



Environment,  
Climate Change & Water  
National Parks & Wildlife Service



# Gibraltar Nature Reserve

## Plan of Management





**GIBRALTAR NATURE RESERVE**

**PLAN OF MANAGEMENT**

**NSW National Parks and Wildlife Service**

**Part of the Department of Environment, Climate Change and Water**

**May 2010**

**This plan of management was adopted by the Minister for Climate Change and the Environment on 18<sup>th</sup> May 2010.**

### **Acknowledgments**

The NPWS acknowledges that this reserve is in the traditional country of the Ngarrabul people.

This plan of management is based on a draft plan prepared by the staff of the Tenterfield Area of the Northern Tablelands Region of the National Parks and Wildlife Service (NPWS), part of the Department of Environment, Climate Change and Water.

Cover photograph: Gibraltar Nature Reserve from Mole River Road.

### **Further information**

For additional information or enquiries on any aspect of the plan, contact the NPWS Tenterfield Area, 10 Miles Street, Tenterfield NSW 2372 or by phone on (02) 6736 4298.

© **Department of Environment, Climate Change and Water (NSW) 2010:** Use permitted with appropriate acknowledgment.

**ISBN 978 1 74232 798 3**

**DECCW 2010/491**

## FOREWORD

Gibraltar Nature Reserve is situated on the Northern Tablelands of New South Wales approximately 35 kilometres west of Tenterfield and covers an area of 160 hectares.

Gibraltar Nature Reserve conserves poorly reserved vegetation communities, one threatened plant, nine regionally uncommon plant species and one new record for the Northern Tablelands. It also provides habitat for five vulnerable animals and is of value as part of a conservation corridor.

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 Gibraltar Nature Reserve was placed on public exhibition from 20<sup>th</sup> March until 29<sup>th</sup> June 2009. The submissions received were carefully considered before adopting this plan.

The plan contains a number of actions to achieve the State Plan priority to “Protect our native vegetation, biodiversity, land, rivers and coastal waterways” including regeneration of native vegetation in disturbed areas to reduce erosion and sedimentation of streams, implementation of recovery plans and priority actions for threatened species, and control of weeds and pest animals.

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

A handwritten signature in black ink, appearing to read 'Frank Sartor', with a long horizontal flourish extending to the right.

**Frank Sartor MP**  
**Minister for Climate Change and the Environment**



## 1. GIBRALTAR NATURE RESERVE

This plan of management applies to the land reserved as Gibraltar Nature Reserve (herein referred to as the “reserve”) (see Map 1). The reserve is located on the Northern Tablelands of New South Wales approximately 35 kilometres west of Tenterfield. It covers an area of 160 hectares south of the Bruxner Highway, and is within the Moombahlene Local Aboriginal Land Council area, Tenterfield Local Government Area, Border Rivers/Gwydir Catchment Management Authority area, and New England Livestock Health and Pest Authority area.

The reserve was formerly Crown land with grazing leases and was gazetted under the *National Parks and Wildlife Act 1974* (NPW Act) on the 17<sup>th</sup> December 1999. The reserve protects poorly reserved vegetation communities, threatened flora and the conservation corridor value of the area (NPWS 1993).

The Regional Forest Agreement for North East NSW (RFA) provided for major additions to the reserve system, including the establishment of Gibraltar Nature Reserve.

The reserve lies in the Nandewar Bioregion, which is under represented in the reserve system. It supports a rich diversity of flora and fauna with many species at the limit of their distributions. The reserve is also part of a disjunct corridor of reserved land from Donnybrook State Forest and Donnybrook Nature Reserve in the north to Torrington State Conservation Area in the south. Much of the adjoining private land supports small-scale sheep and cattle grazing enterprises.

## 2. MANAGEMENT CONTEXT

### 2.1. Legislative and Policy Framework

The management of nature reserves in New South Wales (NSW) is in the context of a legislative and policy framework, primarily the *National Parks and Wildlife Act 1974* (NPW Act) and Regulations, the *Threatened Species Conservation Act 1995* (TSC Act) and the policies of the National Parks and Wildlife Service (NPWS).

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) may require the assessment and mitigation of environmental impacts of works proposed in this plan. The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) also applies in relation to actions that may impact on matters of National Environmental Significance, such as threatened species and endangered ecological communities listed under that Act.

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

## **2.2. Management Purposes and Principles**

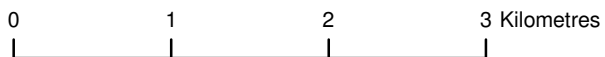
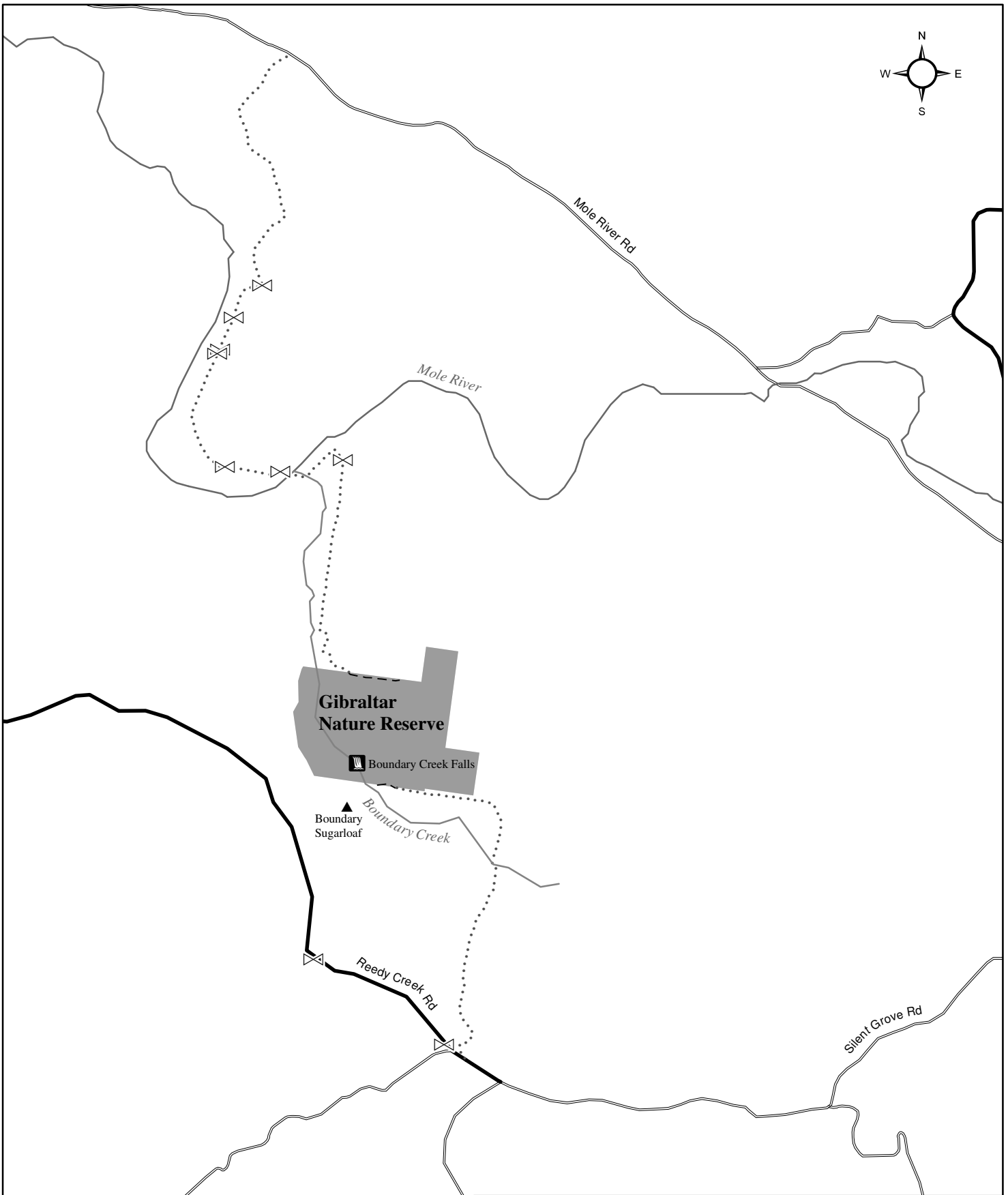
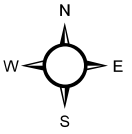
Nature reserves are reserved under the NPW Act to protect and conserve areas containing outstanding, unique or representative ecosystems, species, communities or natural phenomena.

Under the Act (section 30J), 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.

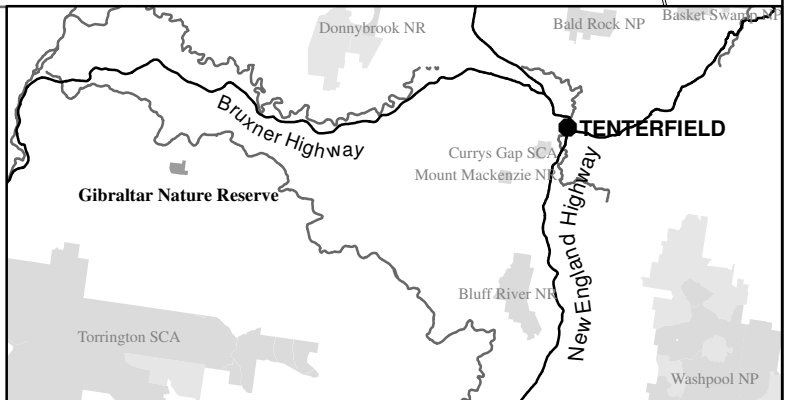
Nature reserves differ from national parks in that they do not have the provision of recreation as a management principle.





**Legend**

- ⊗ Gate - non NPWS
- Rivers / Creeks
- The Planning Area
- Other NPWS Estate
- State Forest
- - Management Trail
- ⋯ Private Property Trail
- Sealed Road - off park
- Unsealed Road - off park



### 3. VALUES OF THE RESERVE

The location, landforms and plant and animal communities of an area have determined how it has been used and valued. Both Aboriginal and non-Aboriginal people place values on natural areas, including aesthetic, social, spiritual and recreational values. These 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 heritage, cultural heritage, threats and on-going use are dealt with individually, but their inter-relationships are recognised.

While Aboriginal use of the area is believed to have been widespread, the rugged terrain of the reserve has limited the non-Aboriginal use of the reserve. The vegetation communities and diverse range of plant and animal species in the reserve are important in a region where widespread clearing of native vegetation has resulted in biodiversity loss and habitat fragmentation.

#### 3.1. Landform, Geology and Soils

The landscape of Gibraltar Nature Reserve encapsulates a steep northwest facing slope that varies in altitude from 440 metres above sea level at Boundary Creek to 700 metres at a plateau in the southwest of the reserve. The reserve is situated in the upper Mole River sub-catchment. The ephemeral Boundary Creek dissects the reserve and includes the Boundary Creek waterfall, which is over 30 metres high. Boundary Creek flows north to Mole River which eventually flows to the Dumaresq River forming the Queensland/NSW border.

The reserve lies on the Bodonga Beds, which are sedimentary rocks of early-Permian age. Soils are moderately infertile and susceptible to erosion when grass cover is removed.

#### 3.2. Native Plants

A detailed vegetation survey of the reserve recorded 112 species (Hunter, 2002). These include nine regionally uncommon species and one new record for the Northern Tablelands (refer to Table 1). The threatened plant Ooline (*Cadellia pentastylis*), a spreading tree, has been recorded in the reserve and it is possible that the threatened Gibraltar Rock Apple (*Angophora exul*) may also occur within the reserve. A report of the endangered vine, Climbing Caustic (*Euphorbia sarcostemmoides*), which is rare on the New England Tablelands and North West Slopes, has also been made for this reserve, but remains unconfirmed.

**Table 1. Threatened and significant plant species recorded in the reserve**

Common name	Scientific name	Status
Reedgrass	<i>Arundinella nepalensis</i>	Regionally uncommon
	<i>Austrodanthonia moniticola</i>	Regionally uncommon
Slender Bamboo Grass	<i>Austrostipa verticillata</i>	Regionally uncommon
Tarvine	<i>Boerhavia dominii</i>	Regionally uncommon
Ooline	<i>Cadellia pentastylis</i>	Vulnerable*#
Yellow Burr-daisy	<i>Calotis lappulacea</i>	Regionally uncommon
Sticky Cassinia	<i>Cassinia uncata</i>	Regionally uncommon
Tiger Orchid	<i>Cymbidium canaliculatum</i>	Regionally uncommon
Cotton Panic Grass	<i>Digitaria brownii</i>	Regionally uncommon
Narrow Leaf Holland Daisy	<i>Vittadinia muelleri</i>	Regionally uncommon
Basket Grass	<i>Oplismenus aemulus</i>	New record for the Tablelands

\* Status under TSC Act

# Status under the EPBC Act

Hunter (2000) describes three native vegetation communities within the reserve, whilst a fourth community, Alectryon Rusty Fig Mock Olive Dry Rainforest, was recorded from the reserve by the Nandewar Western Regional Assessment surveys (DEC, 2004) (refer to Table 2). The dominant community is silver-leaved ironbark - white box woodlands on steeper slopes (80% of the reserve), with smaller areas of box - red gum grassy woodlands and apple - cabbage gum woodlands on the lower, more fertile areas (Hunter, 2002). Along the northern and eastern boundaries of the reserve, land clearing has encroached upon the reserve. Over 20 hectares were cleared when the reserve was Crown land and this land remains in a highly modified condition. Box-gum grassy woodland is listed as an Endangered Ecological Community under the TSC Act and the EPBC Act.

**Table 2. Vegetation communities recorded in the reserve**

Communities	Dominant Tree Species
Alectryon Rusty Fig Mock Olive Dry Rainforest	Wild Quince ( <i>Alectryon subcinereus</i> ), Rusty Fig ( <i>Ficus rubiginosa</i> ), <i>Notelaea microcarpa</i> var <i>microcarpa</i> , <i>Alectryon subdentatus</i>
Apple - Cabbage Gum Woodlands#	Rough-barked apple ( <i>Angophora floribunda</i> ) and cabbage gum ( <i>Eucalyptus amplifolia</i> subsp. <i>sessiliflora</i> )
Box - Gum Grassy Woodlands *	Fuzzy box ( <i>E. conica</i> ), Blakely's red gum ( <i>E. blakelyi</i> ), Tenterfield woollybutt ( <i>E. banksii</i> ) and yellow box ( <i>E. melliodora</i> )
Silver-leaved Ironbark - White Box Woodlands #	Silver-leaved ironbark ( <i>E. melanophloia</i> ) and white box ( <i>E. albens</i> )

\* Listed as Endangered Ecological Community under TSC Act and EPBC Act.

# Inadequately reserved (Hunter 2002)

Under the TSC Act, a Threatened Species Priorities Action Statement has been prepared which identifies actions and strategies to promote the recovery of threatened plant species, populations and ecological communities. Priority actions and recovery plans will be used to guide management of threatened species in the reserve. These

include protection from disturbance and control of goats in areas containing Climbing Caustic and potential areas of Gibraltar Rock Apple, and avoidance of frequent fires for Climbing Caustic.

### 3.3. Native Animals

A fauna survey was conducted in Gibraltar Nature Reserve in 2003 (Spark, in prep). Five amphibians, four reptiles, 29 birds and six mammals were recorded. Of these, five species are listed as Vulnerable under the TSC Act and one is also listed under the EPBC Act (see Table 3).

**Table 3: Threatened fauna in the Gibraltar Nature Reserve**

Common Name	Scientific Name	Legal Status
Border Thick-tailed Gecko	<i>Underwoodisaurus sphyrurus</i>	Vulnerable* <sup>#</sup>
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Vulnerable*
Grey-crowned Babbler	<i>Pomatostomus temporalis temporalis</i>	Vulnerable*
Speckled Warbler	<i>Pyrrholaemus sericornis sagittatus</i>	Vulnerable*
Turquoise Parrot	<i>Neophema pulchella</i>	Vulnerable*

\* Status under TSC Act

<sup>#</sup> Denotes species nationally threatened under the EPBC Act.

The Comprehensive Regional Assessment (CRA) process also predicted that a number of other threatened species were likely to occur in the reserve including barking owl (*Ninox connivens*), regent honeyeater (*Xanthomyza phrygia*), brown tree creeper (*Climacteris picumnus victoriae*), square-tailed kite (*Lophoictinia isura*), diamond firetail (*Stagonopleura guttata*), hooded robin (*Melanodryas cucullata*), squirrel glider (*Petaurus norfolcensis*), eastern bent-wing bat (*Miniopterus schreibersii oceanensis*), and greater long-eared bat (south eastern form) (*Nyctophilus timoriensis*) (NPWS, 1999).

The Threatened Species Priorities Action Statement also identifies actions and strategies to promote the recovery of threatened fauna species and populations. Priority actions and recovery plans will be used to guide management of threatened species in the reserve (refer to Section 5).

### 3.4. Aboriginal Heritage

Aboriginal communities have an association with 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.

The reserve lies within the Moombahlene Local Aboriginal Land Council area and the Ngarrabul language group. Gibraltar Nature Reserve is further along the Mole Tableland escarpment to the west of Rock of Gibraltar, land owned by the local Aboriginal people.

No detailed surveys for cultural heritage sites have been conducted in the reserve. However, within a 20 kilometre radius of the reserve an art site, a burial site and over twenty artefact scatters have been recorded including within the Torrington State Conservation Area to the south (also on the Mole Tableland) (English 1998). NPWS maintains regular contact with the Moombahlene Local Aboriginal Land Council and any sites identified in the future will be recorded and maintained appropriately in association with this group.

### **3.5. Historic Heritage**

The reserve was formerly Crown land and was known by locals as the 'prickly pear lease'. There are no existing European cultural heritage structures within the reserve except the boundary fence.

According to Hunter (2002), extensive clearing in the Northern Tablelands began in the 1860s after the introduction of the Robertson Selection Acts. By 1890 approximately 10% of the Northern Tablelands had been ringbarked or cleared. Pasture improvement with a range of exotic species commenced in the 1920s, and by the 1970s 19% of the region was sown to improved pastures (Benson and Ashby, 2000).

Gibraltar Nature Reserve, along with other reserves in the Tenterfield Area including Bluff River Nature Reserve, Mount MacKenzie Nature Reserve and Currys Gap State Conservation Area (all formerly reserved Crown land with grazing leases), was identified for conservation under the Regional Forest Agreements. Hunter (2002) notes that grazing permits existed over many of these reserves while Crown land, however, there is little evidence in Gibraltar Nature Reserve of this past use except for the clearing along the northern and eastern boundaries.

### **3.6. Recreation Values**

There are no recreational facilities or public vehicle trails in the reserve. Low-key self-reliant activities such as bushwalking, photography and bird watching are permissible within the reserve, however, access to the reserve is through private property. Public access requires the permission of the relevant private landholders and for this reason visitation to this reserve by members of the public is generally not promoted.

## 4. THREATS TO RESERVE VALUES

### 4.1. Pest Species

The feral goat (*Capra hircus*) is the most significant introduced species threatening the reserve's natural values. Rabbits (*Oryctolagus cuniculus*) are also present within the reserve, however the soil is generally unsuitable for the construction of warrens.

Prickly pear (*Opuntia stricta*) is the only identified weed within the reserve (Hunter 2002). The control requirements under the NSW Noxious Weeds Act 1993 for this weed, state that 'the growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority and the plant may not be sold, propagated or knowingly distributed'.

The control of all pest species within the reserve will be undertaken in accordance with the Northern Tablelands Regional Pest Management Strategy (NPWS, 2007). This Strategy identifies appropriate control mechanisms and management strategies for all pest species throughout the Region. In particular, it identifies aerial shooting and ground trapping as the most effective means of goat control for a reserve such as this.

Livestock from adjacent lands occasionally stray into parts of the reserve where fencing is inadequate or absent. Although not bound by legislation to provide for fencing of NPWS estate, the NPWS recognises that cooperative boundary fencing may enhance conservation values and resolve management problems within reserves.

### 4.2. Fire Management

No fires have been recorded in Gibraltar Nature Reserve since its gazettal in 1999, and there are no fire history records for the reserve prior to this date.

The primary fire management objectives of the NPWS are to protect life and property and community assets from the adverse impacts of fire, whilst managing fire regimes to maintain and protect biodiversity and cultural heritage.

Fire is a natural feature of many environments and is essential for the survival of some plant communities. However, inappropriate fire regimes can lead to loss of particular plant and animal species and communities, and high frequency fires have been listed as a key threatening process under the TSC Act.

A separate (map-based) fire management strategy has been prepared for the reserve (NPWS 2006). The fire management strategy outlines the recent fire history of the reserve (in this case no history is known), key assets within and adjoining the reserve including sites of natural and cultural value, fire management zones which may include asset protection zones, and fire control advantages such as management trails and water supply points. Hazard reduction programs, ecological burning proposals and fire trail works are submitted annually to the Bush Fire Management Committee.

Listed in the table below are suggested fire thresholds for the three ecological community types found in the reserve.

**Table 4. Fire Interval Guidelines for Ecological Communities**

<b>Vegetation Community</b>	<b>Fire Threshold</b>
Apple Cabbage Gum Woodlands	Minimum 5 – Maximum 40 years
Box-red Gum Grassy Woodlands	Minimum 5 – Maximum 40 years
Silver leaved Ironbark – Whitebox Woodlands	Minimum 5 – Maximum 40 years

Source: adapted from Bradstock et al. 1995, Keith 1996.

The endangered vine, Climbing Caustic (*Euphorbia sarcostemmoides*), is vulnerable to fire (Hunter, 2002). Many fauna species are also threatened by fire, particularly from too frequent, intense or extensive fires. Loss of habitat resources, such as stags, fallen logs and trees with hollows, also affect the ability of fauna populations to recolonise a burnt area and the continuing viability of populations (RACAC, 1996).

Fire within Gibraltar Nature Reserve is most likely to start from lightning strike. Steep terrain and poor access complicate fire management and constrain vehicle-based fire control. Fire management therefore focuses on the planning area boundaries and requires the cooperation of neighbours.

#### **4.3. Isolation and fragmentation**

Clearing of vegetation within the bioregion has resulted in a high loss of biodiversity and fragmentation of habitat. Long term conservation of biodiversity depends upon the protection, enhancement and connection of remaining habitat across the landscape, involving vegetation remnants on both public and private lands. Nearby vegetated areas consolidate the habitat values of the reserve and provide ecological corridors to other surrounding forested areas.

The reserve forms an integral component of both the east-west and north-south corridors on the Northern Tablelands. Forested properties adjacent to the reserve are of high conservation value for their connectivity to other reserved land, enabling them to function as wildlife corridors. Maintaining the integrity of the remaining habitat within the reserve and, where possible, linking this to adjacent areas of bushland to facilitate wildlife corridors is important in ensuring long term viability of the reserve's biological values.

#### **4.4. Climate Change**

Climate change has been listed as a key threatening process under the TSC Act. Projections of future changes in climate for NSW include higher temperatures, increasing sea levels and water temperatures, elevated CO<sub>2</sub>, more intense but possibly reduced annual average rainfall, increased temperature extremes and higher evaporation. These changes are likely to lead to greater intensity, duration and frequency of fires, more severe droughts and increased regional flooding.

The *National Biodiversity and Climate Change Action Plan 2004-2007* points out that “Climate change is expected to increase the risk of invasion by alien organisms, including pests, weeds and diseases from neighbouring territories. Climate change may also favour some established alien and native organisms that are currently restricted, causing them to become invasive.”

Climate change may significantly affect biodiversity by changing population size and distribution of species, modifying species composition, and altering the geographical extent of habitats and ecosystems. The potential impact of climate change is difficult to assess since it depends on the compounding effects of other pressures, particularly barriers to migration and pressure from weeds and feral animals. Species most at risk are those unable to migrate or adapt, particularly those with small population sizes or with slow growth rates. Programs to reduce pressures arising from such threats will help reduce the severity of the effects of climate change.

It has been suggested that the greatest detrimental impact will be on the cover and diversity of woody species. The warm to cool temperate sclerophyll forests and woodlands typical of the planning area will see an increased fire risk resulting from more droughts with a decline in shrub species and potentially an increase in invasive grasses (Bradstock, 2007).

Adjusting NPWS management of the environment, through programs to reduce the pressures arising from other threats such as habitat fragmentation, invasive pest species, bushfires, pollution and urban expansion, will help reduce the severity of the effects of climate change. For this reason NPWS will continue with existing pest and weed management programs to increase the ability of native flora and fauna to cope with future climatic disturbances.



## 5. MANAGEMENT STRATEGIES AND ACTIONS

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
<p><b>5.1. Soil and Water Conservation</b></p> <p>Soil in the reserve is susceptible to erosion due to the steepness of terrain and lack of vegetation cover in disturbed areas.</p>	<p>Soil erosion is minimised.</p> <p>Water quality and health of reserve streams is improved.</p>	<p>5.1.1 Undertake all works, such as fire management, in a manner that minimises erosion and water pollution.</p>	High
		<p>5.1.2 Continue to support the Border Rivers/Gwydir Catchment Management Authority to maintain and improve water quality in the catchment.</p>	Medium
		<p>5.1.3 Promote the regeneration of native vegetation in disturbed areas to reduce erosion and sedimentation of streams.</p>	Low
<p><b>5.2. Native Plants and Animals</b></p> <p>The reserve contains four vegetation communities. One of these communities is an Endangered Ecological Community under the TSC Act.</p> <p>The threatened plant Ooline (<i>Cadellia pentastylis</i>), has been recorded in the reserve and it is possible that the threatened Gibraltar Rock Apple (<i>Angophora exul</i>) and Climbing Caustic (<i>Euphorbia sarcostemmoides</i>) may also occur.</p>	<p>Native plant species and communities are conserved.</p> <p>Structural diversity and habitat values are restored in areas subject to past disturbance.</p>	<p>5.2.1 Control feral goats to minimise browsing threatened flora (PAS Action) (refer to Section 5.4).</p>	High
		<p>5.2.2 Conduct further flora surveys to confirm the presence of the endangered vine <i>Euphorbia sarcostemmoides</i> and other threatened species in the reserve.</p>	Low

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
<p>14% of the reserve is in a degraded state from previous clearing.</p> <p>Five threatened fauna species have been recorded in the reserve.</p> <p>Vegetated areas on private land are important in providing connectivity between vegetation communities and habitats.</p>		<p>5.2.3 Allow natural revegetation of cleared areas, monitor vegetation succession and undertake rehabilitation works if required.</p> <p>5.2.4 Implement relevant strategies in the Priorities Action Statement and recovery plans for threatened species.</p> <p>5.2.5 Work with neighbours, local Landcare groups and vegetation management committees to encourage conservation of remnant native vegetation in the vicinity of the reserve.</p>	<p>Low</p> <p>Medium</p> <p>Low</p>
<p><b>5.3. Aboriginal and Historic Heritage</b></p> <p>The reserve occurs with the Moombahlene Local Aboriginal Land Council (LALC) area.</p> <p>No Aboriginal or non-Aboriginal cultural heritage sites have been identified within the reserve.</p>	<p>Aboriginal and historic features and values are identified and protected.</p> <p>Aboriginal people are involved in management of the Aboriginal cultural values in the reserve.</p> <p>Understanding of the cultural values of the reserve is improved.</p>	<p>5.3.1 Consult and involve the Moombahlene LALC and other relevant Aboriginal community organisations in the identification and management of Aboriginal sites, places and values, including interpretation of places or values.</p> <p>5.3.2 Encourage further research into the Aboriginal heritage values of the reserve in consultation with the Moombahlene LALC and Elders.</p> <p>5.3.3 Encourage research into the history of the reserve.</p> <p>5.3.4 Precede all ground disturbance work by a check for cultural features.</p>	<p>Medium</p> <p>Medium</p> <p>Low</p> <p>High</p>

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
<p><b>5.4. Introduced Plants and Animals</b></p> <p>The NPWS Northern Tablelands Regional Pest Management Strategy (NPWS 2007) has been developed for the Region as a whole. This strategy identifies pest populations, priorities for control and suggested control methods.</p> <p>The species of most concern to the reserve are feral goats. Prickly pear also occurs within the reserve.</p> <p>Stray stock from neighbouring pastoral properties frequently enter the reserves and may also impact on natural values of the reserve. Appropriate fencing is important to minimise this.</p>	<p>Introduced plants and animals are controlled and where possible eliminated.</p> <p>Pest control programs are undertaken in consultation with neighbours.</p> <p>Distribution of introduced plants does not expand beyond the current extent.</p>	<p>5.4.1 Control, and where possible eradicate, introduced species in accordance with the Northern Tablelands Regional Pest Management Strategy. In particular, conduct regular shooting to reduce threats posed by goats on <i>Angophora exul</i> (PAS Action) and other threatened flora and continue the biological control of prickly pear.</p> <p>5.4.2 Undertake integrated pest control programs with the Livestock Health and Pest Authority, Landcare, Tenterfield Shire Council, Forests NSW and neighbours.</p> <p>5.4.3 Undertake a survey of the reserve to map weed and pest animal distribution.</p> <p>5.4.4 Enter into boundary fencing agreements with neighbours where appropriate to exclude stock from entering the reserve, in accordance with the NPWS Boundary Fencing Policy.</p>	<p>High</p> <p>Medium</p> <p>Low</p> <p>Low</p>
<p><b>5.5. Fire Management</b></p> <p>Unplanned fire is a major threat to biodiversity in the reserve. The threatened vine, <i>Euphorbia sarcostemmoides</i>, is particularly vulnerable to fire and fauna species are also threatened by</p>	<p>Life, property and natural and cultural values are protected from fire.</p>	<p>5.5.1 Implement the Gibraltar Nature Reserve Fire Management Strategy (refer to Section 4.2).</p>	<p>High</p>

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
<p>loss of habitat resources.</p> <p>A Reserve Fire Management Strategy has been prepared for the reserve.</p> <p>There is limited access to the reserve which makes fire management difficult. Cooperative fire management with neighbours and other fire authorities is integral to effective fire management in the planning area.</p>	<p>Fire frequencies are appropriate for conservation of native plant and animal communities.</p> <p>A cooperative approach is developed for fire management with neighbours and other fire authorities.</p>	<p>5.5.2 Participate in the Northern New England Bush Fire Management Committee. Maintain cooperative arrangements with Rural Fire Service brigades and fire control officers, other fire authorities and surrounding landowners in regard to fuel management and fire suppression.</p> <p>5.5.3 Manage the nature reserve to protect biodiversity in accordance with the identified fire interval guidelines for vegetation communities.</p>	<p>Medium</p> <p>High</p>
<p><b>5.6. Recreational Opportunities</b></p> <p>There are no public roads, visitor facilities or interpretive signs located in the reserve. Access requires permission from neighbouring landholders.</p>	<p>Visitor use is appropriate and ecologically sustainable.</p> <p>Visitor use encourages appreciation of the reserve's values.</p>	<p>5.6.1 Only permit low-key self-reliant activities such as bushwalking, photography and bird watching in the reserve.</p> <p>5.6.2 No visitor facilities or public vehicle access will be provided or permitted.</p>	<p>High</p> <p>High</p>

Current Situation	Desired Outcomes	Management Strategies / Actions	Priority
<p><b>5.7. Climate Change</b></p> <p>Climate change has been listed as a key threatening under the TSC Act.</p>	<p>The impacts of climate change on natural systems are minimised.</p>	<p>5.7.1 Continue existing fire, pest and weed management programs to increase the ability of native flora and fauna to cope with future disturbances, including climate change.</p>	<p>High</p>
<p><b>5.8. Management Operations and Other Uses</b></p> <p>No management trails occur in Gibraltar Nature Reserve. Access to this reserve is gained through private property.</p>	<p>No new uses or infrastructure are developed within the reserve.</p>	<p>5.8.1 Negotiate a 'right of carriage way' formal agreement or easement with relevant neighbours regarding the use and maintenance of the private trail used for NPWS access and fire management purposes.</p>	<p>High</p>

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

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

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

## 6. REFERENCES

- Benson, J.S. & Ashby, E. (2000). *Vegetation of the Guyra 1:100 000 Map Sheet*. *Cunninghamia* 3:679-788.
- Bradstock, R. (2007). 'Fire and Climate Change in Australia – Is Gondwana a Goner?'. Conference proceedings "Bushfire in a heating world" 31/5/2007 -1/06/07 Sydney, Australia. Sponsored by New South Wales Nature Conservation Council.
- Department of Environment and Conservation (2004). *Nandewar Biodiversity Surrogates: Vegetation*. Report for the Resource and Conservation Assessment Council (RACAC), NSW Western Regional Assessments, coordinated by NSW Department of Infrastructure, Planning and Natural Resources, Project no. NAND06. Department of Environment and Conservation, Coffs Harbour.
- English, A. (1998) *Archaeological Survey for Aboriginal Sites, Torrington State Recreation Area*. Northern New South Wales, Cultural Heritage Services Division, NSW National Parks and Wildlife Service.
- Hunter, J.T. (2002) *Vegetation and Floristics of the Tenterfield Nature Reserves: Bluff River, Bolivia Hill, Curry's Gap, Gibraltar and Mt McKenzie*. A report to the NSW National Parks and Wildlife Service, Northern Tablelands Region.
- Keith (2002). *Fire Interval Guidelines for Broad Vegetation Types*. Document produced for NPWS.
- NPWS (1993) *Rock of Gibraltar Investigation Report*, A report to the NSW National Parks and Wildlife Service, Northern Tablelands Region.
- NPWS (1999) *Modelling Areas Of Habitat Significance For Vertebrate Fauna And Vascular Flora In North East NSW: A project undertaken as part of the NSW Comprehensive Regional Assessments*, A report to the NSW National Parks and Wildlife Service.
- NPWS (2006) *Northern Tablelands Region Gibraltar NR Fire Management Strategy*. Department of Environment and Climate Change.
- NPWS (2007) *Pest Management Strategy Northern Tablelands Region*. NSW National Parks and Wildlife Service, Hurstville.
- Natural Resource Management Ministerial Council (2004). *National Biodiversity and Climate Change Action Plan 2004–2007*. Australian Government, Department of the Environment and Heritage, Canberra, ACT.
- RACAC (1996) *Regional Report of Upper North East New South Wales: Volume 4, Biodiversity Attributes*. A report initiated by the Natural Resources Audit Council. Resource and Conservation Assessment Council.
- Spark, P. (in prep) *Vertebrate Fauna Survey of Gibraltar Nature Reserve and Surrounds*, A report to the NSW National Parks and Wildlife Service, Northern Tablelands Region.



