Broken Head Nature Reserve

Type-1 Reserve Fire Management Strategy

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1. Fire Management Principles

The Department of Environment and Conservation (DEC) manages about seven per cent of the land area of NSW. These areas have been reserved to conserve their natural and cultural values. These values include biodiversity, landscapes, Aboriginal sites, historic structures and recreational settings.

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 an active member of the Far North Coast Zone Bush Fire Management Committee.

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

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 known to exist within NSW and 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 d*etails 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 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

Two fires have been recorded within and adjoining Broken Head Nature Reserve. A fire of about 1hectare occurred above Kings Beach in 1987 and burnt areas of headland brushbox / dry rainforest vegetation and native grassland. The most recent fire affected the southwest part of the reserve in 1991. About 22 hectares of headland brushbox / dry rainforest community was burnt in this fire which entered the reserve from private property west of Seven Mile Beach Road and burnt downhill through rainforest to Whites Beach.

3.2 Topography

The 98ha nature reserve is bounded in the north by the Broken Head Caravan Park and to the south where it adjoins the northern end of Seven Mile Beach. The main ridgeline of the reserve reaches a maximum height of 60 metres and is aligned in a north-south direction. The top of this sub-coastal ridge forms the present western boundary of the reserve and is the general route of Seven Mile Beach Road. Intermittent creeks drain to the east into the Pacific Ocean that forms the reserve's eastern boundary.

The geology of sub-coastal range of the reserve consists of phyllite, slate, greywacke and quartzite that weather to produce podsolic soils of moderate to low fertility with heavy clay subsoil. They are highly erodible if the surface vegetation is disturbed. The dunal areas of Kings, Brays and Whites Beaches are composed of recent sand deposits.

3.3 Vegetation

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

The reserve contains a variety of vegetation types including littoral rainforest, headland brushbox and dry rainforest community, dry sclerophyll, and native grasslands. The coastal dune vegetation is characterised by *Pandanus tectorius* and *Banksia integrifolia*. The exposed headlands support isolated areas of *Themeda* grassland. Bitou Bush has established itself widely along the rocky cliffs and understorey on the coastal edge.

The main vegetation types have been classified as belonging to the *Cupaniopsis anacardioides* – Acmena spp. Alliance; *Syzygium luehmannii – Acmena hemilampra* suballiance, *Cupaniopsis anacardiodes* suballiance and *Lophostemon confertus* suballiance.

Requirements for most plant species can be summarised on the basis of vegetation communities. There is a threshold in fire regime (fire interval) variability, which marks a critical change from a high species diversity to low species diversity. The following guidelines will be used to guide management of fire regimes in vegetation communities in identified Land Management Zones within the reserve.

Table 1. Fire Regime Guidelines for Vegetation Communities.

Vegetation Community	Minimum Interval	Maximum Interval	Notes
Rainforest	n/a	n/a	Fire should be avoided
Wet sclerophyll forest	25	60	Crown fires should be avoided at the lower end of the interval range
Shrubby dry sclerophyll forest	7	30	
Grassland	2	10*	Some intervals greater than 7 years should be included in coastal areas.

Source: Bradstock *et al* (2003) - intervals given are tentative due to insufficient data.

3.4 Climate and weather

Bushfires in the region mostly occur in the hot and dry months of spring and early summer, with a peak in October. Strong northwesterly winds may combine with low humidity to result in very high and above fire danger ratings several times each season. Southerly changes also have the potential to strongly influence fire behaviour. Summer rains in January/February normally mark the end of the fire season, and conditions generally favour prescribed burning in autumn and early winter. Prescribed burning may be undertaken in late winter and spring, however conditions supportive of wildfire can occur as early as July and so prescribed burning during this period should be avoided.

3.5 Built assets vulnerable to fire

Built assets located on the reserve that are vulnerable to fire are limited to park signage and timber used on the walking tracks. Off-park the Broken Head Camping Area adjoins the northeastern corner of the reserve. It is downslope from the reserve and this relationship significantly reduces the threat of fire from the reserve to the camping area, but conversely, ignitions emanating from the camping area have a high potential for impacting on the reserve.

A number of private properties lie to the west of Seven Mile Beach Road and contain an assortment of built assets, including habitable dwellings, surrounded by grasslands and various forest types within those adjoining properties. The vegetation within these adjoining properties poses the actual threat to the built assets within those properties.

3.6 Natural assets vulnerable to fire

Fourteen threatened fauna species and ten threatened flora species are recorded as occurring on the reserve (NPWS Wildlife Atlas).

Flora that are restricted to wetter vegetation communities, such a rainforest, are more likely to be vulnerable to fire events.

All natural assets in the reserve are vulnerable to too frequent fire.

3.7 Cultural Heritage values vulnerable to fire

There are no known cultural heritage assets that are vulnerable to fire or fire fighting operations

3.8 Bushfire risk

The Byron Bush Fire Risk Management Plan makes the following risk assessments of fires affecting the reserve:

Risk to Community Assets (life and property): moderate
Risk to Environmental Assets (natural and cultural): moderate

3.9 Bushfire zoning

The ‘NPWS Strategy for Fire Management’ (2003) uses a system of bushfire management zones for bushfire management in NPWS reserves. These zones are compatible with the system adopted by the Bushfire Coordinating Committee for use in District Bushfire Management Committee (DBFMC) bushfire risk management plans.

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

NPWS has assessed the reserve for fire management planning purposes and has zoned the reserve as a Land Management Zone (LMZ). The primary fire management objectives for this zone are to prevent the extinction of all species

that are known to occur naturally within the reserve, and to protect culturally significant sites. The reserve has been designated as a LMZ because fuels on the reserve do not pose a high level of threat to immediately adjacent built assets (due to slope relationships), does not have a history of frequent bushfire ignitions and no history of fires leaving the reserve.

The LMZ does not require intensive management and focuses on those actions appropriate to conserve biodiversity and cultural heritage including managing for appropriate fire regimes.

Current Situation	Desired Outcomes	Strategies and priorities
The reserve is characterised by its easterly aspect, steep rainforest gullies, small headlands, exposed drier ridges and isolated beaches. The reserve is vegetated with a mosaic of vegetation types varying from fire sensitive to fire adapted types. No fires have occurred on the reserve in the past 15 years. A small isolated fire occurred in the reserve in 1987. A second fire, emanating from outside the reserve, occurred in 1991 and impacted on vegetation in the reserve between Seven Mile Beach Road and Whites Beach Fire poses a threat to some vegetation types within the reserve whilst others are fire adapted or pyrogenic	Persons and property protected from fire. Exclude fire from rainforest communities within the reserve. Have a fire regime that is appropriate for the conservation of plant and animal communities No fuel management zones or fire trails are to be established within the reserve, however Seven Mile Beach Road, closed former management trails (eg Bryant's old track to former water pump on Brays Beach) and walking trails may offer wildfire and prescribed burning control options.	**High** - Continued participation in the Far North Coast Bush Fire Management Committee and direct liaison with the Rural Fire Service and neighbours with regard to promoting the establishment and maintenance of adequate APZs around nearby built assets and other fuel management and containment options on adjoining properties. **Low** - Install signposting at the top of walk trails identifying Seven Mile Beach Road and associated car parking areas, beaches, wet gullies and areas of rainforest as suitable refuges in the event of fire. **High** - Suppress wild fire **High** - Manage the reserve as a Land Management Zone **Mod** - Manage the fire regime within the various vegetation types within the reserve using monitoring of vegetation dynamics and research as a basis for decision making regarding applying prescribed burning. **High** - Maintain a response capability to address residual risk. **High** - Maintain cooperative detection and response coordination plans with BFMC and other bush fire response agencies.

Legend for priorities

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

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

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