

**FIFES KNOB NATURE RESERVE
PLAN OF MANAGEMENT**

NSW National Parks and Wildlife Service

January 2004

This plan of management was adopted by the Minister for the Environment on 19 January 2004.

Acknowledgments

This plan of management was prepared by NPWS Macleay Area staff, NPWS Mid-North Coast Regional staff and the NPWS Northern Directorate Planning Group.

Further information

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NSW National Parks and Wildlife Service

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FOREWORD

Fifes Knob Nature Reserve is located on the southern side of the Macleay River, approximately 60km west of Kempsey.

Fifes Knob Nature Reserve is named after a local topographic feature to the north of the reserve that derived its name from an early land surveyor. The reserve is part of the rugged terrain abutting the Carrai Plateau, and forms part of the regional fauna corridor connecting the plateau to the Macleay Valley lower slopes.

The majority of the reserve is dry eucalypt forest, chiefly white mahogany with brush box and tallowwood. Dry rainforest and moist sclerophyll forest is found in protected gullies. Six animal species listed under the Threatened Species Conservation Act are known to occur within the reserve, and a further 21 species are considered likely to occur in the reserve.

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. The procedures for the adoption of a plan of management for a nature reserve are specified in the Act.

A draft plan of management for Fifes Knob Nature Reserve was placed on public exhibition for almost four months from 18th October 2002 until 3rd February 2003. The exhibition of the plan of management attracted 4 submissions which raised 7 issues. All submissions received were carefully considered before adopting this plan of management.

This plan of management aims to preserve the natural biodiversity of the reserve. There are no recreation facilities in the reserve and none are proposed, however, there are visitor facilities in the nearby Carrai State Forest.

This plan of management establishes the scheme of operations for Fifes Knob 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 environmental impacts of any works proposed in this plan.

1.2 MANAGEMENT OBJECTIVES

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 FOR MANAGEMENT — FIFES KNOB NATURE RESERVE

This plan applies both to the land currently reserved as Fifes Knob Nature Reserve and to any future additions to the reserve. Where management strategies or works are proposed for the reserve or additions that are not consistent with the plan, an amendment to the plan will be required.

2.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Fifes Knob Nature Reserve (hereafter called “the reserve”) is located on the southern side of the Macleay River, approximately 60km west of Kempsey. The reserve was gazetted on 5 March 1999, with a later addition on 17 December 1999, to give an area of 553 ha.

The reserve is wholly within the Kempsey Local Government Area, the Kempsey Local Aboriginal Land Council area, the Mid North Coast Catchment Management area and the Kempsey Rural Lands Protection Board area.

Fifes Knob Nature Reserve is named after a local topographic feature to the north of the reserve that derived its name from an early land surveyor. The reserve is part of the rugged terrain abutting the Carrai Plateau, and forms part of the regional fauna corridor connecting the plateau to the Macleay Valley lower slopes. Vacant crown land (VCL) and forested leaseholdings connect the reserve to Carrai National Park, Carrai State Forest, The Castles Nature Reserve and Willi Willi National Park. These in turn adjoin Werrikimbee National Park and Oxley Wild Rivers National Park. The addition of these areas to the reserve would greatly enhance the value of the reserve for biodiversity.

2.2 LANDSCAPE CONTEXT

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. More accessible parts of Fifes Knob Nature Reserve were heavily logged for quality timber species into the late 1980's, resulting in a network of logging and snig trails within the reserve. However, with limited access to other parts of the reserve, little disturbance has occurred and a number of significant plant and animal species are predicted to occur.

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 NATURAL AND CULTURAL HERITAGE VALUES

Landform, Geology and Soils

The reserve straddles the mid-section of the major ridge connecting Fifes Knob to Mount Mystery. The western fall to Stockyard Creek is very steep to precipitous, whilst the eastern fall to Branch and MacKenzies Creeks is slightly less steep to moderately steep. Elevation ranges from 290m to 800m above sea level.

The parent rocks of the reserve are Permian lithic sandstones and mudstones, which have been highly altered by the Fifes Knob granitic intrusion. The extreme north-western corner of the reserve includes an area of limestone, which is a fault-displaced fragment of the Yessabah-Moparrabah limestone belt (Dept. Mineral Resources 1992). The soils are typically shallow, stony, infertile and easily eroded by water (Atkinson 1999).

The reserve is fully forested and provides a scenic foreground to Fifes Knob when viewed from Carrai Road.

Catchment values

The reserve experiences an average annual rainfall of approximately 1250 mm with the highest monthly average of 190 mm in January (BOM 2000). The main watercourses are Stockyard and MacKenzies Creeks, which provide water for stock outside the reserve. These creeks enter the Macleay River above Bellbrook. The Macleay River is the source of the domestic water supply for the town of Kempsey.

Native Plants

The majority of the reserve is dry eucalypt forest, chiefly white mahogany (*Eucalyptus acmenoides*) together with brush box (*Lophostemon confertus*) and tallowwood (*E. microcorys*). The rainforest and moist sclerophyll components of the reserve are restricted to protected gullies. A flora survey of the rainforest component of the reserve (Floyd 1983) listed 123 species of plants, of which 50 were rainforest tree species. The rainforest was classed as dry rainforest of the shatterwood (*Backhousia sciadophora*) – yellow tulip (*Drypetes australasica*) association (Floyd 1983). An opportunistic flora survey in 1992 did not find any threatened plant species (Dodkin 1992). Significant plants known to occur in the reserve are shown in Table 1.

Table 1 Significant plant species known to occur in the reserve.

Common name	Scientific name	Significance
small leaved laurel	<i>Cryptocarya williwilliana</i>	ROTAP
—	<i>Goodenia fordiana</i>	ROTAP
white-topped box	<i>Eucalyptus quadrangulata</i>	Regionally significant

ROTAP = Listed as a Rare or Threatened Australian Plant (Briggs and Leigh 1995)

The reserve was modelled during the comprehensive regional assessment (CRA) process as potentially containing other significant plant species, including four listed as threatened species under the TSC Act (Table 2).

Table 2 Significant plant species predicted to occur in the reserve.

Common name	Scientific name	Status under the TSC Act or other significance
ravine orchid	<i>Sarcochilus fitzgeraldii</i>	Vulnerable
acomis	<i>Acomis acoma</i>	Southern limit
climber	<i>Cynanchum elegans</i>	Endangered [#] ROTAP
ground orchid	<i>Pterostylis torquata</i>	Regionally significant
grevillea	<i>Grevillia guthrieana</i>	Endangered [#]
silkpod	<i>Parsonsia dorrigoensis</i>	Vulnerable*

[#] also listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999*

* also listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*

Native Animals

Six animal species listed as vulnerable under the TSC Act are known to occur within the reserve (Table 3). A further 21 significant species, including 15 listed as vulnerable under the TSC Act, were considered in the CRA process as likely to occur in the reserve (Table 4). In addition, the reserve forms part of the Fifes Knob regional and Macleay sub-regional corridors, which link habitats across the Macleay Valley.

Table 3 Threatened animal species known to occur in the reserve

Common name	Scientific name	Status under TSC Act
Mammals		
red-legged pademelon	<i>Thylogale stigmatica</i>	Vulnerable
spotted-tailed quoll	<i>Dasyurus maculatus</i>	Vulnerable ^r
little bent-wing bat	<i>Miniopterus australis</i>	Vulnerable
Birds		
powerful owl	<i>Ninox strenua</i>	Vulnerable ^r
wompoo fruit dove	<i>Ptilinopus magnificus</i>	Vulnerable
glossy black-cockatoo	<i>Calyptorhynchus lathami</i>	Vulnerable

^r recovery plan in preparation

Table 4 Significant animal species predicted to occur in the reserve

Common name	Scientific name	Status under TSC Act or other significance
Mammals		
parma wallaby	<i>Macropus parma</i>	Vulnerable
greater broad-nosed bat	<i>Scoteanax rueppellii</i>	Vulnerable
eastern false pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable
koala	<i>Phascolarctos cinereus</i>	Vulnerable ^r
yellow-bellied glider	<i>Petaurus australis</i>	Vulnerable ^r
eastern pygmy-possum	<i>Cercartetus nanus</i>	Vulnerable
white-striped free-tail bat	<i>Nyctinomus australis</i>	Regionally significant
eastern free-tail bat	<i>Mormopterus norfolkensis</i>	Vulnerable
golden-tipped bat	<i>Kerivoula papuensis</i>	Vulnerable
eastern forest bat	<i>Vespadelus pumilus</i>	Regionally significant
eastern horseshoe-bat	<i>Rhinolophus megaphyllus</i>	Regionally significant
grey-headed flying-fox	<i>Pteropus poliocephalus</i>	Vulnerable
long-nosed potoroo	<i>Potorus tridactylus</i>	Vulnerable
Birds		
paradise riflebird	<i>Ptiloris paradiseus</i>	Regionally significant
sooty owl	<i>Tyto tenebricosa</i>	Vulnerable
Reptiles		
–	<i>Saltuarius swaini</i>	Regionally significant
burrowing skink	<i>Ophioscincus truncatus</i>	Regionally significant
Amphibians		
frog	<i>Litoria revelata</i>	Regionally significant
New England tree frog	<i>Litoria subglandulosa</i>	Vulnerable
green-thighed frog	<i>Litoria brevipalmata</i>	Vulnerable
large frog	<i>Mixophyes balbus</i>	Vulnerable
sphagnum frog	<i>Philoria sphagnicolus</i>	Vulnerable*

^r recovery plan in preparation.

* also listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*

NPWS is required by the TSC Act to prepare and implement recovery plans for all listed threatened species. These are progressively being prepared and will be used to guide management of threatened species in the area.

The reserve contains a significant area of key regional habitats. It is also part of a major regional corridor and connects the Temagog, Collombatti and Crystal Hill Regional corridors.

Aboriginal Heritage

Aboriginal communities have an association and connection to the land. The land and water biodiversity values within a whole landscape context are the centre of Aboriginal spirituality and contribute to Aboriginal peoples identity. Aboriginal communities associate natural resources with the use and enjoyment of valued foods and medicines, caring for the land, passing on cultural knowledge and

strengthening social bonds. Aboriginal heritage and nature are inseparable from each other and need to be managed in an integrated manner across the landscape.

The reserve is within the Dunghutti tribal area and Kempsey Local Aboriginal Land Council area. There are no Aboriginal sites recorded in or near the reserve.

Non-Aboriginal Heritage

There are no registered historic places or other European historic sites known within or near the reserve.

The accessible parts of the reserve were heavily logged in the late 1980s, yielding high quality white mahogany, brush box and tallowwood. Fifes Knob Road was constructed by BHP in the early 1980s to allow drilling for copper and gold adjacent to Fifes Knob. This road was upgraded by State Forests NSW (SFNSW) to allow logging.

2.4 THREATS TO THE RESERVE'S VALUES

Introduced plants

There has been no formal survey for introduced plants in the reserve. Casual observation indicates that weed species are currently not a major problem within the reserve, although minor infestations of pink lantana (*Lantana camara*) occur in the moister hardwood areas, as well as red flowered lantana on the drier ridges. The red flowered lantana is listed as a noxious weed in the Kempsey Shire Council area.

Introduced animals

There has been no survey of pest animal species in the reserve, although scats and tracks of wild dogs have been observed within the reserve and neighbours have reported wild dogs on nearby properties (RLPB 1998). Aerial baiting for wild dogs was undertaken jointly by NPWS, RLPB and SFNSW in 2000. Ground baiting and soft jaw trapping was also conducted adjacent to the reserve on Fifes Fire Trail by NPWS in 2002. Deer may also be present in the reserve (Landers, pers. comm.)

The reserve is unfenced, however the lack of watering points and low grazing potential limits the likelihood of stock entering and remaining in the reserve.

Fire

There are no fire history records prior to 2000, and no hazard reduction work is known to have occurred within the reserve. However, an infrequent and low intensity fire history for the reserve is indicated because white mahogany trees previously logged from the reserve did not display the fire induced defect of internal gum veins or 'rings' which are characteristic of a more frequent and intense fire regime.

The 2001/02 fire season was extremely severe, resulting in the whole of the reserve being burned by wildfire.

Assets which border the reserve include steep, forested Crown land leaseholdings which support minimal seasonal grazing, as well as Fifes Knob trigonometrical site.

The NPWS approach to fire management emphasises the protection of life and property as well as providing direction for the protection of natural and cultural heritage. To achieve these objectives the NPWS uses a system of bushfire management zones (NPWS 2002). These zones are compatible with the system adopted by the Bushfire Coordinating Committee for use in District Bushfire Management Committee (DBFMC) bushfire risk management plans.

The approach divides reserves into fire management zones. These zones are management areas where specified fire management operational objectives, strategies and performance indicators have been developed to mitigate against the threat of a wildfire.

NPWS has assessed the reserve for fire management planning purposes and has zoned the reserve as a Heritage Area Management Zone (HAMZ). The primary fire management objectives for this zone are to prevent the extinction of any species that are known to occur naturally within the reserve, and to protect culturally significant sites. The reserve has been designated as a HAMZ because it contains rainforest vegetation, invertebrate fauna, bat communities, a number of significant plant and animal species and the likely presence of a number of additional significant species.

Ecological research in fire-prone ecosystems has established some general principles about fire regimes and the conservation of biodiversity. That is, groups of plants and animals respond similarly to fire according to characteristics of their life history. Therefore it is not necessary to individually specify fire regimes for the conservation of every species. Requirements for most plant species can be summarised on the basis of vegetation communities and there is a threshold in fire regime variability that marks a critical change from high species diversity to low species diversity. The following regimes have been identified for the reserve:

Table 5: Fire Regime Guidelines

Vegetation type	Minimum interval	Maximum interval	Notes
Rainforest	n/a	n/a	Fire should be avoided
Wet sclerophyll forest	25	60	Crown fires should be avoided in the lower end of the interval range
Grassy dry sclerophyll forest	5	50	
Shrubby dry sclerophyll forest	7	30	

Source: Auld & O'Connell (1991), Keith (2002), Keith et al (2002), Morrison et al (1995)

The HAMZ does not require intensive management and focuses on those actions appropriate to conserve biodiversity and cultural heritage, including exclusion of fire from rainforest. Management of fire regimes for dry eucalypt forest will be in accordance with fire regime guidelines identified for dry sclerophyll forest in table 5, above, any threatened species requirements or further research.

There is potential for fire to spread into the reserve from the east and west, as the reserve is a south to north running ridge with steep side slopes, particularly on to the west. Lands adjoining the reserve are forested and have no boundary trails. The only trails within or about the reserve are Fifes Knob Road and Fifes Fire Trail. Fifes Knob Road may be used as a fire advantage for low intensity back burning to fires ascending slopes into the reserve. Water is available in Mackenzies Creek, 5 kilometres from the reserve on the steep Fifes Fire Trail, to assist in fire management. Due to the terrain and lack of barriers near the reserve boundaries, it is impracticable to hazard reduce any specific areas of the reserve. Hazard reduction within the reserve may occur by back burning in response to a threat of fire on neighbouring lands entering moist hardwood and rainforest sections of the reserve.

Modification of surrounding lands

Much of the surrounding lands were logged at the same time as the reserve. These lands are covered by forest that has regenerated since logging in 1986-1988 and are unlikely to be cleared in the future due to the skeletal soils, absence of permanent water and steep terrain. Grazing only occurs on these lands if there is a spring flush of bladey grass (*Imperata cylindrica*) after a fire with following rain.

2.5 VISITOR USE

Public access to the reserve is via Fifes Fire Trail, off the Carrai Road. Frequent tree falls lead to the temporary closure of this access to the reserve. This trail is not available for recreational vehicle use within the reserve.

The reserve currently receives a very low level of visitor use. There are no recreation facilities in the reserve, however there are visitor facilities at 'Kookaburra' in Carrai State Forest, where an overnight hut is maintained by NPWS to facilitate fieldwork in nearby reserves. There are two open-air barbecues for public use available at this site. There is currently no signage within the reserve.

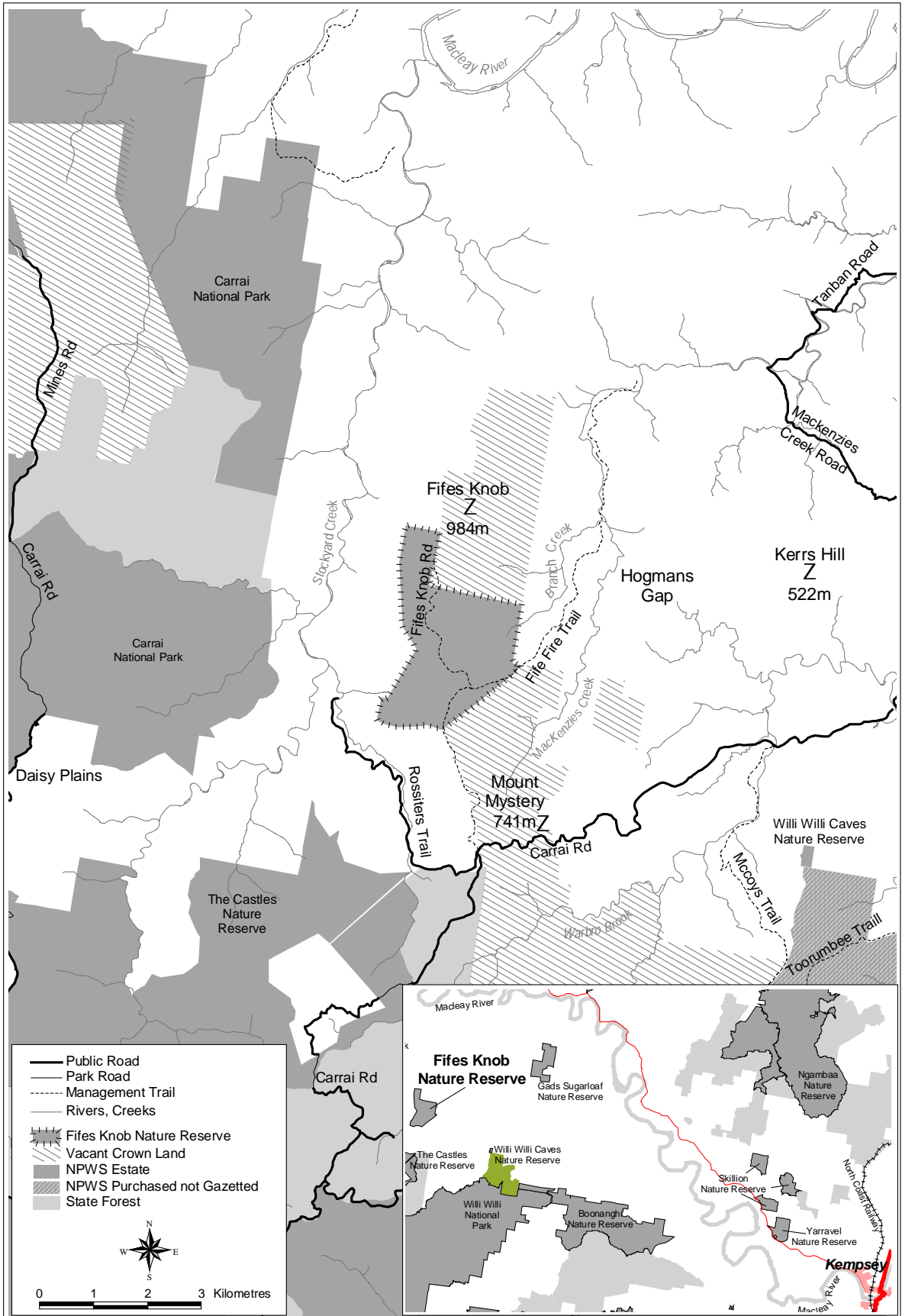
Recreational activities not consistent with the study of nature and natural environments are generally considered inappropriate uses of a nature reserve. Horse riding, camping and recreational four-wheel driving are inconsistent with the purposes of a nature reserve under the NPW Act, while horse riding is not permitted in a nature reserve under NPWS policy. Carrai National Park and the Kookaburra site in Carrai State Forest, some 20km to the south-west, provide opportunities for horse riding, camping and recreational driving.

2.6 MANAGEMENT ACCESS

NPWS can access the reserve via Fifes Fire Trail off Carrai Road, or via the same trail off MacKenzies Creek Road through private property, with the agreement of the landholder. Access roads to the reserve are frequently closed to traffic due to tree falls.

As a result of a long history of former logging, the reserve contains numerous logging and snig trails. In order to protect reserve values, only those trails shown on the map that are required for the protection and management of the reserve will be retained.

3. FIFES KNOB NATURE RESERVE AND LOCALITY MAP



4. FIFES KNOB NATURE RESERVE — MANAGEMENT ISSUES AND STRATEGIES

Current Situation	Desired Outcomes	Strategies	Priority
<p>Soil and water conservation</p> <p>Although there are currently minimal soil erosion or water quality issues, the soils in the reserve are highly erodible if disturbed.</p> <p>The reserve is a steep watershed between Stockyard and MacKenzies Creeks.</p>	<ul style="list-style-type: none"> • There is no evidence of accelerated soil erosion. • There is no reduction in water quality in the reserve’s streams. 	<ul style="list-style-type: none"> • Undertake all works that have the potential to disturb the soil, such as trail maintenance and fuel reduction, in a manner that minimises erosion and water pollution. 	High
<p>Native plant and animal conservation</p> <p>Native animals have not been formally surveyed. Native plant surveys have found two ROTAP species. Modelling has predicted the occurrence of additional significant plant and animal species. A formal animal survey of the reserve would significantly enhance the understanding of the reserve’s habitat values.</p> <p>The VCL around the Fifes Knob area north of the reserve and the Warbro Brook area south of the reserve contain a significant area of rainforest, including red cedar (<i>Toona ciliata</i>).</p>	<ul style="list-style-type: none"> • There is no loss of native plant and animal species found in the reserve, or reduction in habitat diversity. • Increased knowledge of native plant and animals in the reserve and their ecological requirements. 	<ul style="list-style-type: none"> • Undertake or encourage appropriate plant and animal surveys, in particular those that determine the occurrence of significant species (refer to Research). • Encourage appropriate research into the ecological requirements of significant species in the reserve (refer to Research). • Work with relevant neighbours including leaseholders, Landcare groups and others to encourage retention of vegetation in the vicinity of the reserve. • Allow natural regeneration of previously logged areas and logging trails not shown on the map. If required, undertake works to encourage successful revegetation. 	<p>Medium</p> <p>Medium</p> <p>Medium</p> <p>Medium</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Ecological viability of the reserve would be improved by the maintenance of vegetation corridors on neighbouring lands. This would assist in the movement of wildlife between the reserve and other forested areas.</p>	<ul style="list-style-type: none"> • The ecological viability of the reserve is enhanced by retention of native vegetation in surrounding areas and by incorporation of nearby areas of VCL. 	<ul style="list-style-type: none"> • Seek to have the nearby areas of VCL added to the reserve. 	<p>Medium</p>
<p>Introduced species</p> <p>Pest weeds are not currently a major problem on the reserve, however both pink and red flowering varieties of lantana do occur.</p> <p>Wild dogs have been observed in the reserve and on grazing lands in the lower Stockyard Creek area.</p> <p>A Pest Management Strategy has been developed for the region as a whole. This strategy identifies pest populations, priorities for control and suggested control methods.</p>	<ul style="list-style-type: none"> • The impact of introduced species on native species and neighbouring lands is minimised. • Lantana distribution does not expand beyond the current extent. • Wild dogs are controlled. 	<ul style="list-style-type: none"> • Control, and where possible eradicate, introduced pest plant and animal species found in the reserve in accordance with the Regional Pest Management Strategy. Control of wild dogs will be a priority in the reserve. • Seek the cooperation of other authorities and neighbours in implementing weed and pest animal control programs. Undertake control in cooperation with neighbours, the Kempsey Rural Lands Protection Board, Kempsey Shire Council, the Mid North Coast Weeds Advisory Council, and other stakeholders. 	<p>Medium</p> <p>High</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Fire management</p> <p>Fire is a natural feature of the environment of the reserve and is essential to the survival of some plant communities. Frequent or regular fire, however, can cause loss of particular plant and animal species and communities. Fire could also damage fences, or some cultural features that may be found on the reserve, as well as threaten neighbouring land.</p> <p>Fifes Knob Road and Fifes Fire Trail are maintained for management and fire protection purposes.</p> <p>There are no perimeter trails and their construction is not considered feasible.</p> <p>An infrequent, low intensity fire regime is thought to have occurred in the past, and the entire reserve was burnt by wildfire in 2001/02.</p> <p>The reserve is designated as a HAMZ (refer to 2.3 – Fire).</p>	<ul style="list-style-type: none"> • The potential for unplanned fires to enter into or exit from the reserve is minimised. • Life and property are protected from fire. • There is no reduction to the extent of dry rainforest in the reserve as a result of fire. • Fire regimes are appropriate for long-term maintenance of the reserve’s plant and animal communities. 	<ul style="list-style-type: none"> • Manage the reserve as a Heritage Area Management Zone, where fire is managed to protect biodiversity in accordance with the identified fire frequency thresholds for vegetation communities (refer Table 5), threatened species requirements or further research. • Prescribed burning will not be undertaken on the reserve unless required to maintain biodiversity, as above, or in cooperation with neighbours. • Should prescribed burning be carried out it will be done in a way that minimises the likelihood of fire entering rainforest or moist sclerophyll forest. • Cooperate with and assist neighbours who wish to conduct hazard reduction burns or maintenance of fire breaks adjacent to the reserve boundary as appropriate. • Continue to participate in the Kempsey Bush Fire Management Committee and maintain close contact and cooperation with neighbours, Council fire officers and volunteer bush fire brigades concerning fire management on the reserve. • The use of heavy machinery and vehicles for fire management purposes will be confined to trails shown on the reserve map. In emergency situations, former trails (e.g. logging trails) may be reopened if essential to protect natural or cultural values in or off the reserve. No new trails are to be constructed anywhere in the reserve. 	

Current Situation	Desired Outcomes	Strategies	Priority
		<ul style="list-style-type: none"> • Protect dry rainforest communities in the reserve from fire. • Encourage research into the ecological effects of fire in the reserve, particularly the fire response of significant plant species and the fire requirements of the various plant communities (refer to Research). • The reserve may be closed to public use during periods of extreme fire danger. 	<p>High</p> <p>Medium</p> <p>High</p>
<p>Cultural heritage</p> <p>There are no known Aboriginal or European cultural sites within the reserve.</p> <p>No formal cultural heritage surveys have been undertaken within the reserve.</p>	<ul style="list-style-type: none"> • Cultural heritage studies are undertaken and any objects or sites are appropriately recorded and protected. 	<ul style="list-style-type: none"> • Encourage appropriate cultural heritage surveys in the reserve (refer to Research). • Undertake an archaeological survey and cultural assessment prior to all new works with the potential to impact on Aboriginal or non-Aboriginal sites and values. Maintenance of existing reserve infrastructure will not require this assessment. • Consult with the Dughutti elders and the Kempsey Local Aboriginal Land Council in all aspects of management of any identified Aboriginal sites, objects, places and values. Provide copies of any research findings on Aboriginal cultural heritage to the Land Council (refer to Research). 	<p>Low</p> <p>High</p> <p>Medium</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Visitor use</p> <p>Promotion of community understanding and appreciation of the conservation values of the reserve can minimise inappropriate visitor activities.</p> <p>The reserve currently receives very low levels of visitor use.</p>	<ul style="list-style-type: none"> • Signage identifies reserve boundaries and prohibited activities. • There is community understanding and appreciation of the reserve's natural and cultural values, as well as management programs. • Visitor use is ecologically sustainable and consistent with its management as a nature reserve. 	<ul style="list-style-type: none"> • Liaise with neighbours and community organisations to promote community understanding of the reserve's values and management strategies. • Permit nature based visitor use such as bushwalking, bird watching and nature observation in the reserve. • Public vehicles will not be permitted on Fifes Knob Road and on Fifes Fire Trail within the reserve. • Wood fires, camping and horse riding will not be permitted in the reserve. • Erect tenure and information signage at reserve boundaries. No other visitor facilities will be provided. 	<p>Low</p> <p>Low</p> <p>Medium</p> <p>High</p> <p>Low</p>

Current Situation	Desired Outcomes	Strategies	Priority
<p>Research</p> <p>Scientific study is needed to improve understanding of the reserves natural and cultural values, the processes that affect them and the requirements for management of particular species.</p>	<ul style="list-style-type: none"> Research that enhances the information base and assists management of the reserve is encouraged or undertaken. 	<ul style="list-style-type: none"> Undertake or encourage research to improve knowledge and management of the reserve's natural and cultural values (refer Native plant and animal conservation and Cultural heritage). 	Low
<p>Management operations</p> <p>Fifes Knob Road and Fifes Fire Trail are required for ground baiting of pest animals, and may be required for the control of fires.</p> <p>Fifes Knob Road allows provides authorised access to the foot track to Fifes Knob trigonometrical site outside the reserve.</p>	<ul style="list-style-type: none"> Fifes Knob Road is available for authorised access to Fifes Knob trigonometrical site and for pest and fire management, however, it is not available for recreational vehicle use. 	<ul style="list-style-type: none"> Maintain Fifes Fire Trail within the reserve to 4WD dry weather standard. Maintain Fifes Knob Road to the minimum standard that allows authorised vehicle access to the trigonometrical station, and access for pest management, fire protection and fire management purposes. Close if no longer required for these purposes. 	High Medium

High priority activities are those imperatives to achievement of the objectives and desired outcomes. They must be undertaken in the near future to avoid significant deterioration in natural, cultural or management resources.

Medium priority activities are those that are necessary to achieve the objectives and desired outcomes but are not urgent.

Low priority activities are desirable to achieve management objectives and desired outcomes but can wait until resources become available.

Once a plan has been adopted by the Minister it must be implemented, and no operations may be undertaken except in accordance with the plan. If after adequate investigation, operations not included in the plan are found to be justified, the plan may be amended in accordance with section 73B of the Act.

5. REFERENCES

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GLOSSARY

ACRONYMS

NPW Act	NSW <i>National Parks and Wildlife Act (1974)</i>
NPWS	NSW National Parks and Wildlife Service
TSC Act	NSW <i>Threatened Species Conservation Act (1995)</i>
RLPB	Rural Lands Protection Board

SELECTED DEFINITIONS

Biodiversity	Biological diversity, namely the variety of life forms: the different plants, animals and microorganisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystem
Cultural heritage	Encompasses past and present cultural associations of all people in Australia, including tradition, knowledge and customs. It can be tangible (i.e. have physical manifestations in the form of art, buildings etc.) or intangible (i.e. spiritual or social associations, songs, stories and cultural practices). Cultural significance includes values that are social, spiritual, aesthetic, historic and scientific. When natural resources acquire meaning for a particular group, they become cultural resources as well.
Ecologically sustainable use	Using society's natural resources within the capacity of the species and ecosystems, so that the health, diversity and productivity of the environment and the ecological processes on which life depends are conserved and enhanced, and the quality of life, now and in the future, can be increased.
Fauna	Any mammal, bird, reptile or amphibian. NPWS has responsibility for the conservation of fauna. Note this definition excludes fish or invertebrates.
Fire Management	Includes all activity associated with the use and control of fire in bushland designed to achieve stated objectives for the protection of life and property, and the maintenance of wildlife communities.
Fire management plan	A plan of operations to prevent, detect and suppress unplanned fires and to reduce bushfire hazard, prepared by a Bushfire Management Committee, constituted under the Rural Fires Act for coordinated fire management and operations within a rural fire district.
Historic places	Landscapes, sites buildings or other works together with pertinent contents and surroundings and include structures, ruins, archaeological sites and areas

Introduced species	A species occurring in an area outside its historically known natural range as a result of intentional or accidental dispersal by human activities. Also known as exotic or alien species.
Policy	A statement of attitude and courses of action, directed toward the attainment of NPWS corporate goals and/or objectives.
Recovery plan	A document, prepared under the <i>TSC Act</i> , that identifies the actions to be taken to promote the recovery of a threatened species, or endangered population or ecological community.