

TINGIRA HEIGHTS NATURE RESERVE
PLAN OF MANAGEMENT

NSW National Parks and Wildlife Service

Part of the Department of Environment and Climate Change (NSW)

April 2009

This plan of management was adopted by the Minister for Climate Change and the Environment on 22nd April 2009.

Acknowledgments

For additional information or any inquiries about this reserve or this plan of management, contact the NPWS Lakes Area Office, Elizabeth Bay Drive, Lake Munmorah or by telephone on (02) 4358 0400.

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FOREWORD

Tingira Heights Nature Reserve is located on the Central Coast of NSW between Belmont and Eleebana. It consists of approximately 18 hectares of bushland surrounded by urban development.

Tingira Heights Nature Reserve conserves one of the last remaining outcrops of the Belmont Insect Bed. The insect fauna from the Belmont Insect Bed is among the oldest in Australia, and contains the oldest Heteroptera found anywhere in the world. The reserve also contains significant biological values, including habitat for threatened species.

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

A draft plan of management for the Tingira Heights Nature Reserve was placed on public exhibition from 18th January until 21st April 2008. The submissions received were carefully considered before adopting this plan.

This plan contains a number of actions to achieve “Better environmental outcomes for native vegetation, biodiversity, land, rivers, and coastal waterways” (Priority E4 in the State Plan) including control of weeds and pest animals, rehabilitation of disturbed areas and revegetation with locally endemic native species.

This plan of management establishes the scheme of operations for Tingira Heights Nature Reserve. In accordance with section 73B of the *National Parks and Wildlife Act 1974*, this plan of management is hereby adopted.

Carmel Tebbutt MP
Deputy Premier
Minister for Climate Change and the Environment

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1. TINGIRA HEIGHTS NATURE RESERVE

Tingira Heights Nature Reserve is located at Tingira Heights, between the Lake Macquarie suburbs of Belmont North and Eleebana, approximately 20 kilometres south of Newcastle and 150 kilometres north of Sydney.

Tingira Heights Nature Reserve was gazetted on 12 July 1989. It consists of approximately 18 hectares of bushland now surrounded by urban development (Maps 1 & 2). Prior to dedication as a nature reserve, the land was set aside as a Crown Reserve (R.81914) for the preservation of fossils. Tingira Heights Nature Reserve conserves one of the last remaining outcrops of the Belmont Insect Bed, which occurs between Belmont and Warners Bay. The insect fauna from the Belmont Insect Bed is among the oldest in Australia, and contains the oldest Heteroptera found anywhere in the world.

The reserve derives its name from the suburb in which it is located. Tingira Heights was originally known as Violet Town but there was a town of that name in Victoria. In 1965 the Violet Town Progress Association called for suggestions for a new name and the H.M.A.S. Tingira Old Boys Association asked that the name of their ship be commemorated. Tingira was the name of a sailing ship commissioned in 1912 as Australia's first naval training craft and remained in commission until 1927. In May 1965, the name Tingira was adopted with the addition of the word Heights (Lake Macquarie City Council, 2004).

Key features conserved in Tingira Heights Nature Reserve include:

- significant geological heritage, namely the Belmont Insect Bed; and
- significant biological values, including habitat for threatened species such as *Tetratheca juncea* (an herbaceous plant) and the Squirrel Glider (*Petaurus norfolcensis*).

Tingira Heights Nature Reserve forms part of the system of coastal conservation reserves between Newcastle and Broken Bay. This system of reserves includes Lake Macquarie State Conservation Area, Pulbah Island Nature Reserve, Moon Island Nature Reserve, Glenrock State Conservation Area, Awabakal Nature Reserve, Munmorah State Conservation Area, Bird Island Nature Reserve, Wallarah National Park, Wyrribalong National Park, Bouddi National Park, Brisbane Water National Park and Wamberal Lagoon Nature Reserve (Map 1).

2. MANAGEMENT CONTEXT

2.1. Legislative and Policy Framework

The management of nature reserves in NSW is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act), the NPW Regulation, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS). The policies are based on the legislative background and internationally accepted principles of park management. They relate to nature conservation, Aboriginal and historic heritage conservation, recreation, commercial use, research and communication.

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

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

2.2. Management Purposes and Principles

Section 30J(1) of the NPW Act states that the purpose of reserving land as a nature reserve is “to identify, protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena”. Section 30J(2) of the NPW Act states that nature reserves are to be managed in accordance with the following principles:

- the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena;
- the conservation of places, objects, features and landscapes of cultural value;
- the promotion of public appreciation, enjoyment and understanding of the reserve’s natural and cultural values; and
- provision for appropriate research and monitoring.

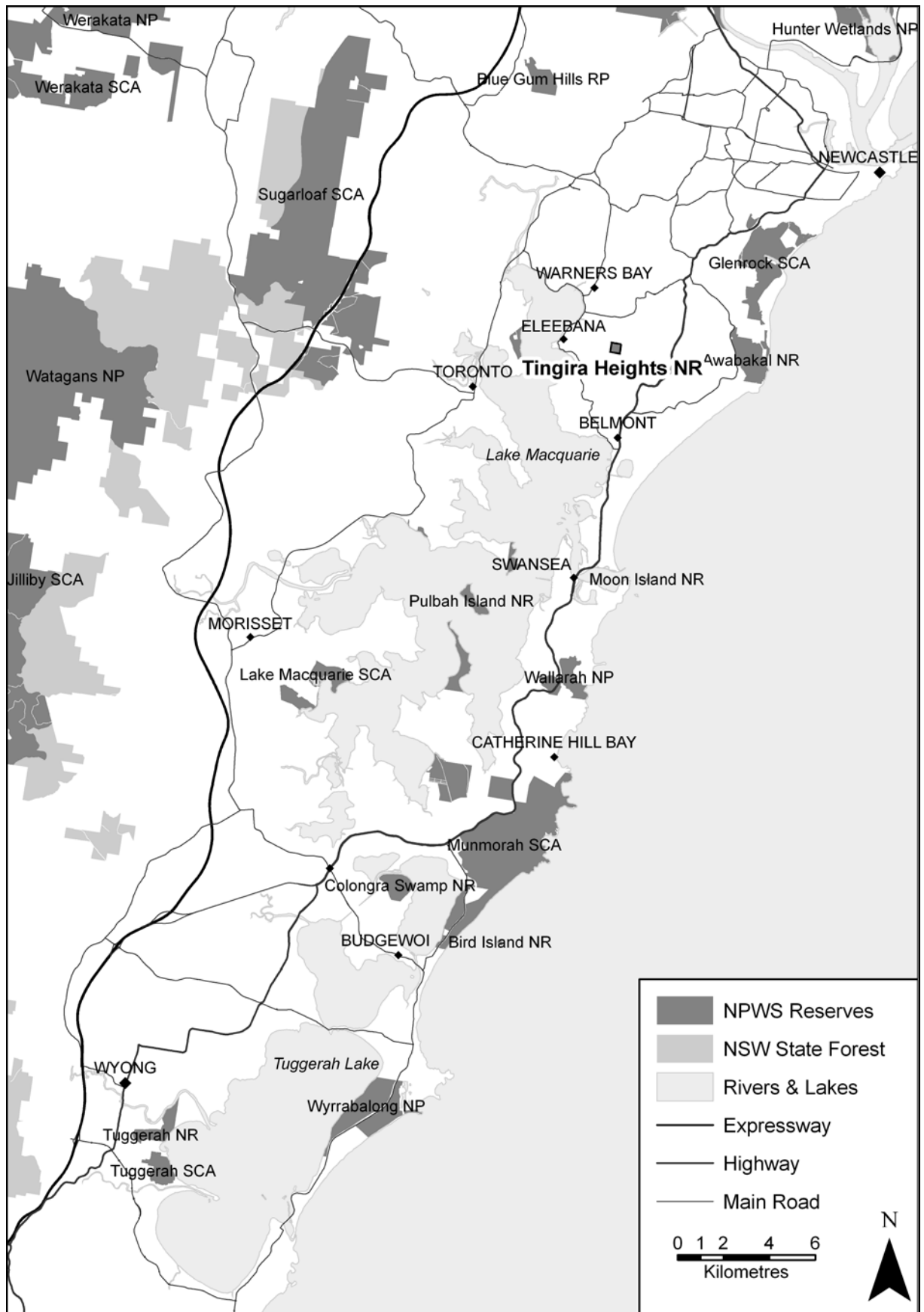
Providing for visitor use is not a management principle for nature reserves. This is a primary difference between national parks and nature reserves.

2.3. Management Objectives for Tingira Heights Nature Reserve

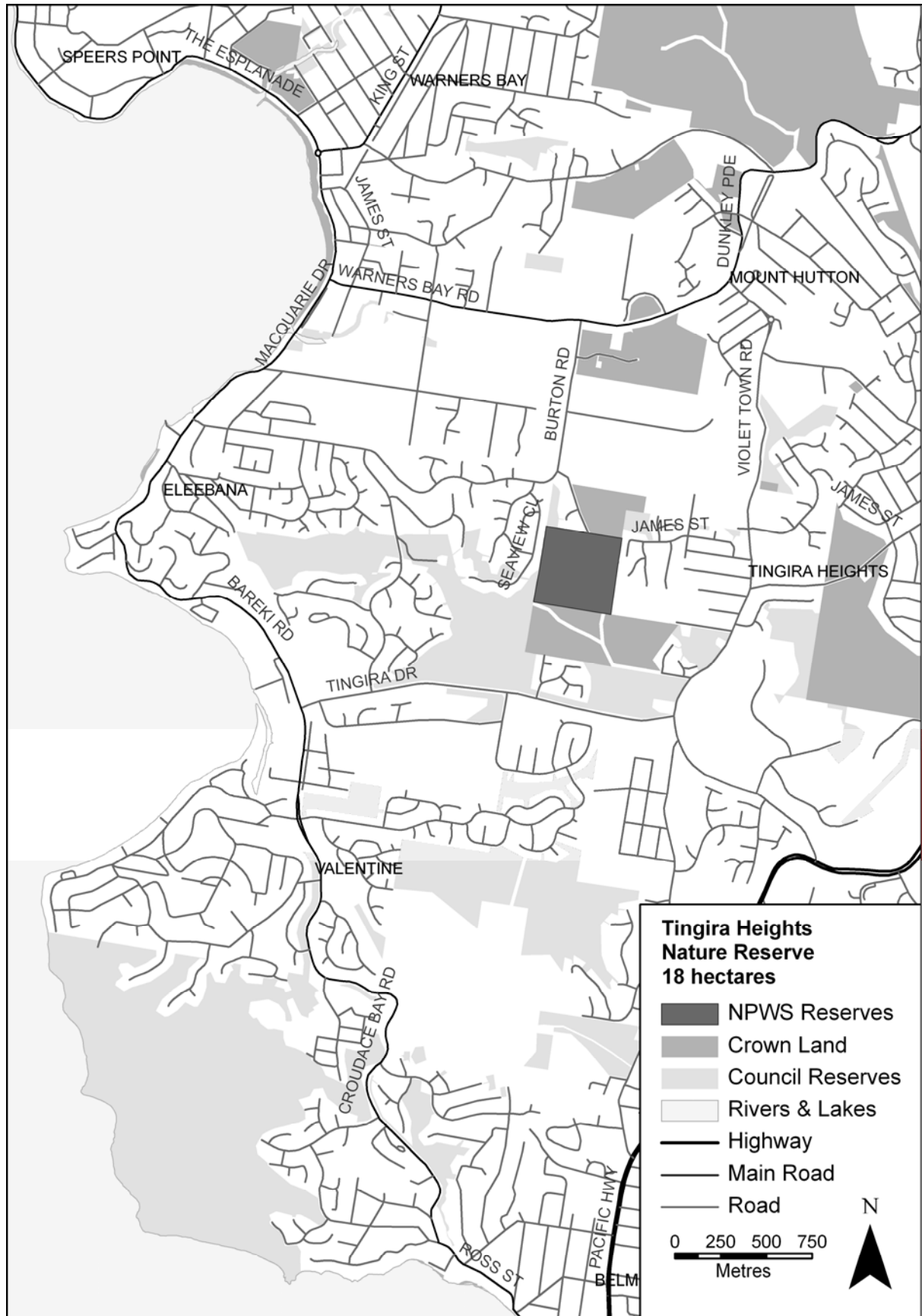
The primary objectives for management of Tingira Heights Nature Reserve are:

- To conserve the Belmont Insect Bed;
- To conserve the natural biodiversity, with emphasis on conservation of the threatened plants and animals found in the reserve; and
- To provide opportunities for appropriate research.

MAP 1 Regional Context



MAP 2 Local Context



3. MANAGEMENT OF TINGIRA HEIGHTS NATURE RESERVE

3.1. Geological Heritage

Tingira Heights Nature Reserve conserves significant geological heritage. One of the last remaining outcrops of the Belmont Insect Bed, which occurs between Belmont and Warners Bay, is found in the reserve. The earliest sucking bugs (*Paraknightia magnifica*, Heteroptera) found anywhere in the world come from this layer. They are also among the oldest of any insect fauna found within Australia (except for a single specimen in Tasmania, and four specimens in the Newcastle Coal Measure) (Percival, 1985).

This world famous fossil insect bed is found in hard, fine-grained tuffaceous chert below the Fassifern Coal Seam in the upper Newcastle Coal Measures. The horizon is within the Croudace Bay Formation, regarded as late Permian (approximately 254 million years old) (Percival, 1985).

The outcrop of this fossil insect bed found in the reserve provides a unique opportunity for insight into the past environment and ecology of the Lake Macquarie area. Mr Robert Beattie has been researching the Belmont Insect Bed at Tingira Heights Nature Reserve and other locations as part of his studies with the Department of Geology at the Australian National University since 2002 (Beattie, 2003).

Desired Outcomes

- Conservation of significant geological heritage in the reserve, particularly outcrops of the Belmont Insect Bed.
- Palaeontological research into the Belmont Insect Bed at Tingira Heights Nature Reserve continues.

Management Strategies

- 3.1.1 No work with the potential to damage outcrops of the Belmont Insect Bed will be undertaken.
- 3.1.2 Trail maintenance will be completed in a manner which does not impact on outcrops of the Belmont Insect Bed (refer section 3.7 Fire Management and Map 3).
- 3.1.3 Existing research into the fossil beds will be supported, and continuing research will be encouraged.
- 3.1.4 Research will be managed in accordance with NPWS policies and the NPW Act and Regulation. This includes a requirement for written consent for all research conducted on the reserve.

3.2. *Biological Values*

Tingira Heights Nature Reserve conserves significant biological features which contribute to the conservation of biodiversity in the region, particularly in the urban environment. Threatened flora and fauna are conserved, along with remnant native vegetation communities and important habitat for native wildlife.

Tingira Heights Nature Reserve conserves remnant native vegetation in the Lake Macquarie region. Vegetation communities in the reserve (Bell, 1998) include:

- Sydney Sandstone Sheltered Dry Forest (found along drainage lines); and
- Permian Macquarie Grassy Forest (which covers the majority of the nature reserve).

The threatened plant *Tetradlea juncea* (Black-eyed Susan) has been recorded in the reserve in the Permian Macquarie Grassy Forest. The Permian Macquarie Grassy Forest community is considered poorly conserved at the local, regional and national scale (Bell, 1998).

The reserve also contains habitat for the threatened Squirrel Glider (*Petaurus norfolcensis*) (SWC Consultancy, 1996). Spotted Gums (*Corymbia maculata*), Ironbarks (*Eucalyptus paniculata* subsp. *paniculata* and *Eucalyptus siderophloia*) and Bloodwoods (*Corymbia gummifera*), which are found in the reserve, are also often present in Squirrel Glider habitat (Bell, 1998; Fleay, 1954). The gum producing *Acacia falcata* is also common in the area and would also provide key habitat for Squirrel Gliders (Quin, 1993). Squirrel Glider populations in the area are considered to be of local, regional and state significance (SWC Consultancy, 1996). Surveys targeting the Squirrel Glider were conducted in and around the reserve in April 2006 but no Squirrel Gliders were recorded (Forest Fauna Surveys, 2006).

Grey-headed Flying-foxes roost in Blackbutt Reserve to the north and Glenrock State Conservation Area to the north east of the reserve. These roosts disperse each evening to forage for nectar and pollen, including within the nature reserve and surrounds during periods of the year when *Eucalyptus* and *Angophora* trees are in flower. Many individuals were observed in and around the nature reserve in the 2006 surveys when Red Bloodwood (*Corymbia gummifera*) was flowering in abundance (Forest Fauna Surveys, 2006).

It is likely that the reserve provides important foraging habitat for broad ranging threatened species such as the Powerful Owl (*Ninox strenua*). Other threatened fauna may also be present (Table 1). Recovery plans and/or Priority Action Statements have been prepared for a number of the threatened species known or likely to occur on the reserve.

Table 1 – Threatened fauna within five kilometres of Tingira Heights Nature Reserve for which the reserve may provide habitat (NPWS Atlas of NSW Wildlife, 2008)

Scientific Name	Common Name
<i>Ninox strenua</i>	Powerful Owl
<i>Tyto novaehollandiae</i>	Masked Owl
<i>Lathamus discolor</i>	Swift Parrot
<i>Ninox connivens</i>	Barking Owl
<i>Tyto tenebricosa</i>	Sooty Owl
<i>Petaurus norfolcensis</i>	Squirrel Glider
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat
<i>Miniopterus australis</i>	Little Bentwing-bat
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bent-wing Bat

Desired Outcomes

- Conservation of threatened species in Tingira Heights Nature Reserve.
- Protection of the vegetation and habitat values of the nature reserve.

Strategies

- 3.2.1 Native vegetation will be managed to conserve biodiversity, maintain floristic and structural diversity and to conserve species and communities that are threatened, inadequately represented in the reserve system, or of conservation significance.
- 3.2.2 Research and survey will be encouraged into the distribution, habitat requirements and ecology of fauna known or likely to occur in the nature reserve. Priority will be given to threatened species, particularly the Squirrel Glider.
- 3.2.3 Actions within recovery plans or priority action statements for threatened species which are known or likely to occur in the reserve will be implemented.
- 3.2.4 Native amphibians, reptiles, birds and mammals will not be introduced into the reserve unless under the provisions of an approved recovery plan.
- 3.2.5 Endemic plants, propagated from seed collected as close as possible to planting locations, will be used in landscaping, revegetation and rehabilitation work, except where non endemic and/or exotic species are essential for initial stabilisation and present no risk of infestation.
- 3.2.6 No activities will be undertaken that might impact on threatened species or their habitat in the reserve.

3.3. Connections to other bushland remnants

When Tingira Heights Nature Reserve was gazetted in 1989, it was mainly surrounded by bushland under public and private ownership. The reserve is now bounded by urban development to the north, east and west.

The nature reserve has a narrow connection with crown land to the north, managed by the NSW Department of Lands. To the south, the nature reserve is connected to a Lake Macquarie City Council (LMCC) bushland reserve. These links to other bushland remnants increase the conservation value of the reserve by providing important habitat corridors through urban development.

Desired Outcome

- Maintenance of the reserve's ecological links to other bushland areas.

Strategy

3.3.1 The NPWS will seek cooperation from LMCC and the Department of Lands in maintaining nearby native bushland and wildlife corridors.

3.4. Cultural Heritage

Aboriginal communities have an association and connection to the land. The land and water within a landscape are central to Aboriginal spirituality and contribute to Aboriginal identity. Aboriginal communities associate natural resources with the use and enjoyment of foods and medicines, caring for the land, passing on cultural knowledge, kinship systems and strengthening social bonds. Aboriginal heritage and connection to nature are inseparable from each other and need to be managed in an integrated manner across the landscape.

Tingira Heights Nature Reserve is located within the traditional lands of the Awabakal people and the current area of the Bahtabah Local Aboriginal Land Council. There are no recorded Aboriginal or historic sites in the reserve.

Desired Outcomes

- Understanding of the cultural values of the reserve is improved.
- Aboriginal people are involved in management of any Aboriginal cultural values identified for the reserve.

Strategies

3.4.1 The Central Coast Hunter Range Region Aboriginal Co-management Committee will be consulted and involved in the identification and management of Aboriginal sites, places and values, including interpretation of any places or values.

3.4.2 Local historic societies will be consulted to identify any historic heritage values of the reserve.

3.5. Recreation

Unlike national parks, sustainable visitor use is not a management objective for nature reserves. However, bushland remnants in urban areas, such as Tingira Heights Nature Reserve, provide important opportunities for nature appreciation in an otherwise highly modified environment through passive recreational activities such as bushwalking and cycling.

Management trails in the reserve are used for walking and cycling. Cycling is not permitted on management trails in nature reserves unless signposted and is not permitted off formed trails. Public vehicle access is not provided in Tingira Heights Nature Reserve.

The reserve is also known to be used for inappropriate and prohibited recreational activities such as motor biking, horse riding and dog walking.

Desired Outcomes

- Visitor use is appropriate and ecologically sustainable.
- Visitor use encourages appreciation of the reserve's values.
- The local community is aware of the significance of the reserve and of management programs.

Strategies

- 3.5.1 Walking and cycling will be permitted on management trails in the reserve. Management trails will be signposted accordingly.
- 3.5.2 Vehicles, horses and other domestic animals will not be permitted in the reserve. Management trails will be signposted accordingly.
- 3.5.3 Information will be provided to the local community regarding appropriate activities in the reserve.
- 3.5.4 The NPWS will work with LMCC and the Department of Lands to secure the boundaries of the nature reserve to prevent illegal access.
- 3.5.5 Maintain liaison with the Police regarding illegal trail bike use

3.6. Other Use

The western boundary of the reserve is covered by an easement for transmission lines, underground cables and access. This easement is managed by Energy Australia and is slashed regularly.

Desired Outcomes

- Effectively manage non-NPWS infrastructure in cooperation with relevant authorities whilst ensuring minimal impact on reserve values

Strategies

- 3.6.1 Continue to allow Energy Australia to maintain the powerline easement in accordance with NPWS Policy, Energy Australia notification procedures, and relevant REFs.
- 3.6.2 Require NPWS approval and an appropriate level of environmental impact assessment for any alterations to the existing infrastructure.
- 3.6.3 Investigate the need for a formal easement agreement with Energy Australia.

3.7. Fire Management

The NPWS has limited fire history for Tingira Heights Nature Reserve, however most of the reserve was burnt by a wild fire in 2001. There are reports of a large bush fire in the area in 1982, before acquisition by the NPWS, which apparently destroyed several houses (Lake Macquarie City Council, 2004) and the vegetation of the reserve suggests a regime of reasonably frequent small-scale fires.

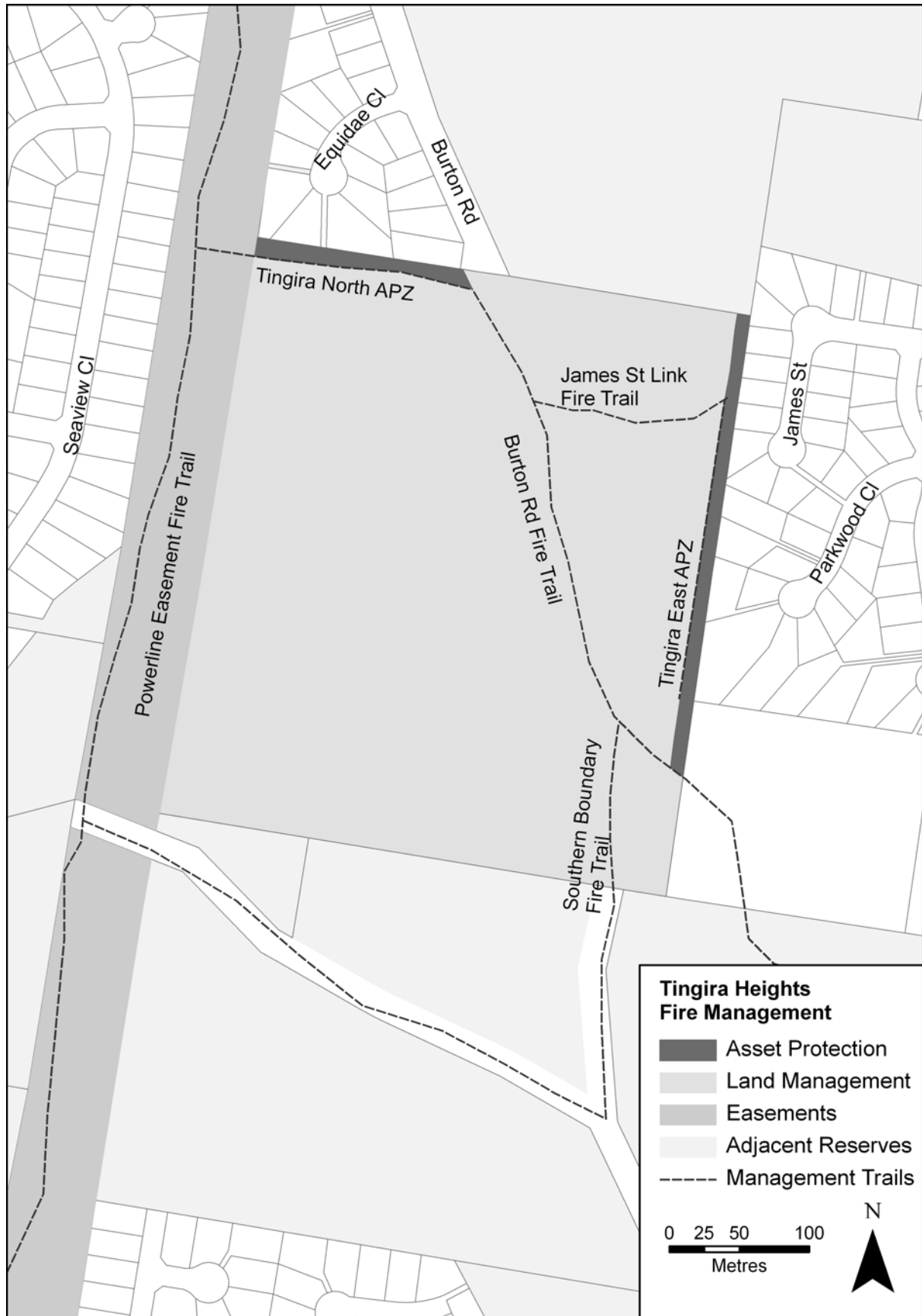
According to the Lake Macquarie Bush Fire Risk Management Plan (Lake Macquarie Bush Fire Management Committee, 2001), bush fires occur frequently in the City of Lake Macquarie as a result of “deliberate or careless use of fire around urban areas and poor fire management practices in rural areas”.

Response to bush fires at Tingira Heights Nature Reserve is in accordance with the Lake Macquarie Bush Fire Management Plan of Operations and involves the NPWS, NSW Fire Brigade and NSW Rural Fire Service. The most quickly available resource makes first response to fires in the reserve. For larger fires, control is in accordance with the Lake Macquarie Bush Fire Management Plan of Operations, or as negotiated by the senior officers from attending agencies.

Fire management in the nature reserve focuses on the protection of life and property and the conservation of biodiversity. A fire management strategy has been prepared for Tingira Heights Nature Reserve (DEC, 2006). The fire management strategy identifies areas for asset protection (Map 3) and heritage management. Hazard reduction and fire trail maintenance in the reserve are conducted in accordance with the fire management strategy. On the eastern and north western boundaries of the reserve, hazard reduction is required to protect private property in urban areas. Hazard reduction in these areas is undertaken by mowing and slashing. The western boundary of the reserve is covered by an Energy Australia easement and is slashed regularly.

The management trail system (Map 3) provides access for the NPWS, fire and emergency services. These organisations have been issued keys for locked gates. The trails in the reserve are maintained to a standard suitable for category 9 fire tankers (i.e. small four wheel drive units) by the NPWS, or where an easement exists by Energy Australia.

MAP 3 Fire Management



Desired Outcomes

- Fire management in the nature reserve protects life and property and conserves biodiversity and geological values.
- Response to bush fires at Tingira Heights Nature Reserve is in accordance with the Lake Macquarie Bush Fire Management Plan of Operations and the Tingira Heights Nature Reserve Fire Management Strategy.

Strategies

- 3.7.1 Fire in the reserve will be managed in accordance with the reserve fire management strategy, which will be reviewed annually.
- 3.7.2 Asset protection zones will be maintained on the northern and eastern boundaries of the reserve by mowing and slashing in cooperation with neighbours.
- 3.7.3 The management trails shown on Map 3 will be maintained for hazard reduction and wildfire control as well as other management operations.
- 3.7.4 Fuel loads will be monitored annually in strategic locations in the reserve.
- 3.7.5 Neighbours will be encouraged to help ensure that bush fire management zones (particularly asset protection zones) in the reserve are managed consistent with the fire management strategies with consent from the NPWS.
- 3.7.6 LMCC will be encouraged to manage the fire trail networks around the reserve in consultation with the NPWS.

3.8. Pest and Weed Management

Tingira Heights Nature Reserve is relatively free of pests and weeds.

It is likely that foxes are present in the reserve, however no sightings or evidence have been recorded. The reserve's proximity to residential areas means that any pest species control programs in the reserve will require cooperation from neighbours, including LMCC and Department of Lands.

Domestic dogs are walked in the reserve despite the fact that this is not permitted, and may have an impact on native wildlife. Domestic cats may roam in the reserve from nearby residential areas and horses are occasionally ridden along the trails.

The main source of weeds is from neighbouring gardens and the dumping of garden waste. Some neighbours have built gardens on the edge of the reserve. Introduced plants found in the reserve include Agapanthas, Spider Plant and grasses such as Kikuyu and Buffalo Grass. There is a small amount of Crofton Weed (*Ageratina adenophora*) and Lantana (*Lantana camara*) in the reserve. Crofton Weed and Lantana are listed as noxious weeds in the Lake Macquarie Local Government Area (LGA). Lantana is a weed of national significance and the invasion, establishment and spread of *Lantana camara* is listed as a key threatening process under the TSC Act.

Desired Outcomes

- Introduced plants and animals are controlled and where possible eliminated.
- Pest control programs are undertaken in consultation with neighbours.
- Domestic pets (including dogs, cats and horses) do not enter the nature reserve.

Strategies

- 3.8.1 Weeds and pest animals will be controlled, with priority given to those weeds declared noxious in Lake Macquarie LGA, to weeds of national significance (e.g. Lantana), to key threatening processes, and to weed infestations in significant vegetation communities. Other environmental weeds will be progressively controlled and removed.
- 3.8.2 Neighbours will be encouraged to assist with weed control programs and the prevention of dumping of garden waste.
- 3.8.3 Vertebrate pest control programs will be conducted as required, using techniques appropriate in an urban residential environment.
- 3.8.4 The cooperation of neighbours will be sought to prevent access to the reserve by domestic pets (this includes dogs, cats and horses but does not include guide dogs and registered assistance dogs).
- 3.8.5 Monitor the effectiveness of weed and pest control actions on pest species abundance and biodiversity response.

3.9. Drainage and Erosion

Parts of the nature reserve have been severely eroded due to poor drainage on trails and disturbance from neighbouring developments. Neighbours to the north and east of the reserve have been affected by this erosion with sediment and water running onto their properties

Trails in the nature reserve will be maintained to reduce erosion. Where possible, local native plants will be propagated and planted on reserve boundaries to slow water flows and reduce erosion. This work will be conducted cooperatively with neighbours.

Desired Outcome

- Erosion is minimised in the nature reserve.

Strategies

- 3.9.1 Human-induced erosion will be minimised by undertaking, where necessary, rehabilitation works to re-establish natural processes.
- 3.9.2 Disturbed areas will be rehabilitated using local soils, material free of contaminants, and locally endemic native plants.
- 3.9.3 Fire trails and asset protection zones will be managed to minimise erosion by providing adequate drainage and erosion control measures.
- 3.9.4 Neighbours will be encouraged to undertake work on their land to minimise erosion and control drainage.

4. PLAN IMPLEMENTATION

As a guide to the implementation of this plan of management, respective priorities for actions are outlined below. Priority one actions will be implemented in the short term (within two or three years); priority 2 actions will be implemented in the medium term (five or so years) and priority three actions will be implemented in the longer term.

Priority 1 Actions	Strategy
No work with the potential to damage outcrops of the Belmont Insect Bed will be undertaken.	3.1.1
Trail maintenance will be completed in a manner which does not impact on outcrops of the Belmont Insect Bed.	3.1.2
Existing research into the Belmont Insect Bed will be supported, and continuing research will be encouraged.	3.1.3
Research will be managed in accordance with NPWS policies and the NPW Act and Regulation.	3.1.4
Native vegetation will be managed to conserve biodiversity, maintain floristic and structural diversity and to conserve species and communities that are threatened, inadequately represented in the reserve system, or of special conservation significance.	3.2.1
Actions in recovery plans and priority action statements will be implemented for threatened species which are known or expected to occur in the reserve.	3.2.3
Native amphibians, reptiles, birds and mammals will not be introduced into the reserve unless under the provisions of an approved recovery plan.	3.2.4
Endemic plants, propagated from seed collected as close as possible to planting locations, will be used in landscaping, revegetation and rehabilitation work, except where non endemic and/or exotic species are essential for initial stabilisation and present no risk of infestation	3.2.5
No activities will be undertaken that might impact on threatened species or their habitat in the reserve.	3.2.6
Walking and cycling will be permitted on management trails in the reserve. Management trails will be signposted accordingly.	3.5.1
Vehicles, horses and other domestic animals will not be permitted in the reserve. Management trails will be signposted accordingly	3.5.2
Maintain liaison with the Police regarding illegal trail bike use.	3.5.5
Continue to allow Energy Australia to maintain the powerline easement in accordance with NPWS Policy, Energy Australia notification procedures, and relevant REFs.	3.6.1
Require NPWS approval and an appropriate level of environmental impact assessment for any alterations to the existing infrastructure.	3.6.2
Fire in the reserve will be managed in accordance with the reserve fire management strategy, which will be reviewed annually.	3.7.1
Asset protection zones on the northern and eastern boundaries of the reserve will be maintained by mowing and slashing in cooperation with neighbours.	3.7.2
Management trails will be maintained for hazard reduction and wildfire control in accordance with this plan and the fire management strategy for the reserve.	3.7.3
Fuel loads will be monitored annually in strategic locations in the reserve.	3.7.4
Neighbours will be encouraged to help manage bush fire management zones (particularly asset protection zones) in the reserve with consent from NPWS.	3.7.5

Priority 1 Actions continued	Strategy
Weeds and pest animals will be controlled on a priorities basis.	3.8.1
Human-induced erosion will be minimised by undertaking, where necessary, rehabilitation works to re-establish natural processes.	3.9.1
Fire trails and asset protection zones will be managed to minimise erosion by providing adequate drainage and erosion control measures.	3.9.3

Priority 2 Actions	Strategy
The NPWS will seek cooperation from LMCC and the Department of Lands in maintaining nearby native bushland and wildlife corridors.	3.3.1
The CCHR Aboriginal Co-management Committee will be consulted and involved in the identification and management of Aboriginal sites, places and values, including interpretation of any places or values	3.4.1
Information will be provided to the local community regarding appropriate activities in the reserve.	3.5.3
The NPWS will work with LMCC and Department of Lands to secure the boundaries of the nature reserve to prevent illegal access.	3.5.4
Investigate the need for a formal easement agreement with Energy Australia.	3.6.3
LMCC will be encouraged to manage fire trail networks around the reserve in consultation with the NPWS.	3.7.6
Neighbours will be encouraged to assist with weed control programs and the prevention of dumping of garden waste.	3.8.2
The cooperation of neighbours will be sought to prevent access to the reserve by domestic pets.	3.8.4
Disturbed areas will be rehabilitated using local soils and material free of contaminants and locally endemic native plants.	3.9.2
Neighbours will be encouraged to undertake work on their land to minimise erosion and control drainage.	3.9.4

Priority 3 Actions	Strategy
Research and survey will be encouraged into the distribution, habitat requirements and ecology of fauna, threatened species or endangered populations in the nature reserve. Priority will be given to threatened species and habitat for threatened species known or likely to occur in the reserve.	3.2.2
Local historic societies will be consulted to identify any historic heritage values of the reserve.	3.4.2
Vertebrate pest control programs will be conducted as required using techniques appropriate in an urban residential environment.	3.8.3
Monitor the effectiveness of weed and pest control actions on pest species abundance and biodiversity response.	3.8.5

5. ABBREVIATIONS

NPWS National Parks and Wildlife Service
LMCC Lake Macquarie City Council

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