gum Tableland Forest) also occur at lower elevations on valley sides and hillslopes, while Black Cypress Pine Tableland Open Forest is found on dry rocky steep slopes. Montane Shrubland may occur naturally or be the result of previous land clearing.
- **Middle elevations (1 100–1 600 m):** At these elevations vegetation is dominated by montane forest except in locations where conditions are too poor to sustain such forests e.g. dry rocky westerly and north-westerly facing slopes, as in parts of the area east of Bendora reservoir. Montane forest communities comprise Mountain Gum Montane Forest, Narrow-leaved Peppermint – Ribbon Gum Montane Forest, Brown Barrel Montane Forest and Alpine Ash Montane Tall Forest. Broad-leaved Peppermint – Candlebark Montane Dry Forest occurs on dry exposed sites with northerly or westerly aspects. Montane and Subalpine Moist Shrubland occurs above 1500 m in areas such as narrow drainage lines.
- **Higher elevations (above 1 600 m):** Subalpine and alpine communities occur at these elevations. There is no extensive alpine area (defined as above the tree line) in Namadgi. These communities comprise Subalpine Tussock Grassland, Subalpine Herbfield, Montane and Subalpine Fen, Montane and Subalpine Bog, and Snow Gum Subalpine Woodland. Subalpine Dry Shrubland occurs on exposed drier sites.

The dominant vegetation is montane forest with woodland and tussock grassland also covering a significant area. Wetland communities make an important contribution to the diversity and interest of the vegetation, but occupy only a relatively small area of the park.

The ACT, and Namadgi in particular, is located at the overlap of two bioregions: the 'South Eastern Highlands' and the 'Australian Alps' (Department of Environment and Heritage 2006). The area is also on the divide between the drier western environments of the continent and the cooler, moister parts of south-eastern Australia. The higher altitude environments maintain subalpine communities near their northern limits. The park contains a number of species and vegetation communities that are at the limit of their range. This is exemplified by the Alpine Ash Montane Tall Forest, which is near its northern limit, and Brown Barrel Montane Forest, predominantly found in coastal wet forests, which is at its western limit. Many of the understorey species also demonstrate this biogeographical overlap, some species having montane affinities while others are found mainly in the ecosystems of coastal escarpments.

Ecological surveys of the Cotter valley and the Mt Tennent–Blue Gum Creek area have revealed species that are uncommon in the ACT or at the limits of their geographic distribution. Blue Gum Hill is the only known location for the rare eucalypt, *E. cinerea* subsp. *triplex*. In the treeless and subalpine communities at higher elevations, many species are growing at the northern edge of their distribution and there is a rich and complex assemblage of species within bog, fen and herbfield communities. Species growing near the edge of their range are of particular scientific interest due to their need to adapt to conditions that may not be optimal for their survival.

Namadgi contains a number of wetlands that are locally, nationally or internationally important. Thirteen nationally important wetlands occur in the ACT, eleven of which are in Namadgi, totalling 1 083 ha (Environment Australia 2001) (Appendix 3). These wetlands are primarily montane and subalpine bogs and fens. They are of high ecological value and are important in the hydrology of the mountain catchments. The largest wetland is in the upper Cotter (600 ha).

Ginini Flats Wetlands in the Brindabella Range is included on the List of Wetlands of International Importance kept under the Ramsar convention (1971) (see s. 2.3.1). Ramsar wetlands come under the provisions of the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* (Commonwealth) and regulations under that Act require that at least one management plan is prepared for the site. The *Ginini Flats Wetlands Ramsar Site Plan of Management 2001* (ACT Government 2001) remains a valid document for management of the wetlands. Since it was published, however, the wetlands have been substantially affected by fire, and therefore some

additional management policies and actions are required. These will be considered in the current review of the plan.

Three vegetation communities in Namadgi have been identified as requiring special protection and management (Sharp *et al.* 2007 and Baines pers com). These are Natural Temperate Grassland of the Southern Tablelands of NSW and the ACT, Montane and Subalpine Bog (forming a significant component of the EPBC listed Alpine *Sphagnum* Bogs and Associated Fens) and Black Cypress Pine Tableland Open Forest (assumed less than 30% of 1750 distribution remaining). A 'watching brief' is proposed for the Red Stringybark – Scribbly Gum Tableland Forest. Several rare and unusual species occur in Namadgi, but only two plant species are formally recognised as threatened: *Gentiana baeuerlenii* (a subalpine herb) and *Corunastylis ectopa* (Brindabella Midge Orchid). Both are declared threatened under ACT and Commonwealth legislation.

With the exception of clearing native forests and woodlands on the valley floors in the south-eastern area of the park, the broad distribution of vegetation types in the park is considered to be relatively unchanged since European settlement. However, an increase in fire frequency following European settlement and the effects of grazing are likely to have altered some ecological communities but the extent of change is difficult to measure. Increased shrub growth and even-aged regrowth of Snow Gum following much more frequent burning at high altitudes (Banks 1982; Good 1998 in Leaver and Good 2004), and the presence of weed species typically associated with grazing in the upper Cotter valley (Helman *et al.* 1988) are two examples of change in vegetation composition and/or structure. In general, it can be surmised that the communities most vulnerable to fire and grazing pressures have been altered in some way and such changes may be irreversible.

In the valley floors there may be considerable conservation benefits derived from restoring the ecological functions that have been altered as a result of clearing. This would require a long-term, scientifically based, ecological restoration program that takes into account the natural and cultural heritage values of the valleys. Native species have been planted on the former Boboyan Pines plantation site, but considerable resources need to be applied to continue restoration, control weeds and monitor the site (see s. 5.13).

5.8 Native vegetation: management considerations

The significance of the biogeographical setting of Namadgi (s. 5.7) is an important consideration for management, which should seek to maintain the integrity of the ecosystems for future reference. Interpretation of the special characteristics of the vegetation, including its ability to recover from major disturbance such as the 2003 fire, has the potential to increase community appreciation of the values of the park.

Vegetation communities were affected to varying degrees by the 2003 bushfire when more than 90% of Namadgi was burnt. A major consideration for this management plan with regard to native vegetation is the recovery from the fire and ongoing monitoring to document how ecological communities respond to fire. A long-term monitoring program commenced soon after the 2003 fire. This is a targeted program focused mainly on forest communities and does not aim to cover all the ecological communities that occur in Namadgi. Vegetation recovery will be a natural process unassisted by any direct management action. Fire recovery often involves a series of successional changes in vegetation and there may be more permanent changes in structure and species composition, including the creation of even-aged regrowth tree cover. Post-fire recovery provides the opportunity to monitor the responses to fire of the vegetation communities in the park.

The most significant management intervention following the fire has been to assist the rehabilitation of the Montane and Subalpine Bogs. The 2003 fire burned almost all the bog areas, with the burnt area in individual mires varying from 55% to 100% (Sharp *et al.* 2007). The work has involved techniques to re-wet areas, damming of eroded flowlines, creation of pools, transplanting of *Sphagnum* clumps, trenching of peat beds and lining with sterile straw bales, filling of incised streams and shading of *Sphagnum* hummocks (Good 2006). Recovery of the

bogs will only occur over the long-term (twenty years or more) and some areas may not recover at all, given that conditions are now marginal in south-eastern Australia for mire growth (Hope 2003). The impact of the fire on the hydrology, water quality and ecology of the bogs and the success of the rehabilitation measures should be monitored for the next five to ten years, and possibly longer. The bog restoration work draws upon the interplay of management experience and scientific knowledge developed in other parts of the alpine park network (Good 2006).

Black Cypress Pine Tableland Open Forest has been identified as a vegetation community requiring special protection and management (Sharp *et al.* 2007). In Namadgi, this community occurs in the Mt Tennent area. It has been highly disturbed in the past and most was burnt in the 2003 bushfire, following which there has been some seedling recovery. The main threat to the community is another fire prior to the re-establishment of the trees and seed production. Seedlings should be protected from grazing by stock or rabbits and fire should be excluded from the community for forty to fifty years.

A diversity of age and structure in the vegetation communities in the park will provide an optimal range of habitats. Vegetation communities are presently in varying stages of recovery following the 2003 fire and there is likely to be some uniformity in the structure of particular vegetation communities related to post-fire regrowth. There is some potential to intervene, particularly through fire management, in order to influence vegetation structure for biodiversity purposes. However, any such intervention must be scientifically based, be in the context of an overall strategy, and have well-defined objectives. Any such intervention should also take into account the effects of wider scale unplanned fires that have regularly occurred in the mountains and are likely to occur again. The use of planned fire for fuel reduction must also take into account potential effects on fire-sensitive communities and species, noting that there is considerable uncertainty regarding the assessment of such effects (see Chapter 7). Long term monitoring is essential to understanding the response of communities and species to fire, and recovery from the 2003 fire provides an opportunity for such monitoring.

Two particular threats to the vegetation of the park are pest animals and weeds. Pest animals, such as hoofed grazers (pigs, goats, horses) and rabbits have the potential to damage the integrity of vegetation communities by selective grazing, over-grazing, and disturbing soil, leading to erosion and weed invasion. Many parts of Namadgi are relatively weed-free, weeds mainly being restricted to roadsides and along management tracks and land previously used for grazing. A comprehensive weed management program is essential to control existing weeds and keep new invasive species from establishing in the park.

Survey and monitoring are key elements of vegetation management, with the following considerations pertinent to Namadgi:

- The long-term monitoring program currently underway should be maintained, to document the recovery of vegetation communities and habitats from the 2003 bushfire, and to establish the ecological fire thresholds to inform fire management strategies.
- Vegetation analysis and mapping is established for some areas but in general, mapping across the entire park is incomplete. In particular, there is an absence of detailed knowledge about vegetation in the eastern section of the park, particularly the Booth Range.
- Knowledge about areas already systematically surveyed may require updating. New knowledge needs to be included in relevant literature and information systems. The mapping of specific vegetation communities requires surveys to provide baseline data.
- Vegetation classification needs to be consistent with the National Vegetation Inventory System.
- Some sensitive subalpine communities and species may need special attention and monitoring. The species or communities are ones that may be affected by climate change, possible increased fire frequency or intensity, and the impacts of visitors.

5.9 Native vegetation: objective, policies and actions

OBJECTIVE

Vegetation is managed to retain a high level of ecological integrity across representative communities, successional stages and age classes.

POLICIES

- The highest priority in vegetation management will be given to meeting the conservation requirements of vegetation communities of regional significance, particularly those that are threatened, rare, part of an unusual alliance, provide habitat for threatened species or are vulnerable to changed conditions (including climate change). Action Plans (ACT) and Recovery Plans (Commonwealth) for threatened species or ecological communities provide authoritative guidelines.
- Long-term monitoring of the post-fire recovery of ecological communities will be undertaken to provide data to inform fire management strategies. This will be focused on communities where long-term data are most required e.g. forest communities and *Sphagnum* bogs.
- Development activities that have the potential to affect native vegetation (and therefore wildlife and habitat) will be subject to an appropriate level of environmental impact assessment.
- The impacts of pest plants and animals will be managed, giving a high priority to the most vulnerable communities, including subalpine wetlands, areas that provide habitat for threatened and rare species, and where an introduced species is likely to have a profound impact on biodiversity.

ACTIONS

- 28 Conduct systematic surveys and mapping of vegetation communities across the park giving a high priority to areas that have not been previously surveyed e.g. the eastern section of the park, including the Booth Range. Ensure that vegetation surveys and mapping are consistent with the National Vegetation Inventory System.
- 29 Conduct a systematic monitoring program and support research that assists in identifying specific management requirements for species and communities, including responses to: (a) planned and unplanned fire, (see Chapters 7 and 9); (b) climate change; and (c) impacts of threats such as introduced species. A key objective would be the identification of ecological fire thresholds (minimum and maximum fire intervals and fire intensity required for biodiversity conservation) for vegetation communities and important species, with the aim of integrating fire management and biodiversity protection requirements, and using planned fire for biodiversity conservation purposes (see Chapter 7).
- 30 Ginini Wetlands:
 - Continue post-fire rehabilitation work to assist the natural regeneration of the Ginini Wetlands *Sphagnum* bogs following the 2003 fire, and adapt management according to the results of monitoring and assessment.
 - Undertake the management actions set out in the *Ginini Flats Wetlands Plan of Management 2001*. (Note: the plan is currently under review.)
 - Limit access to the Ginini Wetlands (except for research and management purposes) until the bogs have sufficiently recovered from the impact of fire.
 - In accordance with the Management Plan for Ginini Wetlands, do not permit the use of heavy machinery for fire suppression purposes or any other reason in the immediate catchment of the wetlands (see s. 7.4.5).
- 31 Avoid disturbance to sensitive vegetation communities and species by visitors and management activities, and confine the use of vehicles to formed roads and trails.
- 32 Foster community stewardship and appreciation of the native vegetation of Namadgi through community involvement in research and monitoring and communication and interpretation programs (see Chapters 9 and 10).

5.10 Native animals

The preferred habitat for any particular animal is defined by a range of ecological and landscape characteristics such as vegetation type, the mix and density of understorey and the prevalence of habitat components such as tree hollows, leaf litter, substrate composition of streams, fallen logs and rocks and crevices. Many species range across more than one habitat type in order to meet all their requirements for survival, whereas others are highly specialised and occupy a specific and limited niche. The more specialised species are most vulnerable to change. The north-south extent of Namadgi, its altitudinal range, and connection to other reserve areas in NSW mean that it is an important contributor to habitat connectivity in south-eastern Australia.

A primary goal of national parks is the conservation of biological diversity. However, declaring an area as national park is not an automatic guarantee that all species within it are safe from extinction or decline. An important aspect of conservation is to conserve natural processes of change (AHC 2002a). Animal populations are dynamic and changes in habitat (e.g. changes in vegetation following disturbance) are likely to be accompanied by changes in faunal composition and abundance. Systematic survey, monitoring and research is necessary to understand how species are faring and to take appropriate action to manage threats. Habitats in the park also provide opportunities to conduct research on particular species and ecological communities that addresses wider biological and ecological questions, including those of a theoretical nature.

The importance of surveys and monitoring are demonstrated by the discovery of four species in Namadgi since the release of the first management plan in 1986. These are three mammals (brush-tailed phascogale *Phascogale tapoatafa*, spotted-tailed quoll *Dasyurus maculatus* and smoky mouse *Pseudomys fumeus* and one frog species (southern leaf-green tree frog (Cotter River form) *Litoria nudidigitus*). The mammals were previously thought to occupy a narrower range in the region. The southern leaf-green tree frog is a rare species in the ACT region being known only from the Cotter River and the Goodradigbee and Geehi rivers in NSW. The discovery of these species in the park demonstrates that knowledge of wildlife in Namadgi is not complete. Appendix 5 contains a list of vertebrate species known to occur or likely to occur in the park.

It can be difficult for visitors to Namadgi to fully appreciate the diversity of animals that live in the park as many are nocturnal, secretive, difficult to locate and do not frequent commonly visited areas. For these reasons, inclusion of wildlife in interpretation is essential so that people can gain some knowledge and understanding of the fauna of the park, as well as appreciating the importance of the park for biodiversity conservation.

5.10.1 Rare and threatened species

A species or ecological community is considered threatened if it is likely to become extinct in the foreseeable future under prevailing environmental conditions. The *Nature Conservation Act 1980* establishes a formal process for the identification and protection of threatened species and ecological communities. The Conservator of Flora and Fauna is required to prepare a management response to each declaration by way of an Action Plan that outlines conservation requirements. Species or ecological communities declared as threatened in the ACT (Table 5.2) may also be listed under Commonwealth and State legislation. Appendix 4 shows the conservation status nationally of ACT threatened species occurring in Namadgi.

5.10.2 Mammals

Namadgi provides habitat for a diverse mammal fauna, with at least thirty-five native species recorded in the park (Appendix 5). Native mammals include:

- arboreal species (koala *Phascolarctos cinereus*, possums, gliders, eastern pygmy possum *Cercartetus nanus*, brush-tailed phascogale *Phascogale tapoatafa*)
- large terrestrial grazers (eastern grey kangaroo *Macropus giganteus*, common wallaroo *Macropus robustus*, red-necked wallaby *Macropus rufogriseus*, swamp wallaby *Wallabia bicolor* and the common wombat *Vombatus ursinus*)

- small ground-dwelling mammals (*Antechinus ssp*, common dunnart *Sminthopsis murina* and various species of rodent)
- at least nine species of bat.

The spotted-tailed quoll *Dasyurus maculatus* the largest native mainland carnivore, the short-beaked echidna *Tachyglossus aculeatus* and the platypus *Ornithorhynchus anatinus* also occur in the park.

Three mammal species recorded in the park are threatened (spotted-tailed quoll, smoky mouse *Pseudomys fumeus* and brush-tailed rock-wallaby *Petrogale penicillata*). The latter is now no longer present in the park (probably largely due to fox predation), although its rocky habitat remains. Rare or uncommon species include the broad-toothed rat *Mastacomys fuscus*, an inhabitant of sub-alpine bogs and heaths, yellow-bellied glider *Petaurus australis*, eastern pygmy possum and koala.

Introduced mammals that have been recorded in the park (some species sighted only once or occasionally) include house mice, black rats, cats, dogs, rabbits, hares, foxes, pigs, ferrets, goats, horses, sheep, cattle, and fallow deer *Dama dama*, sambar deer *Cervus unicolor* and red deer *Cervus elaphus*.

Table 5.2 Animals in Namadgi listed as threatened under the *Nature Conservation Act 1980*

Scientific name	Common name
Frogs	
<i>Pseudophryne pengilleyi</i>	northern corroboree frog
Fish and crayfish	
<i>Gadopsis bispinosus</i>	two-spined blackfish
<i>Maccullochella macquariensis</i>	trout cod
<i>Macquaria australasica</i>	Macquarie perch
<i>Euastacus armatus</i>	Murray River crayfish
Birds	
<i>Melanodryas cucullata</i>	hooded robin
<i>Climacteris picumnus</i>	brown treecreeper
<i>Daphoenositta chrysoptera</i>	varied sittella
<i>Lalage sueurii</i>	white-winged triller
<i>Hieraaetus morphnoides</i>	little eagle
Mammals	
<i>Pseudomys fumeus</i>	smoky mouse
<i>Dasyurus maculatus</i>	spotted-tailed quoll
<i>Petrogale penicillata</i>	brush-tailed rock-wallaby

5.10.3 Frogs

Namadgi National Park contains a range of habitats for frogs, including rivers, streams, dams, subalpine *Sphagnum* moss bogs, heaths and wetlands. At least fourteen species or subspecies of frog have been recorded in the park (Appendix 5). Most frog species are restricted to the lower areas of Namadgi, although two species (northern corroboree frog *Pseudophryne pengilleyi* and alpine tree frog *Litoria verreauxii alpina*) occur only in the higher areas and are alpine or subalpine specialists.

The most widespread species in Namadgi is the ubiquitous common eastern froglet *Crinia signifera*, whose distribution in the park extends from the lowest areas to the high subalpine bogs. Threatened frog species include the endangered northern corroboree frog, which has declined to very low numbers in the Brindabella and Bimberi ranges over the past two decades.

Genetic differences between populations of northern corroboree frog in the ACT and those in NSW highlight the importance of conserving ACT populations. The alpine tree frog (threatened in NSW) also occurs in the park.

Rare and uncommon species include the southern leaf-green tree frog (Cotter River form), known from only the Cotter River and nearby Goodradigbee and Geehi rivers in NSW, and the brown toadlet *Psuedophryne bibroni*, which is known to occur in a few locations in the ACT. One frog species formerly found in the park area (warty swamp frog *Litoria raniformis*) is now extinct in the ACT.

5.10.4 Reptiles

Namadgi National Park is home to a diverse reptile fauna. At least forty-one species have been recorded, including seven species of snake, thirty-three species of lizard and one species of tortoise—the eastern long-necked tortoise *Chelodina longicollis* (Appendix 5). Lizards include geckos (two species), skinks (twenty-five species), dragons (five species), monitors (one species) and legless lizards (one species). Four species of snake and six species of skink that occur in Namadgi (and Tidbinbilla) are not found elsewhere in the ACT. None of these species is listed as threatened in the ACT. Rare or uncommon species include the seldom seen Rosenberg's monitor *Varanus rosenbergi*.

5.10.5 Fish

Four native fish species—trout cod *Maccullochella macquariensis* (endangered), Macquarie perch *Macquaria australasica* (endangered), two-spined blackfish *Gadopsis bispinosus* (vulnerable) and mountain galaxias *Galaxias olidus*—are found in Namadgi's streams. Three of these species are presently restricted to the Cotter Catchment, with the mountain galaxias being widely distributed throughout Namadgi. A small remnant population of Macquarie perch is present in the Cotter River below Bendora Dam. They have also been translocated to the Cotter River above Corin Dam. Trout cod are present in Bendora Dam and the Cotter River downstream of the dam.

Introduced fish species, including rainbow trout *Oncorhynchus mykiss*, brown trout *Salmo trutta* and eastern gambusia (mosquito fish) *Gambusia holbrooki* pose the greatest long-term threat to native fish. The eastern gambusia is only known to occur in a small number of dams within and adjacent to the park. Oriental weatherloach *Misgurnus anguillicaudatus*, a widespread alien species in the ACT, does not occur in the park, but has been recorded approximately one kilometre upstream from the Cotter Dam, along with goldfish *Carassius auratus*. Oriental weatherloach are also known in the Gudgenby River behind the Namadgi Visitor Centre. Carp *Cyprinus carpio* also occur in the lower Gudgenby River.

The streams of the Cotter Catchment are among the very few south-eastern river systems without carp, redfin perch *Perca fluviatilis* and brown trout (absent from Bendora Dam and upstream), which makes the Cotter an important habitat and refuge for native fish. Both rainbow trout and brown trout are distributed throughout the Naas-Gudgenby Catchment, while rainbow trout are prevalent in the Cotter River upstream of Bendora Dam.

5.10.6 Invertebrates

Invertebrates constitute the bulk of biodiversity in most ecosystems and several species are restricted to the montane and subalpine areas. However, research in this field has been extremely limited and invertebrate biology and ecology is poorly understood compared to that for vertebrates.

Active insect life is a feature of the mountains in the summer period. An aggregation of considerable numbers of insects often occurs on higher peaks. This 'hill-topping' behaviour, almost entirely by males, facilitates mating as the patrolling males encounter females that cross the area. An example from the Brindabella Range is the black and green swallowtail butterfly, Macleays swallowtail *Graphium macleayanus*.

In spring, large numbers of bogong moths *Agrotis infusa* migrate from northern inland NSW to the cool rock crevices on the high mountain peaks. Here they remain more or less dormant

during the summer before flying back to mate and lay their eggs. They provide an important food resource for other animals such as ravens, currawongs, lizards and carnivorous mammals. The moths formerly provided a ready source of nutritious food for Aboriginal clans that travelled to the mountains to engage in ceremonies, trade and cultural exchange.

Five large native crustacean species are present in Namadgi, as well as many microcrustaceans. The five large species are yabby *Cherax destructor*, freshwater prawn *Macrobrachium australiense*, freshwater shrimp *Paratya australiensis*, and two species of spiny crayfish *Eustacus rieki* and *E. crassus*. The *E. rieki* is commonly found in montane bogs and features in the diet of foxes.

5.10.7 Birds

Namadgi contains a wide range of bird habitats related to topography and the types of vegetation communities. Records held by Canberra Ornithologists Group indicate that 170 native species occur in the park (Appendix 5). The Brindabella Ranges are important habitat for a wide range of altitudinal migrants. These are species that breed in the mountains during summer and descend to lower elevations in winter e.g. yellow-faced honeyeater *Lichenostomus chrysops*, white-naped honeyeater *Melithreptus lunatus*, satin flycatcher *Myiagra cyanoleuca*, cicadabird *Coracina tenuirostris*, yellow-tailed black cockatoo *Calyptorhynchus funereus*, gang-gang cockatoo *Callocephalon fimbriatum* and Australian king-parrot *Alisterus scapularis*. First documented in the early 1950s, the autumn exodus of many thousands of honeyeaters from the Canberra region to lower elevations nearer the coast is a special phenomenon (Taws 1999; Wilson 1999). The birds mass together and move from the higher ranges in a general west to east direction following various land features, especially the river systems including the Murrumbidgee Valley. These are mostly the yellow-faced honeyeater, white-naped honeyeater and to a lesser extent fuscous honeyeater *Lichenostomus fuscus*. Other species are the red wattlebird *Anthochaera carunculata*, noisy friarbird *Philemon corniculatus* and white-eared honeyeater *Lichenostomus leucotis*.

The moist montane forests (Brown Barrel Montane Forest, Narrow-leaved Peppermint-Ribbon Gum Montane Forest) provide habitat for some wet forest/wet forest floor specialists such as the pilotbird *Pycnoptilus floccosus*, red-browed treecreeper *Climacteris erythrops*, brush bronzewing *Phaps elegans* and powerful owl *Ninox strenua*. These species are affected by burning of this habitat, for example, it is not known if any of the small brush bronzewing population survived the 2003 bushfire. The powerful owl is a rare species, generally restricted to the high wet ranges, where it maintains a huge territory and roosts by day in Blackwood *Acacia melanoxylon* and other dense tall shrubs and trees.

Threatened species found in Namadgi include hooded robin *Melanodryas cucullata*, brown treecreeper *Climacteris picumnus*, varied sitella *Daphoenositta chrysoptera*, white-winged triller *Lalage sueurii* and little eagle *Hieraaetus morphnoides*. Latham's snipe *Gallinago hardwickii*, which is a summer migrant from Japan and subject to international migratory bird agreements for the protection of its habitat, occurs in the Montane and Subalpine Bog/Fen areas.

5.11 Native animals: management considerations

Namadgi National Park is close to Canberra and is readily accessible to universities and other research institutions. This has resulted in the park being a focus of applied and theoretical research that links to similar research across the other parks of the Australian Alps. Despite the many research projects undertaken in the park, much remains to be learnt about the biology and ecology of Namadgi's fauna and flora and how to monitor and manage its ecosystems to ensure their conservation in perpetuity. In particular, further research is required to improve our understanding of how ecosystems and individual species respond to environmental changes (such as fire, climate change and introduced species).

Surveys and monitoring are needed to establish the characteristics and condition of fauna and habitats in the park and the key factors influencing trends in animal populations. This information together with the results of research conducted in the park and elsewhere is an essential foundation to sound wildlife management programs.

Despite the destruction caused by the 2003 fire it has presented an opportunity for scientists to understand better how animals respond to such catastrophic events. Research findings will provide useful knowledge to better integrate fire management and biodiversity conservation objectives with other goals in the future (see Chapter 7).

The main threats to native animals in the park are detailed below:

- **Limited knowledge about some species.** This may result in inappropriate management actions or lack of necessary action.
- **Predation (mainly by introduced species).** This can contribute to decline or extinction of prey species. Highly successful introduced predators that prey on native species include the red fox *Vulpes vulpes*, brown trout and rainbow trout. They are major threats to native species. The fox is considered to be the primary cause of extinction of the brush-tailed rock-wallaby in the ACT, and is implicated in the decline of the spotted-tailed quoll. Introduced fish species pose the greatest threat to the survival of threatened native fish.
- **Lack of understanding of the ecological relationships and interactions between species.** Most predators have several prey species, and introduced predator species may help control introduced prey species. For example, in Namadgi, foxes help control rabbits. Dingo/wild dogs killing sheep in areas adjoining the park need to be controlled, but their predation deeper in the park is likely to be beneficial for the management of vertebrate pests such as foxes, pigs, goats and rabbits. Pest animal control programs should be based on good knowledge of the ecology of the target species.
- **Introduced plants.** These exert pressure through competition and habitat modification.
- **Exotic diseases, pathogens and parasites.** These often come from introduced species but may affect the health of native animals. The decline of the northern corroboree frog has been attributed largely to the introduced chytrid fungus, which has been detected in ACT populations. Liver fluke and hydatid tapeworms are introduced organisms that affect some native mammals.
- **Habitat modification as a result of land clearing.** This has occurred in the lower elevation valleys of Namadgi, adversely affecting species such as the quoll, arboreal mammals and some birds, while favouring other species such as the rabbit and eastern grey kangaroo.
- **Changed fire regimes and intense landscape fires.** These may affect the short and long-term survival prospects for many species. Animals may be killed by fire, suffer starvation soon afterwards, or be easily preyed upon due to lack of vegetation cover. The most significant long-term effect of fire on fauna is through changes to habitat (such as the loss of tree hollows and other places for refuge), reduced food availability, and sedimentation of spawning sites for aquatic animals.
- **Climate change.** Alpine and subalpine species are identified in *Weathering the Change – The ACT Climate Change Strategy 2007-2025* (ACT Government 2007c) and in the *National Biodiversity and Climate Change Action Plan* (2004-2007) as likely to suffer from climate change. The Action Plan recognises the Australian Alps bioregion as one of the three Australian ecosystems most vulnerable to warming because of their restricted area and predominance of cold-adapted species. It is predicted that global warming will create warmer and drier landscapes and an increased fire frequency throughout the Alps. Specialised alpine species and communities such as the bogong moth, northern corroboree frog and broad-toothed rat, subalpine bogs, herbfields and wet heaths are most at risk. Both introduced and non-specialist native species are likely to extend their range. However, there is much uncertainty about how individual species and ecosystems will respond. Ongoing monitoring is therefore essential to track change.
- **Recreational use of the park.** In some areas, this may pose a threat to the conservation requirements of sensitive or threatened species and therefore requires careful management and ongoing monitoring (see Chapter 8).

5.12 Native animals: objective, policies and actions

OBJECTIVE

Viable populations of all existing native fauna species are maintained by protecting and improving habitat and managing key threats.

POLICIES

- Management programs will be designed that:
 - improve understanding of the biology and ecology of animal species as a basis for managing habitat
 - minimise or eliminate threats to native fauna
 - provide the highest priority to conservation of species that are most vulnerable to change (including climate change), such as specialist and threatened species and those of regional significance.
- Liaison will be undertaken with regional and national bodies to achieve coordinated research and monitoring programs and to encourage external organisations to undertake appropriate faunal research in the park.
- The habitat of all declared threatened species and ecological communities will be protected and managed according to objectives and strategies specified in ACT Action Plans, Commonwealth Recovery Plans and similar plans in other jurisdictions.
- Pest management programs will be implemented to reduce impacts on native plants and animals, and on production values on adjoining lands where relevant (e.g. sheep on adjoining rural land attacked by dingo/wild dogs).
- Using the best available knowledge, fire management strategies will be adopted that recognise and take account of animal ecology (see Chapter 7).

ACTIONS

- 33 Maintain a fauna inventory to national standards and ensure that it is regularly updated as new knowledge becomes available.
- 34 Develop a fauna research and monitoring program to record the distribution, abundance and other details of fauna species, giving priority to sensitive, specialist and threatened species, species of regional significance and species that provide good indicators of change.
- 35 Continue with long-term post-fire recovery research and monitoring.
- 36 Develop population management programs for declared threatened species.
- 37 Provide information to park visitors and neighbours on the special qualities and need for protection of the park fauna.
- 38 Refer species and communities that may be under threat to the ACT Flora and Fauna Committee for consideration for declaration as threatened.

5.13 Ecological restoration

Worldwide, ecological restoration is a growing scientifically based discipline. More strictly defined, restoration is one level of rehabilitation of natural ecosystems. Rehabilitation may involve regeneration, restoration or reinstatement (often in combination) that represents progressively greater degrees of human intervention. Definitions adopted for this Plan are from the *Australian Natural Heritage Charter*, 2nd edit. (AHC 2002a):

- **Regeneration** means the natural recovery of natural integrity following disturbance or degradation.
- **Restoration** means returning existing habitats to a known past state or to an approximation of the natural condition by repairing degradation, by removing introduced species or by reinstatement.
- **Reinstatement** means to introduce to a place one or more species or elements of habitat or geodiversity that are known to have existed there naturally at a previous time, but that can no longer be found at that place.

Rehabilitation can simply mean the removal of a disturbing influence to allow ecological processes to recover independently or it can involve a more complex process such as restoration and reinstatement of a species of concern in conjunction with control or elimination of an ecological threat. Rehabilitation projects need to give careful attention to objectives. Given the ecological dynamics of the natural environment, rarely is it possible to recreate previously existing environmental conditions, even when there is reasonable confidence that these were known.

Since the declaration of Namadgi National Park, considerable efforts have been made to restore natural integrity, defined as the degree to which a place or ecosystem retains its natural biodiversity and geodiversity and other natural processes and characteristics (AHC 2002a). Work to control populations of feral pigs, horses, rabbits, goats and foxes is ongoing. The objective of these control programs is generally to minimise threats to park values. The programs are essential elements of an ecological restoration program.

While most landscapes and vegetation communities in the park retain much of their pre-European integrity, introduced species have caused considerable disruption to the natural ecological processes. In particular, the introduction of predators such as foxes has changed the predator-prey balance to the detriment of native species such as the spotted-tailed quoll (threatened) and brush-tailed rock-wallaby (now locally extinct). Many introduced species have achieved some ecological balance (albeit in most cases undesirable). Therefore the control or elimination of an introduced species may have unforeseen consequences for other introduced or native species. Ecosystems are inherently complex and an adequate understanding is required for appropriate management, particularly where management involves manipulation of species abundance or habitat.

5.14 Ecological restoration: management considerations

5.14.1 Restoration of cleared valleys

The disruption of ecological systems in Namadgi is most prevalent in the lower elevation valleys that were cleared for farming from the 1830s and 1840s. Abrupt boundaries separated the secondary grasslands that were created from the remaining upslope tree cover. Varying degrees of natural regeneration have occurred on these boundaries, but this is limited by (a) changed local microclimate resulting in cold frost-hollow conditions that inhibit seedling germination and growth, and possibly (b) grazing pressure from eastern grey kangaroos that have established on the open grassy areas. The clearing of the forests and woodlands on the valley floors and lower slopes has produced an ideal environment for eastern grey kangaroos resulting in very high densities. Their populations have grown significantly in the ACT region due to increased food, and reduced predation or hunting. Management of kangaroos will be in accordance with the current ACT Government Kangaroo Management Plan.

High densities of kangaroos may lead to undesirable effects on ecosystems, such as overgrazing of the ground layer vegetation or the prevention of tree seedling establishment. Winter increases the mortality rates of kangaroos, which may distress visitors to the park. Interpretation and education programs have an important role in helping people understand that annual mortality is natural because food is limited, and that mortality rates will always naturally increase during drought.

By re-establishing vegetation and controlling introduced species, ecological restoration of valley floors could assist in providing more habitat for arboreal mammals (e.g. greater glider *Petauroides volans*, common ringtail *Pseudocheirus peregrinus*) and their native predators (powerful owl and spotted-tailed quoll). Revegetation may only require plantings at the edges of clearings to initiate natural regeneration that has been inhibited by environmental factors. Such manipulation of the vegetation cover would have the effect of reducing the food supply for eastern grey kangaroos and lead to a reduction in total numbers, however densities on the remaining grassy areas would remain high.

A program of restoration in the cleared valleys would require balancing natural and cultural values. Vegetation surveys (e.g. Helman *et al.* 1988; Ingwersen 2001, 2006) show the prevalence of introduced plant species, many associated with earlier pastoralism in these areas. While some of these introduced species may have a relatively benign impact on the ecosystems of which they are a part, ongoing management of introduced plant species is necessary to minimise their impacts on natural values.

5.14.2 *Sphagnum* bog rehabilitation

Work has commenced on the long-term ecological restoration of *Sphagnum* bogs damaged by fire (see s. 5.8 for more detail).

5.14.3 Boboyan Pines rehabilitation project

The removal of a 380 ha pine plantation in the Gudgenby Valley and the rehabilitation of the area with appropriate native species began in 1997, supported by the Gudgenby Bush Regeneration Group. This has been the first attempt in the park at undertaking a large rehabilitation project involving a totally modified area. The last stands of pine were cleared in early 2004. A larger scale ecological restoration project in the Gudgenby Valley would ideally build on the work undertaken in the former pine plantation and extend restoration work into a much larger area of the valley.

5.14.4 Species reintroduction

Reinstatement of native species, especially native animals, is a complex task requiring the availability of animals of suitable genetic stock, presence of suitable secure habitat, and an understanding of likely predation pressure. Given that the decline of native species such as the spotted-tailed quoll is largely attributed to predation and competition with introduced species, the control of introduced species is paramount. A vigorous, scientifically based program for control of introduced predator species is a high priority for any reinstatement program.

The northern corroboree frog populations in the subalpine wetlands have declined dramatically in the past two decades. Burning of the *Sphagnum* bogs in the 2003 bushfire had a devastating effect on corroboree frog habitat. A captive rearing program is under way using eggs collected from the wild. This experimental program aims to increase survival rates of tadpoles and release the reared frogs back to their habitat to establish and maintain viable wild populations.

The decline of native fish such as Macquarie perch is partly attributable to the altered flow regimes in the Cotter River following the construction of water supply dams and other associated infrastructure. Environmental flows in the Cotter Catchment are currently designed to benefit aquatic communities, including fish, but more active rehabilitation measures may be required. Reintroduction of Macquarie perch to additional locations within the Cotter or to the other streams will lessen the likelihood of localised catastrophic events eliminating this species from the park.

5.15 Ecological restoration: objective, policy and actions

OBJECTIVE

Biodiversity is conserved and enhanced through the implementation of a systematic, scientifically based ecological restoration program.

POLICY

- The conservation benefits and feasibility of implementing scientifically based, ecological restoration programs and activities in the park will be investigated and kept under review. Lower elevation valleys will be a key focus.

ACTIONS

- 39 Subject to feasibility and an assessment of cost-effectiveness, design and implement scientifically based ecological restoration programs and activities. Focus on those valleys where there is a greater likelihood of success, and complementary objectives can be achieved, such as extension of important habitat types and reduction in eastern grey kangaroo numbers.
- 40 Where feasible and appropriate, re-introduce locally extinct species (e.g. brush-tailed rock-wallaby) and undertake actions outlined in Action Plans (ACT) and Recovery Plans (Commonwealth) for the conservation of threatened native species.
- 41 Pursue research and control programs for introduced predator species, particularly for foxes, using methods that are not harmful to native species.

5.16 Management of pest species

Introduced plants and animals now form part of most 'natural environments' influencing the ecosystems in which they live. These introduced species create varying levels of threat to those ecosystems. In the ACT, this is recognised by the declaration of pest plants and pest animals under the *Pest Plants and Animals Act 2005*.

The main objects of the Act are to protect land and aquatic resources in the ACT from threats from pest plants and animals; to promote a strategic and sustainable approach to pest management; to identify pest plants and animals; and to manage pest plants and animals. The Act provides for the declaration of pest plants and animals and the preparation of management plans. It also prescribes offences in relation to propagation, supply and reckless disposal of pest plants, and supply, keeping and reckless disposal of pest animals. Declared pest species are listed in the *Pest Plants and Animals (Pest Plants) Declaration 2005* and the *Pest Plants and Animals (Pest Animals) Declaration 2005*.

The *ACT Vertebrate Pest Management Strategy* (ACT Government 2002) and the *ACT Weeds Strategy 2009-2019* (ACT Government 2009b) are two key documents produced by the ACT Government in relation to invasive species management. Any management actions should be guided by these two strategies (and their subsequent revisions).

5.17 Pest plant management

Pest plants are defined as species that are having undesirable ecological, physical, economic or aesthetic impacts due to their characteristics and location. They may include non-Australian plants, some Australian plants from outside the local region and, in exceptional circumstances, plants that occur naturally in an area.

Weed management in the ACT is undertaken in accordance with the principles outlined in the *ACT Weeds Strategy 2009–2019*. The ACT Weeds Working Group (technical reference group) oversees the implementation of the strategy. Setting of priorities for weed control work is guided by the *ACT Priority Weed Control Plan 2008–13* (ACT Government 2008). Priority weeds are identified according to:

- nomination on priority lists e.g. Weeds of National Significance, ACT Pest Plants Declaration
- ecological threat
- socio-economic impact
- potential to spread further
- ability and technology to effectively control species
- aesthetic impact.

5.18 Pest plants: management considerations

The wide range of weed species, their varying levels of threat to native ecosystems, and the cost and difficulty of controlling many species mean that carefully targeted approaches to weed management are required. The following considerations are relevant to Namadgi:

- Weed management requires persistence and vigilance and is resource-intensive. Management of existing infestations requires regular monitoring, mapping and control measures.
- New weeds detected early can be eradicated before they become naturalised. Complete eradication is very difficult once species become naturalised.
- Technical expertise and local knowledge is required to devise the most effective, cost-efficient strategies for exclusion, control or eradication.
- A coordinated, regional approach to weed management is important for the identification and control of weed spread across land tenures.
- Exotic plantings form an important element of cultural heritage sites. Examples in Namadgi include the Bendora Arboretum, plantings at the Honeysuckle and Orroral Tracking Stations and plantings at historic homesteads. Many of the plantings have the potential to become a significant weed problem in the park. A balance between protection of cultural heritage and ecological values needs to be achieved.
- In some locations (e.g. riparian areas) where native vegetation has been wholly or partially replaced by weed species, the latter often provide a vegetation structure for birds and other animals. Weed control programs need to be strategic, with phased removal of weed species and replanting of substitute native species to provide habitat continuity.
- Control measures need to take account of water resource values (see s. 11.2.6).

5.19 Pest plants: objective, policies and actions

OBJECTIVE

Pest plants are excluded, controlled and, where feasible, eradicated from Namadgi through the implementation of effective management programs.

POLICIES

- The weed control programs presently in place for Namadgi will continue to be developed, reviewed and implemented. Specific attention will be given to high priority weed species (e.g. ACT Declared Pest Plants, Weeds of National Significance), weed infested areas that provide a source for spread to other areas, and invasion routes such as roads, tracks and fire trails.
- The effectiveness of weed control programs will be evaluated regularly and management programs adapted accordingly.
- A best practice approach will be applied to weed control measures. This encompasses continuous improvement through monitoring, use of new technologies where appropriate, and adequate training in control and detection of new species.
- Hygiene measures aimed at minimising the introduction and spread of weed species (and pathogens) by park staff and contractors will be applied that include:
 - washing machinery used by management and contractors
 - working from the least infested areas to the most infested
 - minimising soil disturbance by management activities
 - controlling feral animals such as horses, goats and pigs that spread seed and disturb soil
 - avoiding the introduction of material such soil, fill and gravel that is likely to be infested with seeds of weed species
 - requiring horse riders to carry clean feed for horses and feed their horses with clean feed two days before coming to the park (see s. 8.7.6 for more detail)
 - educating park users about the potential for weeds to spread from fruit cores and on items such as socks, boots, gaiters, bicycles and camping equipment.
- The effects on habitat will be considered in weed control programs. Where habitat maintenance is important for biodiversity conservation, removal and replacement may be staged over time to maintain habitat connectivity and control programs will include both removal of pest plants and replacement with desirable species.
- The cultural heritage value of exotic species associated with cultural heritage sites will be evaluated in relation to their invasive potential and ecological impact. Where necessary, species that aggressively invade bushland will be eradicated and replaced with benign species if appropriate.
- Control programs will comply with Government requirements and policies for the safe and appropriate use of chemicals in controlling pest plants.

ACTIONS

- 42 Continue the development and implementation of an annual weed control program. Adapt weed control programs according to the findings of evaluation and monitoring.
- 43 Work with neighbours and Australian Alps national parks agencies to implement effective measures for weed control, focusing specifically on priority weeds that have the potential to spread through bushland.
- 44 Support community involvement in weed control programs conducted within the park.
- 45 Provide effective training for staff on the early detection of new invasive species, ongoing detection of weed spread and control measures.
- 46 Provide education material that supports weed control strategies and informs the community and neighbours about the programs conducted within the park.

5.20 Pest animal management

Pest animal control programs in Namadgi primarily focus on vertebrate pests including foxes, rabbits, horses, goats, dingo/wild dogs and pigs. Feral deer populations represent an emerging pest problem that will also require control to the extent that effective measures are available. Introduced fish are also pests but there are currently no technically feasible control programs for them. Two invertebrate species are recognised as pests in the park: European wasp *Vespa germanica* and European honey bee *Apis mellifera*.

Targeted management pest animal control programs are essential to the maintenance of biodiversity, protection of ecosystem services such as supply of high quality water, reduction in the spread of disease carried by pests, and protection of landscapes and recreational amenity from disturbance and degradation. Pest management programs are also an essential element of ecological restoration. The most effective strategic approach is to focus on reducing the impact of a pest animal on a desired environmental attribute. Complete eradication is rarely feasible.

5.21 Pest animals: management considerations

Pest animal programs should be integrated into a systematically planned landscape or ecological restoration framework. A range of programs has been undertaken in Namadgi with regard to management of pest animals:

- **Feral pigs:** Namadgi has conducted a successful wild pig management program for twenty years. Keeping pig populations low is an important strategy for protecting sensitive ecological communities such as wetlands and for preventing the spread of foot and mouth disease should an outbreak of the disease occur in the region.
- **Horses:** Small numbers of feral horses enter the park from the Kosciuszko National Park and are a particular concern if they are present in the sensitive subalpine wetlands that provide an important hydrological function for Canberra's water supply. A feral horse management plan is being implemented to deal with incursions of feral horses into the park.
- **Dingo/wild dogs:** Dingoes are dogs which have been in Australia for at least 4 000 years, and are native animals under the *Nature Conservation Act 1980*. Dingoes and domestic dogs are the same species and are capable of interbreeding.

Based on DNA sampling, the Namadgi animals are best described as dingoes with a small component of domestic dog. Their coat colours vary, but they howl like dingoes instead of barking as domestic dogs do. They perform the role of a top predator.

Dingo/wild dogs are problematic for sheep graziers whose properties adjoin the park and the animals must be diligently controlled on these properties and within a defined area of Namadgi bordering sheep grazing areas to prevent losses. Dingo/wild dogs appear to play an important ecological role in limiting the recovery of pest populations after control and there is evidence that they limit eastern grey kangaroo numbers.

- **Foxes (European red fox):** Foxes are highly successful introduced predators. Research indicates that foxes affect population densities of red-necked wallabies and common brush-tailed possums in Namadgi and they are assumed to potentially also affect less abundant species that are harder to monitor. Monitoring of fox density is an important activity, based on comparison of valleys with and without control, to monitor the effectiveness of the program.
- **Feral cats:** Feral cats have been observed throughout the park but their impact on native animals has not been quantified. There are currently no practical methods of control. Methods of monitoring and control will be adopted if they become available.
- **Rabbits:** Systematic monitoring of rabbits is undertaken via long-term spotlight transect counts. Rabbit numbers have been increasing in recent years in Namadgi and adjacent grazing properties. Coordinated landscape-scale management programs are required to minimise their impacts on ecological values and agricultural production.

- **Feral deer:** Three deer species occur in the ACT: sambar, fallow and red deer. The occurrence of sambar deer is mainly reported in the middle and upper Cotter catchments and it is likely that they have been present in low numbers for many years. Fallow deer are a more recent introduction, occurring in lower elevation areas of the ACT including eastern parts of Namadgi. Red deer are also present in this area in low numbers. There is a need for objective monitoring of the populations, identification of potential impacts, and development of effective control methods.
- **Invertebrate pests (European wasp and European honey bee):** The European wasp, a declared pest animal, has become widely established in the ACT. It was first recorded in Namadgi in 2003 and has been found in many locations across the park at both lower and higher elevations, including remote, relatively intact natural areas e.g. Bimberi Wilderness Area. Control (nest destruction and baiting) has been undertaken in some recreation visitor nodes with a focus at picnic areas for public safety. European wasps are likely to be a threat to native biodiversity especially insects and spiders. The most effective approach to reducing numbers of this species is likely to be a baiting program at picnic areas and biodiversity hotspots.

The European honeybee, from apiaries or feral colonies, is also widespread in the park. Honeybees use a wide variety of plant species, competing with and displacing many native insect, mammal and bird species. It is not practical to control feral colonies, except on a limited scale (e.g. where they are a nuisance to visitors). Placing of hives in the park is not permitted (s. 11.5.5).

Occasionally, a native animal can become a pest at a certain location and under certain circumstances. In Namadgi an over-abundance of eastern grey kangaroos may have impacts on biodiversity and the economic viability of neighbouring grazing properties. An important check on kangaroo populations is predation by dingo/wild dogs, which is an indicator of the complex dynamics of animal populations in altered environments. Other than culling, a long-term ecological restoration program to re-establish tree cover in parts of cleared valley is currently the only permanent solution to addressing over-abundance (see s. 5.13). Eastern grey kangaroos in Namadgi will be managed in accordance with the current ACT Government Kangaroo Management Plan (see s. 5.14).

Pest animal control is a regional issue. The exclusion of new pests from the park and control of existing populations requires collaborative planning and implementation with neighbours, individuals and groups with an active interest in pest management, including researchers and tertiary institutions. Additionally, the general community can play an important role in preventing the introduction or reintroduction of new pests. In some instances, human assisted dispersal is the only way particular species have been able to extend their range e.g. establishment of trout in Gibraltar Creek above Gibraltar Falls (Lintermans 2004).

Early detection and control of new pest species is essential to successful eradication, containment or control. Examples of species of concern not established in particular park habitats include the red-eared slider turtle *Trachemys scripta elegans* (waterways), and brown trout in the Cotter Catchment above Bendora Dam (ACT Government 2007b).

Research into methods of eradication and control is essential to improve the humaneness, efficiency, effectiveness and target specificity of pest animal management. Collaboration with research institutions, national program managers and regional partners for research projects is important to further scientific advances in pest management. It may be necessary to conduct control programs for some pest species within an approved experimental framework.

Monitoring and evaluation are also essential elements of a pest management program in order to test the effectiveness of programs and improve strategies. Monitoring provides information about distribution and abundance of pest species, the condition of park attributes (e.g. important habitats) that are at risk, and how these attributes change over time in response to pest damage and pest animal control programs. This information is essential to make sound management decisions, report on the effectiveness of pest management programs, and revise programs accordingly.

Alpine and subalpine environments are of particular concern with regard to feral animal impacts, especially pigs, foxes, horses, deer and goats. In Namadgi, many of these areas were severely burnt in the 2003 bushfire and may also be under stress due to the effects of climate change. It is appropriate for control programs to place a high priority on subalpine areas, particularly within the catchment of the subalpine wetlands.

Feral animals may also be vectors for the spread of exotic diseases, pathogens and parasites that also affect the health of native animals. Specific management strategies are required to address the spread of pathogens particularly if the survival of a species is at stake.

5.22 Pest animals: objective, policies and actions

OBJECTIVE

Pest animal numbers are reduced and controlled and, where feasible, pest animals are eradicated from the park through the implementation of control programs that are integrated with landscape and biodiversity conservation and ecological restoration objectives.

POLICIES

- Pest animal management programs for the park will be developed in accordance with objectives and policies set out in the *ACT Vertebrate Pest Management Strategy* (and subsequent versions) and address actions identified in threatened species Action Plans.
- A strategic approach to pest animal management will be undertaken that addresses management priorities for landscape and biodiversity conservation, ecological restoration, protection of neighbouring livestock and public safety.
- A systematic approach to monitoring and evaluation of feral animal control programs will be developed by ensuring that information on species abundance, distribution and control measures previously undertaken is collected, stored, mapped, assessed and made accessible.
- Pest animal control programs will comply with relevant national and ACT codes of practice.

ACTIONS

- 47 Evaluate the benefits of establishing of a Pest Animal Working Group (similar to the ACT Weeds Working Group) or species specific working group that involves ACT Land Management Agencies and key stakeholders.
- 48 Continue to develop cooperative pest animal control programs that involve neighbours, other stakeholders and research organisations in the planning and delivery of programs.
- 49 Evaluate the control and management of introduced pathogens for the protection of biodiversity.
- 50 Develop capacity for early detection of new pest species or the spread of existing pest species.
- 51 In collaboration with research organisations and Australian Alps national parks agencies identify a research agenda for pest animal control and ways to support such research.
- 52 Ensure that pest species eradicated or successfully controlled continue to be contained or excluded from the park through regular monitoring and control, working with neighbours and by other feasible means.
- 53 Identify opportunities for raising community awareness about existing and potential pest animals.
- 54 Assess the effects of control measures on non-target species and make changes to procedures as required.

5.23 Special scientific area and biosphere reserve

The Cotter Catchment contains many places of considerable scientific interest, in particular because of the diversity of plant and animal habitats, geological and geomorphological features, and biogeographical characteristics. It is important for management to recognise the significance of the biogeographical overlap that occurs in the area and seek to maintain the integrity of the ecosystems for future reference.

The 1986 *Namadgi National Park Management Plan* made provision for the Cotter Catchment area to be managed within the park boundaries as a Special Scientific Area, in recognition of its undisturbed nature and unusual combination of habitats. It is intended to continue this provision. Namadgi National Park, and particularly the Special Scientific Area, would form a core element of an ACT Biosphere Reserve should such a proposal proceed. The UNESCO Biosphere Reserve concept covers one or more protected areas and their surrounds, provided the areas are managed for both conservation and the sustainable use of natural resources. The following features of a Biosphere Reserve are relevant to Namadgi:

- The area contains examples of characteristic ecosystems of one of the world's natural regions, managed for protection and study; lands in which people are an integral component, and which are managed for objectives ranging from complete protection to intensive, yet sustainable, production.
- The reserve is a regional centre for monitoring, research, education and training on natural and managed ecosystems.
- The reserve is a place where government decision-makers, scientists, managers and local people cooperate in developing a model program for managing land and water to meet human needs while conserving natural processes and biological resources.
- The reserve is a symbol of voluntary cooperation in the conservation and use of resources for the wellbeing of people everywhere.

5.24 Special scientific area and biosphere reserve: objective, policies and actions

OBJECTIVE

Maintain the ecosystems and landforms of the Cotter Catchment that lie within the park in a natural and undisturbed state for future reference and scientific study.

POLICY

- Protection of the scientific values of the Cotter Catchment will be given high priority in management of Namadgi providing opportunities for reference to relatively large and diverse undisturbed ecosystems and landforms for comparison with ecosystems under other land uses in the surrounding region.

ACTIONS

- 55 Encourage scientific inquiry and education, and provide interpretation for the ACT community, about the natural and cultural heritage values of Namadgi and ecosystem processes (see Chapter 9).
- 56 Provide the ACT community with opportunities for managed recreational activities that are consistent with the natural, cultural or scientific values of the park (see Chapter 8).
- 57 Work with the research community and neighbours (particularly Australian Alps national parks) to establish cooperative arrangements for research and management of Namadgi (see Chapter 10).

5.25 The concept of wilderness

Wilderness and its protection have been at the centre of many passionate environmental debates and vigorous campaigns. The increasing scarcity of large natural areas, expanding urbanisation, and growing awareness of environmental problems and issues have encouraged societies throughout the world to value wilderness and provide for its protection in reserve systems and through legislation.

Wilderness now plays an important role in the nature conservation estate by providing areas that are sufficiently large to be self-regenerating, in which natural systems can continue to evolve. Large areas are likely to have greater resilience than smaller ones to impacts from both natural and human induced disturbances. Wilderness areas also deliver important ecosystem services to human populations, such as the protection of whole catchments and high quality water supply.

5.25.1 What is wilderness?

Wilderness is one of six internationally recognised protected area categories of the International Union for the Conservation of Nature (IUCN). The IUCN definition of wilderness is:

A large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.

Australia has not adopted one singular definition for wilderness; over time definitions have changed to reflect changing attitudes and values. ACT legislation prescribes management objectives (s. 2.1) but does not provide a definition for wilderness. The Commonwealth Government's *National Wilderness Inventory* (Lesslie and Maslen 1995) identifies the key characteristics of wilderness as:

- Remoteness from settlement (permanent habitation).
- Remoteness from access (remoteness from established access routes).
- Apparent naturalness (the degree to which the landscape is free from the presence of permanent structures associated with modern technological society).
- Biophysical naturalness (the degree to which the natural environment is free from disturbance caused by modern technological society).

The 'nationally agreed criteria for the establishment of a comprehensive, adequate and representative reserve system for forests in Australia' (Commonwealth of Australia 1997) provide the following definition:

Wilderness areas are large areas in which ecological processes continue with minimal change caused by modern development ... Indigenous custodianship and customary practices have been, and in many places continue to be, significant factors in creating what non-indigenous people refer to as wilderness and wild rivers.

5.25.2 ACT legislative provisions for wilderness

There is currently one designated wilderness area within the ACT. The Bimberi Wilderness comprises 27% (28 900 ha) of Namadgi National Park. The area and the name were gazetted in 1989 under the *Nature Conservation Act 1980*. The area is also defined in Appendix G of the *National Capital Plan* as the Cotter/Gudgenby Wilderness Area, which is 'to be preserved as an area where the concept of wilderness is the primary consideration and where ecological processes are not disturbed by human interference'. There are a number of statutory controls on activities in a declared wilderness area. The *Planning and Development Act 2007* defines management objectives for 'Wilderness area' (see s. 2.1).

Other statutory provisions are:

- No new tracks are to be created (*National Capital Plan* and *Nature Conservation Act 1980*).
- No excavation is permitted except for archaeological purposes, for which a licence granted by the conservator is required (*Nature Conservation Act 1980*).
- No use of motor vehicles in wilderness is permitted except on roads designed for four-wheeled vehicles (*Nature Conservation Act 1980*).

5.26 Wilderness: management considerations

The value placed on wilderness has grown in Australian non-Aboriginal culture, set in contrast to the density of human settlement, urbanisation, and technological complexity. In this context, characteristics of remoteness, naturalness, lack of mechanical access, minimal contact with other humans and spaciousness are increasingly difficult to find in the landscape. Spiritual values are central to the importance placed on wilderness.

Aboriginal people have expressed concern that the term wilderness denies their connection to their country and their occupation and management of the land for thousands of years. However, Indigenous history and current involvement are now much better recognised than in early wilderness conservation campaigns in Australia.

Interpretations of the intrinsic values of wilderness and what are appropriate management practices vary significantly throughout the community. This is particularly evident in community views on the type of recreation and related support infrastructure that is deemed appropriate in a wilderness area.

5.27 Wilderness: objective and policies

OBJECTIVE

The Bimberi Wilderness is managed: (a) in accordance with legislative requirements and as a water supply catchment; (b) as a relatively unmodified area where the capacity for natural ecological process and systems to evolve in the absence of significant human interference is preserved; (c) as a relatively unmodified area where limited numbers of visitors can enjoy opportunities for solitude, isolation, inspiration and self-reliant recreation.

POLICIES

- High priority will be given to the maintenance of the wilderness qualities of the park and protection of the Bimberi Wilderness Area.
- Use of the gazetted wilderness in the park will be regulated and managed according to legislative provisions.

6

A place of past and present meaning

Protecting and managing
cultural heritage



6.1 Primary management objective

Cultural heritage within Namadgi is identified, conserved, and where appropriate interpreted and promoted to retain and foster community associations and an appreciation of the past.

6.2 Background

Evidence of Aboriginal life in the area we now call Namadgi can be found in continuing oral tradition, the findings of archaeological surveys and the observations of the region's first European settlers (summarised in Flood 1980). Our knowledge of Aboriginal use of Namadgi is limited by the fragmentation of oral tradition and kinship groups that followed European settlement of the region and the limited systematic archaeological survey and anthropological research that has been undertaken.

European occupation dates from the first half of the 19th century. The history of this use is better known and its physical markers are often visible.

6.2.1 Aboriginal cultural heritage

Three Aboriginal language groups have been recorded for the area that is now Namadgi. They are Ngunnawal, Ngarigo and Walgalu. There is no clear delineation of the boundaries between these groups. The prevailing contemporary view is that most of Namadgi was part of Ngunnawal country and that other groups also had cultural connections to the mountain region.

Archaeological research suggests that there were sufficient food and shelter to allow Aboriginal people to inhabit what is now Namadgi on a permanent, rather than a seasonal, basis, in particular lower elevation areas. Within the park, there is evidence of extended occupation in the Cotter, Orroral, Gudgenby and Naas river valleys at elevations around 1 000 m, continuing up into Nursery Swamp (1 100 m), the Boboyan and Grassy Creek valleys (1 200 m) and Rotten Swamp (1 450 m). Ceremonial stone arrangements can be found on a number of Namadgi's peaks and three of the most significant rock art sites in the Australian Alps are found in the park. One of these art sites suffered significant structural damage in the 2003 bushfire.

Apart from being a place of permanent habitation for those whose 'country' covered the area that is now Namadgi, the area was also a place of gathering for a number of other language groups that made seasonal visits to the region. Much has been written on the annual harvesting of bogong moths in the higher ranges of Namadgi by groups from as far away as the Shoalhaven River. These seasonal gatherings, which were probably for purposes of trade, exchange of knowledge, intermarriage and ceremony, highlight the complexity of past Aboriginal society and political organisation. The size of the population using the area is a matter of conjecture. One 19th century account noted the presence of 500 Aboriginal people at a camp in the Gudgenby Valley.

Numerous Aboriginal sites have been recorded in Namadgi. This includes approximately 150 sites that were located as a result of archaeological surveys that took advantage of increased ground visibility following the 2003 fire. Most of these sites include stone artefacts, primarily flakes arising from tool manufacture and small tools. Given the limited survey work that has been carried out in Namadgi, it is likely that many more sites could be found across the park.

The *Heritage Act 2004* protects all Aboriginal sites, which are required to be assessed for entry to the ACT Heritage Register.

6.2.2 European cultural heritage

Appendix 6 lists all European places currently recorded in the ACT Heritage Register. The history of these places is described under the following themes:

- colonisation, pastoralism and agriculture
- federation
- water harvesting
- forestry and arboriculture

- skiing in the Brindabella Range
- education and research
- space communications
- 2003 bushfire.

Colonisation, pastoralism and agriculture

European settlement of the region began after the expeditions by Charles Throsby (1821) and Mark Currie (1823), initially on lands to the east of the Murrumbidgee River. By 1839, approximately 27% of the land that is now Namadgi had been claimed by squatters, principally in the central and southern portions of the park. The establishment of pastoral runs progressed across the ranges with Gudgenby Run taken up in 1844, followed by runs in the Cotter Valley. Homesteads were built, including Punyibah, Cotter, Orroral (the second of which survives today), Gudgenby, Westermans, Mt Clear and Boboyan. Simple huts were also built for absentee pastoralists and for stockmen working in the outlying areas of large runs. A number of stock routes are likely to have developed along traditional Aboriginal routes, linking the area to surrounding valleys and high plains.

By the early 20th century, consolidation of holdings was occurring and a comparatively even distribution of permanently occupied homesteads with substantial ornamental and orchard plantings was to be found across the southern and central Namadgi area, including Tennent, Cotter, Orroral, Gudgenby, Boboyan, Crawfords, Lonesome Pine, Westermans, Brayshaws, Mt Clear and Booths.

By the late 1930s, improvements in roads and motor vehicles allowed many pastoralists to manage their holdings from off-site and so permanent occupation declined. Simple one or two roomed huts of corrugated iron or 'fibro' construction were erected to provide basic accommodation for stockmen. A number of these huts remain, along with traces of yards, sheep dips and fence lines. They are a valued part of Namadgi's heritage and are maintained with the support of groups such as the National Parks Association of the ACT and the Kosciuszko Huts Association. A significant legacy of the pastoral period is weed invasion particularly of the valley areas (s. 5.17 to s. 5.19).

Resumption of pastoral leases and freehold land began in the 1970s with preparation for the creation of Gudgenby Nature Reserve and continued with the creation of Namadgi National Park in 1984. Several of the 19th century homesteads were removed. Gudgenby remained in pastoral use until 1989 and the pastoral holdings around Tennent Homestead and Bushfold Flats were resumed in 1991 for addition to the park.

Federation

In 1909, agreement was reached between the Commonwealth and NSW Governments on the boundaries of the new Federal Capital Territory (later renamed the Australian Capital Territory). From 1910 to 1915, a team under the direction of Charles Scrivener surveyed the Territory's boundaries. The majority of the team's timber border pegs and blazed reference trees were destroyed in the 2003 bushfire, however the stone, concrete and metal border markers survived. A large number of the border markers between Mt Coree and Mt Franklin were destroyed previously when a firebreak was bulldozed along the border in the 1950s. Following the 2003 fire, the border was resurveyed and remarked from Mt Coree to Mt Gingera, with some of the new markers being adjacent to the Mt Franklin Road.

Water harvesting

Protection of the Cotter Catchment as the main source of water for the National Capital was a vital issue during negotiations on the boundaries of the Territory. Between 1911 and 1913, grazing leases in the catchment were terminated and freehold land was resumed. Construction of the Cotter Dam (outside the park) was completed in 1917. The wall of the dam was raised in between 1949 and 1951. As Canberra's population grew, the volume of water storage was increased through the construction of Bendora Dam (1961) and Corin Dam (1967). Construction work for these projects included an upgrading of the Brindabella Road and the construction of the Corin Dam Road. As noted in Chapter 4, proposals for further development of water storage facilities for the ACT may rely on the harvesting of water from Namadgi's streams and rivers.

Forestry and arboriculture

Timber extraction started in the Brindabella Range in the early 1930s to supply a mill in Queanbeyan. From 1934 to 1938, a sawmill was operated at Lees Creek to process timber harvested from selective logging high in the catchment and from more intensive operations in the Uriarra and Pierces Creek areas. There was also a forestry settlement at Bulls Head.

From 1928 until 1968, more than thirty arboreta were planted in the ACT to trial the commercial viability of a broad range of exotic pine species. Six arboreta were planted within the Namadgi section of the Cotter Catchment at Piccadilly Circus (1932), Reids Pinch North (1932), Bendora (1940), Stockyard Creek (1940), Cotter Homestead (1940) and Mt Ginini (1959). Of these, only the Bendora Arboretum survived the 2003 bushfire.

Following the Second World War, intensive harvesting of the area between Piccadilly Circus and Mt Franklin provided hardwood for a post-war building boom in Canberra. This harvesting continued until 1962 when the need to protect water quality in the catchment of the newly completed Bendora Dam led to the end of timber extraction in the area.

From 1966 to 1969, a 400 ha plantation of *Pinus radiata*, known as the Boboyan Pines, was established in the Gudgenby Valley, but received little silvicultural maintenance. From 1997, a program of harvesting and progressive rehabilitation to native vegetation with the support of the Gudgenby Bush Regeneration Group was undertaken and the last trees were removed in 2004.

Skiing in the Brindabella Range

Recreational skiing in the Brindabella Range began with the formation of the Canberra Alpine Club in 1934. Between 1935 and 1937, a road was built from Piccadilly Circus to Mt Franklin and a lease issued to the club for the summit area of Mt Franklin. The Mt Franklin Chalet opened in 1938 and the club eventually cleared five small ski runs by hand on Mt Franklin serviced by primitive ski lifts. Further ski leases were issued around Mt Gingera and Mt Ginini to groups of Canberra Alpine Club members and other organisations such as RMC Duntroon. Facilities were built on Mt Ginini (including a bulldozed ski run) and at Stockyard Gap (Higgins 1994).

The 1960s saw the development of skiing facilities in the Kosciuszko area and the club moved away from the Brindabellas to take advantage of more reliable snow, better runs and easier access. The facilities on Mt Ginini were demolished in 1969 but the Franklin Chalet continued to be used sporadically until the establishment of Namadgi. The chalet was destroyed by the 2003 bushfire. It was the oldest purpose built ski lodge on the Australian mainland. A shelter has been constructed on the site of the Mt Franklin Chalet and includes information on the rich history of the area.

Education and research

The relatively undisturbed nature of the Cotter Catchment and the location close to the national capital (with many national institutions) makes it an important place for scientific research. Early research included the forestry trials that resulted in the establishment of the arboreta referred to above; the Alpine Botanic Garden on Mt Gingera in the early 1950s; catchment monitoring stations in the Cotter Catchment in the 1960s and 1970s; and fire ecology plots near Piccadilly Circus in the 1970s.

Since the establishment of Namadgi National Park, research has generally been pursued through partnerships with tertiary institutions, Cooperative Research Centres (CRCs) and ACTEW. Nationally recognised programs include dendrochronology (dating of past events through the study of tree rings) in Snow Gum woodland (Banks 1982, 1989); subalpine frogs (Osborne 1995; NSW NPWS); dating and palaeobotany of bogs and fens (Hope 1997, 2003); control of feral pigs (Hone 2002); and assessing the effects of environmental flows on threatened species and the aquatic ecology of the Cotter River (CRC for Freshwater Ecology/ACTEW (Cottingham *et al.* 2005)).

As well as these programs, there have been significant archaeological and historical studies by Flood (1980, 1996), Winston-Gregson (1978) and others, and a comprehensive social history record by Higgins (1989, 1990a, 1990b, 1992, 1994, 1998, 1999, 2009).

A large number of survey control marks exist along tracks in Namadgi that are part of a national survey network for the Australian Height Datum. Their position and height above sea level are

regularly used by Geoscience Australia for studies of the land surface across Australia. They are also used in the production of topographic maps.

Space communications

During the mid 1960s, Canberra was a key centre for Australia's participation in the United States space program. Two tracking stations were established, in what is now central Namadgi, at Orroral (1964) and Honeysuckle Creek (1967). The Orroral Tracking Station played an important role in the US earth-orbiting satellites program, the final Apollo moon missions, the Apollo-Soyuz project and the early space shuttle missions. It was decommissioned in 1984. The Honeysuckle Creek Tracking Station was set up initially to support the Apollo moon missions. It subsequently participated in the Skylab missions and was, briefly, part of the Deep Space Network. It was decommissioned in 1983.

It had been expected that the decommissioned buildings would be capable of re-use however they were large, purpose built, not on the electricity grid (therefore requiring expensive diesel generation of power) and would have required extensive refurbishment to make them suitable for other uses. The buildings subsequently deteriorated through lack of maintenance and vandalism. In 1990 all structures at both sites were removed, leaving only the footprint of their foundations. The sites of the former Orroral and Honeysuckle Tracking Stations are included on the ACT Heritage Register.

2003 bushfire

In January 2003, bushfire burnt about 91% of Namadgi National Park. Many of the park's cultural landscapes and historic heritage places were damaged or destroyed. These included Mt Franklin Chalet, Tennent Homestead, Read's Hut (Bushfold 2), most of the arboreta and a number of timber border markers and brumby yards. Dr Pearson's Hut (Bushfold) was severely damaged but has been rebuilt by the Kosciuszko Huts Association.

6.2.3 Community attachment (social value)

The attachment of both Aboriginal and non-Aboriginal people to Namadgi is more than an attachment to the physical evidence of archaeological sites, buildings or artefacts. It is also an attachment based on an intellectual, spiritual or emotional connection to the landscape or specific places or objects within the landscape; a connection to previous occupants, be they ancestors, prominent figures or persons unknown; and/or a connection to community identity, tradition, custom and particular activities. Social value expresses the importance of places to individuals and communities, even though those places may not be formally recognised as having cultural heritage significance.

The Aboriginal community feels a great sense of connection as descendants of the many generations of Aboriginal people who occupied the local area over thousands of years. For them, it is their 'country'. Many aspects of their tradition and culture relate to the history of the land and their people. They feel a strong responsibility for the wellbeing of the land and consider the health of their people and the land to be interconnected.

Many non-Aboriginal people who have lived and worked within Namadgi have developed strong feelings of connection too. In some instances, these feelings of connection are mixed with a sense of loss as a result of the resumption of their land to form part of the national park.

People whose work has made a positive contribution to the park also have strong associations, irrespective of whether their association was relatively short (for example, workers engaged in the building of Bendora and Corin dams, roadworkers) or a lifetime's work (for example, the Cotter Hut rangers, those associated with the building and maintenance of the Mt Franklin Chalet, and those associated with the planting, maintenance and monitoring of the arboreta).

A number of Canberra's conservation groups have a special attachment to Namadgi as a result of their long association with the area, the active role that they played in lobbying for its declaration and their ongoing participation in its management and maintenance. Community groups have been instrumental in undertaking conservation work, preparing conservation plans, undertaking research and commissioning historical studies. These groups include the National Parks Association of the ACT, the Canberra Bushwalking Club, Canberra Alpine Club, the Kosciuszko

Huts Association, Friends of ACT Arboreta and the Gudgenby Bush Regeneration Group. A more formal agreement, such as a Memorandum of Understanding, is an appropriate way to clearly establish the role of community organisations in some instances.

Namadgi is a special place for many who use the park for recreation. The beautiful landscapes offer people respite from busy urban lives, where they can find emotional, intellectual and physical renewal. There are very strong associations with the park on the part of those who have undertaken overnight or multi-day bushwalks, including longer walks into Kosciuszko National Park and along the Alpine Walking Track. Many bushwalkers have regularly walked in the area from the time well before Namadgi was declared, in some instances for forty to fifty years. In more recent times the park has been the location of nationally and internationally significant orienteering and rogaining events.

6.3 Heritage registers

6.3.1 ACT Heritage Register

Under the *Heritage Act 2004* (see s.2.3.4), the ACT Heritage Council is established as the key advisory body on heritage matters in the territory. The council is responsible for keeping a register of heritage objects and places in the ACT. Listing on the ACT Heritage Register means that a place or object is legally protected under the Act. All ACT Government agencies are required to identify, protect and manage heritage places and objects for which they are responsible. The appropriate basis for this is a conservation management plan.

Appendix 6 lists Namadgi National Park European cultural heritage places which are listed on the ACT Heritage Register and some Aboriginal sites (rock art sites and rock shelters).

6.3.2 Commonwealth: National Heritage List

On 1 January 2004 a new national heritage system was established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This heritage system includes the establishment of the National Heritage List, which contains natural, historic and Indigenous places that are of outstanding heritage value to the Australian nation. The former Register of the National Estate will cease as a statutory register in February 2012. Namadgi National Park is included in the National Heritage List as part of the Australian Alps national parks and reserves (gazetted 7 November 2008).

National Heritage places are a *matter of national environmental significance* under the EPBC Act. Under the Act, an action will require approval from the (Commonwealth) Environment Minister if the action is likely to have a significant impact on a *matter of national environmental significance* and the action is not subject to certain specified exceptions. The latter include actions taken in accordance with Commonwealth accredited management plans. An 'action' is defined in the EPBC Act and 'significant impact' is defined in EPBC Act policy statements (DEH 2006b, 2006c).

For places on the National Heritage list that are owned by state or territory governments, the Commonwealth must endeavour, in cooperation with the relevant government, to ensure that a management plan is prepared and implemented for the National Heritage place (EPBC Act: s. 324X). The management plan should be consistent with National Heritage management principles established in regulations under the EPBC Act (s. 324Y).

6.4 Cultural heritage: management considerations

The following considerations are relevant to the management of cultural heritage in Namadgi:

Indigenous and European connection

- Significant gaps in knowledge and understanding relating to Aboriginal use of Namadgi are apparent due to the fact that archaeological research has tended to be opportunistic rather than systematic. Anthropological research has been extremely limited.
- There is an opportunity for greater involvement of the local Aboriginal community in the management and promotion of the park now that the Ngunnawal community is re-establishing ties to the area.
- Some past residents who surrendered their land so that Namadgi could be created continue to have a strong attachment to the area.

Information

- Oral histories form a valuable, enduring record about people and events associated with the park and should be collected as part of historical research.
- Community organisations have researched and collected much useful information about Namadgi's heritage places. These organisations also possess the skills required to maintain the historic fabric of these places and are keen to be involved in their protection.
- The broader community is eager to learn more about Namadgi's heritage places.

Cultural heritage management

- Guidance for the conservation and management of places of cultural significance (cultural heritage places) is provided by the Burra Charter. The charter sets a standard of practice for those who provide advice, make decisions about or undertake works to places of cultural significance including owners, managers and custodians.
- More detailed guidelines for the conservation and management of cultural heritage places are contained in:
 - *Ask First: A guide to respecting Indigenous heritage places and values* (AHC 2002b)
 - *Protecting Local Heritage Places: A guide for local communities* (AHC 2000)
 - *Cultural Landscape Management: guidelines for identifying, assessing and managing cultural landscapes in the Australian Alps national parks* (Lennon and Mathews 1996)
 - *Successful Tourism at Heritage Places: A guide for tourism operators heritage managers and communities* (AHC 2001)
- The ACT Heritage Council, ACT Heritage Unit and community organisations with interest and expertise in the management of cultural heritage places should be consulted in relation to the conservation management of such places.

Conservation

- The fabric of many of Namadgi's cultural heritage places is fragile, vulnerable and expensive to maintain but resources for the maintenance of such places are limited. There is the opportunity to use the skills, knowledge and volunteer labour of community groups to assist with the conservation of heritage places.
- Efforts to protect Namadgi's natural values need to be undertaken with an awareness of the potential impacts of activities on the cultural values of the park's heritage places.

Recreation and tourism

- Recreational and tourism use of some heritage places has the potential to alter, damage or even destroy them. These activities need to be planned carefully to be appropriate to the significance of the place. Recreation and tourism are not appropriate where they are incompatible with the significance or management objectives of the place (AHC 2001).

- It is the responsibility of people planning tourism activities at heritage places to take all reasonable steps to avoid impact on the natural and cultural significance of a place. Each heritage place or area has its own particular significance and requirements for conservation (AHC 2001).
- Adaptive reuse of historic buildings needs to carefully consider the implications for heritage values, management and equity issues relating to community access.
- Gudgenby Homestead precinct offers opportunities for overnight accommodation in the park for a range of users such as community groups, tour operators and individuals, and for artist-in-residence programs and cultural heritage activities. Management of the Homestead and precinct could be modelled on current arrangements for Currango Homestead in Kosciuszko National Park (see Chapter 8) or be undertaken according to a lease arrangement. Appropriate guidelines would need to be developed for use of the site to protect cultural heritage values.
- Namadgi has potential for the development of Aboriginal and European cultural tourism services.

6.5 Cultural heritage: objectives, policies and actions

6.5.1 Statutory compliance and best practice

OBJECTIVE

Namadgi's cultural heritage values are protected in accordance with statutory requirements and accepted best practice.

POLICIES

- Cultural heritage values in Namadgi will be managed in accordance with the provisions of the *National Capital Plan*, the *Territory Plan*, the *Planning and Development Act 2007*, the *Heritage Act 2004* and other relevant legislation.
- Cultural heritage values in Namadgi will be managed in accordance with the Australia ICOMOS (International Council on Monuments and Sites) Charter for the Conservation of Places of Cultural Significance (Burra Charter) and its guidelines.
- Cultural heritage values in Namadgi will be managed using guidelines developed for the Australian Alps national parks, the advice of the ACT Heritage Council, the ACT Heritage Unit, and the advice and assistance of community organisations with interest and expertise in the management of cultural heritage places.

ACTIONS

- 58 Review and update as necessary existing Conservation Management Plans for cultural heritage sites and places of significance.
- 59 Where none exist, prepare Conservation Management Plans for places of significant conservation value, places being visited by the public or places likely to be affected by development or other activity.
- 60 Where appropriate, consolidate Conservation Management Plans to produce a single plan for a themed group of sites (e.g. rock art sites, stone arrangements, huts).
- 61 Report Aboriginal heritage places in accordance with the provisions of the *Heritage Act 2004*.
- 62 Assess and, where appropriate, nominate significant European heritage places, landscapes or thematic groupings for inclusion on the ACT Heritage Register under the *Heritage Act 2004*.
- 63 Recognise the regional significance of Namadgi's cultural heritage places and work with land managers in Kosciuszko National Park and Brindabella National Park on strategies for regional interpretation.

6.5.2 Protection of cultural heritage values

OBJECTIVE

Namadgi's cultural heritage values are protected through strategic planning that is integrated with other management objectives.

POLICIES

- Assessment of relative levels of significance will be one of the guides to management of Namadgi's cultural heritage values and the resolution of conflicts between the protection of cultural, natural, recreational and other values.
- Recognition will be given to the influence of human activities in all landscapes and this human influence will be acknowledged in their management.
- The values of cultural heritage landscapes will be assessed and considered when making land management decisions that potentially impact on these values.
- Heritage places will be managed in a way that acknowledges and respects all histories and does not conserve or interpret one history to the exclusion of another.
- Public access to culturally significant buildings or groups of buildings within Namadgi will be provided except where:
 - the buildings are required for management purposes
 - there is an unacceptable risk to public safety
 - there is a high risk of vandalism
 - there is a high risk of adverse impact on the fabric of the place.
- Where a culturally significant building or a group of buildings is severely damaged or destroyed, decisions on whether to restore, reconstruct or replace (either on the existing site or on another site) will be made on a case-by-case basis following the Burra Charter guidelines and advice from the ACT Heritage Council and the Heritage Unit and taking into account:
 - the nature and extent of damage
 - the heritage values of the buildings including architectural and aesthetic qualities, historical associations and context and social significance
 - the strength of community attachment
 - the importance of the buildings for safety, shelter and survival
 - the recreational value of the buildings
 - the role of the buildings in advancing wider management objectives such as concentrating impacts or drawing visitors away from environmentally sensitive areas
 - the value of the buildings in providing opportunities for the interpretation of natural and cultural values.

ACTIONS

- 64 Through maintenance, stabilisation, restoration, reconstruction and adaptation (as defined in the Burra Charter), conserve Aboriginal cultural places, historic buildings and places, stabilised ruins, exotic plant species of conservation significance and portable heritage objects in accordance with endorsed Conservation Management Plans, Heritage Impact statements, or general best practice.
- 65 Retain all buildings or groups of buildings assessed as having significant cultural heritage values. Provide for the continuing use of these buildings and groups of buildings where this does not have an adverse impact on these values.
- 66 Discourage the use of Namadgi's huts for overnight accommodation, other than in emergencies. This will be achieved through education and creating awareness of their values.
- 67 Exclude horses from hut precincts by providing horse tethering facilities at a suitable distance from huts (where practicable at least 30 m) and providing information to horse riders relating to the protection of park values (also see Action 136).
- 68 Leave portable Aboriginal or non-Aboriginal heritage objects *in situ* unless there is a demonstrated need to remove them for conservation and/or curation purposes or where there is an unacceptable risk of loss through theft, vandalism or other actions.

- 69 If there is an unacceptable risk of loss or destruction requiring the removal of any portable heritage objects, this should be carried out in accordance with the provisions of the *Heritage Act 2004*. Ensure that any objects removed are professionally catalogued and recorded and securely stored. Removed items may be temporarily returned for special occasions (e.g. as part of events that aim to interpret the cultural heritage of a place) provided there is a low risk to their safety and security.
- 70 Ensure that border markers and survey control marks in Namadgi are protected from inadvertent damage in park management activities, especially road and fire trail maintenance and upgrading.

6.5.3 Management of cultural heritage information

OBJECTIVE

Cultural heritage information is collected, stored and managed in an efficient, effective and culturally appropriate way.

POLICY

- Cultural heritage information that is significant to the community will be managed in a way that recognises the need for confidentiality in handling sensitive information conforms to statutory requirements and acknowledges the right of people, in certain circumstances, to control access to information about their culture and history.

6.5.4 Interpretation of cultural heritage

OBJECTIVE

Namadgi's cultural heritage values are interpreted in a way that promotes community understanding and appreciation of these values.

POLICIES

- Recognition of Aboriginal connection to land and an appreciation of Aboriginal culture will be promoted within the community through the interpretation of Aboriginal occupation of Namadgi.
- The right of the Ngunnawal community to be involved in determining the content of educational and interpretive material related to their culture will be respected.
- European cultural heritage of Namadgi will be interpreted for its educational value and to foster historical understanding of the landscapes of Namadgi and the people who lived there.

ACTIONS

- 71 Explore innovative and culturally appropriate ways of providing collected heritage information to particular communities and the broader public.
- 72 Celebrate the cultural connections and historical associations that individuals, families and communities have with Namadgi and with heritage places within Namadgi.
- 73 Interpret and commemorate community connections to land use or recreational activities that have been a significant part of the history of the park.
- 74 Interpret and commemorate the cultural significance of important buildings, or other structures, that are destroyed by events such as bushfire and are not rebuilt.

6.5.5 Acknowledgement of community attachment (social value)

OBJECTIVE

Community attachment to the park and places within it, including identified significant cultural heritage places is respected and acknowledged and the community is encouraged to participate in heritage management.

POLICIES

- Community association with the area now incorporated into Namadgi and with particular cultural heritage places will be recognised and form part of management considerations where relevant.
- The erection of memorials in Namadgi to individuals or communities is to be consistent with the requirements of the ACT Government Memorials Policy. In general, erection of memorials in Zones 1 and 2 of the park (Table 3.1) is not considered appropriate. Should the need arise, the provision of a special area in Zone 3 for such plaques will be considered, however, the most appropriate location is at the Visitor Information Centre for the park.

ACTIONS

- 75 Support, facilitate and, where appropriate, coordinate the recording of Aboriginal and European historical traditions and land management practices.
- 76 Explore the development of protocols with the Ngunnawal community for access to Namadgi by Aboriginal people for cultural purposes that address:
 - access (including vehicle use) by Aboriginal people to remote parts of Namadgi to fulfil cultural obligations or maintain cultural connections
 - potential establishment of Aboriginal cultural camps
 - hunting of animals and gathering of plants by Aboriginal people as part of cultural camps.

Note: If developed these protocols will address issues of public safety and the potential impact of Aboriginal use on non-Aboriginal park users, threatened species, catchment health and other park values, including the heritage values of known Aboriginal places. The protocols will not permit the use of firearms within Namadgi or the sale of plants, animals or other products collected as part of cultural camps.
- 77 Explore opportunities for the dual naming of geographical features within Namadgi in consultation with the Ngunnawal Aboriginal community and in accordance with the *ACT Dual Naming Guidelines*.
- 78 Establish and support heritage management partnerships and/or formal agreements with individuals, families and communities having traditional links to Namadgi and with community groups having an interest in cultural heritage management.
- 79 Facilitate access to Namadgi for individuals and families with connections to particular heritage places, as part of special events or by arrangement.
- 80 Ensure that any proposals for memorials in Namadgi to individuals or communities are consistent with the requirements of the ACT Government Memorials Policy and with policies in s. 6.5.5 (of this management plan).
- 81 Ensure that any proposals for the naming of places or geographic features in honour of individuals or communities are submitted to and approved by the ACT Place Names Committee before being recorded on maps or other information.

6.5.6 Support for sustainable cultural tourism and recreation

OBJECTIVE

Appropriate opportunities for sustainable cultural tourism and recreation¹ are provided.

POLICIES

- The establishment of appropriate sustainable cultural tourism activities and ventures will be encouraged and supported.
- Plan tourism activities carefully to ensure that they are appropriate for culturally significant places. Tourism may not be appropriate for a particular heritage site if it is incompatible with the significance or management objectives.

ACTIONS

- 82 Ensure that all cultural recreation and tourism activities are consistent with the recreation and tourism objectives and strategies set out in Chapter 8 of this plan.
- 83 Ensure that all cultural tourism operators comply with foreshadowed licensing and accreditation provisions outlined in Chapter 8 of this plan.
- 84 Establish protocols for visits to cultural heritage places by tourism operators premised on the retention of the natural and cultural significance of places; monitor the effects of cultural tourism on those places and revise protocols as required.
- 85 Ensure that tourism use and promotion of Aboriginal places within Namadgi occurs with the consent of the Aboriginal community.
- 86 Encourage non-Aboriginal tourism operators to provide cross-cultural awareness training for their staff working in Namadgi.

6.5.7 Promotion of research

OBJECTIVE

Research is encouraged and undertaken to assist in the identification, conservation and management of Namadgi's cultural heritage values.

POLICIES

- Research into and recording (as appropriate) of the human occupation and land use of Namadgi over time will be supported and facilitated including:
 - research into Aboriginal culture (including but not restricted to stories, social customs, use of natural resources and land management practices) relevant to Namadgi
 - research into the effect of 19th century colonisation on the Aboriginal community and their subsequent connection to Namadgi
 - research into: (a) the place of Namadgi in the scientific study of the Australian Alps and montane areas; and (b) the role of the Namadgi as a focus for the bushwalking-conservation movement (Griffiths and Robin 1994; Turner 1979)
 - oral histories of Aboriginal and non-Aboriginal people with a connection or attachment to Namadgi.

¹ Tourism and recreation activities that are compatible with the sustained conservation of the identified cultural heritage values of places within the park.

ACTIONS

- 87 Establish a systematic process for the survey, mapping and recording of Aboriginal and European cultural heritage values in Namadgi.
- 88 As appropriate undertake targeted heritage surveys to identify undiscovered Aboriginal and European heritage landscapes, places and objects.
- 89 Assist the Australian Alps Liaison Committee and contribute to its cultural heritage projects.
- 90 Respect the right of the Ngunnawal community to: (a) accept or reject proposals from researchers wishing to carry out research on Aboriginal places in Namadgi; and (b) require agreements about the publication of the findings of research that relate to these places.
- 91 Where culturally and environmentally appropriate, make information and knowledge flowing from research available to the general public.

6.5.8 Enhancement of staff skills and knowledge

OBJECTIVE

Agency staff have the skills and knowledge to manage Namadgi's cultural heritage places and protect their values.

POLICY

- Opportunities will be provided for agency staff to undertake professional development in the field of cultural heritage conservation and management.

ACTIONS

- 92 Ensure that agency staff working with Aboriginal people and dealing with Aboriginal cultural heritage issues are provided with the opportunity to complete cross-cultural awareness training.
- 93 Support a training, employment and career development program for local Aboriginal people to assist them to participate effectively in the management of their country.
- 94 Foster staff respect and appreciation for both Aboriginal and European cultural heritage places.

7

A place of fire Fire management



7.1 Primary management objectives

- **Fire management strategies integrate fire protection, water supply and conservation objectives and, to provide guidance for management, are supported by an effective research and monitoring program.**
- **Fire management strategies create a mosaic of areas across the park with differing fire histories and a consequent diversity of vegetation age-classes and fuel loads.**

7.2 Background

7.2.1 Fire history

Fire is an integral part of Australia's natural environment, including many ecosystems in the Australian Alps. The continent has been subject to fire for millions of years and human use of fire for possibly 50 000 years. Most scientific knowledge of fire derives from the last fifty years and the use of fire to manipulate landscapes for biodiversity conservation is a feature of the last two to three decades (Gill *et al.* 2002). Much of the native vegetation of the ACT is comprised of fire-adapted ecosystems (ACT ESA 2005), however, there are also vegetation communities that are sensitive to fire or whose survival depends upon long intervals between major fires. Highly significant for ecological communities is the concept of the 'fire regime' (see s. 7.3.1) rather than individual fire events (Gill 1975; Gill *et al.* 2002).

Before European settlement, the ACT region was exposed to fires generated by lightning and those derived from Aboriginal burning. While Aboriginal burning is highly likely to have been a feature of lower elevation grassland, woodland and open forest environments (Benson 1994; Lunt *et al.* 1998, ACT Government 2005), there is no evidence for burning of higher elevation areas such as the Brindabella Ranges. There is no known reason for Aboriginal people to have extensively burned high altitude eucalypt forest and woodland or the alpine zone (Banks 1982, 1989). However, irregular fires of varying extent would have periodically occurred, derived from lightning strike. These differences between lower and higher elevation fire regimes demonstrate the need for an understanding of the local history of fire (Griffiths 2002).

Major fire events in Namadgi are now artefacts of both nature and the history of human land use and may be more severe as a result of the changes that have occurred in the vegetation since the 1850s. The fire history of the Brindabella Ranges has been studied in detail using a variety of techniques, involving physical evidence (dendrochronology, fire scars, regeneration events, growth pulses, wood chemistry and charcoal layers) as well as historical sources. Banks (1982, 1989) suggests that before the arrival of Europeans, fires in the area were probably less frequent but potentially more intense. Pryor (1939b) identified a major fire that took place in the Brindabella Range in about 1740. With the arrival of Europeans the fire regime changed dramatically, with the frequency of fires increasing by more than five times during the period 1850 to 1950, and then reducing thereafter. Ecologically, one of the effects of this was the extensive replacement of open Snow Gum Woodland and *Poa* spp. understorey with dense Snow Gum regrowth and fire prone shrubs (Banks 1982, 1989). At the time Namadgi was declared it was noted that much of the vegetation was in early successional stages derived from the intense burning in the 19th century and the large fires of 1939 and 1983 (ACT Parks & Conservation Service 1986). The 2003 fire has again returned much of the vegetation of the park to an early post-fire recovery phase.

The largest known fires in the Namadgi area occurred in 1920, 1926, 1939, 1983 and 2003 (ACT ESA 2005). All followed a period of drought and occurred during severe fire weather (strong winds, low humidity and high temperatures). The 2003 fire was by far the largest and had the greatest impact on Canberra, destroying nearly 500 houses, and burning 70% of the Territory and 91% of Namadgi National Park.

The history of fires in the ACT since European settlement has enabled an understanding of the conditions that often result in fires, the ignition areas for forest fires and the direction of spread of those fires. The combination of flammable vegetation (with many species rich in volatile oils), dry summers, periodic drought and presence of lightning, result in regular fires and occasional 'blow up' days in alpine and subalpine areas that typically occur towards the end of long hot dry

summers (Banks 1989; ACT ESA 2005). These conditions include prevailing hot dry north-westerly winds that carry fire-fronts eastward and south-eastward from both the Brindabella Range in the ACT and large areas of native vegetation in NSW to the west and north-west of the ACT.

Early suppression of fires in Namadgi can be difficult due to rugged terrain and difficulty of access, the extensive adjacent forest areas in NSW, multiple ignition points due to lightning strike, re-ignition of areas not fully extinguished and considerations of fire fighter safety. These factors may mean that early suppression is not always achievable.

7.2.2 History of fire management

There is a long history of fire management in and on the western border of Namadgi National Park. From 1927 to the 1950s, rangers based at Cotter Hut carried out periodic hazard reduction burns (low intensity but frequent fires) as part of their duties. After a relatively large fire in 1939 (burning more than 15 000 ha), which had originated in the Goodradigbee River Valley and threatened Canberra, two rangers were based at Bulls Head Forestry Settlement. A large part of their duties revolved around fire suppression, and they also conducted hazard reduction burning in the Goodradigbee Valley.

In 1939, the ACT Bushfire Council was established, which largely determined the approach to fire management in both a policy and operational capacity for the next fifty years. Between 1944 and 1996 the ACT leased an area in NSW (referred to as the Lease Area) immediately adjacent to its north-west border, which was managed as a buffer strip in order to mitigate the spread of fires originating in the Goodradigbee Valley. The lease initially comprised 21 500 ha but was reduced to 8 300 ha in 1988. It was terminated in 1996 after the declaration of Brindabella National Park. The role of the lease was replaced, in part, by the *Cross Border Agreement Between the ACT Bushfire Service and National Parks and Wildlife Service (NSW) on fire management and suppression*.

From 1964, the advent of aerial ignition increased broad-acre fuel reduction, although each year the total area burnt varied according to seasonal conditions and planning. In 1976–77 it was reported that 20 000 ha of natural forest was burnt as part of the hazard reduction program. It appears that much of this was in the Lease Area and to its north, with a selective burning program in the fire prone areas of the Cotter Catchment. Hazard reduction planning in the Cotter at this time took into account contemporary knowledge about sensitive environmental areas, defined as those with vegetation and soil types sensitive to low or high intensity burns. This included red and yellow podzolics on Silurian Volcanics, subalpine soils and Snow Gum vegetation.

Planning for fire management and suppression both for Gudgenby Nature Reserve (declared in 1979) and subsequently for Namadgi National Park (gazetted in 1984) evolved under a number of Commonwealth and Territory Government agencies and has been framed to meet the requirements of their respective legislation and land management policies. Initial planning documents for Gudgenby Nature Reserve recognised the importance of fire management but it was generally addressed at a strategic policy level.

The 1986 *Namadgi National Park Management Plan* addressed fire management in more detail. It recommended the development of a fire management plan for the park based on hazard and risk assessment, fire suppression, and strategic protection facilities such as fire trails, helipads, and fuel reduction. A draft Namadgi Fire Management Plan was prepared but not finalised, possibly due to other planning processes superseding its development.

From 1982 there was a marked decrease in hazard reduction burning in the park. At this time there was growing concern in the community about the environmental impacts of broad-acre hazard reduction burning and the practice was eventually discontinued.

In 1996, amendments to the Bushfire Act required that land managers develop a Bushfire Fuel Management Plan (BFMP) for the ACT, which was to be reviewed every two years. The first plan was released in 1998, with revisions in 2000 and 2002. The early plans specified actions to protect recreational, management and cultural heritage assets in the park. The 2002 BFMP proposed that a fire management plan would be prepared for the park, which would include the consideration of strategic fuel management zones and trial hazard reduction burns in two areas on the eastern boundaries of the park. However, the 2003 bushfire occurred before the burns took place.

Fire management for the life of this management plan will be undertaken in the context of the recovery of the landscapes and ecosystems of the park from the effects of the 2003 fire. This will require monitoring of the recovery of the different ecosystems of the park, consideration of catchment protection in the Cotter River system, and evaluation of the need for, and practicability of, management intervention with regard to fire.

7.2.3 Legislative basis for bushfire management in the ACT

The *Emergencies Act 2004* establishes the ACT Emergency Services Agency and requires it to prepare a Strategic Bushfire Management Plan for the whole of the ACT (subject to review every five years). The strategic objective of the plan is 'to minimise the likelihood of bushfires and negative consequences of bushfires'. The plan provides the basis for bushfire risk assessment and risk analysis, bushfire prevention, agency and community preparedness and response, and recovery in relation to bushfire. The Act requires land managers to take reasonable steps to prevent the outbreak and spread of fire on their lands and to prevent fire from spreading to neighbouring properties. It requires land managers to prepare operational plans for the mitigation of bushfire risk and empowers the ACT Rural Fire Service to undertake the suppression of bushfire in rural areas, which includes Namadgi National Park.

As far as practicable, land managers must ensure that the land is managed in accordance with the Strategic Bushfire Management Plan and in compliance with any bushfire management requirements. However, Section 77(3) of the Act states that the 'strategic bushfire management plan has no effect to the extent to which it is inconsistent with any plan of management in force under the *Planning and Development Act 2007*...'. This means that if there is a conflict or an inconsistency between the Strategic Bushfire Management Plan and a management plan prepared under the *Planning and Development Act 2007*, the management plan shall prevail.

During a declared State of Emergency, a Territory Controller is appointed by the ACT Chief Minister. The controller has the power to take any action necessary to respond appropriately to the emergency and can direct the head of an entity to undertake response or recovery operations. The controller operates within the framework of an Emergency Plan.

7.2.4 Current fire planning

Several fire planning processes have been undertaken in parallel with the development of this management plan:

- As required under the *Emergencies Act 2004* (see s. 7.2.3) the *Strategic Bushfire Management Plan for the ACT – Version 2* (ACT ESA 2009) was released in October 2009. The Plan is supported by Bushfire Operational Plans and Regional Fire Management Plans.
 - Bushfire Operational Plans, also required under the *Emergencies Act 2004*, are a mechanism by which land managers plan and specify operational works and account for bushfire prevention, preparedness, response and recovery. Bushfire Operational Plans set out the manner in which a particular parcel of land or area of land is managed for bushfires and defines activities consistent with the Strategic Bushfire Management Plan.

The Commissioner of the ACT Emergency Services Agency approves Bushfire Operational Plans following consultation with the Bushfire Council and they are reviewed every two years.

- Regional Fire Management Plans have been prepared as supporting documents to the Strategic Bushfire Management Plan. Based on sixteen 1:25 000 mapsheets that provide coverage of the ACT and adjacent areas of NSW, the plans detail the proposed fuel management, access and infrastructure activities to be undertaken over the next ten years.

This fire section of the *Namadgi National Park Plan of Management* aims to provide strategic direction that is consistent with these plans and meets the management objectives for Namadgi as stated in the *Planning and Development Act 2007* (see s. 2.1). Current fire planning recognises the importance of fire management in Namadgi National Park in providing for the protection of Canberra. Bushfire management plans and programs will be based on a risk management framework that incorporates sound bushfire and environmental science.

7.2.5 Australian Alps fire management principles

In 2003, the Australian Alps National Parks Liaison Committee and the Australian Alps Ministerial Council agreed to adopt fire management principles to guide fire management planning throughout the Australian Alps protected area system. These principles are being formally adopted in the *Namadgi National Park Plan of Management* to direct the formulation of objectives and future fire planning for the park. In the case of Namadgi, protection of the water supply catchment is a specific addition to these principles.

Australian Alps Fire Management Principles

- 1 Fire fighter safety and the protection of life and property are fundamental issues of concern to all fire authorities and land managers and will underpin every strategy.
- 2 Fire management strategies should be consistent with the primary objective of the protected area system, which is to conserve the natural and cultural heritage values of the Australian Alps.
- 3 Fire management should integrate fire prevention, preparedness, response and recovery strategies. It should make use of appropriate tools such as:
 - a. fuel reduction through burning or by mechanical means in areas of high potential fire intensity hazard
 - b. early detection and rapid suppression of wild fire
 - c. a strategically located fire trail network
 - d. a properly trained and equipped workforce, including volunteers, to undertake fire management
 - e. education to help communities and individuals to be prepared for the likelihood of fire.
- 4 Fire management strategies, including hazard reduction, should:
 - a. be practical, achievable and cost effective
 - b. be based on a strategic analysis of risk to the assets (natural, cultural and physical) that may be affected by fire
 - c. be focused on the protection of significant assets and values at risk from wildfire
 - d. be based on sound science, in particular a clear understanding of the factors which influence fire behaviour (and ecological and landscape response to fire)
 - e. take full account of the known and likely implications of climate change.
- 5 There should be a total landscape approach to fire management, including suppression activities, involving cooperation and collaboration within and between jurisdictions.

7.3 Fire: management considerations

7.3.1 Fire ecology

The frequency and intensity of past fires in Namadgi has influenced the distribution and abundance of plants and animals, the successional stages characterising the vegetation, and the nature of the soils and watercourses. Fires occur as discrete events but their effects on the environment, ecological communities, and component species depend upon the history of these events, the seasons in which the fires occurred, and their properties (e.g. intensity). Together, these comprise a fire regime (Gill *et al.* 2002). While individual species show adaptations to fire, a consideration of fire regimes is necessary to understand the responses to fire of both species and the ecological communities of which they form part.

Fire is an important management tool for maintaining biodiversity. Changes in fire regimes can disrupt ecological processes so that some plants and animals (including invasive species) are favoured to the detriment of other species. Fire at greater or lesser frequencies than species are adapted to, will lead to localised extinction and possibly total extinction if the range of a species is extremely limited or populations very small. Continued frequent fire may keep affected vegetation

communities suspended in early seral stages without the representative range of successional stages of vegetation and age classes that is desirable to maintain biodiversity. Studies of fire responses of plants and animals in Australian ecosystems have been accumulating rapidly in the last twenty years (Whelan *et al.* 2002) providing one of the building blocks to predicting the effects of fire, along with knowledge of the life cycle of organisms and local environmental conditions.

7.3.2 Adaptive fire management

This plan identifies adaptive management as a fundamental principle of fire management in order to reconcile natural and cultural heritage conservation and fire protection management objectives. Adaptive management requires an active, planned and systematic effort to acquire information from management experience, monitoring and research (Lindenmayer and Burgman 2005). The aim is to provide knowledge that enables managers to adapt fire management strategies to meet land management objectives based on a progressive increase in knowledge about fire behaviour, ecological response to fire and management options. Systematic and long-term monitoring of post-fire recovery is an important strategy for understanding how ecological communities respond to fire. A post-fire monitoring program has been established to better understand landscape and ecological responses to the 2003 fire and provide information about the fire thresholds for species and communities. This will provide useful data for fire management strategies.

A key aspect of adaptive management is to manage explicitly for uncertainty. Where there is a lack of scientific certainty, the precautionary principle should be exercised, meaning that the lack of such knowledge does not preclude land managers from acting or making decisions to prevent actions that may cause irreversible environmental impacts. Elements of a management system for fire regimes and biodiversity that incorporates an adaptive management approach have been identified by Gill *et al.* (2005, pp. 440–441), based around clear objectives, knowledge of organisms, ecosystems and condition of the landscape, and monitoring.

7.3.3 Prescribed burning

Fire is one of the few factors controlling long-term patterns in natural communities that land managers can influence. However, prescribed burning is a matter of some complexity especially where multiple objectives are involved (CSIRO 2003). The mountainous terrain of Namadgi also poses difficulties for any prescribed burning program.

Prescribed burning has been used for the following purposes:

- **To reduce fuel loads in order to meet asset protection objectives.** The forests of Namadgi are a source of fuel for wildfire, which under extreme conditions, can pose a fire threat to rural assets, the city of Canberra and surrounding NSW, as demonstrated in 1939 and 2003. Management of fire fuels is important for the protection of these assets, but this needs to be balanced against the protection of key values such as biodiversity and water resources.
- **To reduce fuel loads so that it is easier to control wild fires.** This may help to prevent large, uncontrollable bushfires that can be deleterious to ecosystem health and biodiversity and result in the destruction of important natural and cultural resources. The outcomes of such burning appear to be related to the characteristics of the ecosystems and their location. For the Australian Alps, it has been concluded that 'one of the most dangerous misconceptions about the impact of reduced fuel loads on fire behaviour is that the rate and spread of wildfire is reduced in extreme conditions. This is not the case.' (Leaver and Good 2004). Under extreme conditions the reduction in the rate of spread may not be sufficient to allow a fire to be controlled. If weather conditions are less than extreme, fuel hazard reduction, if undertaken in recent times, may reduce the rate of spread, enabling successful control and containment.
- **To conserve biodiversity.** As discussed previously this requires an adequate understanding of species, ecological communities, fire regimes, fire responses and landscape effects. For some vegetation communities the frequency of burning required to manage fuel may be more frequent than the minimum fire interval required for species regeneration. It may be necessary to vary the timing and intensity of prescribed burning so that particular species

and communities are not favoured to the exclusion of others (Clarke *et al.* 2006). The two objectives of asset protection and biodiversity conservation may not be mutually exclusive, but assessment of this requires an adequate knowledge of the ecological characteristics of the vegetation. In Namadgi, the use of fire for biodiversity conservation requires consideration of other values such as protection of water supply catchments and is made complex by the previous fire history of the park.

7.3.4 Local and regional cooperation

Community engagement and support in the development, implementation and review of fire management strategies should be sought to ensure that local knowledge, values and resources are effectively utilised and to raise awareness, understanding and appreciation of fire management issues throughout the community.

As is the case for many environmental factors, fires are not limited to a specific land tenure or jurisdictional boundary. Fire management planning requires regional cooperation to develop and implement strategies that provide an adequate level of protection for life and property both within and outside the park. In particular this involves NSW Government agencies for land to the west and north-west of the park, rural landholders to the south and east of the park, and ACT Government agencies that manage areas east of the park.

7.3.5 Increasing knowledge

More than forty years of scientific research and observation has significantly advanced the understanding of fire and the Australian environment, including higher elevation areas (CSIRO 2003; Gill *et al.* 2003; Zylstra 2006). However, there is still much to learn about the response of species and ecological communities to particular fire events and changed fire regimes. While there has been a great expansion of research in fire ecology, a high level of uncertainty remains regarding the magnitude of the effects of burning on species and communities (Whelan 2002). However, research in particular ecosystems is now leading to specific recommendations about fire (West 2006). Research into fire ecology and adaptation of the results to management are important aspects of an adaptive management approach discussed in s. 7.3.2.

The interaction between fire and fauna is remarkably complex and poorly understood e.g. no studies have yet reliably quantified the mortality of Australian vertebrates during fire (Whelan *et al.* 2002). Studies indicate that generalist and disturbance-tolerant species are often favoured by frequent fires, whereas, specialised species require longer fire-free intervals. Research on fauna response to planned fire is necessary to provide essential knowledge to balance fire management and biodiversity conservation objectives. Specialist species that are found in long-unburnt habitat are often rare or threatened species. For example, the association of particular bird species with moist montane forests is noted in s. 5.10.7.

In Namadgi, sensitive and significant geological and geomorphological features require mapping and protection from fire management activities.

A report *Erosion Potential Mapping* (URS 2009) was commissioned by the ACT Government to map soil erosion potential and fire management implications across the ACT. The report maps soils, provides erosion and fuel management assessments and general mitigation strategies.

7.3.6 Protecting water resources

The 2003 fire demonstrated the vulnerability of the Cotter Catchment, and consequently, Canberra's water supply, to the effects of broad scale high intensity fire. Effects of the 2003 fire will be evident in the hydrology of the Cotter Catchment for the life of this management plan and require both monitoring and careful consideration in fire management for the park. The basis for this is the involvement of the park manager, ACTEW and the ACT Emergency Services Agency in developing more detailed programs and arrangements for fire management in the Cotter Catchment drawing as required on research conducted by organisations such as the Bushfire CRC and university departments.

The following considerations are relevant to water supply from the park:

- Regenerating forest may decrease run-off and water yields from the ACT water supply catchments in the short to medium term.
- *Sphagnum* bogs were severely burnt and this may have a long-term impact on catchment hydrology in terms of water storage, yield and water quality. Work has commenced on the long-term ecological restoration of *Sphagnum* bogs (see s. 5.8) and it is important to exclude fire from this sensitive community.
- Soil erosion after a fire can lead to significant environmental degradation. The transport of nutrients, ash and sediment into streams, wetlands and water supply reservoirs after rain reduces water quality and has the potential to severely impact on aquatic ecology and drinking water quality. This effect is significantly greater after high intensity, large fires or very frequent fires.
- Ground cover, both living plants and fallen and decaying organic material, provides habitat and a protective mantle against soil erosion in catchments, as well as being a potential fire 'fuel load' under suitable conditions.
- Water quality may be impacted during the construction and maintenance of fire trails and from unsealed roads, which are potentially significant sources of sediment delivery to streams.
- Hydrological systems may be altered by roads, which function in a similar way to dry creek beds.
- Most soils in Namadgi are moderately erodible. Their erodibility increases when they are dry and hydrophobic. Under these conditions soil is more readily transported with water runoff.
- The soft sedimentary rock on the western side of the Tidbinbilla Range (middle Cotter Catchment) is highly erodible. This has implications for fire management and fire access strategies.

7.3.7 Fire access

A network of strategically located fire trails is a key requirement for fire management. Trails assist with rapid suppression and provide fuel breaks for prescribed burning and indirect attack (back burns). The *Strategic Bushfire Management Plan for the ACT* includes standards for fire trails and new trails. The following proposed trail upgrades have the potential to result in significant impacts on park values and require detailed assessment: (a) upgrade of Stockyard Spur Trail to tanker standard and upgraded walking trail linking Stockyard Spur Trail with Corin Dam Road; (b) upgrade of Cotter Hut Road to float standard (i.e. large bulldozer on low loader); and c) upgrade of Mt Franklin Fire Trail to tanker standard from the Ginini locked gate to the intersection with Cotter Hut Road. The form of the network needs to be balanced with construction and ongoing maintenance requirements, other access aids such as helipads, and the potential for impacts on park values. Such impacts include:

- effects on animal populations due to fragmentation of habitat
- potential effects on water quality and hydrology (depending upon the siting, design, use and maintenance of the trails)
- diminution of recreational and wilderness values when new roads are constructed through roadless landscapes (wilderness and remote areas) or existing trails are substantially upgraded (e.g. widening, addition of bridges and road drainage) as these developments reduce the experience of wilderness and the opportunities for remote area recreation
- reduction in scenic values when landscapes are dissected and 'scarred' by roading
- illegal access to trails (e.g. use by trail bikes) and consequent effects such as increased human ignited fire (accidental and deliberate), control of which places more demands on management
- pressure for access by higher impact users, able to enter the park by these routes

- establishment of a pathway for the introduction and spread of weeds, which are often transported by vehicles and are able to take advantage of disturbed ground, sunlight and runoff from the road
- the likelihood that roads provide favourable routes for spread of feral animals.

New and upgraded fire access roads in Namadgi National Park will need to include design features to reduce these impacts to acceptable levels where possible as per current codes of practice.

7.3.8 Social issues

The impact of smoke on public health and safety through the application of planned fire is an issue. The *Environment Protection Act 1997* requires an Environmental Authorisation for prescribed burning (see s. 11.2.3). The authorisation specifies *Smoke Management Conditions* and *Smoke Management Guidelines for Prescribed Burning*.

Use of fire for cooking, warmth and aesthetic purposes by recreational users is a traditional part of Aboriginal and non-Aboriginal culture. Recreational fires present some risk of bushfire ignition during the fire season and appropriate strategies are required to mitigate risk.

7.4 Fire management: objectives, policies and actions

7.4.1 Research and monitoring

OBJECTIVE

Collaborative fire research and monitoring programs with research institutions and regional partners are established to inform fire management planning, policies and strategies and support an adaptive management framework.

POLICY

- Long-term, systematic monitoring and research programs to better understand the fire ecology of ecosystems in the park will be undertaken and supported as a basis for fire management planning.

ACTIONS

- 95 To increase knowledge about how fire affects natural systems, conduct systematic monitoring programs and support fire research that takes account of or includes the following:
 - ecosystem response to fire (including recovery, soil stability, biodiversity and water quality)
 - impacts of planned and unplanned fire on ecosystem services, particularly in relation to water resources
 - ecological effects of fuel reduction activities (in particular, prescribed burning)
 - erosion hazard assessment and mapping
 - effects of fire on riparian and aquatic ecosystems
 - the response of weeds and feral animals to fire and fire management activities
 - preferred fire regimes for species/communities, particularly those of conservation concern
 - fuel load dynamics, including the relationship between fire fuel properties and fire behaviour
 - the effectiveness of hazard reduction strategies
 - mapping fire history for both prescribed and unplanned fires.
- 96 Work collaboratively on a regional level with ACT organisations, Australian Alps agencies, research institutions and neighbouring land managers to plan and implement research and monitoring programs relating to fire and fire management.
- 97 Review the development of emerging pre-suppression and suppression techniques for bushfire and investigate the most appropriate techniques for the relevant terrain, conservation values (including water) and desired outcomes.

7.4.2 Application of ecologically-based fire regimes

OBJECTIVE

Fire regimes that maintain catchment and ecological processes and protect biodiversity are incorporated into broader fire management strategies.

POLICIES

- The results of research into fire ecology and monitoring of ecological responses to fire will be applied to fire management strategies to assist with determining fire regimes that support the creation of: (a) a diversity of vegetation composition and structure; and (b) suitable habitat for naturally occurring species and communities.
- Fire management will aim to ensure maximum compatibility between fire fuel management priorities and preferred water catchment and ecological outcomes. The effects of unplanned fires, fire fuel management activities, as well as new knowledge about conservation requirements and catchment management will inform fire management strategies. This will include, as necessary, a re-evaluation of fire zoning models, response mechanisms and hazard management activities.
- Where desirable, specific fire regimes may be developed for particular ecological communities, and consequent burning programs or fire protection measures undertaken.

ACTIONS

- 98 Give special recognition, in terms of fire management priorities, to the requirements of species and communities of particular conservation concern, such as those that are threatened with extinction, naturally rare, particularly sensitive to fire or important in protecting water supply.
- 99 As far as practicable exclude prescribed fire from hydrologically and ecologically significant or sensitive areas including:
 - erosion-prone zones
 - wet heaths, subalpine bogs and significant wetland
 - dry rocky heath communities (threatened species habitat)
 - areas occupied by obligate seeding species ('seeders') until they have reached sufficient maturity to regenerate after a fire
 - riparian areas.

7.4.3 Fire prevention

Fire management planning

OBJECTIVE

Life and property within and immediately adjacent to the park are protected through integrated fire management strategies that address fire prevention, preparedness, response and recovery. Catastrophic bushfires on a landscape scale are prevented for the life of this plan to protect life, property and the environment and to allow for recovery from the impacts of the 2003 bushfire.

ACTIONS

- 100 In accordance with the *Emergencies Act 2004* and the *Strategic Bushfire Management Plan for the ACT*, prepare Bushfire Operational Plans for the park that are consistent with the Australian Alps Fire Management Principles and the objectives of this plan to address:
 - a program of fuel reduction to provide for the protection of identified built and natural assets, to reduce the spread and intensity of fire and assist in suppression operations (see Fire fuel management below)
 - the provision of access trails and helipads for fire suppression and fuel management activities (see Fire access below)
 - the development of strategies for the early detection and rapid suppression and the management of unplanned fire in the park
 - the provision of a network of water access points
 - the provision of adequate resources including infrastructure, equipment and personnel for suppression operations and the undertaking of fuel management activities
 - training and skills development for staff involved in any aspect of fire management.
- 101 Develop detailed fire management strategies for the park in the context of policies outlined in s. 7.4.2; primarily through the preparation of Regional Fire Management Plans for Namadgi. (Note: this action links with Action 104 below.)
- 102 Work with ACTEW and the ACT Emergency Services Agency in developing more detailed programs and arrangements for fire management in the Cotter Catchment drawing as required on research conducted by organisations such as the Bushfire CRC and university departments.
- 103 Consider fire management objectives and proposed actions in adjacent areas of NSW when developing fire management plans for Namadgi National Park and develop strategies that are compatible across the border (see also s. 7.4.4).

Fire fuel management

OBJECTIVE

Fire fuel management strategies based on a system of zoning are developed and implemented to integrate objectives for water supply, the conservation of natural and cultural heritage values with those for the protection of life and property both within and outside of the park.

ACTIONS

- 104 In accordance with the *Strategic Bushfire Management Plan for the ACT* and the objectives of this plan, develop fire fuel management strategies as part of fire management plans for the differing environments within Namadgi (Regional Fire Management Plans). These plans will provide for a mosaic of areas with differing fire histories and a consequent diversity of vegetation age classes and fuel characteristics. They will take into account hazard reduction for asset protection, provision of fire suppression infrastructure such as fire trails, and ecological responses to fire. (Note: this action links with Action 101 above.)
- 105 Continually monitor, assess and adapt fuel management strategies to develop an effective and sustainable fuel management model whereby natural, cultural and water supply values are adequately protected.
- 106 Conduct prescribed burning in accordance with requirements of the *Environment Protection Act 1997* (see s. 11.2.6).

Fire access

OBJECTIVE

Access infrastructure is provided to support fire management activities.

POLICIES

- An access strategy for fire management in the park will be developed that takes account of environmental, social and economic values. This strategy will include:
 - the provision of an appropriate fire trail network to assist in suppression and/or management operations and to provide the basis for fire fuel management activities
 - specified standards for the maintenance of fire trails and classification of trails according to current codes of practice and requirements under the *Environment Protection Act 1997*
 - a network of helipads, including constructed or naturally suitable remote helipads maintained to specified standards
 - a network of water access points for vehicles and helicopters.
- In accordance with the *Nature Conservation Act 1980* and the *National Capital Plan*, no new fire trails will be permitted in the gazetted wilderness area, Zone 1A of the park. The zoning policy for new fire trails for Zones 1B, 2A, 2B and 3 will take into account the special values of the park by proposing new fire trails only when there is a demonstrated need. The consideration of need will include the following:
 - a requirement for rapid access to an area that poses a high risk of fire ignition near people or property within or outside the park
 - where the use of prescribed burning is identified as high priority and there is no other feasible option for the containment of planned burns.
- The design of new fire trails will consider the following:
 - the location, standard and construction methods of new trails so that they will result in minimal long-term impacts on the natural, cultural and social values of the park and on ecosystem services (for example, water supply)
 - the cost of building and maintaining the trail.

ACTIONS

- 107 Install new fire access, water and communication facilities and maintain existing facilities according to the policies outlined above and zoning policies of this plan. Proposed new facilities will be subject to an appropriate level of environmental impact assessment.

Recreational/domestic fire management**OBJECTIVE**

Appropriate regulation, education and awareness programs help mould visitor awareness and behaviour so as to reduce the likelihood of unwanted wildfires.

POLICIES

- During the officially declared fire season (usually 1 October to 31 March), campfires will only be permitted in designated fireplaces in picnic areas and campgrounds i.e. fires in the open will not be permitted.
- Outside the fire season, campfires in the open will be permitted subject to permit.
- Fuel stoves and gas appliances may be used anywhere in the park subject to general fire restrictions e.g. they are prohibited during Total Fire Ban days. Fuel stoves will be encouraged as an alternative to campfires particularly in the wilderness area.
- Fires in the open during the fire season may be permitted at the discretion of the land manager for specific cultural, interpretive and educational purposes provided a total fire ban is not declared, the site is restored following use and fire risk management provisions are observed.

ACTIONS

- 108 Plan and implement public education programs about fire restrictions relating to park use, campfires, bushfire causes and personal behaviour to minimise bushfire danger.
- 109 Restrict access during Total Fire Ban days particularly to remote areas or areas prone to fire ignition.

7.4.4 Fire preparedness**Annual fire management preparedness and capability****OBJECTIVE**

Staff are adequately trained, equipped and prepared to undertake fire management activities to the highest practicable safety and competency standards.

ACTION

- 110 Prepare an annual plan based on the Bushfire Operational Plan to formalise preparedness for:
- Public safety. This includes planning for an increased management presence in popular recreation areas, park closures on days of predicted very high to extreme fire danger and evacuation procedures for park users.
 - Equipment and staff readiness and capability. This includes training programs for new staff and refresher training for experienced staff.

Relations with neighbours

OBJECTIVE

Cooperative arrangements with neighbours¹ are strengthened in relation to fire management activities and readiness.

ACTION

- 111 Work with: (a) neighbours of the park in NSW through established forums; and (b) NSW agencies such as the Rural Fire Service (see s. 10.5.2), in relation to fire management. This will include:
 - co-operative fire fighting arrangements
 - construction, use and maintenance of fire trails and fire breaks
 - prescribed burning for asset protection
 - provision of, and access to watering points
 - fire emergency procedures
 - communication about effective bushfire protection.
- 112 Develop a Memorandum of Understanding with the NSW Department of Environment, Climate Change and Water and the NSW Rural Fire Service in relation to the fire management considerations listed above (in Action 111).
- 113 Work with neighbours of the park in the ACT in relation to the fire management considerations listed above. Include appropriate provisions in Land Management Agreements with rural landholders.

7.4.5 Fire response

Note: Fire response is the statutory responsibility of the ACT Emergency Services Agency.

OBJECTIVE

Fire suppression operations within the park are undertaken in accordance with the relevant legislation, under the coordination of the ACT Emergency Services Agency.

POLICIES

- Information on environmental sensitivities, natural and cultural assets and park infrastructure will be made available for use in planning fire suppression activities. Inter-agency protocols will be established for regular updating of information on fire suppression.
- The park management agency will ensure that sufficient expertise and equipment is available to develop spatial information, and that identified agency staff are experienced and trained to analyse such information and assist fire suppression operations.
- The park management agency will provide assistance as necessary in the suppression of fire inside or outside the park and respond to fires in accordance with the ACT Emergency Services Agency policies and requirements and provisions of this management plan.
- The ACT Emergency Services Agency and park management agency will together ensure that a rapid response and suppression capability for wildfires is maintained at a high standard, through the provision of: (a) adequate numbers of strategically located, appropriately trained fire fighters; and (b) adequate, appropriate fire fighting equipment. This is to include specialist remote area fire fighters and equipment.

¹ Neighbours of Namadgi in NSW and the ACT comprise mainly rural landholders and government agencies (see s. 10.3.3).

OBJECTIVE

Fire suppression methods take into account water supply and the natural and cultural values of the park.

ACTIONS

- 114 During fire suppression activities, particularly when the use of heavy machinery or the installation of temporary infrastructure is required, avoid damage to ecologically sensitive areas such as *Sphagnum* bogs, wetlands and riparian areas; water storage facilities; and known Aboriginal and other cultural heritage sites.
- 115 Avoid the use of heavy equipment in: (a) the immediate catchment of *Sphagnum* bogs where this is likely to result in sediment flows into the wetlands; and (b) habitat areas for the northern corroboree frog (which includes *Sphagnum* bogs and immediately adjacent woodlands). Operations in the vicinity of Ginini Flats Wetlands are to accord with the management plan for the area (ACT Government 2001) and the Action Plan for the northern corroboree frog (ACT Government 1997).
- 116 Provide incident management teams with appropriate information and trained liaison officers with the aim of ensuring that water supply and important natural and cultural heritage assets are protected during fire suppression activities.
- 117 Avoid using fire retardant and suppression chemicals near streams, wetlands and water bodies (e.g. water supply storages). Develop and implement a policy on the use of retardants and fire control chemicals in collaboration with ACTEW, ACT Emergency Services Agency, ACT Health and the EPA, taking into consideration ecological sensitivities such as streams and wetlands and the need to protect urban water supply in the Cotter Catchment balanced against the reduced area of catchment that may be burnt if these chemicals are used (see also s. 11.2.6).
- 118 Develop and keep under review mandatory requirements and guidelines for the use of fire retardant and suppression chemicals and ensure adequate training of staff (see also s. 11.2.6).
- 119 Actions that lead to substantial impacts e.g. temporary access tracks and firebreaks, should only be undertaken when unavoidable and on the understanding that restoration work will be required.

7.4.6 Fire recovery

OBJECTIVE

Systematic assessment of the condition of natural, cultural and management assets affected by both planned and unplanned fire and fire suppression activities is undertaken following a fire to assist with effective post-fire recovery and to improve the knowledge base for future fire management.

ACTIONS

- 120 After a significant fire, conduct an assessment of its impacts and develop a recovery plan that addresses the following:
- occupational, health and safety issues and public safety
 - the protection and stabilisation of water catchments and riparian areas where feasible
 - natural recovery processes (where appropriate, identifying actions to assist recovery)
 - restoration, reconstruction or relocation of infrastructure
 - post-fire research and monitoring requirements
 - management of ecosystem threats such as weeds and feral animals
 - the location of containment lines, trails and helipads. These will be mapped, closed and rehabilitated after a fire but may be 'reopened' if required for future fire suppression purposes. Reopening of previously made trails is preferable to cutting new containment lines
 - construction of new containment lines or helipads. Subject to impact assessment, these may become part of permanent access facilities, if they are in an alignment similar to or the same as a fire trail planned within the context of this management plan, or provides a better environmental outcome than existing alignments in the area, in which case the pre-existing facility will be closed and rehabilitated
 - the dismantling and removal of temporary communication relay stations and other infrastructure installed during the fire.

A place for community wellbeing
Recreation and visitor use



8.1 Primary management objective

Namadgi provides a variety of sustainable recreation opportunities that are consistent with the protection of the park's natural and cultural heritage values and water supply catchments.

8.2 Background

Namadgi National Park is by far the largest conservation reserve in the ACT. With elevations ranging from below 700 m (Naas River valley) to above 1 900 m (Mt Bimberi) above sea level, the park includes a diversity of ecosystems from mountain summits to valley floors. Visitors are drawn to the park for its wild, rugged and expansive landscapes and a rich cultural heritage, all of which offer a unique setting for a variety of recreational opportunities. Entry into the park is free. Fees are currently charged for camping in the campgrounds but not for dispersed bush camping.

The park has some appeal to interstate and overseas visitors, particularly those introduced to the park by family and friends living in Canberra. Visitors from outside the region are drawn to Namadgi to take part in national events and club-based activities such as rogaining, orienteering or bushwalking. Outward Bound currently generates thousands of overnight stays in the park per year with clients drawn mainly from Canberra and region schools. There are opportunities for both day and overnight ecotours.

Car counters indicate that Namadgi receives approximately 130 000 to 150 000 visitors each year. Visitation occurs throughout the year, however, fewer people visit during the very cold winter months. At this time access roads at higher altitudes (e.g. the Mt Franklin Road) may be closed for varying periods. The Easter break is the most popular time to visit Namadgi.

ACT Parks and Conservation surveys the Canberra community on an annual basis to help determine community and visitor awareness, use and satisfaction with the ACT open space system including parks, reserves and recreational areas. Twelve hundred telephone interviews are randomly conducted with general questions about Namadgi. In addition, face to face interviews and the completion of self administered questionnaires are gathered in the park. The findings show that 69% of visitors were from Canberra and 31% were visitors to the ACT (Queanbeyan 12%, Sydney 5%, other Australia residents 7% and overseas 3%).

The key reasons given for visiting Namadgi are: 26% general interest, 43% bird or animal watching, 17% camping overnight, 64% go bushwalking or hiking and 12% go to visit specific landscape, views or cultural features.

There are no detailed statistics relating to specific recreational activities, especially for activities of a dispersed nature that are undertaken by individuals or small group, for example, rock climbing, bush walking or cycling. There is better information for organised or group activities, especially those requiring approval from park management. Lack of data means that assessment of trends over time is more difficult.

For many years the park has been a focus of day and over-night bushwalking activities by organisations such as the Canberra Bushwalking Club, the National Parks Association of the ACT and Family Bushwalkers. It is also popular for family-based day walks and mountain bike riding by small groups. In suitable areas, climbing and abseiling are also popular. When there is adequate snow, there is some cross-country skiing on the Brindabella Range but this is limited by access. Recreational driving and picnicking activities are also popular. The park is highly valued by those interested in nature study or visiting cultural heritage places. These 'passive' activities are a major attraction of Namadgi and are often combined with driving, walking, bike riding and picnicking.

Three camping areas for car campers located in the eastern section of the park are more heavily used during spring and autumn, while community groups such as scouts use them throughout the year.

There are a small number of tour operators that use the park. The major user of the park for outdoor adventure activities is Outward Bound.

Many bushwalkers seek a remote experience in the Bimberi Wilderness where numbers of overnight visitors are strictly limited to protect the water quality of Corin reservoir, Canberra's main water supply. Camping is not permitted in the middle Cotter Catchment in order to protect water supply in Bendora reservoir, from which water is drawn and diverted directly to Canberra. Overnight bush camping is allowed in other parts of the park.

Two iconic recreational routes in the park are the Australian Alps Walking Track and the Bicentennial National Trail. The Alps Track is for walkers only. It extends from Namadgi Visitor Centre to Walhalla in Victoria (615 km) through the Australian Alps national parks via the Bimberi Wilderness. The Bicentennial National Trail is a 5 330 km route stretching from Cooktown in Queensland to Healesville in Victoria. It is a multi-use trail for horse riders (and packers), bushwalkers and cyclists. In Namadgi the trail follows the Naas River valley and after leaving the park, passes through NSW via Kosciuszko National Park. Both tracks attract regional and interstate visitors.

Roads and trails in the park are central to most of the recreational activities, providing access to preferred locations and the routes for walking, cycling and horse riding. Some roads and trails are purpose built, related to park requirements, but most are related to past land use or to facilities such as the water supply reservoirs. Appendix 7 contains a table listing roads and vehicle trails in Namadgi. The park contains two main categories of roads or trails:

- **Public roads (sealed/unsealed) and management trails (unsealed)** that are normally open to vehicle traffic and are generally suitable for two-wheel drive vehicles, though a few are best suited to four-wheel drive vehicles (e.g. near Mt Coree). Some of these roads/trails have permanently fixed gates that are normally open, but are closed when the road is unusable or dangerous (e.g. Mt Franklin Road from Piccadilly Circus to Mt Ginini carpark with a gate at Bulls Head).
- **Closed management roads or trails** that have locked gates. These are generally available for non-motorised access subject to other restrictions that may apply (e.g. in Zone 1A, Bimberi Wilderness). Examples of such roads or trails are the Wombat, Warks, Parrot and Moonlight Hollow roads (west of Bendora reservoir) and the Old Boboyan Road between Yankee Hat carpark and Boboyan Road (near the Mt Clear campground).

The Roaded Natural Zone (Zone 3) contains unsealed roads (two-wheel drive standard in dry/non-snow conditions) and other roads and management trails suitable for four-wheel drive vehicles. Four-wheel drive vehicles are confined to on-road/trail use. This road/trail network includes forest roads constructed during previous hardwood logging operations north of Bendora Road. Four-wheel drive roads in the north-western part of Namadgi link to the Brindabella National Park (NSW) providing a large network for four-wheel drive enthusiasts. All management trails in Brindabella National Park are open for four-wheel driving and registered trail bikes. The ACT border and the boundaries of Namadgi and Brindabella national parks cross Mt Coree. This peak is a popular lookout, contains a fire tower and is accessible by vehicle.

The *Planning and Development Act 2007*, the *National Capital Plan* and the *Territory Plan* all deem recreational values to be secondary to the natural values of the park and that recreational activities must be compatible with the conservation of natural (and cultural) values. In the Cotter Catchment, water is the primary value to be protected and all other values are secondary to it.

8.2.1 Providing for visitors

The focus of recreational planning for Namadgi is primarily towards low-key recreational activities that are based on the natural and cultural values of the park, and do not require extensive infrastructure. It caters for people who want to have a bush 'adventure' and those who seek the solitude of the bush. This type of visitor is comfortable with, and prefers, low-key facilities that are in keeping with the bush setting. Recreation services for visitors aim to provide an enriching and positive experience so that people can enjoy, learn about and appreciate the qualities of the park. While facilities are low-key, so as not to dominate the natural bush setting, they need to be of a high standard.

Opportunities for tourism revolve around the provision of guided tours, overnight camping/ bushwalking, bush/adventure activities such as rock climbing and abseiling, and ecotours including natural and cultural heritage discovery tours and participation in research and monitoring programs.

Park zoning (Chapter 3), protection of the Cotter Catchment (Chapter 4), management policies and access limitations mean that recreational use of Zone 1A (Upper Cotter Catchment and Bimberi Wilderness), Zone 1B (Middle Cotter Catchment), and Zone 2A (Wild Semi-remote, Booth Range/Bluegum) is limited. Most of the recreational opportunities are within the remainder of the park (Zones 2B and 3) comprising around 54 000 ha. Zone 2B includes the Naas/Gudgenby Catchment which is a possible water source for Canberra in the future. A measured and regulated approach to recreation management in Zones 2B and 3 is necessary to protect the potential water catchments and other values and to ensure that visitor expectations are met. To achieve this, carrying capacities may need to be determined for specific, high impact activities.

The plan recognises that the close proximity of the park to Canberra makes it an ideal day destination for residents while the remote areas are attractive for overnight and adventure pursuits. It also recognises that there are a range of recreation and tourism opportunities available in the region and that Namadgi can provide complementary services related to its remote, semi-remote and natural bushland setting, as well as its Indigenous and European cultural heritage values. Neighbours also provide services such as recreation, interpretation and accommodation, for example, Tidbinbilla. Policies are framed to complement those services available outside of the park rather than compete with them. Table 8.1 illustrates the range of nature-based recreation opportunities available in the immediate region.

The Australian Alps national parks (including Namadgi) have been named as one of Tourism Australia's National Landscapes. Work on a Tourism Master Plan has commenced to develop a collective approach to the delivery of experiences distinctive to the Australian Alps National Landscape. The plan will guide future planning, development, marketing and promotional priorities within the Australian Alps National Landscape area and will also advise on appropriate visitor facilities, industry development, services and infrastructure requirements.

8.3 Recreation: management considerations

The following considerations apply to recreation generally in the park. Particular activities and issues associated with those activities are discussed in s. 8.7.

- Much of the park (47%) lies within the middle and upper Cotter catchments. Here the protection of water resources is paramount. To safeguard public health, recreational activities are limited in this area (see Chapter 4). The implication of limiting recreation in the Cotter Catchment (Zone 1) is that most visitor use will occur in the remainder of the park (Zones 2 (mainly 2B) and 3). These zones include water catchments that may supply Canberra with water in the future. Careful planning, systematic monitoring and regulation are necessary to ensure that the potential water supply and other values of these zones are protected.
- Recreational use of the wilderness area needs to be limited to protect opportunities for solitude, which is an objective for this land use as set out in the *Planning and Development Act 2007* (s. 2.1).
- Recreation activities must be compatible with the natural, cultural, social and economic values of the park.
- Visitor safety is an important consideration for recreation and tourism policies and actions.
- Park users can help to protect the park's values by adopting a stewardship role (see Chapter 10).
- Interpretation and education services are important as they enrich people's experiences and promote an understanding of the park's special values (see Chapter 9).
- Management of recreation in the park would benefit from better knowledge of the types and levels of recreational use, and more detailed and quantified assessment of environmental and social impacts of particular activities.

Table 8.1 Recreation opportunities in the ACT region

Park-based recreation opportunities in the ACT region	
Canberra Urban Parks	Over 6 000 ha throughout Canberra. Many different types of parks ranging from District Parks to Special Purpose Areas. Provides a diversity of recreation opportunities such as picnicking, BBQs, swimming, playgrounds, walking, skateboarding, sport and informal recreation, and specialised recreation and sporting events.
Canberra Nature Park	6 123 ha at the urban interface or within the urban area. Residential day-use focus. Extensive networks of signposted trails. High levels of daily use, year round, 30 minute to three hour activities. Family play, walking, dog-walking, cycling, horse riding.
Murrumbidgee and Molonglo River Corridors	7 500 ha at 0-10 km from the urban interface. Family and water-based recreation focus. Extensive self-use facilities: network of picnic and swimming areas with BBQs and toilets along corridor; continuous walking trail from Point Hut to Casuarina Sands. Serviced campground at Cotter Reserve. High levels of daily use especially summer, one to six hour activities: picnicking, family play, swimming, canoeing/kayaking, fishing, walking, dog-walking, cycling, horse riding.
Tidbinbilla	5 450 ha at 15 km from the urban interface. High levels of weekend use year round. Family based nature-education focus. Concentrated tourism facilities: visitor centre, education centre, wildlife displays, short nature and heritage trails, longer walking trails. Full day activities: BBQs/picnics, guided and self-guided tours of wildlife enclosures, nature and heritage trails, longer day walks into surrounding ranges. More intimate and 'safe' setting for young families and those preferring some developed facilities within a broadly 'natural' setting.
Namadgi National Park	106 095 ha at 7-50 km from the urban interface. Remote/backcountry use and semi-remote interface focus. Self-use facilities along key roads: lookouts, picnic areas with BBQs and toilets, longer walking trails, heritage trails. Popular day-use area for Canberra residents. Opportunities for overnight use include car, campervan, large and small group camping and remote bush camping. Almost all campground amenities include toilets and water. No showers or electricity provided. Car and motorbike touring, competitive events (orienteering, rogaining), BBQs/picnics, walking, fishing, cycling, climbing, abseiling, nature study (e.g. bird watching), horse riding, cross country skiing all take place in Namadgi.

Park-based recreation opportunities in the ACT region	
Lower Cotter Catchment (previously managed as pine plantation prior to 2003 bushfire)	6 000 ha at 15 km from the urban interface. Low use since 2003 bushfire, mainly for vehicle and bicycle touring. Community events to revegetate fire-affected areas have been held regularly since 2006. Catchment management considerations have resulted in many roads being closed and rehabilitated or locked to prevent general public access. Overnight camping not permitted. An active strategy to encourage low impact uses is being implemented.
Uriarra Forest, Pierces Creek Forest, Gibraltar Creek Forest, Stromlo Forest, Kowen Forest and Ingledene Forest (previously managed as pine plantations prior to 2003 bushfire)	18 570 ha (combined total) at 0–25 km from the urban interface. Vehicle touring, adventure sports and family-activity focus. Extensive self-use facilities, widely distributed road and trail networks, picnic areas with BBQs and toilets, mountain bike and walking trails. Basic camping at Blue Range, Laurel Camp. High levels of weekend use year round for day activities such as car and motorbike touring, competitive events (car rallies, mountain biking, orienteering, rogaining), BBQs/picnics, family play, walking, dog-walking, fishing, cycling, horse riding.
NSW National Parks	Extensive network of management trails in Brindabella National Park is available for 4WD vehicles and registered trail bikes (low-key camping is also provided for). Horse riding is permitted in parts of Brindabella and Kosciuszko National Parks. Wilderness/back-country bushwalking from Namadgi to Kosciuszko National Park and Bimberi Nature Reserve. Extensive mountain retreat, resort, chalet and eco-lodge type accommodation is available in, and adjacent to Kosciuszko National Park. Kosciuszko National Park offers an extensive range of recreation opportunities. There are several small reserves in NSW (near to Canberra) suitable for bushwalking and nature study.

8.4 Recreation zoning

Recreation zoning for this plan has been developed as part of an integrated zoning model (Chapter 3). Zones have been identified according to key values of the park. General management and recreation policies have been applied to each of the zones consistent with the identified values of each area (see Table 8.2).

Table 8.2 General recreation zoning policies

	Zone 1 Remote Area Core Conservation and Catchment Area		Zone 2 Semi-Remote Area Conservation and Recreation Area		Zone 3 Roaded Natural Recreation Area
	Zone 1A Bimberi Wilderness including Upper Cotter Catchment	Zone 1B Middle Cotter Catchment and Adjacent Areas	Zone 2A Wild Semi-Remote Booth Range and Blue Gum Creek Area	Zone 2B Conservation and Recreation	Zone 3 Roaded Natural Areas and Road Corridors
Car camping	No	No	No	No	Yes, in designated campgrounds.
Pack camping	Dispersed camping by permit only (maximum of 24 persons at any one time).	No	Yes	Yes	Yes, in designated campgrounds.
Picnicking and sightseeing	Yes	Yes	Yes	Yes	Yes
4W driving (on track only)	* Conditional	* Conditional	N/A	* Conditional	Yes, on public roads only.
Walking	Yes, day and overnight.	Yes, day only.	Yes, day and overnight.	Yes, day and overnight.	Yes, day and overnight.
Cycling and other non-powered wheeled transport (on track only)	* Conditional	Yes, on formed roads. Not permitted south beyond Ginini car park.	N/A	Yes, on formed roads.	Yes, on formed roads.
Trail bikes and other powered wheeled transport	No	No	No	No	Yes, only on public roads and must be registered.
Horse riding	No	No	No	Yes, in designated areas.	Yes
Rock climbing & abseiling	Yes	Yes, day use only.	Yes	Yes	Yes
Snow play	Yes	Yes	Yes	Yes	Yes
Ski touring	Yes	Yes, day use only.	Yes	Yes	Yes
Mechanically assisted skiing	No	No	No	No	No
Fishing	No	No	Yes, subject to regulation and policy (see s. 8.7.10).	Yes, subject to regulation and policy (see s. 8.7.10).	Yes, subject to regulation and policy (see s. 8.7.10).

*Permitted with written consent from the Conservator and for management purposes only

	Zone 1 Remote Area Core Conservation and Catchment Area		Zone 2 Semi-Remote Area Conservation and Recreation Area		Zone 3 Roaded Natural Recreation Area
	Zone 1A Bimberli Wilderness including Upper Cotter Catchment	Zone 1B Middle Cotter Catchment and Adjacent Areas	Zone 2A Wild Semi-Remote Booth Range and Blue Gum Creek Area	Zone 2B Conservation and Recreation	Zone 3 Roaded Natural Areas and Road Corridors
Boating, canoeing, kayaking, rafting	No, except for management purposes.	No, except for management purposes.	N/A	Yes	Yes
Non powered and powered flight (hang gliding, hot air ballooning, paragliding)	No	No	Non-powered - with permission.	Non-powered - with permission.	Non-powered - with permission.
Powered flight (low altitude)	No, except for emergency or management purposes.	Yes, subject to licence and/or permit. No landings except for emergency or management.	Powered - not allowed. Yes, subject to licence and/or permit. No landings except for emergency or management.	Powered - not allowed. Yes, subject to licence and/or permit. No landings except for emergency or management.	Powered - not allowed. Yes, subject to licence and/or permit. No landings except for emergency or management.
Special events	No	Yes, limited to formed trails.	Yes, according to policy (see s. 8.9).	Yes, according to policy (see s. 8.9).	Yes, according to policy (see s. 8.9).
Guided commercial activities	No. Day use may be permitted subject to licensing arrangements.	Yes, subject to licence and/or permit and day use only.	Yes, subject to licence and/or permit.	Yes, subject to licence and/or permit.	Yes, subject to licence and/or permit.
Non commercial groups	Yes, subject to permit and group size.	Yes, day use only.	Yes	Yes	Yes

*Permitted with written consent from the Conservator and for management purposes only

8.5 Visitor impacts and safety: objectives, policies and actions

8.5.1 Monitoring and managing visitor impacts

All visitor use will cause some level of impact on the park (some examples are shown in Table 8.3). Typically, the impact is physical in nature, but it also may be social whereby the experience of other visitors is affected in some way. The question to be answered is 'what level of impact is acceptable?' The type of activity, visitor behaviour, numbers, use frequency and site characteristics are factors that will influence impacts and the necessary management approach.

Away from obvious central areas or 'hubs', visitors generally expect facilities in the park to be subtle and unobtrusive so as not to detract from the bush setting and their experience of remoteness. This can only be achieved while disturbance of natural areas by visitors themselves remains low. Visitor impacts that are not appropriately managed will detract from the bush experience to a greater degree than physical management intervention.

An important basis for managing visitor impacts effectively is a systematic monitoring program that measures the effects of recreational use on natural and cultural heritage and other park users over time (social impact). If visitor impacts are to be managed effectively it is necessary to know the numbers, where people go, and what they do. When coupled with information about how a resource is changing in response to visitor use or to other factors, management is then in a position to make decisions about management options and strategies. The aim is to stop degradation before it reaches unacceptable levels. A proactive and adaptive approach to managing visitor impacts is far cheaper and easier to implement than reactive management after extensive damage has occurred.

Social impact refers to how park users and their activities affect others. This includes:

- the number of encounters with other visitors in remote or semi-remote areas
- incompatible activities, or one type of behaviour affecting other people (e.g. noise)
- the presence of too many people (crowding), particularly in locations where low visitor numbers are expected
- the presence of management facilities which may detract from the bush experience.

Table 8.3 Examples of visitor impacts and indicators

Impacts	Indicators
Changes in vegetation	Introduced species; vegetation removal and trampling; cutting and clearing extended well beyond serviced areas.
Soil loss	Removal or destruction of vegetation resulting in bare ground.
Reduced water quality	Stream turbidity; increased bacterial levels from human and animal waste; disturbance to river banks.
Damage or loss of natural and cultural features	Rubbish; vandalism or deliberate damage; and deterioration.
Changes in wildlife	Loss of species from particular areas; and changes in species composition.

OBJECTIVE

Knowledge gained from research and monitoring of visitor impacts informs management policies and actions that are aimed at protecting natural and cultural heritage and maintaining visitor enjoyment of the park.

POLICIES

- Monitoring programs will be developed to assess visitor impacts and inform recreation management in the park.
- Recreation research projects undertaken through research institutions or tourism organisations will be encouraged and supported.
- All possible measures to address identified visitor impacts will be explored including:
 - liaison and cooperative measures with user groups
 - visitor education
 - promotion of codes of practice for particular activities (e.g. Australian Alps codes of conduct)
 - construction solutions (e.g. site hardening, where appropriate, and within zoning guidelines)
 - regulation of visitor use by permit and licensing systems
 - enforcement of regulations.
- Where there is an unacceptable level of recreational impact on particular areas, sensitive ecosystems or cultural heritage sites, a range of techniques will be employed including the option for managers to temporarily or permanently close these areas to visitors.

ACTIONS

- 121 Develop and implement a monitoring program to allow assessment of environmental and social impacts caused by visitors. Ensure that the program:
 - is consistent with standards used by Australian Alps agencies to ensure compatibility of data
 - identifies criteria for limits of acceptable change
 - targets high use areas or fragile areas that are likely to require active management intervention
 - provides for data to be managed efficiently.
- 122 Provide log books at the start of long distance walking tracks to help monitor use of these tracks.
- 123 Promote the Australian Alps minimal impact codes at the visitor centre, throughout the park and on the website.
- 124 Promote a 'take rubbish home' policy through education and interpretation materials.

8.5.2 Visitor safety

There is some level of risk associated with all recreational activities. Some activities are generally considered riskier than others (e.g. rock climbing, rafting and white water canoeing, caving), however risk is not an absolute in itself, as the competency of those undertaking the activity is a significant factor in mitigating the risk. Outdoor pursuits sometimes require critical judgements to be made, which are based on a combination of skills, knowledge and experience.

Many activities are undertaken by individuals or small groups in places that are remote from communication facilities or access to assistance, and require a level of self-reliance on the part of participants. For many people this is part of the attraction of outdoor activities. For many activities, especially those conducted through clubs or other organisations, codes of conduct, prepared guidelines, training, adequate preparation, use of experienced 'leaders', and formal or informal peer scrutiny (e.g. in a published activities program) mean that there are relatively few incidents of a serious nature.

The duty of park managers is to identify foreseeable risks and take reasonable steps to reduce them, particularly for people who may not have the skills, knowledge or experience to recognise the risk or the magnitude of the risk. Such action may include the closure of particular areas, maintenance or reconstruction work, visitor education, warning signs, and working with recreation clubs and organisations to ensure that the risks associated with their activity undertaken in the park have been appropriately considered. However, park managers cannot take responsibility for the safety of participants who visit the park.

OBJECTIVE

Visitors to the park are adequately advised of and safeguarded from hazards present in the park in a way that does not detract unduly from participation in adventurous outdoor pursuits. As far as practicable, all visitor facilities are developed to a safe standard, and management activities do not pose a risk to visitors.

POLICY

- Risk to park visitors will be managed in a way that conforms to duty of care requirements, adequately informs visitors of hazards, where necessary protects visitors from hazards, but does not detract unduly from participation in adventurous outdoor pursuits.

ACTIONS

- 125 Ensure that all visitor facilities are designed, built and maintained to appropriate standards.
- 126 Provide information to visitors about potential risks and emergency procedures.
- 127 Encourage use of log books provided at the start of long distance walking tracks, to assist park managers in locating visitors in an emergency (see also Action 122).
- 128 Ensure that visitors are adequately warned about management activities that may put visitors at risk (e.g. fuel reduction burns, herbicide or pesticide spraying, feral animal control programs). Methods of warning may include:
 - erection of signs on access routes
 - notification at visitor centres
 - notification through local media when appropriate
 - placement of information on ACT Government websites
 - patrol of areas when considered necessary.

8.6 Recreation facilities: objectives, policies and actions

The *Campground Strategy for ACT Parks and Forests 1997* identifies a campground opportunity spectrum that ranges from primitive (natural) through to modern (developed). The spectrum is a useful tool for categorising recreation facilities according to standards of development and recreation opportunities being offered.

Schedules 1 and 2 outline existing and proposed new visitor service nodes in the park according to the camping opportunity spectrum.

OBJECTIVE

Visitor facilities are designed, constructed and sited so as to minimise adverse impacts upon the values of the park and enhance the experiences available to visitors.

POLICIES

- Visitor facilities will be provided that support permitted recreational activities, enhance visitor experiences, and minimise impacts on the natural and cultural values of the park.
- Picnic sites, camping areas, information and interpretation, signs and other facilities will be maintained to a high standard.
- New facilities will be provided according to general management and recreational policies specified in the zoning model for the park (see Chapter 3 and also Table 8.2).
- The protection of natural and cultural values will have a high priority in the maintenance of existing facilities and in the design and siting of new facilities.
- Where practicable, access and facilities will be provided for visitors with limited mobility or disabilities.

8.6.1 Overnight stays

Built accommodation

In the park, there are several small huts with varying degrees of historical significance. In order to preserve their integrity, it is park policy that they not be used generally for over-night accommodation, although they may be used for shelter in emergencies. There is a significant risk of huts being destroyed by accidental fires.

There is no proposal to augment the current overnight accommodation facilities provided in Namadgi, with the exception of the Gudgenby Homestead precinct. There are several accommodation options available adjacent to the park or nearby in the region to meet demand for a 'mountain retreat' experience within the nature-based tourism market.

POLICIES

- Camping in huts is not permitted except in emergency situations.
- No new overnight accommodation will be built inside the park during the life of this plan.

Gudgenby Homestead precinct

The Gudgenby Homestead precinct includes a homestead with several rooms and a small cottage referred to as Ready Cut Cottage, which is an early example of a kit home. The homestead has been upgraded. The site offers opportunities for community groups, artists in residence programs, cultural groups, commercial tour operators, government agencies and individuals. The maximum capacity of the homestead is around twenty people. As with many early European sites, there are also Aboriginal heritage values present that warrant special protection. Appropriate guidelines would need to be developed for use of the site to protect cultural heritage values (s. 6.4).

Reuse of the homestead would require consultation with the National Capital Authority in relation to the Requirements for Namadgi National Park and Adjacent Areas in Appendix G of the *National Capital Plan*, which states that 'Gudgenby Homestead is to be used for park purposes'.

POLICY

- Opportunities will be explored for adaptive reuse of the Gudgenby Homestead and precinct for overnight accommodation in the park. The value of current community activities in the precinct will be taken into account. Management could be modelled on the current arrangements for Currango Homestead in Kosciuszko National Park or be undertaken according to a lease arrangement. Appropriate guidelines would need to be developed for use of the site to protect cultural heritage values.

Existing accommodation

Accommodation opportunities outside of the park include:

- Caloola Retreat located in the Naas Valley, south of Tharwa: This offers a variety of low-key built accommodation options including a conference centre with bunk-style accommodation, a farmhouse and a cottage as well as camping. Caloola promotes group activities that can be conducted onsite or within the park such as bushwalking, cycling, nature study, horse riding and team games. The services offered by Caloola complement the recreational opportunities offered on the Bicentennial National Trail such as the provision of horse paddocks for long distance riders.
- Birrigai at Tidbinbilla has accommodation available during school holiday periods.
- There are various accommodation options in NSW including those associated with Kosciuszko National Park.

Future accommodation options

Ventures that have been foreshadowed to meet market demand include:

- Corin Forest, a private operation situated just outside of the park along Corin Dam Road is proposing to build guesthouse and chalet accommodation and will offer a range of recreational activities both onsite and within the park. It currently operates as a day-visitor venue with a bobsled, snow play, flying fox and water slide.
- New accommodation facilities have been suggested for the Tidbinbilla precinct and at the Cotter recreation area.

Given the existing and potential commercial and non-commercial opportunities available in the ACT and alpine resorts in Kosciuszko, it is unlikely that there is a large enough market to sustain any new facilities in Namadgi during the life of this plan.

Camping

Camping in the park is a popular, low cost activity. This is either vehicle based at designated camping areas or associated with over-night bushwalks. Many of the issues associated with camping are similar to those for other recreational activities and include localised impact on vegetation (including firewood collection), impacts on wildlife (e.g. feeding) and social considerations (e.g. conflicts between campers over matters such as excessive noise or threatening behaviour).

POLICIES

- Semi-permanent or permanent camping is not permitted in the park.
- The Australian Alps minimum impact camping codes will be promoted.
- The use of campfires for recreational purposes will be strictly controlled (see s. 7.4.3).

Vehicle based camping

Campgrounds in Namadgi are classified as semi-primitive (facilities are limited to toilets, water and fireplaces) or semi-modern (shelter, barbecues and picnic tables may also be provided). Modern campgrounds with hot showers and electricity are catered for outside the park at the Cotter Campground and in Canberra and Queanbeyan. It is appropriate that existing and any new campgrounds in Namadgi continue to provide low-key facilities consistent with the bush setting and experience as indicated in Schedules 1 and 2.

POLICIES

- Vehicle-based camping is generally only permitted in designated campgrounds within Zone 3 (Roaded Natural Areas) of the park.
- Existing campgrounds may be redeveloped or upgraded as necessary, to improve amenity or for environmental protection purposes, but should retain a semi-primitive to semi-modern level of facilities.
- Mt Clear Campground will remain a low-key bush campground for small groups.
- Should demand for campsites grow beyond capacity at peak periods, a ballot system may be introduced to provide a rational means to distribute camp sites.
- Subject to environmental and risk assessment, and provided there is a demonstrated need, new campgrounds may be established at:
 - Orroral Tracking Station
 - Gudgenby Valley, separate to and away from the Gudgenby Homestead Precinct.

ACTION

- 129 Upgrade Mt Clear Pound Campground to provide adequate facilities, including toilets, shelter with fireplace and barbecues, and water for packhorse riders and large groups.

Bush camping

Dispersed bush camping takes place throughout the park except in the middle Cotter Catchment where no camping is permitted. Dispersed camping requires careful monitoring as popular areas can suffer significant impact and the health of visitors and waterways can be threatened by inappropriate disposal of human waste.

POLICIES

- Pack-based camping is permitted throughout the park, except in the middle Cotter Catchment. Pack-based camping in Zone 1A Upper Cotter Catchment is subject to permit and group size limits. A maximum of twenty-four camping permits at any one time applies to Zone 1A, Bimberi Wilderness Zone.
- Pack-based campgrounds (primitive bush campgrounds) may be established where dispersed camping is causing unacceptable impacts (not applicable to Zone 1A).
- Pack-based campgrounds (primitive bush campgrounds) will be subject to limitations on group size and number of campers through a permit system (not applicable to Zone 1A where a limit on numbers and a permit system is already in place).
- Toilet facilities will be provided at campgrounds to reduce the impact of human waste on the environment and water quality.

8.7 Recreation activities: objectives, policies and actions

OBJECTIVE

Recreational activities permitted in the park are consistent with the protection of its natural and cultural heritage values and water supply catchments.

POLICIES

- The compatibility of current and future recreational activities with the natural, cultural, social and economic values of the park will be assessed using the following criteria:
 - suitability for the Namadgi visitor profile—those that seek a bush ‘adventure’, a learning experience and the solitude of the bush
 - likely impact on natural heritage with a particular emphasis on sensitive ecosystems (riparian areas, subalpine bogs and heaths) and habitat of rare and threatened species
 - potential impacts on important ecosystem services such as water supply
 - potential impacts on fragile or culturally sensitive heritage sites
 - economic sustainability (e.g. cost to park management)
 - potential to conflict with other park users.

8.7.1 Recreational driving

Recreational driving is a popular way for people of all abilities to experience natural areas. Zone 3 (Roaded Natural Areas and Road Corridors) is where recreational driving can occur within the park. Turning bays, vehicle parking, lookouts and interpretive signage will be accommodated within this zone. Four-wheel driving is also a popular activity. Some roads and trails in the north-western section of Namadgi are best suited to 4WD vehicles, complementing trails in adjacent areas (e.g. areas which were formerly pine plantations (ACT) and Brindabella National Park (NSW)). Maintenance and upgrade of the major public roads in the park (e.g. sealing unsealed sections) is not part of this management plan as it is the responsibility of Roads ACT (Department of Territory and Municipal Services).

The *Shaping Our Territory Final Report* (Non-Urban Study Steering Committee 2003) proposed that a tourist drive circuit be developed in the Brindabella Range. The roads north of Bendora Road would provide a pleasant circuit drive through wet forests with lush fern gullies and views of the Cotter Catchment and Tidbinbilla Range. A considerable upgrade of the roads would be required to provide all-weather two-wheel drive access. The circuit would pass through the lower Cotter Catchment and therefore the route would be subject to its compatibility with water catchment policies for this area (ACT Government 2006).

Illegal (off-road) recreational driving is regulated by the *Nature Conservation Act 1980*, although measures prescribed in the Act need to be strengthened to ensure that the regulations can be effectively enforced.

The main environmental and/or social impacts of recreational driving are: the hazard to other road/trail users (motorised and non-motorised) and to park fauna; dust and noise; erosion and sedimentation (especially where roads carry much more traffic than they were designed for); road damage and high maintenance costs due to the use of unsealed roads in wet conditions; illegal off-road access from public roads.

POLICIES

- Recreational driving is permitted on all open public roads in the park and on vehicle management trails north of Bendora Road (see Chapter 3, Zone 3 Roaded Natural Areas and Road Corridors).
- Off-road driving (i.e. driving anywhere other than on formed roads) is not permitted in the park except for management purposes.
- The accessible vehicle management trails north of Bendora Road will be maintained to a standard specified in the Bushfire Operational Plan, but this may be varied if a tourist drive circuit route is developed.
- Roads may be temporarily closed for management purposes, for public safety, or if there is an unacceptable environmental impact as a result of use.
- Road closures will be publicly advertised and signposted.
- New developments along road corridors (Zone 3 Roaded Natural Areas and Road Corridors) will be planned according to management policies for defined management zones (Chapter 3, Table 3.2) to integrate opportunities for interpretation with walking, sightseeing and other activities. Appropriate turning bays, vehicle parking, lookouts and interpretive signage will be provided.

ACTIONS

- 130 Investigate the development of an all weather two-wheel drive tourist route from Bendora Road and on trails to the north of Bendora Road.
- 131 Strengthen the *Nature Conservation Act 1980* in relation to illegal off-road driving.

8.7.2 Picnicking and sightseeing

Visitors seeking picnicking and sightseeing opportunities are generally those that enjoy recreational driving. Usually on a day visit to the park, they are often looking for a variety of activities, such as short walks, bird-watching, photography, experiencing interpretative material, and visiting cultural heritage places. They require a variety of destinations with sites of interest and an appropriate level of facilities to meet their needs. Key visitor nodes already exist in the park and some of these will require additional facilities and targeted activities for this user group.

This is often a fairly benign activity but may include some of the impacts noted in s. 8.7.1. The other main environmental and/or social impacts of picnicking and sightseeing are: localised environmental damage (e.g. firewood collection and litter); trampling of popular areas; erosion and runoff from carparks and over-used areas; conflicts between large and small groups or individuals; competition for facilities between day users and campers at shared sites.

POLICIES

- Existing day use areas may be upgraded to manage impacts on natural and cultural values.
- Day visitor service nodes will be restricted to Zone 3 (Roaded Natural Areas and Road Corridors) where recreational opportunities and sites of interest exist.
- Separate facilities for day visitors will be provided where vehicle-based campgrounds exist to reduce user conflicts e.g. at the existing Honeysuckle Campground.
- Toilets will be provided at visitor nodes where facilities are such that visitors are encouraged to stay for a considerable period of time i.e. more than two hours.
- As far as practicable, facilities in the park will be provided for disabled access.
- Interpretation signs, natural and cultural heritage trails and interpretation activities will be concentrated at visitor nodes.
- The development of day-visitor nodes adjacent to sensitive ecological and cultural heritage areas (e.g. where there are increased risks to threatened species or important Aboriginal sites) will be avoided.

8.7.3 Walking

Walking is the most popular recreational activity in Namadgi. This ranges from short day walks to places of interest, long day walks, overnight bushwalks (mainly in the southern part of the park), and sections of extended walks such as the Australian Alps Walking Track. There are many opportunities in the park for keen walkers. However, the walking track network could be improved to include a greater range of short walks for people with limited ability, and a greater range of medium length circular walking tracks suitable for families and people of average ability.

The main environmental and/or social impacts of bushwalking are: localised environmental damage (e.g. firewood collection, vegetation trampling, litter); the use of tracks that have evolved over time but may be poorly sited and result in erosion and sedimentation; inappropriate human waste disposal. The limit of twenty-four overnight camping permits in the Bimberi Wilderness at any one time and a maximum party size of eight (s. 8.9) maintain a sense of isolation for walkers in the area.

POLICIES

- In consultation with the community and in particular, organisations with extensive experience of walking in Namadgi, a walking track strategy will be devised for the park, with the aim of providing a walking track system that caters for a range of abilities and experiences. The walking track strategy will include the following:
 - the development and maintenance of walking tracks to meet the specifications of the Australian Walking Track Classification Standard
 - establishment of a system that complies with the zoning prescribed in this management plan
 - a review of the range of existing walking tracks (including those outside the park) to identify 'gaps' in experiences for walkers
 - establishment of walking tracks that complement other visitor facilities such as day visitor picnic areas and campgrounds
 - the potential for links with historic routes such as stock and trading routes
 - consideration of locations for walking tracks suitable for visitors with disabilities (this may involve upgrading of existing short walking tracks)
 - provision of links to existing walking tracks to develop 'circular' walking routes
 - potential of tracks for other uses such as cycling and fire management
 - costings for walking track development and maintenance.

ACTION

- 132 Develop a walking track strategy for Namadgi that takes into account the details outlined in s. 8.7.3.

The Australian Alps Walking Track

ACTION

- 133 Manage the Australian Alps Walking Track in a manner that is consistent with the Australian Alps Liaison Committee policies and guidelines for the Track.

8.7.4 Cycling

Both road cycling and mountain bike riding occur in Namadgi. This is mainly day touring but there is also some overnight use. The main road cycling event is the annual Fitz's Hill Challenge that attracts a large number of participants. Although only part of the route lies within the park, there are management implications for this type of event. Safety is a key issue for road cyclists as the roads are not designed with wide shoulders or overtaking lanes and therefore cyclists are at risk particularly on hillcrests and corners. Public roads are however, the responsibility of Roads ACT.

Mountain bike riding is becoming increasingly popular in Namadgi. Currently it is allowed on all management trails in the park except those in the upper Cotter Catchment (Bimberi Wilderness). Over 400 km of management trails are available for mountain bikers. The Bicentennial National Trail provides the opportunity to connect with adjoining national parks in NSW via Yaouk. This trail has some limitations for cycling, including very steep sections. Mountain bike riding tends to be an individual or small group dispersed activity. Popular areas for riding are trails in the southern part of the park (Old Boboyan Road, Naas Creek, Grassy Creek Fire Trail, Mt Clear), Smokers Trail, the Mt Franklin Road (south to the Ginini carpark), trails north of Bendora Road and around Mt Coree.

Cycling is not permitted in the wilderness area in accordance with legislation. The primary reason for this is to maintain a sense of remoteness for those using the area for recreation. In addition, limiting access provides an important safeguard for Canberra's drinking water supply. Cycling is not permitted in the adjoining NSW Bimberi Wilderness. However, the Conservator may permit cycling in the wilderness, in writing, if the activity is for management purposes (see Glossary). In such circumstances, the use of a bicycle would be a substitute for a motor vehicle.

The main environmental and/or social impacts of cycling are: damage to trail surfaces including erosion (especially on steep surfaces and in wet conditions); vegetation damage when mountain bikes are taken off tracks; and conflicts with walkers including the possibility of collisions. Impacts of cycling can be minimised by confining the activity to roads and management trails and riding when road surfaces are dry.

Road cycling

POLICIES

- Road cycling is allowed on all public roads within the park.
- Park managers are not responsible for the safety of road cyclists; road cycling event organisers must liaise with the police on road safety matters.

Mountain biking

POLICIES

- Cycling is allowed on all existing formed roads/vehicle management trails within the park except those in the upper Cotter Catchment (Bimberi Wilderness). Cycling is prohibited south of the Mt Ginini carpark.
- The use of bicycles may be permitted in the Bimberi Wilderness for management purposes (i.e. where use of a bicycle substitutes for use of a motor vehicle, see Glossary). Such use is subject to written consent by the Conservator.
- Bicycle access to any new vehicle management trails will be assessed by management according to:
 - the ecological sensitivity of the area
 - the suitability of the trail
 - requirements to safeguard water supply.
- Trails may be temporarily or permanently closed to cycling if there is an unacceptable level of impact on the natural or cultural heritage values of the area or where there is considerable conflict between user groups.
- Cycling is not allowed on existing walking tracks. Cycling may be permitted on multi-use tracks if they are constructed for cycle traffic.

ACTION

- 134 Undertake monitoring as required to assess the impacts of cycling in collaboration with other Australian Alps agencies.

8.7.5 Motorised biking

Registered trail bikes and other all-terrain vehicles (e.g. quad bikes) are permitted off public roads in forest plantation areas around Canberra, but are not allowed off public roads in Namadgi or other nature reserves. Trail bikes and other all-terrain vehicles are incompatible with other nature based recreation pursuits.

The main environmental and/or social impacts of motorised bikes are: the hazard to other road/trail users (motorised and non-motorised) and to park fauna; dust and high noise levels; erosion and sedimentation; and illegal off-road access from public roads.

POLICIES

- Illegal use of trail bikes and other all terrain vehicles in the park will be controlled via access barriers.
- Appropriate legal action will be taken against illegal trail bike riders and users of other all-terrain vehicles.
- Trail bikes and quad bikes may be used on management trails for management purposes.

8.7.6 Horse riding

Horse riding activities in Namadgi generally take the form of pack-saddling, car-based camping with horses or day rides. Horse riders may be individuals, private groups, or commercial tour groups.

Horse riding is allowed on formed roads east of Old Boboyan Road and on Grassy Creek trail which is being trialled for use by horse riders (over one to two years). During the trial period, use of the trail will be monitored and assessed for environmental impacts, compliance by horse riders in staying on formed trails and restriction of overnight camping to the Mt Clear Pound Campground.

A visitor log book will be provided at a locked gate on the trail to assist in monitoring use, and signs will be erected to reinforce the need for horse riders to remain on the trail. Access to the trail is also subject to ongoing agreement by neighbouring landholders and formal arrangements for 'right of passage' for trail users through private property. Following its approval, a review of the route may be triggered at any time should environmental impacts, access and compliance issues arise.

Environmental impacts associated with horse riding are strongly related to numbers and the establishment of large camps for lengthy periods, as occurs in parts of Kosciuszko National Park (NSW NPWS 2006). This is currently not the pattern in Namadgi. Other environmental and/or social impacts that need to be considered in relation to horse riding (including pack-saddling) are vegetation damage due to trampling and grazing, erosion and sedimentation from bare ground at camp sites, pollution of streams, spread of weed species, conflicts with other users and competition for camp sites.

POLICIES

- Horse riding is allowed on all formed roads and management trails east of Old Boboyan Road and the Grassy Creek Trail to the south. These trails are:
 - Mt Clear Fire Trail
 - Naas Valley Fire Trail
 - Long Flat Fire Trail
 - Left Hand Creek Fire Trail
 - Gudgenby Creek Fire Trail
 - The Forest Fire Trail
 - Brandy Flat Fire Trail
 - Burnt Hill Fire Trail
 - Potters Fire Trail
 - Carey Fire Trail
 - Grassy Creek Trail (subject to a trial period)
 - Old Boboyan Road.
- Horse riders bringing in horse feed must use processed feeds or cracked grain that is considered to be weed-free. Horses must be fed this mix at least two days before entering the park. Hay feed is not allowed in the park as it contains weed seeds.
- Small group sizes (numbers of both people and horses) will be encouraged and may be enforced through a permit system.
- Horses must be tethered at least 30 m from lakes, streams, wetlands, huts and camping areas.
- Access to any new trails constructed east of the Old Boboyan Road will be assessed by management according to:
 - the ecological sensitivity of the area
 - compatibility with other uses
 - the suitability of the trail.

ACTIONS

- 135 Provide a visitor log book to assist in monitoring use of the Grassy Creek Trail and install signs to reinforce the need for horse riders to remain on the trail.
- 136 Place signs at huts to indicate that horses must be tethered at least 30 m from lakes, streams, wetlands, huts and camping areas (also see Action 67).
- 137 Promote the Australian Alps Horse Riding Code of Practice to horse riders.

Bicentennial National Trail**ACTION**

- 138 Liaise with the Bicentennial National Trail Committee about the route, facilities, campground bookings, visitor safety, and the code of practice for horse riders and other users (e.g. cyclists, walkers) of the trail.

Camping with horses

Mt Clear Pound is the only designated campground for vehicle-based and pack camping with horses. This campground is also used as an overflow area for large groups, which occasionally creates a clash between users. Facilities at the Mt Clear Pound require considerable upgrading to accommodate both user groups and provide adequate toilet facilities and water. This would require designated camping areas for horses and large groups, and appropriate access. Facilities such as toilets can be shared.

POLICY

- Vehicle-based camping and pack camping with horses is allowed at the Mt Clear Pound Campground and is not allowed anywhere else in the park.

ACTION

- 139 In consultation with user groups, redesign and upgrade the camping facilities at Mt Clear Pound Campground.

8.7.7 Snow play and ski touring

Ski touring (cross country skiing) is a minor activity in Namadgi as snowfall is only adequate for skiing for short periods in winter and spring. In most years, snow play can occur over several weeks, when snow is present in small patches on the higher peaks.

The main access road to the Brindabella Range, the Brindabella Road, and the Mt Franklin Road can be dangerous during wet, icy and snowy conditions. Weather conditions at the time snowfalls occur can be much more severe in the mountains than at lower elevations. Road safety is a key issue especially when people, who may be relatively unprepared for the road conditions, are attracted to the mountains by the prospect of snow-based activities.

Tobogganing is a popular but risky recreational activity. No formal tobogganing slope exists in the park or is proposed. Visitors need to be aware of the inherent risks if they choose to undertake this activity.

Snow play and ski touring are minor activities in the park. The main environmental impact is erosion and sedimentation from vehicle traffic on wet unsealed roads.

POLICIES

- Ski touring, tobogganing, snow boarding and snow play are allowed in all zones within the park (Table 8.2), however, no specific facilities will be developed for these activities.
- Roads may be closed when they are unsafe due to snow and weather conditions. Snow clearing for access to the snow will not be undertaken.
- Park management will liaise with Roads ACT and NSW Department of Environment, Climate Change and Water to improve warning signs along the Brindabella Road, and explore options to provide turning bays at road closure points.
- The use of motorised ski transport (skidoos) is not allowed except for management purposes.
- A designated tobogganing run will not be provided. Visitors may carry out this activity at their own risk.

ACTIONS

- 140 Liaise with the Australian Federal Police about driver safety issues in snow conditions and in relation to providing traffic control assistance throughout the winter months.
- 141 Liaise with Roads ACT regarding the need to close public roads where required by weather conditions.

8.7.8 Alpine or downhill skiing (mechanically assisted skiing)

Namadgi contains no extensive alpine area (above the tree line) (s. 5.7). No facilities exist for alpine (downhill) skiing or snow boarding, although there is a history of downhill skiing associated with the Canberra Alpine Club and the Mt Franklin Chalet (destroyed in the 2003 bushfire) (s. 6.2.2). It is even more unlikely that Namadgi will be suitable for this activity in the future as climate change is causing conditions to become less favourable. More suitable skiing locations with well-developed infrastructure exist in Kosciuszko National Park.

POLICY

- The development of facilities for alpine (downhill) skiing or snow boarding will not be allowed in the park.

8.7.9 Rock climbing and abseiling

Rock climbing groups, university clubs and commercial operators all use Namadgi for rock climbing and abseiling. Popular areas include Booroomba Rocks and the Orroral Ridge area. Booroomba Rocks is popular also for non-climbers because of its views over Canberra and the opportunity at the end of the walking track to view climbers on the rock faces below. Park managers are endeavouring to work with rock climbers to address management issues. In recent years a particular issue has been impacts caused by climbers camping in the car parking area at the Booroomba Rocks track head. This has been addressed through the establishment of the nearby Honeysuckle Campground though many climbers prefer the previous car-based bush camping site.

The main environmental and/or social impacts of rock climbing and abseiling are: vegetation trampling; creation of informal walking tracks (access routes); human waste disposal; disturbance of cliff-breeding birds (particularly the peregrine falcon); and scarring or altering of rock faces with removable or fixed bolts (the latter is considered to be relatively insignificant).

POLICIES

- Rock climbing and abseiling are allowed throughout all zones of the park and will operate under a code of practice established with user groups.
- Park management will work with rock climbing groups to minimise environmental impacts on climbing areas as outlined in a code of practice. Particular areas may be closed if impacts reach unacceptable levels.
- Sections of climbing areas or particular routes may be temporarily closed where peregrine falcons are breeding.
- Small group sizes will be encouraged to reduce impacts. Group size will be controlled through self-regulation based on a code of practice. A permit system may be introduced if self-regulation is ineffective.
- Rock bolts and fixed anchor points may be replaced or new ones installed by users according to the code of practice.

ACTIONS

- 142 Evaluate the establishment of a small walk-in bush camping area in the vicinity of, but away from, the Booroomba Rocks carpark.
- 143 Work with rock climbing groups to establish and promote a code of practice for rock climbers aimed at low impact use of the park and participation in maintenance and management of rock climbing areas.

8.7.10 Fishing and hunting

Fishing in the ACT is regulated under the *Fisheries Act 2000*. There are limited opportunities for fishing in Namadgi. Some of the rivers in Namadgi are classified as prohibited waterways, meaning that they are closed to fishing. These include the Cotter River upstream of Bendora Dam, which is protected as a refuge for threatened fish species such as two-spined blackfish, trout cod and Macquarie perch. Fishing in the Orroral River is prohibited upstream from the Orroral Tracking Station, to provide a source area for trout.

The other waterways in the park are designated as 'trout waters'. These rivers are subject to a closed season that extends from the long weekend in June to the beginning of the long weekend in October. Only artificial fly and lure fishing is allowed in trout waters i.e. no live bait which could lead to the introduction of pest species.

The main environmental and/or social impacts of fishing are: localised trampling of riparian vegetation; creation of riverbank tracks; campsite impacts; human waste disposal; and collection of native invertebrates and frogs for bait and introduction of exotic species used as live bait.

In accordance with Parts 4 and 8 of the *Nature Conservation Act 1980*, the taking of animals or use of a firearm and other hunting weapons is not allowed in reserved areas.

POLICY

- Hunting is not allowed in the park. Aboriginal people may be given permission to hunt for cultural purposes but will not be allowed to use firearms.

ACTIONS

- 144 Regulate fishing in Namadgi in accordance with the *Fisheries Act 2000*.
- 145 Educate recreational fishers about their responsibilities in relation to fishing regulations, and the risks of introducing alien fish species through the use of live bait and impacts on threatened and native fish species.

8.7.11 Boating, canoeing, kayaking, rafting

Limited opportunities exist for the use of watercraft within Namadgi. In order to protect water quality, the water supply reservoirs are not open to water-based activities. Rivers in Namadgi are generally too small to support watercraft and even during higher flows, instream conditions (e.g. rocky stream beds, fallen vegetation) often make streams unsuitable.

POLICIES

- Boating, canoeing, kayaking and use of any kind of watercraft on the water supply reservoirs (Corin and Bendora) is not allowed.
- To protect water quality and the urban water supply, watercraft are not allowed on the Cotter River above Bendora Dam.
- Non-powered watercraft may be used on other streams when conditions permit.

8.7.12 Flying

Flying includes gliding, hang-gliding, power-gliding, paragliding, use of ultralight aircraft, balloon flying, and use of light aircraft and helicopters.

Hang-gliding and similar pursuits are not common activities in the park as there are few suitable areas within close proximity to public roads. Occasional access to Mt Tennent has been granted for hang-gliding as part of the Tharwa Show.

The main environmental and/or social impacts of flying are likely to occur around take-off points. Noise from powered gliding equipment can affect other users. The noise and presence of light aircraft can intrude on the 'wilderness experience' for visitors using remote areas and therefore should be discouraged from remote sections of the park. In accordance with Civil Aviation Regulations light aircraft and helicopters must fly at a ceiling height of 500 ft over non-residential areas. However, at this height noise impacts can be considerable. Air Services Australia has the capacity to direct light aircraft away from wilderness and remote areas via guidelines for pilots set through *Fly Neighbourly Agreements* that have been established with other government agencies. It would be prudent for the Australian Alps national park agencies to work together with Air Services Australia to establish a Fly Neighbourly Agreement for the Australian Alps. Where possible, the impacts of powered flight will be controlled through a licencing or permit system in order to minimise the impact of noise on other users.

POLICIES

- Hang-gliding and paragliding is not permitted in Zone 1 of the park but is allowed elsewhere subject to permission by the park management and for tour operators, subject to licensing arrangements. Consideration will be given to:
 - possible impact on natural and cultural heritage values
 - safety
 - impact on other users.
- Hang-gliding and paragliding must be conducted in accordance with Civil Aviation Safety Authority regulations and pilots must be members of a club that is affiliated with the Australian Hang Gliding Federation.
- Vehicle access via management trails to a suitable hang-gliding or paragliding site will only be allowed if the organiser is a licensed tour operator (see s. 8.8.1) or if access is approved as part of a community event.
- Personal aircraft, such as ultralights, are not allowed to land or take off in the park except in an emergency.
- Light aircraft and helicopter flights over the wilderness area must be in accordance with Civil Aviation Authority Regulations and Air Services Australia guidelines.

ACTION

- 146 Work with the Australian Alps national park agencies and Air Services Australia to establish Fly Neighbourly Agreements over wilderness and remote areas.

8.7.13 Orienteering, rogaining and mountain running

These activities involve a large number of participants. For many years a small number of events have been conducted annually in Namadgi, which offers the best quality terrain in the ACT and is located within an hour's drive from Canberra. Orienteering events commenced in the area in the early 1970s, predating the park.

Orienteering and rogaining are conducted mainly off-track while mountain running occurs on roads and trails.

- Orienteering is a sport in which individual participants walk or run around a course navigating with a map and compass.
- Rogaining is the sport of long-distance cross-country navigation, in which teams of two to five people visit orienteering type control points within a set time period.
- Mountain running is conducted on trails in natural and semi-natural areas and includes an altitudinal component.

There are a number of considerations in conducting such events in a national park, the most significant being:

- potential impacts of the large number of participants on park values (e.g. trampling of vegetation, disturbance to wildlife and cultural heritage sites)
- social impacts, especially on visitors who have come to the park for nature study or to seek the solitude of the bush
- the need for toilet facilities, parking, and sites capable of withstanding high intensity use for short periods as staging areas.

(Also see s. 8.9 Group and special events.)

Environmental impacts can be mitigated by the careful selection of staging areas and the routes of courses, avoidance of sensitive areas or sites, cancelling or postponing events in adverse conditions (e.g. following heavy rain), provision of appropriate facilities (e.g. portable toilets), and initiatives such as car-pooling or using buses to reduce parking requirements. Social impacts may be more difficult to overcome, however, public notification of major events is important to advise other users. The impacts of the activities should be monitored as a basis for management policy.

Orienteering in the ACT operates under an environmental code of practice established nationally. In recognition of the need to minimise environmental impact, the Australian Rogaining Association Inc. has produced environmental guidelines for events.

Park management will develop policy guidelines to guide the assessment of event proposals of different types and sizes within the park. This document will take into account the need to protect natural and cultural heritage values, and will identify areas which are appropriate for different types and scales of events, including large events.

The above policy document will enable organisations proposing events in Namadgi to assess their suitability before submitting an application. Large scale sporting events should be planned with consultation between park management, other government agencies and the sporting organisations concerned. This would include scheduling of events, identification of suitable sites, routes and staging areas, provision of facilities and conditions pertaining to the permitted events.

An indicative guide to the type and location of events permitted in the park is at Schedule 3.

POLICIES

- Orienteering, rogaining and mountain running events will continue to be permitted in the park, subject to the following conditions:
 - Events will require a permit from park management. Fees will apply and a bond may be required (s. 8.9).
 - Event areas are to be chosen in consultation with park management. Events will not be permitted in the upper Cotter Catchment (Bimberi Wilderness). Overnight and off-track events will not be permitted in the middle Cotter (Bendora) Catchment.
 - Limits may apply to the size of an event, car parking, and the staging area.
 - Specific requirements may apply with regard to event facilities (e.g. toilets, placement of checkpoints) protection of park values (including water supply catchments) and impacts on other park visitors.
- Occasional large national or international events may be held in Namadgi. These should aim to showcase both the sport and a high standard of environmental management.

ACTION

- 147 Develop a policy document to guide the assessment of applications for events of different types and sizes within the park, including for large events, within twelve months of the notification of the Plan of Management on the ACT Legislation Register.

8.7.14 New activities

Over the life of this plan, new recreational activities may emerge that have not been catered for or specifically considered. For example, 'geocaching' is an emerging adventure game based on a 'treasure hunt' theme where participants in one party use a handheld GPS device to search for sealed caches left by other parties. This may involve digging a hole and burying a sealed container. Rock shelters, important for Indigenous cultural heritage and habitat, may be attractive sites for such activity. Geocaching is not permitted in national parks in NSW.

POLICIES

- In determining whether or not a recreational activity should be permitted in Namadgi, consideration will be given to:
 - its relation to the objectives and policies outlined in this plan
 - relevant legislative provisions and government policies
 - the capacity to undertake the activity outside the park
 - relevant policy within the other Australian Alps national parks
 - the potential impact of the activity on the natural and cultural heritage values of the park and on park user groups
 - public health and safety and the exposure of park management to risk.
- Digging holes and burying of objects for geocaching are not permitted in Namadgi. The use of the park for geocaching will be monitored and appropriate action taken if the activity has an impact on natural or cultural values.

8.8 Commercial recreation activities: policies and actions

8.8.1 Commercial activities

Commercial activities are those undertaken by organisations, businesses or individuals that charge a fee for services or products. A small number of tour operators offer services within the park. Visitors can participate in a range of activities, such as overnight bushwalking, mountain bike riding, rock climbing and abseiling, horse riding, sightseeing, picnicking and four-wheel driving. Most operators conduct day tours, while a very small number specialise in adventure tours, involving overnight activities.

Day tours by commercial operators provide an important service. In general their activities have minimal social and environmental impact and they assist in the management of the park by providing valuable education and interpretation services. There are social and environmental issues associated with overnight adventure tours. Repeat visits to the same area where there are no facilities (i.e. dispersed camping) can lead to impacts through inappropriate human waste disposal, trampling of vegetation, the creation of networks of informal tracks and disturbance to areas of natural and cultural heritage significance. This is particularly prevalent in areas where sites have not been hardened to withstand frequent use by substantial numbers of people. Large groups impact on other park users as they can dominate camping areas, create noise and cause overcrowding.

These impacts can be managed through a permit or licensing system, under which management principles are agreed with commercial operators, and are formalised and monitored. To date, commercial operators in the ACT have not required a licence. However, it is intended that management conditions for operators will be formalised and monitored through a licensing system.

Special access privileges, such as the use of closed management trails may be granted for the use of vehicles in Zones 2 and 3, especially to service outdoor education and adventure activities. Special access rights to defined management trails by commercial operators would require the written consent of the Conservator, be subject to licensing arrangements, attract an additional fee for the licence, and require an assessment of the impact on other users. A carrying capacity for commercial use of the park for tours would be determined, with particular attention to use of Zones 2 and 3.

POLICIES

- Commercial tours on public access routes are allowed in Zones 2 and 3 of the park. Access to Zone 1 (Bimberi Wilderness Area and Middle Cotter Catchment) will generally be prohibited. Vehicle access by commercial tour operators to Zone 1 may be considered and approved by the Conservator only in exceptional circumstances, where access is necessary to contribute to a wilderness or catchment management project that is approved and supervised by park management. Access to defined management trails in Zones 2 and 3 may be permitted subject to written consent from the Conservator and licensing arrangements.
- Issue of licenses to commercial tour operators will address the following criteria:
 - size of commercial groups, including guides, for dispersed overnight camping
 - size of commercial groups, including guides, in designated camping areas suitable for large groups
 - frequency of visits
 - the potential for impacts taking into consideration the current levels of impact on the area to be visited
 - potential impacts on other visitors, including exclusion of visitors as a result of the commercial tours
 - level of knowledge, professional training, and indemnity of the operator
 - accreditation of the operator e.g. Ecotourism Australia Accreditation
 - submission of trip plan and emergency evacuation procedures in case of emergency
 - safety of participants and other visitors.
- Commercial tour operators will be required to prepare environmental management plans for their operations in the park.
- New commercial tour operators will be subject to an initial one year trial period. Satisfactory performance during this period will be a prerequisite to issuing a longer term licence.
- Fees will be reviewed and determined in accordance with ACT Government policy. Special access privileges will attract a special access fee:
 - Commercial tour operators may be permitted 'special access privileges' by vehicle to particular management trails in Zones 2 and 3 subject to written consent by the Conservator and according to licensing conditions.
- Commercial tour operators will not be permitted to establish permanent camps, bases or storage areas in the park.
- A carrying capacity will be identified for specific activities and areas of the park and no new permits or licenses will be issued if the carrying capacity is reached in any part of the park. Carrying capacities will be subject to regular review and monitoring. A carrying capacity will be based on the limits of acceptable change model that addresses environment, economic, cultural and social parameters.

ACTION

- 148 Design and implement a legislated licensing/permit and accreditation system with associated fees for ACT tour operators in collaboration with tourism industry groups.

8.8.2 Industry

OBJECTIVE

Develop a working relationship with local and regional tourism agencies (government), industry organisations and businesses.

POLICIES

- Mutually beneficial relationships will be established with tourism operators for the delivery of information, interpretation and education services and environmental stewardship.
- Information will be provided as required to the tourism industry on visitor statistics, trends in park use, visitor management strategies and popular destinations and this information made publicly available.

ACTION

- 149 Participate in local and regional tourism forums and work with tourism bodies on licensing, accreditation and other industry-related activities.

8.9 Group and special events: objectives, policies and actions

OBJECTIVE

Group and special events permitted in the park are consistent with the protection of its natural and cultural heritage values and water supply catchments.

Group activities

Many different groups, such as bushwalking clubs, scout groups, schools, university clubs and other organisations, regularly use the park. As discussed above (see s. 8.7.13), frequent use of areas by large groups has the potential to cause considerable impacts over time, as well as affect other park users. Therefore it is desirable that the size of groups is limited. This may be achieved by a permit system or voluntarily, through education and awareness programs.

POLICIES

- The size and number of groups for dispersed overnight camping in the Bimberi Wilderness will be limited by permit. A maximum of twenty-four camping permits will be issued at any one time for the Bimberi Wilderness, with a maximum party size of eight.
- Small group sizes (ten people or fewer) will be encouraged for dispersed overnight camping in other areas of the park and may be enforced by permit.
- Large groups (more than ten individuals) will be encouraged to camp in designated campgrounds.
- Large groups can use designated camping areas suitable for large groups only.
- A fee paying permit system for overnight groups undertaking dispersed or bush camping in the park may be introduced if voluntary arrangements are unsuccessful or if there is an advantage for management.

Special events

Special events encompass a broad range of activities such as weddings, ceremonial events, concerts, sporting events (rogaing, orienteering, road cycling, running) and other public gatherings. The defence forces and the Australian Federal Police occasionally conduct training programs in the park. However, an agreement or protocols may be a more appropriate way to establish an ongoing arrangement with government organisations seeking use of the park annually or more frequently.

The level of impact by a particular event depends on where it occurs and the size and type of event. A small event generally has less impact and can occur without significantly disrupting other park users. A large event can cause substantial environmental impact, particularly if it involves off-trail activities and it is not carefully planned and managed (see s. 8.7.13). More suitable venues for some special events are located outside the park. However, Namadgi can provide for events

that will not cause an unacceptable level of impact. As noted in s. 8.7.13 park management will develop policy guidelines to guide the assessment of event proposals of different types and sizes within the park.

Park managers will work with event organisers to establish a collaborative approach to planning and managing events and to ensure that organisers take responsibility for any site rehabilitation or clean-up that may be necessary. It is proposed that event organisers be charged a bond that would be reimbursed if there are no repair and clean-up costs as a result of an event.

An indicative guide to the type and location of events permitted in the park is at Schedule 3.

POLICIES

- All organised events will require a permit from the park management. Permission for events will depend upon the nature of the activity and likely impacts on environmental, cultural and social values.
- Special events are not permitted in the upper Cotter Catchment (wilderness area).
- Fees for special events will be charged according to the Government approved fees and charges schedule for the park and reflect management and administrative costs.
- A bond may be charged to organisers of medium and large events.
- Off-track events will only be permitted if measures can be taken to adequately protect the environment and if these events will not significantly affect other park users.
- The number of large events permitted in any year in any part of the park may be limited.
- The issue of special event permits will be considered according to the following criteria:
 - the suitability of the event in a national park
 - the availability of venues outside the park
 - the size of the event
 - the capacity of the staging area(s) (e.g. toilets, camping facilities, parking) and of park management to oversee arrangements
 - the likely environmental and cultural impacts
 - the safety of participants and other visitors.

A place for learning

Communication, information, interpretation,
education and research



9.1 Primary management objectives

- **Opportunities are provided for the community to acquire knowledge of, and to understand and enjoy Namadgi's natural and cultural heritage, and to actively participate in protecting the values of the park.**
- **Survey, monitoring and research programs in Namadgi provide knowledge and understanding that underpin park management.**

9.2 Background

Namadgi has tremendous potential for education, interpretation and research programs. Canberra residents can access many areas of the park within a forty to sixty minute drive from the city. They can experience a diversity of landscapes, ecological communities and Aboriginal and historical heritage, all of which provide fertile ground for learning and enjoyment. Nature study and visits to cultural heritage sites are an important component of visitation to the park.

Communication in all its forms is an important component of management, to raise community awareness, gain active support for management policies and encourage community advocacy and stewardship for protected areas.

Communication encompasses the following:

- **Marketing and promotion:** informing the community about the park by effectively and appropriately marketing and promoting educational and recreational opportunities.
- **Information materials:** brochures and other materials that provide information about the park.
- **Interpretation programs:** face-to-face community education, including guided walks, and activities based on natural and cultural heritage.
- **Interpretation materials:** interpretive displays, audio-visuals, signs, brochures, codes of practice for user groups, and web-based educational information.
- **Education programs:** aimed at the formal education sector (including primary and secondary schools and tertiary institutions), including presentations, guided activities, web-based resources for schools, research programs and work experience opportunities.
- **Feedback:** from the community and monitoring of park use is integral to an effective communication program.

9.3 A place for learning

9.3.1 Information services

The combined Namadgi Map and Guide provides detailed information about the park and recreation opportunities, and is the most important publication for visitors. A range of other information material has also been developed for the park including displays at the visitor centre, interpretation signs provided at visitor 'nodes' throughout the park, walking track brochures, information for cyclists, the Alps codes for specific recreation activities, and information for campers. ACT Government websites are also becoming increasingly important for information about the park.

The Namadgi Visitor Centre fulfils an important role by providing information face-to-face, by phone, through the dissemination of printed materials, through interpretive displays and audio-visuals.

9.3.2 Interpretation

Interpretation is a means of communicating ideas and feelings to promote an understanding of our environment. It involves communicating with a range of audiences to arouse their curiosity and to promote their enjoyment of the world around them. Like formal education programs in schools, interpretation should aim for specific learning outcomes by conveying important messages to audiences. Interpretation processes include marketing, formal and informal education, and the presentation of information through a range of media, as well as face-to-face communication, printed material, static and interactive displays, and signs.

Face-to-face interpretation programs (ranger-guided activities) have been conducted in Namadgi for many years, as part of the Canberra-wide Explore program. A review of these programs in 2002 led to recommendations for improvements to the program administration, the types of activities being offered, promotion and marketing, and training for personnel.

Research suggests that visitors are willing to pay for interpretation and education services when appropriate services are offered. The success of a fee-paying program relies upon quality services and products that have a strong market base. For example, Aboriginal cultural tours and spotlight tours are extremely popular and visitors are willing to travel some distance and pay for such experiences. If activities are offered in a busy campground during Easter, success is almost guaranteed as a likely audience is already present.

Interpretation and education services are an essential element of management. However, programs require adequate resources so that objectives can be met and to ensure that services are innovative and professional. Successful programs need to be planned and delivered by trained personnel and continually evaluated.

9.3.3 Education programs for the formal education sector

In Namadgi, education programs for schools have primarily been delivered on a demand basis rather than by a formalised program to attract specific school groups. Formalised nature-based education programs for schools are well catered for at Tidbinbilla and Birrigai at Tidbinbilla, both of which deliver a range of environmental education programs for ACT schools. Outward Bound provides 'self-discovery' outdoor education experiences for Year 7 students and upwards. Opportunities exist for park management to promote key educational messages through Outward Bound programs by working closely with that organisation.

Specific 'niche' schools-based education programs could be developed for Namadgi for both local schools and the large number of inter-state school groups that visit the National Capital. The Namadgi Visitor Centre, which is close to schools in the Tuggeranong Valley, offers the opportunity for both indoor and outdoor activities using a range of media such as displays, audio-visual and outdoor interpretation trails.

9.3.4 Aboriginal cultural tourism

Interest in cultural tourism activities has grown markedly over the past five years. Casual and trainee Aboriginal staff have been able to assist with meeting some of this demand. Guided activities, events and education programs that are centred on Aboriginal history and culture provide important employment opportunities for Aboriginal people, as well as facilitating a reconnection to country, restoring tradition and community identity, and enhancing opportunities for community development.

9.3.5 Work experience, skills development and research

Tertiary students have been encouraged to join the summer volunteer program that provides valuable experience in practical park management. The park also supports tertiary research programs.

9.4 Communication, education, interpretation: management considerations

The following considerations are relevant to communication about the park and education and interpretation activities:

- **Revising the communication strategy:** In the past, communication planning has generally focused on park visitors and park-based interpretation for visitors. Park management would benefit from a communication strategy that provides guidance with regard to communication not only with visitors but also with the broader ACT community, including neighbours, other agencies, commercial tour operators, formal and informal education sectors, the mass media and other stakeholders.
- **Face-to-face interpretation programs** delivered in the park require a systematic approach to planning, delivery and evaluation.
- **The charging of fees** for interpretation and education services requires examination and clear policies.
- **The delivery of interpretation activities** has almost been exclusively the domain of park rangers. However, balancing the demand with other park management priorities is a continuing challenge. An investigation to assess the feasibility of alternative delivery methods—such as casual staff, volunteers or seasonal rangers, licensed tour operators—would be beneficial.
- **Education opportunities for local schools** are limited due to the largely remote location of the park and limited educational resources for delivery. However, a carefully planned environmental education program across all ACT nature reserves could identify particular niche programs for Namadgi.
- **Dissemination of information to the public** can be problematic because there are numerous entry points to the park and not all visitors call into the visitor centre when entering the southern part of the park. Alternative mechanisms for information dissemination, such as signs and brochures throughout the park and web-based information, must be effectively utilised.
- **A strong and steadily increasing demand exists for Aboriginal cultural activities** in the form of guided tours and educational programs. In relation to the international market, research by Tourism Australia confirms this interest, however, Indigenous communities are stereotyped as being almost wholly associated with the outback. Parks like Namadgi provide the opportunity to provide Aboriginal connection to country and interpretation of this connection outside of the stereotype. Suitably trained, local Aboriginal people are best suited to provide such services. Programs such as this have the potential to provide regular employment for Aboriginal people, but an ongoing interpretive training program for Aboriginal guides is essential.
- **Namadgi has benefited from the summer volunteers program** for tertiary students. It may be feasible to expand the program to provide a broader range of activities for students, such as the delivery of interpretation and education programs, and involvement in research and monitoring.

9.5 Communication, education, interpretation: objectives, policies and actions

9.5.1 Communication

OBJECTIVE

Provide cost-effective, customer focused communication services for the community and stakeholders.

POLICIES

- Communication with the community, government and non-government stakeholders will be a central element in delivering effective public relations, interpretation and education programs.
- Evaluation and monitoring processes will be incorporated into the communication plan to ensure that communication programs are regularly reviewed and adapted accordingly.
- Relevant community groups and stakeholders will be involved in the development and delivery of communication services in recognition of their connection with and knowledge of the park and specific aspects of its natural and cultural heritage (see s. 6.4).

ACTION

150 Develop a Communication Plan that includes strategies for communicating with the community, government and non-government stakeholders, and identifies new opportunities for interpretation services.

9.5.2 Interpretation services

OBJECTIVE

Promote Namadgi's natural and cultural heritage values through the delivery of a range of innovative and effective interpretation and education services.

Face-to-face interpretation and education

POLICIES

- Tour operators will be assisted as required with information about accreditation programs, the natural and cultural heritage values of the park, and codes of practice for recreational activities.
- A program of guided interpretation and education programs will be delivered through a range of mechanisms such as the use of in-house and community-based expertise, and casual employment of interpreters and licensed tour operators.

Interpretation facilities

POLICIES

- Signs, displays, brochures and electronic media including web-based interpretation will be identified as part of the Communication Plan (see Action 150).
- To enrich the story-telling content of interpretive materials, as appropriate, the community will be provided with opportunities to participate in their development.
- Interpretation facilities will be developed according to best practice principles including ongoing evaluation of their effectiveness.

9.5.3 Information services

OBJECTIVE

Provide high quality information for the community and visitors to the park.

POLICIES

- Information materials will be accessible to visitors at the visitor centre, and at key locations throughout and outside the park, particularly through the ACT Government website.
- Aboriginal connection to country will be included in information on the park by incorporating locally produced Aboriginal artwork and language into marketing, information, interpretation and educational materials and programs.

9.5.4 Education services

OBJECTIVE

Through assistance to the formal education sector, foster support and understanding for the protection of natural and cultural heritage and appropriate recreational use of protected areas.

POLICIES

- Work with educational institutions to enable them to provide high quality educational services in relation to the park and its values.
- When available, education materials and programs for teachers and students will be included on the ACT Government website.
- The park management agency will work collaboratively with tertiary institutions to identify opportunities for students to participate in and deliver interpretation and education programs.

9.5.5 Aboriginal cultural tourism

OBJECTIVE

Provide opportunities for Aboriginal people to deliver information, education and interpretation services.

POLICIES

- As far as practicable, Aboriginal people will have carriage of Aboriginal cultural interpretation and education activities.
- Cross-cultural awareness programs for a broad range of audiences will be considered as part of education and interpretation programs.
- Local Aboriginal people will be employed to assist in the development of interpretation facilities such as signs, displays and brochures when ever possible.
- As far as practicable, interpretive training programs will be provided for local Aboriginal people to facilitate the delivery of Aboriginal cultural programs by them.
- Opportunities for young Aboriginal people to reconnect with culture and country will be provided.

9.6 Survey, monitoring and research

Much of the knowledge base for the management of Namadgi derives from: (a) surveys of the flora and fauna and cultural heritage of the park; (b) monitoring of populations and the condition of species and ecological communities and cultural heritage places (s. 11.3); and (c) research that has been conducted in the park, as well in the Australian Alps national parks, and other parks and reserves in Australia and elsewhere. The aim of collaborative research in the park is to provide knowledge and understanding that is applicable to park management issues and supports adaptive management. The landscapes and ecosystems of Namadgi also provide a protected environment for carrying out more fundamental research and to use as a baseline against which changes in more disturbed environments can be measured.

9.6.1 Background

Survey, monitoring and research provide valuable information in relation to:

- the functions of natural systems and their interaction with cultural and economic systems
- the behaviour and survival needs of plants and animals
- the human history of the area, including both the Aboriginal and European economies and associated influences on the natural and cultural values of the park
- how management should proceed in dealing with issues (such as fire, recreation, control of introduced species) by providing a structured learning environment and a basis for adaptive management.

Physiography, geology and geomorphology of the Canberra region were the subject of some of the earliest detailed studies in Namadgi. These studies were linked to the development of the Australian Capital Territory, Canberra City and its water requirements. The first botanical study was made in 1911 when RH Cambage recorded 351 plant species native to the ACT. This included thirty plant species from Tharwa to Gudgenby, Middle Creek and the Upper Cotter.

Other research in Namadgi has addressed hydrology, botany, forest ecology, forestry, zoology, archaeology, introduced species and how natural systems respond to fire. Natural heritage, particularly the alpine and subalpine areas of the Brindabella Range and the upper Cotter Catchment has been by far the primary focus for research.

In the early 1950s an Alpine Botanic Garden was partially established on the summit of Mt Gingera to serve as an annex to the Australian National Botanic Gardens in Canberra. The garden included a range of *in situ* subalpine species with introduced alpine and subalpine plantings. A shelter hut (Pryors Hut) was built in 1952 for workers and species were labelled, however the project was eventually phased out. The Snowy Mountains Authority established a small planting of Scots Pine adjacent to the hut to trial this species for re-vegetation of construction sites within Kosciuszko National Park.

A significant applied research project in the Brindabellas was the establishment, maintenance and monitoring of arboreta that were subsequently included in the park. The purpose of the arboreta was to investigate the potential of a range of exotic species, mainly conifers, for plantations. This research involved the Commonwealth Forestry Bureau, the later Forestry and Timber Bureau, Forest Research Institute and CSIRO (s. 6.2.2). Experiments associated with developing commercial forestry yields of hardwoods were undertaken also in the northern Brindabellas through the 1960s and 1970s. These included establishing trial plots with variations in thinning and complementary plantings.

Between 1964 and 1967, the Watershed Management Section of the Forest Research Institute established eleven catchment monitoring stations on creeks within the lower Cotter Catchment as part of a program to compare the forest hydrology of commercial pine plantations with that of native forests. By 1977 there were sixteen gauged catchments in the lower Cotter. Small weirs from this project still exist on some streams in northern Namadgi. The program examined streamflow, canopy and litter interception, and water quality—including the relationship between water chemistry and geology. In 1980 a hot burn of the Bushranger Creek Catchment, which had not been burnt since 1939, resulted in a doubling of base flow from the catchment for two summers due to the absence of transpiration from vegetation (O'Loughlin *et al.* 1982). Flow monitoring across the stations was continued by CSIRO until 1985.

In 1975, CSIRO established a series of 20 x 20 m fire ecology plots near Piccadilly Circus to research the effects of fire frequency upon a Snow Gum/Mountain Gum subalpine plant community. Each plot was managed to a specific fire regime varying from no fire (control plots) to burning as frequently as possible. The experiment was reviewed and consolidated into fewer plots in 1997, and remains one of the longest-running fire ecology experiments in Australia.

Since the establishment of Namadgi as a national park, scientific research has generally progressed through partnerships with other Australian Alps national parks agencies, tertiary institutions, Cooperative Research Centres (CRCs), and the ACT's contracted supplier of water, ActewAGL. Nationally recognised programs include dendrochronology (fire-history dating) of

Snow Gum woodlands (Banks 1982, 1989), research into subalpine frogs (Osborne 1995), dating and palaeobotany of bogs and fens (Hope 2003), control of feral pigs (Hone 2002) and assessing the effects of environmental flows on threatened aquatic ecology in the Cotter River (CRC for Freshwater Ecology, ActewAGL) (Cottingham *et al.* 2005). In recent years, rare and threatened species such as the northern corroboree frog, spotted-tailed quoll and threatened fish species in the Cotter River have been a key area of research.

Unlike botanical studies that began early last century, there was little faunal research in Namadgi until the 1970s. Faunal studies have significantly increased from the early 1990s. Namadgi provides a suitable environment to conduct fundamental research on animal biology and ecology (e.g. Sims (2006) on the cooperative and colonial nesting habits of the migratory dusky woodswallow (*Artamus cyanopterus*)). One significant long-term research project has been bird-banding at sites on New Chums Road, Bushrangers Creek and Old Mill Road. Work began there in 1961 and has continued ever since (Wilson 1999). The earliest vertebrate survey was conducted in the Cotter Catchment (Eberhard and Schultz 1973). Later surveys included mammals in the Gudgenby Catchment by Tidemann *et al.* (1979), ecological surveys by Gilmour *et al.* (1987) in the Mt Tennent–Blue Gum Creek area and Helman *et al.* (1988) in the upper Cotter Catchment, and a survey of treeless vegetation above 1 000 m by Helman and Gilmour (1985). Vertebrate surveys have been undertaken in the Gudgenby area (Lintermans 1993) and fish surveys in the Cotter Catchment (Lintermans and Rutzu 1990). The bird population of Namadgi is well known, based on the monitoring by Canberra Ornithologists Group over many years (Taylor and Canberra Ornithologists Group 1992; Annual Bird Reports in *Canberra Bird Notes* published by Canberra Ornithologists Group). In recent years the research focus has turned to forest dwelling mammals, threatened species and post-fire fauna surveys to monitor and document responses to fire.

Archaeological research has generally progressed through small-scale survey (although notable early programs include the analysis of seasonal occupation sites) (Flood 1980; Winston-Gregson 1978), investigation of several rock art sites, and the undertaking of an integrated multi-disciplinary (ecological, palaeobotanical, archaeological) survey of the Scabby Range. A comprehensive social history of twentieth century occupation has been compiled over the last twenty years (Higgins 1990a, 1992, 1994, 1998, 1999).

After the 2003 fire, archaeological surveys were conducted in forty-six locations in Namadgi to take advantage of exposures of Aboriginal artefacts as a result of reduced biomass. Artefacts were discovered at all locations including a massive open scatter in a location where previous to the fire only two artefacts had been sited. An assessment was also undertaken of the effects of the fire on the ecosystems in the ACT including those in Namadgi (ACT Government 2003).

Work to assist in the restoration of *Sphagnum* bogs to their pre-fire condition is ongoing. Restoration is important for the protection of Canberra's water supply and the maintenance of biodiversity within the bogs. There has been and continue to be investigations addressing a range of issues relating to fire such as post fire regeneration, impacts on water quality and hydrology, landscape responses to fire and impacts on fauna. An introduction to research that has been undertaken in Namadgi as well as landscape recovery work following the 2003 bushfire is contained in NPA (ACT) (2006).

9.7 Survey, monitoring and research: management considerations

Survey, monitoring and research are fundamental to building the knowledge and understanding necessary for professional park management within an adaptive management framework. Adaptive management has evolved from recognition that there is an inherent uncertainty and unpredictability in the future response of systems to change. Only a few research programs conducted in the park have been long-term and aimed at understanding the dynamic nature of natural systems. Such projects usually require a long-term commitment to research and monitoring which is difficult to maintain as organisations inevitably undergo change leading to shifts in priorities and resources. However, long-term research is critical to understanding natural systems.

The following considerations are pertinent in relation to building knowledge and understanding of the natural and cultural heritage of the park:

- Collaborative research between Government agencies and research institutions has been conducted in the park area over the past thirty to forty years. This has generally reflected the priorities of the researchers and/or research institutions rather than those of land and park managers. In addition, projects have often lacked systematic planning and coordination. Park managers, in collaboration with research institutions, could improve this situation by developing a research program that is directed towards the needs of park management. The park also provides opportunities to conduct research that addresses wider biological, ecological, hydrological and geomorphological questions, including those of a theoretical nature.
- Mechanisms to encourage collaborative research programs are important in order to ensure that limited research funding is spent in the most effective and efficient manner.
- The intensity and extent of the 2003 fire (91% of the park was burnt to varying degrees of intensity) has stimulated interest in many aspects of fire ecology and management relating to flora and fauna recovery, hydrology and water quality, riparian recovery and soil erosion. The Australian Alps National Parks Expert Scientific Panel Report, *Beyond the Bushfires of 2003: Environmental Issues in the Australian Alps* makes recommendations on policy matters regarding the effects on the Alps national parks of the widespread and severe 2003 fire and identifies priority research projects relating to fire and fire management (see Chapter 7). The 1986 *Namadgi National Park Management Plan* recognised the biodiversity values and undisturbed nature of the middle and upper Cotter Catchment and its importance for research by identifying it as a Special Scientific Area. The intention of this plan is to further scientific enquiry through systematic planning for research, both within the Special Scientific Area, the whole of the park and within a regional context.
- Climate change is emerging as a priority research area internationally, nationally and regionally. Climate change poses a serious threat to many of the specialised, high altitude species in the park such as the northern corroboree frog and the bogong moth, while other species, including introduced plants and animals, may expand in range. A warmer, dryer climate will impact on catchment hydrology and water supply and the subalpine *Sphagnum* bogs may contract, resulting in a reduced water storage capacity.
- Being a small jurisdiction, it is not practical for the ACT to address climate change and its impacts in isolation. A collaborative approach across the Alps and Southern Tablelands region will be most effective in measuring the impact of climate change. Kosciuszko National Park participates in world wide climate change monitoring programs under the Global Observation Research Initiative in Alpine Environments (GLORIA) and the United Nations Environment Scientific and Cultural Organisation (UNESCO). It would be beneficial for the ACT, as part of the Australian Alps Bioregion, to participate in this research by including within the Namadgi research program, indicators from the Kosciuszko climate change research project.
- Natural and cultural heritage surveys are required in the eastern section of the park including the Booth and Mt Clear Ranges and Naas Valley which have received limited scientific attention to date. Systematic survey has been confined to fire trails as part of regular fire trail maintenance activities. Flora, fauna and heritage surveys for this area will be a high priority for research.
- The Sites of Interest/Significance Database that documents over 1 200 sites in the park is a primary source of information for the documentation and mapping of important values and sites. A collaborative effort across the land management agency to keep the database current is important if it is to continue to fulfil this valuable function. The database requires coordinated management, a field audit to assess the sites, and guidelines for data management to ensure that the history of each site is documented and new sites are entered. The effectiveness of the database would be enhanced if were available online across the agency and to research institutions. Consideration would need to be given to keeping secure the location of sensitive sites such as those identified by the Aboriginal community or the location of threatened species that may attract illegal collectors.

- Research on flora and fauna is licensed under the *Nature Conservation Act 1980*, which specifies that animals cannot be taken or killed, and that native plants cannot be taken without a licence. Licences are issued under the delegation of the Conservator. Prior to the commencement of any project involving animals, approval of the research proposal from an Animal Ethics Committee is required. This is constituted under an approved *Licence for the Use or Breeding of Animals for the Purpose of Research or Teaching in the Australian Capital Territory* issued under the *Animal Welfare Act 1992*.
- Limited research relating to visitors using the park has been conducted in Namadgi. Regular monitoring of visitor numbers occurs at various locations and the number of campers using the campgrounds can be ascertained through booking statistics. It is useful for park managers to understand more about visitors, such as their origins and length of stay, attitudes towards the park, activities they pursue, and their understanding about park management. Such information assists in designing interpretation and information products and other visitor services.

9.8 Survey, monitoring and research: objectives, policies, and actions

9.8.1 Survey, monitoring and research planning

OBJECTIVE

Survey, monitoring and research programs are planned to provide information that is directly relevant to management issues and expands current knowledge about park values.

POLICIES

- Survey, monitoring and research in Namadgi that assists in building the knowledge and understanding necessary for professional park management will be planned, undertaken, encouraged and supported.
- Collaboration with regional partners, such as the Australian Alps national parks and research institutions, in the formulation and implementation of research priorities and projects will be pursued.
- As far as practicable, information and knowledge on the park will be made accessible to field managers, researchers, stakeholders and the community through publications, web-based media and other forms of communication.
- MOUs will be established with research institutions as required to secure a commitment to research priorities and programs.

ACTIONS

- 151 Establish a research committee or working group to: (a) prepare an inventory (including a bibliography) of past and current surveys, monitoring and research in Namadgi; (b) analyse survey, monitoring and research requirements and priorities; and (c) prepare a summary report.
- 152 Using the recommendations of the research committee, plan and coordinate survey, monitoring (s. 11.3) and research programs in the park that aim to:
 - increase knowledge of park values and conservation significance
 - improve knowledge of natural and human-induced processes in the park
 - understand the effect of fire on park values as the basis for appropriate fire management strategies
 - understand the nature and rate of any change in condition of park values
 - improve understanding of the economic and social values of the park
 - support adaptive management for natural and cultural resource conservation
 - promote research at a regional and bioregional level on issues such as climate change
 - support monitoring of designated visitor sites for unacceptable impacts.

- 153 Prepare a prospectus and actively promote and encourage the involvement of research institutions, students and individuals to conduct research relevant to park management.
- 154 Grant licences for research in accordance with legislative requirements. Research not subject to legislation will be assessed to determine possible impacts on park values, park visitors or general public safety.

9.8.2 Visitor research and monitoring

ACTION

- 155 Develop a systematic, visitor research program that addresses:
- visitor statistics
 - visitor satisfaction and attitudes
 - the types of activities that visitors are undertaking
 - impacts of visitor use (see also Action 121).

9.8.3 Natural and cultural heritage: survey, monitoring and research

POLICIES

- A systematic process for the survey, mapping and recording of cultural heritage values of the park will be established (see s. 6.5.7) with a particular focus on heritage themes and areas in the park that have not been adequately addressed in previous surveys.
- Priorities for natural heritage survey, monitoring and research programs include:
 - catchment health and management (see Chapter 4)
 - fire management, so as to inform adaptive fire management strategies—particularly in relation to fuel reduction methods and ecosystem response (see s. 4.6.3 and s. 7.4.1)
 - indicators and measures for climate change that are consistent with Kosciuszko National Park research programs (s. 5.9)
 - systematic survey and mapping of vegetation (s. 5.9) with priority to the eastern section of the park (identified in s. 9.7)
 - systematic survey and mapping of fauna (s. 5.12) with priority to the eastern section of the park (identified in s. 9.7)
 - research required for the management of pest animals with a high priority afforded to fox and dingo/wild dog control measures (s. 5.22).

9.8.4 Information access and management

ACTIONS

- 156 Establish and maintain a central repository (including electronic copy and listing) of research relating to Namadgi.
- 157 Establish agreed procedures for the creation, management and distribution of information related to the Sites of Interest/Significance Database.
- 158 Regularly update and maintain the Namadgi Sites of Interest/Significance Database including the GIS spatial information system.
- 159 Ensure that staff are trained in, and comply with, requirements for data and information management.
- 160 Ensure that the Database is maintained in collaboration with other agencies (as appropriate) so that data are updated.
- 161 Explore opportunities for making the Database accessible across relevant agencies, to research institutions and the community.
- 162 Develop protocols in relation to information security for sensitive sites, such as those that have been identified by the Aboriginal community or require security for other reasons (e.g. the presence of rare or threatened species).
- 163 Continue to link and incorporate the Namadgi Database with the Australian Alps Scientific Sites Database.
- 164 Regularly update and maintain the Namadgi Reference Library.

A place with community

Neighbours, community groups and volunteers



10.1 Primary management objective

Partnerships and collaborative programs are fostered to effectively involve park neighbours and the community in a range of park management activities and cross-border issues.

10.2 Background

Community participation is an integral component of protected area management. Some ACT community groups have a long association with the area that is now Namadgi National Park (e.g. the National Parks Association of the ACT, Canberra Bushwalking Club, Canberra Alpine Club, Kosciuszko Huts Association), as do individuals and families (s. 6.2.3). Since Namadgi's inception, many other groups and individuals have been involved in its management and have formed a strong attachment to the park. These organisation and individuals seek meaningful and ongoing involvement in the conservation of the area and associated management activities.

10.3 Community involvement

10.3.1 Who is community?

For the purposes of community participation in Namadgi, community is made up of people or groups of people with a particular or active interest in the park including:

- park neighbours (private and government landholders)
- ACT Natural Resource Management Advisory Committee
- Gudgenby Bush Regeneration Group
- Landcare and catchment groups
- Waterwatch
- Kosciuszko Huts Association
- Canberra Alpine Club
- National Parks Association of the ACT
- Outward Bound
- Green Corp
- recreation groups and users (Chapter 8)
- Conservation Volunteers Australia
- research and tertiary institutions
- individual volunteers
- Canberra Bushwalking Club
- Canberra Ornithologists Group
- Friends of ACT Arboreta
- Conservation Council of the South East Region and Canberra
- Friends of Grasslands
- Field Naturalists of the ACT.

10.3.2 What is community participation?

Community participation can include commenting on planning and policy, participating in policy formulation, and taking part in on-ground activities such as weed control or revegetation programs. Community participation in Namadgi may include community involvement in a range of activities including but not limited to:

- water quality monitoring
- research
- heritage restoration and maintenance
- track construction and maintenance
- interpretation programs
- provision of visitor services
- erosion control
- bushfire recovery
- discussion on policy and programs through meetings and forums
- feral animal control.

Communication with community groups involved in the park occurs on a regular basis. Generally, volunteer involvement is centrally coordinated and supported in the agency to ensure that Occupational Health and Safety requirements are met, and that equipment and personnel are available as required. To date, formal arrangements with volunteer groups, such as a Memoranda of Understanding (MOU), have generally not been made. The MOUs between the ACT Parks and Conservation Service and Canberra Alpine Club (1989, 1998) are exceptions. Other groups and organisations, including the Kosciuszko Huts Association and Outward Bound Australia, have requested a formal agreement to clarify roles and responsibilities.

10.3.3 Neighbours

Rural neighbours are mainly concerned with the interface between the park and their land. The focus is on issues that apply across land tenures and that arise through shared boundaries. Neighbours include:

- ACT and NSW rural and other landholders
- ACTEW
- local government (Shire Councils)
- NSW Department of Environment, Climate Change and Water
- Tidbinbilla.

Communication between ACT rural landholders and park rangers occurs frequently but on an *ad hoc* basis. *Land News*, a newsletter produced by the Community Programs Officer, provides an avenue for communication about land management programs and issues that are of interest to the rural sector. The ACT Rural Forum, which is open to all ACT rural lessees, meets three or four times a year to provide the opportunity for Government agencies and rural lessees to exchange information and views. Formal mechanisms for regular communication with NSW rural neighbours have not yet been established.

Land previously managed as pine plantations (the 2003 bushfire destroyed most plantations) is the most extensive neighbouring land use in the ACT. The primary focus for this land is now rehabilitation and revegetation to stabilise soils and protect water quality. A strategy of integrated management of these lands and the national park will be adopted.

Namadgi also borders the Kosciuszko and Brindabella National Parks and the Scabby Range Nature Reserve. These areas are part of the Australian Alps national parks and NSW and ACT park managers for these parks (together with their Victorian alpine counterparts) meet regularly through the Australian Alps cooperative management program. Informal meetings with regional staff are arranged as required. The agencies are working towards common land management objectives.

10.4 Community involvement: management considerations

Many groups that regularly use the park and may have done so over a long period feel a sense of stewardship and seek opportunities to take on responsibilities, in particular, to address issues relating directly to the recreational use they and others engage in. Particular examples of such involvement include the work of the Gudgenby Bush Regeneration Group in the former pine plantation area of the Gudgenby Valley, earlier regeneration work and construction of the Yerrabi Track by the National Parks Association of the ACT, and conservation work at cultural heritage places by the Canberra Alpine Club, the Kosciuszko Huts Association and the National Parks Association.

Volunteers require ongoing planning, support and coordination to ensure that:

- occupational, health and safety standards are met
- due process is followed, so that work, accidents and other relevant matters are properly recorded for risk management objectives
- roles and responsibilities are clearly defined and understood.

Management of these issues is coordinated centrally within the agency and followed through at an operational level.

Government agencies managing neighbouring lands have formal and informal communication mechanisms and are represented in cross-jurisdictional planning bodies such as the Australian Alps co-operative management program, regional natural resource management and catchment management programs. However, there are opportunities for more collaboration in operational matters, research, monitoring and knowledge-sharing.

Significant sections of the park border rural lands. Rural neighbours have identified dingo/wild dogs, fire management, pest plant and animal control and boundary fencing as issues that require ongoing involvement and consultation. An integrated, collaborative effort with neighbours on cross-tenure land management issues will provide mutually beneficial outcomes for all concerned. Regular communication with all rural neighbours will help to achieve this.

There may be opportunities for some neighbours to provide visitor services, such as accommodation, information dissemination and guided tours that are complementary to those services provided by park management.

Research institutions in Canberra regularly conduct research in the park (see Chapter 9) and many researchers have links to community organisation such as those listed above. Researchers form a significant part of the park community and often have a keen interest in management issues.

10.5 Community involvement: objectives, policies and actions

10.5.1 Volunteers and community groups

OBJECTIVE

Effective opportunities for the community to participate in the protection and management of the park are facilitated.

POLICIES

- Opportunities will be identified for the community to actively participate in the management of the park and to contribute to meeting management objectives.
- As appropriate and where possible community groups will be supported by:
 - providing funding assistance
 - providing tools and equipment
 - promoting groups and their achievements
 - guiding the development of work programs
 - maintaining occupational health and safety work standards through the provision of relevant training for volunteers.
- As appropriate and where possible agreements will be developed with volunteer groups, commercial and non-commercial organisations to establish protocols for liaison, park access and OH&S management and other issues of mutual concern. Such groups could include, but not be limited to:
 - Kosciuszko Huts Association
 - Outward Bound
 - Gudgenby Bush Regeneration Group
 - Canberra Alpine Club
 - National Parks Association of the ACT
 - Canberra Bushwalking Club
 - Other recreation and interest groups.

ACTIONS

- 165 Foster stewardship by recreation groups through cooperative projects, such as the development and promotion of minimal impact materials, codes of practice and other identified projects.
- 166 Involve community groups in the collection and recording of data for monitoring programs.
- 167 Provide work experience opportunities for individuals, secondary school students, tertiary students and Aboriginal people.

10.5.2 Neighbours

OBJECTIVE

Cooperative relationships with neighbours encourage mutually beneficial land management programs that address issues of common concern.

POLICIES

- Communication mechanisms identified in the Communications Plan (see Action 150) will be established for ongoing liaison with rural neighbours both in the ACT and NSW, to facilitate cooperative working relationships on issues of mutual concern (for example, fire management, pest plant and animal control programs, straying stock, park access and boundary matters).

ACTONS

- 168 Ensure that the planning and management of neighbouring ACT Government land is integrated at both a strategic and operational level, addresses border and land management issues (such as water quality, weeds, feral animal control, fire management and recreation), and includes information services.
- 169 Continue to participate in cross-border cooperative management programs such as those established through the Australian Alps Liaison Committee and, when feasible and advantageous, undertake park operations jointly.
- 170 Under direction of the ACT Rural Fire Service participate in neighbouring NSW Rural Fire Service and NSW Parks and Wildlife fire planning and operational programs.
- 171 Work with neighbours who provide or are planning to provide accommodation and other nature-based tourism services to establish a mutually beneficial and co-operative relationship.

A protected and managed resource



11.1 Primary management objective

Systems for operational management are developed to best practice standards to provide efficient, effective and informed management.

11.2 Environmental quality

Environmental quality is primarily concerned with the following:

- water quality
- water and energy consumption
- air quality
- noise
- waste
- use of chemicals
- contaminated sites.

Park managers are responsible for 'quality control' of the environment and therefore regularly monitor the state of the environment to assess certain parameters. This process is generally addressed through a monitoring and evaluation program (see s. 11.3).

11.2.1 Water quality

Clean water is essential both for the health of aquatic ecosystems and to provide safe drinking water for people. The *Environment Protection Regulations 2005* set out water quality standards for the protection of:

- waters used for domestic water supply (applicable to the Cotter Catchment)
- aquatic habitats (relevant to all streams and wetlands in the park)
- recreational use (where people engage in water-based recreation activities).

Protection of water quality in the water supply catchments of the park is addressed in Chapter 4 (s. 4.6.3).

Domestic water

ACT Health is responsible for monitoring water quality in the Cotter Catchment reservoirs and ACTEW conducts monitoring in Cotter Catchment streams. Park management is responsible for monitoring elsewhere in the park. Currently ACT Health is contracted to monitor water in the Gudgenby River, where water is drawn for the Glendale Depot. Since the 2003 fire, water from the Gudgenby River has been unsafe for drinking and no water treatment for the depot is available.

Aquatic habitat

Under its licence to take water, ACTEW is required to undertake an extensive water quality and stream-gauging program in the Cotter Catchment. This information is gathered to assess environmental health of the river, assess the adequacy of environmental flows, and to assess and minimise the impact of urban water supply activities. Waterwatch volunteers regularly conduct biological and chemical monitoring in six locations in the eastern section of the park.

Recreational use

As there are limited opportunities for activities, such as swimming, canoeing, kayaking and sail boarding in Namadgi, water in the park is not regularly tested for its suitability for recreational use.

The following are important considerations with regard to the management of water quality:

- The potential effects on water quality from management activities (e.g. fire suppression, weed control, road works and maintenance) need to be assessed and appropriate strategies adopted to reduce any damaging impacts (s. 4.6.3).
- A coordinated, collaborative arrangement with key stakeholders for water quality monitoring is required (s. 4.6.4).
- A systematic water quality monitoring program across the park would provide useful information about changes to water quality and the cause of such changes (s. 4.6.4). In particular, the monitoring of the effects of the 2003 fire on water quality (for the next five to ten years), especially following heavy rains would provide a better understanding of landscape change in response to fire. Monitoring would also provide information about:
 - the state of aquatic ecosystems
 - the possible health risks for people drinking water directly from streams
 - the impacts of recreational use on water quality
 - possible sources of stream pollution.

OBJECTIVE

Water quality is monitored to provide information about aquatic ecosystem health, ecosystem responses to natural events, the impact of human activities and the suitability of water for drinking. Appropriate management strategies are employed to maintain water quality standards.

POLICIES

- Park management activities, visitor use and infrastructure provision will be managed to ensure that water quality is not diminished.
- Water quality monitoring will be planned and implemented in collaboration with key stakeholders (e.g. ACTEW; Waterwatch facilitators) (see details in s. 4.6.4).
- Park visitors will be provided with information about the risks of drinking water from streams in the park and how to treat water before drinking it.
- Appropriate measures will be taken to eliminate the causes of water pollution.
- Safe drinking water for Glendale Depot and at other locations in the park will be provided as required.

11.2.2 Water and energy use

OBJECTIVE

Minimise greenhouse gas emissions, energy and water use by implementing ecologically sustainable design principles and technologies.

POLICIES

- Park operations will be aligned with the objectives and principles of the ACT water resources strategy *Think water, act water* (ACT Government 2004), the *ACT Greenhouse Strategy* (ACT Government 1999f) and the ACT Government Energy Management Program.
- Water and energy efficiency principles and technologies will be applied to the design and development of new buildings, park infrastructure, landscaping, and retrofitting of buildings, using energy and water rating schemes where feasible.
- The use of renewable energy sources will be evaluated for infrastructure in remote areas.

ACTIONS

172 Use fuel efficient transport for park operations as far as practicable.

173 Ensure that water extraction is subject to licensing as required under the *Water Resources Act 2007*.

11.2.3 Air quality

Air quality in the park is generally of very high standard. Localised pollution is primarily caused by vehicle emissions along major roads and in car parks. Smoke from prescribed burning and bushfires is likely to occur seasonally. ACT Parks and Conservation are authorised by the EPA under the *Environment Protection Act 1997* to conduct prescribed burning. The *Smoke Management Conditions* and *Smoke Management Guidelines for Prescribed Burning* are specified under the Environmental Authorisation 412.

11.2.4 Noise

Due to the absence of development in the park, noise pollution is generally not an issue. However, vehicles, groups at campgrounds, or management work can be occasional sources of localised noise. Aircraft noise, particularly helicopters, may also affect visitors, and this can be particularly bothersome in the remote areas of the park where people expect a quiet and natural atmosphere.

OBJECTIVE

As far as practicable, ensure that noise does not impact on park visitors.

POLICIES

- Generators are not permitted in park campgrounds.
- Where practicable, campsites will be located at a suitable distance from car parking areas and day use areas.
- The use of heavy or noisy machinery in or near campgrounds and picnic areas will be avoided at times when there is high visitor use.
- Visitors will be encouraged to be aware of the impacts of noise on others and to act accordingly.

ACTION

- 174 Liaise with scenic flight operators and other air services to ensure that light aircraft and helicopters are aware of their obligations in relation to flying over the wilderness area (see s. 8.7.12).

11.2.5 Waste management

Park managers have run a successful program for some years encouraging visitors to take all their garbage with them for disposal elsewhere. However, wastes are inevitably generated as a result of park management activities. All waste is dumped at the closest municipal landfill.

A suitably licensed contractor disposes of sewage from pump-out and septic toilet systems at locations approved by ActewAGL.

Overnight bushwalkers and groups using remote areas are encouraged to bury faecal waste or to carry it out for appropriate disposal. The latter option is not widely practised except by Outward Bound, which provides and manages portable toilet disposal units for group activities when feasible.

Disposal by burying is the most practical and desirable option for most people and this has been promoted to park users for years. The chances of animals digging up the waste, or of streams becoming contaminated are minimised if human faecal waste is buried at a depth of 15–30 cm, and at least 60 m away from watercourses. The digging and use of temporary latrines by groups is not an appropriate method of disposal, as a larger concentration of faeces needs more time for decomposition. A large volume of faeces in one area increases the likelihood of other visitors or animals coming into contact with it, or the groundwater becoming contaminated.

In montane areas, *Salmonella* bacteria can still be present nine months after waste has been buried. This implies that there is potential for the effects of human waste to be cumulative which would be exacerbated by increasing numbers of people. For this reason, a stringent approach to managing the size of groups and number of people in the upper Cotter Catchment (water supply and wilderness area) is applied. It would be ideal if bush walkers carried out waste and this should be encouraged and appropriate transport and disposal methods promoted.

OBJECTIVE

Avoid the accumulation of waste in the park, minimise waste generation and promote the removal of rubbish and other waste to appropriate disposal areas outside the park.

POLICIES

- Through education and interpretation programs, visitors to the park will be encouraged take their rubbish home for recycling and appropriate disposal.
- Rubbish bins will not be provided at recreation sites. Burying rubbish (other than faeces) or leaving rubbish residue in fireplaces will be discouraged.
- Waste materials from management programs and any domestic garbage from management facilities and residences within the park will be removed to an appropriate municipal landfill or recycled if appropriate.

ACTIONS

- 175 Engage suitably licensed contractors to appropriately dispose of sewage as required.
- 176 Educate park visitors about appropriate methods of human waste disposal.
- 177 Discourage the digging of latrine sites for groups that are camping in the park.
- 178 Ensure that licensing and other arrangements for overnight commercial operators, event organisers and large groups include obligations in relation to appropriate methods of removing human waste.

11.2.6 Use of chemicals

Chemicals are commonly used in the park for pest plant and animal control, fire suppression and in the course of everyday management activities that require the use of machinery. It is the responsibility of the relevant agency manager and contractor to ensure that the conditions of the *Environment Protection Act 1997* and any subsequent Environmental Authorisations are met. To safeguard water quality, particular care needs to be given to the use of chemicals near water bodies anywhere in the park but in particular, within the Cotter Catchment.

OBJECTIVE

The application and use of chemicals in the national park complies with Australian standards, legislative requirements and takes into account risks and potential impacts on streams, water supply and the natural and cultural values of the park.

POLICIES

- The handling and use of chemicals will only be conducted by suitably qualified persons.
- Contractors applying chemicals will be authorised as required by the relevant Environmental Authorisation.
- The EPA must receive notification prior to chemical application near watercourses and /or water supply catchments. Chemicals use in emergency situations e.g. fire fighting will be in accordance with a specific policy (s. 7.4.5; Action 116).
- All chemicals used in Namadgi must be registered for use by the Australian Pesticides and Veterinary Medicines Authority (APVMA).
- All chemicals must be applied in accordance with the label or have an approved off-label permit from the APVMA.
- Plant and equipment and other substances and materials must be handled, operated, moved and stored in a proper and efficient manner for the purposes of preventing the pollution of surface and ground waters.
- Prior notification to the ACT community is required for the application of any chemical classified as Schedule 7 Poison. Notification requirements are dependent upon the size of the operation and may include public notices in the local media and signposting in the relevant areas.

- Above and below ground fuel storage tanks must comply with EPA guidelines.
- Fuel oils and chemicals are to be stored and handled in compliance with the requirements of the relevant sections of the *Environment Protection Act 1997*, *Dangerous Substances Act 2005* and the *Medicines, Poisons and Therapeutic Goods Act 2008*.
- The transportation and storage of fuel and chemicals and the refuelling of equipment is to be carried out in a manner that prevents the pollution of surface and ground waters as a result of the leakage of fuel or of chemical spills.
- Vehicles used to transport chemicals must be prominently marked with the appropriate warning signs in accordance with the *Dangerous Goods Act 1984*.
- All operations where there is a potential for fuel, oil or chemical spills must have spill kits available for these materials and any spillage of chemicals must be cleaned up immediately. Pollution incidents that could potentially cause environmental harm must be reported to the EPA and in cases of emergency, the ACT Fire Brigade.
- Material Data Safety Sheets must be kept for all stored chemicals and be available to all relevant personnel.

11.2.7 Contaminated sites

Contaminated sites in the park derive primarily from past land uses, such as pastoralism and the tracking stations. Examples of sites may include former sheep-dip yards, waste disposal sites, fuel and chemical stores and buildings that contain asbestos.

OBJECTIVE

Contaminated sites are identified, managed and remedial action taken when necessary, according to expert advice.

POLICIES

- In accordance with the ACT Government Contaminated Sites Strategic Management Plan, suspected contaminated sites will be documented. This will involve a site investigation and appropriate sampling as a basis for public health and environmental risk assessment.
- A remediation plan will be prepared for any site assessed as posing an unacceptable public health and/or environmental risk. Those sites with an unacceptable risk should be remediated first to minimise health or environmental risks from any residual contaminants remaining on the site.
- Suitably qualified environmental consultants will be engaged for actions associated with contaminated sites (e.g. site investigation, sampling, management, and creation of a remedial action plan, if required).

11.3 Monitoring and evaluation

Monitoring provides information on the condition of the natural and cultural heritage of the park and changes over time, and is essential for assessing the sustainability of particular activities. Sustainable use relates to the effect of activities on environmental, social and economic values. Monitoring involves regular data collection at specific locations and analysis of data to identify any changes. This process is a fundamental tool for adaptive management, which involves adjusting policies and actions in the light of assessment of information gathered through monitoring.

Established monitoring programs in Namadgi include:

- photo-monitoring at over one-hundred key sites in the park, chosen because of their importance for natural and cultural assets, or to measure visitor impacts
- rabbit and kangaroo counts that are conducted regularly to monitor population abundance
- tracking of visitor numbers via car counter and recording statistics
- post-fire recovery plots and ongoing monitoring to record the condition of vegetation and the abundance of wildlife following the 2003 fire
- water quality monitoring throughout the park (see s. 11.2.1 above).

The following objective and associated policies and actions are framed within the objectives, policies and actions outlined in s. 9.8.1.

OBJECTIVE

Monitoring and evaluation provides essential information about the state of park values. Management policies and actions are reviewed and adjusted according to new information.

POLICIES

- Existing monitoring programs in the park will be evaluated in order to assess the usefulness of data being collected.
- Design and implement a monitoring, data collection and storage program that:
 - addresses the most important information requirements for management
 - takes into account existing monitoring programs
 - includes monitoring requirements identified in other sections of this plan
 - addresses existing reporting requirements e.g. State of Environment reporting
 - supports regional monitoring programs
 - identifies performance indicators for the park
 - makes data accessible (see s. 9.8.1).

ACTIONS

- 179 Establish collaborative partnerships for data collection and reciprocal arrangements for information sharing.
- 180 As appropriate analyse data collected, report on key performance indicators and identify policy changes required.

11.3.1 Environmental impact assessment

Requirements for environmental assessment for works or developments on land in the ACT are contained in the *Planning and Development Act 2007*. Schedule 4 (Part 4.3, Item 4) specifies that any 'proposal with the potential to have a significant impact on the management objectives for land reserved under section 315 for the purpose of a wilderness area, national park, nature reserve or special purpose reserve' will require an Environmental Impact Statement.

It is preferable that environmental considerations be part of the early stages of project formulation (an environmental planning approach). It is also advantageous to address a number of planned projects collectively in order to determine cumulative impacts.

'Works' include projects associated with capital works, grants funding, employment programs and training initiatives, voluntary contributions (e.g. Landcare), and urgent works.

OBJECTIVE

Environmental assessments are conducted for any proposed works or developments in the park to ensure that all values are given due consideration and are adequately protected.

POLICIES

- Works planned for the park will be subject to impact assessment as required by legislation. Where ever possible, proposed works and developments will be assessed collectively.
- For minor works which do not trigger the legislative requirement for an Environmental Impact Statement, an environmental assessment will be conducted when development projects or management works:
 - involve soil disturbance to a previously undisturbed area
 - involve disturbance to, or change in the management of an Aboriginal or European heritage site
 - could affect the habitat of threatened or vulnerable species habitat or nearby communities
 - could affect hydrology and water quality
 - could intrude visually on the landscape
 - could affect geodiversity (geological and geomorphological values)
 - could affect existing research or recreational use
 - could affect social/community values
 - are of particular interest to the community.

ACTIONS

- 181 Ensure that procedures are in place for environmental impact assessments and that staff are aware of their responsibilities in adhering to the process.

11.4 Administration

11.4.1 Fees and charges

Namadgi does not have an entry fee. The feasibility of implementing a park fee has been investigated and it was found that implementing a system for collection would be difficult due to the many park entry points and because some park roads are used as a thoroughfare to other places. However, fees are charged for camping in designated campgrounds and for some interpretation and education activities.

On a national and regional level, national park agencies are inconsistent in relation to the application of fees and charges. In NSW there is generally an entry charge for popular, high-use parks. Within the ACT region, entry fees are not charged at Brindabella National Park and reserves on the Southern Tablelands, while charges apply to Kosciuszko National Park and the coastal parks of the southeast region. In the ACT, Tidbinbilla charges an entry fee.

Of most significance is the fact that the ACT is the only jurisdiction in Australia that does not have a licensing and fees system for commercial tour operators. While the number of commercial operators is small, commercial use of the park, particularly for overnight bush camping, is significant. Commercial use and fees addressed through a licensing system are matters requiring urgent attention.

Non-commercial groups are also high users of the park. They include bushwalking clubs, Duke of Edinburgh groups, scout groups and others that camp in the park overnight. Consideration needs to be given to whether a permit and/or fees system is applicable for non-commercial groups.

Issues to consider in introducing fees and charges include:

- Fees provide equitable visitor opportunities through a user-pays philosophy i.e. people who use the park pay for the services provided rather than the total cost of management being met by taxpayers, many of whom do not use the park.
- Cost recovery can lead to improved services and management.
- Fees provide a price mechanism for managing and possibly limiting high-impact use of the park and offsetting management costs for activities that require a high level of services.
- Fees will only be advantageous if the fee structure and its administration are based on sound principles and provide benefits for the park.

OBJECTIVE

Integrate the protection of natural and cultural heritage objectives with an equitable and cost-effective user-pays system.

ACTIONS

182 Investigate and develop, as appropriate, a fees and charges schedule for the park that considers:

- fees for a licensing system for commercial tour operators
- fees for non-commercial group use
- fees for interpretation activities
- potential for charging fees for day and overnight visitors
- appropriate fees (including a bond fee) for events
- fees for commercial use and concessionaires (including a bond fee)
- potential for an annual pass fee.

11.4.2 Park concessions and commercial activities

A park concession is a right granted by way of a lease, licence or permit for the occupation or use of part of a reserve to provide facilities or services or to undertake particular activities e.g. film-making. This right is usually subject to payment of a fee. Licensing for commercial tour operators is addressed in s. 8.8. Agency-run commercial activities, such as souvenir shops and fee collection, already operate in the park. Enterprises operated commercially or by the agency require a clear policy framework for operation.

Issues to be considered include:

- Concessions can offer valued commercial services to the community that otherwise might not be provided.
- Concessions can provide employment for local people and, in particular, the local Aboriginal community may wish to explore new cultural enterprises to promote their culture and provide employment opportunities for their people.
- Licensing arrangements for concessionaires must be equitable and consistent with the management objectives for the park.
- Other commercial activities (such as film-making) require individual assessment and permits subject to specific conditions to ensure that they are conducted under agreed environmental guidelines with an appropriate return to the park.

OBJECTIVE

Commercial activities undertaken in the park are consistent with management objectives and comply with relevant ACT Government policy and guidelines.

POLICIES

- Concessions will be awarded according to procurement processes specified by ACT Government procurement policies.
- Concession licences will be subject to fees and conditions.
- Potential concessionaires must demonstrate that activities support park values and management objectives and will have minimal impact on natural, cultural and social values of the park.
- Concessions operating in Namadgi will comply with existing policies and those included in the management plan and will be carefully monitored.
- Proposed concessions must meet all statutory and industrial requirements in relation to their operation.
- In accordance with the *Nature Conservation Act 1980*, the Conservator's written consent is required for the supply of goods and services, or erection of related structures e.g. a booth or sign, in reserved areas.
- Commercial activities (e.g. film-making) may be allowed provided that:
 - proposals are consistent with the current management requirements and are not harmful to natural and cultural heritage assets and recreation values
 - such activities do not unduly conflict with other park users
 - organisers are prepared to pay a commercial fee for the use of the park (see fees and charges above)
 - activity organisers agree to restore any disturbed area to its previous condition at their expense.
- Commercial activities generally will not be permitted in the wilderness area. In exceptional circumstances, commercial activities may be considered and approved by the Conservator if they contribute to a wilderness management project that is approved and supervised by park management.
- Commercial activities by local Aboriginal people will be encouraged.

11.5 Service operations

11.5.1 Access management

More than 400 km of management trails provide access to the park. These trails are available for recreational purposes, as specified within the park zoning in Chapter 3, however, the trails exist primarily for fire and other management purposes. Road and vehicle trail condition, use and status are outlined in Appendix 7.

Organisations that officially carry out work or approved research in the park are issued with a key to locked gates to access fire trails where necessary. These organisations include ACTEW and affiliated businesses (ActewAGL, Ecowise), research institutions such as the eWater CRC, Australian National University and University of Canberra. Occasionally, event organisers are provided with access for special purposes and commercial tour operators are issued with a key in case of emergency or to remove waste and equipment.

The following are key considerations in managing access:

- The land use objective for the wilderness is to provide opportunities for solitude. This means minimal access by vehicles for management purposes. Monitoring and evaluation are important in order to measure whether this objective is being met.
- Management trails are also available for recreation. They may be designated trails for walkers, cyclists and horse riders. Management must ensure that the use of trails by vehicles does not pose a risk to park users.
- Park visitors need to be aware that the trails are used for management purposes.

- Monitoring the use of management trails by organisations conducting business in the park will provide useful information for:
 - managing conflicts with park visitors
 - assessing whether the objectives for the park zones (as described in Chapter 3) are being compromised, particularly in the wilderness area, by the number of vehicles accessing the trails
 - maintenance purposes.
- Specifications apply to the maintenance of fire trails to assigned standards. Management must ensure that trails are regularly maintained in accordance with their specifications.
- Weeds and erosion require ongoing management in order to protect park values.
- Strict management and monitoring of keys for locked gates is essential to prevent unauthorised use and access to the park.

OBJECTIVE

The use of management trails is monitored and controlled to meet management objectives, maximise visitor safety and minimise conflicts with park users.

POLICY

- The access and use of closed management trails will be guided by standards/protocols.

ACTIONS

- 183 Issue guidelines/protocols on trail use to management staff and organisations using management trails to create awareness of their responsibilities in relation to the use of management trails.
- 184 Where appropriate, provide warnings for visitors at track heads about other users of trails.
- 185 Monitor and assess the use of trails by management and other organisations.
- 186 Ensure that fire trails are maintained to specified standards.
- 187 Conduct appropriate management actions to control weeds, erosion and other factors that could threaten the park's integrity, and which are connected to the construction and use of access trails.

11.5.2 Infrastructure

Infrastructure in the park is of two main types: that related to park management (e.g. roads and trails, fencing, buildings, campgrounds, communications facilities); and facilities serving wider needs (e.g. water supply reservoirs, access roads, electricity connection, communications facilities).

The following considerations are important in relation to infrastructure:

- The use of land in Namadgi for infrastructure is not formalised in leases or licences. In the absence of a licence/lease, or in addition to existing arrangements, management agreements, protocols or the equivalent may be necessary to address a range of environmental and management matters.
- Activities of other organisations and the management of infrastructure require ongoing monitoring.
- The whole of the park is currently unleased Public Land, with the designated land use being wilderness and national park. Some organisations may wish to pursue a lease arrangement to secure land to site infrastructure in the park. The establishment of any lease in the park will be subject to negotiation.
- The Australian Defence Forces and the Australian Federal Police make occasional use of the park for training programs. Protocols and/or an agreement for training exercises will assist with monitoring and managing use of the park.

OBJECTIVE

Relevant authorities responsible for infrastructure in the park and those that use the park for other purposes assist with the protection of park values in accordance with this plan and have a cooperative relationship with management.

POLICIES

- Agreements (leases, licences, management agreements or MOUs) with relevant authorities will be developed and implemented, as necessary, to clearly define roles and responsibilities and management protocols.
- Protocols for organisations with infrastructure in the park will be developed and disseminated, as required, to promote responsible environmental management. Protocols may include:
 - obligations in relation to access
 - maintenance and management
 - proposed works and activities
 - protection of park values
 - Aboriginal heritage issues
 - liaison protocols
 - management of fire hazards
 - weed management
 - emergency procedures
 - waste management
 - low impact techniques
 - fencing of sites
 - impacts on visitors
 - signs and lighting
 - the basis of cost recovery for works carried out by management.

ACTIONS

- 188 Monitor compliance with leases, licences and agreements.
- 189 Liaise with authorities as required regarding the safety and maintenance of infrastructure.
- 190 Disseminate information to the public about any issues relevant to public safety or services such as road conditions, snow conditions, fire danger ratings and bushfires.
- 191 Ensure that community consultation protocols are observed in relation to works conducted in the park by other organisations.
- 192 Consider a fee for use and special access for use of the park for training operations. Such fees would align with any special access fees applied to special events.

11.5.3 Use of firearms

Recreational use of firearms is not permitted in the park. Management or contract staff occasionally use firearms for the control of pest animals and to humanely destroy injured native animals.

OBJECTIVE

Firearms are used in accordance with legislation and policy.

POLICIES

- The carrying or use of firearms is not allowed in the park except for management purposes.
- The use of firearms by management will be in accordance with prevailing legislation and ACT Government policy.

11.5.4 Domestic animals

A domestic animal may be permitted in the park with the consent of the Conservator. For example, permission may be given to park neighbours or management personnel for access to the park on horseback and with dogs to round up straying stock or for a guide dog to accompany a sight-impaired person. Policies in relation to pets kept by staff resident in the park are set out in a government residential policy. This currently allows staff to keep a limited range and number of pets with specific management requirements. Otherwise, domestic animals are not allowed in the park as they disturb wildlife and may cause conflicts between park visitors.

OBJECTIVE

The park is kept free of domestic animals except in exceptional circumstances.

POLICIES

- Consistent with the *Nature Conservation Act 1980*, domestic animals will not be allowed in the park without consent in writing of the Conservator except for those that are in vehicles using the Boboyan and Brindabella Roads as through-routes, in which case the animals must remain in the vehicle at all times.
- Landholders or management personnel, who are authorised on each occasion, may use horses and dogs in association with approved feral animal control programs, mustering or impounding stock.
- Staff resident in the park will comply with government residential policy in relation to keeping pets in nature reserves.
- Boundary fences will be maintained to prevent livestock from straying into the park.

11.5.5 Resource use and extraction

There has been little resource extraction from Namadgi, other than timber taken in the middle and lower Cotter Catchment and water harvesting (which continues today). For example, there is no evidence of mining, and quarrying has been limited to existing roadsides.

In accordance with the legislative objectives for the park, resource extraction will continue to be limited to the strict requirements of park management and, whenever possible, resources will be sourced from outside the park. In some instances, such as extracting gravel for walking track benching, it may be better to source material locally in order to avoid pathogen or weed contamination that may result from bringing in materials from outside the park.

As discussed briefly in s. 6.2.2, parts of the area now incorporated into Namadgi were used for pastoral purposes from the 1830s. Leases were withdrawn in the twentieth century as part of the protection of water supply catchments, and later with the declaration of Gudgenby Nature Reserve and Namadgi National Park. Grazing of livestock is not permitted in the park and livestock (e.g. straying cattle) found in the park will be removed by appropriate means.

OBJECTIVE

Resource extraction complies with legislative requirements and is limited to park management requirements.

POLICIES

- Felling live trees or clearing vegetation within the park will not be permitted except for safety purposes, essential maintenance of roads, fire trails, power line easements and, after appropriate environmental assessment, for development of visitor facilities such as carparks.
- Removal of firewood from within the park will not be permitted. Firewood supplied to recreation sites will be purchased from commercial sources outside the park. However, wood salvaged from essential management programs—such as through removal of burnt trees along roads, tree maintenance around campgrounds, carparks and fire trails—may be used as a source of wood for designated fire places in the park.

- Where firewood is not provided, park users are permitted to use fallen dead timber as firewood for cooking purposes (in constructed fireplaces provided for that purpose) and elsewhere, in accordance the provisions of this plan.
- Quarrying of rock, stone, gravel or soil will not be permitted in the park for use outside the park. As far as possible, all management operations within the park will use materials obtained from appropriate sources outside the park. Where this is not practical, subject to environmental assessment provisions of this plan and subject to visual management and other appropriate provisions to limit impacts on park values, material may be taken from within the park.
- In accordance with the *Nature Conservation Act 1980*, excavation is not permitted in the wilderness area except for archaeological research subject to a licence from the Conservator.
- Mining for any purpose is not permitted in the park.
- Taking, killing, picking, defacing or otherwise disturbing natural or cultural features is not permitted within the park except:
 - by the Ngunnawal people for cultural purposes in accordance with agreed protocols yet to be negotiated
 - with the written permission of the Conservator for authorised purposes (such as research).
- Beekeeping for honey production or any other purpose is not allowed in the park.
- Livestock grazing is not permitted in the park. Livestock found in the park will be removed.

11.6 Implementation of the plan

Management policies and actions outlined in this management plan form the basis for its implementation. Appendix 8 contains a consolidated list of the actions to which priorities have been attached. Primary responsibility for implementation of the policies and actions contained in the plan will rest with the park management agency. However, many of the policies and actions are collaborative undertakings that will involve other government agencies (e.g. ACT Planning and Land Authority, ACT Emergency Services Agency, NSW Department of Environment, Climate Change and Water), utility providers (e.g. ACTEW), universities, commercial interests, adjacent landholders, and community groups.

OBJECTIVE

The Namadgi National Park Plan of Management is implemented in a consistent and transparent way.

ACTION

193 Use the table of management actions and priorities (Appendix 8) as a basis to plan and undertake actions in this management plan and regularly assess progress with the actions.

Appendices



Appendix 1

Summary of water supply and catchment management planning provisions

The National Capital Plan

Appendix G of the *National Capital Plan, Requirements for Namadgi National Park and Adjacent Areas*, sets out general policies relating to the management of the area and specific policies relating to the management of the sub-catchments within the park.

General policy statement of the National Capital Plan

Water Supply: To protect the Cotter and Gudgenby Catchments for Canberra's water supply so as to maintain or improve yield in terms of quality, quantity and reliability. The quality of water supply in the Cotter Catchment will be assured primarily by controls over catchment uses rather than by the use of additional treatment.

These principles are also encapsulated in the *Australian Drinking Water Guidelines* (NHMRC 2004). They emphasise the importance of maintaining multiple barriers to protect the integrity of drinking water; in other words, reliance on water treatment capability alone is not appropriate.

Specific policies of the National Capital Plan

The protection of the Cotter Catchment so as to maintain a water supply for Canberra that is adequate in terms of quality, quantity and reliability requires controls on land uses and appropriate management practices within the catchment. Consequently, a primary concern in formulating the Policy Plan i.e. Appendix G *Requirements for Namadgi National Park and Adjacent Areas* in the *National Capital Plan* is to determine land uses for various parts of the catchment, within the framework of constraints associated with catchment protection requirements.

In terms of catchment protection for water harvesting, the Cotter and the Gudgenby catchments have been divided into five sub-catchments that have varying protection requirements. These sub-catchments are:

- the upper Cotter (Corin Dam)—near pristine
- the intermediate Cotter (Bendora Dam)—near pristine
- the lower Cotter (possible future enhanced Cotter Dam)
- the lower Cotter (Cotter Dam)
- the Gudgenby-Naas (future Tennent Dam). This is a catchment rather than a sub-catchment.

The Territory Plan

The Territory Plan defines objectives and policies for water catchment management under **Water Use and Catchment General Code**. Waters of the ACT and their catchments have been classified into three Water Use Catchment categories:

- conservation
- water supply
- drainage and open space.

The primary value of the Water Supply Catchments (i.e. the Cotter River Catchment) is domestic water supply. The Water Supply Catchment policies allow for a range of other uses, which are generally compatible but secondary or ancillary to the primary value of water supply. These other uses include: conservation, waterscape, recreation and stockwater supply.

The Gudgenby and Naas River Conservation and Catchment policies have a primary value of conservation of aquatic habitat; water supply is of secondary value.

Objectives of the Water Supply Catchment (Part B1)

The objectives of the Water Supply Catchment (Part B1) policies are to:

- a) make provision for domestic water supply as the predominant water use
- b) ensure that water and catchment land uses are consistent with maintaining a safe and reliable water supply (protection of quality and quantity) and other values of the catchment
- c) make provision for a range of other water uses and environmental values that are compatible with use of the water for domestic water supply
- d) ensure that the streamflow and quality of discharges from the catchment are consistent with the protection of environmental values of downstream water
- e) protect and conserve the water quality of groundwater resources of the Territory.

Policies of Water Supply Catchment (Part B2)

Element 6: Water Use and Environment Values

Water within the Water Supply Catchments may only be used for purposes set out in Schedule 3, and in accordance with the location of water uses or prescribed environmental values set out in Schedule 4.

Schedule 3: Water Supply Catchment Policies		
Purposes for which water may be used or prescribed environmental values:		
• Aquatic habitat - mountain streams (AQUA/1) • Aquatic habitat - mountain reservoirs (AQUA/6) • Domestic water supply (DOM/1) • Fishing • Hydro-electric power generation • Stockwater supply (STOCK) • Waterscape (VIEW) • Water storage		
Schedule 4: Water Supply Catchment Policies		
Catchment	Description	Water Uses and Environment Values
Cotter	Headwaters to Corin Reservoir	VIEW, AQUA/1, Discharge - stormwater
	Corin Reservoir	DOM/1, VIEW, AQUA/6, Discharge - stormwater
	Corin Dam to Bendora Dam (incl. Reservoir)	DOM/1, VIEW, AQUA/1, AQUA/6, Hydro-electric power generation, Discharge - stormwater
	Bendora Dam to Cotter Reservoir	DOM/1, VIEW, AQUA/1, Hydro-electric power generation, Discharge - stormwater
	Cotter Reservoir	DOM/1, VIEW, AQUA/6, Discharge - stormwater

Element 7: Protection of Water Quality

- a) Land and water uses and protection measures shall be consistent with maintaining water quality appropriate to the relevant water uses and environmental values set out in Schedule 4.
- b) Residential use and camping shall be excluded from the catchment.
- c) Discharge of wastewater shall not be permitted within the catchment.
- d) Construction activities shall be consistent with minimising erosion and discharge of sediments.
- e) Recreation activities shall be controlled to minimise the potential of pollution of waters.
- f) Total discharge (loading) of various streamflow constituents emanating from the catchment shall not exceed the sustainable loading on receiving waters.
- g) Discharge of wastewater shall not be permitted to groundwater resources.

Element 8: Protection of Streamflow

- a) Streamflow diversions shall be consistent with authorised diversion.
- b) Reservoir releases shall be consistent with protection of downstream ecology and water uses.
- c) Sites shall be established as required to provide storage and maintain supply during extended drought periods.

Element 9: Protection of Stream Environs

- a) Land uses and protection measures within the reservoir and stream environs and floodplains shall be consistent with the protection of the floodplains.

Element 10: Protection of Groundwater Yield

- a) Abstraction of groundwater shall be consistent with authorised abstractions.

Appendix 2

ACT vegetation communities occurring in Namadgi National Park

Vegetation Community	Characteristic species	Where the community occurs in the ACT
Grasslands		
Snow Grass Montane Dry Tussock Grassland	<i>Poa sieberiana</i> <i>Asperula conferta</i> <i>Epilobium billardieranum</i> subsp. <i>hirtigerum</i> <i>Themeda triandra</i>	Landscape position: Occurs on the valley floors and lower slopes of the major rivers and streams of montane valleys subject to cold air drainage. Elevation: 900-1300 m.
Fen Sedge Montane Wet Tussock Grassland	<i>Carex gaudichaudiana</i> <i>Poa sieberiana</i> <i>Poa labillardieri</i> <i>Rytidosperma nudiflora</i> <i>Empodisma minus</i> <i>Themeda triandra</i>	Landscape position: Occurs in the wetter parts of montane valleys, along creek lines where there is a high water table, and on moderately drained soils by fens and creeks. Elevation: 900-1300 m. Comment: Two associations have been identified in the Montane Wet Tussock Grassland: a) <i>Poa labillardieri</i> - <i>Carex gaudichaudiana</i> association occurs on flats of valley floors where extreme local cold creates treeless conditions and soils are usually moist, and b) <i>Poa sieberiana</i> - <i>Carex gaudichaudiana</i> association occurs in moist areas with occasional wet hollows close to fens (1290-1450 m).
Bog Snow Grass Subalpine Tussock Grassland	<i>Poa costiniana</i> <i>Rytidosperma nudiflora</i> <i>Agrostis meionectes</i> <i>Carex appressa</i> <i>Juncus australis</i> <i>Poa labillardieri</i> <i>Poa sieberiana</i> <i>Themeda triandra</i>	Landscape position: At higher elevations on level or gently undulating terrain and commonly in valleys subject to cold air drainage in upland areas of the mountainous western portion of the ACT. Also occurs in exposed subalpine and alpine areas, usually on lower slopes and drier valley floors and in headwater situations associated with bogs. Elevation: 1300-1911 m. Soil type: Alpine humus soils.
Forbland - Sedgeland - Mossland Complex		
Fine-leaf Snow Grass - Snow Daisy Subalpine Herbfield	<i>Poa clivicola</i> <i>Poa costiniana</i> <i>Celmisia longifolia</i> <i>Brachyscome</i> spp. <i>Arthropodium milleflorum</i> <i>Austrodanthonia monticola</i>	Landscape position: Occurs in the mountains and high valleys of the ACT on gentle slopes and flats where soils are not waterlogged or too rocky. Elevation: 1300-1911 m. Soil type: Alpine humus soils. Comment: The Subalpine and Alpine Herbfield forms meadows of flowers in the spring and early autumn. In general the vegetation cover is no more than 0.3 m tall, and consists of abundant tussock grasses and daisies.

Vegetation Community	Characteristic species	Where the community occurs in the ACT
Fen Sedge Montane and Subalpine Fen	<i>Carex gaudichaudiana</i> <i>Juncus breviculmis</i> <i>Ranunculus rivularis</i> <i>Asperula gunni</i> <i>Restio australis</i> <i>Neopaxia australasica</i>	Landscape position: Fens in the ACT are local occurrences on almost level, broad valley flats of permanently wet soils with impeded drainage. They occur on the wettest sites where water remains for extended periods, with some open water. Elevation: 900–1911 m. Soil type: Peaty soils that are moderately acidic or neutral in pH. Comment: Ground water is moving, but not in channels. Water floods out infrequently. Mineral matter is often present, giving higher nutrition. Fens may colonise pond areas within bogs.
Sphagnum Montane and Subalpine Bog	<i>Sphagnum cristatum</i> <i>Empodisma minor</i> <i>Epacris paludosa</i> <i>Richea continentis</i> <i>Restio australis</i>	Landscape position: Common in the high mountains of the ACT at the heads of streams and along valley floors. Elevation: 1050–1911 m. Soil type: More acidic soils than in fens. Rainfall: Greater than 850 mm. Temperature: mean annual temperatures are below 12°C Comment: <i>Sphagnum</i> bog is associated with more variable regimes of inundation than fens. Where <i>Sphagnum</i> grows prolifically it forms many layers of spongy substrate (capable of retaining large amounts of moisture), which decomposes slowly into peat.
Shrubland – Heathland Complex		
Alpine Bottlebrush Montane and Subalpine Moist Heath	<i>Callistemon ptyoides</i> <i>Baeckea utilis</i> <i>Hakea microcarpa</i> <i>Leptospermum myrtifolium</i> <i>Callistemon ptyoides</i> <i>Epacris paludosa</i>	Landscape position: In narrow drainage lines and creeks. In areas of drier heath they occur on humic soils on flats with impeded drainage. Elevation: Above 1500 m. Soil type: Raised peaty soils. Comment: May include small patches of <i>Sphagnum cristatum</i> .
Yellow Kunzea – Namadgi Tea Tree Subalpine Dry Shrubland	<i>Kunzea muelleri</i> <i>Leptospermum namadgiensis</i> <i>Kunzea ericoides</i> <i>Acacia alpina</i> <i>Eucalyptus rubida</i> <i>Eucalyptus debeuzevillei</i> <i>Eucalyptus niphophila</i>	Landscape position: Usually on rock benches. Elevation: Above 1600 m. Soil type: Exposed soils on granite.
Common Fringe Myrtle Montane Shrubland	<i>Calytrix tetragona</i> <i>Stypantra glauca</i> <i>Drosera</i> spp. <i>Lomandra confertifolia</i> subsp. <i>pallida</i> <i>Persoonia pinifolia</i> <i>Kunzea ericoides</i> <i>Leptospermum micromyrtus</i>	Landscape position: On granite benches in northern Namadgi, often in moist areas and on the lower slopes of the Tidbinbilla ranges on rocky outcrops. Elevation: 900–1300 m. Soil type: Skeletal soils. Comment: These shrublands may be the result of previous land clearing or may occur as natural communities, as at Booroomba Rocks where there is a natural <i>Kunzea</i> community.

Vegetation Community	Characteristic species	Where the community occurs in the ACT
Wetland Complex		
Montane and Subalpine Wetlands	<i>Vallisneria spiralis</i> <i>Schoenoplectus validus</i> <i>Eleocharis</i> spp.	Landscape position: In still water including ephemeral or permanent pools, ponds or dams, and in flowing water in a range of landscape positions. Elevation: 900 m – 1950 m Comment: This is not a single community, but a complex of species assemblages which may either be stable or vary with seasonal conditions. These assemblages include fringing, floating and submerged vegetation. Duration of inundation, depth of water, nature of the bottom or bank substrate, temperature and chemical composition influence the range of species present in an area.
Woodlands		
Broad-leaved Peppermint – Apple Box Tableland Woodland	<i>Eucalyptus dives</i> <i>Eucalyptus bridgesiana</i> <i>Eucalyptus nortonii</i> <i>Bursaria spinosa</i> <i>Elymus scaber</i> <i>Themeda triandra</i>	Landscape position: On warm dry lower slopes. Elevation: 900–1200 m. Soil type: Shallow sedimentary soils. Comment: Single species stands of <i>Eucalyptus bridgesiana</i> are part of this community.
Snow Gum Montane Woodland	<i>Eucalyptus pauciflora</i> <i>Eucalyptus rubida</i> <i>Eucalyptus dives</i> <i>Eucalyptus viminalis</i> <i>Eucalyptus stellulata</i>	Landscape position: In frost hollow valleys throughout the montane region. Soil type: Shallow to moderate humic soils.
Snow Gum Subalpine Woodland	<i>Eucalyptus pauciflora</i> <i>Eucalyptus debeuzevillei</i> <i>Eucalyptus niphophila</i> <i>Bossiaea foliosa</i> <i>Oxylobium ellipticum</i> <i>Olearia phlogopappa</i> <i>Tasmania xerophila</i> <i>Oxylobium alpestre</i>	Landscape position: A widespread subalpine woodland occurring in a range of landscape positions. Elevation: 1500–1900 m. Soil type: Moderate depth soils. Comment: Depending on aspect may descend to 1220 m (as at Tidbinbilla).
Forests		
Red Stringybark – Scribbly Gum Tableland Forest	<i>Eucalyptus macrorhyncha</i> <i>Eucalyptus rossii</i> <i>Eucalyptus mannifera</i> <i>Eucalyptus dives</i> <i>Eucalyptus polyanthemos</i>	Landscape position: Exposed dry sites on the hills and foot slopes around Canberra, such as Black Mountain, as well as dry, steep, rocky sites. Elevation: up to 1000 m. Soil type: Often on poorly developed or skeletal soils. Comment: Monocultures of <i>Eucalyptus mannifera</i> on shallow soils are part of this community.
Broad-leaved Peppermint – Candlebark Montane Dry Forest	<i>Eucalyptus dives</i> <i>Eucalyptus rubida</i> <i>Eucalyptus bridgesiana</i> <i>Eucalyptus pauciflora</i> <i>Eucalyptus mannifera</i> <i>Eucalyptus dalrympleana</i> <i>Daviesia mimosoides</i>	Landscape position: On all aspects except southeasterly to south. At higher altitudes it shows a preference for warmer northerly aspects. Soil type: Dry exposed shallow soils occurring equally on granite and sediments throughout the Naas–Gudgenby Catchment.

Vegetation Community	Characteristic species	Where the community occurs in the ACT
Black Cypress Pine Tableland Open Forest	<i>Callitris endlicheri</i> <i>Eucalyptus nortonii</i> <i>Eucalyptus macrorhyncha</i> <i>Eucalyptus blakelyi</i> <i>Allocasuarina verticillata</i>	Landscape position: On dry rocky steep slopes near and adjacent to the rivers, riparian and creek areas and within the steeper gorges of the Gudgenby and Murrumbidgee rivers, on warm aspects tending westerly. Also occurs on dry north-northwest facing lower slopes of Mt Tennent. Comment: May occur as a woodland or open forest, where Black Cypress Pine is a dominant or associated species with eucalypts or shrubs.
Mountain Gum Montane Forest	<i>Eucalyptus dalrympleana</i> <i>Eucalyptus pauciflora</i> <i>Eucalyptus robertsonii</i> <i>Eucalyptus viminalis</i> <i>Daviesia mimosoides</i> <i>Acacia melanoxylon</i> <i>Acacia dealbata</i>	Landscape position: A wide spread intermediate altitude forest on all but sheltered aspects. Elevation: 1150–1600m. Soil type: Granitic geology. On shallow soils on sheltered aspects in Brindabella, Namadgi, and Yaouk and on humic soils in riparian zones within Namadgi and Kosciusko National Park. Comment: The upper limit is determined by upper altitudinal range of <i>Eucalyptus dalrympleana</i> , and lower limit by that of <i>Eucalyptus pauciflora</i> .
Brown Barrel Montane Forest	<i>Eucalyptus fastigata</i> <i>Eucalyptus viminalis</i> <i>Eucalyptus robertsonii</i> <i>Bedfordia arborescens</i> <i>Dicksonia antarctica</i>	Landscape position: On moderate to steep slopes in the Brindabella Range on easterly and southerly sheltered moist aspects. Soil type: Deep soils. Comment: <i>Eucalyptus fastigata</i> has occurs only in a narrow altitudinal range, on southeast aspects. Commonly occurs as a narrow band below Alpine Ash <i>Eucalyptus delegatensis</i> , but has more widespread distribution on soils derived from volcanic rocks and north of Mt Coree.
Alpine Ash Montane Tall Forest	<i>Eucalyptus delegatensis</i> <i>Eucalyptus pauciflora</i> <i>Coprosma hirtella</i> <i>Grevillea victoriae</i> <i>Daviesia latifolia</i> <i>Prostanthera lasianthos</i>	Landscape position: Occurs on moderate to moderately steep moist slopes with south and east aspects and occasionally with a southwest aspect. Elevation: 1070–1550 m. Soil type: Deep soils, where the geology is mainly granitic.
Narrow-leaved Peppermint – Ribbon Gum Montane Forest	<i>Eucalyptus robertsonii</i> <i>Eucalyptus viminalis</i> <i>Eucalyptus pauciflora</i> <i>Eucalyptus dalrympleana</i> <i>Daviesia mimosoides</i> <i>Daviesia ulicifolia</i> <i>Poa</i> spp.	Landscape position: On variable slopes facing northeast to south. Soil type: Moderately deep soils on sediments in Namadgi National Park, and in the Cotter Valley on deep granite soils.

Note: The above list is derived but modified from a revised classification of vegetation communities in the ACT (Sharp et al. 2007). Mapping of these communities (based on previously modelled vegetation communities) has not yet been undertaken, therefore areas and percentages of park area for these communities are not currently available.

Appendix 3

List of nationally important wetlands in Namadgi

Wetland	area (ha)
Cotter Flats	41
Ginini and Cheyenne Flats	125
Rock Flats	12
Rotten Swamp	30
Scabby Range Lake	5
Snowy Flats	35
Upper Cotter River	600
Upper Naas Creek	56
Bendora Reservoir	81
Nursery Swamp	53
Cotter Source Bog	5

Source: *A Directory of Important Wetlands in Australia* (Environment Australia 2001)

Appendix 4

National conservation status of ACT threatened species occurring in Namadgi

Status of threatened plant species						
Species	Common Name	ACT	Common-wealth	Inter-national	NSW	Other
<i>Gentiana baeuerlenii</i>	a subalpine herb	E (SPS)	E (EPBC 1999)		E	
<i>Corunastylis ectopa</i>	Brindabella midge orchid	E	CE (EPBC 1999)			
Status of threatened fauna						
<i>Pseudophryne pengilleyi</i>	northern corroboree frog	E (SPS)	V (EPBC 1999)	V (IUCN)	V	
<i>Gadopsis bispinosus</i>	two-spined blackfish	V			IK	
<i>Maccullochella macquariensis</i>	trout cod	E (SPS)	E (EPBC 1999)	E (IUCN)	E (FMA 1994)	T (Vic)
<i>Macquaria australasica</i>	Macquarie perch	E (SPS)	E (EPBC 1999) V (ASFB)		V (FMA 1994)	T (Vic)
<i>Euastacus armatus</i>	Murray River crayfish	V (PI)	I	V (IUCN 2000)	I	E (SA) T (Vic)
<i>Melanodryas cucullata</i>	hooded robin	V			V (M.c.c)	T (Vic)
<i>Climacteris picumnus</i>	brown treecreeper	V			V (C.p.p)	
<i>Petrogale penicillata</i> (now locally extinct)	brush-tailed rock-wallaby	E (SPS)	V (EPBC 1999)	V (IUCN)	E	T (Vic)
<i>Pseudomys fumeus</i>	smoky mouse	E (SPS)	E (EPBC 1999)	V (IUCN 2000)	E	T (Vic)
<i>Dasyurus maculatus</i>	spotted-tailed quoll	V	E (EPBC 1999)	V (IUCN 2000)	V	V (Qld) E (Vic)
<i>Daphoenositta chrysoptera</i>	varied sitella	V				
<i>Lalage sueurii</i>	white-winged triller	V				
<i>Hieraaetus morphnoides</i>	little eagle	V				

E: Endangered species; CE: Critically Endangered; V: Vulnerable species;
 T: Threatened taxon; R: Rare; IK: Insufficiently known; UC: Under consideration;
 I: Indeterminate; Re: Restricted; SPS: Special Protection Status; PI: Protected Invertebrate
 FMA 1994—Fisheries Management Act (NSW)

Appendix 5

Vertebrate species of Namadgi

Scientific Name	Common Name	Confirmed	Expected in Namadgi
Mammals found in Namadgi			
<i>Macropus giganteus</i>	eastern grey kangaroo	Y	
<i>Macropus robustus robustus</i>	wallaroo	Y	
<i>Macropus rufogriseus</i>	red-necked wallaby	Y	
<i>Petrogale penicillata</i>	brush-tailed rock-wallaby	Y (Historical)	N (Extinct)
<i>Wallabia bicolor</i>	swamp wallaby	Y	
<i>Trichosurus caninus</i>	mountain brushtail possum	Y	
<i>Trichosurus vulpecula</i>	common brushtail possum	Y	
<i>Pseudocheirus peregrinus</i>	common ringtail possum	Y	
<i>Petauroides volans</i>	greater glider	Y	
<i>Petaurus australis</i>	yellow-bellied glider	Y	
<i>Petaurus norfolcensis</i>	squirrel glider		Single record from Michelago
<i>Petaurus breviceps</i>	sugar glider	Y	
<i>Acrobates pygmaeus</i>	feathertail glider	Y	
<i>Cercartetus nanus</i>	eastern pygmy possum	Y	
<i>Phascolarctos cinereus</i>	koala	Y	
<i>Vombatus ursinus</i>	common wombat	Y	
<i>Dasyurus maculatus</i>	spotted-tailed quoll	Y	
<i>Antechinus agilis</i>	agile antechinus	Y	
<i>Antechinus swainsonii</i>	dusky antechinus	Y	
<i>Phascogale tapoatafa</i>	brush-tailed phascogale	Y	
<i>Sminthopsis murina</i>	common dunnart	Y	
<i>Rattus fuscipes</i>	bush rat	Y	
<i>Hydromys chrysogaster</i>	eastern water rat	Y	
<i>Mastacomys fuscus</i>	broad-toothed rat	Y	
<i>Pseudomys fumeus</i>	smoky mouse	Y	
<i>Nyctophilus geoffroyi</i>	lesser long-eared bat	Y	
<i>Nyctophilus gouldi</i>	Gould's long-eared bat	Y	
<i>Tadarida australis</i>	white-striped freetail-bat	Y	
<i>Mormopterus planiceps</i>	southern freetail-bat		Y
<i>Miniopterus schreibersii</i>	common bentwing-bat		Y
<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail-bat		Y
<i>Chalinolobus gouldii</i>	Gould's wattled bat	Y	
<i>Chalinolobus morio</i>	chocolate wattled bat	Y	
<i>Vespadelus regulus</i>	southern forest bat	Y	
<i>Vespadelus darlingtoni</i>	large forest bat	Y	
<i>Vespadelus vulturnus</i>	little forest bat	Y	
<i>Falsistrellus tasmaniensis</i>	eastern false pipistrelle	Y	
<i>Myotis macropus</i>	large-footed myotis		Y (No known ACT record)
<i>Pteropus poliocephalus</i>	grey-headed flying-fox		Y (Unlikely, only as rare vagrant)
<i>Pteropus scapulatus</i>	little red flying-fox		Y (Unlikely, only as rare vagrant)
<i>Ornithorhynchus anatinus</i>	platypus	Y	
<i>Tachyglossus aculeatus</i>	short-beaked echidna	Y	
<i>Canis lupus dingo</i>	dingo	Y	

Scientific Name	Common Name	Confirmed	Expected in Namadgi
Introduced mammals found in Namadgi			
<i>Rattus rattus</i>	black rat	Y	
<i>Mus domesticus</i>	house mouse	Y	
<i>Vulpes vulpes</i>	European red fox	Y	
<i>Felis cattus</i>	cat	Y	
<i>Oryctolagus cuniculus</i>	European rabbit	Y	
<i>Lepus capensis</i>	brown hare	Y	
<i>Sus scrofa</i>	pig	Y	
<i>Capra hircus</i>	goat	Y	
<i>Equus caballus</i>	horse	Y	
<i>Mustela putorius</i>	ferret	Y	
<i>Ovis aries</i>	sheep	Y	
<i>Bos taurus</i>	cattle	Y	
<i>Dama dama</i>	fallow deer	Y	
<i>Cervus unicolor</i>	sambar deer	Y	
<i>Cervus elaphus</i>	red deer	Y	
Frogs found in Namadgi			
<i>Limnodynastes dumerilii</i>	eastern banjo frog	Y	
<i>Limnodynastes tasmaniensis</i>	spotted grass frog	Y	
<i>Neobatrachus sudelli</i>	burrowing frog	Y	
<i>Pseudophryne pengilleyi</i>	northern corroboree frog	Y	
<i>Pseudophryne dendyi</i>	southern toadlet	Y	
<i>Crinia parinsignifera</i>	plains froglet	Y	
<i>Crinia signifera</i>	common eastern froglet	Y	
<i>Uperoleia laevigata</i>	smooth toadlet	Y	
<i>Litoria lesueuri</i>	Lesueur's frog	Y	
<i>Litoria peronii</i>	Peron's tree frog	Y	
<i>Litoria nudidigitus</i>	southern leaf-green tree frog (Cotter River form)	Y	
<i>Litoria raniformis</i>	green and golden bell frog	Y (Historical)	
<i>Litoria verreauxii alpina</i>	alpine tree frog	Y	
<i>Litoria verreauxii verreauxii</i>	Verreaux's tree frog	Y	
Reptiles found in Namadgi			
<i>Chelodina longicollis</i>	eastern snake-necked tortoise (also known as eastern long-necked tortoise)	Y	
<i>Christinus marmoratus</i>	marbled gecko	Y?	Recorded in Mt Tennent study which also included areas outside the park
<i>Diplodactylus vittatus</i>	stone gecko	Y	
<i>Delma inornata</i>	olive legless lizard	N	Recorded from lowland woodland/grassland near Namadgi
<i>Lialis burtonis</i>	Burton's legless lizard	Y	
<i>Pygopus lepidopodus</i>	common scaly-foot	N	Unconfirmed record from Namadgi, and single record from Tidbinbilla
<i>Pogona barbata</i>	bearded dragon	Y	
<i>Tympanocryptis diemensis</i>	mountain dragon	Y	
<i>Amphibolurus muricatus</i>	jacky lizard	Y	
<i>Amphibolurus nobbi</i>	nobbi dragon	Y	
<i>Physignathus lesueurii</i>	eastern water dragon	Y	
<i>Varanus rosenbergi</i>	Rosenberg's monitor	Y	

Scientific Name	Common Name	Confirmed	Expected in Namadgi
<i>Varanus varius</i>	lace monitor	N	
<i>Carlia tetradactyla</i>	four-fingered skink	Y	
<i>Ctenotus robustus</i>	robust skink	Y	
<i>Ctenotus taeniolatus</i>	copper-tailed skink	Y	
<i>Egernia cunninghami</i>	Cunningham's skink	Y	
<i>Egernia saxatilis</i>	black rock skink	Y	
<i>Egernia whitii</i>	White's skink	Y	
<i>Egernia montana</i>	tan-backed rock skink	Y	
<i>Hemiergis decresiensis</i>	three-toed skink	Y	
<i>Nannoscincus maccoyi</i>	Maccoy's skink	Y	
<i>Lampropholis delicata</i>	delicate skink	Y	
<i>Lampropholis guichenoti</i>	spotted grass skink	Y	
<i>Niveoscincus coventryi</i>	Coventry's skink	Y	
<i>Pseudemoiapagenstecheri</i>	grass skink	Y	
<i>Pseudemoia entrecasteauxii</i>	grass skink	Y	
<i>Pseudemoia rawlinsoni</i>	bog skink	Y	
<i>Pseudemoia spenceri</i>	Spencer's skink	Y	
<i>Bassiana platynota</i>	red-throated skink	Y	
<i>Bassiana duperreyi</i>	three-lined skink	Y	
<i>Morethia boulengeri</i>	Boulenger's skink	Y?	Recorded in Mt Tennent study which also included areas outside the park
<i>Eulamprus kosciuskoi</i>	alpine water skink	Y	
<i>Eulamprus heatwolei</i>	Heatwole's water skink	Y	
<i>Eulamprus tympanum</i>	highland water skink	Y	
<i>Tiliqua nigrolutea</i>	blotched blue-tongue lizard	Y	
<i>Tiliqua scincoides</i>	common blue-tongue lizard	Y	
<i>Ramphotyphlops nigrescens</i>	blind snake	Y?	Recorded in Mt Tennent study which also included areas outside the park
<i>Austrelaps ramsayi</i>	highland copperhead	Y	
<i>Drysdalia coronoides</i>	white-lipped snake	Y	
<i>Pseudechis porphyriacus</i>	red-bellied black snake	Y	
<i>Pseudonaja textilis</i>	eastern brown snake	Y	
<i>Notechis scutatus</i>	mainland tiger snake	Y	
<i>Suta spectabilis</i>	black-headed snake	Y	
Fish found in Namadgi			
<i>Maccullochella macquariensis</i>	trout cod	Y	
<i>Macquaria australasica</i>	Macquarie perch	Y	
<i>Gadopsis bispinosus</i>	two-spined blackfish	Y	
<i>Galaxias olidus</i>	mountain galaxias	Y	
Introduced fish found in Namadgi			
<i>Salmo trutta</i>	brown trout	Y	
<i>Oncorhynchus mykiss</i>	rainbow trout	Y	
<i>Gambusia holbrooki</i>	eastern gambusia (mosquitofish)	Y	

Note: Due to inadequate data a list of invertebrate species is not included.

Bird species recorded from Namadgi National Park

Large flightless birds

emu

Grebes

great crested grebe
Australasian grebe
hoary-headed grebe

Cormorants

great cormorant
little black cormorant
little pied cormorant

Egrets

great egret

Heron

white-faced heron
white-necked heron
nankeen night heron

Ibis

Australian white ibis
straw-necked ibis

Swans and shelducks

black swan
Australian shelduck

Ducks

Australian wood duck
Pacific black duck
chestnut teal
grey teal
musk duck

Raptors

swamp harrier
grey goshawk
brown goshawk
collared sparrowhawk
wedge-tailed eagle
little eagle
white-bellied sea-eagle
whistling kite
black-shouldered kite
Australian hobby
peregrine falcon
black falcon
brown falcon
nankeen kestrel

Quail

stubble quail
brown quail
painted button-quail

Rails

Lewin's rail

Gallinules

dusky moorhen
Eurasian coot

Plovers

masked lapwing
black-fronted dotterel

Snipe

Latham's snipe

Pigeons and doves

common bronzewing
brush bronzewing
crested pigeon
wonga pigeon
bar-shouldered dove
peaceful dove

Cockatoos

yellow-tailed black-cockatoo
gang-gang cockatoo
sulphur-crested cockatoo
little corella
galah

Lorikeets, parrots and rosellas

little lorikeet
Australian king-parrot
red-rumped parrot
swift parrot
crimson rosella
eastern rosella

Cuckoos

pallid cuckoo
fan-tailed cuckoo
brush cuckoo
Horsfield's bronze-cuckoo
shining bronze-cuckoo
common koel

Kookaburras

laughing kookaburra

Kingfishers, bee-eaters and rollers

sacred kingfisher
rainbow bee-eater
dollarbird

Owls, frogmouths and owlet-nightjars

southern boobook
barking owl
powerful owl
barn owl
tawny frogmouth
Australian owlet-nightjar

Swifts, swallows and martins

white-throated needletail
welcome swallow
tree martin
fairy martin

Ground-thrushes

Bassian thrush

Larks and pipits

brown songlark
rufous songlark
Richard's pipit
singing bushlark

Cuckoo-shrikes

black-faced cuckoo-shrike

Trillers

white-winged triller
cicadabird

Robins

scarlet robin
red-capped robin
flame robin
pink robin
rose robin
hooded robin
eastern yellow robin
jacky winter

Shrike-tits and whistlers

crested shrike-tit
golden whistler
rufous whistler
olive whistler

Shrike-thrushes

grey shrike-thrush

Monarch flycatchers

leaden flycatcher
satin flycatcher
restless flycatcher
black-faced monarch

Fantails

grey fantail
 rufous fantail
 willie wagtail

Whipbirds

eastern whipbird

Quail-thrushes

spotted quail-thrush

Warblers

little grassbird
 clamorous reed-warbler

Cisticolas

golden-headed cisticola

Fairy-wrens

superb fairy-wren

Scrubwrens

white-browed scrubwren
 pilotbird
 chestnut-rumped heathwren
 speckled warbler

Gerygones

White-throated gerygone

Whitefaces

southern whiteface

Thornbills

striated thornbill
 yellow thornbill
 brown thornbill
 buff-rumped thornbill
 yellow-rumped thornbill
 weebill

Sittellas and treecreepers

varied sittella
 brown treecreeper
 white-throated treecreeper
 red-browed treecreeper

Wattlebirds

red wattlebird

Friarbirds

noisy friarbird
 little friarbird

Honeyeaters

white-naped honeyeater
 brown-headed honeyeater
 eastern spinebill
 Lewin's honeyeater
 fuscous honeyeater
 yellow-faced honeyeater
 white-eared honeyeater
 yellow-tufted honeyeater
 white-plumed honeyeater
 crescent honeyeater
 New Holland honeyeater
 noisy miner

Chats

white-fronted chat

White-eyes and flowerpeckers

silveryeye
 mistletoebird

Pardalotes

spotted pardalote
 striated pardalote

Firetails

diamond firetail
 red-browed finch

Finches

double-barred finch

Orioles

olive-backed oriole

Drongos and Mud-nest builders

spangled drongo
 white-winged chough
 Australian magpie-lark

Woodswallows

masked woodswallow
 white-browed woodswallow
 dusky woodswallow

Butcherbirds

grey butcherbird

Magpies and currawongs

pie currawong
 grey currawong
 Australian magpie

Bowerbirds

satin bowerbird

Lyrebirds

superb lyrebird

Ravens

Australian raven
 little raven

Gulls

silver gull

INTRODUCED SPECIES

feral pigeon
 common blackbird
 skylark
 house sparrow
 European goldfinch
 European greenfinch
 common myna
 common starling

(Source: Database compiled by the Canberra Ornithologists Group)

Appendix 6

Cultural heritage places in Namadgi included on the ACT Heritage Register

Place	District	Identification number	Conservation Management Plan prepared
ACT Heritage Register—Historic Places*			
ACT Forest Hut	Rendezvous Creek	1663	Yes
ACT-NSW Border Markers (Group 1)	Cotter River, Mount Clear and Rendezvous Creek	480	
Bendora Arboretum	Cotter River	1008	Yes
Bendora Hut	Cotter River	482	
Brandy Flat Hut Precinct	Booth	1641	
Brayshaw's Homestead Precinct	Mount Clear	441	
Brumby Yards	Cotter River and Tennent	460	
Cotter Hut Precinct	Cotter River	1662	Yes
Demanding Hut	Mount Clear	331	
Frank and Jack's Hut	Rendezvous Creek	331	
Honeysuckle Creek Tracking station (NASA Ground Station)	Tennent	371	
Horse Gully Hut	Mount Clear	331	
Hospital Creek Hut	Booth	331	
Lees Creek Sawmill Ruin	Cotter River	417	
Luton's Crutching Shed	Mount Clear	1270	Yes
Max and Bert Oldfield's Hut	Booth	331	
Mount Franklin Chalet and Precinct	Cotter River	267	
Old Orroral Homestead and Ploughlands	Rendezvous Creek	1031	
Orroral Valley Homestead and Ploughlands	Rendezvous Creek	327	Yes
Orroral Valley Tracking Station (NASA Ground Station)	Rendezvous Creek	1272	
Orroral Woolshed Precinct	Rendezvous Creek	1461	Yes
Piccadilly Circus Arboretum	Cotter River	1261	
Rowley's Rendezvous Creek Hut	Rendezvous Creek	331	
Sentry Box Olearia Site	Mount Clear	328	
Tennent Homestead	Tennent	418	
Waterhole Hut	Mount Clear	331	
Westerman's Homestead Precinct	Mount Clear	445	

Place	Artefact type	District	Identification number	Conservation Management Plan prepared
ACT Heritage Register—Aboriginal Places* (excluding Potential Archaeological Deposits, artefact scatters and isolated artefacts)				
Bogong Creek 11	Rock Shelter	Rendezvous Creek	1961	
Bogong Creek 12 (also known as G9)	Rock Shelter	Rendezvous Creek	1961	
Bogong Shelters and Cave	Rock Shelter	Cotter River	2026	
BP 34	Rock Shelter	Rendezvous Creek	1961	
CD 1	Rock Shelter	Tennent	2026	
CD 2	Grinding Grooves	Tennent	2022	
Front Paddock Shelter	Rock Shelter	Rendezvous Creek	2026	
G 9	Rock Shelter	Rendezvous Creek	2026	
Greenfield 2	Rock Shelter	Rendezvous Creek	1961	
Hospital Creek 3	Rock Shelter	Rendezvous Creek	1961	
Hospital Creek 5	Stone Source	Rendezvous Creek	1961	
KFS 2	Rock Shelter	Cotter River	2026	
KFS 3	Rock Shelter	Cotter River	2026	
NA 35	Rock Shelter	Rendezvous Creek	2026	
NA 36	Rock Shelter	Rendezvous Creek	2026	
NA 43	Rock Shelter	Tennent	2026	
NA 8	Rock Shelter	Tennent	2026	
Naas River 1	Grinding Grooves	Booth	2022	
Naas River 3	Grinding Grooves	Booth	2022	
NNP CHR 12	Rock Shelter	Tennent	2024	
NNP CHR 17	Rock Shelter	Tennent	2024	
NNP HCGG	Grinding Grooves	Tennent	2022	
NNP MCGG 1	Grinding Grooves	Rendezvous Creek	2022	
NNP MCGG 2	Grinding Grooves	Rendezvous Creek	2022	
NNP MN 04	Rock Shelter	Rendezvous Creek	1257	
NNP MNSA 1	Stone Arrangement	Cotter River	1257	
NNP MNSA 2	Stone Arrangement	Cotter River	1257	
NNP MNSA 3	Stone Arrangement	Cotter River	1257	
NNP MNSA 4	Stone Arrangement	Cotter River	1257	
NNP MNSA 5	Stone Arrangement	Cotter River	1257	
NNP MNSA 6	Stone Arrangement	Rendezvous Creek	1257	
NNP OBR 14	Rock Shelter	Rendezvous Creek	2024	
NNP RCGG	Grinding Grooves	Rendezvous Creek	2022	
NNP RS 07	Rock Shelter	Cotter River	1257	
NNP SBM 02	Rock Shelter	Mount Clear	1257	
NNP SGT 01	Rock Shelter	Tennent	2024	
NNP SQR 02	Rock Shelter	Cotter River	2026	
NNP SQR 03	Rock Shelter	Cotter River	2026	
Nursery Swamp I (NS1)	Art Site Rock Shelter	Rendezvous Creek	465	Yes
Nursery Swamp II (NS 2)	Art Site Rock Shelter	Rendezvous Creek	465	Yes
Nursery Swamp III (NS3)	Art Site Rock Shelter	Rendezvous Creek	465	Yes
OR 1	Rock Shelter	Rendezvous Creek	2026	
OR 10	Rock Shelter	Tennent	2026	
OR 19	Rock Shelter	Tennent	2026	
OV 12	Rock Shelter	Tennent	2026	
OV 5 Egloff	Rock Shelter	Tennent	2026	
Rendezvous Creek (G13)	Art Site Rock Shelter	Rendezvous Creek	465	Yes
Yankee Hat I (G12)	Art Site Rock Shelter	Rendezvous Creek	465	Yes
Yankee Hat II	Art Site	Rendezvous Creek	465	Yes

* The ACT Heritage Register is established under the Heritage Act 2004. For the most current information on places listed on the ACT Heritage Register go to <http://www.tams.act.gov.au/live/heritage/act_heritage_register>.

Appendix 7

Roads and vehicle trails in Namadgi

Name of road/trail	Zone	Location	Current condition/use/status	Potential changes in condition/use/status related to policies in this management plan
Public Roads (2WD): These are the main access roads into the park. Some are subject to closure due to winter snowfall or on Total Fire Ban days. Major public roads in the park are managed by Roads ACT (Department of Territory and Municipal Services). (Bracketed zone indicates park zone adjoining road.)				
Boboyan Road	3 (2B)	South of Tharwa (Naas to NSW border).	Condition: Sealed/unsealed. Occasional winter closure. Use: Access to southern part of park. Through route to NSW.	None
Old Boboyan Road (to Yankee Hat Carpark)	3 (2B)	West of Boboyan Rd in Gudgenby Valley.	Condition: Unsealed. Occasional wet weather closure. Use: Access to Yankee Hat Carpark.	None
Orroral Road	3 (2B)	Orroral Valley. Joins Boboyan Road south of Fitz's Hill.	Condition: Sealed. Use: Access to Orroral Valley and Orroral Campground.	None
Apollo Road	3 (2B)	Honeysuckle Creek/Naas Valley (south of Tharwa). Connects to Naas Road.	Condition: Sealed. Use: Access to Honeysuckle Campground and Booroomba Rocks Road (carpark).	None
Booroomba Rocks Road	2B	Honeysuckle Creek. From Apollo Road to Booroomba Rocks carpark.	Condition: Unsealed. Occasional wet weather closure. Use: Access to Booroomba Rocks.	None
Corin Road	3 (2B, 1B)	Corin Dam/ Gibraltar Creek/ Smokers Gap. Connects Tidbinbilla Road to Corin Dam.	Condition: Sealed. Occasional winter and Total Fire Ban closures. Use: Access to Corin Dam wall/picnic area and walking/cycling tracks (Square Rock, Smokers Trail).	None
Brindabella Road	3 (3)	North-western section of park. From Uriarra Station to Piccadilly Circus (continues to Tumut).	Condition: Sealed/unsealed. Occasional winter and Total Fire Ban closures. Use: Access to Brindabella Range, plantation forestry areas, Goodradigbee Valley and Tumut.	None
Mt Franklin Road	3 (3, 1B)	Brindabella Range crest. Piccadilly Circus to Mt Ginini.	Condition: Unsealed. Occasional winter and Total Fire Ban closures. Use: Access to Brindabella Range for recreation, management purposes, fire management.	Fire management: Proposed major upgrade to Float Standard (SBMP).
Bendora Road	3 (3, 1B)	North of Bendora Dam. Bulls Head Picnic Area to Bendora Dam.	Condition: Unsealed. Occasional winter and Total Fire Ban closures. Use: Access to Bendora Dam	None

Name of road/trail	Zone	Location	Current condition/use/status	Potential changes in condition/use/status related to policies in this management plan
Public Access Trails (unsealed, mainly 2WD except when wet/snow affected, some best suited to 4WD): These fire/management trails are mainly in the north-western section of the park. They originate from previous activities especially hardwood logging. The trails may be temporarily closed (when unusable or dangerous (e.g. very wet), for park or adjacent forestry operations, on Total Fire Ban days). There is no access when the Brindabella Road is closed. Trails around Mt Coree can be accessed from NSW.				
Warks Road, Old Mill Road, Blundells Creek Road	3	North-western section of park, between Bendora Road and Brindabella Road.	Condition: Generally suitable for 2WD but variable. May be untrafficable when wet. Use: Fire trails, management purposes, recreation.	Tourist route: Investigation of all-weather 2WD standard tourist drive circuit proposed (s. 8.7.1).
Two Sticks Road, Pabral Road and Curries Road south of Mt Coree to Blundells Flat.	3	Far north-western section of park around Mt Coree, north of Brindabella Road.	Condition: Best suited to 4WD. Rough in parts and steep. May be untrafficable when wet. Use: Fire trails, management purposes, recreation.	None
Orroral Ridge Road	2B	Honeysuckle Camp Ground. Orroral Ridge.	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Management/fire trails with no public vehicle access (unsealed, mainly 4WD): These trails are located throughout the park and are accessed through locked gates. Most predate the declaration of the park. Short diversions off these trails are not included in the list below.				
Parrot Road, Wombat Road, Chalet Road, Warks Road, Moonlight Hollow Road.	1B	West of Bendora Dam, south and west of Bendora Dam Road. Adjoin Mt Franklin Road and/or Bendora Road.	Former forestry roads. Condition: Good 4WD. Use: Fire trails, management purposes, recreation (non-motorised).	None
Pipeline Road (and Burkes Creek track).	1B	North of Bendora Dam.	Condition: Pipeline Road-good. Use: ACTEW access, fire trail, management purposes.	Fire management: Possible new trail linking Camelback Trail with Pipeline Road to be addressed in regional fire planning process.
Smokers Trail	2B	Vicinity of Corin Road to Orroral Valley. Joins Cotter Hut Road.	Condition: Good. Use: Fire trail, management purposes, recreation (walking, cycling).	Fire management: Possible road upgrade to be addressed in sub regional fire planning process
Mt Tennent Fire Trail	2B	West of Mt Tennent, connects to Apollo Road.	Condition: Good. Use: Fire trails, management purposes, recreation (walking).	None
Blue Gum Creek – Bushfold Flats Fire Trail	2B	West of Mt Tennent.	Condition: Good. Use: Fire trails, management purposes.	None

Name of road/trail	Zone	Location	Current condition/use/status	Potential changes in condition/use/status related to policies in this management plan
Cotter Hut Road	1A, 2B	Upper Cotter Catchment (Orroral Valley to Cotter Hut).	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	Fire management: Proposed major upgrade to Float Standard (SBMP).
Mt Franklin Firetrail	1A, 1B	Intersection of Cotter Hut Road to Ginini Gate.	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	Fire management: Proposed upgrade to Tanker Standard (SBMP).
Stockyard Spur Trail	1B	South of Ginini Carpark, trail extends eastward in direction of Corin Dam wall.	Condition: Only trafficable by 4WD. Dead end road along ridge to top of spur above Corin. Use: Dormant fire trail, not generally accessed, walking.	Fire management: Proposed upgrade to Tanker Standard and upgrade of walking trail to connect with Corin Road at Corin Dam.
Lick Hole Firetrail	1A	Cotter Hut Road to headwaters Corin Dam	Condition: Good. Use: Access to Corin Dam (water supply purposes).	None
Murrays Gap Trail	1A	Yaouk Gap Trail to Murrays Gap (NSW border).	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Yaouk Gap Trail	1A	Cotter Hut to Yaouk Gap (NSW border).	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Honeysuckle to Orroral Link Road	2B	Orroral Valley (intersects with Orroral Ridge Road).	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Brandy Flat Trail	2B	Glendale Depot to Brandy Flat hut. Continues through to Boboyan Road.	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Gudgenby Creek Fire Trail	2B	Caloola Farm to Brandy Flat Hut.	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Rendezvous Creek Trail	2B	Gudgenby Valley.	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Old Boboyan Road (south of Yankee Hat Carpark)	2B	Yankee Hat Carpark to Boboyan Road near Mt Clear Campground. (Network of former forestry trails through the former Boboyan Pines area).	Condition: Good. Use: Fire trail, management purposes, recreation (walking, cycling).	None
Sams Creek Fire Trail	2B, 1A	Along upper Naas Creek in Boboyan Valley - joins to Maurice Luton's Trail.	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None

Name of road/trail	Zone	Location	Current condition/use/status	Potential changes in condition/use/status related to policies in this management plan
Maurice Luton's Fire Trail	2B	From Sams Creek Fire Trail to the NSW border and Scabby Range Nature Reserve	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None
Grassy Creek Fire Trail	2B	Boboyan Valley to Boboyan Road near ACT/NSW border.	Condition: Good. Use: Fire trail, management purposes, recreation (walking, cycling).	None
Waterhole Hut Fire Trail	2B	Bulls Flat Fire Trail to Grassy Creek Fire Trail. (Includes part of the old Grassy Creek Fire Trail)	Condition: Good. Use: Fire trail, management purposes, recreation.	None
Bulls Flat Fire Trail	2B	Old Boboyan Road to Grassy Creek Fire Trail	Condition: Good. Use: Fire trail, management purposes, recreation.	None
Long Flat Fire Trail, Mt Clear Fire Trail, Left Hand Creek Fire Trail.	2B	Mt Clear Campground to Long Flat, ACT/NSW border via Mt Clear, to Horse Gully Hut (Naas River Valley) (Separate but linked trails)	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	Fire management: (a) Proposed new trail linking Burnt Hill Trail and Mt Clear Fire Trail.
Burnt Hill Fire Trail	2B	Links Boboyan Road and Long Flat Fire Trails	Condition: Good. Use: Fire trail, management purposes, recreation.	
Naas Valley Fire Trail	2B	Naas River Valley from Mt Clear Campground to Caloola Farm via Horse Gully Hut.	Condition: Good. Use: Fire trail, management purposes, recreation (walking, cycling).	None
The Forest Trail	2B	Short trail from Naas Valley Fire Trail to ACT/NSW border north of Horse Gully Hut).	Condition: Good. Use: Fire trail, management purposes, recreation (walking).	None

SBMP: Identified in the *Strategic Bushfire Management Plan for the ACT - Version 2* (ACT ESA 2009)

Appendix 8

Management actions and priorities

Notes for the following table:

Priority

(High, Medium, Low) is used in two ways in this table:

- For some actions, it indicates the priority that should be given to *undertaking and completing* the action.
(for example, a High priority action of this type should be undertaken early in the life of the management plan);
- For many actions it indicates the priority that should be given to an action *that will remain current across the life of the plan* (in the context of all management activities). These are generally shown as Ongoing.

Time scales for actions

As a guide the following time scales are appropriate for actions in category 1:

High: Undertaken/completed within three years of completion of this plan.

Medium: Undertaken/completed within five years of completion of this plan.

Low: Undertaken/completed more than five years after completion of this plan.

	Action	Priority
Chapter 4: A place of water—water resource management		
1	4.6.1 Legislative and planning instruments Ensure that subsidiary plans, such as weed and feral animal control strategies, recreation strategies, fire management plans and operational procedures, address legislative requirements for catchment management.	High Ongoing
2	4.6.3 Effective resource management Protect water quality in all streams by minimising the impact of erosion caused by management infrastructure and use (such as fire trails, road works and creek crossings). This means applying a high standard of soil erosion control measures and keeping any new works to an absolute minimum.	High Ongoing
3	Ensure that any road and track maintenance, and the construction of new tracks or containment lines are undertaken by personnel who are competent in techniques that minimise the potential for sedimentation of watercourses.	High Ongoing
4	Where necessary, rehabilitate areas subject to human-induced erosion and ensure that revegetation material is sourced from locally occurring species.	Ongoing through assessment
5	Identify sediment/contaminant loads in streams and water storages as a result of fire impacts and develop strategies to minimise further contamination.	Ongoing. High after fire
6	Identify threats to catchment hydrology and develop strategies to minimise risks to stream ecosystems and the integrity of stored water.	Ongoing
7	Evaluate closing and rehabilitating vehicle trails that are not necessary for management purposes or recreational access, and are likely sources of sedimentation in water supply catchments (e.g. the network of trails in the northern part of the park near Mt Coree).	Medium
8	Identify pollutant sources and prepare pollution control strategies within the catchments, as required.	Ongoing
9	Ensure that fuel and chemical storage and disposal of depot wastes are managed to prevent ground water and stream contamination (see s. 11.2.6).	High
10	Monitor the application of environmental flows where there is modification of the flow regime due to diversion.	Medium

	Action	Priority
11	Enforce the regulation of activities that cause soil erosion—such as illegal off-road four wheel driving, horse riding, and off-road mountain biking.	High
12	Prohibit camping in the middle and lower Cotter Catchment and around the reservoirs. Limit camping in the upper Cotter Catchment (Bimberi Wilderness) by use of a permit system (see s. 3.2, s. 8.6).	Ongoing
13	Manage and protect dam infrastructure and reservoirs by prohibiting watercraft on Corin and Bendora Dams, except for management, research or monitoring purposes. Maintain safe access to the dams for management purposes.	Ongoing
14	Monitor and, as far as practicable, minimise vehicular access for management purposes to the wilderness area.	Ongoing
15	4.6.4 Knowledge and skills Work on a regional level and with other Australian Alps management agencies to gather and analyse information on catchment management, particularly with regard to measuring impacts of climate change on water resources.	Medium Ongoing
16	Plan and implement a structured, ongoing water quality monitoring program for the park based on best practice models and standards to measure water quality for: - maintenance of aquatic ecosystem health - supply of safe drinking water - impacts of development - impacts of management activities - effects of recreation and natural events on ground water, streams and water bodies - impacts of toilets on ground water and streams.	Medium
17	Liaise with EPA, ACTEW and ACT Health regarding water quality issues, as required.	Ongoing
18	Provide training in best practice catchment management for policy and operational staff.	Low Ongoing
19	Participate in local, regional and national scientific and natural resource management forums on catchment and water resource management.	Medium Ongoing
20	4.6.5 Effective partnerships between the community and government Work across departments within government to establish cooperative and knowledge sharing arrangements to achieve catchment management outcomes.	Medium Ongoing
21	Work with community groups, institutions and professional organisations to establish cooperative involvement in catchment monitoring programs, in particular programs relating to measuring water quality and post-fire impacts and regeneration.	Medium Ongoing
22	Assist the Southern ACT Catchment Group, and other community groups working within Namadgi, to implement sub-catchment plans.	Medium Ongoing
23	Work with rural lessees in the Gudgenby/Naas Catchment to protect water quality.	Medium Ongoing
Chapter 5: A place of nature—landscape and biodiversity protection		
24	5.6 Landscapes: objective, policies and actions Conduct a visual impact analysis and develop a strategy to protect the scenic vistas and landscape integrity of the park by identifying areas that should remain free of developments, such as park facilities and infrastructure.	Medium
25	Assess and, where feasible, remove, relocate, or replace facilities that, due to poor location or design, significantly impact on natural landscape quality.	Medium Ongoing
26	Identify and map significant geological and geomorphological features. Prohibit developments (e.g. park facilities and infrastructure) where there is likely to be significant impact on these values.	Medium Ongoing
27	Ensure that park management activities and recreational use are consistent with the protection of important landscape values and features (see Chapter 8).	Ongoing

	Action	Priority
28	5.9 Native vegetation: objective, policies and actions Conduct systematic surveys and mapping of vegetation communities across the park giving a high priority to areas that have not been previously surveyed e.g. the eastern section of the park, including the Booth Range. Ensure that vegetation surveys and mapping are consistent with the National Vegetation Inventory System.	High
29	Conduct a systematic monitoring program and support research that assists in identifying specific management requirements for species and communities, including responses to: (a) planned and unplanned fire (see Chapters 7 and 9); (b) climate change; and (c) impacts of threats such as introduced species. A key objective would be the identification of ecological fire thresholds (minimum and maximum fire intervals and fire intensity required for biodiversity conservation) for vegetation communities and important species, with the aim of integrating fire management and biodiversity protection requirements, and using planned fire for biodiversity conservation purposes (see Chapter 7).	High Ongoing
30	Ginini Wetlands: - Continue post-fire rehabilitation work to assist the natural regeneration of the Ginini Wetlands <i>Sphagnum</i> bogs following the 2003 fire, and adapt management according to the results of monitoring and assessment. - Undertake the management actions set out in the <i>Ginini Flats Wetlands Plan of Management 2001</i> (Note: the plan is currently under review). - Limit access to the Ginini Wetlands (except for research and management purposes) until the bogs have sufficiently recovered from the impact of fire. - In accordance with the Management Plan for Ginini Wetlands, do not permit the use of heavy machinery for fire suppression purposes or any other reason in the immediate catchment of the wetlands (see s. 7.4.5).	High Ongoing
31	Avoid disturbance to sensitive vegetation communities and species by visitors and management activities, and confine the use of vehicles to formed roads and trails.	High Ongoing
32	Foster community stewardship and appreciation of the native vegetation of Namadgi through community involvement in research and monitoring and communication and interpretation programs (see Chapter 9, Chapter 10).	Low Ongoing
33	5.12 Native animals: objectives, policies and actions Maintain a fauna inventory to national standards and ensure that it is regularly updated as new knowledge becomes available.	Medium Ongoing
34	Develop a fauna research and monitoring program to record the distribution, abundance and other details of fauna species, giving priority to sensitive, specialist and threatened species, species of regional significance and species that provide good indicators of change.	High
35	Continue with long-term post-fire recovery research and monitoring.	Medium Ongoing
36	Develop population management programs for declared threatened species.	Medium Ongoing
37	Provide information to park visitors and neighbours on the special qualities and need for protection of the park fauna.	Medium Ongoing
38	Refer species and communities that may be under threat to the ACT Flora and Fauna Committee for consideration for declaration as threatened.	Low Ongoing
39	5.15 Ecological restoration: objective, policy and actions Subject to feasibility and an assessment of cost-effectiveness, design and implement scientifically based ecological restoration programs and activities. Focus on those valleys where there is a greater likelihood of success, and complementary objectives can be achieved, such as extension of important habitat types and reduction in eastern grey kangaroo numbers.	Low
40	Where feasible and appropriate, re-introduce locally extinct species (e.g. brush-tailed rock-wallaby) and undertake actions outlined in Action Plans (ACT) and Recovery Plans (Commonwealth) for the conservation of threatened native species.	High Ongoing

	Action	Priority
41	Pursue research and control programs for introduced predator species, particularly for foxes, using methods that are not harmful to native species.	Medium Ongoing
42	5.19 Pest plants: objective, policies and actions Continue the development and implementation of annual weed control program. Adapt weed control programs according to the findings of evaluation and monitoring.	High Ongoing
43	Work with neighbours and Australian Alps national parks agencies to implement effective measures for weed control, focusing specifically on priority weeds that have the potential to spread through bushland.	Medium Ongoing
44	Support community involvement in weed control programs conducted within the park.	Medium Ongoing
45	Provide effective training for staff on the early detection of new invasive species, ongoing detection of weed spread and control measures.	Medium Ongoing
46	Provide education material that supports weed control strategies and informs the community and neighbours about the programs conducted within the park.	Medium Ongoing
47	5.22 Pest animals: objective, policies and actions Evaluate the benefits of establishing of a Pest Animal Working Group (similar to the ACT Weeds Working Group) or species specific working group that involves ACT Land Management Agencies and key stakeholders.	Medium
48	Continue to develop cooperative pest animal control programs that involve neighbours, other stakeholders and research organisations in the planning and delivery of programs.	Medium Ongoing
49	Evaluate the control and management of introduced pathogens for the protection of biodiversity.	Medium Ongoing
50	Develop capacity for early detection of new pest species or the spread of existing pest species.	Medium Ongoing
51	In collaboration with research organisations and Australian Alps national parks agencies identify a research agenda for pest animal control and ways to support such research.	Medium
52	Ensure that pest species eradicated or successfully controlled continue to be excluded from the park through regular monitoring and control, working with neighbours and by other feasible means.	Medium Ongoing
53	Identify opportunities for raising community awareness about existing and potential pest animals.	Low
54	Assess the effects of control measures on non-target species and make changes to procedures as required.	Medium Ongoing
55	5.24 Special scientific area and biosphere reserve: objective, policies and actions Encourage scientific inquiry and education, and provide interpretation for the ACT community, about the natural and cultural heritage values of Namadgi and ecosystem processes (see Chapter 9).	Medium Ongoing
56	Provide the ACT community with opportunities for managed recreational activities that are consistent with the natural, cultural or scientific values of the park (see Chapter 8).	High Ongoing
57	Work with the research community and neighbours (particularly Australian Alps national parks) to establish cooperative arrangements for research and management of Namadgi (see Chapter 10).	Medium Ongoing
Chapter 6: A place of past and present meaning—protecting and managing cultural heritage		
58	6.5.1 Statutory compliance and best practice Review and update as necessary existing Conservation Management Plans for cultural heritage sites and places of significance.	Medium Ongoing
59	Where none exist, prepare Conservation Management Plans for places of significant conservation value, places being visited by the public or places likely to be affected by development or other activity.	Medium
60	Where appropriate, consolidate Conservation Management Plans to produce a single plan for a themed group of sites (e.g. rock art sites, stone arrangements, huts).	Low

	Action	Priority
61	Report Aboriginal heritage places in accordance with the provisions of the <i>Heritage Act 2004</i> .	High Ongoing
62	Assess and, where appropriate, nominate significant European heritage places, landscapes or thematic groupings for inclusion on the ACT Heritage Register under the <i>Heritage Act 2004</i> .	Medium Ongoing
63	Recognise the regional significance of Namadgi's cultural heritage places and work with land managers in Kosciuszko National Park and Brindabella National Park on strategies for regional interpretation.	Low Ongoing
64	6.5.2 Protection of cultural heritage values Through maintenance, stabilisation, restoration, reconstruction and adaptation (as defined in the Burra Charter), conserve Aboriginal cultural places, historic buildings and places, stabilised ruins, exotic plant species of conservation significance and portable heritage objects in accordance with endorsed Conservation Management Plans, Heritage Impact statements, or general best practice.	High Ongoing
65	Retain all buildings or groups of buildings assessed as having significant cultural heritage values. Provide for the continuing use of these buildings and groups of buildings where this does not have an adverse impact on these values.	High Ongoing
66	Discourage the use of Namadgi's huts for overnight accommodation, other than in emergencies. This will be achieved through education and creating awareness of their values.	Ongoing
67	Exclude horses from hut precincts by providing horse tethering facilities at a suitable distance from huts (where practicable at least 30 m) and providing information to horse riders relating to the protection of park values (also see Action 136).	Medium
68	Leave portable Aboriginal or non-Aboriginal heritage objects <i>in situ</i> unless there is a demonstrated need to remove them for conservation and/or curation purposes or where there is an unacceptable risk of loss through theft, vandalism or other actions.	Ongoing
69	If there is an unacceptable risk of loss or destruction requiring the removal of any portable heritage objects, this should be carried out in accordance with the provisions of the <i>Heritage Act 2004</i> . Ensure that any objects removed are professionally catalogued and recorded and securely stored. Removed items may be temporarily returned for special occasions (e.g. as part of events that aim to interpret the cultural heritage of a place) provided there is a low risk to their safety and security.	High Ongoing
70	Ensure that border markers and survey control marks in Namadgi are protected from inadvertent damage in park management activities, especially road and fire trail maintenance and upgrading.	High Ongoing
71	6.5.4 Interpretation of cultural heritage Explore innovative and culturally appropriate ways of providing collected heritage information to particular communities and the broader public.	Medium Ongoing
72	Celebrate the cultural connections and historical associations that individuals, families and communities have with Namadgi and with heritage places within Namadgi.	Medium Ongoing
73	Interpret and commemorate community connections to land use or recreational activities that have been a significant part of the history of the park.	Medium Ongoing
74	Interpret and commemorate the cultural significance of important buildings, or other structures, that are destroyed by events such as bushfire and are not rebuilt.	Medium Ongoing
75	6.5.5 Acknowledgement of community attachment (social value) Support, facilitate and, where appropriate, coordinate the recording of Aboriginal and European historical traditions and land management practices.	Medium Ongoing

	Action	Priority
76	Explore the development of protocols with the Ngunnawal community for access to Namadgi by Aboriginal people for cultural purposes that address: - access (including vehicle use) by Aboriginal people to remote parts of Namadgi to fulfil cultural obligations or maintain cultural connections - potential establishment of Aboriginal cultural camps - hunting of animals and gathering of plants by Aboriginal people as part of cultural camps.	Medium
77	Explore opportunities for the dual naming of geographical features within Namadgi in consultation with the Ngunnawal Aboriginal community and in accordance with the <i>ACT Dual Naming Guidelines</i> .	Medium Ongoing
78	Establish and support heritage management partnerships and/or formal agreements with individuals, families and communities having traditional links to Namadgi and with community groups having an interest in cultural heritage management.	Low
79	Facilitate access to Namadgi for individuals and families with connections to particular heritage places, as part of special events or by arrangement.	Low
80	Ensure that any proposals for memorials in Namadgi to individuals or communities are consistent with the requirements of the ACT Government Memorials Policy and with policies in s. 6.5.5 (of this management plan).	High Ongoing
81	Ensure that any proposals for the naming of places or geographic features in honour of individuals or communities are submitted to and approved by the ACT Place Names Committee before being recorded on maps or other information.	High Ongoing
82	6.5.6 Support for sustainable cultural tourism and recreation Ensure that all cultural recreation and tourism activities are consistent with the recreation and tourism objectives and strategies set out in Chapter 8 of this plan.	High Ongoing
83	Ensure that all cultural tourism operators comply with foreshadowed licensing and accreditation provisions outlined in Chapter 8 of this plan.	Medium Ongoing
84	Establish protocols for visits to cultural heritage places by tourism operators premised on the retention of the natural and cultural significance of places; monitor the effects of cultural tourism on those places and revise protocols as required.	Medium
85	Ensure that tourism use and promotion of Aboriginal places within Namadgi occurs with the consent of the Aboriginal community.	High Ongoing
86	Encourage non-Aboriginal tourism operators to provide cross-cultural awareness training for their staff working in Namadgi.	Medium
87	6.5.7 Promotion of research Establish a systematic process for the survey, mapping and recording of Aboriginal and European cultural heritage values in Namadgi.	Medium
88	As appropriate undertake targeted heritage surveys to identify undiscovered Aboriginal and European heritage landscapes, places and objects.	Low
89	Assist the Australian Alps Liaison Committee and contribute to its cultural heritage projects.	Medium Ongoing
90	Respect the right of the Ngunnawal community to: (a) accept or reject proposals from researchers wishing to carry out research on Aboriginal places in Namadgi; and (b) require agreements about the publication of the findings of research that relate to these places.	High Ongoing
91	Where culturally and environmentally appropriate, make information and knowledge flowing from research available to the general public.	Ongoing
92	6.5.8 Enhancement of staff skills and knowledge Ensure that agency staff working with Aboriginal people and dealing with Aboriginal cultural heritage issues are provided with the opportunity to complete cross-cultural awareness training.	Medium Ongoing
93	Support a training, employment and career development program for local Aboriginal people to assist them to participate effectively in the management of their country.	Medium Ongoing
94	Foster staff respect and appreciation for both Aboriginal and European cultural heritage places.	Medium Ongoing

	Action	Priority
Chapter 7: A place of fire—fire management		
95	7.4.1 Research and monitoring To increase knowledge about how fire affects natural systems, conduct systematic monitoring programs and support fire research that takes account of or includes the following: - ecosystem response to fire (including recovery, soil stability, biodiversity and water quality) - impacts of planned and unplanned fire on ecosystem services, particularly in relation to water resources - ecological effects of fuel reduction activities (in particular, prescribed burning) - erosion hazard assessment and mapping - effects of fire on riparian and aquatic ecosystems - the response of weeds and feral animals to fire and fire management activities - preferred fire regimes for species/communities, particularly those of conservation concern - fuel load dynamics, including the relationship between fire fuel properties and fire behaviour - the effectiveness of hazard reduction strategies - mapping fire history for both prescribed and unplanned fires.	High Ongoing
96	Work collaboratively on a regional level with ACT organisations, Australian Alps agencies, research institutions and neighbouring land managers to plan and implement research and monitoring programs relating to fire and fire management.	High Ongoing
97	Review the development of emerging pre-suppression and suppression techniques for bushfire and investigate the most appropriate techniques for the relevant terrain, conservation values (including water) and desired outcomes.	Medium Ongoing
98	7.4.2 Application of ecologically-based fire regimes Give special recognition, in terms of fire management priorities, to the requirements of species and communities of particular conservation concern, such as those that are threatened with extinction, naturally rare, particularly sensitive to fire or important in protecting water supply.	High Ongoing
99	As far as practicable exclude prescribed fire from hydrologically and ecologically significant or sensitive areas including: - erosion-prone zones - wet heaths, subalpine bogs and significant wetlands - dry rocky heath communities (threatened species habitat) - areas occupied by obligate seeding species ('seeders') until they have reached sufficient maturity to regenerate after a fire - riparian areas.	High Ongoing

	Action	Priority
100	7.4.3 Fire prevention In accordance with the <i>Emergencies Act 2004</i> and the <i>Strategic Bushfire Management Plan for the ACT</i>, prepare Bushfire Operational Plans for the park that are consistent with the Australian Alps Fire Management Principles and the objectives of this plan to address: - a program of fuel reduction to provide for the protection of identified built and natural assets, to reduce the spread and intensity of fire and assist in suppression operations (see Fire fuel management, Actions 104-106) - the provision of access trails and helipads for fire suppression and fuel management activities (see Fire access, Action 107) - the development of strategies for the early detection and rapid suppression and the management of unplanned fire in the park - the provision of a network of water access points - the provision of adequate resources including infrastructure, equipment and personnel for suppression operations and the undertaking of fuel management activities - training and skills development for staff involved in any aspect of fire management.	High
101	Develop detailed fire management strategies for the park in the context of policies outlined in s. 7.4.2; primarily through the preparation of Regional Fire Management Plans for Namadgi. (Note: this action links with Action 104 below.)	
102	Work with ACTEW and the ACT Emergency Services Agency in developing more detailed programs and arrangements for fire management in the Cotter Catchment drawing as required on research conducted by organisations such as the Bushfire CRC and university departments.	Medium Ongoing
103	Consider fire management objectives and proposed actions in adjacent areas of NSW when developing fire management plans for Namadgi National Park and develop strategies that are compatible across the border (see also s. 7.4.4).	Medium Ongoing
104	In accordance with the <i>Strategic Bushfire Management Plan for the ACT</i> and the objectives of this plan, develop fire fuel management strategies as part of fire management plans for the differing environments within Namadgi (Regional Fire Management Plans). These plans will provide for a mosaic of areas with differing fire histories and a consequent diversity of vegetation age classes and fuel characteristics. They will take into account hazard reduction for asset protection, provision of fire suppression infrastructure such as fire trails, and ecological responses to fire. (Note: this action links with Action 101 above.)	High
105	Continually monitor, assess and adapt fuel management strategies to develop an effective and sustainable fuel management model whereby natural, cultural and water supply values are adequately protected.	High Ongoing
106	Conduct prescribed burning in accordance with requirements of the <i>Environment Protection Act 1997</i> (see s. 11.2.6).	High Ongoing
107	Install new fire access, water and communication facilities and maintain existing facilities according to the policies outlined above and zoning policies of this plan. Proposed new facilities will be subject to an appropriate level of environmental impact assessment.	High
108	Plan and implement public education programs about fire restrictions relating to park use, campfires, bushfire causes and personal behaviour to minimise bushfire danger.	Medium Ongoing
109	Restrict access during Total Fire Ban days particularly to remote areas or areas prone to fire ignition.	High Ongoing

	Action	Priority
110	7.4.4 Fire preparedness Prepare an annual plan based on the Bushfire Operational Plan to formalise preparedness for: - Public safety. This includes planning for an increased management presence in popular recreation areas, park closures on days of predicted very high to extreme fire danger, and evacuation procedures for park users. - Equipment and staff readiness and capability. This includes training programs for new staff and refresher training for experienced staff.	High Ongoing
111	Work with: (a) neighbours of the park in NSW through established forums; and (b) NSW agencies such as the Rural Fire Service (see s. 10.5.2), in relation to fire management. This will include: - co-operative fire fighting arrangements - construction, use and maintenance of fire trails and fire breaks - prescribed burning for asset protection - provision of, and access to watering points - fire emergency procedures - communication about effective bushfire protection.	High Ongoing
112	Develop a Memorandum of Understanding with the NSW Department of Environment, Climate Change and Water and the NSW Rural Fire Service in relation to the fire management considerations listed above (in Action 111).	Medium
113	Work with neighbours of the park in the ACT in relation to the fire management considerations listed above. Include appropriate provisions in Land Management Agreements with rural landholders.	High Ongoing
114	7.4.5 Fire response During fire suppression activities, particularly when the use of heavy machinery or the installation of temporary infrastructure is required, avoid damage to ecologically sensitive areas; such as <i>Sphagnum</i> bogs, wetlands and riparian areas; water storage facilities; and known Aboriginal and other cultural heritage sites.	High Ongoing
115	Avoid the use of heavy equipment in: (a) the immediate catchment of <i>Sphagnum</i> bogs where this is likely to result in sediment flows into the wetlands; and (b) habitat areas for the northern corroboree frog (which includes <i>Sphagnum</i> bogs and immediately adjacent woodlands). Operations in the vicinity of Ginini Flats Wetlands are to accord with the management plan for the area (ACT Government 2001) and the Action Plan for the northern corroboree frog (ACT Government 1997).	High Ongoing
116	Provide incident management teams with appropriate information and trained liaison officers with the aim of ensuring that water supply and important natural and cultural heritage assets are protected during fire suppression activities.	High Ongoing
117	Avoid using fire retardant and suppression chemicals near streams, wetlands and water bodies (e.g. water supply storages). Develop and implement a policy on the use of retardants and fire control chemicals in collaboration with ACTEW, ACT Emergency Services Agency, ACT Health and the EPA, taking into consideration ecological sensitivities such as streams and wetlands and the need to protect urban water supply in the Cotter Catchment balanced against the reduced area of catchment that may be burnt if these chemicals are used (see also s. 11.2.6).	High Ongoing
118	Develop and keep under review mandatory requirements and guidelines for the use of fire retardant and suppression chemicals and ensure adequate training of staff (see also s. 11.2.6).	High Ongoing
119	Actions that lead to substantial impacts e.g. temporary access tracks and firebreaks, should only be undertaken when unavoidable and on the understanding that restoration work will be required.	High Ongoing

	Action	Priority
120	7.4.6 Fire recovery After a significant fire, conduct an assessment of its impacts and develop a recovery plan that addresses the following: - occupational, health and safety issues and public safety - the protection and stabilisation of water catchments and riparian areas where feasible - natural recovery processes (where appropriate, identifying actions to assist recovery) - restoration, reconstruction or relocation of infrastructure - post-fire research and monitoring requirements - management of ecosystem threats such as weeds and feral animals - the location of containment lines, trails and helipads. These will be mapped, closed and rehabilitated after a fire but may be 'reopened' if required for future fire suppression purposes. Reopening of previously made trails is preferable to cutting new containment lines - construction of new containment lines or helipads. Subject to impact assessment, these may become part of permanent access facilities, if they are in an alignment similar to or the same as a fire trail planned within the context of this management plan, or provides a better environmental outcome than existing alignments in the area, in which case the pre-existing facility will be closed and rehabilitated - the dismantling and removal of temporary communication relay stations and other infrastructure installed during the fire.	High (following an event)
Chapter 8: A place for community wellbeing—recreation and visitor use		
121	8.5.1 Monitoring and managing visitor impacts Develop and implement a monitoring program to allow assessment of environmental and social impacts caused by visitors. Ensure that the program: - is consistent with standards used by Australian Alps agencies to ensure compatibility of data - identifies criteria for limits of acceptable change - targets high use areas or fragile areas that are likely to require active management intervention - provides for data to be managed efficiently.	Medium
122	Provide log books at the start of long distance walking tracks to help monitor use of these tracks.	Ongoing (in place)
123	Promote the Australian Alps minimal impact codes at the visitor centre, throughout the park and on the website.	Ongoing (in place)
124	Promote a 'take rubbish home' policy through education and interpretation materials.	Ongoing (in place)
125	8.5.2 Visitor safety Ensure that all visitor facilities are designed, built and maintained to appropriate standards.	High Ongoing
126	Provide information to visitors about potential risks and emergency procedures.	High Ongoing
127	Encourage use of log books provided at the start of long distance walking tracks, to assist park managers in locating visitors in an emergency (see also Action 122).	High Ongoing
128	Ensure that visitors are adequately warned about management activities that may put visitors at risk (e.g. fuel reduction burns, herbicide or pesticide spraying, feral animal control programs). Methods of warning may include: - erection of signs on access routes - notification at visitor centres - notification through local media when appropriate - placement of information on ACT Government websites - patrol of areas when considered necessary.	High Ongoing

	Action	Priority
129	8.6.1 Overnight stays Upgrade Mt Clear Pound Campground to provide adequate facilities, including toilets, shelter with fireplace and barbecues, and water for packhorse riders and large groups.	Medium
130	8.7.1 Recreational driving Investigate the development of an all weather two-wheel drive tourist route from Bendora Road and on trails to the north of Bendora Road.	Medium
131	Strengthen the <i>Nature Conservation Act 1980</i> in relation to illegal off-road driving.	Medium
132	8.7.3 Walking Develop a walking track strategy for Namadgi that takes into account the details outlined in s. 8.7.3.	Medium
133	Manage the Australian Alps Walking Track in a manner that is consistent with the Australian Alps Liaison Committee policies and guidelines for the Track.	Medium Ongoing
134	8.7.4 Cycling Undertake monitoring as required to assess the impacts of cycling in collaboration with other Australian Alps agencies.	Medium Ongoing
135	8.7.6 Horse riding Provide a visitor log book to assist in monitoring use of the Grassy Creek Trail and install signs to reinforce the need for horse riders to remain on the trail.	High
136	Place signs at huts to indicate that horses must be tethered at least 30 m from lakes, streams, wetlands, huts and camping areas (also see Action 67).	Medium
137	Promote the Australian Alps Horse Riding Code of Practice to horse riders.	Medium Ongoing
138	Liaise with the Bicentennial National Trail Committee about the route, facilities, campground bookings, visitor safety, and the code of practice for horse riders and other users (e.g. cyclists, walkers) of the trail.	High
139	In consultation with user groups, redesign and upgrade the camping facilities at Mt Clear Pound Campground.	Medium
140	8.7.7 Snow play and ski touring Liaise with the Australian Federal Police about driver safety issues in snow conditions and in relation to providing traffic control assistance throughout the winter months.	Medium Ongoing
141	Liaise with Roads ACT regarding the need to close public roads where required by weather conditions.	Ongoing
142	8.7.9 Rock climbing and abseiling Evaluate the establishment of a small walk-in bush camping area in the vicinity of, but away from, the Booroomba Rocks carpark.	Medium
143	Work with rock climbing groups to establish and promote a code of practice for rock climbers aimed at low impact use of the park and participation in maintenance and management of rock climbing areas.	High
144	8.7.10 Fishing and hunting Regulate fishing in Namadgi in accordance with the <i>Fisheries Act 2000</i> .	Medium Ongoing
145	Educate recreational fishers about their responsibilities in relation to fishing regulations, and the risks of introducing alien fish species through the use of live bait and impacts on threatened and native fish species.	Medium Ongoing
146	8.7.12 Flying Work with the Australian Alps national park agencies and Air Services Australia to establish <i>Fly Neighbourly Agreements</i> over wilderness and remote areas.	Medium
147	8.7.13 Orienteering, rogaining and mountain running Develop a policy document to guide the assessment of applications for events of different types and sizes within the park, including for large events, within twelve months of the notification of the Plan of Management on the ACT Legislation Register.	High

	Action	Priority
148	8.8.1 Commercial activities Design and implement a legislated licensing/permit and accreditation system with associated fees for ACT tour operators in collaboration with tourism industry groups.	Medium
149	8.8.2 Industry Participate in local and regional tourism forums and work with tourism bodies on licensing, accreditation and other industry-related activities.	Medium Ongoing
Chapter 9: A place for learning—communication, information, interpretation, education and research		
150	9.5.1 Communication Develop a Communication Plan that includes strategies for communicating with the community, government and non-government stakeholders, and identifies new opportunities for interpretation services.	High
151	9.8.1 Survey, monitoring and research planning Establish a research committee or working group to: (a) prepare an inventory (including a bibliography) of past and current surveys, monitoring and research in Namadgi; (b) analyse survey, monitoring and research requirements and priorities; and (c) prepare a summary report.	Medium
152	Using the recommendations of the research committee, plan and coordinate survey, monitoring (s. 11.3) and research programs in the park that aim to: - increase knowledge of park values and conservation significance - improve knowledge of natural and human-induced processes in the park - understand the effect of fire on park values as the basis for appropriate fire management strategies - understand the nature and rate of any change in condition of park values - improve understanding of the economic and social values of the park - support adaptive management for natural and cultural resource conservation - promote research at a regional and bioregional level on issues such as climate change - support monitoring of designated visitor sites for unacceptable impacts.	Medium
153	Prepare a prospectus and actively promote and encourage the involvement of research institutions, students and individuals to conduct research relevant to park management.	Medium
154	Grant licences for research in accordance with legislative requirements. Research not subject to legislation will be assessed to determine possible impacts on park values, park visitors or general public safety.	High Ongoing
155	9.8.2 Visitor research and monitoring Develop a systematic, visitor research program that addresses: - visitor statistics - visitor satisfaction and attitudes - the types of activities that visitors are undertaking - impacts of visitor use (see also Action 121).	Medium
156	9.8.4 Information access and management Establish and maintain a central repository (including electronic copy and listing) of research relating to Namadgi.	Medium
157	Establish agreed procedures for the creation, management and distribution of information related to the Sites of Interest/Significance Database.	Medium
158	Regularly update and maintain the Namadgi Sites of Interest/Significance Database including the GIS spatial information system.	Medium Ongoing
159	Ensure that staff are trained in, and comply with, requirements for data and information management.	Medium
160	Ensure that the Database is maintained in collaboration with other agencies (as appropriate) so that data are updated.	Medium Ongoing
161	Explore opportunities for making the Database accessible across relevant agencies, to research institutions and the community.	Medium
162	Develop protocols in relation to information security for sensitive sites, such as those that have been identified by the Aboriginal community or require security for other reasons (e.g. the presence of rare or threatened species).	Medium

	Action	Priority
163	Continue to link and incorporate the Namadgi Database with the Australian Alps Scientific Sites Database.	Medium
164	Regularly update and maintain the Namadgi Reference Library.	Medium Ongoing
Chapter 10: A place with community—neighbours, community groups and volunteers		
165	10.5.1 Volunteers and community groups Foster stewardship by recreation groups through cooperative projects, such as the development and promotion of minimal impact materials, codes of practice and other identified projects.	Medium Ongoing
166	Involve community groups in the collection and recording of data for monitoring programs.	Medium Ongoing
167	Provide work experience opportunities for individuals, secondary school students, tertiary students and Aboriginal people.	Medium Ongoing
168	10.5.2 Neighbours Ensure that the planning and management of neighbouring ACT Government land is integrated at both a strategic and operational level, addresses border and land management issues (such as water quality, weeds, feral animal control, fire management and recreation), and includes information services.	High Ongoing
169	Continue to participate in cross-border cooperative management programs such as those established through the Australian Alps Liaison Committee and, when feasible and advantageous, undertake park operations jointly.	High Ongoing
170	Under direction of the ACT Rural Fire Service participate in neighbouring NSW Rural Fire Service and NSW Parks and Wildlife fire planning and operational programs.	High Ongoing
171	Work with neighbours who provide or are planning to provide accommodation and other nature-based tourism services to establish a mutually beneficial and co-operative relationship.	Medium Ongoing
Chapter 11: A protected and managed resource		
172	11.2.2 Water and energy use Use fuel efficient transport for park operations as far as practicable.	High Ongoing
173	Ensure that water extraction is subject to licensing as required under the <i>Water Resources Act 2007</i> .	High Ongoing
174	11.2.4 Noise Liaise with scenic flight operators and other air services to ensure that light aircraft and helicopters are aware of their obligations in relation to flying over the wilderness area (see s. 8.7.12).	Medium Ongoing
175	11.2.5 Waste management Engage suitably licensed contractors to appropriately dispose of sewage as required.	High Ongoing
176	Educate park visitors about appropriate methods of human waste disposal.	Medium Ongoing
177	Discourage the digging of latrine sites for groups that are camping in the park.	High Ongoing
178	Ensure that licensing and other arrangements for overnight commercial operators, event organisers and large groups include obligations in relation to appropriate methods of removing human waste.	High
179	11.3 Monitoring and evaluation Establish collaborative partnerships for data collection and reciprocal arrangements for information sharing.	Medium
180	As appropriate analyse data collected, report on key performance indicators and identify policy changes required.	Medium Ongoing
181	11.3.1 Environmental impact assessment Ensure that procedures are in place for environmental impact assessments and that staff are aware of their responsibilities in adhering to the process.	High Ongoing

	Action	Priority
182	11.4.1 Fees and charges Investigate and develop, as appropriate, a fees and charges schedule for the park that considers: - fees for a licensing system for commercial tour operators - fees for non-commercial group use - fees for interpretation activities - potential for charging fees for day and overnight visitors - appropriate fees (including a bond fee) for events - fees for commercial use and concessionaires (including a bond fee) - potential for an annual pass fee.	Medium
183	11.5.1 Access management Issue guidelines/protocols on trail use to management staff and organisations using management trails to create awareness of their responsibilities in relation to the use of management trails.	Medium
184	Where appropriate, provide warnings for visitors at track heads about other users of trails.	High Ongoing
185	Monitor and assess the use of trails by management and other organisations.	Medium Ongoing
186	Ensure that fire trails are maintained to specified standards.	High Ongoing
187	Conduct appropriate management actions to control weeds, erosion and other factors that could threaten the park's integrity, and which are connected to the construction and use of access trails.	High Ongoing
188	11.5.2 Infrastructure Monitor compliance with leases, licences and agreements.	High Ongoing
189	Liaise with authorities as required regarding the safety and maintenance of infrastructure.	High Ongoing
190	Disseminate information to the public about any issues relevant to public safety or services such as road conditions, snow conditions, fire danger ratings and bushfires.	High Ongoing
191	Ensure that community consultation protocols are observed in relation to works conducted in the park by other organisations.	High Ongoing
192	Consider a fee for use and special access for use of the park for training operations. Such fees would align with any special access fees applied to special events.	Medium Ongoing
193	11.6 Implementation of the plan Use the table of management actions and priorities (Appendix 8) as a basis to plan and undertake actions in this management plan and regularly assess progress with the actions.	High

Schedule 1

Standard of facilities

Table S1.1 Camping area classification

Classification	C1 - Remote camping area	C2 - Basic camping area	C3 - Camping area
Zone Permitted	Zone 2 Semi-Remote	Zone 3	Zone 3
Facilities Permitted			
Barbecues—gas or electric	no	no	optional
Built accommodation (cabins and on-site tents)	no	no	no
Fireplaces	no	optional	optional
Garbage collection	no	no	no
Information shelter/display	no	optional	optional
Kiosk	no	no	no
Resident manager	no	no	no
Shelter/covered area	no	optional	optional
Showers	no	no	no
Tables	no	optional	optional
Toilets—pump out or composting*	optional	yes	yes
Toilets—sewerage or treatment plant	no	no	no
Vehicle access to site	no	optional	optional
Visitor centre	no	no	no
Water—reticulated	no	no	no
Water—tank	no	optional	optional

yes = facility or service should be provided,

no = facility or service will not be provided,

optional = facility or service may be provided

* Existing septic, composting and pit toilets to be replaced with closed pump-out systems (when feasible) when facilities are due for an upgrade.

Table S1.2 Day use area classification

Classification	D1 - Basic day use area	D2 - Medium day use area	D3 - Major day use area	D4 - Major facility area	Lookout	Track/trail head
Zone Permitted	Zone 3	Zone 3	Zone 3	Zone 3 (Visitor Centre Precinct only)	All zones Except 1A and 1B	All zones Except 1A and 1B
Facilities Permitted						
Barbecues—gas or electric	no	optional	optional	optional	no	no
Fireplaces	no	optional	optional	optional	no	no
Garbage collection	no	no	no	optional	no	no
Information shelter/display	no	optional	optional	yes	optional	optional
Shelter/covered area	no	no	optional	yes	no	no
Tables	no	optional	optional	yes	optional	no
Toilets—pump out or composting*	optional	optional	yes	no	optional	optional
Toilets—sewerage or treatment plant	no	no	no	yes	no	no
Vehicle access to site	no	yes	yes	yes	optional	yes
Visitor centre	no	no	no	yes	no	no
Water—reticulated	no	no	no	yes	no	no
Water—tank	no	optional	optional	yes	optional	optional

yes = facility or service should be provided,

no = facility or service will not be provided,

optional = facility or service may be provided

- * Existing septic, composting and pit toilets to be replaced with closed pump-out systems (when feasible) when facilities are due for an upgrade.

Schedule 2

Visitor facilities

Table S2.1 Existing facilities and proposed upgrades

Existing facilities and proposed upgrades				
Site	Zone	Existing standard ¹	Facilities	Proposed upgrades and new facilities at existing locations
Honeysuckle Campground (Camping for small and large groups and camper vans (no electricity))	3	C3	Composting toilets Tank water Shelter with fire place and gas barbecues Tent and campervan sites (no electricity) Picnic tables Disabled access Walking tracks Interpretation at Tracking Station	Upgrade from four to eight sites
Orroral Campground (Tent camping for small groups only)	3	C3	Septic toilet facility Stream water Wood fire places Picnic tables Short nature track Walking tracks with interpretation Interpretation signs	Investigate upgrading for disabled access Upgrade toilet to closed system when feasible
Mt Clear Campground (Tent camping for small groups only)	3	C2	Pit toilet Stream water (seasonal) Wood fire places Walking tracks Interpretation signs Water tank	Upgrade toilet to closed system
Mt Clear Pound Campground (tent camping for large groups and groups with horses or donkeys)	3	C2	Pit toilet	Upgrade to C3 Toilets Tank water Fire places Shelter with barbecues (optional) Disabled access Horse tethering and watering facilities (need separate camping areas for large groups and horse pack campers using shared facilities)
Namadgi Visitors Centre	Not located in the park	D4	Visitor centre with displays, auditorium, flush toilet, gift shop etc. External information shelter Minor picnic area	Opportunities for improved picnic facilities and external interpretation

Existing facilities and proposed upgrades				
Site	Zone	Existing standard ¹	Facilities	Proposed upgrades and new facilities at existing locations
Orroral Day Picnic Area	3	D2	Septic toilet system Stream water Wood fire places Walking tracks with interpretation Interpretation signs	Could be upgraded to D3 Upgrade toilet to closed system when feasible Investigate upgrading for disabled access Investigate shelter with barbecues
Orroral Tracking Station Picnic Area (existing area with proposed new facilities and separate to proposed campground)	3	D2	Composting toilets Tank water Cultural heritage trail (existing) Disabled access	Could be upgraded to D3 to include: shelter with fire place and gas barbecues new interpretation signs for tracking station
Glendale Picnic Area	3	D2	Septic toilet system Stream water Wood barbecues Interpretation signs	Upgrade toilets to pump out system when feasible
Hospital Hill Lookout	3	D2	Interpretation signs Picnic tables	Install closed toilet system if there is an apparent need
Yankee Hat Carpark	3	D1	Composting toilet Interpretation signs	Could be upgraded to D2 Improve amenity, provide picnic facilities
Corin Dam Picnic Area	3	D3	Septic toilet system Potable tap water Gas barbecues Picnic tables Disabled access Walking track to river Interpretation signs at picnic area and dam wall	A picnic shelter may be provided Upgrade toilets to pump out system when feasible
Bulls Head (in NSW but the ACT has permissive occupancy of the picnic area)	3	D3	Composting toilets Bore water Shelter with wood barbecues Disabled access Interpretation signs	Upgrade toilets to pump out system when feasible
Ginini Carpark	3	D1	No facilities	Install pump out toilet system if there is an apparent need
Booroomba Rocks Carpark	3	D1	Composting toilet	Install pump out toilet system if there is an apparent need

1: see Schedule 1.

Table S2.2 Proposed new facilities

Proposed New Facilities			
Proposed New Node	Zone	Standard¹	Proposed Facilities
Honeysuckle Day Picnic Area (proposed new picnic area adjacent to campground)	3	D3	Toilets Tank water Shelter with barbecues Picnic tables Disabled access Walking tracks Short nature and heritage track Interpretation at Tracking Station
Orroral Tracking Station Campground (proposed area for a new campground subject to demonstrated need—includes tent camping for small and large groups and campervans)	3	C3	Toilets Tank water Shelter with barbecues Picnic tables Disabled access Walking tracks Interpretation at Tracking Station Suitable for small and large groups
Gudgenby Valley Campground (subject to demonstrated need—includes tent camping for small groups).	3	C2	Toilets Water tank Interpretation Walking tracks Suitable for small groups
Bush campgrounds for pack walkers (subject to demonstrated need for environmental protection purposes)	2	C1	Toilets (preferably pump out if feasible) Stream water

1: see Schedule 1.

Schedule 3

Indicative guide to events in Namadgi

Proposed type of events permitted in the park are specified in the table below. The policies outlined in the table below may be varied at the discretion of park management dependent upon:

- administrative resources;
- ecological condition of the area proposed events;
- new scientifically based evidence regarding capacity of the park or areas of the park for particular events; and
- willingness of event organisers to accept additional conditions to protect the park from impacts.

All types of events are permitted in Zone 3 – Roaded Natural Recreation area (subject to management approval).

Indicative policies for events in Namadgi

Type of Event	Zone 1 Cotter Catchment		Zone 2 Recreation/Conservation Area		
	Upper Cotter Catchment	Middle Cotter Catchment	Mt Clear and Booth Range Area	Gudgenby & Boboyan area	Orroral Ridge/ Blue Gum/ Mt Tennent Area
Small Events 10–200 Participants					
On-track day event	Not permitted	✓	✓	✓	✓
On-track event overnight event	Not permitted	Not permitted	✓	✓	Not permitted
Off-track day event	Not permitted	Not permitted	✓	✓	✓
Off-track overnight event	Not permitted	Not permitted	✓	✓	Not permitted
Medium Events 200–400 Participants					
On-track day event	Not permitted	✓	✓	✓	✓
On-track overnight event	Not permitted	Not permitted	✓	✓	Not permitted
Off-track day event	Not permitted	Not permitted	✓	✓	✓
Off-track overnight event	Not permitted	Not permitted	✓	✓	Not permitted
Large Events 400 or more					
On-track day event	Not permitted	✓	✓	✓	✓
On-track overnight event	Not permitted	Not permitted	✓	✓	Not permitted
Off-track day event	Not permitted	Not permitted	✓	✓	Not permitted
Off-track overnight event	Not permitted	Not permitted	✓	✓	Not permitted

Glossary

Adaptive management

Adaptive management involves gaining knowledge and using it to modify practices to achieve management goals. Adaptive management requires an active, planned, and systematic effort to acquire information from management experience, monitoring and research (Lindenmayer and Burgman 2005). Adaptive management deals explicitly with the uncertainty that surrounds the policies and actions needed to achieve management objectives that are defined in relation to values of an area such as Namadgi National Park (s. 1.4, s. 1.5).

Biodiversity

Biodiversity (biological diversity) is the variety of all life forms (plants, animals, microorganisms, their genes) and the ecosystems of which they form a part (Commonwealth of Australia 1996).

Conservation: Natural Heritage

Conservation means all the processes and actions of looking after a place so as to retain its natural significance and always includes protection, maintenance and monitoring. It may also involve actions to repair degradation and includes conserving natural processes of change (*Australian Natural Heritage Charter*, 2nd edition (Australian Heritage Commission 2002)).

Conservation: Cultural Heritage

Conservation means all the processes of looking after a place so as to retain its cultural significance. Cultural significance means aesthetic, scientific, social or spiritual value for past, present or future generations (*Australia ICOMOS Burra Charter*, 1999 (Australia ICOMOS 1999)).

Conservator

Conservator of Flora and Fauna (defined under s. 7 of the *Nature Conservation Act 1980*).

Dam

Refers to a barrier built across a river or stream to impound water.

Ecosystem services

The concept of *ecosystem services* refers to the 'products of natural systems that benefit people' (PMSEIC 2002). These products include goods (e.g. timber), ecological processes (e.g. pollination, storage and release of water), and those that are life fulfilling (e.g. recreation). Few ecosystem services have been valued economically and most are unrecognised and under-priced (PMSEIC 2002). One of the most readily identifiable ecosystem services in Namadgi is the provision of high quality water for urban water supply.

Geodiversity

Geodiversity means the natural range (diversity) of geological (bedrock), geomorphological (landform) and soil features, assemblages, systems and processes (*Australian Natural Heritage Charter*, 2nd edition (Australian Heritage Commission 2002)).

Management purposes

Management purposes refers to activities that have the *primary aim* of supporting or assisting park management in carrying out the management functions as outlined in this plan, rather than a *primary aim* of providing enjoyment to individuals. Where this involves activities that are contrary to the policies of the plan, these activities will be:

- subject to the written consent of the Conservator
- making a contribution to projects approved and supervised by park management.

An example of such contrary use is the possible use of bicycles for access to Zone 1A (Bimberi Wilderness) where the use of a bicycle substitutes for a motor vehicle.

MOU

Shortened version of Memorandum of Understanding.

Reservoir

Refers to an impounded body of water.

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Personal communications

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