

**TOWARRI NATIONAL PARK,
WINGEN MAID NATURE RESERVE AND
CEDAR BRUSH NATURE RESERVE**

PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment and Conservation (NSW)

July 2004

This plan of management was adopted by the Minister for the Environment on 20 July 2004.

Acknowledgments

This plan of management is based on a draft plan prepared by staff of the Hunter Region of NPWS. Rachel-Ann Robertson was the principal author with Stephen Wright contributing much information.

Graeme McGregor, Alison Ramsay, Dave Brown, Ken England, Sandro Conduro and Mel Schroder provided information and comments. Members of the public were a valuable source of information. Input and assistance from the Towarri Plan of Management Steering Committee, Hunter Regional Advisory Committee and the Planning Subcommittee of the National Parks Advisory Council is also acknowledged.

Cover photograph of the Liverpool Range from Heavens Ridge in Towarri National Park by Graeme McGregor, NPWS.

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FOREWORD

Towarri National Park, Wingen Maid and Cedar Brush Nature Reserves are located approximately 25 kilometres north of Scone and 160 kilometres north-west from Newcastle, in the Upper Hunter Valley.

The national park and nature reserves contain part of the Liverpool Range and are located at the junction of three biogeographical areas: the NSW North Coast, Brigalow Belt and Sydney Basin. The Liverpool Range provides part of an important east-west corridor linking the Great Dividing Range and Warrumbungle Ranges and supports a significant number of threatened and endemic plant and animal species as well as other species that reach their northern, western or southern distribution limit. The national park and nature reserves also contain sites of Aboriginal and European cultural heritage and high quality scenic landscapes.

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

A draft plan of management for Towarri National Park and Wingen Maid and Cedar Brush Nature Reserves was placed on public exhibition 29th November 2002 until 10th March 2003. The exhibition of the plan of management attracted 20 submissions which raised 12 issues. All submissions received were carefully considered before adopting this plan of management.

This plan of management provides for the conservation of natural and cultural heritage values while providing opportunities for sustainable public use. Strategies and programs to protect, and where necessary restore, the natural and cultural values of the area will be implemented. In addition, provision will be made for picnicking and camping near the Washpools, an additional area for group camping and for short and longer bushwalks including along the Liverpool Range.

This plan of management establishes the scheme of operations for Towarri National Park, Wingen Maid Nature Reserve and Cedar Brush Nature Reserve. In accordance with sections 75 and 76 of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

BOB DEBUS
Minister for the Environment

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1. INTRODUCTION

1.1 LOCATION, GAZETTAL AND REGIONAL SETTING

Towarri National Park, Wingen Maid and Cedar Brush Nature Reserves are located approximately 25 kilometres north of Scone and 160 km north-west from Newcastle, in the Upper Hunter Valley (see the map). In addition to the park and reserves, there are a number of recent acquisitions that have not yet been gazetted as either national park or nature reserve (see the map). Collectively the park, reserves and recent acquisitions are referred to as “the planning area. The planning area totals 6,627 hectares and includes part of the Liverpool Range that constitutes the Great Dividing Range in this area.

The planning area separates the Hunter Valley and the Liverpool Plains and forms the watershed between the Hunter and Namoi catchments. The planning area experiences a rainfall of up to 900 mm on southern slopes and snow falls in the sub-alpine areas every 2-3 years in winter and occasionally in spring and autumn.

Towarri National Park was gazetted in 1998 following the purchase of several key properties that were combined with Vacant Crown Land. The park covers an area of 5,035 hectares fragmented into six separate parcels, being the Washpools Range, Glen Range, Castle Rock, Central, Stringybark Top and Fern Top (see the map). At the time of writing acquisitions were still being added to Towarri National Park.

Wingen Maid Nature Reserve is one kilometre to the east of Towarri National Park. Part of Wingen Maid Nature Reserve was under Crown lease for 7 years from 1922 and remained as Vacant Crown Land until the first 718 hectares were gazetted as a nature reserve in 1974. Further lots of crown and freehold land were added in 1981, bringing the total area to 1,095 hectares. Wingen Maid was originally conserved because it is a prominent scenic landmark in the Upper Hunter Valley and contains an interesting mix of vegetation communities.

Cedar Brush Nature Reserve was gazetted in April 1977 as part of the Government’s Rainforest Conservation Policy and is located 200 metres to the west of the central portion of Towarri (see the map). The reserve totals 206 hectares and protects one of the most complex western extents of rainforest on the Liverpool Range.

The planning area is located in the Local Government Areas (LGAs) of Scone and Murrurundi. The main industries in the area include viticulture, quarrying, dairying, cropping, and grazing of sheep, cattle and goats.

Tourist attractions in both LGAs include wineries, bed and breakfasts and horse studs (Scone is known as the ‘Horse Capital of Australia’). Surrounding recreational areas include Lake Glenbawn and other National Parks and State Forests such as in the Barrington Tops National Park and Barrington Tops State Conservation Area. Nearby is Burning Mountain Nature Reserve that provides opportunities for visitors to observe the effects of a deep coal seam that has been burning for thousands of years.

1.2 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. 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.

1.3 STATEMENT OF SIGNIFICANCE

The planning area is located at the junction of 3 biogeographical areas: the NSW North Coast, Brigalow Belt (black soil country) and Sydney Basin. The Liverpool Range potentially supports a significant number of endangered and endemic species as well as other species that reach their northern, western or southern distribution limit. The key values of the planning area include:

- Geological structures and rock types that demonstrate the tectonic evolution of the New England Tablelands during the late Palaeozoic Era and demonstrates the development of the east Australian landscape from late Cretaceous / early Tertiary period to the present;
- The Liverpool Range provides part of an important east-west corridor linking the Great Dividing Range and Warrumbungle Ranges;
- A catchment and source of high quality water for residential and agricultural purposes in the Middlebrook and Dry Creek catchments;
- The planning area is surrounded by cleared or partly cleared agricultural land and is likely to act as an island refuge. It is an essential part of the conservation strategy for Hunter Region;
- A range of altitude and aspect that supports a diversity of vegetation communities including snow grass open forests on basalt; grass tree low woodlands; box-spinifex open forests on basalt; warm temperate rainforests; river oak riparian forests; grey gum-apple alluvial open forests; box open forests on basalt; and a diversity of eucalypt communities;
- Grassy White Box woodlands, an Endangered Ecological Community, are located in the planning area (refer to section 4.2);
- Plants of national and state significance including the endangered *Pomaderris queenslandica*; vulnerable *Philothea ericifolia*; and two proposed ROTAP

species, *Macrozamia concinna* and *Pomaderris bodalla*. A possible new species of *Typhonium*, that is closely related to *T. brownii*, exists in Wingen Maid and the Captain Creek addition to Towarri National Park;

- Threatened animal species have been recorded in the planning area, including the glossy black cockatoo (*Calyptorhynchus lathami*); rufous fantail (*Rhipidura rufifrons*); powerful owl (*Ninox strenua*); speckled warbler (*Pyrrholaemus saggitata*), yellow tufted honeyeater (*Lichenostomus melanops*), dwarf tree frog (*Litoria fallax*), parma wallaby (*Macropus parma*), squirrel glider (*Petaurus norfolcensis*) and brush tail rock wallaby (*Petrogale penicillata*);
- The planning area is rich in Aboriginal and European cultural heritage;
- High quality scenic landscapes provide an important backdrop to the Upper Hunter Valley; and
- Opportunities for a range of recreational activities for visitors and residents of Scone and the Upper Hunter.

2. MANAGEMENT CONTEXT

2.1 LEGISLATIVE AND POLICY FRAMEWORK

The management of national parks and nature reserves in NSW is in the context of the legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the *Threatened Species Conservation Act 1995* (TSC Act), the *Wilderness Act 1987* and the policies of the National Parks and Wildlife Service (NPWS). Section 72AA of the NPW Act lists the matters to be considered in preparation of a plan of management. The policies arise from the legislative background, the NPW Regulations and internationally accepted principles of park and reserve 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.

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 the planning area except in accordance with the plan. The plan will also apply to any future additions to the planning area. Where management strategies or works are proposed for the planning area or any additions that are not consistent with the plan, an amendment to the plan will be required.

The planning area will be managed in accordance with the following legislative and policy framework. The specific guidelines and actions proposed in this plan have been established in accordance with this framework.

2.2 MANAGEMENT OBJECTIVES

National Parks in New South Wales

National parks are reserved under the NPW Act to protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor use.

Under the Act, national parks are managed to:

- conserve biodiversity, maintain ecosystem functions, protect geological and geomorphological features and natural phenomena and maintain natural landscapes;
- conserve places, objects, features and landscapes of cultural value;
- protect the ecological integrity of one or more ecosystems for present and future generations;

- promote public appreciation and understanding of the park's natural and cultural values;
- provide for sustainable visitor use and enjoyment that is compatible with conservation of natural and cultural values;
- provide for sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to conservation of natural and cultural values; and
- provide for appropriate research and monitoring.

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.

3. MANAGEMENT DIRECTIONS

The planning area will be managed to conserve its natural and cultural heritage values while providing opportunities for sustainable public use. Strategies and programs to protect, and where necessary restore, the natural and cultural values of the planning area include:

- Manage the whole area as an interrelated reserve system;
- Control, and where possible eradicate, introduced plant and animal species;
- Protect and monitor threatened and biogeographically significant species and communities;
- Protect cultural heritage sites;
- Involve Aboriginal people in the management of cultural heritage values;
- Protect water catchment values;
- Implement fire regimes designed to maintain the diversity of vegetation communities;
- Engender greater public awareness and appreciation for the values and management of the planning area;
- Manage visitor use in an ecologically sustainable manner; and

- Maintain a good working relationship with neighbours, local Councils, authorities, Government departments and other agencies to enhance the protection and viability of the planning area.

Provision of recreation facilities, such as day use and camping areas, will be provided in Towarri National Park, with the focus on the Middlebrook area. Walking tracks will also be provided in Towarri National Park. Middlebrook Road, which provides public vehicle access to the main visitor facility sites, is a public road up to the quarry and not technically within the planning area.

It is the remoteness and ruggedness of the park that many people find appealing. Minimal impact recreation practices will be encouraged to protect the environment. Interpretative information will be provided at strategic visitor facilities to encourage appreciation of the natural and cultural values of the planning area.

The management of weeds, pests and fire is the core of management philosophy in the planning area. The maintenance of a system of management trails for NPWS access is essential to carry out the core functions of the planning area.

4. CONSERVATION OF NATURAL AND CULTURAL HERITAGE

4.1 GEOLOGY AND LANDFORM

The Liverpool Range, which is part of the Great Dividing Range, has a range in elevation of between 350m and 1280m above sea level (ASL). The planning area occurs mainly on the southern slopes of the Liverpool Range. The forested slopes provide dramatic mountain scenery that can be seen from the valley floor and provides a scenic backdrop to the Upper Hunter Valley. The cliffs of Wingen Maid Nature Reserve are a prominent landscape feature of the Upper Hunter Valley. Castle Rock is also visually impressive, with steep rocky escarpments up to 50m high. The area is characterised by protruding spurs that extend from the Glen Range.

The Liverpool Range was formed from the Liverpool Shield volcano by basalt outpourings in the Tertiary period approximately 1.5-65 million years ago. These basalt sheets probably covered a large portion of the Hunter Valley but due to erosion are now restricted to the Liverpool and Mt Royal Ranges, Barrington and Coolah Tops Plateaus. The Liverpool Range beds are comprised predominantly of red and brown krasnozems soils, that were derived from basalt, with some dolerite, conglomerate, quartzose sandstone, shale and bole. The Liverpool Range rises to a maximum height of 1280m ASL at Bald Hill and extends west to encompass Coolah Tops National Park and north east to the Mount Royal Range. More recent unconsolidated sediments include alluvial flats adjacent to the Middlebrook and Dry Creek areas that are underlined by Triassic sandstone, mainly in the form of a sandstone conglomerate. This conglomerate is clearly exposed in Middlebrook Creek at Washpools Day Use area.

A number of former sheep camps, mainly in Towarri National Park, are weed infested and tend to attract feral pigs. These areas are a high priority for rehabilitation. Other disturbed areas include roadsides and around the Glen Murray homestead.

The continuation of natural processes and protection of landscape values is an important management goal. The ruggedness of Liverpool Range has limited past disturbances to the landscape, such as the effects of grazing and logging. The surrounding plains have generally been cleared for agriculture.

Desired Outcome

- Geological features and scenic values are protected.

Strategies

- ***Rehabilitation, restoration or programmed works will use gravel and soils that are as free as possible of weeds and other contaminants.***
- ***Visitor facilities and management infrastructure will be located and designed so as to minimise their visual impact.***

4.2 NATIVE PLANTS

The Liverpool Range area is at the junction of the Northern Tablelands and Central Western Slopes botanical divisions and consequently supports a great diversity of vegetation types, ranging from warm temperate rainforest to snow-gum woodlands. The planning area is located in the eastern extension of the Central Western Slopes, being the only part of NSW where the Western Slopes and Coastal subdivisions are not separated by an elevated tableland. In addition the Hunter Valley acts as a conduit for coastal species that generally occur further inland (Hill et al. 2001).

Plant surveys have been undertaken within the planning area, including Hill *et al.* (2001), Visser and Peake (1998), Bruhl & Hosking (2001) and Marriott-Brown (1995). In addition Fisher (1985) and Floyd (1990a and b) have studied several rainforests along the Liverpool Range that are now conserved within the planning area. These studies highlight the diversity of flora, ROTAP (Rare or Threatened Australian Plants) species, threatened species and species at the limit of their known distribution limits found within the planning area.

To date twenty-one distinct vegetation communities have been identified in the planning area (Hill et al 2001, also refer to appendix 1). Significant communities include:

- Warm temperate rainforest;
- Sub-alpine woodlands;
- Grass tree low woodland;
- Box open forest on basalt;
- Box-spinifex open forest;
- Box-snow gum open forest on basalt;
- Sandstone gorge rainforests on basalt;
- Grey gum apple alluvial open forest; and,
- River oak riparian forest communities.

The area contains a great diversity of eucalypt communities that vary with altitude, aspect and soil type. Snow gum (*Eucalyptus pauciflora*) dominate the ridge tops with local occurrences of other species, such as black sally (*E. stellulata*) and mountain gum (*E. dalrympleana*).

Two box communities (box open forest on basalt and box – snow grass open forest on basalt) are similar to the Grassy White Box woodlands (*E. albens* - *E. melliodora*) which is an Endangered Ecological Community under the NSW *Threatened Species Conservation Act 1995* (TSC Act). The community is also identified under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. The box communities are located on the plateau of Wingen Maid Nature Reserve, on the slopes west of the Braeside area, and throughout the Glen Range and Castle Rock additions. The community on Wingen Maid has more prominent shrubby understorey, dominated by native olive (*Notolea microcarpa*) and kangaroo thorn (*Acacia paradoxa*) while the understorey in other areas is dominated by snow grass (*Poa sieberiana* var. *sieberiana*) (Hill *et al* 2001). Disturbance should be avoided in these communities as the impact on these communities may be visible for decades.

The warm temperate rainforest communities of the planning area are of particular scientific and conservation importance. Located approximately 160 kilometres from the coast they are thought to be the furthest inland rainforests in NSW. They survive on the southern side of the range because it receives an average annual rainfall of about 900mm. This rainfall is much lower than the 1,500 mm usually required for rainforest survival but the basalt soils, which are high in phosphorous and have good moisture retention properties, may assist in compensating for the low rainfall. The ecologically important drier northern facing rainforests are also of interest as they are located on sandstone areas.

To date 784 plant species have been recorded in the planning area of which the significant species are listed in table 1. While some plant species are of national and state significance others are outside their normal extent or range.

Table 1: Significant plant species in the planning area.

Scientific Name	Significance ^a			Location ^b	Description	Source ^c
	ROTAP (national)	TSC Act (NSW)	NPW Act			
Legally protected species						
<i>Macrozamia concinna</i>	3R*			T, WM		1
<i>Pomaderris bodalla</i>	2R*			WM		1
<i>Pomaderris queenslandica</i>	-	E		T		1
<i>Philotheca ericifolia</i>	3RC-	V		WM	Rare and restricted	1
<i>Typhonium</i> sp. aff. <i>Brownii</i> (to be confirmed)	Possible new species	E?		T, WM		2, 1
<i>Adiantum aethiopicum</i>			Sch.13	T		3
Rare or uncommon plants not legally protected						
<i>Asplenium australasicum</i>	-	-	-	-	Uncommon	1
<i>Canthium buxifolium</i>	-	-	-	-	Uncommon & poorly known	1
<i>Dendrocnide excelsa</i>	-	-	-	-	Uncommon	1
<i>Eucalyptus cypellocarpa</i>	-	-	-	-	Uncommon	1
<i>Phebalium squamulosum</i> ssp. <i>lineare</i>	-	-	-	-	Restricted to Upper Hunter	1
<i>Platynerium bifurcatum</i> ssp. <i>Bifurcatum</i>	-	-	-	-	Uncommon	1
<i>Pomaderris argyrophylla</i> ssp. <i>graniticola</i>	-	-	-	-	Rare and restricted	3
<i>Sicyos australis</i>	-	-	-	-	Uncommon	1
<i>Tasmannia stipitata</i>	-	-	-	-	Uncommon	1
<i>Trema tomentosa</i> var. <i>viridis</i>	-	-	-	-	Uncommon	1
<i>Triodia scariosa</i>	-	-	-	-	Uncommon	1

Notes: a. Significance Code: ROTAP = Rare or Threatened Australian Plants, TSC Act = NSW *Threatened Species Conservation Act 1995* and NPW Act = *National Parks and Wildlife Act 1974*.

ROTAP Code (refer to Briggs and Leigh, 1996 for definitions)

NR=Conserved in a Nature Reserve.

3RC=Geographic range over 100 km in Australia, rare and reserved.

2R=Geographical range less than 100 km in Australia and Rare

* = proposed code

TSC Act, 1995 E=Endangered, V=Vulnerable

Sch. 13 (NPW Act) = Plants listed under Schedule 13 of the *National Parks and Wildlife Act 1974*

- b. Location: WM = Wingen Maid Nature Reserve NR, CB = Cedar Brush NR and T = Towarri National Park.
- c. Source of Record: 1=Hill et al 2001, 2=ATLAS database and 3=Hosking and Bruhl (2001).

Much of the district surrounding the planning area has been cleared, particularly towards the Merriwa plateau where a considerable amount of the native vegetation has been lost. The retention of nearby forested areas is important in maintaining the diversity of native plants and animals by providing additional habitat and linkages to other areas for the movement of plants and animals.

Under the provisions of the TSC Act, recovery plans must be prepared for all threatened species. These are progressively being prepared and will be used to guide management of threatened species in the planning area.

It is difficult to ascertain to what extent the open forest with a grass understorey is a natural ecosystem or the result of past land use practices, such as selective logging or clearing. With the removal of grazing from the planning area there is evidence of naturally regeneration of this community. A regeneration and monitoring plan needs to be developed to monitor regeneration and identify appropriate management techniques.

Desired Outcomes

- No loss of significant plant species or further degradation to plant communities.
- Vegetation structural diversity and habitat values are maintained and are restored where necessary.

Strategies

- ***Develop a plan for the regeneration and monitoring of degraded vegetation communities in the planning area.***
- ***Encourage natural regeneration of previously disturbed areas. Active revegetation programs may be undertaken in more seriously degraded areas. Only local seed stock of species indigenous to the planning area will be used in rehabilitation programs.***
- ***Undertake further vegetation surveys, with priority given to the following:***
 - ***Recent and future land acquisitions to the planning area;***
 - ***Castle Rock, western and southern sides;***
 - ***Fern Top, this entire land portion;***

- ***Glen Range, the deep western and north-west gullies entering Thompsons Creek and Donald's Gully, especially those influenced by basalt;***
 - ***Stringybark Top, this entire land portion;***
 - ***Washpools, southern and north western parts of park; and***
 - ***Wingen Maid, central part and section near Salisbury trig.***
- ***Record threatened and significant plant species when observed in the planning area.***
 - ***Encourage, in association with neighbours, Landcare, vegetation management committees and land use authorities, the protection of nearby natural vegetated areas through the preparation of voluntary conservation agreements, Landcare programs and/or other incentives under the Native Vegetation Conservation Act 1997.***

4.3 NATIVE ANIMALS

The wide range of vegetation communities in the planning area provides a diverse range of habitats for native animals. It is highly probable that the Liverpool range area supports many significant animal species, including vulnerable and endangered species or those at the limit of distribution. Although no systematic fauna survey has been completed for the planning area it is expected that native animals will occupy similar habitat types and niches to those in other locations along the Liverpool Range.

Mammals

The vegetation communities in the planning area support a significant range of mammal species. Common mammals known to occur in the park include; wallaroo (*Macropus robustus*), common wombat (*Vombatus ursinus*), swamp wallaby (*Wallabia bicolor*), eastern grey kangaroo (*Macropus giganteus*). Threatened mammals found in the planning area include the parma wallaby (*Macropus parma*) and squirrel glider (*Petaurus norfolcensis*). The endangered brush-tailed rock-wallaby (*Petrogale penicillata*) has been recorded in the Wingen Maid area although there have been no recent sightings to confirm whether it still inhabits the area. Targeted surveys should be undertaken to ascertain population numbers. Large numbers of greater gliders (*Petauroides volans*) have been recorded in the Captains Creek area. The red necked pademelon (*Thylogale thetis*) is identified as a regionally significant species. Bat species likely to occur in the area include the eastern free-tail bat (*Mormopterus norfolkensis*), great pipistrelle (*Falsistrellus tasmaniensis*), large bent-winged bat (*Miniopterus schreibersii*), greater broad-nosed bat (*Scoteanax rueppellii*), golden tipped bat (*Kerivoula papuensis*), eastern false pipistrelle bat (*Falsistrellus tasmaniensis*) and large eared pied bat (*Chalinolobus dwyeri*).

Reptiles and amphibians

To date, the eastern water skink (*Sphenomorphus quoyii*) has been recorded in moist forests along creek lines, while the eastern bearded dragon (*Pogona barbata*) and

three toed earless skink (*Hemiergus decresiensis*) have also been recorded. The Caligula skink (*Lampropholis caligula*) is locally endemic with a restricted distribution.

Four frog species brown froglet (*Crinia signifera*), Leseur's frog (*Litoria leseuri*), barking marsh frog (*Limnodynastes fletcheri*), whistling tree frog (*Litoria verreauxi*) and the threatened dwarf tree frog (*Litoria fallax*) have been recorded in the planning area (Mahony 2001). The threatened Booroolong frog (*Litoria booroolongensis*) and the green and golden bell frog (*Litoria aurea*) may also occur in the planning area (Mahony 2001).

Birds

While 81 bird species have been recorded in the planning area, there is likely to be a greater diversity of bird species. Threatened birds that have been recorded in the planning area are the powerful owl (*Ninox strenua*), glossy-black cockatoo (*Calyptorhynchus lathami*), speckled warbler (*Pyrrholaemus saggitata*), hooded robin (*Melanodryas cucullata*), grey-crowned babbler (*Pomatostomus temporalis*), and brown tree creeper (*Climacteris picumnus*). The powerful owl and glossy black cockatoo are also regionally significant species.

Modelling undertaken during the Comprehensive Regional Assessment (CRA) process in 1999 predicted that the turquoise parrot (*Neophema pulchella*), painted honeyeater (*Grantiella picta*) and sooty owl (*Tyto tenebricosa*) may occur in the planning area because it contains suitable habitat.

Invertebrates

During the warmer months the incidence of butterflies on ridgelines is very common. The loss and/or degradation of sites used for hill topping by butterflies is listed as a threatening process under the TSC Act. Research will be encouraged to determine if the planning area contains butterfly hill topping sites. Research will also be encouraged to identify invertebrates and their role in the ecology of the planning area.

Desired Outcomes

- There is continued protection and viability for all native animal communities in the planning area.
- No known population decline or habitat loss for threatened fauna known to occur in the planning area.

Strategies

- ***Undertake fauna surveys of target areas in the planning area.***
- ***Continue to record the distribution of threatened and significant fauna species.***
- ***Encourage further research of animals, especially invertebrates, in the planning area.***

4.4 ABORIGINAL HERITAGE

The planning area contains Aboriginal hunting grounds, water sites, napping floors, scar trees, stone arrangements, ochre and rock quarries, stone and wooden artefact objects, hearths and camping/occupation places. Aboriginals were observed in the Dry, Dartbrook, Middlebrook, Warrah and Thompsons Creeks, and Kars Springs areas late into European exploration of the Upper Hunter Valley. Artefacts reveal that Aborigines from the Middlebrook area travelled to Burning Mountain.

An Aboriginal site assessment is being undertaken in the planning area. Anecdotal evidence and cultural notes and stories of Aboriginal occupation of the planning area has been documented (Veale 2001).

Towarri means 'warrior' in the Wonnarua language, while Wingen means 'fire' and is linked to the Aboriginal legend associated to the area. Aboriginal legend has it that when an Aboriginal woman's husband did not return from battle she asked Biamie to take her life. Biamie took pity on her and instead turned her to stone. As she turned to stone her tears rolled down the hillside and burst into flames igniting the Burning Mountain across the valley. She can still be seen today, sitting and waiting.

Aboriginal people used the rainforests and ridgelines as travelling routes and for collecting food. Archaeological surveys indicate a high frequency of artefact scatters adjacent to creeks. It would appear that ridges offered the best pathways for travel, and the flatter areas for camping. Early European explorers also observed trees with 'toe notches' used by Aboriginals for tree climbing (Veale 2001).

NPWS has legal responsibility for the protection of Aboriginal sites and acknowledges the right of Aboriginal people to make decisions about their own heritage. It is therefore policy that Aboriginal communities be consulted and involved in the management of Aboriginal sites and related issues and the promotion and presentation of Aboriginal culture and history.

The planning area is within the Wonnarua Aboriginal Land Council and Wanaruah Tribal Council. The attachment of Aboriginal people to the land is acknowledged and they may have spiritual and cultural links with the whole landscape and specific locations. Individual places of significance may include archaeological sites, mythological sites, ceremonial sites and contact sites.

Desired Outcomes

- Cultural management of the planning area is undertaken in consultation with relevant Aboriginal people.
- Aboriginal objects are protected.

Strategies

- ***Conduct an archaeological survey of the planning area in consultation with the relevant Aboriginal people.***

- ***Formulate an Aboriginal cultural heritage management plan for the planning area in consultation with the Aboriginal people.***
- ***Aboriginal sites will be protected from recreational and management activities. Works that have the potential to impact on Aboriginal sites and values will be preceded by an archaeological survey and cultural assessment.***
- ***A cultural heritage site will only be interpreted and/or promoted if supported by the relevant Aboriginal community. If interpretation of a site is supported it will be used to promote public knowledge and appreciation of Aboriginal culture. A conservation study may be necessary before a site is available for public visitation.***

4.5 HISTORIC HERITAGE

The first European explorers in the Upper Hunter were Allan Cunningham in 1823, Henry Dangar in 1824, Robert Dixon in 1831 and Thomas Mitchell in 1831. By the late 1820's many Aboriginal people were displaced to the Singleton area.

Selectors took up the central portion of Towarri National Park during the 1870's. These selectors usually applied for land along the creek lines. The original properties/selections that formed the majority of the park were Glen Murray, Willowdene, Braeside and The Basin.

Sheep farming in the Middlebrook area was a major activity in the area. The Washpools area in Towarri National Park was used to clean sheep prior to shearing. Part of Wingen Maid Nature Reserve was under a Crown Lease for 7 years from 1922 when sheep were grazed in the area. More recently the Middlebrook section of Towarri National Park has been used for low intensity cattle and sheep grazing and the Glen Range and Tarrayarra areas were utilised for goat grazing.

There are a number of features in the planning area that may have historical heritage value including:

- **Glen Murray woolshed, cattle yards and house ruins** in Towarri National Park. The house ruins, cattle yards and woolshed were part of the original property selected in the 1870s.
- **Sheep dip** at Braeside.
- **Basin Hut site** in Towarri National Park. No remains are located at this site.
- **Wooden fence posts** throughout the planning area.

A stone fence in Towarri National Park needs to be investigated to determine its origins and management requirements.

Desired outcomes

- Historic features are recorded, assessed for significance and where appropriate protected, conserved and/or interpreted.

Strategies

- *Develop a historic heritage management plan for the planning area to assess the significance and management requirements for historic cultural heritage features.*
- *Undertake an assessment of the stone fence and protect it from deterioration if assessed to be historically significant.*
- *Promote public understanding and appreciation of appropriate historic values through interpretation and education material.*
- *If further historic places are identified in the future they will be recorded and assessed for significance. If required a conservation plan, developing appropriate management prescriptions will be prepared.*
- *Encourage research into the history of the planning area.*
- *Remove the elm trees at Glen Murray before they become a long-term management problem by spreading. Also remove the citrus trees unless they are shown to be of historic significance and do not pose a threat by spreading beyond the immediate area.*

5. PARK PROTECTION

5.1 SOIL EROSION

The higher slopes that have well drained brown earths are prone to mass movement, especially landslips. In the dissected sandstone areas of Towarri National Park and Wingen Maid Nature Reserve the soil is generally shallow and derived from lithic and quartzose sandstone, conglomerate, claystone, shale and siltstone. Some areas are prone to erosion.

Erosion prone areas include bare earth sites caused by feral goats and pigs, the development and use of facilities such as roads, camping areas, car parks, management trails and informal walking tracks. The black soils derived from basalt are a particular problem on 4WD tracks because when the soils are wet they are very greasy, often making the tracks dangerous and/or impassable. Natural landslips are a common occurrence in steep sections of the planning area.

Desired Outcome

- Park maintenance and works do not impact on natural soil erosion processes in the planning area.
- Soil erosion is minimised in the planning area through appropriate management and land use practices.

Strategies

- ***Design and undertake all works in a manner that minimises soil erosion.***
- ***Undertake rehabilitation works on disturbed areas where erosion presents a threat to the values of the planning area.***
- ***Undertake rehabilitation works of natural landslips only if they are posing a safety threat to visitors, park infrastructure or otherwise threaten the natural or cultural values of the planning area.***

5.2 WATER QUALITY

The planning area includes most of the headwaters of Middlebrook Creek. This creek contributes a major part of the agricultural and rural residential water requirements of the Middlebrook Creek valley.

The *Catchment Management Act 1989* provides an umbrella framework that aims to promote cleaner water, reduce soil erosion, improve vegetation cover and promote the maintenance of ecological processes and a balanced and healthier environment. It also provides a focus to balance conservation needs and development pressures and encourages a more aware and involved community.

Given that the planning area forms part of the headwaters of the Hunter River catchment, it is important that the planning area continues to provide a relatively high quality water supply. For this reason community groups will be encouraged to undertake Waterwatch or Streamwatch programs in the area. Waterwatch and Streamwatch programs encourage and facilitate community groups to assess water quality on a catchment basis.

Desired Outcomes

- The catchment values and the water quality and health of streams in the planning area are maintained, and where possible, improved.

Strategy

- ***Ensure park facilities, visitor use and management actions do not adversely impact on water quality.***
- ***Support the formation of a Streamwatch / Waterwatch program to monitor water quality in the area.***

5.3 INTRODUCED SPECIES

Introduced plants and animals are defined in this plan as any species not native to the planning area. Introduced species within the planning area and on adjoining land are of concern because they have potentially detrimental effects on ecological values and can spread to and from neighbouring land. The current NPWS Hunter Region Pest Species Management Strategy outlines the broad overall direction and priorities for dealing with pest species on a region-wide basis.

Introduced Plants

The *Noxious Weeds Act 1993* places an obligation upon public authorities to control noxious weeds on land that they occupy to the extent necessary to prevent introduced weeds spreading to adjoining lands.

The management of weeds in the planning area is an ongoing concern. Wherever possible integrated management programs will adopt a range of methods using the most appropriate techniques which vary according to species targeted and site conditions. Minor weed infestations, such as introduced pasture grasses, will be controlled by promoting natural revegetation of canopy species. Weeds are more common in disturbed areas, particularly in the Glen Murray area (Robertson 1999).

Noxious weeds and those classified as significant environmental weeds will be controlled with techniques including physical removal, herbicide control such as foliar spraying, cut and paint, and systematic coordinated release of biological control agents. Weed control programs will initially aim to treat any isolated infestations of high priority species; weeds that may threaten ROTAP or threatened species; weeds in upper catchment areas, and weeds that will potentially affect neighbouring lands.

Significant weeds of concern in the planning area listed in table 2, with priorities for their control. Other weed species not listed in table 2 will also be controlled where necessary but usually as a lower priority to those listed. The area will be monitored for new weeds species or infestations.

Table 2: Significant weeds in the planning area, with priorities for control.

Name	Control priority ^a	Legal status ^b	Location ^c
Bathurst burr (<i>Xanthium spinosum</i>)	H	W3	T
Blackberry (<i>Rubus fruticosus</i>)	H	W3	T
Blue / Purple periwinkle (<i>Vinca major</i>)	H	-	T
Bridal creeper (<i>Myrsiphyllum asparagoides</i>)	H	-	T, WM
False acacia (<i>Robinia pseudoacacia</i>)	H	-	T
Japanese honeysuckle (<i>Lonicera japonica</i>)	H	-	T
Nodding thistle (<i>Carduus natans</i>)	H	W2	T
Noogoora burr (<i>Xanthium spp.</i>)	H	W2 or W3	T, CB
Prickly pear (<i>Opuntia stricta</i> var. <i>stricta</i>)	H	W4f	T, WM
Privet (<i>Ligustrum</i> sp.)	H	-	T
Sweet briar (<i>Rosa rubiginosa</i>)	H	W2	T, WM
Tiger pear (<i>Opuntia aurantiaca</i>)	H	W4f	T, WM
Tree of heaven (<i>Ailanthus altissima</i>)	H	W2	T, WM
Willow (<i>Salix</i> sp.)	H	W4g	T
<i>Dataru stramonium</i>	M	-	T
Edible fig (<i>Fagus</i> sp.)	M	-	T
Edible peach (<i>Prunus</i> sp.)	M	-	T
Gorse (<i>Ulex europaeus</i>)	M	-	T
Madeira vine (<i>Anredera cordifolia</i>)	M	-	T
Moth vine/plant (<i>Araujia hortorum</i>)	M	-	T
Narrow leaved cotton bush (<i>Gomphocarpus fruticosus</i>)	M	-	T, WM, CB
Oak species (<i>Quercus</i> sp.)	M	-	T
Saffron thistle (<i>Carthamus lanatus</i>)	M	-	T
Scotch thistle (<i>Onopordum acanthum</i> ssp. <i>Acanthum</i>)	M	-	T
Small leaved privet (<i>Ligustrum sinense</i>)	M	-	T, WM
Spear thistle (<i>Cirsium vulgare</i>)	M	-	T, WM
Variegated thistle (<i>Silybum marianum</i>)	M	-	T
<i>Hypericum perforatum</i> (St. Johns wort) has been recorded in the Upper Hunter area. Presence of this weed will be monitored.			

Legend: a. Priority: H = High – Highly invasive of non disturbed areas - priority for immediate control programs;
M = Medium – Invasive in disturbed environments, reduced threat to non disturbed areas;
L = Low – Restricted to areas of disturbance.

b. Legal Status (according to noxious weeds declaration for Central & Upper Hunter Councils (NSW Agriculture)).
- = No legal status for the weed.
Noxious weed control category:
W2 = The weed must be fully and continuously suppressed and destroyed.
W3 = The weed must be prevented from spreading and its numbers and distribution reduced.

W4f = The weed must not be sold, propagated or knowingly distributed. Any biological control or other control program directed by the local control authority must be implemented.

W4g = The weed must not be sold, propagated or knowingly distributed.

- c. Location: WM = Wingen Maid Nature Reserve, CB = Cedar Brush Nature Reserve, T = Towarri National Park.

Note: The above table is not a complete list of weed species in the planning area. More information is available in the resource document for the planning area.

Pest Animals

The scheduled control of introduced animals needs to be prioritised in order to better utilise resources. Priority for control is given to those species that:

- are declared noxious or for which a national emergency control program has been declared or are known to be an important problem in other parks or states;
- have a significant environmental impact, including damage to threatened species, catchment values and recreation values;
- may affect neighbouring lands or are considered of high priority by the community;
- where management is needed to maintain benefits gained from previous control programs or to allow another high priority management program to be effective; or
- where a window of opportunity to control the species occurs.

Priority species in the planning area are outlined in Table 3 below.

Table 3: Introduced animals in the planning area and relative control priorities.

Pest Species	Control Priority^a	Legal Status
Deer (<i>Dama dama</i>) and (<i>Cervus timorensis</i>)	H	-
Feral pigs (<i>Sus scrofa</i>)	H	Noxious
Foxes (<i>Vulpes vulpes</i>)	M / H in places	Threatening process under TSC Act
Feral goats (<i>Capra hircus</i>)	M	-
Rabbits (<i>Oryctolagus cuniculus</i>)	M	Noxious
Feral cat (<i>Felis catus</i>)	L	-
House mouse (<i>Mus musculus</i>)	L	-
Rat (<i>Ratus</i> sp.)	L	-

Legend for priorities:

- H= High – Highly invasive of non disturbed areas Priority for immediate control programs;
M= Medium – Invasive in disturbed environments, reduced threat to non disturbed areas;
L= Low – Restricted to areas of disturbance.

High quality dingo habitat has not been identified in the planning area. The NPWS is bound under the Rural Lands Protection Act 2000 to control wild dogs as they may impact on neighbouring livestock. The NPWS will work in conjunction with the Rural Lands Protection Board to implement and integrated a control program for dingos and wild dogs as required.

Feral pigs occur throughout the Liverpool Range and are responsible for damage to sub-alpine, grassy woodland and riparian habitats. Feral pigs are also recognised as a vector for the spread of blackberry and other weed species and have the potential to spread the exotic Enzootic diseases. Pig and goat control is currently a cooperative program involving NPWS, neighbours and the Rural Lands Protection Board. Continuation of this program will be encouraged.

No significant rabbit populations currently occur within the planning area. Feral cats have been sighted in the Middle Brook, Captains Creek and Singles Creek areas. Where possible, cats and rabbits are controlled on an opportunistic basis where populations are known to occur. Foxes are currently managed through a cooperative baiting program with neighbours and the Rural Lands Protection Board.

Deer have been sighted in and near the planning area in the Liverpool Range. Deer are considered a pest by the NPWS as they are hard hoofed animals that compete with native animals for resources and hamper regeneration in some areas. The NPWS intends to control deer populations within the planning area.

Stock from neighbouring properties often enter the planning area and can impact on the natural values. NPWS has a boundary fencing policy where the NPWS adjoins private property, leasehold or crown land. The NPWS contributes to boundary fencing where possible and as funds permit although it has no legal responsibility under the *Divided Fences Act 1991* to do so.

Desired Outcomes

- The impact of introduced species on native plants and animals, neighbouring properties and catchment values is minimised.
- Boundary fences are adequately maintained to keep stock out of the planning area.
- Introduced species are controlled, and where possible, reduced or eradicated.

Strategies

- ***Continue a cooperative approach with the Rural Lands Protection Board, noxious weed control authorities, committees and neighbours for the implementation of control programs for pests and weeds. Priority will be given to feral pigs, foxes, deer and goats, and all high priority weed species.***
- ***Undertake opportunistic control of other weed and pest species that are not high priority.***
- ***Monitor the occurrence of wild dogs and undertake control programs as needed.***
- ***Monitor for the presence of new weed species in the planning area, including St. Johns wort (*Hypericum perforatum*).***

- ***Unnecessary environmental disturbance will be avoided when undertaking works so as to discourage pest species infestation and movement.***
- ***Encourage construction and maintenance of effective boundary fencing with grazing properties to prevent domestic stock from entering the planning area.***
- ***Rehabilitate roadsides (especially Heaven Ridge, Cedar Log and Main Trails), old sheep camps and the former Glen Murray homestead site.***

5.4 FIRE MANAGEMENT

Fire is regarded by the NPWS as a natural process, one of the established physical factors of the Australian environment that native plant and animal communities have become adapted. The correct management of fire is essential to avoid the extinction of some native plant and animal species and promote biodiversity. In some plant communities, such as rainforest, fire can be a destructive force. Inappropriate fire frequencies and intensities not only impact on native flora and fauna communities but also encourage the spread of weeds. Pest animal densities within the planning area could also be encouraged if the general fire regime is too frequent. In turn this may impact on wildlife through habitat displacement and predation.

Fire has long been a factor in the environment within and surrounding the Liverpool Range area. During prolonged drought periods intense fires have impacted on riparian communities and encroached into areas of warm and cool temperate rainforest. Specifically the 1970's fires along the Liverpool Range burnt 20m into the edges of some rainforests. Some of the grassland and open forest areas within Wingen Maid and Towarri have undergone frequent burning practices associated with grazing.

Fire should be excluded from those vegetation communities that are easily damaged and/or are slow to recover. Warm temperature rainforest; dry rainforest in sandstone gorges, and river-oak forests should have fire excluded from them (Hill *et al.* 2001). Little is known about the effect of fire has on snow grass communities. Therefore, experimental burning should be limited until more is known about how these sensitive communities respond to fire.

Fire can damage cultural heritage values. Features such as scar trees and historic structures can be permanently damaged or destroyed by wildfire. Other sites can be damaged by use of heavy machinery for fire suppression activities.

Scientific understanding of the fire requirements for plant communities is generally more advanced than for animal communities, although recent research indicates that the conservation of many animal species depends upon a mix of fire regimes, including occasional high intensity fires. The use of regular low intensity fires has an unacceptable impact on critical habitat requirements for native animals, particularly on ground flora and undergrowth.

Bushfire regimes are a major determinant of the distribution and abundance of plants and animals. Ecological research suggests the following requirements for biodiversity conservation:

- fire varied at intervals and area burnt is important to conserve floristic diversity and provide diversity of habitat for animals. Fire at regular intervals and intensity will most likely lead to loss of species;
- infrequent fires of moderate to hot intensity are generally required by most plant species and communities to achieve regeneration. Patchy burns are better for fauna as they retain shelter and food refuges, and;
- fires during the breeding season are the most damaging to fauna communities because of direct killing of young and increased exposure.

Fires may threaten human lives, property, park infrastructure, recreation opportunities and the natural and cultural heritage values. NPWS's primary fire management aims are to:

- reduce the risk of bushfire damage to life and property both within and immediately adjacent to the planning area;
- effectively manage bushfires for the protection and conservation of the natural, cultural, scenic and recreational features in the planning area, and
- cooperate and work with other organisations in fire management planning and implementation.

The major asset management protection issues for neighbouring rural properties are complicated by the rural grassy interface between the park and these properties.

A recent review of fire management throughout the NPWS has resulted in a modified approach to fire planning based on the level of complexity involved. In regard to the planning area, the NPWS considers that the area requires separate, map based fire management strategies. Annual hazard reduction programs are also submitted to the district Bush Fire Management Committees.

Fire management strategies will be prepared for the planning area, focusing on the ecological requirements of vegetation communities, fire management zoning, cooperative arrangements, resource and neighbouring land protection considerations and the identification of assets at risk. The planning area will be divided into management zones that will, as far as possible, be bounded by existing roads, management trails and natural boundaries.

Desired Outcomes

- Effective management of fire is established that will protect and conserve natural, cultural, scenic and recreational features of the planning area.
- Fire management is undertaken in cooperation with neighbours and other organisations.
- Appropriate protection is given to life, property and the environment.

Strategies

- *Prepare and implement fire management strategies for the planning area by 2004.*
- *Fire management undertaken for each vegetation community in the planning area will aim to achieve fire intervals within the range identified in Appendix 1. Experimental burning of endangered box communities will be addressed in the fire management strategies.*
- *Except where required for the protection of ecosystems or species, prescription burning will only take place for the protection of life and property where there is a potentially high fire risk. Other appropriate fuel reduction techniques will also be investigated for the protection of assets and the natural and cultural values of the planning area.*
- *Where appropriate, carry out prescribed burning in cooperation with neighbours for mutual protection.*
- *Use of heavy machinery for fire suppression in areas of rare plants, Aboriginal sites and historic places should be avoided.*
- *Aboriginal sites, historic places and culturally significant features will be protected from damage by bushfires.*
- *Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.*
- *Any part of the planning area may be closed to the public during periods of extreme fire danger or prescribed burning operations.*
- *Continue to participate in the local Bush Fire Management Committee. Maintain close contact and cooperation with fire control officers and volunteer bush fire brigades.*

6. VISITOR OPPORTUNITIES AND EDUCATION

6.1 VISITOR INFORMATION

Information assists the protection of natural and cultural heritage, promotes support for conservation and increases the enjoyment and satisfaction of visitors.

The planning area has a number of natural and cultural features of interest to visitors, primarily the:

- geological and geomorphological features of the Liverpool Range;
- biological diversity; and
- cultural heritage of the area.

These features will be promoted and interpreted to visitors in a manner that protects their special values and encourages appropriate use.

Visitor information about the planning area should:

- promote increased community awareness of the planning area, its conservation importance and recreation opportunities (esp. in Towarri National Park);
- orientate visitors to the planning area (esp. in Towarri National Park);
- interpret individual components of the planning area's environment in order to increase visitor understanding and appreciation of the environment;
- promote increased public awareness of NPWS conservation responsibilities, including those to control introduced plants and animals; and,
- promote the use of minimal impact recreation principles.

Some parts of the planning area are completely surrounded by private property, often with a complex and poorly defined boundary. The Fern Top and Stringybark Mountain portions of Towarri National Park highlight the boundary complexity. The delineation of the private property and planning area boundary is important at key visitor locations, such as in the central, or Middlebrook, section of Towarri National Park. Visitor information should be focused at such locations, including information relating to park boundaries.

Desired Outcomes

- Widespread community understanding and appreciation of the planning area's natural and cultural values.
- Visitors are aware of the park's recreation opportunities and can easily find their way to facilities.
- The park is an educational resource for local schools and community organisations.

Strategies

- ***Install and maintain interpretive signage bays at Washpools day use area, Washpools camping area, Glen Murray area, Braeside track head, and the Braeside camping area (subject to development).***
- ***Provide interpretive information along the Washpools Walk and Heaven Ridge Trail.***
- ***Produce a visitors' guide for the planning area. The Middlebrook area will be promoted as the main public access point to the planning area. Access will not be promoted to the nature reserves or where it involves traversing private land.***
- ***Interpretation information (brochure and panel) should include the following information:***
 - ***safety considerations and the unpredictable nature and inherent dangers associated with the Liverpool Range and Middlebrook Creek;***
 - ***encourage the use of gas barbeques and discourage the use of fire wood collection, and***
 - ***discourage the use of glass near swimming areas, particularly at the Washpools day use and camping areas.***
- ***Produce media releases and attend relevant meetings with neighbours and community organisations to promote community understanding of park values and management strategies.***
- ***Maintain directional signposting on the New England, Cressfield and Middlebrook Roads in consultation with Scone Shire Council and the Roads and Traffic Authority.***
- ***The boundaries of the park will be delineated where necessary in the Middlebrook area because this is where there is concentrated visitor usage. Information on boundaries will also be disseminated to neighbours.***
- ***Support and assist educational use by schools, community groups and individuals through provision of information and programs such as discovery walks, talks and tours.***

6.2 RECREATION OPPORTUNITIES

National parks, unlike nature reserves, may provide for ecologically sustainable, nature-based recreation (refer to the management principles for national parks and nature reserves in section 1). Therefore, the promotion of recreation and provision of facilities in the planning area will primarily focus on Towarri National Park rather than on Cedar Brush and Wingen Maid Nature Reserves.

The planning area is located approximately 25 kilometres from Scone and is easily accessed from the New England Highway. Towarri National Park is a relatively new park and so future recreation demands are difficult to predict. The majority of visitation to the planning area is likely to be from the surrounding areas in the Upper Hunter Valley. Prior to the reservation of the Towarri National Park, the Washpools day use area was used as a local recreation facility but had suffered from vandalism.

To many visitors, the park's attraction is its natural and unmodified character and lack of development. The provision of recreational facilities and the promotion of the recreation in the park must aim to protect the natural and cultural values of the planning area while minimising environmental impacts. Rainforest gullies located on basalt areas are particularly sensitive and must be closely monitored to minimise recreational impacts.

The remoteness of the Liverpool Range, quarry traffic on Middlebrook Road, and the hazards associated with the boggy and slippery soils on trails are potential safety concerns for visitors.

Desired Outcomes

- A range of appropriate recreation opportunities and low-key visitor facilities that encourage appreciation of the natural and cultural values are provided in Towarri National Park.
- Facilities are designed and managed to provide a satisfying and safe visitor experience while minimising environmental and social impacts.
- Visitor use is compatible with the purposes of national parks and nature reserves and the objectives in this plan.

Strategies

- ***Promote Towarri National Park as the focus for recreation use in the planning area.***
- ***Manage Cedar Brush and Wingen Maid Nature Reserves for self-reliant use where no visitor facilities are provided.***
- ***To assist future recreation management of Towarri National Park the following visitor use information will be collected:***
 - ***park use;***
 - ***the interests and attitudes of visitors/non-visitors;***
 - ***visitor information requirements, and***
 - ***the impact of park visitor use on the natural and cultural resources to determine sustainable levels of use and to minimise the impact of recreational use.***
- ***Appropriate visitor data will be entered into the visitor data system.***

- ***In consultation with the appropriate agencies, develop a standard operation procedure (SOP) for search and rescue operations, especially for the remote Liverpool Range.***
- ***The environmental and social impacts of recreational use will be monitored. If found to be unacceptable or damaging, the recreational use may be further controlled or regulated or the visitor facility temporarily closed.***

(a) Public vehicular access

Use of park roads and trails has the potential to impact on the environment and require significant resources to maintain the road network to an acceptable standard. The majority of existing trails in the planning area suffer from soil erosion, which is accelerated by vehicle use. During wet conditions many of the trails become slippery and boggy and can become unsafe for visitor use. Many vehicular trails in the Middlebrook also area deviate onto private property or pass through an operating quarry. This constraint is a limiting factor when determining trails suitable for public use.

When considering trails for public vehicular access the following criteria was used:

- the current and potential environmental damage caused by uncontrolled vehicle use;
- public safety;
- conflicts between different recreational activities;
- existing patterns of management and use;
- fire management; and
- neighbours' requirements.

Based on this criteria, public vehicular access in Towarri National Park will be restricted to Middlebrook Road and the access roads to camping areas. There are a number of potential safety implications in relation to Middlebrook Road. Middlebrook Road, which is a public road, is used by visitors accessing the main recreation areas of the park but it is also used by heavy trucks accessing the quarry lease area that adjoins the central portion of the park (see the map). In order to reduce potential conflict between public vehicles and quarry traffic, public vehicular access will not be permitted beyond the quarry gate.

Also based on this criteria and the requirements of relevant landholders and government agencies, public vehicular access from the north-west of the planning area (so as to access the Liverpool Range) will be investigated to determine whether there are any feasible and safe access options available. Any proposals for new facilities will be placed on exhibition as an amendment to this plan.

Vehicular access to the management trails that access the perimeters of the nature reserves are located on Travelling Stock Routes (TSR's). Walking access onto the TSR's is permissible, vehicular access is via consent given by the Rural Lands Protection Board.

Strategies

- ***Public vehicular access will be provided along Middlebrook Road and to camping areas. Public vehicular access to Wingen Maid and Cedar Brush Nature Reserves will not be provided.***
- ***Investigate public vehicular access from the north-west of the planning area (so as to access the Liverpool Range) to determine if there are feasible and safe access options.***

(b) Horse riding

Horse riding was associated with past agricultural use of the area, mainly for stock control, but the park receives little or no use from recreational horse riders. There are potential safety concerns relating to horse riding in the vicinity of the quarry due to increased truck movements and on many of the steep trails in the park. For these reasons horse riding will not be permitted in Towarri National Park. Horse riding is prohibited from nature reserves under NPWS policy and thus is prohibited in Wingen Maid and Cedar Brush Nature Reserves.

Strategies

- ***Horse riding will not be permitted in Towarri National Park or in Wingen Maid or Cedar Brush Nature Reserves.***

(c) Day use and camping

Day use facilities are provided at Washpools day use area in Towarri National Park. The Washpools day use area currently has 5 picnic tables, car parking facilities, dual pedestal toilet, 2 burner gas BBQ and galley, viewing platform, steps to access the Middlebrook Creek, an interpretive information bay, turnaround bay and limited car parking facilities for approximately 10 vehicles.

It is anticipated that demand for recreational facilities, both day use and camping, will increase in the park as it becomes better known. A report on recreational use in Towarri National Park (Gorrell and Leggat, 2001) identified requirements for day use areas in the park. To preserve the desired recreational setting at the Washpools day use area it is not advantageous to expand in its current location. If there is a demonstrated demand for additional day use areas they could be developed a little further upstream (see the map). Middlebrook Creek would still be the main feature for any additional day use areas but they would have minimal facilities. An additional car parking facility for approximately 10 vehicles is also required near the Washpools Reach (see the map).

The Washpool area also provides opportunities for the development of camping facilities. The concept plan for Washpool (Gorrell 2001) has been prepared and proposes a staged development initially comprising ten vehicle-based campsites, a standard galley with twin gas BBQs, toilet and interpretation shelter.

Should demand for the capacity at the Washpools camping area be regularly exceeded, the Braeside area in Towarri National Park has been identified as a potential future camping area. The camping area would provide 21 campsites with parking for 2WD, campervan and caravan/bus, including 5 group camping sites. This development should be staged with 10 sites being developed initially followed by a further 11 sites depending upon demand (Gorrell 2001). Development of this camping area will require an amendment to this plan.

Remote (or backpack) camping can be undertaken in Towarri National Park providing it occurs 200m away from roads and is 500m from camping and day use areas. Group based camping (20 or more persons) will require a permit. If the proposed Braeside camping area is developed it will specifically provide sites for groups.

Strategies

- ***Encourage park visitors, through park interpretation and promotional material, to bring their own cooking facilities. Gas facilities will be provided at the Washpools day use and camping areas.***
- ***Monitor the environmental impact of camping and day use. Facility areas may be temporarily rested and reopened. Remote sites may be temporarily or permanently closed if unacceptable environmental impact occurs.***

Day use areas

- ***Maintain the Washpools day use area at its current capacity. Develop overflow picnic areas north of the Washpools day use area as needed. These additional areas are to have minimal visitor facilities.***
- ***Develop a car-parking facility for approximately 10 vehicles near the Washpools Reach.***

Camping areas

- ***Maintain a camping area in the Washpools area, separate from the day use area. A maximum capacity of 13 sites will be provided. The area will include campsites, a standard galley with gas BBQs, toilets and an interpretation shelter. No shower facilities will be provided.***
- ***Group camping will be allowed by consent at the proposed Braeside camping area, however, groups may be required to provide their own portable toilets as facilities may not be provided. The demand for additional camping facilities will need to be determined before facilities for campers are developed at Braeside. Such development may be staged but will not exceed 21 camping sites, which includes sites that may be available for group bookings.***

- ***Permit remote bush camping in Towarri National Park beyond 200 metres of any road, track, visitor facility or rainforest gully. No facilities will be provided at remote sites and the only access will be by foot.***
- ***Encourage minimal impact camping through appropriate interpretation.***

(d) Bushwalking and walking tracks

Currently there are no formalised walking tracks within the planning area although remote walking (not requiring formed tracks) occurs, especially along the ridge of the Liverpool Range. Towarri National Park offers the potential for the development of a number of walking tracks that will allow visitors to experience a range of natural and cultural features in the planning area. Proposed walking tracks are identified on the map.

Strategies

- ***Develop the following walking tracks and marked routes:***
 - ***Liverpool Range Walk: A marked route linking the northern and southern reaches of the park encompassing the snow gum sections using the Tarrayarra and Heaven Ridge Trails as indicated on the map.***
 - ***Middlebrook Track: From the Washpools day use area the track will head to the Washpools Reach then south to the Washpools Camping Area. The track will then extend along a route to be determined to a bluff overlooking the Upper Hunter Valley. This will provide a walk for day visitors and campers.***
- ***Develop a basic track head facility at the base of the Heaven Ridge Trail to include an interpretation display and car park.***
- ***Provide a basic lookout facility (ie. ground levelling, fencing and surface hardening) at the terminus of the Heaven Ridge and Washpools walk tracks.***
- ***Monitor the environmental and social impacts of walking tracks.***

(e) Cycling

NPWS policy generally provides for cycling on management trails in national parks. Cycling on management trails in the planning area may be hazardous to riders and damaging the environment because of the steep slopes and erodible soils throughout much of the planning area. Due to these reasons, cycling is not considered a safe and ecologically sustainable recreational use in the planning area. Under NPWS policy cycling is not permitted off roads or trails or on walking tracks.

Strategies

- ***Cycling will not be permitted in Towarri National Park or in Wingen Maid or Cedar Brush Nature Reserves.***

(f) Rock climbing and abseiling

The rock faces of Wingen Maid and Castle Rock have not been assessed for their suitability for rock climbing. Because of the nature of geology and the need to access most cliffs areas through private property it is not considered appropriate in the planning area. To date there is no known rock climbing or abseiling activities undertaken within the planning area.

Strategies

- ***Rock climbing and abseiling will not be permitted in Towarri National Park or in Wingen Maid or Cedar Brush Nature Reserves due to access constraints and potentially unsafe conditions.***

6.3 COMMERCIAL ACTIVITIES

Some commercial recreational and environmental education opportunities may be appropriate within Towarri National Park. Commercial operators must be licensed to operate in national parks and are not permitted in nature reserves. All commercial operations will be managed to avoid impact on environmentally sensitive areas and to reduce impact on trails and existing facilities. These activities may be licensed in those areas accessible to other members of the public (such as the beginning of the Main Trail, see the map).

Desired outcome

- Commercial activities are conducted following minimum impact practices.
- All commercial operators are licensed to operate in the Towarri National Park.

Strategies

- ***Ensure all commercial operators operating in Towarri National Park are licensed.***
- ***Commercial bushwalking groups may be allowed throughout Towarri National Park while commercial vehicles will be permitted to use the road network available to the general public.***
- ***Commercial activities will not be permitted in Wingen Maid and Cedar Brush Nature Reserves.***

- ***Commercial activities may be permitted in Towarri National Park subject to the following:***
 - ***program leaders will be required to include the interpretation of the environment and promotion of understanding of conservation requirements and minimal impact practices;***
 - ***program leaders should be suitably qualified and/or experienced;***
 - ***activities in the Park must be conducted on roads, trails and walking tracks;***
 - ***limits may be placed on group sizes and frequency of use to minimise environmental impacts and conflicts with other park users;***
 - ***prior notice of activities, frequency of visits, group sizes and any other information deemed appropriate may be required;***
 - ***recreational activities must use of minimal impact practices and be undertaken in a safe manner;***
 - ***as far as possible peak visitation periods will be avoided; and,***
 - ***licences may be revoked if activities produce unacceptable environmental impact or a significant conflict with other park visitors.***

- ***Commercial operators will be provided with relevant park information and, where appropriate, training by NPWS staff to ensure commercial tours are of a high standard.***

7. RESEARCH AND MONITORING

The purpose of research and monitoring is to improve understanding of natural and cultural heritage, visitor use and the processes that affect them. This can lead to better management of the natural and cultural values, minimise the environmental impact of recreation and enhance visitor satisfaction.

Independent research conducted in the planning area includes a scientific study of the rainforests of the Liverpool Range (Fisher 1980 and 1985); opportunistic flora surveys in Wingen Maid Nature Reserve (Hosking and Bruhl 2001); and surveys by the Hunter Regional Birdwatchers Association.

Priorities for research include:

- Fauna surveys, including birds, bats, amphibians and reptiles;
- Invertebrate studies of terrestrial and aquatic populations;
- Cultural heritage research in the area;
- Vegetation research, specifically the warm temperate rainforest, sub alpine, grass tree and woodland areas;
- Monitoring and surveying of visitors, visitor impacts and visitor satisfaction, and
- Specific research into threatened species known to occur within the planning area.

Desired Outcomes

- Appropriate research that assists management is encouraged in the planning area.
- Research causes minimal environmental damage.

Strategies

- ***Prepare a prospectus of priority research projects that can be distributed to research organisations and/or tertiary institutions as a guide to preferred research projects in the planning area. Preferred topics will be those that enhance management of the planning area.***
- ***Undertake and encourage appropriate research to provide information about the planning area's natural and cultural heritage and human use. Incorporate the outcomes of research into NPWS databases and into management practices where there is an opportunity to improve management.***
- ***Maintain a register of research undertaken in the planning area.***

8. OTHER USES

There are two trig stations within the planning area. Salsbury trig is located in Wingen Maid Nature Reserve, while Towarri trig is in Towarri National Park. These stations are managed by the Land and Property Information, New South Wales (LPI) and require clarification about the proposed future management use of these sites.

Desired Outcome

- No new non-NPWS uses or infrastructure establishes in the planning area.
- Minimise impact on park values from existing non-park uses.

Strategies

- *Prohibit any additional non-NPWS infrastructure or uses.*
- *Liase with LPI to determine on going requirements for trig stations.*

9. MANAGEMENT FACILITIES AND OPERATIONS

The Hunter Region NPWS manages the planning area in an integrated manner due to the close proximity, similar values and management issues.

Managers, rangers, specialists and field staff undertake NPWS operations within the planning area. In order to effectively carry out management of the planning area NPWS staff and contractors use a variety of resources to complete tasks. Major resources include:

- Upper Hunter office and workshop in Scone;
- A system of ground access including the public road system and a network of management trails (see below and the map);
- Fire retardant base;
- NPWS communications towers, located at Rossgole, Mt Barrington and Mt Helen;
- Boundary fencing, and
- Storage facilities at Polblue Crown Reserve.

Currently, management access to the planning area is via various public roads, trails, travelling stock routes and through private property. The use of some trails is available via negotiated permission from public authorities and neighbours. Due to the steep slopes and slippery clay soils many of the management trails are hazardous if public vehicles were permitted to use them.

A system of management trails is necessary to control introduced plants and animals, fire management, visitor management, and other management purposes.

Desired outcomes

- Management of the planning area is undertaken as a single, integrated management unit.
- Necessary resources are available to efficiently and effectively management the planning area.

Strategies

- ***Maintain the following management trails for NPWS management operations: Main Trail; Cedar Log Trail; Dry Creek Trail; Washpools Trail; Captain's Creek Trail; Branch Gully Trail; Kelly's Trail; Heaven Ridge Trail; Skyline Trail; Wallaby Rocks Trail; Petticoat Trail and Steeles Trail (see the map). Where appropriate, access agreements with landholders will be negotiated for those trails that deviate onto private property. Where no agreement can be reached the closure or realignment of trails will be considered.***

- ***Close all other trails, and rehabilitate them where necessary.***
- ***Trails in the Tarrayarra area of the park will be maintained to facilitate eradication of blackberry. When the blackberries are removed, the necessity for the trails will be reviewed and any not required will be revegetated.***
- ***Public vehicles will not be permitted on management trails.***
- ***Additional management trails may only be constructed in the following situations:***
 - ***realignment of an existing trail to a more environmentally acceptable location subject to an appropriate environmental assessment;***
 - ***protection of specific natural and cultural resources, property or life;***
 - ***during an emergency situation, such as wildfires, where there is no practical alternative. In such situations these trails will be assessed for usefulness and if appropriate rehabilitated as soon as practicable after the incident.***
- ***Maintain close liaison with park neighbours to deal with matters of mutual concern. Develop an annual program to keep neighbours informed about matters of mutual concern.***
- ***Boundary fencing and associated boundary trails will be provided in accordance with the NPWS boundary fencing policy where necessary to prevent the incursion of stock into the planning area.***

10. PLAN IMPLEMENTATION

This plan of management is part of a system of management developed by the NPWS. The system includes the National Parks and Wildlife Act, management policies, established conservation and recreation philosophies, and strategic planning at corporate, directorate and regional levels. The latter may include development of related plans such as regional recreation plans, species recovery plans, fire management plans, interpretation plans, and conservation plans.

Section 81 of the Act requires that a plan of management shall be carried out and given effect to and that no operations shall be undertaken in relation to Towarri National Park and Wingen Maid and Cedar Brush Nature Reserves, unless they are in accordance with the plan.

Implementation of this plan will be undertaken within the annual programs of the NPWS Hunter Region. Relative priorities for identified activities are set out in the table below. These priorities are determined in the context of directorate and regional strategic planning, and are subject to the availability of necessary staff and funds and to any special requirements of the Director-General or Minister.

The environmental impact of proposed activities will be assessed at all stages in accordance with established environmental assessment procedures. Where impacts are found to be unacceptable, activities will not be undertaken or will be modified.

Desired outcomes

- An annual review is undertaken of this plan, with a more comprehensive audit undertaken every 5 years.

Strategies

- ***Undertake an annual review of progress in implementing this plan of management.***
- ***Undertake an assessment after 5 years of the effectiveness of managing the planning area in accordance with this plan and of the degree of success in achieving the plan's objectives and desired outcomes. Base the evaluation on the monitoring programs set out in this plan and any others that may be developed.***

Only actions in the management strategies in each section of this plan are included in the implementation table below. Policies and guidelines are not listed or prioritised. The actions in the implementation table are summaries of those outlined in the body of the plan. Please refer to the text in the previous sections for details of all actions.

Implementation table

Key actions summarised - HIGH priority	Plan ref.
All works will use gravel and soils that are as free as possible of weeds and other contaminants, will be undertaken to minimise visual impacts and soil erosion, and will avoid unnecessary environmental disturbance so as to discourage pest species infestation and movement.	4.1, 5.1, 5.3
Develop a plan for the regeneration and monitoring of degraded vegetation communities in the planning area	4.2
Record threatened and significant plant species when observed.	4.2
Continue to record the distribution of threatened and significant fauna.	4.3
Conduct an archaeological survey of the planning area in consultation with the relevant Aboriginal groups.	4.4
Formulate an Aboriginal cultural heritage management plan for the planning area in consultation with the Aboriginal people.	4.4
Precede all works that have the potential to impact on Aboriginal sites and values by an archaeological survey and cultural assessment.	4.4
Develop a historic heritage management plan for the planning area to assess the significance and management requirements for historic cultural heritage features.	4.5
Continue a cooperative approach for the implementation of control programs for pests and weeds. Priority will be given to feral pigs, foxes, deer and goats, and all high priority weeds species.	5.3
Monitor the occurrence of wild dogs and undertake control programs as needed.	5.3
Monitor for the presence of new weed species in the planning area.	5.3
Encourage construction and maintenance of effective boundary fencing with grazing properties to prevent domestic stock from entering the planning area.	5.3
Prepare fire management strategies for the planning area.	5.4
Except where required for the protection of ecosystems or species, prescription burning will only take place for the protection of life and property. Other appropriate fuel reduction techniques will also be investigated.	5.4
Where appropriate, carry out prescribed burning in cooperation with neighbours for mutual protection.	5.4
Aboriginal sites historic places and culturally significant features will be protected from damage by bushfires.	5.4
Rehabilitate areas disturbed by fire suppression operations as soon as practical after the fire.	5.4
Continue to participate in the local Bush Fire Management Committee. Maintain close contact and cooperation with fire control officers and volunteer bush fire brigades.	5.4
Produce a visitors' guide for the planning area. The Middlebrook area will be promoted as the main public access point to the planning area. Access will not be promoted to the nature reserves or where it involves traversing private land.	6.1
In consultation with the appropriate agencies, develop a standard operation procedure for search and rescue operations.	6.2

Maintain the Washpools day use area at its current capacity. Develop overflow picnic areas north of the Washpools day use area as needed.	6.2 (c)
Develop a car-parking facility for approximately 10 vehicles near the Washpools Reach.	6.2 (c)
Maintain a camping area in the Washpools area, separate from the existing day use area. Provide a maximum capacity of 13 sites, a standard galley with gas BBQs, toilets and an interpretation shelter. No shower facilities will be provided.	6.2 (c)
Group camping will be allowed at the site for the proposed Braeside camping area, however, no facilities will be provided at this stage.	6.2 (c)
Encourage minimum impact camping through appropriate interpretation	6.2 (c)
Maintain a network of management trails for NPWS management operations (see map).	9.0
Close all other trails, and rehabilitate them where necessary.	9.0
Maintain close liaison with neighbours to deal with matters of mutual concern and develop an annual program to keep them informed.	9.0
Undertake an annual review of progress in implementing this plan.	10.0
Key actions summarised - MEDIUM priority	Plan ref.
Undertake further vegetation surveys in priority areas.	4.2
Undertake fauna surveys of target areas in the planning area.	4.3
Promote public understanding and appreciation of appropriate historic resources through interpretation and education material.	4.5
Remove the elm trees at Glen Murray before they become a long-term management problem by spreading. Also remove the citrus trees unless they are shown to be of historic significance.	4.5
Undertake rehabilitation works on disturbed areas where erosion presents a threat to the values of the planning area.	5.1
Undertake rehabilitation works of natural landslips where appropriate.	5.1
Undertake opportunistic control of other weed and pest species that are not high priority.	5.3
Install and maintain interpretive signage bays at Washpools day use area, Washpools camping area, Glen Murray area, Braeside track head, and Braeside camping area.	6.1
Provide interpretive information along the Washpools Walk and Heaven Ridge Trail.	6.1
Maintain directional signposting on the New England, Cressfield and Middlebrook Roads.	6.1
Delineate boundaries where necessary in the Middlebrook area and disseminate information to neighbours.	6.1
Promote Towarri National Park as the focus for recreation use in the planning area.	6.2
To assist future recreation management of Towarri National Park visitor use information will be collected.	6.2
Monitor the environmental and social impacts of recreational use.	6.2
Encourage park visitors to bring their own cooking facilities. Gas facilities will be provided at the Washpools day use and camping areas.	6.2 (c)
Monitor the environmental impact of camping and day use.	6.2 (c)
Develop the following walking tracks and marked routes: Middlebrook Track, and Liverpool Range Walk.	6.2 (d)

Develop a basic track head facility at the base of the Heaven Ridge Trail to include an interpretation display and car park.	6.2 (d)
Monitor the environmental and social impacts of walking tracks.	6.2 (d)
Ensure all commercial operators are licensed.	6.3
Undertake an assessment after 5 years of the effectiveness of managing the planning area in accordance with this plan.	10.0
Key actions summarised - LOW priority	Plan ref.
Encourage the protection of nearby naturally vegetated areas.	4.2
Encourage further research of animals, especially invertebrates.	4.3
Undertake an assessment of the stone fence and protect it from deterioration if assessed to be historically significant.	4.5
Encourage research into the history of the planning area.	4.5
Support the formation of a Streamwatch/Waterwatch program to monitor water quality in the area.	5.2
Rehabilitate roadsides (esp. Heaven Ridge, Cedar Log and Main Trails) and the former Glen Murray homestead site.	5.3
Produce media releases and attend relevant meetings with neighbours and community organisations to promote community understanding of park values and management strategies.	6.1
Support and assist educational use by schools, community groups and individuals through provision of information and programs such as discovery walks, talks and tours.	6.1
Investigate public vehicular access into Towarri National Park from the north-west.	6.2 (a)
Subject to demand, develop up to 21 camping sites at Braeside.	6.2 (c)
Provide a basic lookout facility at the terminus of the Heaven Ridge and Washpools walk tracks.	6.2 (d)
Prepare a prospectus of priority research projects.	7.0
Undertake and encourage appropriate research in the planning area.	7.0
Maintain a register of research undertaken in the planning area.	7.0
Liase with LPI to determine on going requirements for trig stations.	8.0

Legend for Priorities:

Priorities are defined as follows:

High	<p>Actions that are necessary to achieving the plan's objectives and require implementation in the near future to meet legal obligations or to prevent:</p> <ul style="list-style-type: none"> • Irreversible or worsening degradation of the natural and cultural values or physical resources of the planning area; • Significant additional cost associated with rehabilitation at a later date; and/ or • Unacceptable risk to the public.
Medium	<p>Actions that are necessary to achieve the management objectives set out in the plan but will be undertaken as resources become available as the time frame for their implementation is not critical.</p>
Low	<p>Actions that are desirable to achieving the management objectives set out in the plan but can wait until resources are made available.</p>

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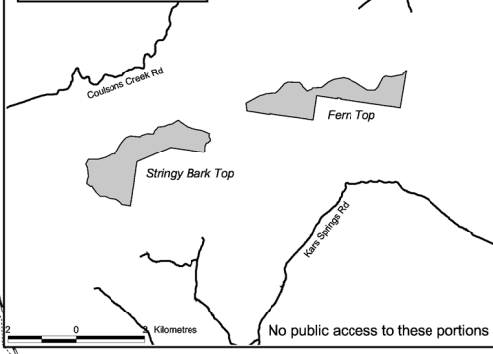
APPENDIX 1: Vegetation communities with associated conservation status, known RoTAP of TSC species found in the planning area and proposed fire vegetation grouping and fire intervals (adapted from Hill et al 2001).

VEGETATION COMMUNITY	Conservation Status				RoTAP or TSC species	Fire Interval *		Fire Vegetation grouping	Notes
	Local	State	National	Other		Min (yrs)	Max (yrs)		
<i>Communities associated with Tertiary basalt at high elevation</i>									
Silver-top stringybark open forest	good	N2	-	-	Not known	5	50	Dry schleophyll	
Snow gum open forest	good	N2	****		Not known	20	60	Snow Gum Open Forest	
Grass tree low woodland	poor	-	-	-	Not known	5	50	Dry Schlerophyll	
Dry rainforest in basalt gullies	moderate	-	-	-	Not known				Fire should be avoided
Warm temperate rainforest	good	N2; A	***1/2	-	Not known				Fire should be avoided
Ribbon gum open forest	reasonable	N2	-		Not known	5	50	Dry schlerophyll	
<i>Communities associated with Tertiary basalt at lower elevation</i>									
Box open forest	poor	V2	****	EEC on TSC & EPBC	Not known	5	50	Endangered Box Open Forest	
Narrow-leaved ironbark open forest	moderate	N3	-	-	Not known	5	50	Dry schlerophyll	
Box-snow grass open forest	poor?	V2	****	EEC on TSC & EPBC	Not known	5	50	Endangered Box Snow Grass	
Box-spinifex open forest	moderate	-	-	-	Not known	5	40		
Derived grassland	n/a	n/a	n/a	n/a	Not known	2	10	Cleared/grassland	Available evidence indicates max interval should be approx 10 yrs.

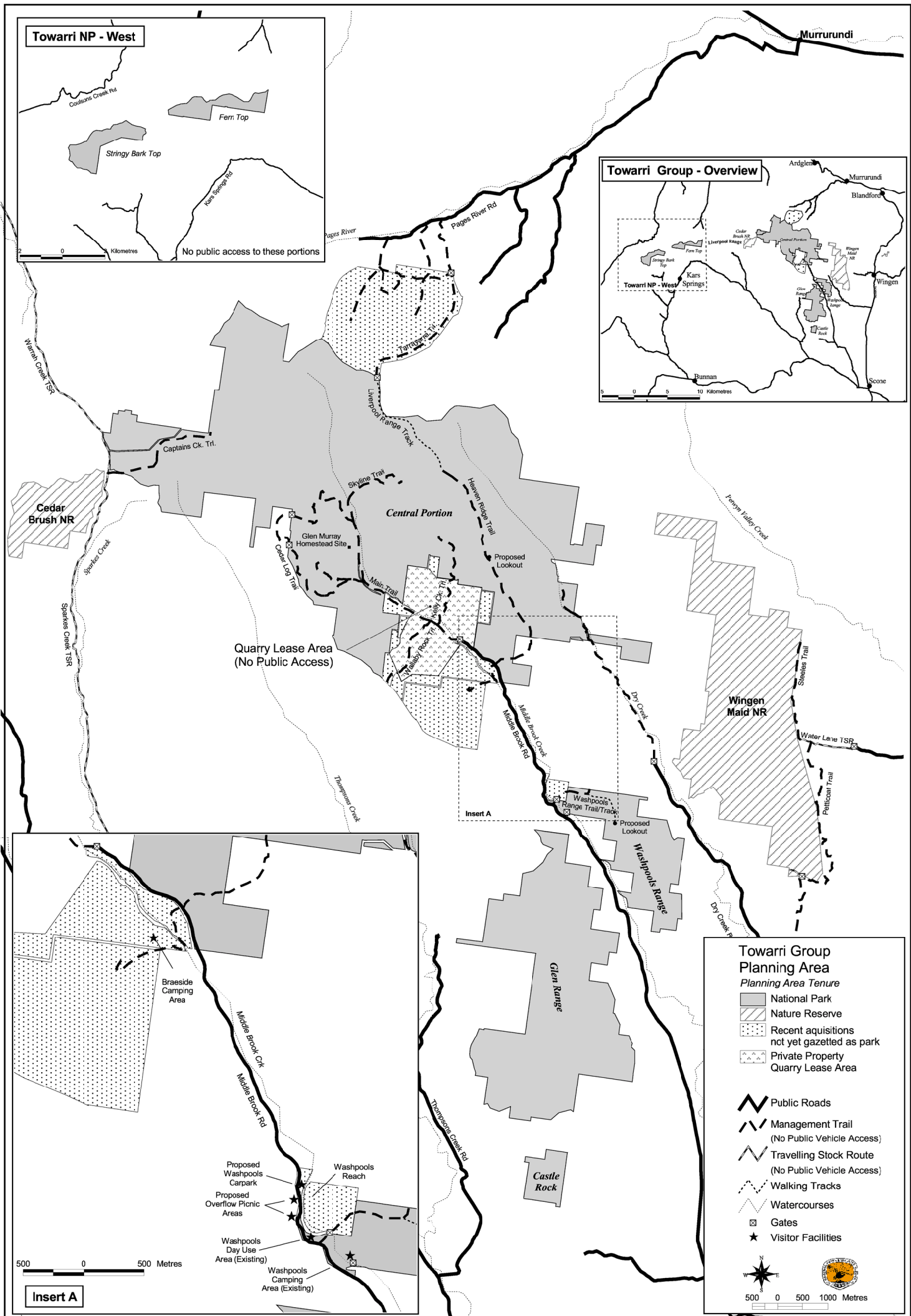
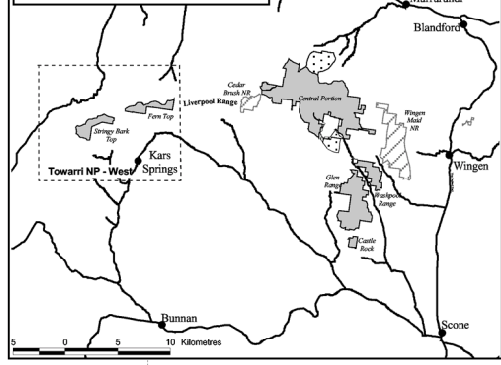
<i>Communities associated with Narrabeen sandstone (Non-Alluvial)</i>									
Acacia exposed low open forest	good	-	-	-	<i>Macrozamia concinna</i> <i>Pomaderris queenslandica</i> <i>Philotheca ericifolia</i>	7	30	Heathy Woodland	
Grey gum-stringybark sheltered open forest	good	N3	***	-	<i>Pomaderris queenslandica</i> <i>Macrozamia concinna</i> <i>Philotheca ericifolia</i>	5	50	Dry sclerophyll	
Ironbark-stringybark open forest	good	N3	***	-	<i>Pomaderris queenslandica</i> <i>Macrozamia concinna</i> <i>Pomaderris bodalla</i> <i>Philotheca ericifolia</i>	7	30	Heathy Woodland	
Stringybark-scribbly gum open forest	good	-	-	-	<i>Macrozamia concinna</i> <i>Philotheca ericifolia</i> <i>Pomaderris queenslandica</i>	5	50	Dry sclerophyll	
Tea tree moist heathland	moderate?	-	-	-	<i>Macrozamia concinna</i>	7	30	Heathy Woodland	
Rocky heathland	good	N2	-	-	<i>Macrozamia concinna</i> <i>Philotheca ericifolia</i> <i>Pomaderris bodalla</i>	7	30	Heathy Woodland	
<i>Communities associated with Narrabeen sandstone (Alluvial)</i>									
Grey gum-apple alluvial open forest	poor	-	-	-	<i>Pomaderris queenslandica</i>	5	50	Dry sclerophyll	
Dry rainforest in sandstone gorges	moderate	-	-	-	<i>Pomaderris queenslandica</i>			Rainforest	
Marginal dry rainforest on sandstone slopes	good	-	-	-	<i>Typhonium</i> sp. aff. <i>brownii</i> <i>Macrozamia concinna</i>			Rainforest	
River oak riparian forest	poor	N2	***1/2	-	None known	25	60	Riparian Forest	Only very cool burn

Notes:	?	indicates uncertainty about the conservation status as a result of inadequate floristic information
	V	vulnerable – likely to become extinct in a few decades if rectifying action not undertaken
	N	not threatened in foreseeable future
	2	inadequately conserved
	3	adequately conserved
	***	conservation status reasonable
	*** 1/2	conservation status reasonable-adequate
	****	conservation status adequate
	A	this community is partially covered by two alliances, whose conservation status is ranked as “good” and “inadequate”
	EEC	Endangered Ecological Community
	TSC	NSW <i>Threatened Species Conservation Act 1995</i>
	EPBC	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
	n/a	not applicable - Derived Grassland is not naturally occurring
	-	no relevant listing.
	*	Fire frequency determined by Dylan Kendall (NPWS Fire Management Officer, Hunter Region) and the Barrington Fire Management Plan.

Towarri NP - West



Towarri Group - Overview



Quarry Lease Area
(No Public Access)

Central Portion

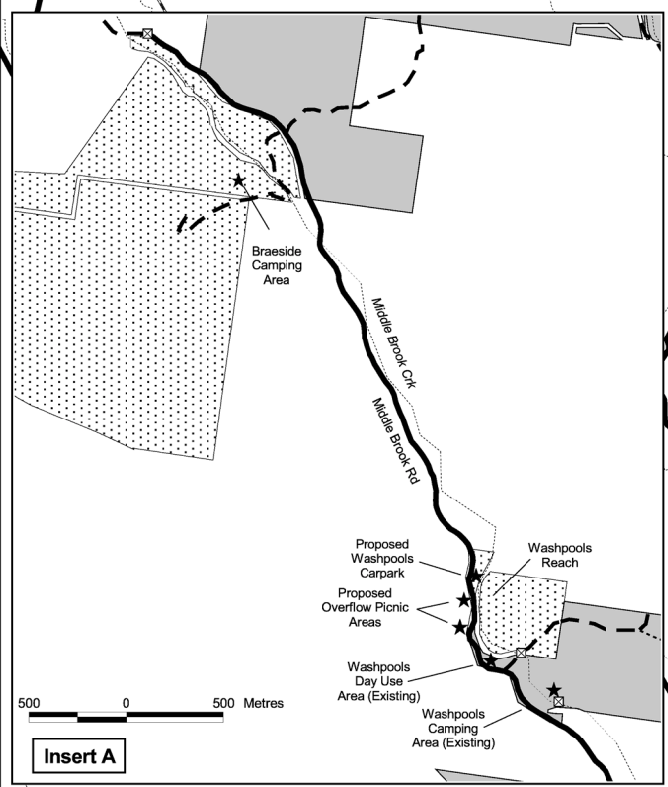
Towarri Group Planning Area

- Planning Area Tenure**
- National Park
 - Nature Reserve
 - Recent acquisitions not yet gazetted as park
 - Private Property Quarry Lease Area

- Public Roads
- Management Trail (No Public Vehicle Access)
- Travelling Stock Route (No Public Vehicle Access)
- Walking Tracks
- Watercourses
- Gates
- Visitor Facilities



500 0 500 1000 Metres



Insert A