KILLARNEY NATURE RESERVE

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment and Conservation (NSW)

May 2004

This plan of management was adopted by the Minister for the Environment on 17 May 2004.

Acknowledgments

The principal author of this plan of management is Sean Thompson, Ranger - Barrington Tops Area, Hunter Region, with assistance from National Parks and Wildlife Service Barrington Tops Area staff and the Northern Directorate Planning Group.

Cover photograph of a spotted gum and grey gum by Sean Thompson.

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FOREWORD

Killarney Nature Reserve covers 434 hectares and is located within the Williams River Catchment.

Nearby parks and reserves include Barrington Tops National Park to the north-west, and Monkerai Nature Reserve to the south-east. Fosterton and Chichester State Forests link the reserve to Barrington Tops National Park.

The reserve is particularly significant because of the regionally significant occurrence of the spotted gum - grey gum association that is poorly represented within other conservation reserves. It is also part of a key vegetation corridor that forms a link from the Barrington Tops and the parks and reserves on the coast.

The *National Parks and Wildlife Act 1974*, requires that a plan of management be prepared for each nature reserve. A plan of management is a legal document that outlines how the area will be managed in the years ahead.

A draft plan of management for Killarney Nature Reserve was placed on public exhibition from 27 September 2002 until 3 February 2003. The exhibition of the plan of management attracted 4 submissions that raised 6 issues. All submissions received were carefully considered before adopting this plan of management.

This plan of management establishes the scheme of operations for Killarney Nature Reserve. In accordance with section 76 of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

BOB DEBUS

MINISTER FOR THE ENVIRONMENT

1. NATURE RESERVES IN NEW SOUTH WALES

1.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of nature reserves in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the NPW Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in the preparation of a plan of management. The policies arise from the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

Other legislation, international agreements and charters may also apply to management of the area. In particular, the *Environmental Planning and Assessment Act 1979* (EPA Act) requires the assessment and mitigation of the environmental impacts of any works proposed in this plan.

The plan of management is a statutory document under the NPW Act. Once the Minister has adopted a plan, no operations may be undertaken within Killarney Nature Reserve except in accordance with the plan. The plan will also apply to any future additions to Killarney Nature Reserve. Where management strategies or works are proposed for the nature reserve or any additions that are not consistent with the plan, an amendment to the plan will be required.

1.2 NATURE RESERVES IN NEW SOUTH WALES

Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the Act, nature reserves are managed to:

- conserve biodiversity, maintain ecosystem functions, and protect geological and geomorphological features and natural phenomena;
- conserve places, objects, features and landscapes of cultural value;
- promote public appreciation, enjoyment and understanding of the reserve's natural and cultural values; and
- provide for appropriate research and monitoring.

Nature reserves differ from national parks in that they do not have as a management principle to provide for visitor use.

2. BASIS OF MANAGEMENT - KILLARNEY NATURE RESERVE

2.1 LOCATION AND REGIONAL SETTING

Killarney Nature Reserve (referred to as "the reserve" in this plan) is located within the Williams River Catchment. The reserve follows a north – south line along the Killarney Forest Road that follows the Fosterton Range. Killarney Road delineates the majority of the eastern boundary of the reserve. To the east of the range is Carowiry Creek and to the west is the Williams River.

The reserve comprises 434 hectares, and was reserved in 1999. Prior to becoming a nature reserve it was part of Fosterton State Forest No.46.

This plan of management includes consideration of the public road that traverses the southern section of the reserve (see the map).

Nearby reserves and parks include Barrington Tops National Park to the north-west, and Monkerai Nature Reserve to the south-east. Two state forest areas – Fosterton SF No.46 and Chichester SF No.292, link the reserve to Barrington Tops National Park. The reserve, along with the state forests, forms part of an interlinking network of regional corridors between Barrington Tops National Park and Monkerai Nature Reserve for fauna identified under the Key Habitats and Corridors Project (Scotts and Drielsma 2002)

Nearby settlements and towns include Main Creek, Fosterton, and Dungog. Dungog is the major centre in the area with a population of approximately 2500.

Major land uses in the area are primarily forestry and beef and dairy cattle production. There are a number of ecotourism operations nearby which offer a range of accommodation options for visitors to the area.

2.2 LANDSCAPE

Natural and cultural heritage and on-going use are strongly inter-related and together form the landscape of an area. Much of the Australian environment has been influenced by past Aboriginal and non-Aboriginal land use practices, and the activities of modern day Australians continue to influence bushland through recreational use, cultural practices, the presence of introduced plants and animals and in some cases air and water pollution.

The geology, landform, climate and plant and animal communities of the area, plus its location, have determined how it has been used by humans (refer to Aboriginal Heritage and Historic Heritage sections below).

Both Aboriginal and non-Aboriginal people place cultural values on natural areas, including aesthetic, social, spiritual, recreational and other values. Cultural values may be attached to the landscape as a whole or to individual components, for example to plant and animal species used by Aboriginal people. This plan of management aims to conserve both natural and cultural values. For reasons of clarity and document usefulness natural and cultural heritage, non-human threats and on-going use are dealt with individually, but their inter-relationships are recognised.

2.3 KEY NATURAL AND CULTURAL HERITAGE VALUES

Landform, Geology and Climate

The reserve occurs on the western slope of the Fosterton Trig ridgeline which falls steeply towards Die Happy Creek. Die Happy Creek continues downstream to join the Williams River. The western slope is very steep, falling in elevation from about 500 metres to 150 metres AMSL. The south-west section of the reserve also features a rocky escarpment with a western aspect.

The reserve lies within the New England Fold belt of eastern Australia. The reserve consists of Early Carboniferous rocks (about 375 million years ago) that were formed in a volcanic forearc setting. The rocks consists of volcaniclastic, lithic sandstone, mudstone, conglomerate, volcanic breccia, dacitic ignimbrite, chert and limestone of the Flagstaff Formation and grey, thinly bedded siliceous siltstone, cherty mudstone and minor lithic sandstone of the Bonnington Siltstone. These rocks are part of a distinct structural block called the Gresford Block which is one of a number of structural blocks that make up a sequence of rocks formed east of a continental volcanic arc in a forearc setting during the Early Carboniferous.

The reserve receives an annual rainfall of 1100-1600 mm/year, and ranges in elevation from 120-575 metres above sea level. Rainfall is influenced by the season and topography. Higher rainfall occurs during the summer as a result of the influence of weakening tropical cyclones crossing the coast and developing into rain depressions. Also warm to hot summer temperatures generate convection rainstorms which increase precipitation (CMPS&F Environmental 1995).

Native Plants

The reserve was identified as a priority conservation area under the Comprehensive Regional Assessment (CRA) process. It was dedicated as a nature reserve in February 1999 in accordance with the North East Forest Agreement. The CRA predicted that the reserve would contain key habitat requirements for a number of priority species including Craven grey box (*Eucalyptus largeana),* grey iron bark *(E. fergusonii* subsp*. Fergusonii)* and large-fruited grey gum (*E. canaliculata)*.

As a further consequence of the CRA process the reserve was identified as being part of the key vegetation corridor that forms a link from the Barrington Tops and the parks and reserves on the coast.

NPWS field surveys indicate that the dominant tree species include: Sydney blue gum (*Eucalyptus saligna*); small fruited grey gum (*E. propinqua*) on moist sites; large fruited grey gum (*E. canaliculata*) on dry sites; white mahogany (*E. acmenoides*); tallowwood (*E. microcorys*); grey ironbark (*E. placita*); spotted gum (*Corymbia maculata*); turpentine (*Syncarpia glomulifera*), and brush box (*Lophostemon confertus*).

Vegetation varies according to slope, soils, aspect and history of past disturbance, particularly fire. The predominant vegetation in the reserve is tall wet sclerophyll forest with

mesomorphic shrubs in the understorey. There are three wet sclerophyll forest communities in the reserve: Grey gum - tallowwood – white mahogany; Sydney blue gum –tallowwood, and brush box. These forest types are generally found in the northern part of the reserve on the deeper and moister soils derived from siltstones and mudstones.

In the very moist gullies on the deeper alluvial soils the moist open forests give way to narrow bands of closed subtropical rainforest.

The southern section of the reserve is noticeably drier with thin rocky soils supporting a dry grassy eucalypt forest on the ridges with exposed upper slopes and a dry shrubby eucalypt forest on the lower slopes. The dry, grassy eucalypt forests support a spotted gum – grey gum community while the shrubby eucalypt forest of the lower slopes supports a grey gum – grey ironbark community.

The reserve is particularly significant because of the regionally significant occurrence of the spotted gum - grey gum association that is poorly represented within other conservation reserves.

Native Animals

Data on native animal species present in the reserve is very limited, however, NSW State Forest records for the Fosterton and Chichester State Forests (White 1994) provides some detail of reptile, amphibian and mammal species present in the area. The NPWS Wildlife Atlas, and State Forest records (Ecotone 1995) also provide data on animal species scheduled under the *Threatened Species Conservation Act 1995* (TSC Act) that have been recorded within 5 kilometres of the reserve.

Species of significance listed as vulnerable under the TSC Act include: Stephen's banded snake (*Hoplocephalus stephensii*); parma wallaby (*Macropus parma*); spotted-tailed quoll (*Dasyurus maculatus);* brush-tailed phascogale (*Phascogale tapoatafa*); long-nosed potoroo (*Potorous tridactylus*); koala (*Phascolarctos cinereus*); glossy black cockatoo (*Calyptorhynchus lathami*); powerful owl (*Ninox strenua*), and the masked owl (*Tyto novaehollandiae).*

Aboriginal Heritage

Documentation of early local Aboriginal use and occupation of the area is scant. It is understood that the Barrington Tops area was home to the Worimi tribal group who inhabited the lands from Port Stephens to Forster on the coast and west to Barrington Tops. The Worimi people were of the Kattang language group (Breeton et al 1998). Koettig (1986) refers to a number of campsites being recorded in the mid 1800s in the Karuah River area, slightly to the east of the reserve. Byrne (1984) suggests that highland rainforest areas, such as the Barrington Tops, were tribal hinterlands and used occasionally rather than frequently. There are no recorded sites within the reserve.

The contemporary significance of the reserve to local Aboriginal people is not known but Byrne (1992) indicates that despite the coastal residence of most of these people today they continue to look toward hinterland forests as places to get away to as well as for resource collection and use. The reserve is in the Karuah Local Aboriginal Land Council's area of responsibility.

Historic Heritage

The history of European settlement commenced with incentives of land grants offered by Governor Macquarie to open more lands to pastoral and agricultural activities. Settlement in the Dungog area commenced in the 1820s by cedar getters. Up to the 1890s cedar getting and dairy were the most important industries, after which time cedar began to lose prominence because of unsustainable harvesting. The construction of the nearby Chichester Dam in the 1920s stimulated local sawmilling industries as significant amounts of timber was cleared from the dam site. This also resulted in logging operations expanding further afield into less accessible country. By the 1930s timber getting was a major feature of the local economy (Murray 1995) but has now significantly declined from these levels. Dairy and beef cattle, and more recently tourism, are now considered the main industries in the Dungog area.

The reserve contains no known historic features of significance.

2.4 THREATS TO RESERVE VALUES

Introduced Species

There are a number of threats to the reserve's biodiversity values that have been identified. There are minor infestations of pest plant species such as lantana (*Lantana camara*), and mist flower (*Ageratina riparia*) that will require management and containment as soon as practicable.

One major infestation occurs in the Die Happy Creek at the site of a former lease area. In the past the original rainforest in the leased area had been clear felled and replaced by pest plant species. Another significant weed infestation occurs along the sides of the public road (refer to map) in the southern section of the reserve.

Illegal Vehicular Use

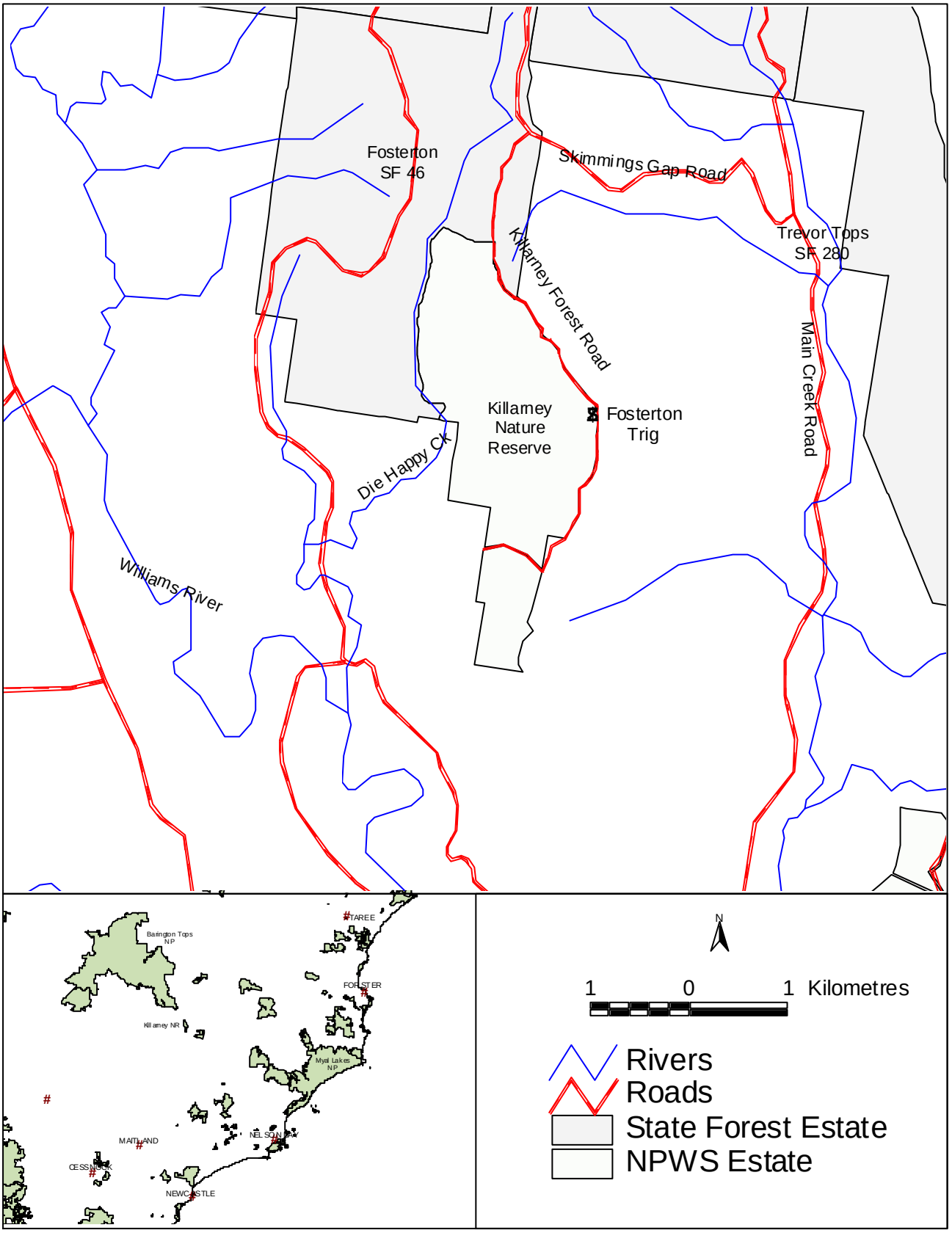
Unauthorised vehicle access (primarily trail bikes) along an informal trail that cuts through the reserve is recognised as a significant management issue. The trail is badly eroded in sections and has formed a number of erosion gullies on the steeper slopes. Trail bike riding is an activity not compatible with the management principles for a nature reserve.

Fire

Fire events are not a frequent natural feature of the wet sclerophyll forests in the reserve. There has only been one major wildfire event recorded for the reserve, occurring about 1968, when a major wildfire swept through the Barrington Tops region.

The majority of the reserve's contemporary fire history relates to forest management burns in the northern section of the reserve.

KILLARNEY NATURE RESERVE AND LOCALITY MAP



3. MANAGEMENT ISSUES AND STRATEGIES – KILLARNEY NATURE RESERVE

Management Issues and Considerations	Desired Outcomes	Strategies	Priority
Soil and water conservation There is potential for soil erosion on the Killarney Forest Road, which is main access road into the reserve. This unsealed road adjoins, but is not within, the reserve. The informal trail used by trail bikes is eroded and will require remedial action to stabilise and prevent further deterioration.	? Soil loss from roads and trails do not threaten reserve values. ? The informal trail is closed and stabilised.	? On an opportunistic basis, monitor soil erosion on the Killarney Forest Road and rectify where necessary. ? Close, and where necessary rehabilitate, the informal trail through the reserve. Rip compacted sections and install soil conservation structures where required. ? Allow natural regeneration to occur former logging trails not required for management purposes.	Medium High Medium
Native plant and animal conservation Limited studies have been undertaken in the reserve. The presence or absence of threatened species needs to be established and this will require more extensive survey work.	? There is an increased knowledge of flora and fauna values and their ecological requirements. ? All native plant and animal communities within the reserve are conserved.	? Encourage surveys for threatened plant and animal species in the reserve. ? Liaise with neighbours to encourage conservation of native vegetation in the vicinity of the reserve through conservation agreements and wildlife refuges.	Medium High

Management Issues and Considerations	Desired Outcomes	Strategies	Priority
Introduced species Pest plants and animals are present in the reserve but are considered a minor threat at this stage. *Lantana camara* is present in the southern and eastern sections of the reserve, along the escarpment area, and in a former lease area along the Die Happy Creek. There has been no formal survey of introduced animals in the reserve. Further survey work needs to be undertaken to establish the presence or extent of introduced species.	? There is a reduction in the population and extent of pest plants and animals.	? Prepare a pest species management plan for the reserve. ? Undertake surveys to determine the extent and scope of introduced species infestation in the reserve. ? Undertake a control program for pest plant infestations, with priority given to species that can be contained or eradicated from the reserve.	Medium Medium High
Fire management Forest management burns have been undertaken in the northern section of the reserve and were confined to the ridgeline. Fire management for the reserve will be undertaken in accordance with the Draft Fire Management Plan for Barrington Tops National Park and nearby reserves. There are no local water sources accessible to fire fighters within the reserve, however, a number of dams and streams off the reserve may supply water for fire fighting. Other than the public road reserve (refer to map and the 'Management Operations' section below) there are no management trails in the reserve, although the Killarney Forest Road borders the eastern boundary. Due to the steep slopes and erodible soils, management trails are not considered necessary or practical.	? Life and property are protected from wildfire incidents. ? There is no reduction in species or community diversity from inappropriate fire regimes. ? Landscape and catchment values are protected from the adverse effects of fire.	? Wildfires in the reserve will be extinguished as quickly as possible. ? All fire will be excluded from rainforest areas. ? Maintain an optimal prescribed burn fire frequency of 10-30 years in dry eucalypt forest areas. ? Maintain an optimal prescribed burn fire frequency of 50-200 years in moist eucalypt forest areas. ? Where possible maintain a mosaic pattern of burnt and unburnt areas to mitigate against the eastward spread of fire. ? Encourage further research into the ecological effects of fire in the reserve.	High High High High High Medium

Management Issues and Considerations	Desired Outcomes	Strategies	Priority
Cultural heritage No significant cultural heritage sites or objects are known to occur in the reserve, although this may be because there has been minimal surveys undertaken. Surveys are required to expand the knowledge of the cultural heritage values of the reserve.	? There is an improved knowledge of the cultural heritage values of the reserve.	? Precede all new ground disturbance work by an appropriate assessment of cultural heritage values. Maintenance of previously disturbed areas, such as existing roads, may not require such an assessment. ? Liaise with the Karuah Local Aboriginal Land Council in the management of any Aboriginal places, objects and values.	High High
Use of the reserve The relatively small size, steep terrain and remoteness of the reserve restricts opportunities for recreational use. Consequently recreational and educational activities in the reserve are currently minimal. Activities, such as bushwalking, are known to occur at low levels of use in the reserve. Trail bike riders use the informal trail from the Killarney Road down into the Die Happy Creek area. Trail bike riding is not considered an appropriate activity in a nature reserve. Self-reliant nature-based day use activities, such as bushwalking, can occur in the reserve but no visitor facilities of any kind will be provided. Visitor facilities are provided at nearby Jerusalem Creek day use area in Barrington Tops National Park.	? Illegal and inappropriate uses of the reserve cease. ? Visitor facilities are not provided. ? There are no negative environmental impacts from visitor use.	? Recreational use of the reserve will not be encouraged. ? Commercial and group recreational use will not be permitted in the reserve. ? The informal trail from the Killarney Road to the Die Happy Creek area will be closed and, where necessary, rehabilitated (refer to “Soil and water conservation” section above). ? Camping is not permitted in the reserve.	High High High Medium

Management Issues and Considerations	Desired Outcomes	Strategies	Priority
Management operations The south-eastern section of the reserve adjoins a grazing property and, due to inadequate fencing, cattle enter the reserve. A public road crosses the lower southern section of the reserve (see map). Previously this road provided access to a landowner with holdings on both sides of the reserve. A subsequent change in ownership has negated the need for this access. It is considered that there is no future requirement for this public road to provide either access to neighbouring properties or visitors to the reserve.	? Livestock do not enter the reserve. ? The redundant road reserve is incorporated into the nature reserve and allowed to revegetate.	? Cattle proof fencing will be installed along the south-eastern boundary of the reserve under a joint fencing agreement with the relevant neighbours in accordance with the NPWS Boundary Fencing policy. ? Investigate the incorporation of the public road into the reserve if no longer required for access to neighbouring properties. If incorporated into the reserve, the public road will be closed and allowed to revegetate.	High Medium

Legend for priorities

High priority actions are those imperative to achievement of management objectives. These actions need to be implemented in the near future to prevent degradation of natural and cultural values or the physical resources within the park.

Medium priority actions are those that are necessary to achieve management objectives but will be implemented as resources become available because the time frame for their implementation is not urgent.

Low priority actions are desirable to achieve management objectives but can wait until resources become available.

On going is used against a priority where the action may be implemented throughout the planning period.

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FURTHER INQUIRIES:

Inquiries about this plan of management or Killarney Nature Reserve, should be directed to the NPWS Gloucester Area Office, 59 Church Street, Gloucester on 02-6538 5300.