



TYPE 1 FIRE MANAGEMENT STRATEGY PULBAH ISLAND NATURE RESERVE

*NSW National Parks and Wildlife Service
Central Coast Hunter Range Region
June 2006*



Department of
Environment and Conservation (NSW)

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**TYPE 1
FIRE MANAGEMENT STRATEGY
for
Pulbah Island Nature Reserve**

For additional information or enquires on the management of fire in Pulbah Island Nature Reserve, please visit the Central Coast Hunter Range Region Office at 207 Albany Street, Gosford or telephone (02) 43204248 during business hours.

This strategy has been endorsed by;

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Date approved: 30 June 2006

Cover Photo: Pulbah Island Nature Reserve overlooking Lake Macquarie. Photo by Susan Davis.

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Type 1 Pulbah Island Nature Reserve Fire Management Strategy

1. Fire Management Principles

The management of fire is a critical component of land management across the NSW landscape. As both a fire authority and conservation agency, the NSW National Parks and Wildlife Service plays an important role in protecting life and property and in conserving natural and cultural heritage.

Under the *Rural Fires Act 1997*, the NPWS is a fire authority and is responsible for the management of fire on all lands under its control. This includes the detection and suppression of fires and the implementation of risk prevention programs to protect life and property from fires. The NPWS also assists with the suppression of fires on adjacent lands, as may be required under plans prepared under the *Rural Fires Act 1997*.

Cooperative arrangements are derived from the Bush Fire Coordinating Committee and implemented through local Bush Fire Management Committees. The other three agencies that participate in cooperative fire management across NSW are the Department of Primary Industries, the NSW Rural Fire Service and NSW Fire Brigades. NPWS is also an active member of the Lake Macquarie Bush Fire Management Committee.

2. Fire Management Objectives

The primary objectives of fire management by the NPWS are to:

- protect life, property and community assets from the adverse impacts of fire;
- develop and implement cooperative and coordinated fire management arrangements with other fire authorities, reserve neighbours and the community;
- manage fire regimes within reserves to maintain and enhance biodiversity;
- protect Aboriginal sites and places, historic places and culturally significant features known to exist within reserves from damage by fire; and
- assist other fire agencies, land management authorities and landholders in developing fire management practices to conserve biodiversity and cultural heritage across the landscape.

The maintenance of biodiversity to avoid the extinction of natural species, populations and communities within the landscape underpins fire management activities within the NPWS.

The NSW National Parks and Wildlife Service *Fire Management Manual* details the policies and procedures for all fire management planning and fire operations on lands reserved under the *National Parks and Wildlife Act 1974*, and any land managed by the Department of Environment and Conservation (DEC) on behalf of the Minister for the Environment. This strategy is a *Relevant Plan* under *Section 38(4)* and *Section 44(3)* of the *Rural Fires Act 1997*.

3. The Fire Environment

3.1 Fire History

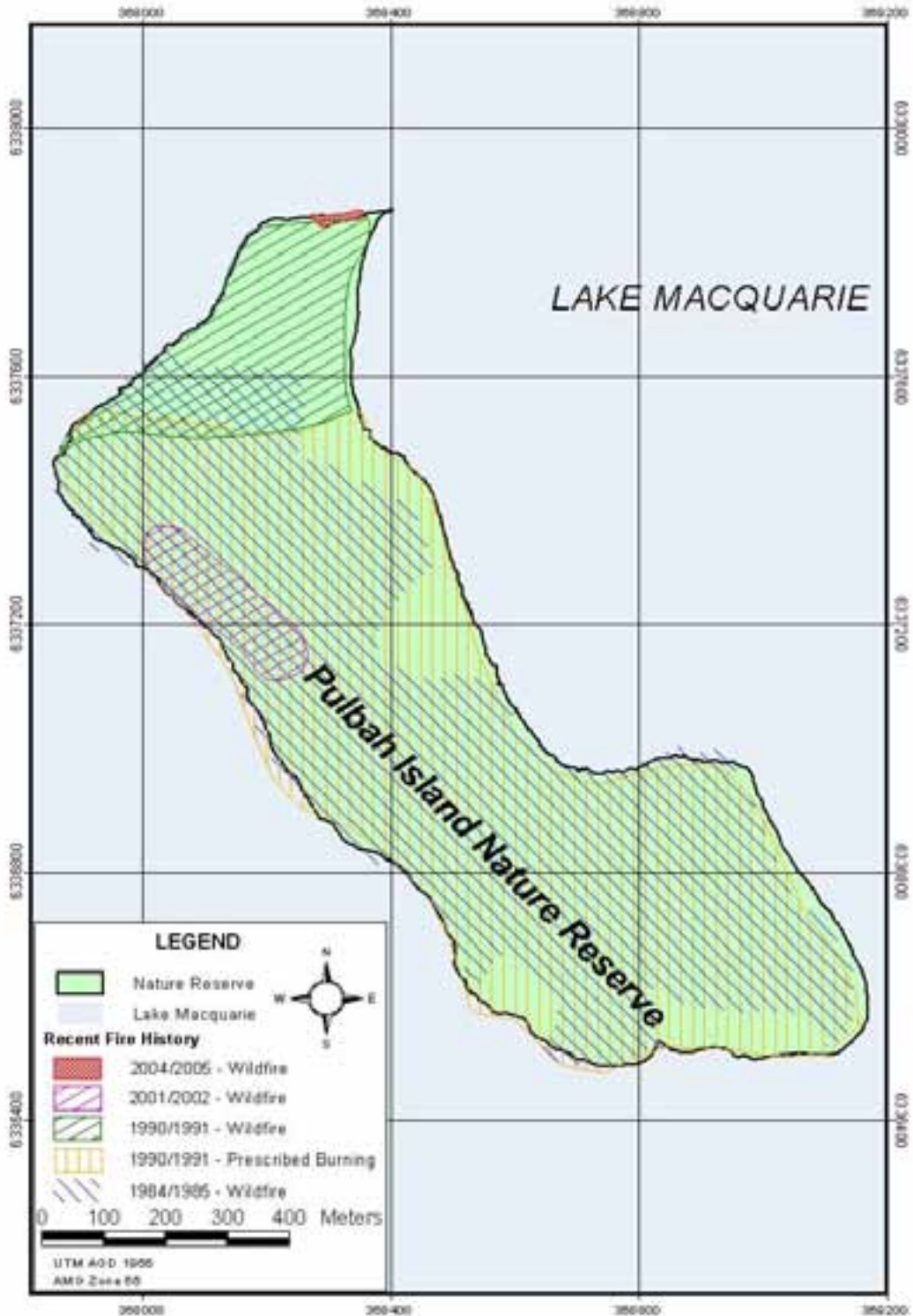


Figure 1: Recent Fire History for Pulbah Island Nature Reserve.

In 1984 - 1985 wildfire concentrated around the southern portion of the island, burning approximately 50 ha of the reserve. Wildfire occurring in 1990 - 1991

affected almost 10 hectares in the north of the reserve, after which a hazard reduction burn was carried out on a further 55 hectares of the island. Wildfire also occurred in October 2001, burning a section on the western side of Pulbah Island. Another small wildfire broke out on the north of the island in February 2005. (See Figure 1.)

Pulbah Island Nature Reserve (Pulbah Island NR) has been designated as a Land Management Zone (LMZ 17) for fire management planning purposes. The reserve has been designated as a LMZ because it is not adjacent to built assets, which would be exposed to a high level of bushfire risk.

3.2 Topography

Pulbah Island NR (69 ha) is located nearby Lake Macquarie State Conservation Area, north of Point Wolstoncroft and south east of Wangi Point. The slight rise from the north to the south of the island could provide an uphill run for ignitions, however, the gentle slope has little influence on increased fire behaviour potential. Being surrounded by Lake Macquarie, there is little encouragement for fires to spread from, or to nearby estates.



Figure 2: Location of Pulbah Island Nature Reserve

3.3 Vegetation

Permian Macquarie Grassy Forest covers the majority of Pulbah Island NR. Dominant tree species include *Corymbia maculata* (Spotted Gum), *Eucalyptus punctata* (Grey Gum), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus paniculata ssp paniculata* (Grey Ironbark), and *Eucalyptus umbra* (Bastard Mahogany). The main shrubs include *Pultenaea euchila* (a Pea), *Acrotriche divaricata* (Ground Berry), *Persoonia linearis* (Narrow Leaved Geebung), *Acacia implexa* (Hickory), *Acacia longifolia* (Sydney Golden Wattle), and *Exocarpus cupressiformis* (Cherry Ballart). Threatened and rare species may include the vulnerable *Tetratheca juncea*, the endangered *Cynanchum elegans* and the ROTAP *Macrozamia flexuosa*.

Another vegetative community located in Pulbah Island NR is Macquarie Relic Dry Rainforest consisting mainly of *Backhousia myrtifolia* (Grey Myrtle), *Angophora costata* (Smooth Barked Apple) and *Eucalyptus umbra*. Shrubs include *Backhousia myrtifolia* and *Notolea lingfioia var intermedia* (Mock Olive). Estuarine Swamp Oak Forest containing mostly *Casuarina glauca* and *Eucalyptus tereticornis*, with an understorey of sedges, herbs and grasses also occurs within Pulbah Island NR. Macquarie Melaleuca Scrub-forest and only a minor area of Pulbah Island Nature Reserve has disturbed vegetation, while coastal estuarine vegetation includes species such as *Posidona australis*.

3.4 Fire Weather

The statutory fire season occurs between 1 October and 31 March. This may be extended if weather conditions lead to increased fire danger outside of this period.

3.5 Built assets vulnerable to fire

There are no contemporary built assets within Pulbah Island NR.

3.6 Natural assets vulnerable to fire

Pulbah Island NR was created in 1970 in an attempt to conserve the native plant and animal communities. A range of fire intervals, intensities and timing (season) is recommended for all vegetation communities within the known range. Fire should not exceed more than 30% of the zone at any one time where practicable, in order to maintain a mosaic of age classes within the zone. Crown fires should be avoided at the lower end of interval ranges and fire regimes applied should aim to maintain floristic and structural diversity, as well as avoid the extinction of species and habitats. If the fire regime thresholds are exceeded or not met, the decline and/or local extinction of plant species and habitats may be expected.

Permian Macquarie Grassy Forest should maintain fire intervals of 5 to 50 years while Macquarie Melaleuca Scrub-forest requires variable fire regimes of 7 to 30 years. For both these vegetative communities, any 2 fires within 5 years should be avoided. Similarly, repeated low intensity fires should be prevented, however a decline is predicted if no fire occurs for more than 15 years. Any fires less than 15 years apart should be avoided within known locations of Macquarie Relic Dry Rainforest. If no fire occurs for more than 25 years however, a decline in the species is expected. Estuarine Swamp Oak Forest should be excluded from all fire events.

The vulnerable *Tetratheca juncea*, the endangered *Cynanchum elegans* and the ROTAP *Macrozamia flexuosa* may occur on Pulbah Island however the presence of the latter has not been recently recorded. Magenta Lilly Pilly (*Syzygium paniculatum*) has been reported to occur on Pulbah Island Nature Reserve as remnant riparian vegetation. High frequency fires should be avoided within the known habitat of these species, and fire free intervals of no less than 15 years should be maintained. Trail construction and ground disturbance (earth moving machinery or aerial bombing) in known locations should be avoided, as should the use of foam and retardants.

The range in vegetation communities occurring within the reserve provides a diversity of habitats for native fauna. Some threatened species have been recorded within the reserve, and 22 other threatened species are considered likely to occur based on their distribution and habitat requirements (see Lake Macquarie State Conservation Area Plan of Management). Sugar Gliders are known to exist on Pulbah Island NR, as well as Eastern Bent-wing Bats, possums and a wide range of birds, including a breeding pair of white-breasted sea eagles (*Haliaeetus leucogaster*). Breeding areas, such as maternity caves should be protected from smoke and fire. Lace monitors have also been reported in Pulbah Island NR.

Koalas have been introduced to the island on several occasions, however their numbers have declined to the extent that no sightings have been made in eight years.

Table 1: Threatened Fauna known to occur on Pulbah Island NR.

Species known to occur within the reserve		
Common Name	Scientific Name	Status
Eastern bent-wing bat	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable
Koala	<i>Phascolarctos cinereus</i>	Vulnerable

Source: NPWS fauna modelling database 1999, NPWS Atlas 2005, NPWS 1999.

Further surveys are required to identify other threatened species or communities within the reserve. The reserves' (biological) isolation by water means that populations of plants and animals dependent on migration for recruitment following fire are particularly vulnerable to adverse impacts of large uncontrolled fires.

3.7 Cultural Heritage values vulnerable to fire

An abundance of natural resources allowed Aboriginal people to live in the region for thousands of years. Shell middens recorded at several locations on the island provide evidence of this occupation. Pulbah Island NR is a significant place in Aboriginal culture and was declared an Aboriginal Place under the *National Parks and Wildlife Act* in 1982.

The Caretaker's Cottage (and jetty), and Pulbah Reservoir are the only other historic sites recorded. Impacts on cultural heritage from fire are unlikely and would only arise from a loss of vegetation followed by rain leading to erosion.

3.8 Bushfire risk

Lake Macquarie separates the reserve from adjacent private property, limiting the likelihood of fires within the reserve threatening neighbouring assets. There are numerous walking trails within the reserve, which will be maintained and may be used as containment lines in the event of a fire. Permian Macquarie Grassy Forest has high bushfire behaviour potential, while Macquarie Relic Dry Rainforest has low bushfire behaviour potential. Both Macquarie Melaleuca Scrub-forest and Estuarine Swamp Oak Forest have moderate bushfire behaviour potential.

4. Fire Management Strategy

Table 2: Fire Management Strategies for Pulbah Island Nature Reserve.

ISSUE	OBJECTIVE(S)	STRATEGIES
Land Management Zone (LMZ 17)	<ul style="list-style-type: none"> ▪ To prevent the extinction of all species which are known to occur naturally within NPWS parks and reserves (conserve biodiversity), and to protect aboriginal sites, historic heritage sites and other culturally significant features from fire. 	<ul style="list-style-type: none"> ➤ As far as possible maintain fire regimes within specified intervals. ➤ As far as possible implement specified threatened species management guidelines. ➤ As far as possible implement cultural heritage management guidelines.
Fire thresholds for vegetative communities	<ul style="list-style-type: none"> ▪ Vegetative communities managed within desired fire thresholds 	<ul style="list-style-type: none"> ➤ Plan to keep fire interval for each vegetative community within recognised appropriate fire regimes. ➤ Maintain a mosaic of fire regimes within zone in order to create a diversity of habitat age classes.
Walking trails/ Containment Lines	<ul style="list-style-type: none"> ▪ Maintenance of existing walking trails (to prevent further erosion and minimise encroachments) as possible fire containment lines 	<ul style="list-style-type: none"> ➤ Maintain and preserve existing walking trails (to prevent further erosion and minimise encroachments) as potential fire containment lines. ➤ It is not intended to maintain walking tracks to a high standard.
Backburning	<ul style="list-style-type: none"> ▪ Appropriate use when required 	<ul style="list-style-type: none"> ➤ As far as possible, backburning should take into account threatened species and cultural heritage guidelines. ➤ On days when the fire danger > High, as far as possible, delay backburning until late afternoon – early evening when the temperature is decreasing and humidity increasing. ➤ Backburning may be safely undertaken during the day when the fire danger is < High.
Historical Sites (Caretakers cottage and jetty)	<ul style="list-style-type: none"> ▪ Cultural heritage adequately protected, recognising the significance of these sites. 	<ul style="list-style-type: none"> ➤ A buffer separating these assets from vegetation should be maintained.

ISSUE (continued)	OBJECTIVE(S) (continued)	STRATEGIES (continued)
Aboriginal sites and artefacts	<ul style="list-style-type: none"> ▪ Aboriginal shell middens adequately protected, recognising the significance of these sites 	<ul style="list-style-type: none"> ➤ Avoid all ground disturbances including handline construction. ➤ Site may be burnt by bushfire, back burn or prescribed burn without immediate damage - loss of vegetation followed by rain may cause erosion.
Threatened Fauna	<ul style="list-style-type: none"> ▪ Threatened fauna adequately protected 	<ul style="list-style-type: none"> ➤ Avoid fire or smoke around known sites and habitats.
	<ul style="list-style-type: none"> - Eastern Bent-wing Bat (<i>Miniopterus schreibersii oceanensis</i>) 	<ul style="list-style-type: none"> ➤ No fire or smoke around known roost sites. ➤ Protect hollow bearing trees (live and dead ones) and large mature trees which will provide future hollows. ➤ Maintain a mosaic of fire frequencies and intensities within habitat to increase/maintain a diverse food supply.
	<ul style="list-style-type: none"> - Koala (<i>Phascolarctos cinereus</i>) 	<ul style="list-style-type: none"> ➤ Avoid fire (smoke and heat) around known habitat. ➤ Avoid burning 100% of known habitat – mosaic burn.
Threatened Flora	<ul style="list-style-type: none"> ▪ Threatened flora adequately protected 	<ul style="list-style-type: none"> ➤ Avoid high frequency fires within known habitats, and avoid all fire within fire sensitive communities. ➤ Maintain fire regimes that preserve floristic and structural diversity. ➤ Avoid trail construction, ground disturbance in known locations.
	<ul style="list-style-type: none"> - Magenta Lilly Pilly (<i>Syzygium paniculatum</i>) 	<ul style="list-style-type: none"> ➤ Low frequency, low intensity burns. ➤ Avoid the use of retardants and foams in locations where this species occurs.

5. Fire Management Map

Fire control advantage features that may be used to support bushfire suppression operations in and around Pulbah Island Nature Reserve include walking tracks providing potential control lines, and Lake Macquarie providing water access for helicopters.



Figure 3: Fire control advantages, assets and fire management zones for Pulbah Island Nature Reserve.