



# Fire Management Strategy



Slashed Break – Merry Beach Asset Protection Zone - NPWS

Murramarang National Park  
Murramarang Aboriginal Area  
Belowla Island Nature Reserve  
Brush Island Nature Reserve  
Tollgate Islands Nature Reserve







**Fire Management Strategy**  
for  
**Murramarang National Park**  
and  
**Murramarang Aboriginal Area**  
**Belowla Island Nature Reserve**  
**Brush Island Nature Reserve**  
**Tollgate Islands Nature Reserve**

This Fire Management Strategy has been on public exhibition for a period and members of the public, either individually, or as representatives of community interest groups, and government authorities were invited to comment on its contents.

These comments have been assessed and where they have improved the purpose and intent of the strategy, amendments have been made. A summary of these submissions and the recommendations for change is available at the Ulladulla Area office of the NSW NPWS.

The NPWS appreciates any ongoing feedback on the Fire Management Strategy. This will contribute to the periodic review process.

Comments should be forwarded to:

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Fire Management Strategy  
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**Murramarang National Park**  
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Murramarang Aboriginal Area  
Belowla Island Nature Reserve  
Brush Island Nature Reserve  
Tollgate Islands Nature Reserve

South Coast Region  
NSW National Parks and Wildlife Service  
April 2009 (Revised December 2009)

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**December 2009 Revision Notes:**

Maps 3b & 4f revised to incorporate transfer of Lot2 DP777520 from Planning NSW to DECCW (addition to Murramarang National Park).

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# **1. INTRODUCTION**

## **1.1 Scope and purpose of this fire management strategy**

This plan describes the strategies that the National Parks and Wildlife Service (NPWS) will apply to meet fire management obligations under the Rural Fires Act 1997, National Parks and Wildlife Act 1974 and Threatened Species Conservation Act 1995 in Murramarang National Park, Murramarang Aboriginal Area, Belowla Island Nature Reserve, Brush Island Nature Reserve and Tollgate Islands Nature Reserve between March 2008 and October 2013.

This strategy has been prepared in accordance with policies and procedures set out in the NPWS Fire Management Manual (NPWS, 2007 and as revised), the NPWS Strategy for Fire Management (NPWS, August 2003) and Plans of Management for Murramarang National Park, Murramarang Aboriginal Area, and nearby island Nature Reserves (NPWS, 2004)

This strategy is supported by:

- Regional Fire Management Works Schedules which are revised annually and list the fire management activities and works proposed for each financial year (July one year, to June the next year)
- Bush Fire Operational Maps (Ops Maps) which identify fire suppression advantages, nearby assets and sites of natural, cultural and community values to be protected. These maps are reviewed periodically.
- NPWS South Coast Region – Regional Incident Procedures, which detail bushfire preparedness and response procedures. These are revised annually.

This Strategy is also supported by reference maps, Geographic Information System (GIS) and other databases maintained at the NPWS South Coast Region office at Nowra. This plan is to be integrated with the Bush Fire Risk Management Plans prepared by the Bush Fire Management Committees (BFMC) for the Shoalhaven and Eurobodalla / Far South Coast Fire Districts. The NPWS is an active member of these BFMCs and seeks to work cooperatively with fellow committee members and the community to achieve coordinated fire management and suppression across the Shoalhaven and Eurobodalla.

The NPWS South Coast Region would like to acknowledge the valuable input provided by the community, neighbours, RFS members and other agencies during the consultation, compilation and review for this plan.

## **1.2 Fire Management Objectives**

Consistent with the statutory obligations and policies described in the NPWS Strategy for Fire Management the fire management objectives for Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves are:

- reduce the occurrence in the reserves of unplanned fire caused by people,
- contain, and where achievable, suppress unplanned fires occurring in the reserves,
- minimise the potential for the spread of bushfires from the reserves,
- limit the potential spread of fires into the reserves,
- protect people and property in, or immediately adjacent to, the reserves from bushfires occurring in the reserves,
- manage fire regimes to sustain all species and processes known to occur naturally within the reserves and thereby avoid possible extinction or unnatural change,
- protect from damage by bushfire all recorded Aboriginal sites, historic places and culturally significant features that are recorded within the reserves, Where possible seek appropriate direction and response to these and other cultural sites and values within and linked to the reserve with regard to fire management activities.
- promote awareness of the reserves natural and cultural values that may be under threat from inappropriate fire regimes or suppression activities.

## **1.3 Description of the Reserves**

### **1.3.1 - Location and Terrain**

This strategy applies to the following reserves: Murramarang National Park, Murramarang Aboriginal Area and nearby Tollgate Islands, Belowla Island and Brush Island Nature Reserves.

The reserves are some 190km from Sydney on the NSW South Coast. They lie between the Princes Highway and the coastline north of Batemans Bay and adjoin the settled areas of Bawley Point, Kioloa, Depot Beach, North Durras, South Durras, Maloneys Beach and Long Beach. (see Map 1 – Location of Reserves)

Murramarang National Park includes parts of the catchments of Cullendulla Creek, and the eastern tributaries of the lower Clyde River, as well as Durras Lake.

Nearby island Nature Reserves lie offshore from Murramarang National Park with Tollgate Islands off the mouth of the nearby Clyde River estuary.

In addition to the 12,200 hectares within the reserves, this strategy also considers bush fire fuels, assets, and fire control advantages that are outside but are contiguous with, or adjacent to, those in the reserves.

Topography within the reserves varies from coastal dunes, wetlands and estuaries rising to steep sided gullies surrounding the basalt capped Mount Durras (283m).

### **1.3.2 - Fire Weather and History**

The climate predominant over Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves is temperate including a strong maritime influence. Whilst the overall trends indicated by continental weather patterns may be more predictably forecast, the variability of the more localised effects such as the summers coastal 'nor-easters' and 'southerly busters' with their characteristic sudden wind changes can present difficulties for fire suppression. Similarly, the deteriorating fire weather conditions associated with hot dry continental winds usually preceding the passage of frontal systems may be exacerbated over the reserves by the downstream turbulence created by Durras Mountain and to the west along the coastal ranges. This again may lead to sudden change in wind speed and fire behaviour.

Regional rainfall is variable both annually and seasonally with a recorded average of approximately 960mm (Moruya Heads). The rainfall pattern is summer dominant and often results from thunderstorm activity in this period. This leads to widely variable and localised rainfall across the landscape. This variability needs to be monitored when prescribing 'burning off' conditions or considered when using regionally based fire-weather indices and meteorological stations. The summer storms can also present dangerous fire weather conditions for firefighting crews.

The area is subject to periodic drought both regionally and as part of larger meteorological trends such as 'El Niño'. These trends can result in drying out the soils and vegetation making more fine fire fuel available than usual as well as promoting intense fire behaviour as observed in the prolonged drought and exceptional summers of 2001/2002 and 2002/2003. Under such conditions, fire behaviour makes control very difficult and can easily compromise the usually sufficient protection measures.

Most recorded wildfire arises from suspected deliberate ignition and escaped fire with the only identified "natural" cause being occasional lightning. Most of the suspected deliberate events originate from access routes and adjacent to settled areas. Recorded major fire runs across the reserves are west to east either originating near or crossing the Princes Highway from the west.

Whilst this information on the fire history of the area is limited in both span and accuracy, it appears that areas of Murramarang National Park have been burned more frequently than is indicated for the maintenance of biodiversity. This could have resulted in the selected promotion of more fire prone vegetation in parts of the landscape. Former land use and deliberate ignition may have exacerbated this vegetation response. This fire history presents challenges for the maintenance of the reserves biodiversity, protection of adjacent assets and community understanding of fire management options and decisions.

Fire history, vegetation maps and other data are maintained within the Geographic Information System and records at the South Coast Region office and Area workcentres.

### **1.3.3 - Natural and Cultural Heritage**

The vegetation of the reserves is both diverse and fire-prone. This diversity includes taller forests on deeper sediments along drainage lines and a variety of coastal vegetation communities on sands, exposed coastline and offshore islands. The proximity of Durras Mountain to the coastline with its isolated basalt soils sustains significant rainforest elements noted for their persistence in a western aspect. Foreshore vegetation of Durras Lake and littoral rainforest patches along the coast also have significant value including the limits of distribution of some species.

The reserves include a number of rare and threatened plant species such as *Genoplesium vernale*, and *Cryptostylis hunteriana*. Particular management strategies to protect Threatened plant species are outlined in Table 7.

The landforms and vegetation of the reserves include the habitats of a diverse range of fauna. Of particular note are the populations of arboreal mammals as well as shorebirds, waders and other species using the offshore islands.

Over a dozen threatened species have been recorded in and around the reserves. These include the Masked Owl - *Tyto novaehollandiae*, Green and Golden Bell Frog - *Litoraea aurea*, Grey Headed Flying Fox - *Pteropus poliocephalus*, Osprey - *Pandion haliaetus* - Yellow Bellied Glider - *Petaurus australis*, Squirrel Glider - *Petaurus norfolcensis*, Sooty Owl - *Tyto tenebricosa*, Powerful Owl - *Ninox strenua*, Large-footed Myotis - *Myotis adversus* and Common Bentwing Bat - *Miniopterus schreibersii*. A number of threatened species may be considered at threat if inappropriate fire regimes prevail or unsuitable fire management strategies or control options are applied. Such species include the Glossy Black Cockatoo - *Calyptorhynchus lathami*. Specific fire management strategies for affected threatened fauna species are outlined in Table 7.

Evidence of Aboriginal use and sites of cultural significance are found across the reserves with concentrations of recorded occupation sites along creeklines, headlands and foreshores. Murramarang Aboriginal Area is noted for its cultural significance and archaeological importance. As with remnants of early historic use, these values may not be so vulnerable to further direct fire but may be vulnerable to fire suppression activities such as the use of earthmoving machinery or erosion of exposed areas if the vegetation is burned. The most widespread historic values are associated with the timber extraction industry in the form of tramways and mill sites. Protection measures and fire suppression options for these cultural and historic assets are detailed in Table 8.

Much of Murramarang National Park has been the site of considerable forestry activity including the legacy of a complex vehicle access network. This access network is undergoing suitability and maintenance assessment to identify which elements meet the foreseen needs of public access, and reserve and fire management needs. This assessment also considers environmental stability as well as the community use and appreciation of the reserves.

Whilst all access routes may have some usefulness for fire management, only those tracks primarily maintained by the NPWS for fire suppression are specifically listed in this strategy as

'fire trails' and shown on operational maps as such. The NPWS also maintains a number of management and public access vehicle and walking tracks across the reserves.

### **1.3.4 - Infrastructure, assets, and economic values**

There are few community infrastructure assets within the reserves. There are a number of major visitor facilities within the reserves such as accommodation at Merry Beach, Pretty Beach, Pebbly Beach, Depot Beach and at South Durras. Major community assets include the aerial power supply lines to the southern NSW coast and feeder lines to the communities of South and North Durras / Depot Beach. These routes traverse extensive bushland including the reserves and may be vulnerable to intense fire. Other assets include a communications tower east of Cullendulla. There are also numerous underground telephone cables including fibre optic lines. The consequent effects of loss of service from such infrastructure can pose significant problems to the community.

The reserves virtually surround the settlement areas of South Durras, Durras Lake, North Durras, Depot Beach, and the southern side of Kioloa. The predominant uses of these settlements are holiday and residential accommodation. The seasonal fluctuation of population and absentee ownership presents particular problems for community information, property maintenance and neighbour interaction with regard to bush fire preparedness and protection.

A longstanding concern to the community is the singular vehicular access routes to these settlements that may be readily compromised by bush fire. Apart from reserve appreciation and enjoyment, a few vehicle access routes across the reserves are regularly used for commuting by local communities. The use of routes such as Mount Agony Road and South Durras Drive also raise concerns about safety during fire outbreaks as well as the potential source of more frequent of illegal ignitions.

A number of rural subdivisions adjoin the reserves with many containing a large proportion of natural vegetation eg Kioloa and Long Beach areas. Most of the portions within these subdivisions are of sufficient size to accommodate measures to protect existing dwellings - without the demand to modify adjacent reserve lands. The scattered placement and access to these assets presents particular challenges for fire suppression and protection.

There are also considerable areas adjoining the reserves that have the potential for further subdivision or development. At present some of these areas are naturally vegetated and may be included in planning for fire management zones and strategies within bush fire risk management plans - especially where they adjoin closer settled areas. Current legislation and guidelines include the need to address the risk from bush fire in subdivision design and development approval processes managed by local government. This should recognise the prior and ongoing risk from bush fire and, through inherently safer design approach, lessen the expectation and consequent effect of further demands for fire protection to take place within adjacent reserves. The responsibility for adequate planning for bush fire protection within these newer developments rests with local government.

Whilst the NPWS will undertake its responsibilities to reasonably limit the possible spread of bush fire from adjacent lands, it cannot be expected that fire management regimes and conservation outcomes on existing reserves will be altered to maximise future development outcomes on adjacent lands. Consistent with planning requirements of the Rural Fires Act, development options for these lands will need to recognise the inherent risk from bush fire in such landscapes and continue to include sufficient protective design options within the lands to be developed.

### **1.3.5 - Recreational Use and Facilities**

Most of the reserve's recreational use is focussed on the coastal fringe and along public access routes through or adjacent to the reserves. This use of the reserve is highly seasonal over summer and other holiday periods and largely emanates from the adjacent settlements of Kioloa, Batemans Bay and adjacent villages. These towns and villages are often swelled

with visitors or non-permanent residents who may be unfamiliar with the locality and the associated fire risks.

Recreation use of the reserves includes foreshore and waterway use for beach activities, fishing, vehicle based touring, camping and bushwalking.

NPWS visitor facilities are located at North Head, along beaches north to South Durras, North Durras, Depot Beach, Pebbly Beach, Pretty Beach and Merry Beach including a number of trackheads and carparks. Visitor use is spread across these sites, walking tracks, and along the roads, foreshores and beaches of the reserves. Some visitor use is also generated at sites along the Princes Highway, including the large Spotted Gum "Blotchy" south of Termeil and the former Kioloa State Forest roadside stop near East Lynne.

There are several implications for fire management from this dispersed and seasonal use. These include:

- the primary need to consider visitor safety in fire suppression response,
- communication of risks and appropriate response for casual visitors and isolated villages,
- bush fire preparedness and response information and activities for adjacent neighbours and communities, and
- risk of unplanned ignition from the dispersed use of the reserves and access network.

### **1.3.6 Summary of Key Fire Issues**

The following fire management issues across the Murramarang area are of note.

- The fragmented nature of neighbouring urban settlement throughout fire-prone bushland. Associated with this is the complex mix of land ownership and management along the urban / bushland interface.
- The 'single road-in-and-out' vehicle / emergency access to isolated communities.
- The vulnerability of key infrastructure and routes across bushland to these developed areas. eg power supply and communications.
- The dispersed arrangement of access and dwellings in rural subdivision areas, eg Kioloa, Long Beach and various isolated properties.
- The planning for bush fire risk in the development of areas adjacent to the reserves eg Kioloa, Long Beach, Bawley Point and nearby.
- The options and obligations for cooperative fire management of bushland areas where they are contiguous with the reserves.
- The urban water supplies to remoter villages is not reticulated so local water sources for fire suppression and defence are limited and cannot be relied upon.
- The considerable biodiversity found in these reserves that may be at risk from inappropriate fire regimes, eg – infrequent fire, too frequent fire or inappropriate fire suppression techniques.
- The promotion and maintenance of community / neighbour awareness and preparation with regard to bush fire risk – especially to absentee or casual occupants.
- The need to encourage greater community understanding of the implications of fire management for biodiversity and the limits of achievable fire protection under certain fire weather conditions
- The incidence of 'unplanned fire' arising from arson or careless use of fire.
- The ongoing contribution by the National Parks and Wildlife Service to assist the local Bush Fire Management Committees in developing detailed bush fire risk management plans for areas adjoining the reserves.
- The continuing participation and contribution to the Shoalhaven and Eurobodalla Emergency Management Committees dealing with emergency management and community response.



## Map 1 – Location of the Reserves







## 2. BUSHFIRE RISKS

### 2.1 Introduction

The large number and complexity of assets in and around the reserves mean it is not realistically possible to implement active fire management strategies to protect all assets that could be damaged by extreme wildfire events or inappropriate fire regimes. Bush fire risk analysis has been undertaken to identify those assets most at risk from fire of higher intensity and therefore most in need of the application of active fire management strategies.

For the purpose of this strategy, bush fire risk is defined as *“the chance of a bush fire or inappropriate fire regime occurring and causing damage to assets within or adjacent to the reserves”*.

‘Assets’ include life and property, cultural heritage (such as historic or aboriginal sites) and natural heritage (such as flora, fauna and natural ecosystems).

The method of grading the bush fire behaviour potential and consequent risk of damage is described in the *NPWS Approach to Fire Management Planning (NPWS, Aug 2003)*.

Whilst these methods are based on available climatic, vegetation and terrain data, periods of extreme fire weather and prolonged drought will considerably increase the potential behaviour and damage from bush fire. Under these exceptional conditions the potential risk to the community’s property, natural and cultural assets will increase significantly.

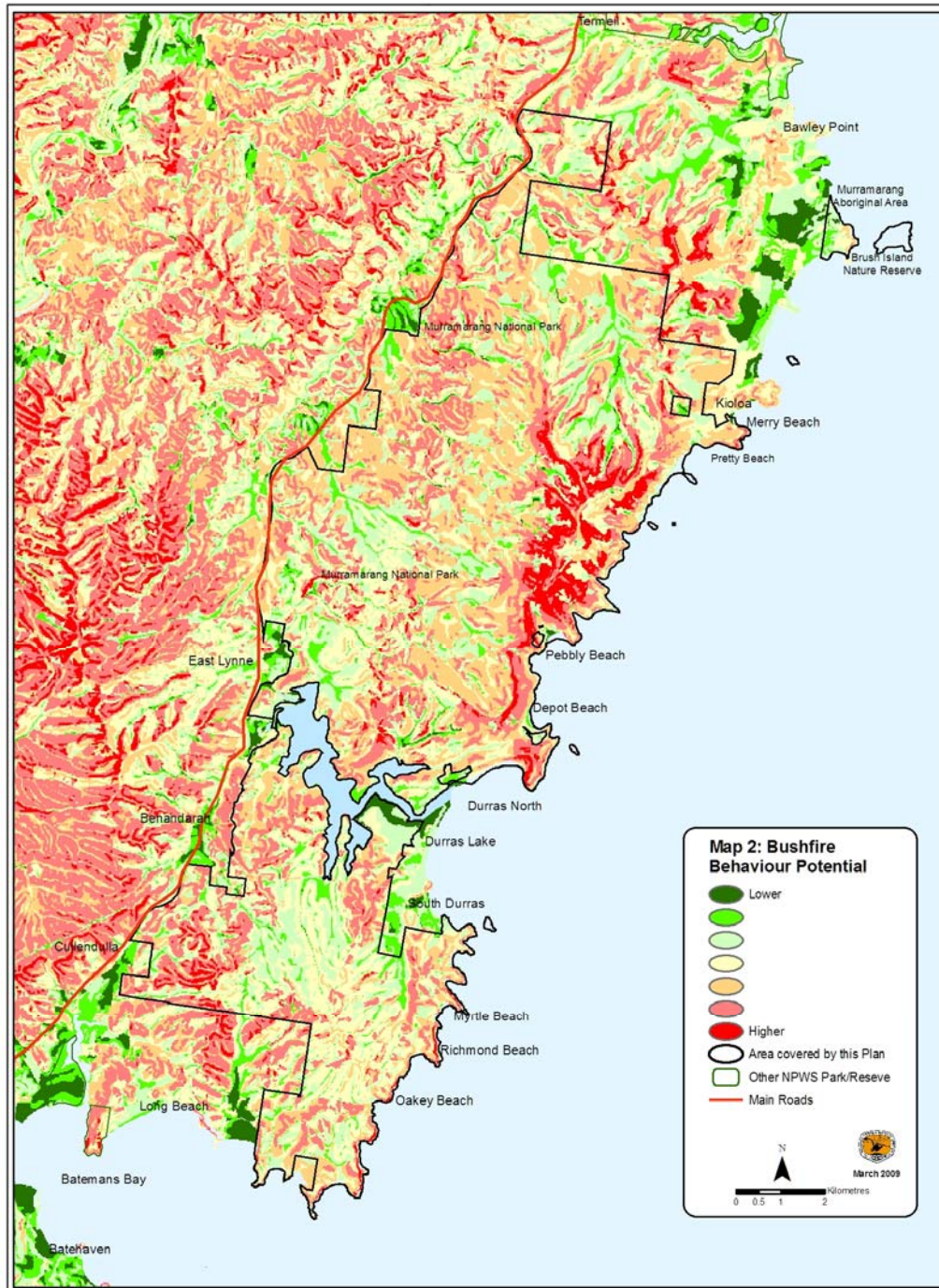
This risk assessment method has been applied to the area within and adjacent to Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves. Life and property, natural and cultural assets within these areas have been sorted into one of the following fire potential / risk classes - *higher, moderate, or lower*.

This strategy will focus on all assets within or adjacent to the reserves where identified in areas of higher bush fire potential.

These areas of higher potential for bushfire impact have been illustrated in Map 2 and strategies to manage this risk within and adjacent to the reserves are identified in the following sections.



**Map 2 – Potential Bush Fire Behaviour map**





## 2.2 Life and Property

Based on the criteria set out in the *NPWS Approach to fire Management Planning (NPWS 2003)*, there are specific locations within Murramarang National Park where life and property are identified within areas at 'higher' risk from bush fire. Generally the other reserves covered by this strategy do not present high fire risk to any assets.

As has been demonstrated in events of extreme fire weather, coupled with prolonged drought, there can be exceptional fire behaviour that can readily breach commonly accepted fire mitigation measures. Under such circumstances, bush fire fuels not normally available, such as in moister vegetation types, may carry intense fire whilst the incidence of spot fires can occur at considerable distance ahead of the fire front.

The risk of life and property damage is exacerbated at the interface between built-up areas and adjoining bushland where there can be a concentration of people and assets. Similarly, key community infrastructure located within fire prone areas is also vulnerable and damage to such facilities may have significant effects on wide areas not directly concerned with fire events. Such sites in and around Murramarang National Park have been identified within Tables 1a, 1b & 1c. (see Maps 3a&b, 4a-g)

### **Table 1a - Sites near Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves identified at higher risk from bush fire.**

(using criteria for fire risk factors in NPWS Strategy for Fire Management 2003)

Feature / Location	Tenure
Urban interface - Depot Beach	Private & NPWS

Though most assets do not directly adjoin the reserves, in places there is a continuum of bushland from the reserve boundary to areas near the assets. For this reason at some locations, it makes sense to extend fire management zoning to include this bushland. The Fire Management Strategy for Murramarang NP, Murramarang Aboriginal Area and nearby island nature reserves can only deal with zoning within the reserves but in such areas the NPWS will support the cooperative approach to planning for and managing bush fire risk currently being promoted by the Eurobodalla and Shoalhaven Bush Fire Management Committees both of which the NPWS is a member.

Such sites include areas listed in Table 1b:

### **Table 1b - Locations near Murramarang National Park and Murramarang Aboriginal Area where detailed cooperative planning for asset protection will be required.**

Feature / Location	Tenure
Urban interface – Kioloa	Private, NPWS, Crown, Shoalhaven City.
Accommodation / bushland interface – Merry Beach and Pebbly Beach	Private & NPWS
Urban interface / accommodation - North Durras	Private, NPWS and Shoalhaven City.
Urban interface - Durras Lake	Private, NPWS and Local Govt.- Eurobodalla
Urban interface and accommodation - South Durras, Long Beach and Maloneys Beach	Private, NPWS and Local Govt.- Eurobodalla

There are also a number of community infrastructure assets within or near the reserves that may be vulnerable to fire.

Such sites include:

**Table 1c - Community Infrastructure in or near the reserves - vulnerable to fire.**

<b>Feature / Location</b>	<b>Owner</b>
Communications Tower – Carls Mountain	Private
Electricity supply feeder lines – North & South Durras	Integral Energy, Southern Energy
Electricity supply lines to South Coast - parallel to Princes Highway	Integral Energy
Visitor Facilities within the reserves	DECC

## 2.3 Cultural Heritage

Although there are a large number of aboriginal cultural sites within Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves not all sites are at risk from bush fire. Based on the criteria set out in the *NPWS Approach to fire Management Planning (NPWS 2003)*, an assessment of the type and location of recorded Aboriginal and Historic cultural sites was undertaken.

A variety of sites have been recorded in the reserves including stone tool scatters, and middens, indicating widespread use of the landscape. No recorded sites were assessed as being directly vulnerable from the effects of bush fire in areas of higher fire potential within Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves. However, a significant threat to sites in all areas can arise from fire suppression operations such as disturbance created by vehicles, earthmoving plant, and creation of hand-tool lines. Erosion arising from disturbance of vegetation / burning in exposed areas is also a potential problem eg Murramarang Aboriginal Area. Some valuable sites may exist that have not yet been recorded.

To limit the risk of this disturbance a number of locations including cultural sites that could be vulnerable to fire control operations have been identified on Operational Maps. Operational guidelines for firefighters and planners aimed at avoiding disturbance are included.

The types of site are not indicated but all sites that are indicated on maps are considered at risk from usual methods of creating fire control lines. The operational maps have been referred to relevant interests and the information is provided with permission. **(Their location is sensitive and these operational maps are not for wider circulation to non-operational personnel.)**

**NB - Not all cultural sites are indicated. Where operations are planned - especially in areas near indicated cultural sites or along routes not previously used, - then planning and operational staff should allow time and resources for preliminary assessment by skilled personnel.**

The indicated site locations may only be approximate. Where there may be limited options for control routes in such areas that may compromise an indicated site, then crew leaders should seek appropriate guidance from skilled and relevant personnel. These concerns should be relayed to the Divisional Commander and Incident Management Team and where disturbance is likely, alternatives should be considered or - where practical to do so - works delayed until appropriate assessment is completed.

It is recognised that at times there will be circumstances where quick action is required under certain conditions to implement control measures. Where possible and if safer success of control is likely, then unnecessary disturbance should be avoided and control options less likely to disturb sites should be employed eg. the use of hose lays and wetlines as opposed to earthmoving machinery at a particular site.

Where likely strategic control options such as useful hand tool routes are identified beforehand or as a result of previous field operations then these should be assessed for sites and mapped as time and resources allow during non-operational periods. These options are to be recorded in access databases available to incident planning teams and where suitable marked on planning map upgrades. (For safety reasons such 'dormant' fire control options cannot be marked on operational maps under current policy).

Similarly, those historic cultural assets at risk from control operations may be identified on operational fire maps and protective strategy options identified. If there is any doubt as to the appropriate measures to be taken or should further cultural assets be identified during operations, then disturbance will be avoided where possible and contact made with the appropriate NPWS representative.

**Table 2 – Cultural sites considered at higher risk from bush fire**

Feature / Location	Tenure
Murramarang Aboriginal Area (from erosion and disturbance as a result of unplanned fire or suppression operations)	NPWS

NB No other specific sites have been identified at higher risk from direct fire – Table 2 may be updated to include possible sites identified during field operations or ongoing survey and evaluation within the reserves.



## 2.4 Natural Heritage

Based on the criteria set out in the *NPWS Approach to fire Management Planning (NPWS 2003)*, there are some vegetation communities in Murramarang National Park at higher risk from inappropriate fire regimes. (See Table 3)

Given the relatively short span of recorded fire history and the diversity of vegetation communities found within the reserves, it is a challenge to assess which sites and communities are at risk from inappropriate fire regimes. Some vegetation may be burned too frequently (*overburnt*) whilst others may require fire to be introduced in order to conserve biodiversity (*underburnt*).

There appear to be vegetation communities that - although the 'time-since-fire' is within the desirable thresholds - may be *vulnerable* to being '*overburnt*' if fire is introduced too soon after the latest fire event. This may be more relevant in areas of former production forest more recently transferred to the reserves in 2000.

Most of these biodiversity concerns related to fire frequency are addressed in the strategies to manage fire within the Land Management Zones (LMZ) where a range of 'times-since-fire' can be managed for in each vegetation community.

Within Strategic Fire Advantage Zones (SFAZ), where a closer watch may be kept on bush fire fuel levels, fire may be introduced towards the lower or more frequent end of the required biodiversity/fire interval thresholds.

In Asset Protection Zones (APZ) fuel conditions are most closely monitored and provided there are not specific identified communities, habitats or species at risk, lower fire frequency thresholds may be exceeded where prescribed fire is considered the best way to manage fuel conditions.

In certain areas it is not recommended to introduce fire at all to sustain biodiversity eg rainforest and wetlands. Such areas are identified as Fire Exclusion Zones (FEZ). It is recognised that it may not be possible to prevent fire from affecting these areas but where possible the introduction of fire should be avoided.

After consideration of the recommended upper and lower fire frequency thresholds needed to sustain biodiversity in vegetation communities and recorded fire history, the following broad scale summary status of fire regimes was revealed – as based on available fire history records.

About 36% of the reserve's vegetation is currently within the recommended and sustainable fire frequency / biodiversity thresholds. Some 16% of the vegetation has been burnt within the past few years with 4% being burnt too frequently to sustain biodiversity (*overburnt*). A further 8% of vegetation may lose biodiversity if fire is applied again within the next few years (*vulnerable*).

A significant proportion - some 33% - may require the application of fire to remain within recommended biodiversity thresholds (*underburnt*) but past disturbance by logging may significantly reduce this requirement depending on species composition of these areas.

A summary of the vegetation communities where biodiversity is at risk as a result of current fire regimes is found in Table 3

Simplistically this assessment indicates that the use of prescribed fire will be a major commitment over the coming seasons in order to create sustainable fire / biodiversity regimes within the reserves.

From a property protection viewpoint, this analysis does not imply that the bushfire hazard in *underburnt* areas is necessarily a problem within these reserves. Overall bush fire fuel quantities reach a steady level after extended periods since fire as fuels are recycled through

decay. The availability of these fuels alter considerably with vegetation structure and seasonal conditions.

The broad aim for the use of prescribed fire for biodiversity management are to sustain a range of 'times-since-fire' or fire/age classes within the desirable upper and lower time limits or 'thresholds' indicated for each of the vegetation communities within the reserves.

First priority will always be given to maintenance of asset protection zones (APZ) and strategic fire advantage zones (SFAZ) in the application of prescribed burning. This will address community bush fire risk management requirements and provide useful advantages when dealing with biodiversity burning for biodiversity in other areas more remote from dwellings and assets.

After a detailed analysis using geographic information systems and on-ground assessment the proposals for conserving the reserves natural heritage using prescribed fire will be set out within the annually reviewed Fire Management Works program.

To better identify appropriate and site-specific fire regimes within the reserves, fire / vegetation monitoring plots may be established in a representative variety of vegetation types with a focus on rare or threatened plant species. These commitments will also be described in the Fire Management Works schedule.

**Table 3. Biodiversity at threat within the reserves (as assessed October 2007).**

Vegetation Community	Area within reserves (ha.)	% of Vegetation community within reserve affected		
		overburnt (burnt too frequently)	vulnerable (to overburning if burnt again within next 5 yrs)	underburnt (overdue - requires fire)
Southern coastal hind dune/headland scrub & southern coastal dune scrub	75			0.3
Northern plateau and escarpment dry forest / heath shrub understorey - <i>Eucalyptus sieberi</i> / <i>Eucalyptus consideniensis</i>	685	2.1	7.1	5.6
Hinterland heath / dry shrub forest - <i>Corymbia gummifera</i> / <i>Syncarpia glomulifera</i>	532	1.2	5.6	21.0
Coastal sands shrub/fern forest - <i>Eucalyptus botryoides</i> / <i>Banksia serrata</i>	162		1.6	1.0
Coastal lowlands dry forest - Cycad / dry shrub understorey - <i>Corymbia maculata</i>	3352	1.0	2.2	40
Sea cliff scrub	29			0.4
Coastal headland heathlands	37		1.0	1.0
South Coast swamp forest complex - <i>Allocasuarina glauca</i>	82	0.3	0.5	0.4
Coastal tall wet heath swamp forest - <i>Allocasuarina glauca</i> / <i>Melaleuca ericifolia</i>	5.5	1.0	0.6	23.0
Southern coastal dune scrub complex & coastal dune herb/swamp complex	3.6			2.4
Northern Coastal hinterland moist shrub forest	5900	28.5	21.5	0.7
Northern Coastal tall wet sedge heath	10.6	0.4	1.4	2.8
<b>Communities where fire should be avoided</b>				
Central Coastal hinterland rainforest and Lowland warm temperate rainforest	261	0.8	3.6	0.3 #
Coastal hinterland gully rainforest	825	0.7	1.7	0.3 #
Sand-Dune wetlands	2.6			
Southern Coastal hinterland dry gully rainforest - <i>Backhousia myrtifolia</i>	29	4.7	1.0	
<b>Whilst these communities are not considered fire prone they may be nevertheless vulnerable to higher intensity fire events after prolonged drought</b>				
Saltmarshes / (Mudflats)	20	25.0	75.0	

NB: Fire records may not be complete and this may skew the amount of vegetation communities considered at risk of being underburnt, particularly where the extent of that vegetation community is limited. In addition, extensive logging history occurring across Murramarang National Park means that there may be a level of disturbance to vegetation communities that may result in similar impacts on species composition of some communities. More detailed analysis is required before a decision is made to burn areas within Land Management Zones to fit their biodiversity fire thresholds.



## 3. BUSH FIRE RISK MANAGEMENT STRATEGIES

### 3.1 Introduction

The fire management strategies identified for the zones in this plan (illustrated in maps 3a to 4g) will be implemented over the life of the plan. These strategies have been designed to reduce the bush fire risk to assets within and adjacent to the reserves (as outlined in section 2 of this strategy)

A Fire Management Works Schedule for works to apply these strategies is being prepared and will be reviewed annually. (See section 3.7 of this strategy)

### 3.2 Fire Management Zones

Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves have been divided into fire management zones according to the zoning system described in the *NPWS Approach to fire Management Planning (NPWS 2003)*. These zones are Asset Protection Zones (APZ), Strategic Fire Advantage Zones (SFAZ), Land Management Zones (LMZ) and Fire Exclusion Zones (FEZ). Where possible the boundaries of fire management zones have been defined by fire control 'advantages' or useful operational boundaries. eg roads, water, or areas of lower bush fire behaviour potential.

It should be noted that the width of Asset Protection Zones as described may vary according to specific site conditions and the consideration of setbacks for existing dwellings (existing at July 2003) as outlined in the guidelines *Planning for Bushfire Protection (2006 and as revised)*

To provide useful boundaries for field operations fire management zone boundaries can logically extend beyond the reserves onto other land tenures especially where bush fire fuels are continuous. There are no strategies proposed in this plan for other land tenures nor can those used by the NPWS be implied for use in the adjacent bushland. Specific fire management strategies for lands outside the reserves are developed by Shoalhaven City Council, private property owners and other fire agencies.

The NPWS South Coast Region will be submitting the fire management zones and strategies for inclusion as part of Bush Fire Risk Management Plans for both Eurobodalla / Far South Coast and Shoalhaven Fire Districts. The Bush Fire Risk Management Plans outline bush fire management strategies across the whole landscape including private property as well as public lands. The NPWS is a participant in that planning process and will seek consistent strategies for lands adjoining the reserves that protect both reserve values and adjacent assets. This planning contribution and works commitment by the NPWS becomes part of the overall strategy for the Shoalhaven and Eurobodalla communities to better understand and live with the risks associated with bush fires in this region.

For the areas where the bushland extends from the reserve boundary to adjacent assets the zone descriptions may indicate the land tenures involved and direct readers to contact the owners / managers of these areas for details concerning fire management activities.

During the life of this strategy, the NPWS will endeavour to seek agreement and further define strategies in these overlap areas so that there is a common understanding of fire management expectations of the community, neighbours, land managers and firefighters alike.

Where there are unresolved differences in management of bush fire risk along adjacent areas the NPWS or neighbours may seek the assistance of the Bush Fire Risk Management Committee in both Eurobodalla and the Shoalhaven to resolve these matters.

## Changes in Fire Management Zone names

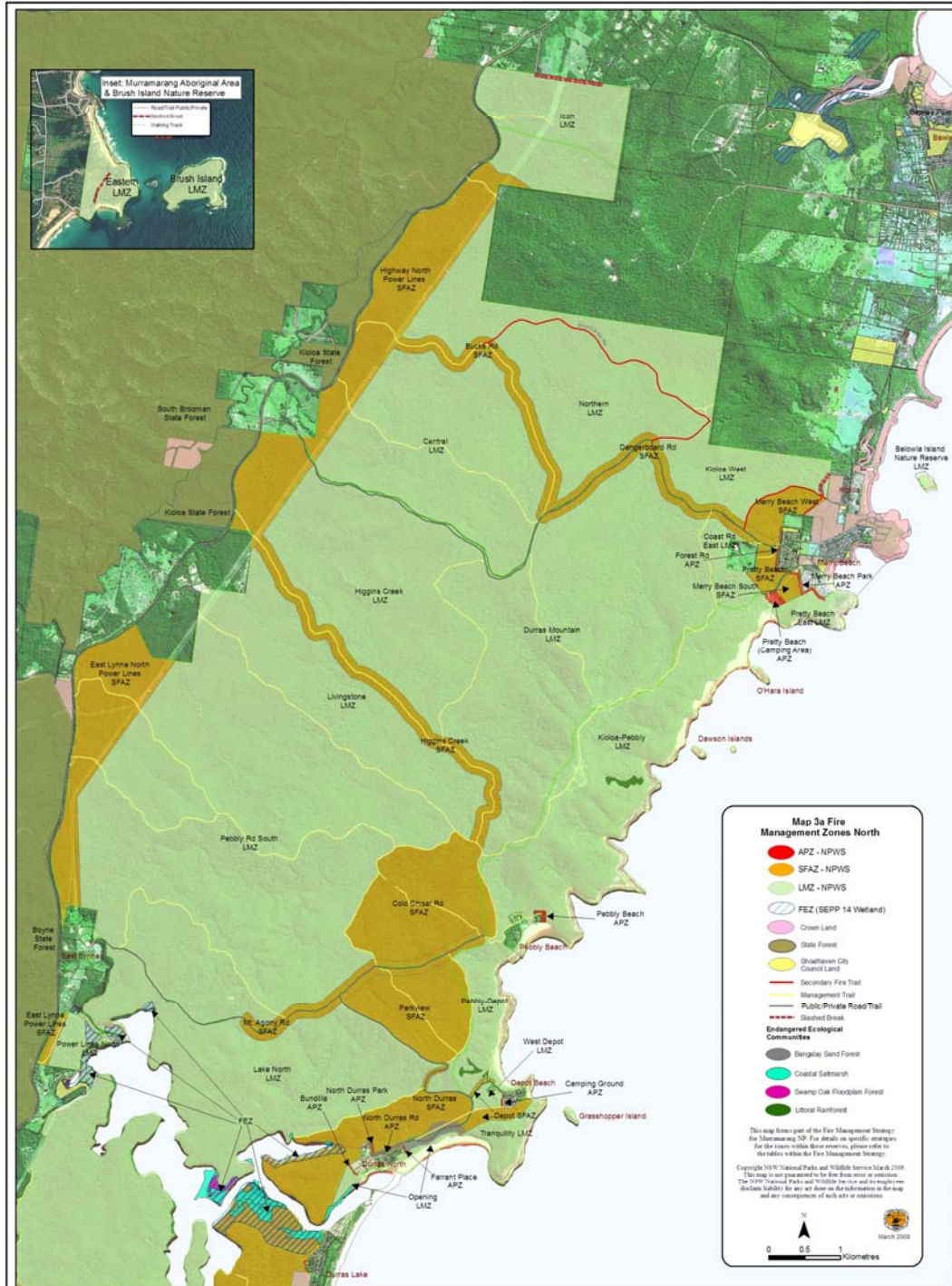
It should be noted that Strategic Fire Management Zones – (SFMZ's) mentioned in *the NPWS Approach to Fire Management Planning (NPWS 2003)* at the time the state-wide strategy was assembled are the equivalent of Strategic Fire Advantage Zones – (SFAZ) used in the current Bush Fire Risk Management Plans for the Shoalhaven and Eurobodalla.

Similarly the term Heritage Management Zone (HMZ) used in that strategy is consistent with the later developed Land Management Zone (LMZ) now used in Bush Fire Risk Management Plans.

In the term SFAZ, "Advantage", refers to the advantage to fire managers and firefighters if fire is managed in these zones according to the strategies suggested.

In a similar way, this plan refers to the number of "slashed breaks" that the NPWS maintains. (see Table 10) . These may also serve the function of a "Radiation Zone" mentioned in the *NPWS Approach to fire Management Planning (NPWS 2003)* but are more easily identified locally as 'slashed areas' or 'slashed breaks'.

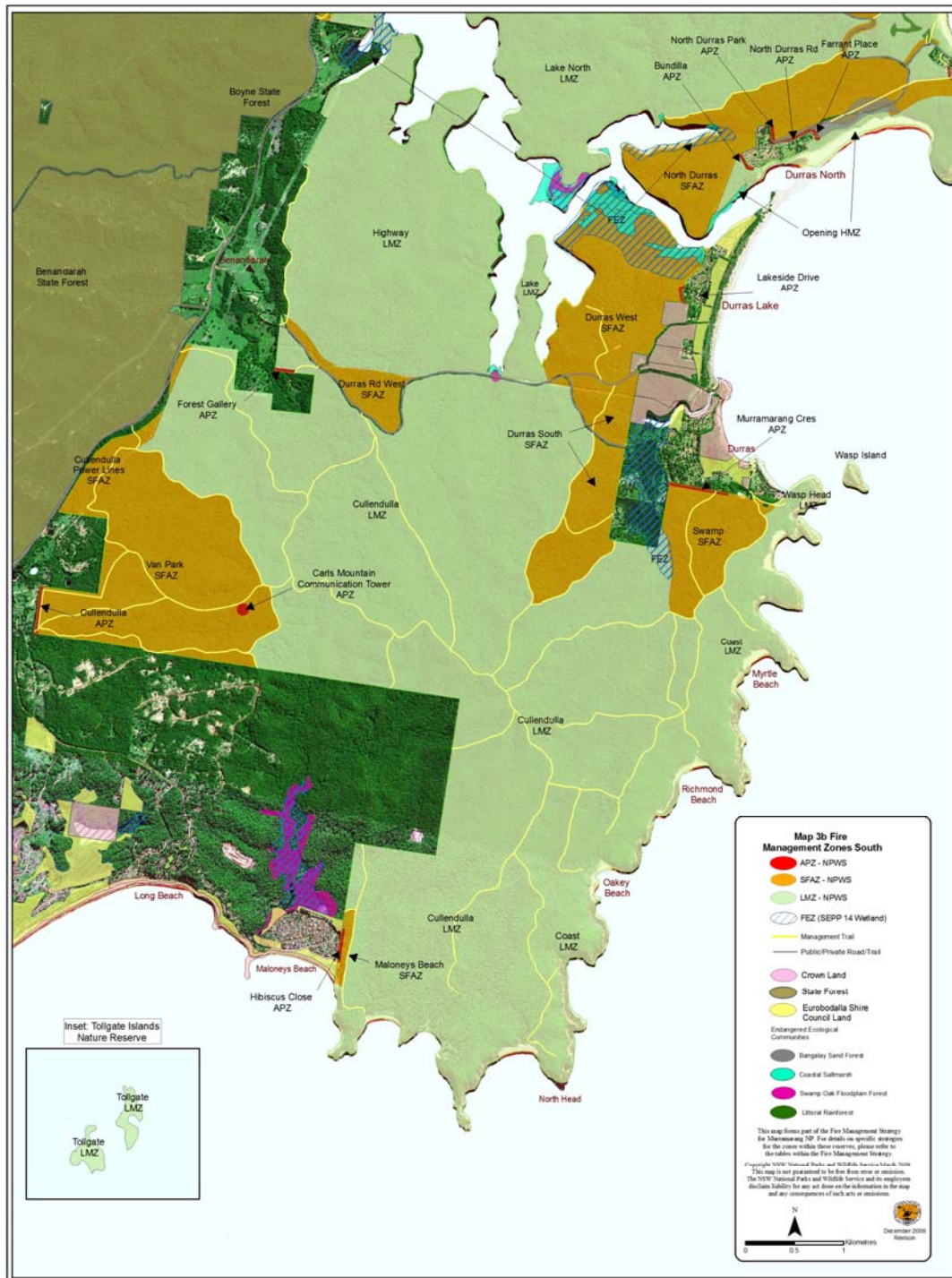
**Map 3a - Fire Management Zones – northern Murramarang National Park, Murramarang Aboriginal Area & Brush and Belowla Island Nature Reserves**







**Map 3b – Fire Management Zones - southern Murramarang National Park and Tollgate Island Nature Reserve.**





**Map 4a – Detailed Bush Fire Management Zone Map – Merry Beach / Kioloa area.**





**Map 4b – Detailed Bush Fire Management Zone Map – Pebbly Beach & Depot Beach areas**





## Map 4c – Detailed Bush Fire Management Zone Map – North Durras area







**Map 4d - Detailed Bush Fire Management Zone Map - Durras Lake area**



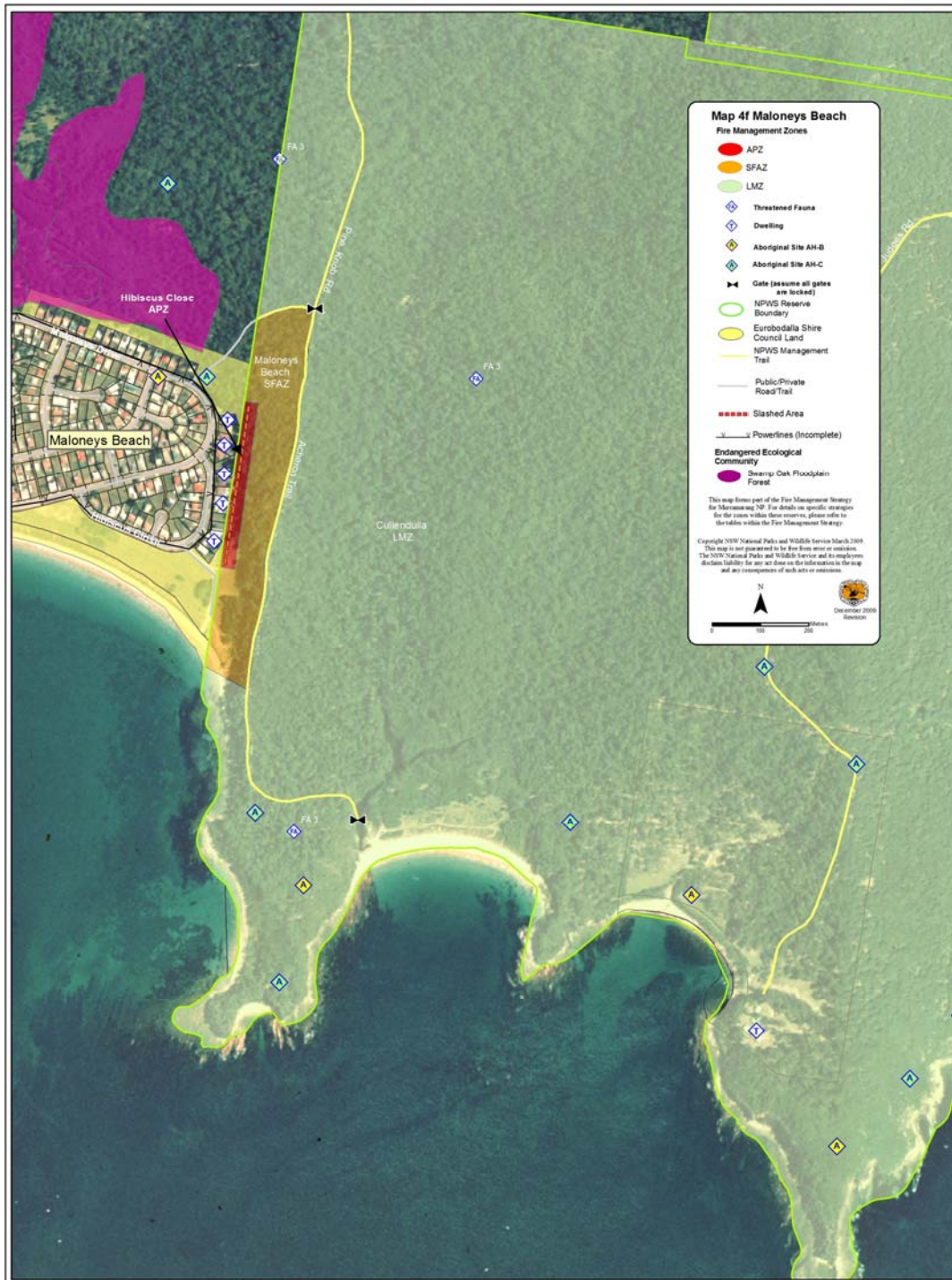


**Map 4e - Detailed Bush Fire Management Zone Map – South Durras area**



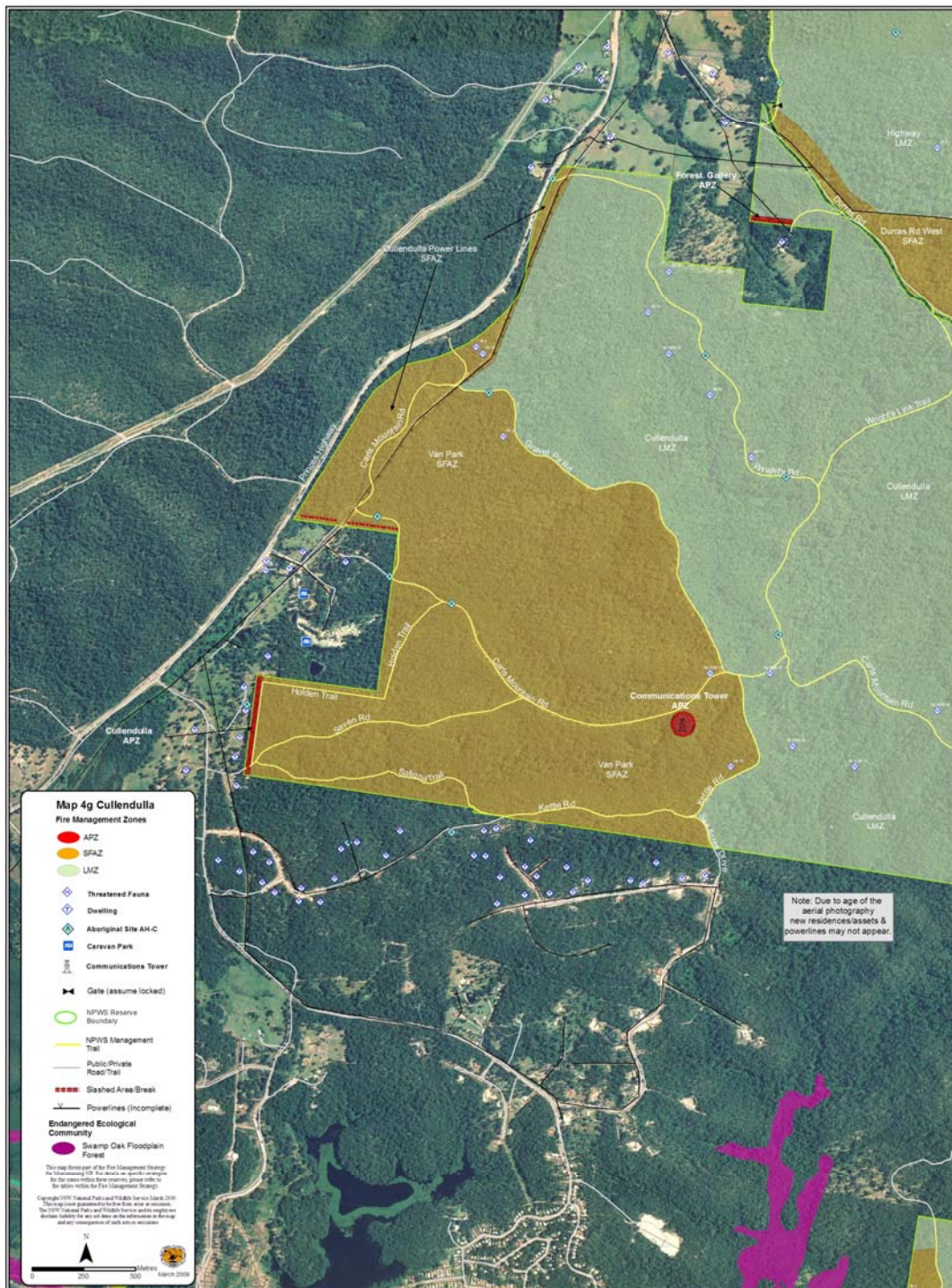


**Map 4f - Detailed Bush Fire Management Zone Map – Maloneys Beach area**





## Map 4g - Detailed Bush Fire Management Zone Map – Cullendulla / Benandarah / Long Beach areas







### **3.2.1 Asset Protection Zones (APZ)**

**Sixteen** asset protection zones have been identified within and around Murramarang National Park, Murramarang Aboriginal Area and nearby island Nature Reserves. (see Maps 3 to 4) The primary fire management objective for asset protection zones is the protection of life and property that may be achieved by applying the strategies as outlined in Table 4 below. Note that the slashed breaks described in Table 10 also contribute to the protection of life and property.

The following APZ have been identified within the reserve:

- Forest Road APZ
- Merry Beach Park APZ
- **Pretty Beach (Camping Area) APZ**
- Pebbly Beach APZ
- Camping Ground APZ
- Farrant Place APZ
- North Durras Road APZ
- North Durras Park APZ
- Bundilla APZ
- Lakeside Drive APZ
- Murramarang Crescent APZ
- Cullendulla APZ
- Forest Gallery APZ
- Hibiscus Close APZ
- Carls Mountain Communication Tower APZ

**Table 4. The specific fire management objectives and strategies for Asset Protection Zones (Maps 3a - 4g)**

**Murramarang National Park APZ - Kioloa / Merry Beach / Pretty Beach area**

Zone ID	Map/s	APZ Name	Zone Area (ha)	Specific Objectives	Strategies
			in reserves		
MMN A1	3a, 4a	<b>Forest Road APZ</b>	2.05 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area along reserve boundary within Murramarang NP – to complement slashed break on adjacent Forest Road Reserve – to a maximum width of 25m from the rear of existing houses.</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual bush fire fuel and slashed area assessment for maintenance and fuel management works required – by end September</li> </ul>
		- north and south of Forest Road and to the west of Glasford Cres, Hapgood Close and Nundera Circuit - Kioloa			
		adjacent areas..			
		<b>Private Property areas</b> - between dwellings and reserve boundary		Contact owner / manager for details of fire management / protection works on private property. See Shoalhaven City Council for owner details – 02 4429 3111	
		<b>Shoalhaven City areas</b> – Forest Road Reserve and area north of Nundera Cct. as mapped		Contact Shoalhaven City Council for details of fire management works – 02 4429 3111	

**Murramarang National Park APZ - Kioloa area**

Zone ID	Map/s	APZ Name	Zone Area (ha.)	Specific Objectives	Strategies
			in reserves		
MMN A2	3a, 4a	<p><b>Merry Beach Park APZ</b></p> <p>- adjoining Merry Beach Caravan Park/Resort accommodation - from Pretty Beach Road eastern and southern sides</p>	4.0ha.	<ul style="list-style-type: none"> <li>• To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>• To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>• To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of a slashed area along the reserve boundary within Murramarang National Park – approx 10m. wide (NPWS)</li> <li>• Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>• Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions and provision of community information.</li> <li>• Seek the cooperation of neighbours and park occupants in watching for unauthorised use of the APZ that may lead to arson, rubbish dumping or compromise emergency personnel and equipment access.</li> <li>• Annual bush fire fuel and slashed area assessment for maintenance and fuel management works required in the APZ – by end September</li> <li>• Maintain liaison with adjacent park management, owners and lessees to encourage adequate bush fire protection measures on site.</li> </ul>

Zone ID	Map/s	APZ Name	Zone Area in reserve	Specific Objectives	Strategies
<b>Merry Beach Park APZ continued...</b>					
<b>MMN A2</b>	<b>3a, 4a</b>	<b>NPWS/DECC leased areas</b> within Murramarang NP at Merry Beach		<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants (within the NPWS leased areas adjoining bushland) from the threat of bushfires.</li> </ul>	<p>Through lease management and liaison seek to have the following strategies applied to leased areas within Murramarang Nat. Park at Merry Beach.</p> <p>In cooperation with the lessee:</p> <ul style="list-style-type: none"> <li>Ensure that when on-site vans within this area become vacant, they are removed from bushland interface. No new on-site vans are permitted within this leased area. Maintenance and some level of improvements may be permitted to NPWS authorised on-site vans remaining in this area. Where this is permitted, NPWS should ensure that enhanced bush fire protection measures are a priority for such works.</li> <li>Identify safely accessible areas for assembly and refuge.</li> <li>Determine process for the development and implementation of a site-specific bush fire response plan to deal with visitor / occupant safety and use of fire protection infrastructure. (esp. casual visitation)</li> <li>Establish a process for the lessee to provide information to occupants on bushfire preparedness and response during times of High fire danger or above. Check this system in place by end September annually.</li> </ul> <p>Contact NPWS / DECC - for details of lease/site management contacts. ( 02 4423 2170)</p>
adjacent areas..					
		<b>Private Property areas</b> - within Merry Beach Caravan Park / Resort		Contact owner / manager for details of fire management / protection works on private property. See Shoalhaven City Council for owner details – 02 4429 3111	
		<b>Dept of Lands</b> - within leased areas		Contact lessee/ management for details of fire protection works and facilities within Park/Resort - Contact – Dept of Lands for details of lease management contacts – 02 4428 6900	
		<b>Shoalhaven City areas -</b> Public Road reserves		Contact Shoalhaven City Council for details of fire management works – 02 4429 3111	

### Murramarang National Park APZ - Kioloa area - Pretty Beach

The following strategies are enabled via site specific management direction by NPWS.

Zone ID	Map/s	Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A3	3a, 4a	Pretty Beach APZ NPWS / DECC managed camping area at Pretty Beach.	1.0 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants of the facility from the threat of bushfires.</li> </ul>	<ul style="list-style-type: none"> <li>Assess site and where required ensure adequate separation of sites, provide sufficient fuel management / boundary setbacks, and fire protection infrastructure. Options include bush fire fuel management and maintenance on site, radiation barriers or hose-reels/sprinklers etc.</li> <li>Identify safely accessible areas for assembly/refuge on site or nearby.</li> <li>Develop and implement a site-specific bush fire response plan to deal with visitor / occupant safety and use of fire protection infrastructure.</li> <li>Provide information to occupants on bushfire preparedness and response during times of <i>High</i> fire danger or above.</li> <li>Annual bush fire protection assessment for management and maintenance works that may be required on the site. – by end September.</li> </ul> <p>-Contact NPWS / Dept of Conservation - ( 02 4454 9500)</p>
adjacent areas					
		Shoalhaven City areas - road reserve west of facility	Contact Shoalhaven City Council for details of fire management works – 02 4429 3111		

**Murramarang National Park - Kioloa area.**

Due to frequent misconceptions about land tenure and fire management responsibilities around Kioloa the tenure of areas between the reserve and dwellings is identified in the following table (these areas may be identified within the local Bush Fire Risk Management Plan as possible SFAZ / APZ zoning and fire protection works – refer to RFS for information). (This identification is current as at July 2007)

Zone ID	Map/s	Area	Contact / Fire management
	3a, 4a	western side of Kioloa <b>Butler St. and north of Forest Road</b> - west of dwellings	
		<b>Private Property</b> - areas on private property between dwellings and road reserve (east side of Butler St. - areas between dwellings and reserve north of Nundera Cct.) and east to adjoining Crown Land.	Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111  Responsibility for individual dwelling APZ maintenance on private property rests with owner/occupant.
		<b>Dept of Lands</b> - areas between NP boundary and Butler Street road reserve as mapped.	Contact – Dept of Lands for details of fire management works – 02 4428 6900
		<b>Shoalhaven City</b> areas - Butler Street road reserve	Contact Shoalhaven City Council for details of fire management works – 02 4429 3111
	3a, 4a	south-western side of Kioloa <b>South of Forest Road to Pretty Beach Road</b>	
		<b>Private Property</b> - areas between dwellings - western side of built-up area and SCC managed reserve.	Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111
		<b>Private Property</b> - areas between dwellings along southern side of built-up area and NP boundary / to Pretty Beach Road reserve.	Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111
		<b>Shoalhaven City</b> areas - narrow reserve west of dwellings – built-up area south of Forest Road.	Contact Shoalhaven City Council for details of fire management works – 02 4429 3111

### Murramarang National Park APZ - Pebbly Beach area...

Dwellings in the Pebbly Beach area are considered in a comparatively safer situation given the vegetation types adjacent to the dwellings, the steeply sloping terrain uphill away from the dwellings, the limited area down-slope between the dwellings and the nearby foreshore and the easterly aspect of the site close to the ocean and beach refuge sites. Greater risks arise from ember attack from drier forest areas to the west and use of the access roads if fire is in the area. Leased/facility areas are not directly included in fire management zones in this plan. Strategies for these areas within the reserves may be enabled by site management processes.

Zone ID	Map/s	APZ Name	Zone Area in reserve/s	Specific Objectives	Strategies
MMN A4	3a, 4b	<b>Pebbly Beach APZ</b> - north/east of NPWS leased land including accommodation and managers facilities. -as mapped	1.35 ha	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these areas.</li> </ul>	<p>Through lease management and liaison seek to have the following strategies applied to leased area within Murramarang Nat. Park at Pebbly Beach. In cooperation with the management of the site...</p> <ul style="list-style-type: none"> <li>Assess site and dwellings and where required determine process to enable adequate fire risk management measures. Options include sufficient setbacks from any fire prone bush areas, maintenance fire fuel free areas adjacent to dwellings, access for firefighters, contingency water supply, bush fire fuel management and maintenance on site, structural assessment to improve fire resistance (where necessary), pumps/hose-reels/sprinklers or other infrastructure etc.</li> <li>Identify safely accessible areas for assembly and refuge</li> <li>Establish a process for the sites managers to provide information to occupants on bushfire preparedness and response during times of <i>High</i> fire danger or above. -Contact NPWS / DECC - for details of lease/site management contacts ( 02 4423 2170)</li> <li>Seek cooperation of managers and local RFS brigades in the monitoring of fire protection measures</li> <li>Annual bush fire protection assessment for management and maintenance works that may be required on the site.</li> </ul>

continued over/-

**Murramarang National Park APZ - Pebbly Beach area - continued...**

<p>MMN A4</p>		<p><b>NPWS / DECC</b> facility areas</p> <p>(- under contract management as of March '08)</p>		<ul style="list-style-type: none"> <li>• To aid in the protection of dwellings and camp-ground occupants from the threat of bushfires.</li> <li>• To aid firefighters in the protection of life and property in these areas.</li> </ul>	<p>Through site direction/contract/lease management and liaison seek to have the following strategies applied to facility areas within Murramarang Nat. Park at Pebbly Beach.</p> <p>In cooperation with the management of the site:</p> <ul style="list-style-type: none"> <li>• Assess site and where required determine adequate fire risk management measures. Options include sufficient site setbacks from fire prone bush areas, separation of sites, access for firefighters, contingency water supply, bush fire fuel management and maintenance on site, building assessment, hose-reels/sprinklers or other infrastructure etc.</li> <li>• Develop and implement site-specific bush fire response plan to deal with visitor / occupant safety and use of fire protection infrastructure.</li> <li>• Identify safely accessible areas for assembly and refuge</li> <li>• Establish a process for the sites managers to provide information to occupants on bushfire preparedness and response during times of <i>High</i> fire danger or above.</li> </ul> <p>- Contact NPWS / DECC - for details of lease/site management contacts ( 02 4423 2170)</p> <p>Generally...</p> <ul style="list-style-type: none"> <li>• Seek cooperation of managers and local RFS brigades in the monitoring of fire protection measures</li> <li>• Annual bush fire protection assessment for management and maintenance works that may be required on the site.</li> </ul>
<p>adjacent areas...</p>					
		<p><b>Private Property</b> - properties to southwest of Pebbly Beach straddling entrance road</p>		<p>These portions have sufficient size to contain appropriate bush fire protection measures to west of dwellings. Area between dwellings and foreshore is within reserve. RFS may provide appropriate assessment and preparedness advice.</p> <p>Contact owner / manager for details of fire management / protection works on private property.</p> <p>- See Shoalhaven City Council for owner details – 02 4429 3111</p>	



### Murramarang National Park APZ - Depot Beach area

Zone ID	Map/s	APZ Name	Zone Area in reserve	Specific Objectives	Strategies
MMN A5	3a & 4b	<b>Camping Ground APZ</b> - On east side Depot Beach camping area to southern end of Carr Street	0.25 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area along the boundary and within NPWS camping area adjoining bushland (where required) – approx. 5m wide adjacent to Carr St.</li> </ul> <p>Through site management apply the following strategies to facility areas within Murramarang Nat. Park at Depot Beach camping area:</p> <ul style="list-style-type: none"> <li>Assess site and where required determine process to enable adequate fire risk management measures. Options include sufficient site setbacks from fire prone bush areas, separation of sites, access for firefighters, contingency water supply, bush fire fuel management and maintenance on site,, hose-reels/sprinklers or other infrastructure improvement etc.</li> <li>Develop and implement a site-specific bush fire response plan to deal with visitor / occupant safety and use of fire protection infrastructure.</li> <li>Identify safely accessible areas for assembly and refuge.</li> <li>Ensure site managers provide information to occupants on bushfire preparedness and response during times of <i>High</i> fire danger or above. Ensure system in place by end September annually.</li> </ul> <p>-Contact NPWS / DECC - for details of lease/site management contacts ( 02 4423 2170)</p> <p>Generally...</p> <ul style="list-style-type: none"> <li>Undertake annual bush fire protection and slashed area assessment for management and maintenance works that may be required</li> </ul>
adjacent areas..					
		<b>Private Property</b> areas between dwellings and Carr St. road reserve		Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111	
		<b>Shoalhaven City</b> areas Carr Street road reserve and RFS fire shed environs		Contact Shoalhaven City Council for details of fire management works – 02 4429 3111 <ul style="list-style-type: none"> <li>If required, undertake cooperative bush fire fuel management with Council/RFS in conjunction with fire management activities within the adjacent Depot SFAZ. ie strip burning to south along road reserve.</li> </ul>	

### Murramarang National Park - Depot Beach Area...Land Tenure

Due to frequent misconceptions about land tenure and fire management responsibilities around Depot Beach the tenure of areas between the reserve and dwellings is identified in the following table (these areas may be identified within the Shoalhaven Bush Fire Risk Management Plan as possible SFAZ / APZ zoning and fire protection works – refer to RFS for information). (This identification is current at July 2007)

Zone ID	Map/s	Area	Contact / Fire management
	3a, 4b	<b>Depot Beach</b> (lands adjoining developed areas)	
		<b>NPWS area</b> - north of Depot Beach Road. - between road reserve and foreshore	This area is within Murramarang National Park but is not within an APZ or SFAZ as the road reserve and area on private property provide for an APZ for dwellings. Given limited area of natural vegetation and erodible soils it is not proposed to use prescribed fire in these areas. There have been problems in this area with the dumping of garden waste and encouragement of understorey scrub as a result of tree/canopy removal. This area is zoned within Pebbly-Depot LMZ.
		<b>Private Property</b> - area within individual dwelling APZs on private property between dwellings and road reserve	Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111  Responsibility for fire protection measures on private property remains the responsibility of property owners. RFS may provide assessment and fire preparedness advice.
		<b>Shoalhaven City</b> areas - Carr Street, Fairley Street and Depot Beach Road - road reserves	Contact Shoalhaven City Council for details of fire management works – 02 4429 3111
		<b>Crown Land</b> areas - a narrow strip of Crown Land on the southern and western side of Carr Street to its junction with Fairley St.	Contact – Dept of Lands for details of fire management works – 02 4428 6900
		<b>NPWS area</b> - area uphill and south of Carr St. road reserve.	This area is within Murramarang National Park - see Depot SFAZ

### Murramarang National Park APZ - North Durras area

Zone ID	Map/s	APZ Name	Zone Area in reserves	Specific Objectives	Strategies
MMN A6	3a & 4c	<b>Farrant Place APZ</b> - - north and east of Farrant Place west to Durras Road	<b>0.4 ha.</b>	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area – in the reserve - along the boundary within Murramarang National Park – to a width extending up to 25m from existing <u>dwellings</u> (not from property boundaries – area within properties is responsibility of owners)</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual bush fire fuel and slashed area assessment for maintenance and fuel management works required in the APZ.</li> </ul>
adjacent areas...					
		<b>Private Property areas</b> - APZ area on private property between dwellings and road reserve boundary - section between the northern end of Farrant Place to Durras Road		Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111  RFS may provide risk assessment and fire preparedness advice.	
		<b>Shoalhaven City areas</b> - road reserve Farrant Place and Durras Road.		Contact Shoalhaven City Council for details of fire management works – 02 4429 3111	

**Murramarang National Park APZ - North Durras area**

Zone ID	Map/s	APZ Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A7	3a & 4c	<b>North Durras Road APZ</b> - Strip along the western side of Durras Road north from caravan park to 25m beyond northern-most house on eastern side of road	1.0 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining Durras Road from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of slashed areas within Murramarang National Park west of and adjoining the road reserve - only where required to meet APZ distances from existing dwellings (2003 guidelines) – this is to complement SCC road reserve management that comprises most of the APZ. NB, Determination of APOZ width <u>includes</u> areas on private property between dwellings and road reserve.</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, garden debris and dumped property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual bush fire fuel and slashed area assessment for maintenance and fuel management works required in the APZ. – by end September</li> <li>Work cooperatively with maintenance of adjacent road reserve to maintain effective APZ.</li> </ul>
adjacent areas....					
		<b>Private Property</b> APZ areas on private property between dwellings and road reserve -properties on eastern side of Durras Rd. between Boyne St. and northeast corner of village.		Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111  RFS may provide risk assessment and fire preparedness advice.	
		<b>Shoalhaven City</b> - Durras Road reserve		Contact Shoalhaven City Council for details of fire management works – 02 4429 3111	

**Murramarang National Park APZ - North Durras area**

Zone ID	Map/s	APZ Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A8	3a & 4c	<p><b>North Durras Park APZ</b> - along the eastern margins of the caravan park to the creekline.</p> <p>Much of this area contains moister forest elements with rainforest areas along the creek margins.</p>	0.7 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of an APZ approx. 10 m wide within the park along the caravan parks eastern boundary. Note this will be in the form of understorey fuel management as opposed to a slashed break due to moist nature of forest type.</li> <li>If required, undertake bush fire fuel management concurrently with fire management activities within the adjacent North Durras SFAZ. i.e. strip burning.</li> <li>Enable clear access for firefighters and limit available fire fuels by defining and marking boundary, clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual assessment for bush fire fuel and slashed area maintenance and fuel management works required.</li> <li>Maintain liaison with adjacent park management lessee to encourage adequate bush fire protection measures. Options include inherent fire resistance of dwellings, sufficient separation and fuel / boundary setbacks, provision of fire protection infrastructure, occupant awareness / preparedness, and response planning etc.</li> </ul>
adjacent areas...					
		<p><b>Dept of Lands</b> areas - leased caravan park areas.</p>		<p>Contact – Dept of Lands for details of lessee contact numbers– 02 4428 6900 Contact lessee / manager for details of fire protection works on site.</p>	
		<p><b>Shoalhaven City</b> areas - unmade road reserve to west of caravan park and across rear of caravan park near creekline.</p>		<p>Contact Shoalhaven City Council for details of fire management works – 02 4429 3111</p>	

**Murramarang National Park APZ - North Durras area...**

Zone ID	Map/s	APZ Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A9	3a & 4c	<b>Bundilla APZ</b> - strip on the northern side of Durras Road along powerline easement then south-east along reserve boundary to lake-side and picnic area. - much of this area adjoining the boundary contains littoral rainforest elements.	1.1 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants of Bundilla Caravan Park adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area along the boundary within Murramarang National Park – approx. 6m. wide (NPWS)</li> <li>Avoid deliberate introduction of fire into littoral rainforest areas southeast along boundary from powerline easement.</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual bush fire fuel and slashed area assessment for maintenance and fuel management works required in the APZ</li> <li>Maintain liaison with adjacent park management, owners and lessees to encourage adequate bush fire fuel management and maintenance on site. Options include inherent fire resistance of dwellings, sufficient separation and fuel / boundary setbacks, provision of fire protection infrastructure, occupant awareness / preparedness, and response planning etc.</li> </ul>
adjacent areas...					
		<b>Dept of Lands</b> areas - leased caravan park		Contact – Dept of Lands for details of lessee contact numbers– 02 4428 6900 Contact lessee / manager for details of fire protection works on site.	
		<b>Private Property</b> areas - between dwellings and reserve boundary - Bundilla Caravan Park		Contact owner / manager for details of fire management / protection works on private property. - See Shoalhaven City Council for owner details – 02 4429 3111	
		<b>Shoalhaven City / Integral Energy</b> - road reserve and powerline easement along northern boundary		Contact Shoalhaven City Council for details of fire management works – 02 4429 3111 Contact Integral energy for details of powerline easement maintenance activities - 02 9853 6666	

### Murramarang National Park - North Durras area...land tenure

Due to frequent misconceptions about land tenure and fire management responsibilities around North Durras the tenure of areas between the reserve and dwellings is identified in the following table (these areas may be identified within the local Shoalhaven Bush Fire Risk Management Plan as possible SFAZ / APZ zoning and fire protection works – refer to RFS for information). (This identification is current at July 2007)

Zone ID	Map/s	Area	Contact / Fire management
	3a, 4c	<b>North Durras area</b>	
		<p><b>NPWS area</b></p> <ul style="list-style-type: none"> <li>- bushland strip between Flinders Road reserve and beach.</li> <li>- between Joalah Caravan Park and beach.</li> <li>- between Durras Road and beach north from Farrant APZ to picnic area track at northern end of beach.</li> </ul>	<p>These areas are all part of Murramarang National Park. It is proposed not to introduce fire for protection purposes to these narrow strips of vulnerable and exposed vegetation near the foreshore.</p> <p>These are part of the Opening LMZ.</p> <p>Fire should only be carefully introduced for biodiversity conservation purposes in the drier woodland sections.</p>
		<p><b>Private Property</b></p> <ul style="list-style-type: none"> <li>- Private APZ areas on private property between dwellings and road reserve</li> <li>- properties on eastern side of Durras Rd. between Boyne St. and northeast corner of village.</li> </ul>	<p>Asset Protection Zones (APZ) for dwellings along Durras Road include the private property on which the dwellings are located and the road reserve itself. Under current guidelines this requires only a small strip of the Nat. Park on the northern side of the road to be treated as an APZ. The area to the north of this strip is part of North Durras SFAZ. (see details for bush fire fuel management)</p> <ul style="list-style-type: none"> <li>- For details of fire management/protection works on private property contact owner / manager.</li> <li>- See Shoalhaven City Council for owner details – 02 4429 3111</li> </ul>
		<p><b>Shoalhaven City areas</b></p> <ul style="list-style-type: none"> <li>- road reserves</li> <li>- Durras Road, Flinders Road, Farrant Place and unmade roads.</li> </ul>	<p>Contact Shoalhaven City Council for details of fire management works – 02 4429 3111</p>

**Murramarang National Park APZ - Durras Lake area...**

Zone ID	Map/s	APZ Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A10	3b, 4d	<b>Lakeside Drive APZ</b> - area within reserve at rear of dwellings.	1.1 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland along the western side of Durras Lake village from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area along the boundary of the reserve where it adjoins the rear of properties off Lakeside Drive – extends to a width of 25 m from existing houses.</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Restriction of unauthorised vehicle access onto APZ to help limit rubbish dumping, arson and maintain access conditions for emergency vehicles.</li> <li>Annual bush fire fuel assessment for maintenance and fuel management works required in the APZ</li> </ul>



### Murramarang National Park - Durras Lake area...land tenure

Due to frequent misconceptions about bushland areas, land tenure and fire management responsibilities around Durras Lake / South Durras the tenure of areas between the reserve and dwellings is identified in the following table. (These areas may be identified within the local Eurobodalla Bush Fire Risk Management Plan as possible SFAZ / APZ zoning and fire protection works – refer to RFS for information). (This identification is current at July 2007)

Zone ID	Map/s	Area	Contact / Fire management
		<b>Private Property</b> - individual dwelling APZ areas on private property between dwellings and reserve	Contact owner / manager for details of fire protection works on private property. - See Eurobodalla Shire Council for owner details – 02 4474 1000
		<b>Dept of Lands</b> areas - areas west of village near Fern Drive	Contact – Dept of Lands for details of fire management works – 02 4428 6900
		<b>Eurobodalla Shire</b> managed areas. - road reserves - Fern Drive and Durras Road etc.	Contact Eurobodalla Shire Council for details of fire management works – 02 4474 1000

**Murramarang National Park APZ - South Durras area**

Zone ID	Map/s	APZ Name	Zone Area in reserves	Specific Objectives	Strategies
MMN A11	3b, 4e	<b>Murramarang Crescent APZ</b> - area within reserve to the south of properties off Murramarang Crescent and west of Old Coast Road - South Durras	1.6 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland - from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area where existing dwellings adjoin the reserve extending to a distance of 20m from the existing dwellings. (2003 guidelines)</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, garden debris and removal of property from slashed areas of the APZ.</li> <li>Restriction of unauthorised vehicle access onto APZ to help limit rubbish dumping, arson and maintain access conditions for emergency vehicles.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual bush fire fuel assessment for maintenance and fuel management works required in the APZ</li> </ul>
adjacent areas ...					
		<b>Private Property</b> areas - west of village and southwest of properties off Murramarang Crescent		Contact owner / manager for details of fire management / protection works on private property. - See Eurobodalla Council for owner details – 02 4474 1000	
		<b>Eurobodalla Shire</b> areas - road reserves - eg Benandarah Road etc.		Contact Eurobodalla Shire Council for details of fire management works – 02 4474 1000	

**Murramarang National Park APZ - Cullendulla area**

Zone ID	Map/s	APZ Name	Zone Area in reserves	Specific Objectives	Strategies
MMN A12	3b, 4g	<b>Cullendulla APZ</b>  - area to the east of properties off Long Beach Road - Cullendulla	1.5 ha.	<ul style="list-style-type: none"> <li>• To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>• To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>• To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of a slashed area along the boundary within Murramarang Nat. Park adjacent to dwellings approx.15m wide (NPWS)</li> <li>• Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>• Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>• Annual bush fire fuel assessment for maintenance and fuel management works required in the APZ</li> </ul>
		<b>Private Property areas</b> - Individual dwelling APZ area on private property between dwellings and reserve boundary.		Contact owner / manager for details of fire management / protection works on private property. - See Eurobodalla Shire Council for owner details – 02 4474 1000	

**Murramarang National Park APZ - Maloneys Beach area**

Zone ID	Map/s	APZ Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A13	3b, 4g	<b>Forest Gallery APZ</b>  - area within reserve near Forest Gallery complex		<ul style="list-style-type: none"> <li>• To aid in the protection of dwellings and occupants adjoining the bushland from the threat of fires</li> <li>• To aid fire fighters in the protection of life and property in the adjoining areas.</li> <li>• To provide a fuel reduced area to aid in bushfire suppression.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of a slashed area to the northwest of the Forest Gallery building complex - within the National Park - extending to a distance of 25m from existing buildings.</li> <li>• Enable clear access for fire fighters and limit available fire fuels by routine slashing.</li> <li>• Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>• Annual bush fire fuel and slashed area assessment for maintenance and fuel management works required in the APZ.</li> </ul>

**Murramarang National Park APZ - Maloneys Beach area**

Zone ID	Map/s	APZ Name	Zone Area	Specific Objectives	Strategies
			in reserves		
MMN A14	3b, 4f	<b>Hibiscus Close APZ</b> - area to the east of Hibiscus Close - Maloneys Beach	1.2 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of dwellings and occupants adjoining the bushland from the threat of bushfires.</li> <li>To aid firefighters in the protection of life and property in these adjoining areas.</li> <li>To provide a fuel reduced area from which firefighters can undertake fuel management in adjoining bushland.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance of a slashed area along the boundary within Murramarang Nat. Park adjacent to dwellings extending to a distance of 25 metres from existing dwellings (2003 guidelines)</li> <li>Enable clear access for firefighters and limit available fire fuels by clearing rubbish, gardening debris and removal of property from the APZ.</li> <li>Seek cooperation of local RFS brigades in the monitoring of APZ fuel conditions, and the assistance of neighbours in watching for unauthorised APZ use that may lead to arson, rubbish dumping or compromise emergency vehicle access.</li> <li>Annual bush fire fuel assessment for maintenance and fuel management works required in the APZ - prior to October</li> </ul>
		<b>Private Property areas</b> - area on private property between dwellings and reserve boundary.		Contact owner / manager for details of fire management / protection works on private property. - See Eurobodalla Shire Council for owner details – 02 4474 1000	

**Murramarang NP – Infrastructure APZ,**

Zone ID	Map/s	APZ Name	Zone Area (ha)	Specific Objectives	Strategies
			in reserves		
Infrastructure APZ,					
MMN A15	3b, 4g	<b>Carls Mountain Communication Tower APZ</b>  - area adjacent to telecommunications tower and enclosure	1.25 ha.	<ul style="list-style-type: none"> <li>To aid in the protection of infrastructure from the threat of bushfires.</li> </ul>	<ul style="list-style-type: none"> <li>Assess protection works and strategies with infrastructure owners to implement appropriate asset protection works.</li> <li>Confirm site management responsibilities and assess strategies for inholding/infrastructure owner to implement asset protection works as a condition of access/occupancy within Murramarang National Park</li> <li>Assess such protection measures that may affect the reserves as per 'Planning for Bush Fire Protection 2006'.</li> </ul>

### **3.2.2 Strategic Fire Advantage Zones (SFAZ)**

Twenty one strategic fire advantage zones have been defined within and around the reserves (Maps 3a – 4g). Primary fire management objectives in strategic fire advantage zones are to complement asset protection zones, reduce the extent of human caused unplanned fires in the reserves and to limit the spread of fire within, from and into the reserves.

Strategic fire advantage zones also contribute to limiting the possibility of extinction of species which are known to occur naturally within the reserves ie - conserving biodiversity. This may be achieved by affording some measure of control over the spread of unplanned fires that might otherwise result in fire regimes that can lead to the extinction of species. This will be achieved by implementing the strategies prescribed in Table 5 in each SFAZ.

Note that the slashed breaks described in Table 10 and the tracks and roads maintained for fire management purposes – Table 11- also serve an important role in preventing the spread of bushfire within, from, and into the reserves. The Shoalhaven and Eurobodalla Bush Fire Risk Management Plans may complement this strategy where fire management zoning outside the reserves on local government, land management agency or private lands are identified.

Where there is a continuum of bushland between the reserve and more closely settled areas there is often a misconception that the bushland is managed by the NPWS. Where SFAZ in this plan are adjoined by bushland areas - off the reserve - that can lead to this misunderstanding, the tenure of the adjacent areas adjoining the reserve has been identified. Fire management activities for these areas may be obtained by contacting the owner or manager for the identified area.

To enable a consistent approach across the landscape, bush fire risk management planning is also undertaken by the local Bush Fire Management Committee of which the NPWS is a member. The zone approach used by the NPWS in this strategy is the same as used in the local Bush Fire Risk Management Plan and the zones within the reserves will form part of those Plans for the Eurobodalla and Shoalhaven. For details on this planning, contact local Rural Fire Service representatives.

Strategic Fire Advantage Zones (SFAZ) are similar in purpose to Strategic Fire Management Zones (SFMZ) used in the NPWS Strategy for Fire Management (2003). The word 'advantage' in this name refers to the zone objectives for providing a useful advantage to fire fighters.

The following tables identify each Strategic Fire Advantage Zone and outline the objectives and strategies to be applied in that zone. Maps 3a – 4g show the location and extent of these zones.

Strategic Fire Advantage Zones identified within Murramarang National Park, Murramarang Aboriginal Area etc are listed overleaf.

- Merry Beach West SFAZ – 43.4ha.
- Merry Beach South SFAZ – 8.8ha.
- Pretty Beach SFAZ – 17.3ha.
- Cold Chisel Road SFAZ – 248.0ha.
- Parkview SFAZ – 159.0ha.
- North Durras SFAZ – 180.0ha.
- Depot SFAZ – 19.0ha.
- Highway North Powerlines SFAZ – 375.0ha.
- East Lynne North Powerlines SFAZ – 218.0ha.
- East Lynne Powerlines SFAZ – 9.0ha.
- Bucks Road 'strip' SFAZ – 82.0ha.
- Dangerboard Rd. 'strip' SFAZ – 80.0ha.
- Higgins Creek 'strip' SFAZ – 121ha.
- Mt. Agony Rd, 'strip' SFAZ – 74.0ha.
- Durras West SFAZ – 193.0ha.
- Durras South SFAZ – 102.0ha.
- Swamp SFAZ – 89.0ha.
- Cullendulla Powerlines SFAZ – 32.0ha.
- Van Park SFAZ – 303.0ha.
- Maloneys beach SFAZ – 14.0ha.
- Durras Road West SFAZ – 37.0ha.



**Table 5 - The specific fire management objectives and strategies for each of the Strategic Fire Advantage Zones  
Murramarang National Park SFAZ**

**Merry Beach West SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S16	3a & 4a	<p><b>Merry Beach West SFAZ</b></p> <p>- west of Merry Beach village and north of Dangerboard Road.</p>	43.4 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires to the west of Kioloa.</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Monitor unauthorised vehicle access along identified access routes or slashed breaks that are normally closed to public use. This is needed to help limit the opportunity for arson and rubbish dumping, or to avoid damage to tracks that in turn may prevent ready access by emergency vehicles.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands.</li> </ul>

### Murramarang National Park SFAZ

Zone ID	Map/s	SFAZ Name	Specific Objectives	Strategies
<b>Merry Beach West SFAZ</b> continued ...				
adjacent areas....				
		Private Property area adjoining the zone - off Dangerboard Road	For information on bush fire management activities for this area - Contact Shoalhaven City Council for owner details – 02 4429 3111	
		Shoalhaven City area adjoining the zones - road reserves (including Dangerboard Rd)	For information on bush fire management activities for this area - Contact Shoalhaven City Council – 02 4429 3111	

Murramarang Nat. Park SFAZ continued

**Merry Beach South SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S17	3a & 4a	Merry Beach South SFAZ - area between Pretty Beach Road and Snapper Point to south and east of caravan parks.	8.8 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires to the south of Merry Beach and north of Pretty Beach.</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Avoid the introduction of fire to headland / dune vegetation within or adjoining this zone.</li> <li>Maintain identified access routes and slashed breaks within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Monitor unauthorised vehicle access along adjoining slashed breaks (normally closed to public use) in order to help limit the opportunity for arson, rubbish dumping, and to avoid damage to access routes that in turn may prevent ready access by emergency vehicles.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands - Merry Beach caravan park operators.</li> </ul>
adjacent areas....					
		Shoalhaven City area adjoining the zone - Pretty Beach Road reserve		For information on bush fire management activities for this area - Contact Shoalhaven City Council – 02 4429 3111	

Murramarang Nat. Park SFAZ continued

**Pretty Beach SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S18	3a & 4a	<p><b>Pretty Beach SFAZ</b></p> <p>- area north west of Pretty Beach camping area to Dangerboard Rd.</p>	17.3 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires west of built-up areas between Dangerboard Rd. and Pretty Beach Rd.</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Avoid the introduction of fire to areas with rainforest elements and adjoining foreshores.</li> <li>Maintain identified access routes and slashed breaks within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> </ul>
adjacent areas...					
		Shoalhaven City area adjoining the zone - Pretty Beach Road reserve		For information on bush fire management activities for this area - Contact Shoalhaven City Council – 02 4429 3111	

Murramarang Nat. Park SFAZ continued

**Cold Chisel Road SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S19	3a & 4b	<p><b>Cold Chisel Road SFAZ -</b> area to west of Pebbly Beach.</p> <p>This area includes water catchment /storage that supplies Pebbly Beach.</p>	248 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires to the west of Pebbly Beach.</li> <li>To maintain a strategically useful water storage and access point.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Where possible avoid the introduction of fire to creekline margins.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Seek improvement for the protection of essential infrastructure within the SFAZ eg slashing along public access routes and near water storage access points.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholder, (SCC), so that effective bush fire risk management is maintained across the SFAZ and the Mount Agony road reserve.</li> </ul>

Murramarang Nat. Park SFAZ continued

**Parkview SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S20	3a & 4b	<p><b>Parkview SFAZ</b></p> <p>- northwest of Depot Beach, south of Mt. Agony Road and North Durras Rd.</p> <p>- includes strip approx. 50m. wide either side of North Durras Road between Parkview Road and Lake Road.</p>	159 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires west of Depot Beach and Pebbly Beach</li> <li>To provide protection to rainforest areas in the Pebbly-Depot LMZ</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Avoid the introduction of fire to rainforest areas within this zone.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholder, SCC, so that effective bush fire risk management is maintained across the SFAZ and adjoining Mount Agony and North Durras road reserves.</li> </ul>

Murramarang Nat. Park SFAZ continued

**North Durras SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S21	3a & 4b	<p><b>North Durras SFAZ</b></p> <p>- northwest of North Durras village between Lake Road and North Durras Road and southwest to foreshores of Lake Durras</p>	180 ha.	<ul style="list-style-type: none"> <li>• To assist in the strategic control and containment of bush fires between to the northwest of Durras North village</li> <li>• To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> <li>• To complement APZ works undertaken within and around Durras North village</li> <li>• To reduce possible ember attack to Durras North village from bushfires in zone.</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Avoid the introduction of fire to wetland or rainforest areas and EECs identified within this zone.</li> <li>• Maintain identified access routes and slashed breaks within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>• Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>• Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>• Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>• Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg Shoalhaven City – North Durras Road reserve.</li> </ul>

Murramarang Nat. Park SFAZ continued

**Depot SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S22	3a & 4b	<p><b>Depot SFAZ</b></p> <p>-southeast of Depot Beach village between headland and North Durras Road. – (approx 150m deep)</p> <p>- also includes strip on the northern side of Depot Beach Road – approx. 50m. wide - between North Durras Road and entrance to Depot Beach day use area.</p>	19 ha.	<ul style="list-style-type: none"> <li>• To assist in the strategic control and containment of bush fires to the south and west of Depot Beach and access road.</li> <li>• To restrict the movement of fires between neighbouring lands and NPWS managed areas.</li> <li>• To complement APZ works undertaken within and around Depot Beach village.</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Carefully consider the introduction of fire to EECs within the zone.</li> <li>• Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>• Seek improvement for the protection of essential infrastructure within the SFAZ eg slashing along powerline routes and around power-poles.</li> <li>• Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>• Monitor unauthorised vehicle access along identified access routes or slashed breaks (normally closed to public use) in order to help limit the opportunity for arson, rubbish dumping, and to avoid damage to tracks that in turn may prevent ready access by emergency vehicles.</li> <li>• Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>• Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>• Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg Crown Lands to south of village and Shoalhaven City – Carr St and North Durras Rd. reserves.</li> </ul>



**Murramarang National Park SFAZ**

Zone ID	Map/s	SFAZ Name	Specific Objectives	Strategies
<b>Depot Beach SFAZ</b> continued ...				
adjacent areas...				
		<b>Private Property</b> – areas between dwellings and road reserves/SCC managed Crown Land areas adjoining the zone	For information on bush fire management activities for this area - Contact Shoalhaven City Council for owner details – 02 4429 3111	

## Murramarang National Park SFAZ

### *Highway North Power Lines SFAZ*

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S23	3a	<p><b>Highway North Power Lines SFAZ</b></p> <p>- east of the Princes Hwy. to power line easement</p>	375 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires adjacent to the Princes Highway</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas.</li> <li>To complement infrastructure protection works undertaken along the powerline easement.</li> <li>To complement fire protection works undertaken on private property adjacent to the reserve.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland along the Princes Hwy.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. RTA – Princes Hwy. and private property.</li> </ul>

Murramarang National Park SFAZ

**East Lynne North Power Lines SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S24	3a	<p><b>East Lynne North Power Lines SFAZ</b></p> <p>- east of the Princes Hwy. to powerline easement north of East Lynne to vicinity of East Lynne Store.</p>	218 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires adjacent to the Princes Highway</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas.</li> <li>To complement infrastructure protection works undertaken along the powerline easement.</li> <li>To complement fire protection works undertaken on private property adjacent to the reserve.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland along the Princes Hwy.</li> <li>Seek to exclude fire from the East Lynne Midge Orchid research area adjacent to north side of Maidens Rd.</li> <li>Maintain identified access routes and slashed breaks within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>Seek improvement for the protection of essential infrastructure within the SFAZ eg slashing along powerline routes and around power-poles.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. RTA – Princes Hwy. and private property.</li> </ul>

## Murramarang National Park SFAZ

### *East Lynne Power Lines SFAZ*

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S25	3a	<p><b>East Lynne Power Lines SFAZ</b></p> <p>- east of the Princes Hwy. to powerline easement, south of East Lynne</p>	9 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires adjacent to the Princes Highway</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas.</li> <li>To complement infrastructure protection works undertaken along the powerline easement.</li> <li>To complement fire protection works undertaken on private property adjacent to the reserve.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland along the Princes Hwy.</li> <li>Maintain identified access routes and slashed breaks within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>Seek improvement for the protection of essential infrastructure within the SFAZ eg slashing along powerline routes and around power-poles.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. RTA – Princes Hwy. and private property.</li> </ul>

**Murramarang National Park – northern areas - ‘Strip’ SFAZ**

**Bucks Road SFAZ, Dangerboard Rd. SFAZ, Higgins Creek SFAZ, Mount Agony Rd. SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S26	3a	<b>Bucks Road SFAZ</b> - approx 100m both sides of Bucks Rd.	82 ha.	<ul style="list-style-type: none"> <li>To assist in the control and containment of bush fires using strategically useful routes linking other SFAZ and containment features.</li> <li>To limit opportunities for spread of bushfire from arson along popular public access routes.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent strips adjacent to identified routes to provide a sequence of fuel reduced bushland.</li> <li>Prescribed conditions and timing should aim for strip burning to self extinguish at a distance of about 100m from the road.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages along the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Dangerboard road reserve.</li> </ul>
MMN S27		<b>Dangerboard Rd. SFAZ</b> - approx 100m both sides of Dangerboard Rd. from Kioloa to Bucks Rd	80 ha.		
MMN S28		<b>Higgins Creek SFAZ</b> - approx 100m both sides of Higgins Creek Road	121 ha.		
MMN S29		<b>Mount Agony Rd. SFAZ</b> - approx 100m both sides of Mt Agony Rd. where mapped	74 ha.		

**Murramarang National Park SFAZ**

***Durras West SFAZ***

<b>Zone ID</b>	<b>Map/s</b>	<b>SFAZ Name</b>	<b>Zone Area(ha)</b>	<b>Specific Objectives</b>	<b>Strategies</b>
<b>MMN S30</b>	<b>3b &amp; 4d</b>	<b>Durras West SFAZ</b>  - west of Durras lake village between Durras Road and Durras Lake	<b>193 ha.</b>	<ul style="list-style-type: none"> <li>• To assist in the strategic control and containment of bush fires west of Durras Lake village.</li> <li>• To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> <li>• To complement APZ works undertaken within and around Durras Lake village</li> <li>• To improve protection to adjacent wetland areas</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland.</li> <li>• Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>• Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>• Monitor unauthorised vehicle access along identified access routes or slashed breaks (normally closed to public use) in order to help limit the opportunity for arson, rubbish dumping, and to avoid damage to tracks that in turn may prevent ready access by emergency vehicles.</li> <li>• Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>• Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>• Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Crown Land areas</li> </ul>

### Murramarang National Park SFAZ

Zone ID	Map/s	SFAZ Name	Specific Objectives	Strategies
<b>Durras West SFAZ</b> continued ...				
adjacent areas....				
	<b>3b</b>	Private Property area adjoining the zone	For information on bush fire management activities for this area - Contact Eurobodalla Shire Council for owner details – 02 4474 1000	
		Crown Land area adjoining the zone - extensive areas of Crown Land between Durras Lake and South Durras villages.	For information on bush fire management activities for this area - Contact – Dept of Crown Lands – 02 4428 6900	

## Murramarang National Park SFAZ

### *Durras South SFAZ*

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S31	3b & 4e	<b>Durras South SFAZ</b>  - west of private property and Crown Land adjoining South Durras village	102 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires west of South Durras</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Assess the possibility of creating small water storages as part of roadside drainage structures to aid in fire suppression response.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Private Property owners to east and adjacent Crown Lands.</li> </ul>



### Murramarang National Park SFAZ

Zone ID	Map/s	SFAZ Name	Specific Objectives	Strategies
<b>Durras South SFAZ</b> continued ...				
adjacent areas....				
	<b>3b</b>	Private Property - area to the east of the zone containing extensive wetland areas adjoining village.	For information on bush fire management activities for this area - Contact Eurobodalla Shire Council for owner details – 02 4474 1000	
		Crown Land - area adjoining the zone - areas of Crown Land between Durras Lake and South Durras villages.	For information on bush fire management activities for this area - Contact – Dept of Crown Lands – 02 4428 6900	

## Murramarang National Park SFAZ

### Swamp SFAZ

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S32	3b & 4e	<b>Swamp SFAZ</b>  - south of South Durras village	89 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires to south of South Durras village</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> <li>To complement APZ works undertaken along reserve boundary near Murramarang Crescent.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Assess the possibility of creating small water storages as part of roadside drainage structures to aid in fire suppression response.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders and managers so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Leaseholders for NPWS leased areas at Murramarang Resort and neighbours adjoining the reserve off Murramarang Crescent.</li> </ul>

### Murramarang National Park SFAZ

Zone ID	Map/s	SFAZ Name	Specific Objectives	Strategies
<b>Swamp SFAZ</b> continued ...				
adjacent areas....				
	<b>3b</b>	Leased area of Murramarang National Park - area adjoining the zone	Leased area of National Park is not included within fire management zones for this strategy. An individual fire prevention/response/management plan is being prepared for the leasehold area. This recognises both on-site fire protection measures and risk from bush fire. For information on bush fire management activities for this area - Contact NPWS Ulladulla Area office for details of fire management within the leased area – 02 4454 9500	
		Private Property area adjoining the zone to west.	For information on bush fire management activities for this area contact owners. - Contact Eurobodalla Shire Council for owner details – 02 4474 1000	

Murramarang National Park SFAZ

**Cullendulla Power Lines SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S33	3b	<p><b>Cullendulla Power Lines SFAZ</b></p> <p>- east of the Princes Hwy. to powerline easement, south of Benandarah</p>	32 ha.	<ul style="list-style-type: none"> <li>To assist in the strategic control and containment of bush fires adjacent to the Princes Highway</li> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas.</li> <li>To complement infrastructure protection works undertaken along the powerline easement.</li> <li>To complement fire protection works undertaken on private property adjacent to the reserve.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland along the Princes Hwy. Where possible avoid the introduction of fire to creekline margins.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Tables 11.</li> <li>Consider the safety of travellers along the Princes Hwy. and public access routes in any prescribed burning or initial response to bushfire in the area.</li> <li>Seek improvement for the protection of essential infrastructure within the SFAZ eg slashing along powerline routes and around power-poles.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. RTA – Princes Hwy. and private property.</li> </ul>

## Murramarang National Park SFAZ

### Van Park SFAZ

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S34	3b & 4g	<p><b>Van Park SFAZ</b></p> <p>- Area east of Cullendulla to Carls Mountain and north of rural - residential part of Long Beach.</p>	322 ha.	<ul style="list-style-type: none"> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> <li>To assist in the strategic control and containment of bush fires east of Cullendulla and northwest of rural residential areas off Long Beach Road.</li> <li>To complement APZ works undertaken within and around Cullendulla APZ and Carls Mountain Communications Tower APZ.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. .</li> <li>Maintain identified access routes and slashed breaks within the SFAZ for use under appropriate conditions - see Tables 10 &amp; 11.</li> <li>Consider extensive bushland and isolated dwellings on rural residential subdivisions adjoining the zone in any initial response to bushfire in the area.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Assess the possibility of creating small water storages as part of roadside drainage structures to aid in fire suppression response.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Private property to west and south.</li> </ul>

### Murramarang National Park SFAZ

Zone ID	Map/s	SFAZ Name	Specific Objectives	Strategies
<b>Van Park SFAZ</b> continued ...				
adjacent areas....				
		Private Property - area adjoining the zone to east of Cullendulla and - rural subdivisions off Long Beach Road	For information on bush fire management activities for this area contact the owners - Contact Eurobodalla Shire Council for owner details – 02 4474 1000	
		RTA -area adjoining the zone – Princes Highway road reserve.	For information on bush fire management activities for this area - Contact the local operational office for the Roads and Traffic Authority.	

## Murramarang National Park SFAZ

### **Maloneys Beach SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S35	3b & 4f	<b>Maloneys Beach SFAZ</b>  - area to west of Hibiscus Close – Maloneys Beach	14 ha.	<ul style="list-style-type: none"> <li>To restrict the movement of fires between neighbouring lands and NPWS managed areas</li> <li>To assist in the strategic control and containment of bush fires between Long Beach / Maloneys Beach area and North Head.</li> <li>To complement APZ works undertaken within and around Hibiscus Close</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent areas to provide a mosaic of fuel reduced bushland. Avoid burning steep sections of bushland adjoining Acheron Trail as regular burning may make these slopes unstable and increase erosion.</li> <li>Maintain identified access routes within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, gates, information signs, identified water points, etc.</li> <li>Monitor unauthorised vehicle access along identified access routes or slashed breaks (normally closed to public use) in order to help limit the opportunity for arson, rubbish dumping, and to avoid damage to tracks that in turn may prevent ready access by emergency vehicles.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages within the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Assess the possibility of creating small water storages as part of roadside drainage structures to aid in fire suppression response.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Eurobodalla Shire – access management off Hibiscus Close – Maloneys Beach.</li> </ul>

### Murramarang National Park SFAZ

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
Maloneys beach SFAZ continued...					
adjacent areas....					
		Private Property - area adjoining the zone to west		For information on bush fire management activities for this area contact owners. - Contact Eurobodalla Shire Council for owner details – 02 4474 1000	



**Murramarang National Park – southern areas - ‘Strip’ SFAZ**

**Durras Road West SFAZ**

Zone ID	Map/s	SFAZ Name	Zone Area(ha)	Specific Objectives	Strategies
MMN S36	3b & 4g	Durras Road West SFAZ - 100m both sides of Durras Drive	37 ha.	<ul style="list-style-type: none"> <li>To assist in the control and containment of bush fires using strategically useful routes linking other SFAZ and containment features.</li> <li>To limit opportunities for spread of bushfire from arson along popular public access routes.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake burning under prescribed conditions where required within the reserve - as indicated by fire hazard assessments and biodiversity maintenance requirements. This will focus on sequential burning of non-adjacent strips adjacent to identified routes to provide a sequence of fuel reduced bushland. Avoid the introduction of fire to creek margins or EEC along this route.</li> <li>Prescribed conditions and timing should aim for strip burning to self extinguish at a distance of about 100m from the road.</li> <li>Maintain identified access routes and slashed areas within the SFAZ for use under appropriate conditions - see Table 11.</li> <li>Review annual fire management works program following a post-season assessment of bush fire fuel, fire history, biodiversity thresholds, habitat conservation and the condition of fire control advantages within the zone such as fire access tracks, slashed areas, information signs, identified water points, etc.</li> <li>Assess the possibility of creating small water storages as part of roadside drainage structures to aid in fire suppression response.</li> <li>Undertake an annual pre-season review of identified key fire access tracks and other fire suppression advantages along the SFAZ with advice on conditions circulated to local and regional fire emergency agencies.</li> <li>Seek cooperation of local RFS brigades in the monitoring and reporting of SFAZ fuel and access conditions.</li> <li>Maintain cooperative management and communication with adjoining landholders so that effective bush fire risk management is maintained across the SFAZ and adjoining lands eg. Eurobodalla Shire – managers of Durras Drive road reserve.</li> </ul>



### **3.2.3 Land Management Zones (LMZ)**

Twenty six Land Management Zones have been defined within and around the reserves. These are listed in Table 9 (Maps 3a & b, 4a to 4g). The primary fire management objectives in Land Management Zones are to prevent the extinction of all species which are known to occur naturally within the reserves – i.e. conserve biodiversity – and to protect Aboriginal and historic heritage sites.

Except where noted otherwise, these objectives will be achieved by:

- Containing and where achievable, suppressing bushfires, and where necessary, conducting prescribed burns to maintain fire regimes within biodiversity thresholds specified in Table 6.
- Implementing the threatened species and cultural heritage management guidelines specified in Table 7 and 8 in locations where threatened species and cultural heritage sites are known or likely to occur

When manipulating fire regimes (by suppressing fires and conducting prescribed burns) to conserve biodiversity within these land management zones, managers will take account of the status of fire regimes across all fire management zones in the reserves. This should ensure regard for the maintenance of biodiversity within the reserves and particularly applies to Asset Protection and Strategic Fire Advantage Zones where fire is more likely to be deliberately introduced. Due to the emphasis on fire protection aspects in these zones, fire frequency and other strategies prescribed for these areas may see the possibility of an adverse impact on biodiversity within these zones.

As can be seen from Table 6 the vegetation types and communities within these reserves are both diverse and complex. The information on vegetation types comes from a number of sources over a number of surveys as land has been added to the reserves. One of the important objectives for reserve management will be to reassess these vegetation classification systems to provide a uniform appreciation of vegetation complexity across the reserves. This work is currently in progress.

From records, the only observed “natural” cause of fires is occasional lightning. Within LMZ it may be possible to prevent unnecessary damage or disturbance arising from suppression operations during a “naturally” caused fire by using existing containment lines and features.

This may only occur after careful consideration of potential fire weather and behaviour, safety and protection issues, biodiversity maintenance requirements or cultural assets and values at risk.

The decision making process for such consideration is described within section 4.6 of the NPWS Fire Management Manual - Natural Area Fire Management. (<http://www.environment.nsw.gov.au/>)

**Table 6 - Fire regimes to be applied to vegetation in the reserves in order to sustain biodiversity.**

These regimes are time and frequency thresholds in which fire events may not compromise biodiversity within the listed vegetation types. (Adapted from Bradstock et al, 1995, and Keith, 1996.)

Fire regimes outside these thresholds - eg too frequent fire - are predicted to cause significant declines in species populations especially if they prevail over more than 50% of the vegetation type in the area.

Veg'n. Class ID	Vegetation communities	Approx. area in reserves (ha)	Biodiversity Thresholds – Fire Frequency		
			Minimum Fire interval	Maximum Fire interval	Notes
e	Southern coastal hind dune/headland scrub & southern coastal dune scrub	75	7	30	
	Northern plateau and escarpment dry forest / heath shrub understorey - <i>Eucalyptus sieberi</i> / <i>Eucalyptus considiana</i>	685			
	Hinterland heath / dry shrub forest - <i>Corymbia gummifera</i> / <i>Syncarpia glomulifera</i>	532			
	Coastal sands shrub/fern forest - <i>Eucalyptus botryoides</i> / <i>Banksia serrata</i>	162			
	Coastal lowlands dry forest - Cycad / dry shrub understorey - <i>Corymbia maculata</i>	3352			
	Sea cliff scrub	29			
	Coastal headland heathlands	37			
f	South coast swamp forest complex - <i>Allocasuarina glauca</i>	82	7	35	Crown fires should be avoided in the lower end of the interval range
	Coastal wet heath swamp forest - <i>Allocasuarina glauca</i> / <i>Melaleuca ericifolia</i>	5.5			

**Table 6. – Fire regimes to be applied to vegetation in the reserves – continued**

Veg'n. Class ID	Vegetation communities	Approx. area in reserves	Biodiversity Thresholds – Fire Frequency		
			Minimum Fire interval	Maximum Fire interval	Notes
<b>g</b>	Southern coastal dune scrub complex & coastal dune herb/swamp complex	3.6	8	30	
<b>h</b>	Northern Coastal hinterland moist shrub forest	5900	25	200	Crown fires should be avoided in the lower end of the interval range
	Northern Coastal tall wet sedge heath	10.6			
<b>i</b>	Central Coastal hinterland rainforest and Lowland warm temperate rainforest	261	n/a	n/a	Fire should be avoided
	Coastal hinterland gully rainforest	825			
	Sand-Dune wetlands	2.6			
	Southern Coastal hinterland dry gully rainforest - <i>Backhousia myrtifolia</i>	29			
	Mudflats/saltmarshes	20			

**Table 7 - Threatened Species – specific fire management strategies to be applied in the reserves.**

NB These are not all the threatened species identified within the reserves. These are the threatened species considered at risk from inappropriate fire regimes or unplanned fire management and suppression activities. These strategies are derived from NPWS (1999), (2000a), 2000b), and Hunter and Alexander (2002)

Map ID	Flora and Fauna Strategies	Species	Common Name	Species status
Flora				
FL 1	No fire more than once every 10 years. No slashing in autumn and no more frequently than once every 10 years.	<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	Vulnerable
FL 2	No fire more than once every 10 years. No slashing, trittering or tree removal at these sites. Avoid unplanned fire in research plot near Maidens Road	<i>Genoplesium vernale</i>		Vulnerable
FL 3	Specific Requirements undetermined. *	<i>Prostanthera marifolia</i>		Endangered

Table 7 - Threatened species strategies – continued – Fauna

Fauna				
<b>FA 1</b>	No fire No slashing, trittering or tree removal.	<i>Botaurus poiciloptilus</i>	Australasian Bittern	Vulnerable
<b>FA 2</b>	No slashing, trittering or tree removal.	<i>Calamanthus fuliginosus</i>	Striated Fieldwren	Vulnerable
<b>FA 3</b>	Mechanical hazard reduction ok, avoid Allocasuarina thickets. No burning of Allocasuarina thickets.	<i>Calyptorhynchus lathami</i>	Glossy Black- Cockatoo	Vulnerable
<b>FA 4</b>	No slashing, trittering or tree removal.	<i>Climacteris picumnus</i>	Brown Treecreeper	Vulnerable
<b>FA 5</b>	Specific Requirements undetermined.*	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable
<b>FA 7</b>	No fire. No slashing, trittering or tree removal.	<i>Ixobrychus flavicollis</i>	Black Bittern	Vulnerable
<b>FA 8</b>	Specific Requirements undetermined.*	<i>Lathamus discolor</i>	Swift Parrot	Endangered 1
<b>FA 9</b>	No burning within 50 metres of wetlands and other large water bodies. No slashing, trittering or tree removal.	<i>Litoria aurea</i>	Green and Golden Bell Frog	Endangered 1
<b>FA 10</b>	No fire around known roost sites. No slashing around known maternity caves.	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bent-wing Bat	Vulnerable
<b>FA 11</b>	No fire around known roost sites. No removal of trees.	<i>Myotis adversus</i>	Large-footed Myotis	Vulnerable
<b>FA 12</b>	No burning around known nesting sites at any time. No slashing, trittering or tree removal of or around known nesting sites.	<i>Ninox connivens</i>	Barking Owl	Vulnerable
<b>FA 13</b>	No burning around known nesting sites at any time. No slashing, trittering or tree removal of or around known nesting sites.	<i>Ninox strenua</i>	Powerful Owl	Vulnerable

Table 7 - Threatened species strategies – continued – Fauna

<b>FA 14</b>	No slashing, trittering or tree removal at these sites.	<i>Pachycephala olivacea</i>	Olive Whistler	Vulnerable
<b>FA 15</b>	No slashing, trittering or tree removal of or around known nesting sites.	<i>Pandion haliaetus</i>	Osprey	Vulnerable
<b>FA 16</b>	No slashing, trittering or tree removal at these sites.	<i>Petaurus australis</i>	Yellow-bellied Glider	Vulnerable
<b>FA 17</b>	No slashing, trittering or tree removal at these sites.	<i>Petaurus norfolcensis</i>	Squirrel Glider	Vulnerable
<b>FA 18</b>	No fire. No slashing, trittering or tree removal at these sites.	<i>Pezoporus wallicus wallicus</i>	Ground Parrot	Vulnerable
<b>FA 19</b>	Specific Requirements undetermined.*	<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	Vulnerable
<b>FA 20</b>	Specific Requirements undetermined.*	<i>Phascolarctos cinereus</i>	Koala	Vulnerable
<b>FA 21</b>	Avoid known roost sites when using mechanical or fire hazard reduction methods.	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable
<b>FA 22</b>	Specific Requirements undetermined.*	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable
<b>FA 23</b>	Specific Requirements undetermined.*	<i>Sminthopsis leucopus</i>	White-footed Dunnart	Vulnerable
<b>FA 24</b>	No burning around known nesting sites at any time. No slashing, trittering or tree removal at these sites.	<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable
<b>FA 25</b>	No burning around known nesting sites at any time. No slashing, trittering or tree removal at these sites.	<i>Tyto tenebricosa</i>	Sooty Owl	Vulnerable
<b>FA 26</b>	Specific Requirements undetermined.*	<i>Xanthomyza phrygia</i>	Regent Honeyeater	Endangered 1

\* Specific Requirements undetermined – No species specific fire requirements known at present, however the potential impact of firefighting chemicals and heavy machinery use should be considered and minimised where possible.

(1) as per Threatened Species Conservation Act 1995

(2) as per ROTAP classification 1995



Table 7. Threatened Species – specific fire management strategies to be applied in the reserves. - continued  
 Endangered Ecological Communities (EECs) - known to occur within the reserve.

Map ID	Strategies	Status (1), (3)	Strategies	
			Specific fire strategies #	Other fire management activities
EEC-1	Bangalay Sand Forest of Sydney Basin Bioregion	EEC	Thresholds 7-30 years	No slashing, trittering or tree removal
EEC-2	Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	EEC	Thresholds 7-35 years	No slashing, trittering or tree removal
EEC-3	Littoral Rainforest – Southeast Corner Bioregion	EEC	Avoid fire – esp. margins	Avoid disturbance
EEC-4	Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	EEC	Avoid fire	Avoid disturbance

(1) as per Threatened Species Conservation Act 1995

(3) as per Environment Protection and Biodiversity Conservation Act 1999 (Aust. Government)

# These strategies are taken from overall fire/biodiversity thresholds for the reserves vegetation communities. They are NOT listed within specific hazard reduction conditions as per the NPWS / DECC maintained conditions available from the RFS website.

**Table 8 - Cultural Heritage strategies for fire management to be applied in the reserves**

As detailed in section 2.3 there were no cultural sites in the reserves at risk within areas of higher fire potential. Nevertheless most known sites are vulnerable to disturbance from fire suppression and management operations. Below are the strategies relevant to sites identified within the reserves. In all cases a precautionary approach should be adopted where activities are undertaken away from formed tracks or roads. Skilled assistance should be sought in guiding these operations.

Site ID	Fire Management Strategies	Site Types
<b>Aboriginal Heritage Sites</b>		
AH-A	As far as possible – protect site from fire Do not cut down trees Use of foams, wetting agents and retardants is acceptable	Sites affected by fire itself eg possible artefacts of flammable materials such as scarred or carved trees.
AH-B	As far as possible – protect site from fire Avoid all ground disturbance including the use of earthmoving machinery, handline construction and driving over sites. Avoid water bombing, which may cause ground disturbance.	Sites less affected by fire but prone to disturbance by suppression operations eg - stone arrangements, ceremonial rings, rock engravings, rock art, grinding grooves.
AH-C	Avoid all ground disturbance including the use of earthmoving machinery, handline construction and driving over sites. Avoid water bombing, which may cause ground disturbance. Site may be burned by bushfire, backburn or prescribed burn without damage	Sites least affected by fire itself but still prone to disturbance by fire suppression operations. eg - burial sites, artefact scatters, middens.

**Historic Heritage Sites**

NB There no historic sites considered at direct risk from fire itself but remnant artefacts and features may be vulnerable to fire suppression and management activities —especially the use of machinery.

Should additional historic sites be confirmed, the following strategies may be applied depending on the site vulnerability to fire and suppression effects.

Site type HH-A	As far as possible – protect site from fire Avoid all ground disturbance including the use of earthmoving machinery, handline construction and driving over sites. Avoid water bombing, which may cause ground disturbance. Use of foams, wetting agents and retardants is acceptable	Flammable but structurally unsound sites including buildings with low structural integrity
HH-B	As far as possible – protect site from fire Avoid all ground disturbance including the use of earthmoving machinery, handline construction and driving over sites. Water bombing, use of foams, wetting agents and retardants is acceptable	Flammable and structurally sound sites including buildings, wooden fences, signs, stock rails, etc
HH-C	Avoid all ground disturbance including the use of earthmoving machinery, handline construction and driving over sites. Avoid water bombing.	Sites which are not flammable but are structurally unsound including dry stone walls

**Table 9 - Land Management Zones – area, fire regimes and fire management strategies.** in section 3.7, survey work to uniformly assess the vegetation classes continues across these reserves. Extensive tables and mapping tools are available to managers indicating the vegetation types to be found in each zone, the status and area of each type with regard to fire history, biodiversity thresholds and current vulnerability. These are used to determine which areas should be protected from bushfire or subject to prescribed fire in order to maintain biodiversity.

Map	Zone Name	Zone Area	Approx. area each Biodiversity Threshold class ( see Table 6)					Threatened Species Guide-lines (Table 7)	Cultural Asset Guide-lines (Table 8)	Overall Strategies
			inside reserves	e	f	g	h			
3a	Central LMZ	582	180.0				321.0	81.2	FA16, 17,3	<ul style="list-style-type: none"> <li>• Suppress bushfires and implement prescribed burning as appropriate to maintain fire regimes within the biodiversity thresholds as specified in Table 6.</li> <li>• Implement threatened species fire management strategies as specified in Table 7.</li> <li>• continued/...</li> </ul>
3b	Coast LMZ	327	214.0				52.6		FA10, 15,16	
3a	Coast Rd East LMZ	46	36.0					9.8	FA13, 25	
3b	Cullendulla LMZ	1958	751.0	6.2			1145.0	43.7	FA13,5,16,24,25,26,3	
3a	Durras Mountain LMZ	1057	231.0				530.0	278.0	FA13,16,17,25	
3b	Eastern LMZ	60	52.0	1.1	3.6				FA15,18	
3a	Higgins Creek LMZ	600	241.0				306.8	51.8	FA16,17,23,24,25,3	
3b	Highway LMZ	549	268.4	6.1			258.3	7.3	FA16,24, 25, 3, 4,7,8	
3a	Icon LMZ	283	87.2				176.8	4.7	FA22	
3b	Kioloa West LMZ	157	40.6				116.1		FA13,16,23,25	
3a	Kioloa-Pebbly LMZ	598	190.0				273.5	85.4		
3b	Lake LMZ	41	4.8	0.2			34.2		FA16,3	

Table 9 – fire regimes etc. – LMZ - continued

Map	Zone Name	Zone Area	Area each Biodiversity Threshold class ( see Table 6)					Threatened Species Guide-lines (Table 7)	Cultural Asset Guide-lines (Table 8)	Overall Strategies	
		inside reserves	e	f	g	h	i				
3b	Lake North LMZ	630	198.2	12.3			271.0	139.4	FA11,15,16, 22,25,3	AH-B, C,	As above and/... • Implement cultural asset protection strategies as specified in Table 8 • Specific implications for offshore islands are found in Table 9a
3a	Livingstone LMZ	402	78.5				242.1	78.7	FA16, 17, 24		
3a	Northern LMZ	615	280.0				263.4	66.4	FA10,13, 16,24,25,5	AH-C,	
3a	Opening LMZ	40	12.5	5.9			1.45		FA15,21	AH-B, C,	
3a	Pebbly Rd South LMZ	1697	527.1	0.2			979.4	189	FA13,16,17,25,3,FL-3	AH-C,	
3a	Pebbly-Depot LMZ	129	46.6				43.4	16.2	FA,3, 9	AH-B, C,	
3a	Power Lines North LMZ	39	9.95	2.5			15.7	4.8	FA11		
3a	Pretty Beach East LMZ	44	32.8						FA16, 24, 3	AH-C	
3a	Tranquillity LMZ	58	35.9				3.32	0.4			
3b	Wasp Head LMZ	18	8.1							AH-B	
3a	West Depot LMZ	9	3.0				5.0		FA2, 21 3		
	<b>Island LMZ</b>										
3a	Brush Island LMZ	37	27.4				9.0				
3a	Belowla Island LMZ	3	2.9				0.1				
3b	Tollgate Islands LMZ	10.5	2..8								

NB Within some zone areas, biodiversity thresholds are not assigned eg estuarine areas within the zone.

**Table 9a. Land Management Zones – Offshore Islands – area and specific fire management strategies.**

Map ID	Map	Zone Name	Area (ha.)	Specific Strategies
<b>Brush Island</b>	<b>3a</b>	Brush Island Nature Reserve	37	<ul style="list-style-type: none"> <li>• Where prescribed burning is to be implemented as appropriate to maintain fire regimes within the biodiversity thresholds as specified in Table 6.</li> <li>• Special consideration is to be given to fauna habitat / use requirements, weed control implications and the goal to maintain various age classes within vegetation communities.</li> <li>• This may require careful definition of burn limits and control measures to be employed.</li> <li>• The likelihood of bushfire covering all an island in one event may have specific implications for vegetation and habitat management.</li> <li>• Specific response strategies need to be developed for each island coupled with the assessment for burning for biodiversity maintenance.</li> </ul> <p>The goals here are to achieve biodiversity conservation (by prescribed fire where indicated) and concurrently limit the extent / intensity of any unplanned fire.</p>
<b>Belowla Island</b>	<b>3a</b>	Belowla Island Nature Reserve	3	
<b>Tollgate Islands</b>	<b>3b</b>	Tollgate Island Nature Reserve, and other islands within	10.5	
<b>Grasshopper Island</b>		Murramarang National Park - Grasshopper Island and Wasp Island		
<b>Wasp Island</b>				

### 3.3 - Strategic fuel management areas – Slashed Areas and Slashed Breaks

Slashing is undertaken in identified areas to assist in the protection of adjacent dwellings or key infrastructure as well as enhance the usefulness of other features for fire management and suppression.

Slashed Areas listed below are those sections of Asset Protection Zones where there is a commitment to have the site inspected and in an acceptable operational state prior to the bush fire season. Slashed Breaks are similarly identified and treated areas or strips but not in Asset Protection Zones. These Slashed Breaks also provide an advantage to reserve managers and fire fighters - such as along certain fence lines or linking key fire suppression features or 'advantages'.

The NPWS also undertakes slashing along the sides of certain access routes as part of road maintenance and safety operations. These works also provide an 'advantage' for fire operations but are not undertaken primarily for fire control purposes and so are not specifically listed in this Fire Management Strategy.

**Table 10. - Slashed Breaks (SB) and Slashed Areas (SA) – specifications and objectives**

Table 10 lists the specifications for slashed breaks to be maintained during the life of this plan

Slashed Break ID	Map/s	Fuel Management Area / Slashed Break Name / Location	Specific actions	Zone	Tenure	Fire management Objectives
MMA SB1	3a	Murramarang Point Slashed Break Murramarang Aboriginal Area near Bawley Point – bisecting reserve in a north/south direction	5m	Eastern LMZ	NPWS	- Provide containment option for bushfire suppression. - Assist in management of prescribed fire / hazard reduction burning
MMN SB1	3a	Icon Slashed Break – west of Kioloa – adjoining neighbouring property	6m.	Northern LMZ	NPWS	- Assist in limiting the spread of fire from or to adjacent property. - Assist with fence protection from bushfire. - Provide containment option for bushfire suppression. - Assist in management of prescribed fire / hazard reduction burning
MMN SB2	4a	Kioloa Village South Slashed Break – roughly parallel to boundary with Crown Land	5m	Kioloa West LMZ	NPWS	- in cooperation with Lands Dept. – maintain slashed break - where required for fuel management operations on Crown Land to east adjacent to built-up area.

**Table 10 – Slashed Breaks and Slashed Areas cont.**

<b>Slashed Break ID</b>	<b>Map/s</b>	<b>Fuel Management Area / Slashed Break Name / Location</b>	<b>Specific-ations</b>	<b>Zone</b>	<b>Tenure</b>	<b>Fire management Objectives</b>
<b>MMN SA1</b>	<b>4a</b>	Forest Road Slashed Area – western side of urban area north and south of Forest Road, - southern side of built-up area west of Pretty Beach Road	up to 20m	Forest Road APZ	NPWS	- Assist in protection of adjacent dwellings. - Assist in management of prescribed fire / hazard reduction burning - Forms APZ Boundary
<b>MMN SA2</b>	<b>3a &amp; 4a</b>	Merry Beach Slashed Area – near Merry Beach resort/camping area	up to 10m	Merry Beach Park APZ	NPWS	- Assist in protection of adjacent dwellings. - Provide containment option for bushfire suppression. - Assist in management of prescribed fire / hazard reduction burning
<b>MMN SA3</b>	<b>3a &amp; 4a</b>	Pretty Beach camping ground – slashed areas	var.	Pretty Beach (Camping Area) APZ	NPWS	- Assist in protection of facilities, occupied sites and dwellings. - Assist in management of prescribed fire / hazard reduction burning in adjacent areas.
<b>MMN SA4</b>	<b>3a &amp; 4b</b>	Depot Beach Camping Ground slashed areas	5m	Camping Ground APZ	NPWS	- Assist in protection of facilities, occupied sites and dwellings. - Assist in management of prescribed fire / hazard reduction burning in adjacent areas.
<b>MMN SA5</b>	<b>3a &amp; 4c</b>	Farrant Place Slashed Area – northern end of Durras North village	5m.	Farrant Place APZ	NPWS	- Assist in protection of adjacent dwellings. - Assist in management of prescribed fire / hazard reduction burning - Forms APZ Boundary - Village protection

**Table 10 – Slashed Breaks and Slashed Areas cont.**

<b>Slashed Break ID</b>	<b>Map/s</b>	<b>Fuel Management Area / Slashed Break Name / Location</b>	<b>Specific-ations</b>	<b>Zone</b>	<b>Tenure</b>	<b>Fire management Objectives</b>
<b>MMN SA6</b>	<b>3a &amp; 4c</b>	North Durras Road Slashed Area	var. <5m	North Durras Road APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of nearby dwellings.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> <li>-Complements maintenance of slashed areas along North Durras Road</li> <li>- Forms APZ Boundary - Village protection</li> </ul>
<b>MMN SA7</b>	<b>3a &amp; 4c</b>	Bundilla Slashed Area	6m	Bundilla APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of facilities, occupied sites and dwellings.</li> <li>- assist protection of adjacent rainforest areas.</li> <li>- Assist in management of prescribed fire / hazard reduction burning in adjacent areas.</li> </ul>



**Table 10 – Slashed Breaks and Slashed Areas cont.**

<b>Slashed Break ID</b>	<b>Map/s</b>	<b>Fuel Management Area / Slashed Break Name / Location</b>	<b>Specific-ations</b>	<b>Zone</b>	<b>Tenure</b>	<b>Fire management Objectives</b>
<b>MMN SA8</b>	<b>3a &amp; 4e</b>	Murramarang Crescent Slashed Area – southern side of South Durras village	up to 20m from dwellings	Murramarang Crescent APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of adjacent dwellings.</li> <li>- Provide boundary for adjacent fuel management zone</li> <li>- Provide containment option for bushfire suppression.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> <li>- Forms APZ Boundary - Village protection</li> </ul>
<b>MMN SA9</b>	<b>3b &amp; 4g</b>	Lakeside Drive Slashed area – western side of Durras Lake Village	40m	Lakeside Drive APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of adjacent dwellings.</li> <li>- Provide containment option for bushfire suppression.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> <li>- Forms APZ Boundary - Village protection</li> </ul>
<b>MMN SB2</b>	<b>3b &amp; 4g</b>	Carls Mountain Slashed Break – north of Cullendulla	6m	Van Park SFAZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in limiting the spread of fire from or to adjacent property.</li> <li>- Assist in limiting the spread of fire from or to adjacent lands</li> <li>- Assist with fence protection from bushfire.</li> <li>- Provide boundary for adjacent fuel management zone</li> <li>- Provide containment option for bushfire suppression.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> </ul>
<b>MMN SA10</b>	<b>3b &amp; 4g</b>	Cullendulla Slashed Area – near Long Beach Road - Cullendulla	15m	forms Cullendulla APZ where within APZ distances of dwellings	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of adjacent dwellings.</li> <li>- Assist in limiting the spread of fire from or to adjacent property.</li> <li>- Assist in limiting the spread of fire from or to adjacent lands</li> <li>- Assist with fence protection from bushfire.</li> <li>- Provide boundary for adjacent fuel management zone</li> <li>- Provide containment option for bushfire suppression.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> </ul>

**Table 10 – Slashed Breaks and Slashed Areas cont.**

<b>Slashed Break ID</b>	<b>Map/s</b>	<b>Fuel Management Area / Slashed Break Name / Location</b>	<b>Specific-ations</b>	<b>Zone</b>	<b>Tenure</b>	<b>Fire management Objectives</b>
MMN SA11	3b & 4g	Forest Gallery Slashed Area – near Benandarah	10m	Forest Gallery APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of adjacent dwelling.</li> <li>- Assist in limiting the spread of fire from or to adjacent property.</li> <li>- Assist with fence protection from bushfire.</li> <li>- Provide containment option for bushfire suppression.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> <li>- Forms APZ Boundary</li> </ul>
MMN SA12	3b & 4f	Hibiscus Close Slashed Area – near Maloneys Beach	up to 25m from ex. dwellings.	Hibiscus Close APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of adjacent dwelling.</li> <li>- Assist in limiting the spread of fire from or to adjacent property.</li> <li>- Assist in limiting the spread of fire from or to adjacent lands</li> <li>- Assist with fence protection from bushfire.</li> <li>- Provide boundary for adjacent fuel management zone</li> <li>- Provide containment option for bushfire suppression.</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> <li>- Forms APZ Boundary - Village protection</li> </ul>
MMN SA13	3b & 4g	Carls Mountain Slashed Area – near communications facility Carls Mountain.	18m	Carls Mtn. APZ	NPWS	<ul style="list-style-type: none"> <li>- Assist in protection of adjacent infrastructure.</li> <li>- Provide boundary for adjacent fuel management zone</li> <li>- Assist in management of prescribed fire / hazard reduction burning</li> <li>- Forms an APZ Boundary –</li> </ul>

### **3.4 Fire management access – Tracks and Roads**

Tracks and roads provide access for firefighting vehicles and may be used to contain lower intensity fires or enable lower intensity backburning to contain larger bushfires or prescribed burns.

The network of tracks and roads in these reserves are a result of historic use and past land management practices. Existing tracks have been accepted and assessed for their advantage to fire suppression and management based on their current condition and position. This is not to say that all tracks and trails are primarily fire trails. Over time, the strategic and operational assessment of this network may identify options for fire access that better reflect local fire patterns, changes in adjacent land use and fire management objectives as set out in this plan. Such assessment will need to be part of a landscape-wide approach to these issues such as the current Bush Fire Risk Management planning being undertaken for the Eurobodalla and the Shoalhaven.

Where changes may be necessary to the network as committed to in this strategy, then a formal community advice, consultation and revision process is undertaken.

As stated above, **not all tracks or roads are maintained as fire trails**, though most vehicle access routes may provide some fire suppression advantage depending on the terrain, track status, crew competency, equipment, fire behaviour, weather conditions, and the task for which the route is to be used. These and other factors need to be considered by fire crews and planning teams prior to the use of a route for fire operations. Following this assessment, some routes will require works to prepare them to a sufficient standard for the proposed operation. The time and resources required to undertake this preparation also need to be considered within operational planning.

Not all routes or tracks can or will be maintained to all weather 2wd standard for fire suppression operations at all times. The economic, resource, and environmental consequences are presently unacceptable. As a member of the Eurobodalla and Shoalhaven Bush Fire Management Committee the NPWS has identified those routes of higher strategic significance in fire operations for which the NPWS is responsible. Along with the maintenance of identified slashed breaks and slashed areas in asset protection zones, the NPWS will give priority to those tracks and roads of higher strategic significance in the preparation of works programs and commitment of available resources.

**Table 11 lists the tracks and routes that will be maintained primarily for fire management purposes during the life of the strategy.**

Roads and tracks classified as Category 1 will be maintained to a standard sufficient to carry Category 1 fire vehicles (e.g. 4WD Heavy Tanker up to a 3500 litre capacity), Roads and tracks classified as Category 9 will be maintained to a standard sufficient to carry a Category 9 fire tanker (e.g. 4WD Ute/Cab-chassis up to 400 litre capacity). These classifications relate to the NSW Bush Fire Coordinating Committee grading of fire access tracks for heavy and light fire vehicles.

Other tracks and roads shown on maps within the reserves are not primarily maintained for fire purposes but may have usefulness in fire management or suppression operations. Access to these tracks however may be limited at times during the life of this strategy as priority will be given to maintenance of the tracks identified in Table 11 and Slashed Areas and Slashed Breaks in Table 10. The fire vehicle categories for other management and public access tracks are as assessed when this strategy was compiled.

Tracks made or upgraded beyond routine standard as a result of fire suppression operations will be stabilised and rehabilitated as soon as practicable after the fire. These tracks may not be listed or marked on future maps. Where strategically useful such routes may be indicated on operational maps or recorded as possible control options for future operations.

Some of the roads and tracks listed in Table 11 and illustrated on Map 3 are used for management purposes only and are not open for public use by vehicle. The NPWS makes keys for access to such tracks available via the RFS to be kept in Shoalhaven and Eurobodalla RFS fire tankers and other emergency service vehicles.

Some of the fire management tracks within the reserves are currently available for vehicle access by visitors.

Whilst this unrestricted use of the fire management tracks may be considered sustainable under current levels of use and climatic conditions, if such use compromises the routes usefulness as a fire access track at the identified standard then general vehicle use by the public may need to be limited. There is a formal process for advising the community and consulting relevant interests if this is required.

Otherwise, routes that may be used for vehicle access by visitors are described in the Plans of Management for the reserves.

**NB. Not all tracks within or around the reserves depicted on published topographic or guide maps may exist. Not all tracks shown may be located where marked or may be accessible in the indicated condition.**

The NPWS will seek more accurate depiction of these features in any map editions that are referred to the organisation.

**Table 11. The Tracks and Roads that will be maintained for fire management**

within Murramarang National Park and Murramarang Aboriginal Area

NB – As stated above, this is not the complete list of tracks, trails, roads or routes within these reserves that are managed and maintained by the NPWS. The tracks below are the routes and carrying capacity of those trails identified where their **primary function** is supporting fire management and suppression. As such their status and maintenance for fire management functions are identified and committed to in this Fire Management Strategy. Most other tracks will have usefulness for fire suppression or prescribed burning but their primary function may be for public access, supporting infrastructure - such as powerlines, or for other reserve management functions. The full list of access routes to be managed are described in the overall Plan of Management for each reserve.

Track ID	Map/s	Road / Track Name	Firefighting Vehicle Category	NSW Bush Fire Coord. C'tee classification	Tenure	Comments
Existing Roads / Tracks / Routes –						
<b>U121</b>	<b>4a</b>	Kioloa Village Fire trail	Cat 7/9	Secondary	NPWS	
<b>(U121)</b>	<b>4a</b>	Kioloa Village (South) Fire Trail	Cat 7/9	Secondary	NPWS	spur trail off Kioloa Village Fire Trail to southeast
<b>U150</b>	<b>3a</b>	South Arm Road	Cat 7/9	Secondary	NPWS	
'Ops' refers to Operational Maps supporting this plan that are made available to local RFS brigades, Emergency Control Centres and land management agencies. .						

### **3.5 Information, Cooperation, and Enforcement**

The NPWS will undertake the following during the life of this strategy:

- Participate within the Eurobodalla and Shoalhaven Bush Fire Management Committees (BFMC) and their sub-groups and functions to better provide an integrated and cooperative approach to fire management and suppression in the reserves and surrounding communities.
- Support the Eurobodalla and Shoalhaven BFMCs, the RFS, Eurobodalla Shire Council, Shoalhaven City Council and other agencies to increase the awareness of fire, to improve property and personal preparedness in the surrounding communities and encourage residents and visitors to report fire outbreaks or arson.
- Participate and maintain communications with RFS Brigades adjacent to the reserves in order to improve shared operations, training, community liaison and the monitoring and reporting of fire management access, bush fire fuel conditions and other fire management issues of concern to the community.  
    These RFS brigades and communities include:  
    Bawley Point  
    Kioloa  
    Depot Beach  
    South Durras  
    Maloneys Beach
- Assist landholders /occupiers and other agencies to undertake prescribed burns on private property and public lands adjacent to the reserves where this burning will help protect assets on neighbouring property from bush fires that may exit the reserves or may assist in limiting fires entering the reserves from adjacent lands. These cooperative works should be undertaken where resources allow and do not conflict with essential fire management activities being undertaken at the same time within the reserves
- Develop a cooperative approach to the maintenance and monitoring of slashed breaks and fire management tracks especially where they link with breaks and access managed by other agencies or land managers. Where appropriate, to describe this approach within Memorandums of Understanding for all jointly managed and maintained breaks and access routes.
- Investigate all fires within the reserves that appear to have been deliberately lit and actively pursue this investigation and where evidence permits, initiate legal action in cooperation with other agencies against those responsible.
- Assess appropriate visitor or entry sites to erect signs to advise reserve visitors of fire use conditions or where required, actions that may need to be taken in the event of fire.
- Advise visitor centres and appropriate media outlets of the status of current fires or visitor restrictions within the reserves.

### **3.6 Research and Monitoring**

At the time of preparation of this strategy an ongoing review of the vegetation mapping for the reserves was being undertaken. It is planned to use this revised data to better define the appropriate fire regimes and indicate where fire may need to be applied or where fire should be avoided in order to conserve biodiversity.

This survey will also define which vegetation communities in the reserves may be the site of monitoring plots that will contribute to the knowledge of vegetation response to fire and the accumulation of bush fire fuels. There are a number of these sites located in the reserves covered by this strategy..

As Species Recovery Plans are prepared for threatened species identified within the reserves, implications for fire management will be incorporated in site and species management strategies in Table 7.

### **3.7 Fire Management Works Schedule**

From all the above strategies a priority list of fire management works has been assembled and is reviewed annually. These works programs are advised to the Eurobodalla and Shoalhaven District Bush Fire Management Committees annually as part of the NPWS contribution to cooperative bush fire risk management across the community.

The fire management works schedule for all agencies for the current financial year may be viewed during business hours at the Eurobodalla RFS office – Moruya for areas within the Eurobodalla. For areas within the Shoalhaven, details may be viewed at the Shoalhaven RFS office at the Shoalhaven Emergency Management Centre – Albatross Road Nowra. Details on the works and other fire management activities within the reserves are also available at the or at NPWS Area office Collier Rd. – Ulladulla, and NPWS South Coast Region Office - Nowra. To discuss works proposals for areas of concern it is best to contact the local NPWS Area office (Ulladulla) that will be managing the program.

The fire management works schedule indicates the works proposed in the present financial year and the indicated tasks over the following four years. The works for the present financial year indicate those activities that the NPWS has budgeted for and committed to its overall works programs along with other management tasks. Each year this program is reviewed with consideration of the following factors:

- seasonal conditions,
- available resources,
- the achievements of the past works year
- fire history of the previous season,
- biodiversity and risk management indications, and
- the indicated program over the next four years

Some of the tasks require appropriate conditions in order to be completed eg prescribed burning. Opportunities for suitable conditions are limited and highly variable according to seasonal weather patterns and drought cycles.

Similarly the limited opportunities for prescribed burning may be used by higher priority works of the same type eg burning in asset protection zones may displace biodiversity burning in remoter areas where timing is less critical. In all cases the NPWS provides explanation to the relevant Bush Fire Management Committee where works cannot be achieved or where works may need to be deleted, eg where a summer bushfire overtakes a prescribed burning proposal. In most cases, works not completed are automatically carried forward into next year's program.

It should be noted that much of the works indicated within the zone strategies for Murramarang Nat. Park, Murramarang Aboriginal Area and nearby island Nature Reserves—especially those related to asset protection and along the urban-bushland interface - have been implemented and improved since 2001. This is part of the NPWS commitment to assess and initiate appropriate fire strategies and works across its reserves and within cooperative fire management frameworks. This applies especially to more recently declared reserves transferred to the NPWS as part of the Southern Regional Forest Agreement.



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