BOURNDA National Park & BOURNDA Nature Reserve
Fire Management Strategy
2010
Sheet 1 of 3

This strategy should be used in conjunction with aerial photography and field reconnaissance during incidents and the development of incident action plans.

This strategy is a relevant Plan under Section 38 (4) and Section 44 (3) of Rural Fires Act 1997.

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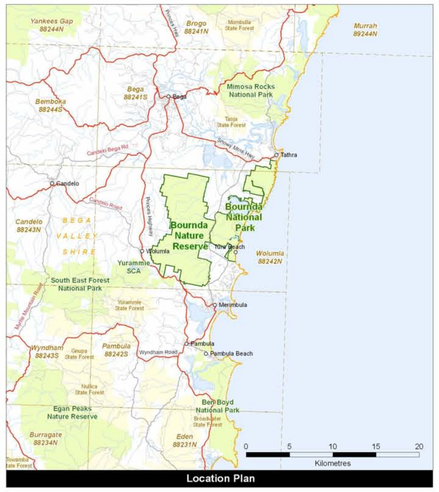


Location Plan

A Basis For Management

This fire management strategy covers Bournda National Park and Nature Reserve, a total of 8,669 hectares (referred to as the planning area). The strategy is designed to be consistent with the primary objective of conserving the natural and cultural heritage values in the planning area as well as reducing the potential risk to life and property from wildfire. As such, fire management will be broadly based and involve an integration of fire prevention, preparedness, response, and recovery strategies. It will make strategic use of all appropriate tools, in particular:

- Early detection and rapid suppression of unplanned fire.
- Fuel reduction through burning or by mechanical means in areas of high potential fire intensity hazard.
- A strategically located and adequately maintained fire trail network.
- A properly trained and equipped workforce to undertake fire management; and
- Education to help communities and individuals to be prepared for the likelihood of fire.

As far as practicable, the strategy (including fuel reduction) has been designed to be:

- Based on a strategic analysis of risk to the assets (natural, cultural and physical) that may be affected by fire.
- Focused on the protection of significant assets and values at risk from unplanned fire.
- Based on sound science, in particular a clear understanding of the factors which influence fire behaviour and the effects of fire on biodiversity.
- Based on the known and likely implications of climate change.
- Practical, achievable and cost effective.

In conjunction with neighbouring landowners, agencies and fire authorities a total landscape approach underpins this strategy.

The Fire Management Planning Framework

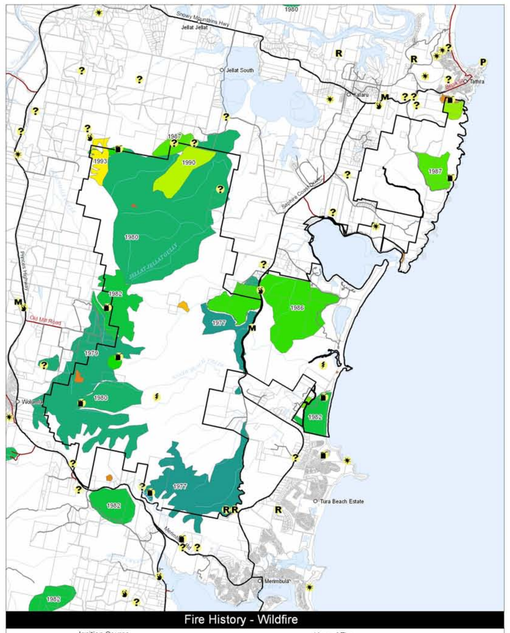
The management of fire in the planning area is determined by legislation, DECCW, fire management policies and relies on a number of operational frameworks. These are detailed in the Bush Fire Operations Plans for Bega Valley and Eurobodalla Shires which are consistent with the Policy Statement of the NSW Bushfire Coordinating Committee and the Manual of Procedures for Coordinated Fire Fighting.

A bush fire risk analysis has been undertaken to identify the level of risk to assets within and immediately adjacent to the Park. These assets include life and property, natural heritage, cultural heritage, and economic values. The bush fire risk analysis method compliments Bush Fire Risk Management Plans and is further described in the NPWS Strategy for Fire Management Planning (NPWS, 2003). The risk assessment process is based on the best available data. However, fire ignitions and fire behaviour are subject to a range of variables, such as weather, that make fire impossible to predict with certainty. While a risk assessment outcome may indicate a low risk, it does not preclude the possibility of a fire occurring, with subsequent consequences, in any given location as this is impossible to predict. It is also important to acknowledge that after risk management strategies and controls have been implemented in preparation for the fire season, a residual level of risk to many assets and features will still remain.

As a result of this assessment it is clear that:

- The occurrence of wildfire in the planning area can not be prevented and, under certain fuel moisture and weather conditions, fire may not be controlled, regardless of available resources.
- The planning area comprises rugged and remote terrain with minimal vehicular access which necessitates rapid initial wildfire suppression tactics.

Irrespective of the above assessment, fire is an essential part of the ecology, in that many species depend on fire for their long term existence.



Fire History - Wildfire

Ignition Source

Accidental	Other/Unknown	Escaped burn	Rubbish tip
Lightning	Suspected arson	Machinery/vehicle	Power line

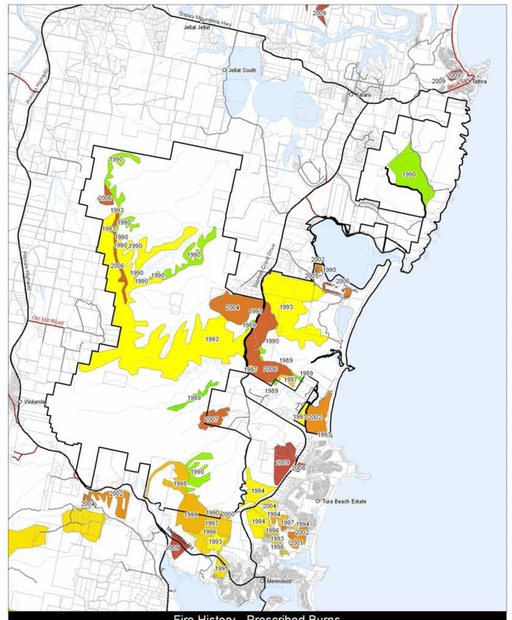
Year of Fire

1977	1983	1989	1995	2002	2008	
1978	1984	1990	1996	2003		
1979	1985	1991	1997	2004		
1980	1986	1992	1999	2005		
1981	1987	1993	2000	2006		
1982	1988	1994	2001	2007		

Fire Season Information

Wildfires
- Have been known to occur as early as Spring, but the potential for fires is greatest between November and February
- During this period in dry seasons, fires may exhibit high intensity behaviour in windy conditions.

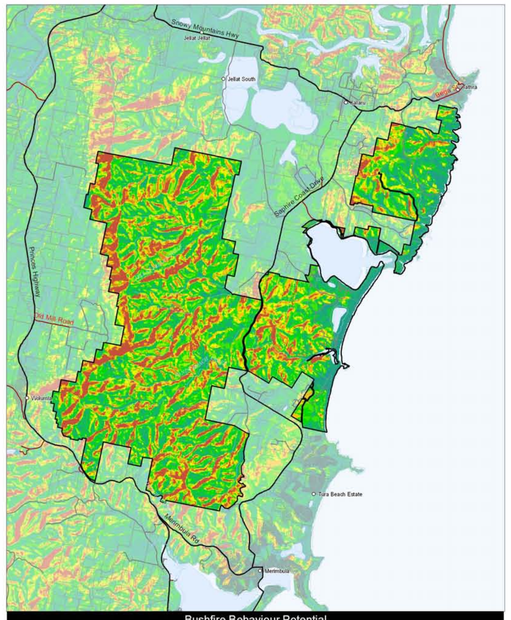
Prescribed Burning (NPWS FMM 4.7)
- Autumn to late Winter. Burning is possible in early Spring but not desirable on a regular basis for ecological reasons. Furthermore, any fire ignited in Spring has the potential to be problematic if not contained within safe boundaries.



Fire History - Prescribed Burns

Year of Burn

1977	1982	1987	1992	1997	2002	2007
1978	1983	1988	1993	1998	2003	2008
1979	1984	1989	1994	1999	2004	2009
1980	1985	1990	1995	2000	2005	
1981	1986	1991	1996	2001	2006	



Bushfire Behaviour Potential

Score	Slope°	X	Aspect	X	Veg. class	=	Score	Area (Ha)	% of reserve
1	0 – 5°		90 - 179°		Rainforest, Wetland		Very Low (1-16)	4,614	54%
2	6 – 10°		45 – 89°, 180 - 224°		Grassland, Wet sclerophyll forest		Low (17-32)	2,044	24%
3	11 – 15°		0 – 44°, 225 - 269°		Woodland, Heathland		Medium (33-48)	1,223	14%
4	15 – 18°		270 - 359°		Dry Sclerophyll Forest		High (49-64)	451	5%
5	> 18°						Very High (65-80)	258	3%

Model details
Bushfire behaviour potential was modelled using a combination of slope, aspect and vegetation type. The model equation is: Slope score (1-5) x Aspect score (1-4) x Vegetation score (1-4). Giving an overall range of 1 to 80. Class intervals were defined as: Very low (1-16), Low (17-32), Medium (33-48), High (49-64), Very high (65-80).
* Source: Planning for Bushfire Protection, NSW Planning 2001

The Risk Assessment Process, Zoning and Management Implications

A number of risk assessment processes, using ArcMap databases, have been completed to determine the level of risk to life and property, natural heritage, cultural heritage and economic values, including analysis of:

- Location, type and distribution of built, natural, cultural and economic assets within and adjacent to the park.
- Ignition cause and density.
- Fire history including unplanned fire frequency, size and location.
- Direction of spread of major fires.
- Slope, proximity to vegetation and estimated fuel loads around Assets.
- Climate and weather affecting bushfire behaviour.
- Fuel and vegetation types in relation to bushfire behaviour.

The adjoining maps on this sheet highlight the results of these assessments. In summary, the wildfire history within the planning area reveals that wildfires move from North-west to South-east under the influence of hot, dry North-westerly winds and tend to run up North and Western aspect slopes with great speed and intensity which leads to spotting, and travel down East and South slopes more slowly and with less intensity.

Using an analysis of aspect, slope and vegetation type (surrogate for fuel quantity and structure) a model of Bushfire Behaviour Potential (BBP) was developed over the planning area (see BBP map, this sheet) and these have been related to the identified assets (see Operations Maps on accompanying sheets). In the case of Natural heritage assets these can be placed at risk as a result of adverse fire regimes, fire suppression operations, and pest species invasions resulting from post fire changes to habitats.

High fire frequency (regular short inter-fire interval) has been identified as a key threatening process under the *Threatened Species Conservation Act* 1995. Sustained high frequency fire will consequently lead to a loss of plant species, a reduction in vegetation structure and a corresponding loss of animal species (NPWS website, 2008). To aid in identifying the vulnerability of natural heritage asset, bushfire *thresholds* have been determined for each vegetation community across the planning area (see Veg. community map, this sheet). Biodiversity fire regime threshold is the time between a series of fire events that a suite of plants and animals within a defined community requires to recover after a fire, before being at risk from a decline in biodiversity. These are defined in the adjoining table titled Biodiversity thresholds.

Minimum fire interval based on the minimum maturity requirements of species sensitive to extinction under frequent fire regimes is the length of time between fires that should avoid any local species extinctions. The maximum fire interval indicates the time since fire at which it may be expected that species may be lost from the community due to absence of fire. This figure is a "best estimate", and based on a number of unverified assumptions. Having identified the minimum and maximum fire intervals, the greatest species diversity is maintained by variable inter-fire intervals, i.e. a mosaic of age classes within each community. Variability of all aspects of the fire regime including frequency are generally required for the maintenance of a variety and diversity of habitats for both flora and fauna species (Gill and Bradstock, 1995). Notwithstanding this, the thresholds, when being used to inform prescribed burning proposals shall be complemented by more detailed local survey, where possible, of flora and fauna species in the proposed burn area to ensure that biodiversity values are not to be compromised by the proposed burn.

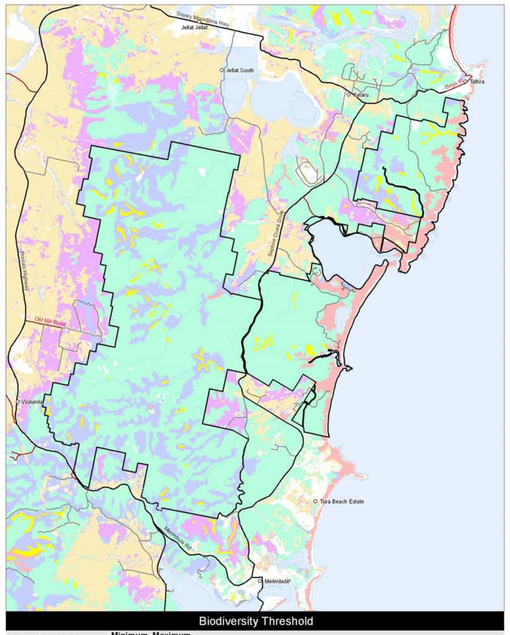
The accompanying sheet titled "Zoning and Works" identifies bush fire management zones. Determination of these zones was governed by the outcomes of the risk assessment process, and BBP, while also taking into account areas of similar topography, cultural and social characteristics. The boundaries of zones have been determined where possible, using practical fire control advantages such as roads, catchments, drainage lines and areas of low bush fire behaviour potential. Zone boundaries and locations may be subject to change in the future pending future wildfire, research, BFMC Risk Management Plan reviews and changes to zoning classifications.

While zoning provides general guidelines for asset protection and how fuels may be managed, NPWS also considers in detail the wide range of natural and cultural heritage values that may be found in an area. Accordingly management practices will vary between zones even though fuel loads and type may be similar. This management flexibility is essential for the maintenance of natural and cultural heritage values across the planning area. The current status and treatment guidelines for each zone are shown in the textboxes on the accompanying "Zoning and Works" sheet.

It should also be noted that the potential advantages and importance of on-park zones need to be complimented by managing zones in identified high BBP areas neighbouring the planning area, particularly those closest to the asset being protected. Whether these are formally designated as Asset Protection Zones or not, the present requirements for developments in Bush Fire Prone Areas provides considerable practical information to assist neighbouring landowners with identification and implementation of mitigation measures.

The broad Strategic Fire Advantage Zones (SFAZs) identified in the planning area have been examined in terms of fire history to prioritise order of treatment. In planning individual treatment areas, fuel will be assessed using the overall fuel hazard (OFH) technique. This is considered essential in order to ground-truth treatment priorities in regard to fuel accumulation, burn prescription, operational planning and refining zone priorities due to fuel moisture variations across the planning area. Implementation will be driven by seasonal and resource availability factors and where practical, coordination with planned activities in adjoining zones, whether DECCW estate or otherwise.

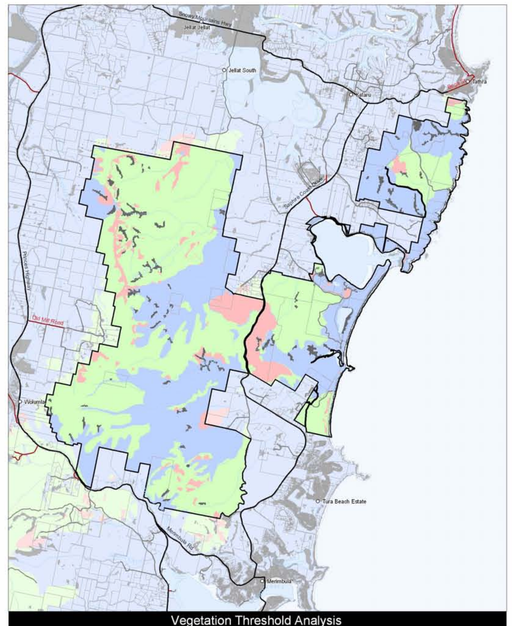
It is important to recognise that fuel reduction burning in temperate forests, woodlands and heaths is generally only effective for up to 2-5 years (Gill *et al* pg 438 in Bradstock *et al* 2002) in relation to reduction of surface fuels. This effectiveness extends to 10-12 years for bark when bark fuel has been successfully treated (McCarthy and Tolhurst, 2001, McCarthy, G. pers comm. 2006). A low intensity prescribed burn is likely to result in incomplete consumption of surface fuels (which may be positive for soil stability and micro-organism viability) and to leave the elevated fuel layer above about 2 metres unburnt. A higher intensity burn will assist with the removal of bark fuels. However, higher intensity burns can be very difficult to control and to keep inside the control lines, as well as potentially having negative soil erosion effects.



Biodiversity Threshold

Class ID	Vegetation Communities	Minimum Fire Interval	Maximum Fire Interval	Notes
A	Rainforest	n/a	n/a	Fire should be avoided
C	Saline Wetland	n/a	n/a	Fire should be avoided
D	Wet Sclerophyll Forest	25	60	Crown fires should be avoided in the lower end of the interval range
E	Semi-mesic Grassy Forest	10	50	Crown fires should be avoided in the lower end of the interval range
F	Swamp Sclerophyll Forest	7	35	
G	Sclerophyll Grassy Woodland	5	40	
H	Grassy Dry Sclerophyll Forest	5	50	
I	Shrubby Dry Sclerophyll Forest	7	30	
J	Semi-arid Woodland	6	40	There was insufficient data to give definite intervals. Available data indicates min. intervals should be at lest 5-10 years, & maximum intervals approximately 40 years
L	Heathland	7	30	
M	Grassland	2	10	Some intervals greater than 7 years should be included in coastal areas. Available evidence indicates maximum intervals should be approximately 10 years
N	Freshwater Wetland	6	35	
N/A	Rock / Sand / Agricultural Areas	n/a	n/a	

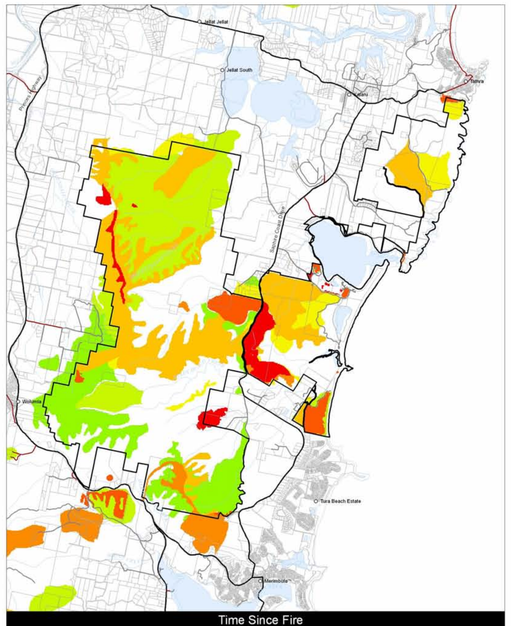
NB. These are indicative guidelines based on broad statewide vegetation formations (using the classification of Keith (2002)). These guidelines are not intended to be interpreted as prescriptions. They define a domain of 'acceptable' fire intervals consistent with the maintenance of existing plant species.



Vegetation Threshold Analysis

Below threshold	The area will be Overburnt if it burns this year. *- Protect from fire as far as possible.*
Within Threshold	Fire history is within the threshold for vegetation in this area. *- A burn is neither required nor should one necessarily be avoided.*
Above Threshold	Fire frequency is above maximum inter-fire interval in the area. *- A prescribed burn may be advantageous. Consider allowing unplanned fires to burn.*
Fire Intolerant	The vegetation in this are is fire intolerant. *- Protect from fire as far as possible.*
Unknown	Insufficient data to determine fire threshold.

NB. Fire thresholds are defined for vegetation communities to conserve biodiversity



Time Since Fire

Years since Fire

1 - 5 years	16 - 20	31 - 35
6 - 10	21 - 25	36 - 40
11 - 15	26 - 30	> 40 years

Prescribed Burning Works

Name	Zone	Proposed = 0, Implemented = X					
		2003	2004	2005	2006	2007	2008
Kianinny	SFMZ 1					0	
Games Bay Nth	SFMZ 2						
Hobart Beach	SFMZ 3	0 X	0 X	0 X	0 X	0 X	0 X
Bournda Road	SFMZ 4						
Sandy Creek	SFMZ 5	0 X				X	
Sapphire Coast Drive East	SFMZ 6					X	
Sapphire Coast Drive West	SFMZ 7						
Quarry	SFMZ 8		0 X				
Rubbish Tip	SFMZ 9	2001					
Merimbula Creek	SFMZ 10	0 X					
Black Range	SFMZ 11				0 X		
Kangarutha	HMZ 1						
Bournda	HMZ 2	X					
Black Range	HMZ 3						

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