



Fire Management Plan



Yengo National Park, Parr State Recreation Area and Dharug National Park.

May 2003

NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

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Cover Photograph: Looking at Mt Yengo from Finchley Trig

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EXECUTIVE SUMMARY

PLANNING AND CONSULTATIVE PROCESS

This Fire Management Plan has been developed to provide direction for fire management activities, including bushfire suppression, in Yengo National Park, Parr State Recreation Area and Dharug National Park. The plan will emphasise the protection of life and property as well as providing direction for land managers in the protection of the natural and cultural heritage of Yengo National Park, Parr State Recreation Area and Dharug National Park.

Yengo National Park, Parr State Recreation Area and Dharug National Park have a number of threatened plants and animals, some of which are unique to these areas. This plan will deal with the protection of these species and communities through the implementation of appropriate fire management regimes to promote biodiversity.

In consultation with local Bush Fire Management Committees, volunteer Rural Fire Brigades, park neighbours and other stakeholders, areas have been prioritised for fuel management treatment by assessing bush fire threat to assets.

The co-operation of the community will be critical to the success of the plan. The Service seeks support from the community to manage fuel loads near their own assets. This will complement work undertaken in the parks and state recreation area.

Although every effort has been made to ensure accuracy of details from existing databases, additional information is continually being collected and management concepts and practices evolving. Therefore, it is proposed that this plan will have a shelf life of five years before a review is undertaken.

FIRE MANAGEMENT OBJECTIVES

In accordance with Sections 63 & 64 and Part 1, Section 3 of the ***Rural Fires Act (1997)*** and also in accordance with the ***National Parks and Wildlife Act (1974)***; the primary objectives for fire management in the Reserves are as follows:

- Protect life, property and community assets from the adverse impacts of fire;
- Develop and implement cooperative and coordinated fire-management arrangements with other fire related authorities, reserve neighbours and the community;
- Manage fire regimes within reserves to maintain and enhance biodiversity;
- Protect aboriginal sites, historic places and culturally significant features known to exist within NSW from damage by fire; and

- Assist other fire agencies, land management authorities and landholders in developing fire-management practices to conserve biodiversity and cultural heritage across the landscape.

STRATEGIES FOR LIFE AND PROPERTY PROTECTION

Strategies for the protection of life and property from the effects of wildfires included in the draft plan are:

- Early detection and rapid suppression of all wildfires posing a threat to life, property and infrastructure assets within and adjoining the Reserves.
- Implementation of strategic fuel management programs.
- Promotion of fire safety and fire protection procedures throughout the community.
- Maintenance of a strategic fire trail network.

STRATEGIES FOR FIRE MANAGEMENT

Strategies for the prevention, detection and control of wildfire that are included in the draft plan are:

- Emphasis on boundary fuel reduction measures to protect against direct flame attack on assets on / off Park.
- Aerial surveillance of the Reserves following severe thunderstorms.
- Maintenance of fire trails and utilities to assist with the suppression of wildfire.
- Rapid suppression of wildfires where possible.
- Monitoring of fuel levels within strategic wildfire control zones.
- Strategic prescribed burning to reduce the potential for large scale wildfires.
- Implementation of other fuel reduction activities such as slashing, manual removal of fuel and shrubs and mowing of radiation zones.
- Continued liaison with Bush Fire Management Committees.

STRATEGIES FOR HERITAGE MANAGEMENT

Strategies for the management of the natural and cultural heritage values that are included in the draft plan are:

- The use or exclusion of fire to maintain a complex diversity of vegetation communities and age structures, prevent species extinctions and protect specific natural or cultural assets.
- Emphasis on hazard reduction along boundary areas to allow for ecologically sustainable fire regimes within core Park areas.

- Assessment of environmental impacts prior to any fire management activity.
- Pre-burning surveys for threatened species or Aboriginal / historic relics where possible.
- Minimising use and impacts on the Old Great North Road in accordance with the *Old Great North Road Conservation Management Plan*.
- Monitoring vegetation re-generation following a prescribed burn where possible.
- Compliance with identified fire regime thresholds for all vegetation communities, threatened species and communities.

These strategies are based on guiding principles of fire ecology drawn from current ecological research and represent a best practice approach within existing levels of knowledge.

An Environmental Impact Assessment for the activities identified in the plan has also been prepared and placed on public exhibition with the plan.

TABLE OF CONTENTS

1. Introduction	1
1.1 Scope and Purpose	1
1.2 The Planning Environment	2
1.2.1 Legislation	2
1.2.2 Management Objectives of the Parks and State Recreation Area	3
1.2.3 Fire Management Policies of the NPWS	4
1.2.4 Local-Regional Environmental Plans	5
1.2.5 State Environmental Planning Policies	5
1.2.6 Fire Management Policies-Regulations of Involved Organisations	6
1.2.7 NSW Biodiversity Strategy	6
1.3 Definitions and Principles	7
2. Description of the Reserves	13
2.1 Location	13
2.2 Terrain	14
2.3 Biodiversity	16
2.3.1 Flora	16
2.3.2 Fauna	27
2.4 Cultural Heritage	32
2.4.1 Aboriginal	32
2.4.2 Historic	34
2.5 Recreational Use and Facilities	36
3. Bushfire Environment	37
3.1 Fire History and Frequency	37
3.1.1 Wildfires	37
3.1.2 Prescribed Burning	40
3.1.3 Fire Frequency	43
3.2 Fire Weather	43
3.2.1 Climate	43
3.2.2 Conditions Associated with Bush Fires	43
3.2.3 Conditions Suitable for Prescribed Burns	44
3.3 Fire Behaviour Potential	45
3.3.1 Elevation	45
3.3.2 Slope	45
3.3.3 Aspect	46
3.3.4 Fuel	46
3.3.5 Analysis of likely Fire Behaviour	49
3.4 Damage Potential	51
3.4.1 Historical Damage	52
3.4.2 Economic Damage	52
3.4.3 Natural Heritage Damage	52
3.4.4 Cultural Heritage Damage	52
4. Fire Management	53
4.1 Bush Fire Management Zones	53
4.2 Strategic Fire Management Zones	54
4.3 Asset Protection Zones	54
4.4 Heritage Management Zones	55
4.5 Summary of Fire Management Zones	57
4.6 Biodiversity Conservation	57

4.6.1	Principles and Thresholds	57
4.6.2	Distribution of Biodiversity in Fire Management Zones	59
4.6.3	Evaluation of Current Fire Regimes	64
4.6.4	Effects of Management for Human Protection and Strategic Wildfire Control on Biodiversity	65
4.6.5	Fire Regime Strategies for Biodiversity Conservation	65
4.7	Aboriginal Heritage	70
4.8	Historic Heritage	71
4.9	Smoke Management	71
4.10	Summary of Operational Guidelines	71
4.10.1	Guidelines for Cooperative Fire Fighting Arrangements	74
5.	Fire management assets	75
5.1	Fire Management Access	75
5.2	Fire Management Utilities	80
5.2.1	Aviation	82
5.3	Fire Management Facilities	82
6.	Works schedule	84
6.1	Biodiversity Works Schedule	84
6.1.1	Fire Mapping and Database Management	84
6.1.2	Monitoring Fuel	84
6.1.3	Monitoring Fire Regimes and Changes to Biodiversity	85
6.2	Operations Works Schedule	85
6.2.1	Prescribed Burning	85
6.2.2	Fire Radiation Zones	85
6.3	Infrastructure Works Schedule	85
6.3.1	Fire Management Access	86
6.3.2	Fire Management Utilities	89
6.3.3	Fire Management Facilities	89
6.4	Summary Table of Works to be Undertaken Annually	90
7.	Plan administration	93
7.1	Management of Works	93
7.2	Environmental Assessment of Scheduled Works	93
7.3	Plan Review	93
7.4	Implementation and Evaluation	93
7.5	Life and Property Protection	94
7.6	Maintenance of Biodiversity	94
7.7	Further Research	95
8.	REFERENCES	96

APPENDICES

Appendix 1 Fire Zone Specifications

Appendix 2 Fire Management Zones

Appendix 3 Interim Smoke Management Guidelines

MAPS

MAP 1 - location of Reserves	15
MAP 2 - Vegetation Communities	18
MAP 3 – Ignition Points	38
MAP 4 – Fire Frequency 1967 – 1998	41
MAP 5 – Assets within 1 kilometer of the Reserves	42
MAP 9 – Fuel Categories	47
MAP 10 – Bushfire Behaviour Potential Classes	50
MAP 11 – Fire Management Zones	56
MAP 12 – Minimum Inter-fire Period for Species Conservation	63
MAP 13 – Fire Trails	76

TABLES

Table 1 - Desirable Fire Frequency For Varying Vegetation Communities	
Table 2 - Vegetation Communities within Yengo National Park and Parr State Recreation Area	
Table 3 - Vegetation Communities within Dharug National Park	
Table 4 - Threatened Flora Species Occurring or Predicted to Occur within Yengo and Dharug National Parks and Parr State Recreation Area	
Table 5 - Rare or Threatened Australian Plants (ROTAP) Species Located Within Yengo and Dharug National Parks and Parr State Recreation Area	
Table 6 - Threatened Fauna Species Occurring or Predicted to Occur Within Yengo and Dharug National Parks and Parr State Recreation Area	
Table 7 - Wildfires Occurring Within Yengo and Dharug National Parks and Parr State Recreation Area	
Table 8 - Wildfires Occurring Within Yengo and Dharug National Parks and Parr State Recreation Area (by Year and Areas Burnt 1975-1999)	
Table 9 – Monthly Maximum Keetch Byram Drought Index	
Table 10 - Slope Categories within Yengo and Dharug National Parks and Parr State Recreation Area	
Table 11 - Aspect Categories within Yengo and Dharug National Park and Parr State Recreation Area	
Table 12 - Description and Characteristics of Fuel Groups	
Table 13 - Estimates of Bush Fire Behaviour Potential from Fuel Categories Located within Yengo National Park and Parr State Recreation Area	
Table 14 - Estimates of Bush Fire Behaviour Potential From Fuel Categories Located Within Dharug National Park	
Table 15 - Bush Fire Behaviour Potential Classes Within Yengo and Dharug National Parks and Parr State Recreation Area	
Table 16 - Desirable Fire Frequency For Varying Vegetation Communities	
Table 17 - Distribution of Vegetation Types in Fire Management Zones within Yengo National Park and Parr State Recreation Area	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Table 18- Distribution of Vegetation Types in Fire Management Zones within Dharug National Park

Table 19 - Fire Thresholds for Vegetation Communities Within Yengo National Park and Parr State Recreation Area

Table 20 - Fire Thresholds for Vegetation Communities Within Dharug National Park

Table 21 – Fire Regimes Within Vegetation Communities

Table 22 - Fire Regimes / Strategies For Conservation of Flora Species

Table 23 - Key Characteristics of Fire Regimes Which Impact Upon Fauna

Table 24 - Fire Management Guidelines for Conservation of Threatened Fauna Species

Table 25 - Operational Guidelines For Prescribed Burning and Wildfire Suppression Within the Reserves

Table 26 - Policies for Wildfire Suppression Within the Reserves

Table 27 Trail Classification Within the Reserves

Table 28 - Trails Within and adjacent to the Reserves

Table 29 - Utilities and Equipment Held by the Central Coast Hunter Range Region of National Parks and Wildlife Service

Table 30 - Main Radio Systems and Channels Utilised by Various Fire Fighting Authorities

Table 31 - Trail Maintenance Work within the Reserves

Table 32 - Annual Works Schedule

1. INTRODUCTION

This Draft Fire Management Plan applies to the land area dedicated under the National Parks and Wildlife Service Act, 1974, as Yengo National Park, Parr State Recreation Area and Dharug National Park. The NSW National Parks and Wildlife Service manage these Reserves.

This Plan is supported by maps, documents and computer databases that are maintained at the Central Coast Hunter Range Regional Office. This Plan will be reviewed annually and formally updated after five years.

All inquiries regarding the Plan, should be directed to the Regional Manager, Central Coast Hunter Range Region, PO Box 1477, Gosford, NSW, 2250.

1.1 Scope and Purpose

Under the *Rural Fires Act 1997* the National Parks and Wildlife Service (NPWS, or the Service) is a prescribed fire fighting authority and is responsible for the control and suppressing of all fires on areas that it manages. This responsibility also extends to fuel management with the Service being responsible for the implementation of fuel management programs to protect life and property.

Section 50 of the *Rural Fires Act 1997* sets up provisions for the establishment of Bush Fire Management Committees (BFMCs) with the task of developing and co-ordinating co-operative fire management between fire authorities across the state.

The Service is a member of these committees, which are responsible for the development of both co-operative fire-fighting and programs for the reduction of bushfire hazards. Within the scope of this plan the Service is an active member of the following Bush Fire Management Committees:

Cessnock Bush Fire Management Committee
Gosford Bush Fire Management Committee
Hawkesbury Bush Fire Management Committee
Singleton Bush Fire Management Committee

Under Section 52 of the *Rural Fires Act 1997*, each Bush Fire Management Committee is to prepare two kinds of bush fire management plans for the rural fire district or other part of the state for which it is constituted. These plans are:

- A plan of operations, and
- A bush fire risk management plan.

When a fire occurs on 'managed land', the Fire Control Officer must comply with the conditions set out in any relevant bush fire management plan, or

other relevant plan, agreed to by the authority responsible for the prescribed land (Section 38 s4). This Fire Management Plan is such a plan under Section 38 s4 of the *Rural Fires Act 1997*.

1.2 The Planning Environment

The National Parks and Wildlife Service requires that a fire management plan be prepared for each National Park, Nature Reserve and State Recreation Area.

This Plan specifies the fire management objectives and strategies appropriate for Yengo National Park, Parr State Recreation Area and Dharug National Park. All fire suppression and fuel management operations must be in accordance with this plan and other NPWS plans, for example, the Plan of Management for each respective Reserve.

1.2.1 Legislation

The Service has statutory obligations under the *Rural Fires Act 1997* to protect life and property on its lands and to prevent fire from leaving its property. Under the *National Parks and Wildlife Act 1974* the Service is empowered with the authority to conserve the natural and cultural heritage of NSW.

This authority extends to the protection of heritage off reserve and is given greater legislative backing through the *Threatened Species Conservation Act 1995*. These obligations, though not mutually exclusive, require a flexible approach to fire management. The TSC Act 1995 (NSW) lists “*High fire frequency resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*” as a Key Threatening Process in relation to threatened species.

The Service must give appropriate consideration in its fire management planning to the requirements of protection for both human life and property as well as the protection of the environment.

As a prescribed authority the NPWS is required to implement the provisions of Bush Fire Management Plans. The Service, if required, can act to suppress fires up to eight kilometres from its reserve boundaries in collaboration with local brigades and park neighbours in accordance with provisions of local Bushfire Management Plans.

Other relevant legislation for fire management includes the *Environment Protection and Biodiversity Conservation Act 1999* and the *Native Vegetation Act 1997*.

1.2.2 Management Objectives of the Parks and State Recreation Area

A Draft Plan of Management has been prepared for Yengo National Park, Parr State Recreation Area and Dharug National Park, which outline the broad management objectives for these Reserves (NPWS, 2000).

Within the Plans of management, a recommendation is made for a fire management plan to be prepared for the Reserves. Below is a list of the broad management objectives outlined within the Plans of Management for Yengo National Park, Parr State Recreation Area and Dharug National Park.

The following specific objectives relate to the management of Yengo National Park and Parr State Recreation Area:

- promotion of wildlife corridors that link these two areas to the system of protected lands and enhance their conservation value;
- protection of the warm temperate and dry rainforest communities;
- protection, and where necessary restoration, of wilderness values;
- provision of opportunities for the Aboriginal community to continue their traditional practices and to continue their traditional practices and maintain sites;
- maintenance of dispersed, low-impact recreation opportunities so that visitors may experience the scenic, natural and wilderness values of the two nights;
- promotion of public awareness and appreciation of the areas with emphasis on:
 - their importance as part of the system of conservation areas in the Sydney Basin;
 - wilderness values; and
 - adoption of minimal impact recreation practices by park visitors;
- promotion within the local community, of the importance and purpose of management programs necessary for the protection of natural features and the control of fire, weeds and feral animals.

The following specific objectives relate to the management of Dharug National Park:

- to manage Dharug National Park as part of a system of National Parks, State Recreation Areas and Nature Reserves which together conserve the biodiversity and natural processes of the lower Hawkesbury River system
- to protect the Park's scenic value as part of the lower Hawkesbury River land system

- to protect the catchments that occur within the Park
- to protect Aboriginal sites within the Park in conjunction with the local Aboriginal community
- to protect the historic Old Great North Road
- to promote the use of the Park for environmental education purposes
- to promote the use of the Park for low-impact recreation in a natural setting and for appropriate cultural tourism.

Policies to achieve objectives include maintenance of vegetation communities, the addition of suitable lands to the Park to increase range and preserve wildlife corridors, suitable fire management policy, education of residents, and restriction of trail incursions, which favour predator incursions, and reduction of predator animals in the Reserves.

1.2.3 Fire Management Policies of the NPWS

Service policies concerning fire and fire management include the following:

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

All prevention and suppression works will, where possible, be pre-planned and coordinated with neighbour and other agencies likely to be affected by Service activities. The Service will undertake fire prevention programs, though public education and through local supervision and enforcement of the Acts and regulations applying to fires.

The *2000/03 NPWS Corporate Plan* features fire management in two objectives for conservation management. These objectives are:

- Objective 4: “ensure effective management systems are in place for ecologically sustainable management of NPWS operations, including NPWS parks and reserves”. One of the strategies to achieve this includes maintaining the current resource commitment to fire planning.
- Objective 7: “to contribute to the environmental, social and economic well being of local and regional communities” One of the performance targets

listed is to increase the number of joint fire management programs with NPWS and the community.

1.2.4 Local-Regional Environmental Plans

Yengo National Park, Parr State Recreation Area and Dharug National Park lie in the local government areas of Gosford, Hawkesbury, Cessnock and Singleton Shire Councils. Each of these Local Government Areas provide varying degrees of protection to the National Parks and State Recreation Area.

Cessnock City Council *Local Environmental Plan 1989* lists Yengo National Park under the zoning title 1a Rural A Zone.

Gosford City Council *Interim Development Order 122* lists Dharug National Park as being zoned as 6a Open Space (Recreation) and 7a Conservation and Scenic Protection (Conservation).

Hawkesbury City Council *Local Environmental Plan 1999* lists Parr State Recreation Area and Yengo National Park as being zoned 8a Nature Reserves. The objective of this zone is to identify, preserve and manage national parks and nature reserves for conservation and recreation purposes and to provide for their continued management under the National Parks and Wildlife Act, 1974.

Singleton Shire Council *Local Environmental Plan 1996* zones Yengo National Park as - 8 (National Parks and Nature Reserves Zone). The objectives of this zone are to identify, preserve and manage national parks and nature reserves for conservation and recreation purposes and to provide for their continued management under the National Parks and Wildlife Act 1974 as well as to protect and conserve Aboriginal sites.

The reserve areas are also subject to:

- Sydney Regional Environment Plan 20 (A small area at Rose's Run and the Wetlands at Mill Creek)
- Dharug National Park Plan of Management (1997)
- Yengo National Park and Parr State Recreation Area Draft Plan of Management (2000)

These policies should be taken into account at the beginning of the hazard reduction season in order to determine their relative impact on areas earmarked for hazard reduction.

1.2.5 State Environmental Planning Policies

Yengo National Park, Parr State Recreation Area and Dharug National Park (including adjacent properties) are subject to a State Environmental Planning Policy (SEPP) as follows:

- SEPP 44 1995. Koala Habitat Protection. This policy aims to protect koala habitat in New South Wales and sets out procedures to achieve this.

This policy should be taken into account at the beginning of the hazard reduction season in order to determine their relative impact on areas earmarked for hazard reduction.

1.2.6 Fire Management Policies-Regulations of Involved Organisations

The *Rural Fires Act 1997* requires each Bushfire Management Committee to prepare and submit a Bushfire Management Plan, comprising a Plan of Operations and a Bushfire Risk Management Plan to coordinate the activities of organisations for the prevention, control and suppression of bushfires.

The risk management plan identifies areas of high potential risk. Land managers are responsible for developing strategies to reduce that risk.

The Cessnock, Gosford, Hawkesbury and Singleton Bushfire Management Committees have adopted co-ordinated fire-fighting policies based on the Policy Statement of the Co-ordinating Committee and the Manual of Procedures for Co-ordinated Fire Fighting.

The Yengo National Park, Parr State Recreation Area and Dharug National Park Fire Management Plan will form part of the NPWS input into the Plan of Operations and the Bushfire Risk Management Plan.

1.2.7 NSW Biodiversity Strategy

The *NSW Biodiversity Strategy (1999)* was developed by the New South Wales Government and develops a collaborative approach to biodiversity conservation. Its over-riding goal is: "to protect the native biological diversity of NSW and maintain ecological processes and systems". To this end inappropriate fire regimes has been identified as one of the seven key threatening processes that is effecting the biological diversity of NSW. This issue is targeted within the Biodiversity Strategy through:

Action 43: manage fire in accordance with ecologically sustainable development principles;

Action 44: improve the consideration of fire threat in land-use planning and incorporate the results of applied fire research, including the knowledge and experience of Aboriginal and local communities, inland management and land-use planning; and

Action 45: continue a research program to examine the effects of fire on biodiversity.

1.3 Definitions and Principles

*Most definitions described below come from the Australian Fire Authorities Council (AFAC) **Glossary of Rural Fire Terminology** (March 1996).*

Aerial Detection	The discovering, locating and reporting of fires from aircraft.
Aerial Fuels	The standing and supporting combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, bark and creepers.
Aspect	The direction towards which a slope faces, e.g. northeast. Slopes on a west to north-westerly aspect are the most hazardous during fire fighting operations.
Assets at Risk	The natural resources or improvements that may be jeopardised if a fire occurs. Examples include: threatened species habitat, rainforests, forestry coups, human built structures or infrastructures, Park information signs, transmission poles etc. and may also include scenic values. For the fire manager it may also include natural values that may be threatened by a fire (e.g. water catchment quality).
Backburning	A fire started intentionally along the inner edge of a fireline to consume the fuel in the path of a wildfire.
Buffer	A strip or block of land on which the fuels are reduced to provide protection to surrounding lands.
Burning Programme	All the prescribed burns scheduled for a designated area over a nominated period of time.
Bush Fire Management Unit (FMU)	Management areas of a variable size that define containment blocks in the event of a wildfire. Alternatively they have also been designated as areas of specific ecosystem types defined by management authorities in order to monitor the long term effects of fire upon those areas.
Bush Fire Management Zone (BFMZ)	Management areas (usually sub-sets of fire management units) where a specified fire management operational objective, strategy and performance indicator has been developed to mitigate against the threat of a wildfire.

Special note about the above: an **FMU** is usually a monitoring and containment block whilst a **BFMZ** is a sub-unit of an **FMU** where fire managers undertake activities such as prescribed burning to achieve a set outcome (including the protection of life and property or slow the advance of a wildfire).

Coarse Fuels	Dead woody material, greater than 25mm in diameter, in contact with the soil surface (fallen trees and branches).
Controlled Burning	see <i>Prescribed Burning</i> .
Crown Fire	A fire burning in the crowns of trees and usually supported by fire in ground fuels. Its is a fast travelling fire that usually consumes all available fuels in its path.
Drought Index	A numerical value, such as the Keetch Byram Drought Index, reflecting the dryness of soils, deep forest litter, logs and living vegetation.
Ecosystem	The interacting system of a biological community, both plant and animal, and its non living surroundings
Edge Burning	A term used to describe perimeter burning of an area in mild conditions prior to large scale prescribed burning. This practice is used to strengthen buffers and to reduce mop-up operations.
Fine Fuels	Generally all fuels less than 6mm in diameter, comprised of surface litter and aerial shrub layer.
Fire	The chemical reaction between fuel, oxygen and heat. Heat is necessary to start the reaction and once ignited, fire produces its own heat and becomes self-supporting. Removal of any one of the three elements of fuel, oxygen and heat will extinguish a fire.
Fire Behaviour	The manner in which a fire reacts to the variables of fuel, weather and topography. Changes in any of these variables with result in a change in the fires behaviour.
Fire Break	Any natural or constructed discontinuity in a fuel bed used to segregate, stop and control the spread of a wildfire, or to provide a fireline from which to suppress a fire.
Fire Extent	The area burnt by a wildfire, measured in hectares. Within that area there will be “islands” of unburnt

vegetation (these islands are generally included in the total fire extent).

NB: it is preferable that fire affect only part of a vegetation community at any one time so that nearby areas of more mature plants may provide a seed source for recolonisation and animals will have suitable unburnt habitat in order to seek shelter and forage.

Fire Front	The part of a fire where the rate of spread, flame height and intensity are greatest, usually when burning downwind or upslope.
Fire Intensity	The rate of energy released per unit length of fire front. This is usually expressed as kilowatts per metre (kW/m).
Fire Management	All activities associated with the management of fire-prone land, including the use of fire to meet land management goals and objectives.
Fire Perimeter	The entire outer boundary of a fire area.
Fire Regime	The history of fire in a particular vegetation type or area including the frequency, intensity and season of burning (season in this context refers to the time of the year in which the fire occurred). It may also include proposals for the use of fire in a given area.
Fire Season	The period(s) of the year during which fires are likely to occur, spread and do sufficient damage to warrant organised fire control. In New South Wales the core fire season is from 1 st October to the 31 st March of the following year. <i>NB: At the regional scale, the season may be introduced or extended by one month dependent upon the prevailing weather conditions, drought indexes and number of wildfire's that may already be burning within that area.</i>
Fire Storm	Violent convection caused by a large continuous area of intense fire; often characterised by destructively violent surface indrafts, a towering convection column, long distance spotting, and sometimes by tornado-like whirlwinds.
Flame Height	The vertical distance between the tip of the flame and

	ground level, excluding higher flame flashes. Expressed in vertical metres.
Fuel	Any material such as grass, bark, leaf litter and living vegetation which can be ignited and sustains a fire. Fuel is usually measured in tonnes per hectare of dry weight.
Fuel Arrangement	A general term referring to the spacing and arrangement of fuel in a given area.
Fuel Load	The oven dry weight of fuel per unit area. Commonly expressed as tonnes per hectare.
Fuel Bed	The arrangement and vertical profile of all readily combustible materials lying on the ground.
Fuel Management	Modification of fuels by prescribed burning, manual removal, slashing, grazing, or other means. The objective is to reduce the fuel thereby reducing the risk posed by unplanned fires.
Fuel Type	An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause predictable rate of spread or difficulty of control under specified weather conditions.
Habitat	<p>A physical portion of the environment that is inhabited by an organism or population of organisms. A habitat is characterised by a relative uniformity of the physical environment and fairly close interaction of all the biological species involved.</p> <p><i>NB Organisms within a given habitat will express a level of co-dependency upon one-another. The loss of the physical characteristics of a given habitat can have severe and long term detrimental effects upon the organisms living in that habitat.</i></p>
Hazard Reduction Island	<p><i>see Fuel Management</i></p> <p>An unburnt area within a fire perimeter. Islands are critical for species survival and recruitment after a wildfire event.</p>
Keetch Byram Drought Index	A numerical value reflecting the dryness of soils, deep forest litter, logs and living vegetation, and expressed as a scale from 0 - 200 points. When 100 points has

	been reached in an area, that area is said to be in drought
NPWS	The National Parks and Wildlife Service of New South Wales.
NSWFB	The New South Wales Fire Brigades
Prescribed Burning	The controlled application of fire under specified environmental and weather conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives.
RFS	The New South Wales Rural Fire Service.
Rate of Spread	The forward progress per unit time of the head of the fire or another specified part of the fire perimeter.
Service, the	The National Parks and Wildlife Service of New South Wales.
SF	State Forests of New South Wales
Scorch Height	The height above ground level up to where foliage has been browned by a fire.
Slip-on Unit	A fire fighting unit that can be placed on to the back of a four wheel drive vehicle to convert it to a fire tanker. <i>Depending upon the units water carrying capacity, a four wheel drive tray top vehicle could be converted to Category 2,7 or 9 fire tankers in a very short space of time.</i>
Spot Fire	Isolated fires started ahead of the main fire by sparks, embers or other ignited material, sometimes to a distance of several kilometres.
Striker	A small four wheel drive fire tanker capable of carrying from 400 to 600 litres of water for fire fighting purposes. Also known as a Category 9 Fire Tanker.
Structure Fire	A fire burning part, or all of any building, shelter, or other human made construction.
Tanker	A mobile firefighting vehicle equipped with a water tank, pump, and the necessary equipment for

spraying water and/or foam on unplanned fires.

NB Under NSW Dept. of Rural Fire Service guidelines, bushfire fighting tankers have been designated into nine 'Categories' delineating water carrying capacity and whether the unit is two or four wheel drive capable.

Topography	The surface features of a particular area or region, i.e. the lay of the land, and includes mountains, rivers etc.
Unplanned Fire	<i>see Wildfire</i>
Urban/Rural Interface	The line, area, or zone where structures and other human development adjoin or overlaps with undeveloped bushland. Also known as the urban/bush interface, urban interface or just the interface.
Wildfire	An unplanned fire. A generic term which includes grass fires, forest fires and scrub fires.

2. DESCRIPTION OF THE RESERVES

2.1 Location

Yengo National Park and Parr State Recreation Area comprise an area of about 199,050 hectares and lie to the north of the Hawkesbury and Colo Rivers and south of the Hunter Valley.

Prior to the dedication of these reserves as National Park and State Recreation Area in March 1988, the two Reserves have been exposed to limited grazing and forestry operations.

Dharug National Park covers an area of 15,211 hectares, north of the Hawkesbury River, approximately 55 km north of Sydney and 25 km west of Gosford. The Park is bounded by Yengo National Park, the Hawkesbury River and Old Great North Roads, McPherson State Forest, private land along Mangrove Creek and the townships of Gunderman and Spencer.

Reserved in 1967, Dharug National Park features spectacular sandstone cliff-lines and gullies, a substantial part of the historic Old Great North Road and a great many Aboriginal sites.

Yengo National Park, Parr State Recreation Area and Dharug National Park are part of a group of sandstone National Parks within the Sydney bioregion. Also included within this group are Wollemi and Blue Mountains to the west, Goulburn River to the north, Royal, Marramarra to the south and Ku-ring-gai Chase, Popran and Brisbane Water National Parks to the east.

A number of other protected natural areas lie adjacent to and complement the National Park reserve system within this sandstone region. These protected areas include State Forests, the Sydney and Central Coast Water Catchment Areas.

The outer fringes of the Sydney metropolitan area adjoin the south-eastern section of the two Parks, where the present mix of urban and rural uses is undergoing rapid change as the region's population increases. This area is subject to intensive pressure, requiring management similar to metropolitan Parks and reserves.

Yengo National Park, Parr State Recreation Area and Dharug National Park lie in the local government areas of Gosford, Hawkesbury, Cessnock and Singleton Shire Council.

Map 1 shows the location of the Reserves.

2.2 Terrain

Yengo National Park and Parr State Recreation Area

The two Reserves lie on the north-western edge of the Sydney Basin, within the Hornsby Plateau, a highly dissected sandstone plateau forming a large number of narrow sandstone ridges and steep-sided valleys. The plateau extends from the eastern edge of the Blue Mountains from a height of about 270 m and gradually increases altitude to 370 m in the north on the southern rim of the Hunter Valley (Bell *et al*, 1993).

The lowest rock strata belong to the Narrabeen group, which is a mixture of sandstone, mudstone and shale. Above this are the rocks of the Hawkesbury Sandstone which are composed almost entirely of sandstone but also include some shale lenses. In the south-west of the area, around Colo Heights, are small remnants of the shales of the Wiannamatta Group which once overlaid the Hawkesbury Sandstone, but has now mostly weathered away.

Important sub-catchments of the Hawkesbury and Hunter River systems wholly or partly included in the two reserves are those of the MacDonald River, Webbs Creek and Wollombi Brook. The waters of Webbs Creek and the MacDonald River and all its tributaries have been classified Class P (Protected Waters) by the Environment Protection Authority.

Creeks within the two reserves flow in a southeast direction into the Hawkesbury River near Wiseman's Ferry via the Macdonald River, Webbs Creek and in the south-west corner of Parr SRA and the Colo River. Creeks in the north-eastern section of Yengo National Park flow north-easterly into the Hunter River via Wollemi Brook.

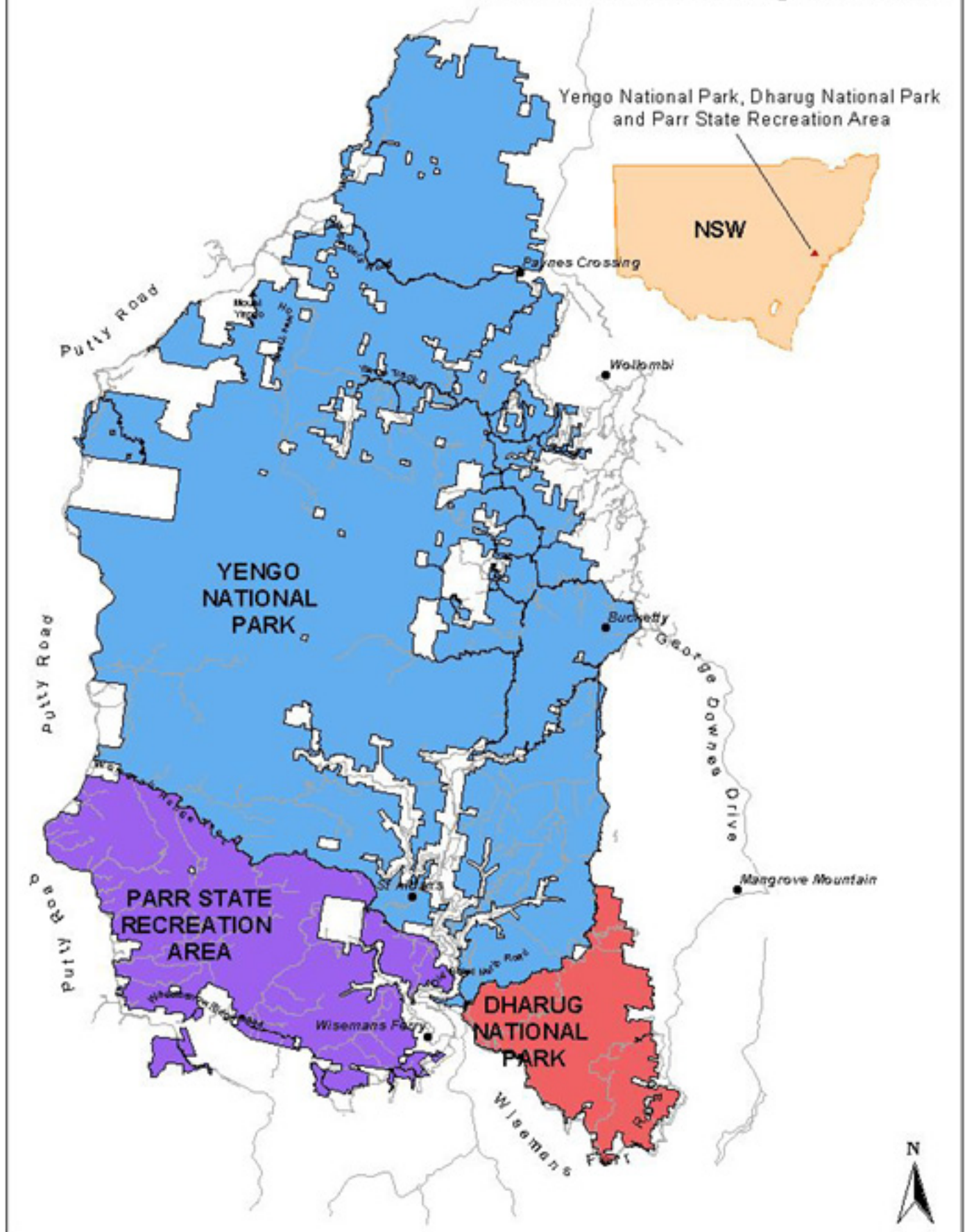
Dharug National Park

Dharug lies within the Sydney Basin, a major structural unit of Permian and Triassic age (270-180 million years ago consisting almost entirely of horizontally bedded sedimentary rocks). The Park lies on the northern margin of the Hawkesbury plateau; a subdivision of the Sydney Basin (NPWS, 1997).



A complex of interconnecting ridge systems divides the Park into two main catchment systems. The eastern creeks flow into Mangrove Creek via ten linear valley systems. These valleys are deeply incised and are orientated in an east-west direction. By contrast, the southern catchments flow from north to south into the Hawkesbury River and have a dendritic drainage pattern.

The Park contains a number of undisturbed creek catchments that lie completely within the Park. Undisturbed streams in the lower catchment of the Hawkesbury River are scarce and the continued protection of these features is an important management objective for the Park.

Map 1 - Location of Yengo National Park, Parr State Recreation Area and Dharug National Park



LEGEND

-  Study Area
-  Road

0 4 8 12 16 20 Kilometers

Scale 1:400,000

2.3 Biodiversity

Yengo National Park is part of the Greater Blue Mountains area, which in November 2000 was listed on to the World Heritage List by the World Heritage Committee of UNESCO. The Committee recognised that the Greater Blue Mountains Area provided “*outstanding examples representing significant on-going ecological processes in the evolution and development of terrestrial, fresh water ...ecosystems and communities of plants and animals*”

The 3 Reserves form part of an important corridor of bushland extending from Brisbane Water to the western side of the Blue Mountains. The maintenance of such “corridors of green” linking areas of bushland across a wide range of environments is important for the conservation of biodiversity.

2.3.1 Flora

Yengo National Park and Parr State Recreation Area

Due to the location of the two Reserves at the convergence of three botanical provinces (Central Western Slopes, Central Tablelands, Central Coast), the vegetation types contained therein have developed some unusual associations.

A high variability in microclimates and soil fertility has led to a high degree of biodiversity within the two reserves. This is reflected both in the numbers of plant species present at some sites and the number of quite different plant communities occurring near each other.

Most of the ridge tops and north-west facing slopes consist of low woodland with sclerophyllous shrubs underneath. This vegetation is generally similar to that found on Hawkesbury Sandstone close to the coast, but with significant differences due to the drier conditions. There is also considerable local variation.

Dharug National Park

Dharug National Park conserves an important area of natural vegetation fringing the Hawkesbury River. The vegetation of the Park was surveyed by the Royal Botanic Gardens (Clarke and Benson, 1986) which identified a total of 700 vascular plant species and 21 vegetation communities.

On the exposed ridges and slopes of the Hawkesbury Sandstone, the vegetation pattern is mainly low open forest, open forest and low woodland with either a dry or moist understorey. The dominant tree species include grey gum *Eucalyptus punctata*, Sydney Peppermint *Eucalyptus piperita*, Narrow-leaved Apple *Angophora bakeri* and Yellow Bloodwood *Corymbia eximia*.

Small areas of shrubland also occur on Hawkesbury Sandstone in poorly drained areas on resistant sandstone platforms along valley slopes. Shrubland in the Park is dominated by Dwarf Apple *Angophora floribunda*, *Banksia oblingifolia* and *Baekkea diosmifolia*.

Narrabeen group vegetation communities consist of closed forest and open forest with dominant species including rough-barked apple *Angophora floribunda*, Thin-leaved Stringybark *Eucalyptus eugenioides*, Forest Red Gum *Eucalyptus tereticornis* and Grey Ironbark *Eucalyptus paniculata*.

Closed forest occurs in the deep sheltered valleys on Narrabeen shales and on the rich igneous area near Spencer. Plants that are typical of this community are Lillypilly *Acmena smithii*, Rusty Fig *Ficus rubiginosa* and Coachwood *Ceratopetalum apetalum*.

A wide range of structural formations from closed forests to heathland occurs on the alluvium. Fringe forest occurs on the edge of the alluvial flats, some of which is found inside the Park. This community is typified by species adapted to varying levels of salinity and waterlogging such as Swamp Oak *Casuarina glauca* and Reed Grass *Phragmites australis*.

The three volcanic intrusions have distinctive vegetation communities. In the large volcanic diatreme depression at the head of Scotchman's Creek, a forest dominated by Gosford Wattle *Acacia prominens* and Grey Ironbark *Eucalyptus paniculata* occurs. Large areas of the crater were cleared for pasture and some regeneration is now occurring at the edges of the clearings. Several uncommon shrub species are found in the crater.

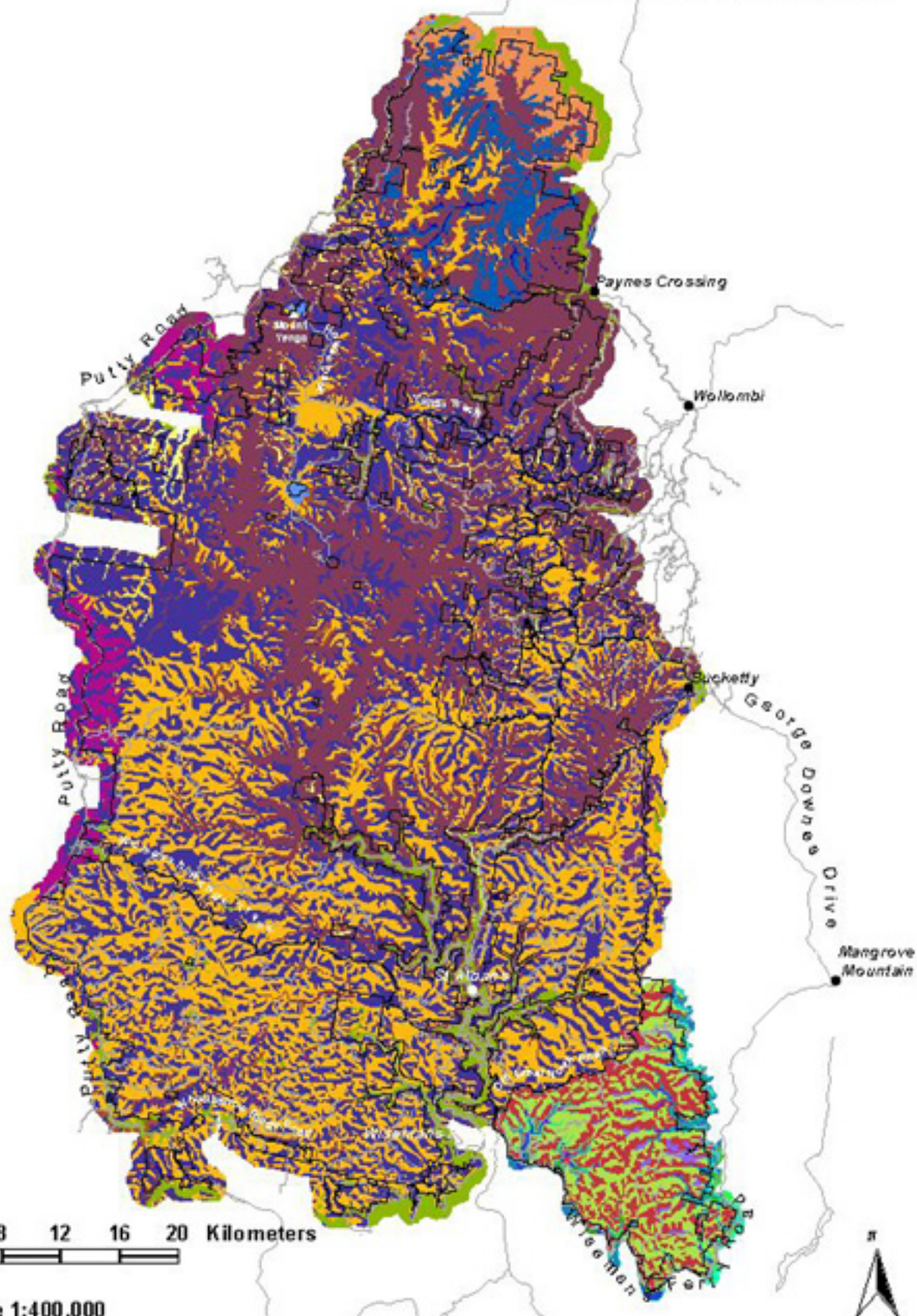
Fern-leaf Wattle *Acacia filicifolia*, Forest Oak *Allocasuarina turlosa*, Rough-barked Apple and Narrow-leaved Ironbark *Eucalyptus crebra* dominate forests on and down slope of the Ten Mile Hollow volcanic breccia dyke. The rare *Acacia matthewii* also occurs in this locality.

2.3.1.1 Communities

Survey work conducted by the NPWS (Bell *et. al.*, 1993) recognised 15 distinct vegetation communities within the Yengo National Park and Parr State Recreation areas. These communities were derived by the way of a full floristic analysis of 235 plots by a computer program called PATN.

The vegetation associations within Dharug NP were surveyed and analysed by Benson and Clarke (1986). A total of 21 vegetation types were recognised, mostly on the basis of the floristic composition of the dominant canopy species. Vegetation types within Dharug are grouped (A, B, C, D) in relation to the four land units described above in section 2.2, and are listed in Table 3 and illustrated on Map 2.

Map 2 - Vegetation Communities



0 4 8 12 16 20 Kilometers

Scale 1:400,000

Legend

	1		3d		A1		A7		B5		C5		Unknown
	2a		4a		A2		A8		B6		Cleared		Study Area
	2b		4b		A3		B1		C1		D1		Road
	3a		5		A4		B2		C2		D2		
	3b		6a		A5		B3		C3		N/A		
	3c		6b		A6		B4		C4		Ponds		

Thresholds for fire regimes have been determined (refer to section 4.6) for each of the communities within the reserves. Thresholds are based on broad fire regime requirement recognised in Table 1.

Table 1
Desirable Fire Frequency for Varying Vegetation Communities

Community	Desirable Ecological Fire Frequency	Regime Type
Dry - Open Forest and Woodland	Decline predicted if more than two successive fires occur at less than intervals of 8 years apart. Decline predicted if there are no fires for more than 25 years. Decline predicted if successive fires occur which totally scorch or consume the tree canopy. Avoid successive fires of intensity sufficient to scorch or consume dominant tree crown	B
Moist - forest, open forest, and woodland.	Variable fire frequency, no more than two fires within a 10 year period. No more than two consecutive fires more than 25 years apart. No more than two consecutive fires where less than 10 t/ha of fuel is consumed.	C
Wet sclerophyll, sheltered, swamp Forests.	Variable fire frequency, No more than one fire every 10 years. Decline expected if more than two fires in a row occur at intervals of more than 40 years apart.	D
Rainforest / Wetland	Fire intolerant - No desirable Ecological fire frequency.	E

(Source: Bell *et. al.*, 1993)

Table 2
Vegetation Communities within Yengo National Park and Parr State Recreation Area

Vegetation Community	Area (ha)	% of total area	Dominant Species *	Determining Ecological / Environmental Factors *	Thres hold
1 - Sheltered Dry Hawkesbury Forest	6179 9	31.05	<i>Angophora costata</i> , <i>Syncarpia glomulifera</i> , <i>Allocasuarina torulosa</i> . <i>Persoonia linearis</i> .	Found on Hawkesbury sandstone (sand to sandy loams) in sheltered south and east facing slopes or in gullies.	C
2a - Exposed Hawkesbury Woodland	6942 0	34.88	<i>Corymbia eximia</i> , <i>Angophora bakeri</i> . <i>Leptospermum trinervium</i> , <i>Monotoca scoparia</i> .	Generally found on Hawkesbury Sandstone (skeletal sand, sandy loam, sandy clay) on crests or north slopes.	C
2b - Dwarf Apple Low Open Woodland	1058	0.53	<i>Angophora hispida</i> . +/- <i>Angophora bakeri</i> , <i>Eucalyptus haemastoma</i> , <i>E. sparsifolia</i> . <i>Banksia oblongifolia</i> .	Generally found on Hawkesbury Sandstone (well drained skeletal sand, sandy loam, sandy clay) on crests or exposed slopes.	C
3a - Hawkesbury - Narrabeen Sheltered Forest	1474	0.74	<i>Syncarpia glomulifera</i> , <i>Allocasuarina torulosa</i> . <i>Backhousia myrtifolia</i> .	Hawkesbury SS, Narrabeen SS and alluvium (moist, shallow, loam, sandy loam or sandy clay) with south or east aspects, and in gullies.	D
3b - Sheltered Forest on Rich Soils	585	0.29	<i>Allocasuarina torulosa</i> . +/- <i>Eucalyptus deanei</i> , <i>E. saligna</i> , <i>Angophora floribunda</i> , <i>Syncarpia glomulifera</i> , <i>E. punctata</i> .	Narrabeen SS and associated colluvium and alluvium (moist, shallow to deep loam, sandy loam or clay loam) on sheltered mid to lower slopes and gullies.	D
3c - Grey Box Open Forest	158	0.08	<i>Eucalyptus moluccana</i> . +/- <i>E. tereticornis</i> , <i>E. punctata</i> . <i>Acacia fulva</i> .	Hawkesbury SS downslope from basalt on Mount Yengo and Mount Wareng. Boundary between Narrabeen SS and permian mudstone at Fig Tree Camp.	B
3d - Rough barked Apple Woodland on	1364	0.69	<i>Angophora floribunda</i> . +/- <i>Eucalyptus crebra</i> , <i>E. tereticornis</i> ,	Wide valley flats on moist, perched silty alluvium. Well drained deep loam (+/- sand or	B

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Vegetation Community	Area (ha)	% of total area	Dominant Species *	Determining Ecological / Environmental Factors *	Thres hold
alluvium			<i>E. agglomerata</i> , <i>E. viminalis</i> .	clay).	
3e - Stinging Tree Dry Rainforest	<10	0.006	<i>Toona ciliata</i> , <i>Dendrocnide excelsa</i> , <i>Neolitsea dealbata</i> , <i>Claoxylon australe</i> .	Slopes of basalt occurring on Mount Yengo (5 - 10 hectares).	E
3f - Rainforest on Alluvium	300	0.17	<i>Backhousia myrtifolia</i> . +/- <i>Angophora floribunda</i> , <i>Eucalyptus deanei</i> , <i>Syncarpia glomulifera</i> <i>E. hypostomatica</i> , <i>E. punctata</i> , <i>Alphitonia excelsa</i> , <i>Ficus rubiginosa</i> .	Sheltered gullies and lower sheltered slopes on alluvium	E
4a - Exposed Narrabeen Woodland	4820	2.42	<i>Eucalyptus sparsifolia</i> , <i>E. punctata</i> , <i>Corymbia eximia</i> .	Narrabeen SS (well drained, skeletal to shallow, sandy loam or loam) on exposed ridgetops, upper slopes and north and west facing slopes.	B
4b - Narrabeen Hawkesbury Ironbark Forest	5246 5	26.36	<i>Eucalyptus fibrosa</i> , <i>E. crebra</i> , <i>E. beyeriana</i> , <i>E. fergusonii</i> ssp. <i>dorsiventralis</i> . +/- <i>Corymbia eximia</i> , <i>Angophora costata</i> , <i>E punctata</i> .	Most commonly associated with shale benches within Narrabeen and Hawkesbury sandstones. More common on exposed slopes and ridges, but also occurs on intermediate slopes and gullies.	B
5 - Northern Escarpment Woodland	2449	1.23	<i>Eucalyptus moluccana</i> , <i>Acacia bulgaensis</i> . +/- <i>E. punctata</i> , <i>E. crebra</i> .	Narrabeen lithic sandstone and Permian mudstones in exposed situations. Occurs on crests and exposed slopes.	B
6a - Woodland on Perched Sands	2127	1.07	<i>Eucalyptus parramattensis</i> , <i>Angophora bakeri</i> , <i>E sclerophylla</i> . +/- <i>E. tereticornis</i> , <i>A. floribunda</i> .	Found on perched alluvium and perched wet silty loams. Occurs in shallow or almost flat plain-like valleys.	B
6b - Swamp Woodland on Perched Sands	73	0.04	<i>Eucalyptus tereticornis</i> , <i>E. parramattensis</i> . <i>Melaleuca thymifolia</i> .	Mellong swamp area. On perched wet silty loams. This community is always found in flat plain-like valleys.	D
7 - Melaleuca Swamp Forest	200	0.11	<i>Melaleuca linariifolia</i> , <i>Acacia parramattensis</i> .	Occurs in permanent water in a sunken stream channel in a broad valley.	D

* - Adapted from Bell *et al*, (1993).

Table 3
Vegetation Communities within Dharug National Park

Vegetation Community	Area (ha)	% of total area	Dominant Species *	Determining Ecological / Environmental Factors *	Thres hold
A1 - Closed Forest/ Low woodland	1	0.01	<i>Avicennia marina</i> , <i>Aegiceras corniculatum</i> .	Intertidal estuarine areas inundated daily. Quaternary alluvium - Estuarine sediment.	E
A2 - Herbland/ Sedgeland	2	0.01	<i>Juncus kraussii</i> , <i>Sarcocornia quinqueflora</i> .	Intertidal estuarine areas inundated at least monthly. Quaternary alluvium - Estuarine sediments.	D
A3 - Forest	37	0.24	<i>Casurina glauca</i> .	Swamp areas with estuarine influence. Quaternary alluvium.	D
A4 - Reedland/ Rushland/ Sedgeland	20	0.13	<i>Phragmites australis</i> , <i>Juncaceae</i> , <i>Cyperaceae</i> .	Estuarine - freshwater swamp on alluvial flats. Often regenerating on cleared land. Quaternary alluvium.	D
A5 - Low Forest/ Scrubland	109	0.72	<i>Melaleuca linariifolia</i> , <i>Melaleuca ericifolia</i> , <i>Leptospermum juniperinum</i> .	Freshwater - estuarine swamp on alluvial flats. Often regenerating on cleared land. Quaternary alluvium.	D
A6 - Forest	61	0.40	<i>Eucalyptus robusta</i>	Freshwater swamp alluvial flats. Quaternary alluvium.	D
A7 - Scrubland	41	0.27	<i>Acacia parramattensis</i>	Regeneration on cleared and drained areas. Quaternary alluvium.	C

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Vegetation Community	Area (ha)	% of total area	Dominant Species *	Determining Ecological / Environmental Factors *	Thres hold
A8 - Reedland/ Rushland			<i>Submergent and emergent aquatic complex</i>	Streams and ponds. Quaternary alluvium.	E
B1 - Forest	163	1.07	<i>Rainforest complex</i>	Protected aspects and drainage lines. Narrabeen group - Terrigal formation.	E
B2 - Forest	391	2.57	<i>Eucalyptus deanei, Eucalyptus saligna.</i>	Sheltered lower hill slopes and alluvial valleys, with SSW - SSE Aspect. Narrabeen group - Terrigal formation and Quaternary alluvium.	D
B3 - Forest/ Open Forest	663	4.36	<i>Angophora floribunda, Allocasuarina torulosa, Eucalyptus punctata.</i>	Sheltered slopes and valleys, with SW - SE Aspect. Narrabeen Terrigal formation.	D
B4 - Open Forest	262	1.72	<i>Angophora floribunda, Allocasuarina torulosa, Eucalyptus punctata.</i>	Steeper slopes with W - SSE Aspect. Narrabeen group - Terrigal formation.	D
B5 - Open Forest	195	1.29	<i>Angophora floribunda, Allocasuarina torulosa, Eucalyptus eugenioides, Eucalyptus tereticornis.</i>	Exposed slopes with NNW - E Aspect. Narrabeen group - Terrigal formation.	C
B6 - Open Forest/ Woodland	95	0.63	<i>Angophora floribunda, Eucalyptus paniculata, Eucalyptus tereticornis</i>	Exposed slopes with N - NE Aspect. Narrabeen group - Terrigal formation.	C
C1 - Forest / Open Forest	5795	38.1	<i>Angophora costata, Eucalyptus agglomerata, Corymbia gummifera, Eucalyptus piperita, Syncarpia gummulifera.</i>	Sheltered slopes and gullies with E - SW Aspect. Hawkesbury sandstone.	C
C2 - Woodland	6285	41.32	<i>Angophora bakeri, Corymbia eximia, Eucalyptus oblonga</i>	Exposed slopes and ridges with W - NE Aspect. Hawkesbury sandstone.	B
C3 - Woodland	507	3.33	<i>Angophora bakeri, Eucalyptus haemastoma, Eucalyptus racemosa</i>	Exposed lower hill slopes and valleys. Hawkesbury sandstone.	B
C4 - Scrubland	13	0.08	<i>Banksia ericifolia, Hakea gibbosa, Acacia oxycedrus</i>	Poorly drained areas on ridges and drainage lines. Hawkesbury sandstone.	B
C5 - Heathland	7	0.04	<i>Angophora hispida, Banksia oblongifolia, Baeckea diosmifolia</i>	Poorly drained areas on rock shelves. Hawkesbury sandstone.	B
D1 - Forest	9	0.06	<i>Acacia filicifolia, Allocasuarina torulosa, Angophora floribunda, Eucalyptus crebra.</i>	Ten Mile Hollow - Clay soils derived from weathered dyke material from Volcanic breccia and adjacent Hawkesbury sandstone.	D
D2 - Forest	3	0.02	<i>Acacia prominens, Eucalyptus paniculata</i>	Scotchmans Creek - Soils derived from weathered diatrema. Volcanic breccia geology.	D

* - Adapted from Benson & Clarke, (1986) and Bell *et al*, (1993).

2.3.1.2 Species

The species listed under the TSC Act 1995 are listed in Table 4. They are threatened species occurring or predicted to occur within each of the three reserves. These species have a legislative requirement for conservation.

Rare or Threatened Australian Plant (ROTAP) species listing is based on academic opinion as to the taxa which are rare in Australia but which are not considered Endangered or Vulnerable under the TSC Act 1995. Table 5 lists the flora species found within the three reserves. There are no legislative requirements for ROTAP species.

The species lists in Tables 4-6 was sourced from the NPWS Geographical Information System (GIS) database. The database is made up of information from such organisations as the Royal Botanical Gardens (RBC), Birds Australia, The Australian Bird and Bat Banding Scheme (ABBBS), the NSW Wildlife Atlas, the CSIRO and the Australian Museum.

**Table 4
Threatened Plant Species Occurring or Predicted to Occur within
Yengo and Dharug National Parks and Parr State Recreation Area**

Species	Growth Form and Habitat Requirements	Conservation Status	Response to Fire *	Location within Park
<i>Acacia bynoeana</i>	Low prostrate shrub to 50cm across. Habitat - Open sometimes slightly disturbed sites in Eucalypt woodland, shrubland and open forest	Recorded in Blue Mountains NP, Yengo NP and Royal NP. Endangered	Survives 100% scorch (Benson and McDougall, 1996). Seeds shed at maturity. Apparently there is little dispersal of seed. Has long term soil-stored seed bank.	Western Yengo NP
<i>Ancistrachne maidenii</i>	Scrambling perennial grass with slender, rigid decumbent stems and ascending branches. Habitat - sandstone derived soils.	Five of the total seven recorded locations have an area of occupancy of less than 75 square metres. Vulnerable	Unknown	Southern Dharug NP.
<i>Callistemon linearifolius</i>	Single or multi stemmed shrub or small tree. 3 to 4 metres in height. Habitat - open forest and scrubland	<1000 plants within Ku-ring-gai Chase NP. Unknown population in Yengo NP. Yengo NP contains the northern limit of distribution of this species. Vulnerable	Adults likely to resprout from stem and root buds. Seed held in woody capsules and released after fire	Riparian areas within Yengo NP
<i>Dillwynia tenuifolia</i>	Low spreading shrub 0.6-1.0 metre high. Habitat Communities-4a	Blue Mountains NP (<1000 plants). Windsor Downs NR Castlereagh NR Scheyville NP >1000 plants). Yengo NP (unknown population). Vulnerable	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	Northern Yengo. Recorded in the Bulga Mountains.
<i>Kennedia retrorsa</i>	Climbing perennial herb. Habitat Communities-3e	<1000 plants - Goulburn River NP. >1000 plants - Wollemi NP. Unknown population in Parr SRA. Vulnerable	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	South West of Yengo NP within Parr SRA. East of Putty Road, north of Colo Heights.
<i>Lasiopetalum joyceae</i>	Erect shrub to 2 m high. Habitat - Heath on sandstone.	Unknown populations within Dharug NP and Ku-Ring-Gai Chase NP. The study area contains the northern	Individuals likely to be killed. Recruitment dependant on seed from soil or	Has been recorded along the Womerah range.

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species	Growth Form and Habitat Requirements	Conservation Status	Response to Fire *	Location within Park
		limit of distribution for this species. Vulnerable	unburnt areas. Track maintenance a significant threat to this species.	
<i>Melaleuca deanei</i>	Shrub to 3 m high with fibrous flaky bark. Leaves alternate, narrow-elliptic. Sometimes with massy woody lignotuber.	Total Pop. 1000 – 3000 individuals. Occur as scattered clumps. Found in Coastal districts from Berowra to Nowra. Vulnerable	Resprouts from epicormic buds, coppicing and suckering. No flowering observed in absence of fire, may require fire to stimulate flowering.	In Parr SRA near St Albans. Also found in Northern Dharug NP.
<i>Melaleuca groveana</i>	Single or multi stemmed paper bark shrub, typically <10 metres high. Habitat Communities-4a	Blackdown Tableland NP, Mount French NP (unknown populations). Beerwah NP, Six-B FLR, Tomaree NP, Yengo NP (<1000 plants). Vulnerable	Adults likely to resprout from stem and root buds. Seed held in woody capsules and released after fire.	Throughout northern sections of Yengo NP.
<i>Micromyrtus blakelyi</i>	Low spreading shrub 0.3 – 0.6 high. Leaves linear to oblong, deeply keeled. Habitat - Heath on sandstone rock platforms.	Restricted and endemic, very poorly known. Found on Central Coast, from Cowan to Maroota. Vulnerable	Adults killed by 100% scorch. Apparently has soil stored seedbank, seedling recruitment observed after fire. Flowering within two years after fire	Found in southern Yengo NP
<i>Olearia cordata</i>	Sweetly aromatic slender shrub <2m high. Habitat Communities-2a	<1000 plants in Wollemi NP, Yengo NP. Unknown population at Wisemans Ferry historic site. Vulnerable	Adults likely to resprout after fire from root and stem buds. Fire may encourage flowering.	Northern limit - Yengo Trail. Found at Mount Yengo, Howes Range, Grassy Hill, Colo River, St Albans and Wisemans Ferry.
<i>Persoonia hirsuta</i> ssp <i>evoluta</i>	Spreading shrub covered with coarse hairs. Habitat - Sandy soils in open forest, woodland and tall shrubland.	<1000 plants - Blue Mountains NP, Dharug NP, Ku-Ring-Gai Chase NP, Marramarra NP, Royal NP, Sydney Harbour NP. Unknown population in Wollemi NP, Fred Caterson Reserve. Dharug contains the northern limit of distribution. Endangered	Individuals likely to be killed. Recruitment probably dependant on seed storage in soil. Track maintenance a significant threat.	One known recording found in North West Yengo NP
<i>Persoonia marginata</i>	Spreading shrub to 50 cm high, 1 m across. Young branches are hairy (Geebung).	Restricted local endemic, confined to Capertree district. Rare to occasional local abundance Vulnerable	Resprouts after fire. Soil-stored seed bank, germination triggers unknown.	Found in north west Yengo NP
<i>Pomaderris brunnea</i>	Medium sized shrub 1-3 m tall. Stems covered with long brownish hairs. Habitat - Open	Unknown population within Wollemi NP, Yengo NP. Vulnerable	Individuals likely to be killed. Recruitment dependant on seed from soil or unburnt areas.	Expected along waterways within southern Yengo NP. Found south of the Culoul Range.

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species	Growth Form and Habitat Requirements	Conservation Status	Response to Fire *	Location within Park
	Forests.			
<i>Prostanthera cinctolifera</i>	Strongly aromatic erect shrub. 1-4 m high. Habitat - Sclerophyll and grassy forests.	Unknown reserved population in Yengo NP. Record is from 1920 only. Vulnerable	Individuals likely to be killed. Recruitment dependant on seed from soil or unburnt areas.	Only one recording - On ridge <2 kilometres North East from the town of St Albans.
<i>Tetratheca glandulosa</i>	Low growing, Spreading shrub 10-50 cm tall. Habitat Communities-2a	Unknown population numbers in Dharug NP, Garigal NP, Ku-Ring-Gai Chase NP, Marramarra NP and Cattai NP. Vulnerable	Individuals observed to survive fire. Recruitment response after fire unknown.	South east corner of Yengo NP and in Dharug NP Found along and east of the Great North Road and north of Wheelbarrow Ridge. East & Western Commission Track, Watt Buddah Dharma Track.
<i>Velleia perfoliata</i>	A small herb with short, thick rootstock. Habitat - Sandstone heaths and sandy shallow soils.	< 1000 plants in Wollemi NP and Yengo NP. Vulnerable	Individuals likely to be killed by fire. Seed storage in soil - replenished annually.	The main locations have been found along the Boree Track.
<i>Zieria involucreta</i>	Tall, erect Shrub 1-2 m high. Covered with white hairs. Habitat Communities - 1	Marramarra NP, Yengo NP (<1000) - Parr SRA (>1000) Blue Mountains NP (unknown). Vulnerable	Individuals likely to be killed by fire. Seed storage in soil. Ash bed may be required for germination.	Southern Yengo NP. North of Wheelbarrow Ridge, south of Womerah Range and south of Howes Range.

* - Adapted from Gill *et al* (1981), Gill and Bradstock (1992) and Maryott-Brown & Wilks (1993)

Table 5
Rare or Threatened Australian Plant (ROTAP) Species Located within Yengo and Dharug National Parks and Parr State Recreation Area

Species	Growth Form and Habitat Requirements	Conservation Status	Response to Fire *	Location within Park
<i>Acacia bulgaensis</i>	Shrub to small tree (1.5-8 metres high). Habitat Communities-4a, 5	Unknown population in Yengo NP. 2RC-	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	Northern areas of Yengo NP. Around Bulga, Milbrodale and the Putty Road.
<i>Acacia fulva</i>	Shrub or small tree (1.5-10 metres high). Habitat Communities-3b, 3c	Wollemi NP, Yengo NP (populations unknown). 2RC-	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	Mount Wareng and Mount Yengo. Also California Trail and Old Bulga Road.
<i>Acacia mathewii</i>	Erect or spreading shrub up to 4 m high. Habitat - dry sclerophyll on sandy soils.	Unknown population in Dharug NP, Wollemi NP, Yengo NP. 3RC-	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	Found on rocky ridges within Dharug NP. Recorded at Ten Mile Hollow.

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species	Growth Form and Habitat Requirements	Conservation Status	Response to Fire *	Location within Park
<i>Acacia terminalis</i> (Kulnura form)	Slender open shrub (2-4 metres high). Habitat Communities - 4a	Unknown population in Yengo NP. 2RC-	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	Found on park boundary along the Bucketty - St Albans Road and the Great Northern Road
<i>Acacia terminalis</i> (winged form)	Slender open shrub (2-4 metres high). Habitat Communities - 2a	Unknown population in Yengo NP - 2RC-t	Individuals likely to be killed. Seed storage in soil, fire or physical disturbance needed for germination.	NW section of Yengo. In the vicinity of Howes Valley.
<i>Atkinsonia ligustrina</i>	Root parasitic, erect shrub 1-2m high. Habitat - Woodland and Heaths.	Unknown populations within Wollemi NP, Yengo NP and Blue Mountains NP. 2RCa	Individuals likely to be killed. Recruitment dependant on seed storage in soil.	Known to occur on the western border of Yengo NP. - along Colou Range, St Albans Common.
<i>Callistemon shiressii</i>	Single or multi stemmed shrub or small tree. 1.5 to 12 metres in height. Habitat Communities-3a	Wollemi NP, Yengo NP (populations unknown). 3RC-	Adults likely to resprout from stem and root buds. Seed held in woody capsules and released after fire.	Riparian areas of Drews Creek, Mogo Creek, and the Colo River.
<i>Darwinia procera</i>	Erect Shrub up to 2m tall. Habitat - Forested slopes on sandy soils.	Unknown population in Brisbane Water NP, Garigal NP, Dharug NP and Ku-Ring-Gai Chase NP. 2RCa	Individuals likely to be killed. Recruitment from seed storage in soil.	Located at the head of sheltered gullies on sandstone. Eastern Commission Track.
<i>Eucalyptus fergusonii</i> subsp. <i>dorsiventralis</i>	A medium sized tree < 25m High. persistent dark grey ironbark. Habitat Communities-3b, 4a, 4b	Wollemi NP, Yengo NP (populations unknown). 2RC-	Adults likely to resprout from stem and root buds. Seed held in woody capsules and released after fire.	Northern end of Yengo NP. From the old Settlers Road to the Milbrodale Road.
<i>Eucalyptus hypostomatica</i>	Tree to 40 m high with persistent grey fibrous-flaky bark throughout. Found on sheltered slopes in moist forest on clay soils.	Uncommon and localised. Found in Central Coast and North Coast Botannical regions (Benson and McDougall 1998). 3RC-	Unknown. Seeds held in woody capsule, no dormancy mechanism.	Found on northern tip on Yengo NP.
<i>Eucalyptus michaeliana</i>	Medium sized forest tree 20-30 m high. smooth mottled gum bark. Habitat Communities-3a, 3b, 4b	Mount Barney NP, Guy Fawkes River NP (unknown populations) Oxley - Wild Rivers NP, Yengo NP (>1000 plants). 3RCa	Adults likely to resprout from stem and root buds. Seed held in woody capsules and released after fire.	Riparian zone of Mogo, Boggy Swamp, Reedy, Devils Hole, Yengo and Drews Creeks. Also the Macdonald River.
<i>Eucalyptus prominula</i>	Tree to 25m high, with persistent grey to red brown stringy bark.	Distributed form Bucketty to Hunter Range. (Benson and McDougall, 1998). 2KC-	Unknown. Seeds are held in woody capsule, no dormancy mechanism in seed.	Northern Yengo NP.
<i>Lissanthe</i>	Bushy, rigid	Wollemi NP, Dharug	Individuals likely to	Western border of

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species	Growth Form and Habitat Requirements	Conservation Status	Response to Fire *	Location within Park
<i>sapida</i>	shrub < 2.5 metres high. Linear to oblong leaves. Habitat Communities-2a	NP (populations unknown) Blue Mountains NP (>1000 plants). 3RCa	be killed by fire. Recruitment dependant on seed from soil or unburnt areas.	Yengo. Isolated populations within Colo Gorge, Coloul Range and Mt. Popping areas.
<i>Lomandra brevis</i>	Small tussock herb < 20 cm high. grass-like. Habitat Communities-2a	Ku-Ring-Gai Chase NP, Muogamarra NR, Royal NP, Parr SRA (populations unknown). 2RC-	Adults likely to resprout from root buds. Likely to flower within the first two years after fire.	Sheltered drainage lines in the vicinity of the Old Settlers Road, Womerah Range, Howes Range and Kulnura.
<i>Lomandra fluviatilis</i>	Riparian grass like herb forming large tussocks 25 -75 cm high. Habitat - Riparian.	>1000 plants - Blue Mountains NP. Unknown populations - Morton NP, Bents Basin SRA, Garigal NP, Marramarra NP, Royal NP, Dharawal SRA. 3RCa	Adults likely to resprout from root buds. Likely to flower within the first two years after fire.	No known locations within Yengo. Likely to occur along Colo River, Mogo Creek and the Macdonald River.
<i>Platysace clelandii</i>	Very aromatic, branching shrub. 30-60 cm High. Habitat Communities-1, 2a, 3a, 4b	Marramarra NP, Parr SRA, Yengo NP (populations unknown). Wollemi NP (>1000 plants). 2Rca	Adults likely to resprout after fire from root buds.	Northern Limit - cliffs above Colo River. Found along the Coloul Range, Rush Creek and Wisemans Ferry.
<i>Rhizanthella slateri</i>	Terrestrial saprophytic herb. Habitat - almost entirely subterranean.	<1000 plants in Dharug NP. Unknown population in Lamington NP 3KC-	Adults likely to resprout after fire. Fire may encourage flowering.	Located in sclerophyll forests on shallow to deep loams in Dharug NP.

- - Adapted from Briggs and Leigh (1996), Gill *et al* (1981), Gill and Bradstock (1992), and Maryott-Brown & Wilks (1993).

2.3.1.3 Exotic Flora Species

Weeds are not presently a significant threat to the conservation of the native flora in the Reserves. Additional nutrients, particularly from agricultural activities, are presently limited as many of the creek catchments in the Reserves are largely undisturbed.

Blackberry thickets are a major weed problem on the alluvial flats and these will be progressively removed (NPWS, 1997). Other weeds include Lantana *Lantana camara* found in the previously cleared areas, especially the moister gullies, Noogoora Burr *Xanthium occidentale* and Whiskey Grass *Andropogon virginicus* which is found on the grass flats of the Mill Creek area.

Wildfire events can act as a disturbance to native communities encouraging the growth of exotic species. On the other hand, fire can be used as a tool for weed management. In areas with large weed infestations, fire could be used to reduce the overall abundance of the plants and their seed banks.

2.3.2 Fauna

Yengo National Park and Parr State Recreation Area

The native animals of Yengo National Park and Parr State Recreation Area have not been well studied, although 2 Endangered and 21 Vulnerable species listed under the TSC Act 1995 (NSW) have been recorded. The endangered and vulnerable species recorded within the two Parks are listed in Table 6.

233 fauna species have been recorded within Yengo National Park and Parr State Recreation Area. 19 species of amphibians, 57 species of reptiles, 36 species of mammals and 183 species of birds have been recorded in the two Parks.

The unusually high number of amphibians and reptiles are probably related to the relative lack of disturbance and the extensive, topographically diverse areas of sandstone terrain. The richness of herpetofauna is comparable to the World Heritage Area rainforests in northern New South Wales which have a well documented diversity of amphibians and reptiles.

The two Parks provide specialised habitat for species such as the threatened Brush-tailed Rock Wallaby, which now only occurs in very small disjunct populations in New South Wales and Queensland. The threatened Regent Honeyeater has a major population centred over the Capertee Valley / Wollemi and Yengo National Parks and Parr State Recreation Area.

Species not listed under the Threatened Species Conservation Act, 1995 although of conservation concern include the Legless Lizard *Anomalopus swainsonii*, New Holland Mouse *Pseudomys novaehollandiae*, and the Yellow-tailed Black Cockatoo *Calyptorhynchus funereus*.

Dharug National Park

A good record exists of the native animals in the Dharug National Park. There is a lot of information on birds and mammals but less information on reptiles and amphibians. 46 species of mammals, including 11 species of microbats and 100 species of birds have been recorded in the Park.

23 species of amphibians and 35 species of reptiles have been recorded in and around the Park. The lack of disturbance and the extensive topographically diverse areas of weathered sandstone provide a diversity of microhabitats and niches suitable for both invertebrates and smaller invertebrates.

17 species listed as threatened fauna in the TSC Act 1995 (NSW) have been recorded in and around Dharug National Park.

Table 6

Threatened Fauna Species Occurring / Predicted to Occur within Yengo and Dharug National Parks and Parr State Recreation Area

Species Name	Legal Status	Preferred Habitat*	Potential Fire Effects*
Amphibians			
Giant Burrowing Frog <i>Heleioporus australiacus</i>	Vulnerable	Mostly restricted to Hawkesbury Sandstone. Inhabits open forests and riparian forests along streams (usually with crayfish burrows), digging burrows into sandy creek banks. Recorded in Yengo and Dharug	Potential for mod to high intensity fire within riparian habitat to kill individuals, reduce habitat quality, foraging areas, breeding success and long term viability. Potentially open to predation within fire cleared areas.
Giant Barred Frog <i>Mixophyes iteratus</i>	Endangered	Inhabits coastal riverine rainforest. Calling from the leaf litter along the banks of creeks and streams. Breeding late spring and early summer, were eggs are laid on stream banks to be washed into the water following rain. Recorded at St. Albans Common. Predicted in Yengo NP.	Any fire within rainforest habitat will potentially decrease habitat quality, foraging area, breeding success and long term viability. Potentially open to predation within fire cleared areas.
Red-crowned Toadlet <i>Pseudophryne australis</i>	Vulnerable	Prefers sandstone areas, breeds in grass and debris beside non-perennial creeks or gutters. Individuals also found under logs and rocks in non-breeding periods. Recorded in Yengo, Dharug, Parr, Pokolbin, Wollemi.	Potential for any fire within riparian habitat to decrease foraging area and breeding success. Leaf litter quantity, log (habitat) quality and long term viability can be impacted upon by frequent fire. Potentially open to predation within fire cleared areas.
Reptiles			
Broad-headed Snake <i>Hoplocephalus bungaroides</i>	Endangered	Restricted to Sandstone plateaus from Newcastle to Nowra. Shelters in wind-blown sandstone caves or beneath boulders and slabs resting on bare rock. Recorded in Yengo, Dharug and Wollemi	Potential for mod to high intensity fires to kill individuals. Inappropriate fire regimes have potential to reduce prey diversity and numbers. Potential for fire to impact on reproduction between late summer and early Autumn.
Heath Monitor <i>Varanus rosenbergi</i>	Vulnerable	Hawkesbury sandstone outcrop specialist. Inhabits woodlands, dry open forests and heathland sheltering in burrows, hollow logs, rock crevices and outcrops. Recorded in Parr, Dharug and Wollemi	Potential for mod to high intensity fires to kill individuals. Frequent fires have the potential to reduce habitat diversity and refuge areas. Termite mounds could also be impacted by fire, reducing habitat quality. Potential for fire to impact on reproduction between November and February.
White-crowned Snake <i>Cacophis harriettae</i>	Vulnerable	Wet sclerophyll forests, rainforests and well-watered urban areas, on coast and ranges. Eggs are laid in summer, hatching in late summer to early autumn. Recorded in Dharug	Potential for Mod to high intensity fires to kill individuals and reduce sheltering and foraging habitat. Inappropriate fire regimes have potential to reduce prey diversity and numbers. Potentially open to predation within fire cleared areas.
Birds			
Australasian Bittern <i>Botaurus poiciloptilus</i>	Vulnerable	Reedbeds, rushes, cumbungi, in swamps, lagoons, sluggish rivers; tussocky wet paddocks, drains. Recorded in Dharug	Fire unlikely to impact on individuals or aquatic habitat. Nests in reeds over water, therefore no impact on reproduction by fire expected.
Barking Owl <i>Ninox connivens</i>	Vulnerable	Open forests, woodlands, dense scrubs; foothills and timber along	Fire unlikely to impact on adults. Nests in tree hollows (any height)

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species Name	Legal Status	Preferred Habitat*	Potential Fire Effects*
		watercourses, often those penetrating otherwise open country; swamp woodlands. Recorded in Dharug	and sometimes on the ground, therefore there is potential for fire to impact on reproduction between July and November.
Black Bittern <i>Ixobrychus flavicollis</i>	Vulnerable	Leafy riverside, creekside or swampside trees, mangroves; occasionally in willows; on margins of rivers, swamps, tidal creeks, mudflats. Recorded in Yengo, and Dharug	Fire unlikely to impact on individuals. Nests on branch over water, therefore no impact on breeding by fire expected.
Flock Bronzewing <i>Phaps histrionica</i>	Endangered	Treeless grassy plains; saltbush, spinifex, open mulga, tanks, bores, flooded clay pans, watercourses, river pools. Recorded in Dharug	Fire unlikely to impact on adults. Nests in low bush or tussock therefore there is potential for fire to impact on reproduction between July and October.
Glossy Black-cockatoo <i>Calyptorhynchus lathami</i>	Vulnerable	She oaks (mostly <i>Allocasuarina</i> species) in forests, woodlands, timbered watercourses. Recorded in Yengo, Dharug, Corrabare, Wollemi, McPherson, Parr, Putty, Comleroy, Popran,	Fire unlikely to impact on adults. Potential for inappropriate fire regimes to remove foraging habitat (<i>Allocasuarina</i> species) and tree hollow generation. Nests in high, large tree hollows. Therefore mod to high intensity fires have potential to impact on breeding between March and August.
Gould's Petrel <i>Pterodroma leucoptera</i>	Endangered	Marine bird. Disperses through offshore waters of SE Australia to feed during non-breeding season, June to September. Recorded in Dharug	Fire unlikely to impact on individuals. Breeds only on Cabbage Tree Island. Therefore no impact from fire within the reserves is expected on this species.
Grass Owl <i>Tyto capensis</i>	Vulnerable	Tall grass; swampy, sometimes tidal areas; mangrove fringes, grassy plains, coastal heaths, grassy woodlands, cane grass, lignum, sedges, cumbungi, cultivated sorghum. Recorded at St. Albans Common. Predicted within Yengo NP.	Fire unlikely to impact on adults. Frequent fires have potential to decrease habitat diversity and prey numbers. Breeds on the coast of north Australia. Therefore no impact from fire within the reserves is expected on the reproduction of this species. Clearing by fire likely to increase foraging potential.
Little Shearwater <i>Puffinus assimilis</i>	Vulnerable	Marine bird. Uncommon to rare during spring and summer in coastal waters of NSW. Recorded in Yengo	Fire unlikely to impact on individuals. Breeds only on oceanic islands. Therefore no impact from fire within the reserves is expected on this species.
Masked Owl <i>Tyto novaehollandiae</i>	Vulnerable	Open forest & woodlands with cleared areas for hunting and hollow trees or dense vegetation for roosting. Timbered watercourses, paperbark woodlands. Recorded in Yengo, Dharug, Parr, Pokolbin, McPherson	Fire unlikely to impact on adults. Inappropriate fire regimes have potential to reduce prey diversity and numbers. Clearing by fire likely to increase foraging potential. Nests in a Eucalypt hollow (12 - 20m high). Potential for mod to high intensity fire to impact on reproduction, particularly between autumn and winter.
Osprey <i>Pandion haliaetus</i>	Vulnerable	Coastal waters, inlets, estuaries, offshore islands: occasionally far up larger rivers. Recorded at Wisemans Ferry. Expected within Dharug National Park	Fire unlikely to impact on individuals or habitat. Nests are located high in trees (live or dead) or on pylons. Therefore nests are unlikely to be impacted by low intensity fires.
Painted Honeyeater <i>Grantiella picta</i>	Vulnerable	Frequently in trees afflicted with mistletoes; also open eucalypt forest and woodland, swamp woodlands, timber along	Fire unlikely to impact on adults. Potential for inappropriate fire regimes to reduce habitat diversity and invertebrate feed

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species Name	Legal Status	Preferred Habitat*	Potential Fire Effects*
		watercourses; belar and other casuarinas, mulga and other acacias; mallee. Recorded in Yengo NP	diversity and numbers. Nests in tree foliage 3-20 meters high. Therefore there is potential for fire to impact on reproduction between October and March.
Powerful Owl <i>Ninox strenua</i>	Vulnerable	Forests containing mature trees for shelter or breeding & densely vegetated gullies for roosting. Coastal forests, woodlands, scrubs. Exotic pine plantations. Recorded in Yengo, Dharug, Pokolbin, McPherson, Popran	Fire unlikely to impact on adults. Potential for inappropriate fire regimes to reduce habitat and prey diversity. Nests in tree foliage 8-20 meters high. Therefore there is potential for mod to high intensity fire to impact on reproduction between June and September. Clearing by fire likely to increase foraging potential.
Red-tailed Black-cockatoo <i>Calyptorhynchus banksii</i>	Vulnerable	Open forests and woodlands; grasslands, scrublands; trees along watercourses. Recorded North of Yengo	Fire unlikely to impact on adults. Potential for inappropriate fire regimes to reduce habitat diversity. Nests in high tree hollows. Therefore there is potential for mod to high intensity fires to impact on reproduction between July and October. Not expected to be breeding within Reserves.
Regent Honeyeater <i>Xanthomyza phrygia</i>	Endangered	Found in temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts. Recorded in Yengo, Dharug and Wollemi	Fire unlikely to impact on Individuals. Intense fires may cause tree damage interrupting winter flowering of feed species. Inappropriate fire regimes have potential to reduce habitat diversity and invertebrate feed numbers. Winter visitor, not known to breed within reserves.
Sooty Owl <i>Tyto tenebricosa</i>	Vulnerable	Tall, wet forests in sheltered east and south-east facing mountain gullies. Recorded in Dharug, McPherson, Pokolbin and Popran	Fire unlikely to impact on adults. Potential for inappropriate fire regimes to reduce habitat and prey diversity. Nests on tree trunk up to 30 meters high. Therefore there is potential for Mod to high intensity fire to impact on reproduction between April and June. Clearing by fire likely to increase foraging potential.
Turquoise Parrot <i>Neophema pulchella</i>	Vulnerable	Open woodlands, grasslands or areas of weed, heaths or clearings bordering woodland or scrub. Recorded in Yengo, Parr, Wollemi	Fire unlikely to impact on adults. Potential for inappropriate fire regimes to reduce habitat diversity. Nests in dead stump or spout of eucalypt. Therefore there is potential for fire to impact on breeding between Aug-Dec, and April-May.
Mammals			
Tiger Quoll <i>Dasyurus maculatus</i>	Vulnerable	Rainforest, open forest, woodland, coastal heathland and inland riparian forest. Dry and moist open forests containing rock caves, hollow logs or trees. Recorded in Dharug and Popran	Individuals likely to escape low to moderate intensity fire. Potential for inappropriate fire regimes to reduce habitat and prey diversity. Highest population's known from long unburnt sites (Dickman & Read, 1992).
Eastern Quoll <i>Dasyurus viverrinus</i>	Endangered	Dry sclerophyll forest, scrub, heathland and cultivated land. Found near St. Albans, predicted within Yengo NP.	Individuals likely to low to moderate intensity escape fire. Potential for inappropriate fire regimes to reduce habitat and prey diversity.
Parma Wallaby <i>Macropus parma</i>	Vulnerable	Moist sclerophyll forest with dense understorey and grassy patches.	Individuals likely to escape moderate to low intensity fire. High intensity over large areas or during breeding season could

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species Name	Legal Status	Preferred Habitat*	Potential Fire Effects*
		Recorded in Yengo	cause adverse impacts on the species.
Brush-tailed Phascogale <i>Phascogale tapoatafa</i>	Vulnerable	Open forest with sparse groundcover. Recorded in Dharug	Adults likely to escape low to moderate intensity fire. Potential for inappropriate fire regimes to reduce prey diversity and cause a lack of nesting tree hollows. Potential for moderate to high intensity fires to impact on nesting in tree hollows between June and January.
Koala <i>Phascolarctos cinereus</i>	Vulnerable	Inhabits both wet & dry Eucalypt forest on high nutrient soils containing preferred feed trees. Recorded in Yengo, Dharug, Parr, McPherson, Wollemi	Individuals likely to be unaffected by low to medium intensity fires (ie hazard burns). High intensity fires have potential to kill individuals and directly reduce habitat. Potential for inappropriate fire regimes to reduce habitat quality.
Yellow-bellied Glider <i>Petaurus australis</i>	Vulnerable	Tall mature Eucalypt forests with high nectar producing species and hollow bearing trees. Recorded in Yengo, Dharug, Wollemi, McPherson	Individuals likely to be unaffected by low to medium intensity fires (ie hazard burns). Long absence of fire may cause a lack of nesting hollow regeneration. Potential for inappropriate fire regimes to reduce regenerating tree (food resource) numbers.
Squirrel Glider <i>Petaurus norfolcensis</i>	Vulnerable	Dry sclerophyll forest and woodland. Recorded in Yengo, Dharug and Popran	Individuals likely to escape low to medium intensity fire. Inappropriate fire regimes may cause a lack of nesting hollow regeneration, and may reduce the diversity and quantity of Eucalypt and Acacia feed trees.
Brush-tailed Rock Wallaby <i>Petrogale penicillata</i>	Vulnerable	Suitable rocky areas in a wide variety of habitats, including rainforest gullies, wet and dry sclerophyll forest, open woodland and rocky outcrops on semi-arid country Recorded in Yengo, Wollemi, Pokolbin and Parr	Individuals likely to escape low to medium intensity fire. Inappropriate fire regimes may cause reduced habitat diversity and a short-term reduction in feed quantity (grasses and forbs).
Yellow-bellied Sheath-tail-Bat <i>Saccolaimus flaviventris</i>	Vulnerable	Rainforests, sclerophyll forests and woodlands. Recorded near St. Albans. Predicted within Yengo.	Feeds above the canopy, Adults likely to escape fire. Inappropriate fire regimes may cause a decline in roosting hollow regeneration and prey (invertebrate) diversity. Potential for moderate to high intensity fire to impact on breeding success during summer.
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>	Vulnerable	Moist and dry eucalypt forest and rainforest, particularly at high elevations in the northern part of its range Recorded in north-west Yengo	Adults likely to escape low to medium intensity fire. Inappropriate fire regimes may cause a decline in roosting hollow regeneration and prey (invertebrate) diversity. Fire during breeding season would be unfavourable.
Eastern Freetail-bat <i>Mormopterus norfolkensis</i>	Vulnerable	Dry eucalypt forest and woodland east of the Great Dividing Range. Recorded in Dharug and Parr	Adults likely to escape fire. Inappropriate fire regimes may cause a decline in roosting hollow regeneration and prey (invertebrate) diversity. Potential for moderate to high intensity fire to impact on breeding success.
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	Vulnerable	Most common in dry sclerophyll forests and woodlands, but they also occur in sub-alpine woodland, the edge of rainforest and wet sclerophyll forest.	Forages for small flying insects below the forest canopy, roosting in sandstone caves. Individuals likely to escape fire. Inappropriate fire regimes may cause a decline in

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Species Name	Legal Status	Preferred Habitat*	Potential Fire Effects*
		Recorded in Yengo and Parr	prey (invertebrate) diversity.
Common Bent-wing Bat <i>Miniopterus schreibersii</i>	Vulnerable	Prefers areas where there are caves, old mines, old buildings, stormwater drains & well-timbered areas. Recorded in Yengo, Dharug, Popran and Wollemi	Frequent fire near nursery caves may impact upon breeding success. Forages above the tree canopy on insects. Potential for inappropriate fire regime to reduce prey (invertebrate) diversity.
Large-footed Myotis <i>Myotis adversus</i>	Vulnerable	Rainforests and open forests near creeks and lakes over which it feeds. Roosts in tree hollows, caves, mines and tunnels. Recorded in Dharug	Forages for insect over water, roosts in caves, mines, tunnels and structures. Individuals likely to escape fire. Potential for inappropriate fire regime to reduce prey (invertebrate) diversity.
Greater Long-eared Bat <i>Nyctophilus timoriensis</i>	Vulnerable	Tall eucalypt forests of the south-west as well as mallee, open savanna and Black Box woodland. Recorded within tributary of Mangrove Dam. Expected within Yengo.	Adults likely to escape fire. Potential for inappropriate fire regime to reduce prey (invertebrate) diversity and cause a decline in roosting hollow regeneration.
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>	Vulnerable	Prefer moist gullies in mature coastal forest or rainforest, lying between the Great Dividing Range and the coast. Also in gullies associated with open woodland, wet and dry sclerophyll forests. Recorded in Yengo and Dharug	Adults likely to escape fire. Roosts in tree hollows. Potential for mod to high intensity fires, near maternity sites, to impact on breeding success. Potential for inappropriate fire regimes to reduce prey (invertebrate) diversity.

* - Adapted from Strahan (1998), Simpson and Day (1996), Pizzey and Knight (1997), Cogger (1996), Robinson (1994), Gill *et Al* (1981), and NPWS GIS databases.

2.3.2.1 Introduced Fauna

Cats, foxes, wild dogs and European bees are distributed throughout Yengo National Park, Dharug National Park and Parr State Recreation Area. Cattle, pigs and goats also occur, but are of more localised distribution.

Fire events can encourage short term predation by feral animals such as wild dogs by creating edge effects and removal of important habitat for native species (Catling, 1991). Frequent fires can simplify forest understorey structures enabling the expansion of feral animals. Fire management should avoid creating conditions that encourage the spread of feral species into and within the Park.

2.4 Cultural Heritage

The Reserves are important in conserving evidence of prehistoric and historical land use in Australia.

2.4.1 Aboriginal

Yengo National Park and Parr State Recreation Area

The area contains some of the richest and most outstanding rock engraving sites in the eastern part of NSW. Of particular significance to Aboriginal

people is Mount Yengo, which is a sacred site with a well documented ethnographic, and religious significance to Aboriginal society. It is believed that many of the other Aboriginal sites in the two Parks and the surrounding regions are related to Mount Yengo (NPWS, 2000).

The Aboriginal community and various Local Aboriginal Land Councils have a strong and active interest in the management of these sites. There has also been an active interest in the revival of the culture in the area.

Aboriginal people have had a long history of settlement in the area. The MacDonal River formed a part of the territory of the Darkinjung people, while the northern portion of Yengo National Park formed a part of the Wonaruah people.

The Hawkesbury Sandstone area is particularly rich in Aboriginal sites and the two Reserves conserve an important sample of these. There are currently 648 Aboriginal sites recorded on the boundaries of the two Reserves and on nearby lands. Because of the remote and rugged nature of the terrain and the fact that it has not been systematically surveyed, there are certain to be more sites than those presently recorded.

A number of Aboriginal community groups as well as the Metropolitan, Darkinjung, Koopahtoo, Mindaribba, Wanaruah and Awabakal Local Aboriginal Land Councils have a strong interest in the management of these sites.

Rock art and engraving sites are a focus for interpretative and tourist interest in the area. They can be used to interpret significant aspects of past Aboriginal life and also provide a guide to visitors to assist in the site's protection.

Dharug National Park

One of the main reasons for the establishment of Dharug National Park was the high density of Aboriginal sites it contains. The Daruk Aboriginal people occupied parts of the area now included in the Park for at least 11,000 years. Evidence of their habitation is abundant and varied and includes occupation deposits in sandstone shelters, foreshore middens, rock engravings, stone arrangements, paintings and axe grinding grooves.

The most well known and visited art site in the Park is the "Group Six", an engraving and grinding groove site listed on the register of the National Estate.

The Park is criss-crossed with Aboriginal routes that were used by highland and coastal tribes. The path of the historic Old Great North Road approximates an Aboriginal travelling route and was first shown to surveyors by Aboriginal people.

2.4.2 Historic

Yengo National Park and Parr State Recreation Area

The two Reserves are rich in European culture with remnants of early transport routes between Sydney and the Hunter Valley running through the area. This area was part of one of the earliest frontiers of European attempts to settle and explore eastern Australia.

The Old Great North Road and the Putty Road / Old Bulga Road represent two early transport routes (early 1800s). The earliest official such road, the Old Great North Road lies adjacent to the eastern boundary of Yengo National Park.

The earlier but unofficial route between Sydney and the Hunter Valley generally lies to the west of the two Reserves near or on the present route of the Putty Road. Some of the original sections of this unofficial route, such as the Old Bulga Road, occur within the two Reserves.

Also of importance is the “Old Settlers Road”, previously known as the “Old Convict Road”, which was built by Howes Valley settlers. It linked Howes Valley with the Wollombi District and is almost wholly surrounded by Yengo National Park. Stone embankments and pavements along the route of this road are still obvious.

Dharug National Park

The Old Great North Road

The Old Great North Road (OGNR) is an historic feature of national cultural significance and is listed on the Register of National Estate. The Great North Road was built using convict labour between 1825 and 1836, spanning 250 km between Sydney and the central Hunter Valley.

Approximately sixteen kilometres of the road is protected within Dharug National Parks. In the recent past, this section has been labelled the “Old” Great North Road to distinguish it from those sections of the road that have been further developed as a modern road.

The road offers unparalleled evidence of convict life, road construction work and the role of convict labour in the development of New South Wales. There are no comparable convict-built roads of such length in New South Wales and the three remaining bridges north of the Hawkesbury River are understood to be the oldest surviving stone bridges on mainland Australia. There are also the foundations of an old inn at Ten Mile Hollow associated with the construction and use of the Old Great North Road.

A community based group called the Convict Trail Project has been formed consisting of various local and state government departments, historical societies and concerned individuals. They have prepared a Conservation

Management Plan for the 240km of the Great North Road which was endorsed by the NSW Heritage Office.

In December 1992, a total of 43 kms of the Old Great North Road between Settlers Road and Mount Manning was closed by the NSW National Parks and Wildlife Service, to all unauthorised vehicles.

A number of specialist studies of the road, commissioned by the Service, have been completed. These formed the basis of the NPWS *Conservation Plan for the Old Great North Road from Wiseman's Ferry to Ten Mile Hollow*, November 1999. This plan has been endorsed by the NSW Heritage Office.

The plan addresses fire issues in Conservation Management Policy 11 which is outlined as follows;

Use of and impact on the "road" for fire operations will be reduced as much as possible through long term planning.

Due to its historic nature, physical use of the "road" for vehicle based fire operations will be minimised as much as possible. Fire fighting vehicles will be permitted on sections of the "Road" where road pavement protection works using a layer of imported material are present (dependant upon load bearing capacities). Vehicle based fire fighting operations on other sections of the "Road" will be minimised with the use of alternative fire fighting methods such as water bombing and aerial incendiaries in back burning operations.

Relevant strategies and actions are as follows;

- The NPWS Region will ensure that the Old Great North Road is identified in the Dharug, Yengo and Parr Reserve Fire Management Plan and that areas of particular sensitivity and / or significant fabric (eg wooden artefacts) are highlighted and strategies developed to protect them.
- Fire fighting vehicles will be permitted on sections of the "Road" where road pavement protection works using a layer of imported material are present (dependant upon load bearing capacities of the "Road").
- Vehicle based fire fighting operations on intact sections of the "Road" will be minimised with the use of alternative fire fighting methods such as water bombing and aerial incendiaries in back burning operations.
- The NPWS Region will ensure that the Old Great North Road is identified as an item of high cultural significance and vulnerability in Gosford and Hawkesbury District Operations and Risk Management Plans (under section 52 of the Rural Fires Act 1997).
- Access between Shephard's Gully and the Western Commission track for fire operations will be permitted via liaison with the NPWS Region dependant upon the conditions of the "Road".

The Shepherds Gully Road, in Yengo National Park, is associated with the Great North Road and is also historically significant. This road is also used for access and interpretation of the Old Great North Road.

Other

Most of the alluvial flats along the Hawkesbury River and its associated tributaries were settled in the early 1800's. The first school on the north side of the Hawkesbury was established at Spencer and the foundations of this school are in the Park.

Sandstone residences, such as the Meisterham house, were constructed in the area in the early nineteenth century and the foundations of these are also found in the Park.

Limited logging activities from the early days of settlement continued until about 1959, when many substantial trees were removed prior to the reservation of the National Park.

Evidence of historic structures associated with agriculture and residences, including a system of drains in the river valleys, has been recorded in the Service's historic place register.

2.5 Recreational Use and Facilities

The Reserves offer visitors a range of recreational opportunities including camping, bushwalking, orienteering, canoeing, bicycle touring, picnicking and bird watching. The main form of recreational pursuit within the Reserves consists of four wheel drive and vehicle based touring with day / weekend tours. Horse riding is also popular in sections of Yengo NP and Parr SRA.

Cycling, predominantly mountain biking, is becoming an extremely popular recreational pursuit, particularly near Wiseman's Ferry and St Albans along the Old Great North Road and adjacent fire trails.

Yengo is a large park with few developed facilities. Mogo Camping Area, at the top of Old Great North Road as well as Finchley Camping Area along the Finchley Track, are both 2WD accessible. Heartbreak Hill (part of the Womerah Range Track) provides a camping area suitable for overnight bushwalkers.

Emphasis on recreation in Dharug National Park is for low-intensity, self-sufficient overnight and day use of the Park. Mill Creek has picnic areas and camping facilities. Picnic facilities are available at Hazel Dell. Basic facilities are provided at the remote camping area at Ten Mile Hollow (on the Old Great North Road).

3. BUSHFIRE ENVIRONMENT

3.1 Fire History and Frequency

Fire history includes the collation of information on origin, cause, size, intensity and frequency of known fire events. It is this information that enables a pattern of events to be analysed and or predicted. These patterns can then be assessed for their capability to impact upon biodiversity issues within NPWS estates.

Accurate fire history records for Yengo and Dharug National Parks and Parr State Recreation Area are available from the 1967/1968 fire season to the present. These records are maintained at the Central Coast Hunter Range Region Office of the NSW National Parks and Wildlife Service.

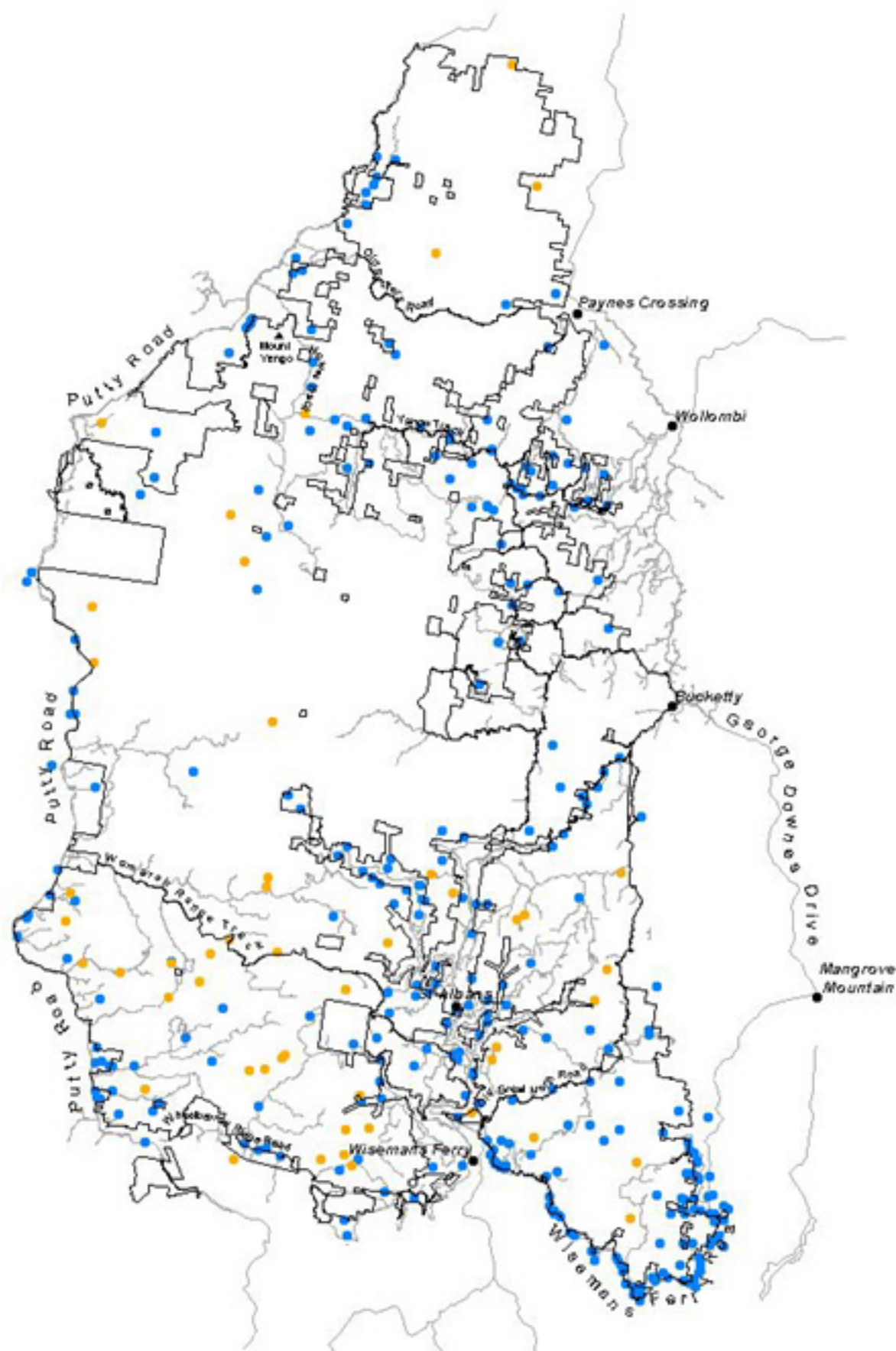
Yengo and Dharug National Parks and Parr State Recreation Area fall into Walker's Fire Region 12 (Walker, 1981), which has an average fire interval of 5 - 12 years based on broad fuel dynamics. The bush fire danger period for NSW is from 1st October to the 30th March. Bush fire risk is greatest during the months of October to March with the occurrence of north-west winds, high temperatures and low humidity.

3.1.1 Wildfires

The Reserves have experienced a high frequency of wildfire events since the 1967/1968 fire season. The majority of wildfires within the Reserves originate from adjacent properties (refer to Map 3). The most significant (>20000 hectares) wildfire events within the Reserves have occurred during the following fire seasons; 2002/2003, 2001/2002, 1997/1998, 1993/1994, 1991/1992, 1990/1991, 1979/1980, 1977/1978.

Previous wildfires within the Reserves have shown to burn very large areas including 43502 hectares in the 1997/1998 fire season and 113726.26 hectares in the 1993/1994 fire season. Combined, these two recent wildfire events burnt 154715 hectares within the Reserves including 71.3% of Yengo National Park, 85.8% of Parr State Recreation Area and 87.2% of Dharug National Park.

Map 3 - Ignition Points



LEGEND



Study Area



Lightning



Road



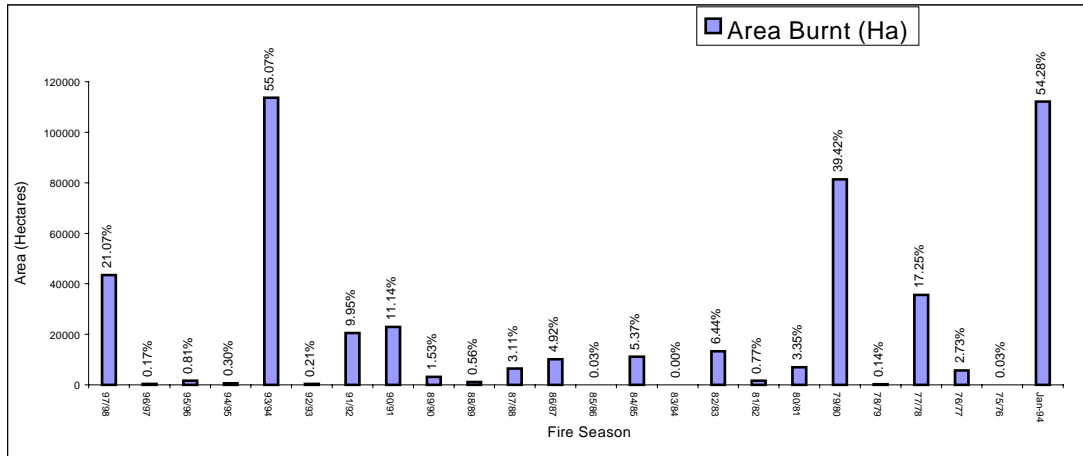
Human

0 4 8 12 16 20 Kilometers



Scale 1:400,000

Table 7
Wildfires Occurring in Yengo and Dharug National Parks and Parr State Recreation Area (Including percentage of Total Reserve)



Map 4 illustrates areas of Yengo National Park, Dharug National Park and Parr State Recreation Area that have been subject to wildfire between the 1975/1976 and 1998/1999 fire seasons. Tables 7 and 8 detail the corresponding areas burnt in wildfires and associated percentage of each Reserve area.

A review of Map 4 (Fire Frequency 1967/1968-1998/1999) reveals that wildfires over this time frame have generally impacted the entire Reserve Areas. Minimal areas of the Reserves have not been affected by reported fire events including the area directly north and south of the Macdonald River (section of the river that flows west, approximately 12 kilometres north west of St. Albans).

Table 8
Wildfires Occurring in Yengo and Dharug National Parks and Parr State Recreation Area by Year and Areas Burnt (1975-1999)

Fire Season	Reserve Area Burnt (Ha)	%Yengo	%Dharug	%Parr	% of total Reserve Area	No. Of Fires in Yengo	No. Of Fires in Parr	No. of Fires in Dharug
98/99	0.00	0.00	0.00	0.00	0.00	0	0	0
97/98	43688.77	9.78	0.12	77.76	20.39	48	20	15
96/97	360.77	0.03	0.01	0.88	0.17	6	5	1
95/96	1663.37	1.01	0.00	0.03	0.78	4	3	0
94/95	613.35	0.35	0.00	0.13	0.29	8	6	0
Jan-94	118077.6	62.58	87.06	7.23	55.12	66	1	9
93/94	123910.6	66.02	88.05	7.41	57.84	22	4	7
92/93	441.43	0.24	0.18	0.05	0.21	32	9	1
91/92	20635.87	11.95	3.26	1.70	9.63	55	6	5
90/91	23152.14	10.97	2.93	13.41	10.81	63	9	9
89/90	3166.76	1.45	1.80	1.47	1.48	29	6	4
88/89	1432.41	0.82	0.59	0.00	0.67	4	0	4
87/88	6568.99	3.23	0.00	3.64	3.07	25	2	0
86/87	10498.92	3.82	0.58	11.70	4.90	11	6	13

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Fire Season	Reserve Area Burnt (Ha)	%Yengo	%Dharug	%Parr	% of total Reserve Area	No. Of Fires in Yengo	No. Of Fires in Parr	No. of Fires in Dharug
85/86	61.31	0.00	0.40	0.00	0.03	2	4	6
84/85	11097.9	4.64	0.09	9.85	5.18	2	4	6
83/84	0.00	0.00	0.00	0.00	0.00	0	0	0
82/83	13307.19	6.69	3.57	5.14	6.21	36	3	5
81/82	1617.08	0.00	10.42	0.09	0.75	2	2	3
80/81	7125.4	0.00	44.81	0.87	3.33	0	0	4
79/80	85468.26	50.53	0.40	7.96	39.89	67	5	13
78/79	287.05	0.00	1.89	0.00	0.13	0	0	4
77/78	35615.11	10.76	6.08	48.05	16.62	5	6	1
76/77	5712.68	1.81	18.07	0.00	2.67	5	0	13
75/76	59.64	0.00	0.39	0.00	0.03	0	0	2
74/75	0.00	0.00	0.00	0.00	0.00	0	0	0

3.1.2 Prescribed Burning

There are limited records on prescribed burning within the Reserve Areas. Prescribed burning was undertaken within Dharug National Park during 1986, this prescribed burn was undertaken as a strip burn from Dubbo Gully Track and burnt an area of 121.66 hectares within the Park. Prescribed burning has also been recorded within Parr State Recreation Area during 1998, this prescribed burn was undertaken within bushland to the west of Central Macdonald Public School and burnt 49.95 hectares of the reserve.

The reasoning behind the use of fire for prescribed burning is to lower the fuel loads. This aids in the reduction of fire intensity whereby fire suppression is possible. Research has shown that the application of prescribed burning can reduce the intensity of a wildfire.

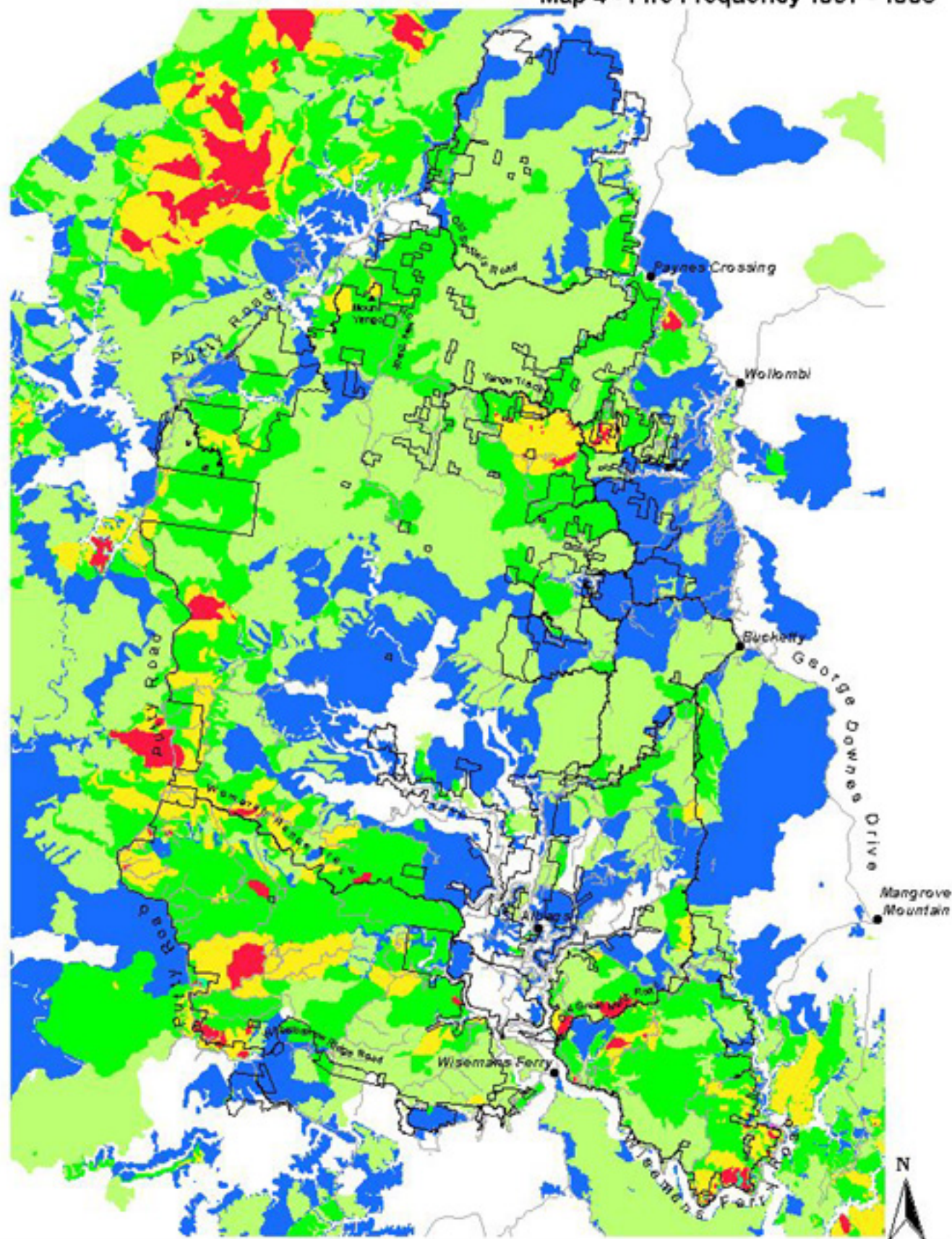
A balance is required whereby sufficient burning is undertaken to enable safe fire fighting operations to occur with the benefit of providing strategic hazard management for the reserves neighbours. These strategic fuel reduced areas will be identified and used to provide 'strategic barriers' in the event of a fire.

The State's fire authorities can provide fire fighting resources to combat any fire within the Reserves. However given that fire can move quickly under strong wind conditions there is a need to ensure that all assets at risk (e.g. dwellings) are well protected in the event fire threatens. Map 5 identifies the location of assets within and adjacent to the Reserves.

There is strong need for all neighbours of the Reserves to implement their own protection strategies as well as those undertaken by the NPWS.

Whilst the community partakes in the management of the Park by the active involvement of Volunteer fire fighters in the various local brigades there is need to involve the wider community where they are neighbours to the Reserves. This is being undertaken on a professional basis by the Rural Fire Service through Community Fire Guard approach. This aims to involve the community in their own protection.

Map 4 - Fire Frequency 1967 - 1998



LEGEND

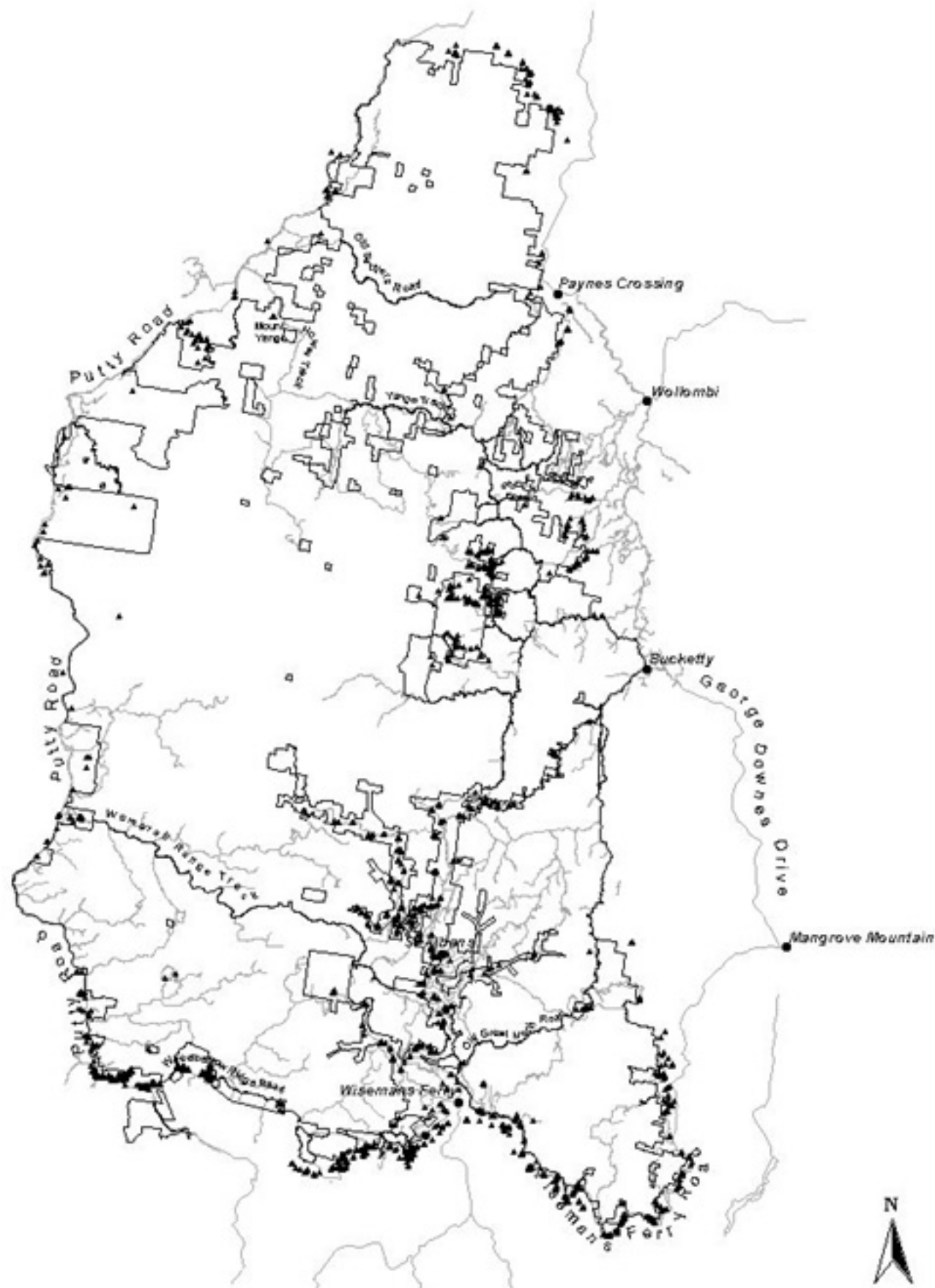


0 4 8 12 16 20 Kilometers



Scale 1:400,000

Map 5 - Assets within 1 Kilometre of the Reserves



LEGEND

- ▲ Asset
- Study Area
- Road

0 4 8 12 16 20 Kilometers

Scale 1:400,000

3.1.3 Fire Frequency

A total of 133 wildfires have been recorded within Yengo National Park since 1986 and a total of 89 wildfire events have been recorded for Parr State Recreation Area since 1989 (NPWS, 2000). Map 4 illustrates the fire frequency for Yengo National Park, Dharug National Park and Parr State Recreation Area.

Over the past 20 years a number of areas within the Park have received repetitive wildfires. Areas subjected to repetitive wildfire events diminish the ecological attributes of the Reserves.

The impact of frequent fires in the Park is not known at this time. It will only be from ongoing empirical observation and applied scientific research that a reliable understanding of the past and future fire regimes may occur.

3.2 Fire Weather

3.2.1 Climate

Yengo and Dharug National Parks and Parr State Recreation Area are located within the sub-tropical climatic zone, which extends along the coastal district from Wollongong to Queensland. The variation in elevation provides a variation in microclimatic conditions at different periods of the year.

The variability of the rainfall in and around the Park is reflected in the Mean figures illustrated in the following sections. Winter drought periods and seasonal summer drought periods are common. The area is also known to have severe storms in late summer to Autumn.

Rainfall records from Mangrove Mountain indicate that on average, approximately 973 mm of rainfall is annually recorded within the southern section of the Reserves. Most of this rainfall falls within mid summer to late Autumn (approx. 485mm), particularly within the months of January, February and March.

Humidity levels remain relatively constant throughout the year, with levels ranging from 39% in August to 73% in May. The highest mean daily maximum temperature is 27.1°C for the month of February. The lowest mean daily minimum temperature is 5.7°C in July.

3.2.2 Conditions Associated with Bush Fires

Climatic and weather conditions associated with serious bushfire seasons and events include;

- a) Occurrence of an extended drought period (BKDI >100) and lower than average rainfall through winter drying fuel for spring.
- b) Summer rainfall is lower than average (Negative SOI), extending the fire season into autumn,
- c) Prolific fuel accumulation from strong growing seasons the previous summer(s), followed by point a),
- d) Spring/ summer thunderstorm activity in dry years,
- e) Occurrence of particular synoptic patterns that bring persistent W to NW winds in late winter/ early spring and are followed by strong cold fronts or southerly changes (high FFDI).

The major factor that enables fires to develop into large events is the prevailing weather conditions occurring at the time. Hot and dry westerly, north-westerly winds combined with drought conditions aid in the creation of conditions suitable for significant fire events.

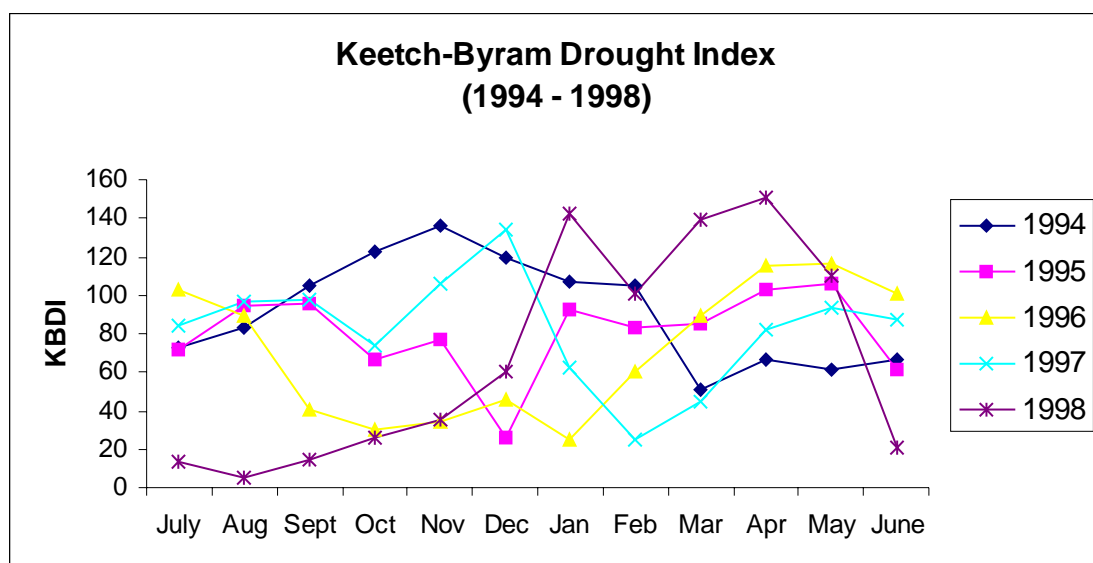
3.2.3 Conditions Suitable for Prescribed Burns

Late summer to early winter is the preferred period for prescribed burning. Spring burning is acceptable in periods when the precedent rainfall has been sufficient to allow fires to extinguish overnight.

Spring burns are also important ecologically, as a variation in season for prescribed burn regimes is important for ecological conservation. Strip burning at appropriate times in strategic locations may be useful to slow or stop the movement of large fires spreading into or through the Park area and are a potential management consideration.

The 'monthly maximum' KBDI data for Singleton is shown as an example in Table 9. It depicts KBDI over a period of 5 years.

Table 9
Monthly Maximum Keetch-Byram Drought Index (Singleton)



3.3 Fire Behaviour Potential

Bushfire behaviour potential is a term used to describe the behaviour of a fire under given conditions for a specific location. Fire behaviour potential is a measurable value relative to the following parameters:

- Elevation
- Slope
- Aspect
- Fuel

The knowledge of a specific area and its bushfire behaviour potential is a valuable tool in the assessment, containment and suppression of bushfire.

Strategies to reduce the impact of wildfire events can be greatly assisted by an accurate understanding of the bushfire behaviour potential. The following sub-sections will detail each of the identified parameters. Overlays of these individual assessments will identify areas of low to high bushfire behaviour potential, which will then be subject to specific management procedures to reduce the potential for damaging fire events.

3.3.1 Elevation

Yengo National Park and Parr State Recreation Area

Parr State Recreation Area is generally under 500 metres in elevation, with the western section having generally higher elevation than the east. The highest point within the Yengo National Park boundary is 660 metres on the slopes of Mount Yengo, which is 665 metres high. In general the northern section of Yengo National Park has higher relief than in the southern sections.

The highest point within Dharug is 304 metres and is located approximately 1 kilometre south west of Windra Park. In general the majority of Dharug National Park is less than 200 metres in elevation. The lowest point within the Park is sea level (AHD - Australian Height Datum) associated with areas along the Hawkesbury River.

3.3.2 Slope

Bushfire behaviour potential is strongly influenced by degree of slope. Gradual increments in slope increase the potential severity of a wildfire. Steep slopes allow for the 'pre-heating of fuels' by means of hot winds fanning unburnt material ahead of the fire front.

Slope has been classified into 3 separate categories to aid in the prediction of potential fire behaviour within the Park. Table 10 defines the categories used for the modelling of potential fire behaviour.

Table 10

Slope Categories within Yengo and Dharug National Parks and Parr State Recreation Area

Slope (degrees ^o)	Bushfire Potential
0-10 ^o	Low
10-20 ^o	Moderate
20-90 ^o	High

3.3.3 Aspect

Bushfire behaviour potential is strongly influenced by aspect. Aspect has a significant influence on ambient temperature, fuel moisture content and vegetation composition.

Aspect determines the type of vegetation present and the moisture content of that community. Slopes receiving limited sunlight and humid winds (easterly to southerly aspects) often result in moist environments and vegetation of lower combustion value.

Slopes receiving high quotas of sunlight and dry winds (westerly to northerly aspects) often result in drier environments and vegetation of high combustion value.

Aspect has been classified into 3 separate categories to aid in the prediction of potential fire behaviour within the Park. Table 11 defines the categories used for the modelling of potential fire behaviour.

Table 11

Aspect Categories within Yengo and Dharug National Parks and Parr State Recreation Area

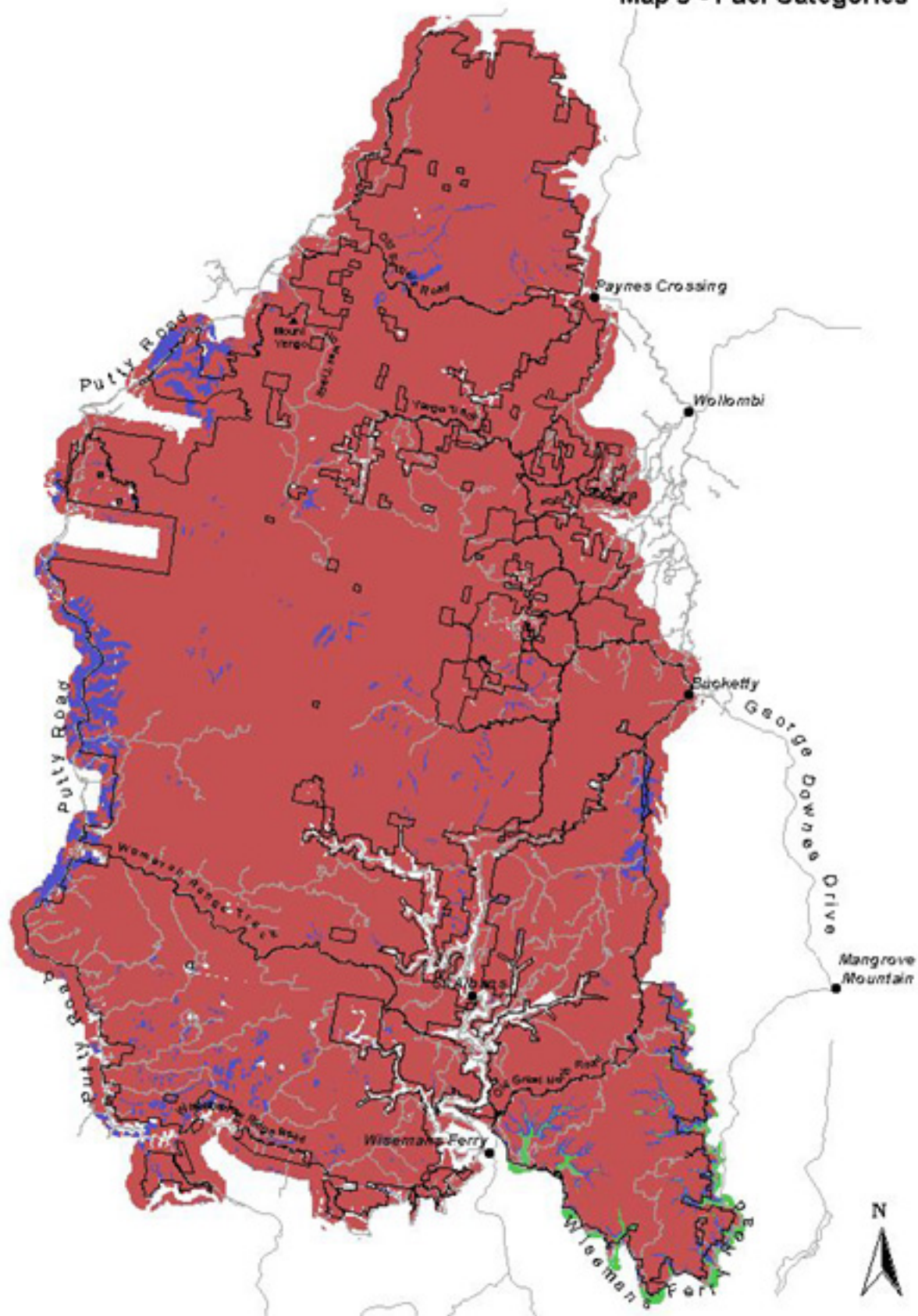
Aspect (degrees)	Bushfire Potential
360-170 ^o	Low
170-220 ^o	Moderate
220-360 ^o	High

3.3.4 Fuel

Fuel characteristics such as fuel loading, fuel arrangement and fuel type have a significant impact upon fire behaviour potential occurring under varying climatic influences.

The vegetation associations listed in Tables 1 and 2 have been simplified in line with a methodology devised by the Southern Regional Fire Association (1994). This methodology involved the grouping of vegetation associations into similar fine fuel characteristics based on four fuel groups. The vegetation communities have been classified into fuel groups using the following parameters, the;


Map 9 - Fuel Categories



LEGEND

- | | | | |
|---|----------|---|---------------|
|  | Low |  | Park Boundary |
|  | Moderate |  | Road |
|  | High | | |

0 4 8 12 16 20 Kilometers



Scale 1:400,000

- *frequency* that the vegetation community provides ‘available fire fuel’
- *structure* of the vegetation and the ability of ground level fuels to carry fire into higher vegetation levels e.g. from understorey into crown fire
- *arrangement* of the fuel within the vegetation type, e.g. fine fuels that are elevated such as in heath contribute more to fire intensity than a similar quantity of leaf litter fuel
- *amount* of fuel that accumulates after a long period without fire.

Table 12 depicts the categorised fuel groups and their respective definitions.

Table 12
Description & Characteristics of Fuel Groups

Fuel Group	Characteristics
High	Continuous fuels, higher quantity, available to burn during average seasons (higher fire intensity expected e.g. woodland and forest fuels)
Medium	Less continuous fuels, low-medium fuel quantity, available to burn during average seasons but may be less often than high (medium or high fire intensity expected)
Low	Possibly discontinuous fuels, low-medium fuel quantity, moister fuels unlikely to contribute to high intensity fires in average season, fuel structure facilitates easier control, (fire intensities expected range from low-high and generally regarded as easier to control e.g. moist and wet forests)
Negligible	Unlikely to burn or always burns within controllable limits

The fuel groups for each of the vegetation communities within the Reserves are illustrated in Tables 13 and 14 and Map 9.

Table 13
Estimates of Bush Fire Behaviour Potential from Fuel Categories Located within Yengo National Park and Parr State Recreation Area.

Vegetation Community	Bushfire Potential
1 - Sheltered Dry Hawkesbury Forest	High
2a - Exposed Hawkesbury Woodland	High
2b - Dwarf Apple Low Open Woodland	Medium
3a - Hawkesbury - Narrabeen Sheltered Forest	Medium
3b - Sheltered Forest on Rich Soils	Medium
3c - Grey Box Open Forest	High
3d - Rough -barked Apple Woodland on alluvium	High
3e - Stinging Tree Dry Rainforest	Low
3f - Rainforest on Alluvium	Low
4a - Exposed Narrabeen Woodland	High
4b - Narrabeen - Hawkesbury Ironbark Forest	High
5 - Northern Escarpment Woodland	High
6a - Woodland on Perched Sands	Medium
6b - Swamp Woodland on Perched Sands	Medium
7 - Melaleuca Swamp Forest	Medium

Table 14

Estimate of Bush Fire Behaviour Potential from Fuel Categories located within Dharug National Park

Vegetation Community	Bushfire Potential
A1 - Closed Forest/ Low woodland	Low
A2 - Herbland/ Sedgeland	Low
A3 - Forest	Low
A4 - Reedland/ Rushland/ Sedgeland	Low
A5 - Low Forest/ Scrubland	Low
A6 - Forest	Low
A7 - Scrubland	Low
A8 - Reedland/ Rushland	Low
B1 - Forest	Low
B2 - Forest	Medium
B3 - Forest/ Open Forest	Medium
B4 - Open Forest	High
B5 - Open Forest	High
B6 - Open Forest/ Woodland	High
C1 - Forest / Open Forest	High
C2 - Woodland	High
C3 - Woodland	High
C4 - Scrubland	Medium
C5 - Heathland	Medium
D1 - Forest	Medium
D2 - Forest	High

3.3.5 Analysis of likely Fire Behaviour

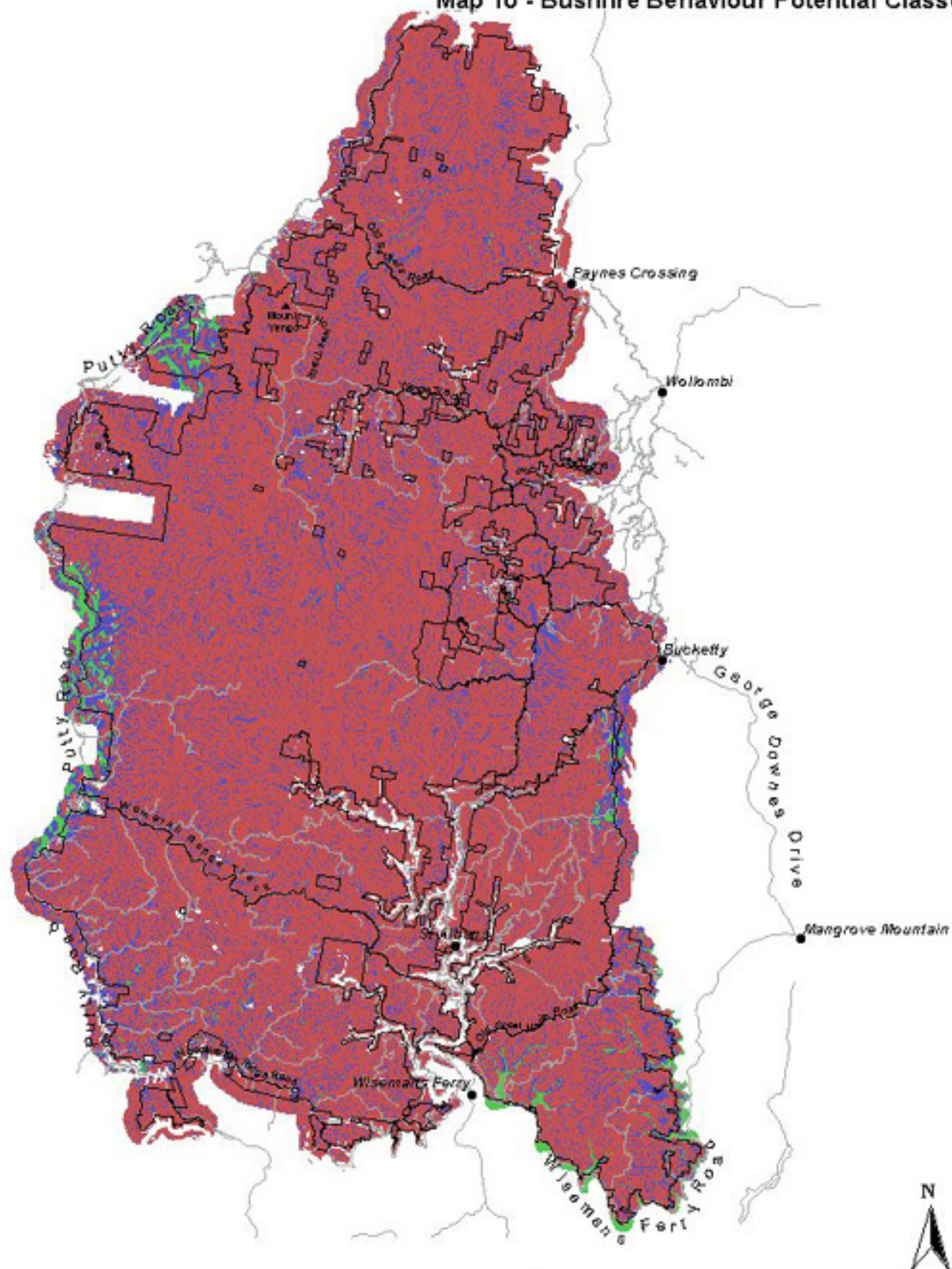
Yengo and Dharug National Parks and Parr State Recreation Area constitute an area of high fire behaviour potential due to steep exposed slopes associated with the weathering of both Hawkesbury and Narrabeen Sandstones.

A higher fire danger potential exists within areas associated with the Hawkesbury River Catchment (southern sections of the Reserves) than areas associated with the Mangrove Creek Catchment (northern sections of the Reserves).

This is due to the fact that drainage generally runs in a north-south direction into the Hawkesbury River (creating predominantly west-east aspects) compared to east-west drainage (creating predominantly north-south aspects) into Mangrove Creek. Rugged terrain and predominantly Hawkesbury sandstone vegetation make for a dry easily combustible landscape within the reserve areas.

Table 15 lists the percentage of each fire behaviour category within the Reserves. Map 10 illustrates where each of these classes are located within the Park. Fires burning on west facing slopes can achieve significant fire intensity (see Fire Behaviour Potential Map 10). The type of vegetation typically associated with this aspect is low open woodland and is highly combustible. This vegetation type when coupled with slopes above 5 % has been identified as High (82.5%) and Moderate (15.9%). This totals 98.4% of the Reserve Area. The difference between high and moderate categories is


Map 10 - Bushfire Behaviour Potential Classes



LEGEND

- | | | | |
|---|----------|---|---------------|
|  | Low |  | Park Boundary |
|  | Moderate |  | Road |
|  | High | | |

0 4 8 12 16 20 Kilometers



Scale 1:400,000

marginal on days of High to Extreme fire danger days (as determined by the Fire Danger Index).

Table 15

Bushfire Behaviour Potential Classes within Yengo and Dharug National Parks and Parr State Recreation Area

Class	Percentage of the total Reserve Area
High	82.47
Moderate	15.87
Low	1.00
Negligible	0.59

3.4 Damage Potential

The greatest potential for bushfire to cause damage occurs where areas of high fire behaviour potential and high ignition potential are closely located to assets. The identification of such areas in close proximity to assets form the basis and priorities for the bushfire risk management activities identified in this Plan. NPWS will seek co-operation from adjoining landholders to manage areas of high fire behaviour potential on private property in a manner that complements the actions undertaken in the Reserves.

The damage potential from wildfires can be mapped by reviewing the bushfire behaviour potential (fuel, slope, aspect) and the likely locations of property and/or fire sensitive features that can be potentially affected. The mapping provides a useful comparison of areas, indicating sites of comparatively higher and lower potential fire behaviour. This information is essential in the development of strategies to manage life and property and other areas of biological significance.

Three groups at risk from wildfire are considered in the study area, these are:

- i. human life; including residents, visitors and fire-fighters
- ii. residential property; Park structures; and cultural sites / relics
- iii. flora and fauna species / communities that are sensitive to fire

The threat to human life is the most important of these three groups. It has the highest priority for protection and is implicit within every strategy in the Plan.

The Reserve areas are scattered with many privately owned inholdings, some of which are located in remote and inaccessible areas. Due to the large number and size of inholdings within the Reserves, bushfire damage potential can only be reduced by enforcing landholders to manage fuels on their own land. Residents in some of the remote areas of the reserves tend to have unconventional lifestyles, making asset mapping and fuel management of these remote areas difficult.

3.4.1 Historical Damage

The most significant (>20000 hectares) wildfire events within the Reserves have occurred during the following fire seasons; 1997/1998, 1993/1994, 1991/1992, 1990/1991, 1979/1980, 1977/1978. Wildfires have caused damage to the natural vegetation and wildlife of the reserves and assets including fences, structures and property.

3.4.2 Economic Damage

Wildfire events within the reserves have caused economic damage to assets including fences, structures and property. Fires leaving the reserves have the potential to impact on agricultural assets and drinking water catchments.

3.4.3 Natural Heritage Damage

Yengo and Dharug National Parks and Parr State Recreation Area are characterised by a diverse range of wildlife including many threatened flora and fauna species. Inappropriate fire regimes can also reduce the biodiversity and conservation values of the Reserves. Representations of threatened wildlife are detailed in Section 2.3. Issues relating to the threatened flora and fauna of this Park are discussed in Section 4.6 "Biodiversity Conservation".

3.4.4 Cultural Heritage Damage

The incidence of high intensity fires is an extremely destructive force on Aboriginal and European sites of historical importance. Aboriginal paintings and rock carvings can be damaged by smoke and exfoliating rock respectively (the cracking and weathering of rock surfaces from temperature extremes). European sites such as bridges, structures and farmland are equally subject to damage from high intensity fires.

The Park contains a number of sites that are considered to have cultural importance. The majority of these sites are of Aboriginal origin, and are at most risk during operational activities particularly the use of heavy machinery during trail construction and fire fighting events.

4. FIRE MANAGEMENT

4.1 Bush Fire Management Zones

Bush fire management zones are used by the NSW National Parks and Wildlife Service to facilitate broad and specific fire management objectives within its conservation Reserves.

Each zone has fire management objectives, strategies, actions and performance criteria specific to the area within its boundary. For example, zones with fire sensitive communities such as littoral rainforest will have fire exclusion objectives and a zone on the fire prone side of the residential development will have objectives that specifically provide for protection of assets.

The objectives and strategies for each zone are complementary and together provide the reserves with a fire management plan consistent with the objectives in Section 2. Although each zone has management prescription reflecting its emphasis, a site-specific variation of the prescription may be necessary for the occurrence of unusual features.

This management flexibility is essential for achieving conservation of biodiversity in situations such as the isolated occurrence of rare plant and animal species. The boundary of fire management units is delineated by strategically located roads, trails, or tracks or by natural fire barriers such as creeks and water bodies.

97 fire management zones have been identified for the study area. Some of these zones overlap with private lands adjacent to the Reserves.

The BMZ's define operational activities to best mitigate against fire threat and to help assist in preventing species loss and damage to assets and property. Three major categories of fire management zones are used in the plan. These are:

- Asset Protection Zones
- Strategic Fire Management Zones
- Heritage Management Zones

Each major category is divided into sub categories using a state wide fire management planning methodology (NPWS, 1996).

4.2 Strategic Fire Management Zones

Within this Fire Management Plan, Strategic Fire Management Zones (SFMZ's) are designed to reduce the risk of damage to life and property within and adjacent to the Reserve areas. SFMZ's primarily protect property from direct flame and ember attack from a passing fire front as well as providing protection from intense radiant heat. They also provide for the strategic containment and management of high intensity wildfire events.

SFMZ's provide protection for a wide range of assets including roads, residential and industrial areas, camping and picnic areas and areas of special use such as schools and other community facilities. SFMZ's are also useful in creating buffers in higher fuel areas to reduce the spread of fire into and from the Reserves and across whole landscapes.

SFMZ's have been mapped over both NPWS and private land. Where SFMZ's occur on private land it is recommended that the land owner manage these areas as asset protection zones. The NPWS is not responsible for the hazard reduction of private lands.

11 SFMZ's have been identified for Yengo NP, Dharug NP and Parr SRA. Each of these zones is made up of a number of zone areas (73 in total). Details on each zone area can be found in Map 11 and Appendix 1.

4.3 Asset Protection Zones

Within this Fire Management Plan Asset Protection Zones will be encouraged around private dwelling assets adjacent to the boundary of the Reserves. Due to the size of the reserves it is not possible to map and identify all of the Asset Protection Zones around adjoining private properties. NPWS responsibility is primarily in identifying and maintaining strategic zones in reserves adjoining the private assets.

The major mitigating factor that limits the effect of wildfire on a dwelling is the amount of fuel available to be consumed by the advancing wildfire. By reducing the fuel there will be a reduction in the intensity of the fire, and thus the potential threat to life and property.

Thus the provision of an area that is termed a fire protection zone acts as an advantage for fire protection by providing a buffer between excess combustible fuel and any structures.

A fire protection zone (FPZ) is a buffer zone located between bushland and a dwelling (or some other defined value at risk). The FPZ aims to reduce heat radiation and direct flame contact (two of the three causes of bush fire damage). It is also an area where airborne embers (the third cause) can fall with minimal opportunity to create further outbreaks. This zone is also broken down into two further zones. They are:

- Fuel Free Zone (Inner protection) - This encompasses an area that is primarily almost free of combustible fuels. It is often designed to be grassy areas, car parks, roads, concrete areas, track or trails. It does not imply the wholesale removal of all existing trees and isolated shrubs. However the fuel free zone requires ongoing maintenance to reduce the fuels to a minimum state of growth so as to reduce the potential for ignitions and to eliminate the carriage of intense fire.
- Fuel Reduced Zone (Outer protection) - This comprises an area that is designed to aid in reducing the carriage and spread of fire and thus potential intensity or heat radiation from the flames. The fuel reduced zone will require hazard reduction through thinning, removal of vegetation, clearing or burning.

Recent legislative changes (Rural Fires Act 1997) now require private land owners to be responsible for the management of fuels within their ownership or occupation. This was not the case in the previous Bush Fires Act 1949.

Section 63(2) of the Rural Fires Act 1997 sets out the basic guidelines for fire management on private lands. This requires that all 'occupiers of land' are required to prevent bush fires by taking the notified steps and other practical steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread on, or from, that land.

Notified steps are defined in the Act as:

- (i) Any steps that the Bush Fire Coordinating Committee advises a person to take.
- (ii) Any steps that are included in a Bush Fire Risk Management Plan applying to the land.

Any other practical steps are those which would lessen the potential for a fire to spread from one property to another.

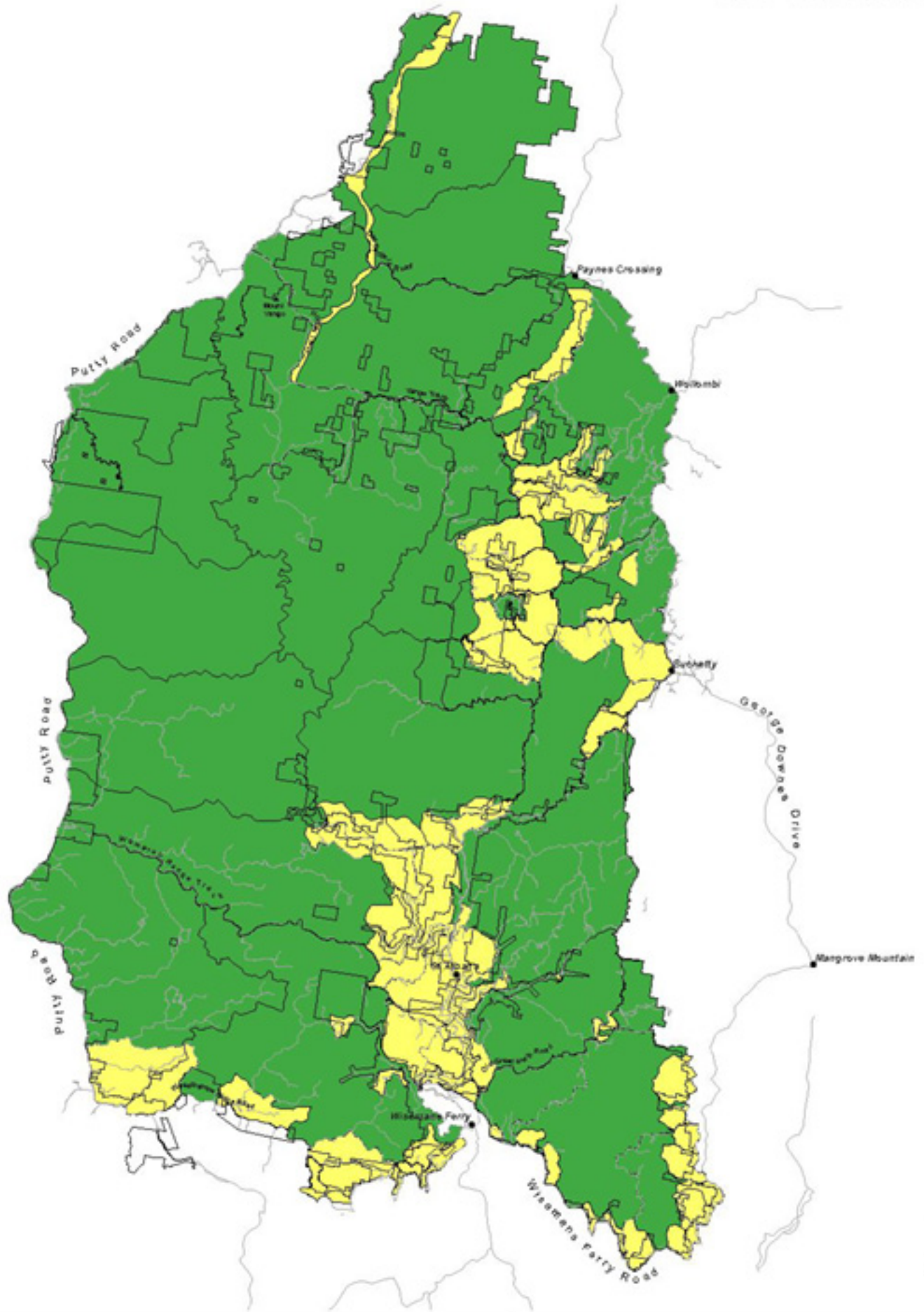
4.4 Heritage Management Zones

Heritage Management Zones are those areas where assets are not at threat by wildfire and therefore management can concentrate on the ecological values of the zone.

The purpose of Heritage Protection Zones (HPZ) is to prevent / limit the damage of wildfire events on sensitive areas within and adjacent to the Reserves. For the purposes of this Plan, HPZ's have been defined as a combination of natural and/ or cultural item.

Heritage items are often irreversibly damaged or lost to inappropriate fire management. The management of HPZ's is often undertaken in accordance with other previously determined conditions for the conservation of heritage

Map 11 - Fire Management Zones



LEGEND

-  Heritage Management Zone
-  Strategic Fire Management Zone
-  Park Boundary
-  Road

0 3 6 9 12 15 Kilometers



items, including Recovery Plans, Plans of Management, Conservation Plans etc.

4.5 Summary of Fire Management Zones

Appendix 1 and 2 detail the zones in the Park. They provide detailed information on each of the identified zones e.g. size in hectares, percentage of zone within the Park, vegetation communities present, bushfire behaviour potential and past fire frequency.

4.6 Biodiversity Conservation

In practical terms conservation is about the prevention of the extinction of species, especially extinctions brought about by the actions of humans. One aim of fire management within the Park is to maintain the species and community biodiversity.

This is supported by the objective of keeping the fire regimes of each plant community within the appropriate thresholds for ongoing maintenance of biodiversity (see Table 16). Basically these require the management of fire to retain (avoid extinction of) all native species known to occur within the Park.

4.6.1 Principles and Thresholds

Contemporary ecological research in fire-prone ecosystems of the kind represented in the Reserves has established some general principles in relation to the fire regimes required to conserve biodiversity. Management of fire for conservation in the Reserves will be guided by the following general principles.

1. Groups of flora and fauna species respond similarly to fire according to characteristics of their life history. Therefore it is not necessary to individually specify fire regimes for the conservation of every species. Rather an overview is needed of the requirements for broad groups of species. Requirements for most plant species can be summarised on the basis of a small number of groups. The knowledge of requirements for groups of animals is less advanced.
2. Flora and fauna are interrelated. Flora forms an important component of habitat for fauna. Fire management must consider this important interaction.
3. A diversity of fire regimes may be required in order to maintain native biodiversity. This means that over time there may be a need to implement fires of high, moderate and low intensity, frequency and size throughout the Park. Extinctions may be likely when fire regimes of relatively fixed intensity, frequency and extent prevail without interruption.
4. Bradstock *et al*, (1995) contend that there is a threshold in fire regime variability that marks a critical change from high species diversity to low species diversity. For some groups of biota these thresholds separating desirable and undesirable fire regimes can be defined. Management

should therefore be targeted toward desirable fire regimes using these thresholds as a guide. The advantage of using thresholds to determine fire regimes is that it is not directing an ecosystem to a single state but maintaining it in a range of states above the threshold (Walker, 1984).

5. Management strategies involve the manipulation of fire regimes. While information may be lacking about important elements in this strategy, fire management using this framework can progress while further knowledge is accumulated. Assessment of fire regimes through mapping of the locality and characteristics of all fires will be ongoing so that strategies (manipulation of fire regimes) can be regularly reviewed, refined and adjusted. Depending on the circumstances (a function of community type and prevailing fire regimes) there may be a role for both prescribed fire and/or fire-exclusion in parts of a given Reserve in the future.

Knowledge of the fire-ecology on resident animal species is currently insufficient to formulate comprehensive fire-regime-thresholds for the management of fauna species as outlined for plant communities.

Maintenance of vegetative cover and structure within flora communities in the Reserves is essential for conserving viable fauna populations. The information in Table 16 is not only a guide to conserving flora species in their own right, but is also a guide to maintaining fauna habitat. Thus the table serves as a guide to conserving flora and fauna species resident in various flora communities.

Table 16
Desirable Fire Frequency for Varying Vegetation Communities

Community	Desirable Ecological Fire Frequency	Regime Type
Dry - Open Forest and Woodland	Decline predicted if more than two successive fires occur at less than intervals of 8 years apart. Decline predicted if there are no fires for more than 25 years. Decline predicted if successive fires occur which totally scorch or consume the tree canopy. Avoid successive fires of intensity sufficient to scorch or consume dominant tree crown	B
Moist - forest, open forest, and woodland.	Variable fire frequency, no more than two fires within a 10 year period. No more than two consecutive fires more than 25 years apart. No more than two consecutive fires where less than 10 t/ha of fuel is consumed.	C
Wet sclerophyll, sheltered, swamp Forests.	Variable fire frequency, No more than one fire every 10 years. Decline expected if more than two fires in a row occur at intervals of more than 40 years apart.	D
Rainforest / Wetland	Fire intolerant - No desirable Ecological fire frequency.	E

Source: Bell *et. al.*, (1993), Bradstock *et al.*, (1995)

Unburnt areas are extremely important for the recolonisation and protection of species. However, it is not possible at present to define and quantify guidelines concerning the size of unburnt areas required for critical fauna habitat.

The guidelines provided for the management of animal species within this plan will be subject to the TSC Act, 1995 (NSW). This Act provides the

framework to protect and encourage the recovery of threatened species, populations and ecological communities.

The development of 'Recovery Plans' is a requirement under the Act to ensure the appropriate management and planning for the conservation of threatened species. As these Recovery Plans are developed there may be a need to adjust the fire management guidelines provided in this plan.

4.6.2 Distribution of Biodiversity in Fire Management Zones

The combined composite vegetation map (Map 2) has been used as the foundation for the preparation of the biodiversity conservation strategies for the Reserves.

The combined composite map identified 15 vegetation communities/formations within Yengo National Park and Parr State Recreation Area and 21 vegetation communities/formations within Dharug National Park, as shown in Map 2. The percentage area covered by each vegetation community for the Reserves is shown in Table 17, and Table 18.

Table 17

**Distribution of Vegetation Types in Fire Management Zones within
Yengo National Park and Parr State Recreation Area**

Vegetation Community	Percentage of Vegetation Type in Each Zone	
	Heritage	Strategic
1 - Sheltered Dry Hawkesbury Forest	84.8	13.6
2a - Exposed Hawkesbury Woodland	86.4	13.9
2b - Dwarf Apple Low Open Woodland	80.5	12.1
3a - Hawkesbury - Narrabeen Sheltered Forest	68.1	16.8
3b - Sheltered Forest on Rich Soils	76.6	7.4
3c - Grey Box Open Forest	99.0	1.0
3d - Rough -barked Apple Woodland on alluvium	90.0	10.0
3e - Stinging Tree Dry Rainforest	91.5	1.8
3f - Rainforest on Alluvium	100	0
4a - Exposed Narrabeen Woodland	91.5	1.8
4b - Narrabeen - Hawkesbury Ironbark Forest	91.8	7.9
5 - Northern Escarpment Woodland	87.5	5.8
6a - Woodland on Perched Sands	97.2	0
6b - Swamp Woodland on Perched Sands	78.2	0
7 - Melaleuca Swamp Forest	100	0

Table 18

**Distribution of Vegetation Types in Fire Management Zones within
Dharug National Park**

Vegetation Community	Percentage of Vegetation Type in Each Zone	
	Heritage	Strategic
A1 - Closed Forest/ Low woodland	92.0	0.0
A2 - Herbland/ Sedgeland	0.0	100
A3 - Forest	98.4	0.0
A4 - Reedland/ Rushland/ Sedgeland	96.9	4.6
A5 - Low Forest/ Scrubland	100	0.0
A6 - Forest	93.7	0.0
A7 - Scrubland	94.3	4.1
A8 - Reedland/ Rushland	0.0	0.0
B1 - Forest	81.3	11.0
B2 - Forest	62.1	20.1
B3 - Forest/ Open Forest	86.1	13.9
B4 - Open Forest	60.4	38.7
B5 - Open Forest	68.7	35.7
B6 - Open Forest/ Woodland	47.6	45.4
C1 - Forest / Open Forest	78.5	14.8
C2 - Woodland	75.1	15.3
C3 - Woodland	68.2	16.9
C4 - Scrubland	65.1	16.3
C5 - Heathland	0.0	0.0
D1 - Forest	0.0	0.0
D2 - Forest	82.7	15.9

Tables 19 and 20 provide the broad prescription for fire regimes (thresholds) within the Reserves. Map 12 illustrates the location of each of these thresholds within the Reserves. The thresholds are not regarded as absolutes rather they indicate a requirement for managers to carefully review the fire management requirements of a site where fire regimes exceed the thresholds.

Table 19
Fire Thresholds for Vegetation Communities within
Yengo National Park and Parr State Recreation Area

Vegetation Community	Area (ha)	Percentage of Total Area	Threshold
1 - Sheltered Dry Hawkesbury Forest	59613	31.16	C
2a - Exposed Hawkesbury Woodland	67384	35.22	C
2b - Dwarf Apple Low Open Woodland	1073	0.56	C
3a - Hawkesbury - Narrabeen Sheltered Forest	1511	0.79	D
3b - Sheltered Forest on Rich Soils	608	0.32	D
3c - Grey Box Open Forest	161	0.08	B
3d - Rough -barked Apple Woodland on alluvium	1390	0.73	B
3e - Stinging Tree Dry Rainforest	<10	0.00	E
3f - Rainforest on Alluvium	300	0.16	E
4a - Exposed Narrabeen Woodland	4594	2.4	B
4b - Narrabeen - Hawkesbury Ironbark Forest	49236	25.74	B
5 - Northern Escarpment Woodland	2218	1.16	B
6a - Woodland on Perched Sands	2113	1.10	B
6b - Swamp Woodland on Perched Sands	82	0.04	D
7 - Melaleuca Swamp Forest	912	0.48	D

Table 20
Fire Thresholds for Vegetation Communities within
Dharug National Park

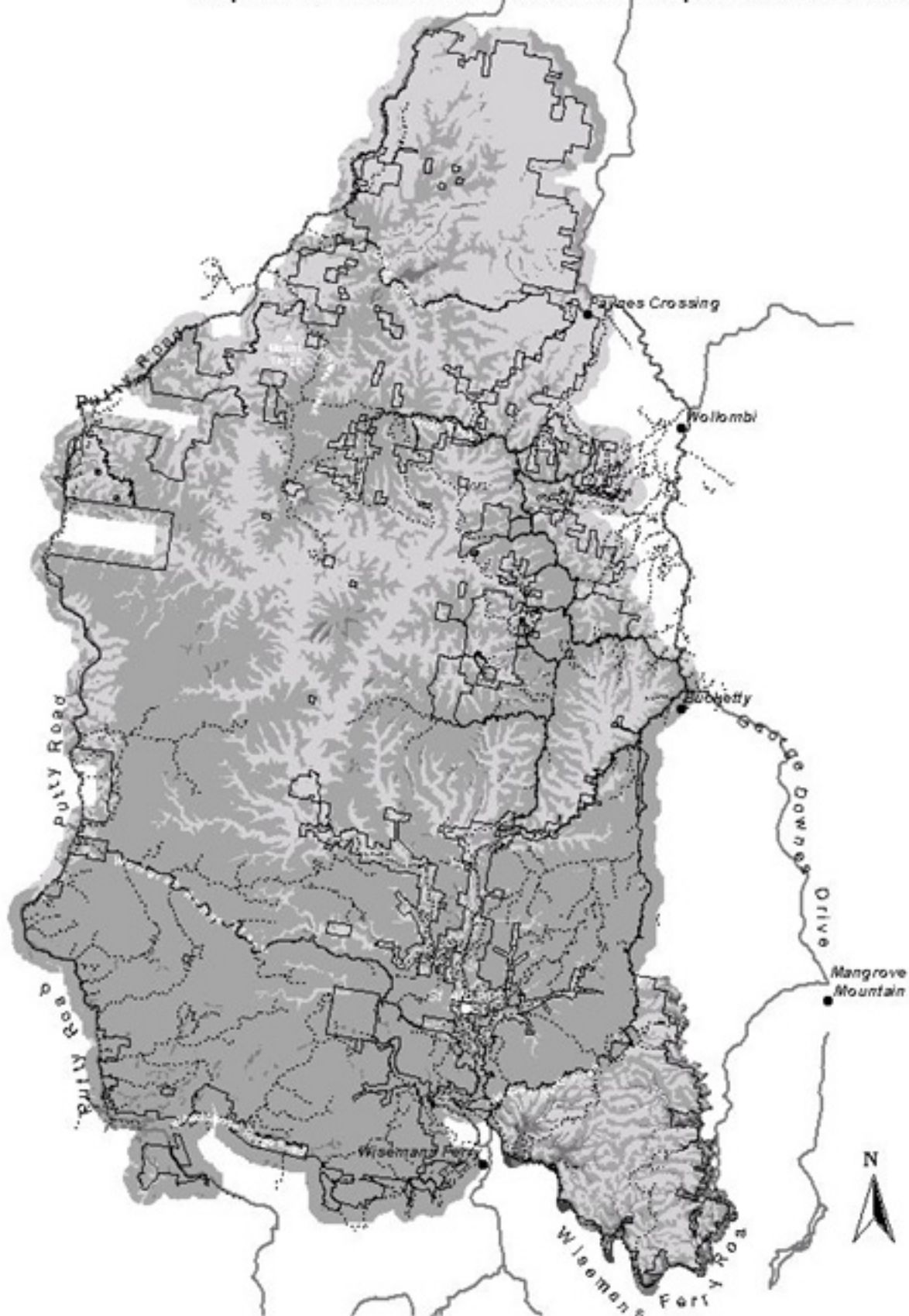
Vegetation Community	Area (ha)	Percentage of Total Area	Threshold
A1 - Closed Forest/ Low woodland	1	0.01	E
A2 - Herbland/ Sedgeland	3	0.02	D
A3 - Forest	37	0.24	D
A4 - Reedland/ Rushland/ Sedgeland	10	0.07	D
A5 - Low Forest/ Scrubland	104	0.68	D
A6 - Forest	63	0.41	D
A7 - Scrubland	40	0.26	C
A8 - Reedland/ Rushland	0	0	E
B1 - Forest	156	1.03	E
B2 - Forest	476	3.13	D
B3 - Forest/ Open Forest	673	4.43	D
B4 - Open Forest	271	1.78	D
B5 - Open Forest	192	1.26	C
B6 - Open Forest/ Woodland	115	0.76	C
C1 - Forest / Open Forest	6082	40.02	C
C2 - Woodland	6269	41.25	B
C3 - Woodland	504	3.32	B
C4 - Scrubland	12	0.08	B
C5 - Heathland	7	0.05	B
D1 - Forest	10	0.07	D
D2 - Forest	29	0.19	D

The fire regimes listed in Tables 19 and 20 have been further refined for their application within fire management zones in the Reserves. This involved the following process;

- Study of the attributes of each of the 36 vegetation communities/formations and the effects of local site conditions on the fire tolerance of each community
- Review of the fire history and likely future fire management within the Reserves so as to understand the impact of fire regimes over a relatively wide area
- The selection of appropriate fire regimes for the Reserves and their regional setting.

The various fire management zone profiles in Appendix 1 depict the fire regimes most suitable for the varying vegetation communities within management zones.


Map 12 - Minimum Inter-fire Period for Species Conservation



LEGEND

- | | | | |
|---|---------|---|---------------|
|  | B* |  | Park Boundary |
|  | C* |  | Road |
|  | D* | | |
|  | E* | | |
|  | Cleared | | |
- *Refer to Table 1*

0 4 8 12 16 20 Kilometers



Scale 1:400,000

4.6.3 Evaluation of Current Fire Regimes

Table 21 gives an indication of the current fire regimes within vegetation communities.

Table 21
Fire Regimes within Vegetation Communities

Vegetation Type (Regime B)	% Burnt Once in the last 8 years	% Burnt 2 or more times in the last 8 years	% Not burnt in the last 8 years but burnt in the last 25 years'	% Not burnt in 25 years
3c - Grey Box Open Forest	73.2	19.3	87.4	6.3
3d - Rough-barked Apple Woodland on Alluvium	84.7	9.0	77.5	0.0
4a - Exposed Narrabeen Woodland	69.2	4.5	79.1	5.3
4b - Narrabeen - Hawkesbury Ironbark Forest	74.3	6.7	73.7	10.5
5 - Northern Escarpment Woodland	63.5	0.0	15.9	33.0
6a - Woodland on Perched Sands	56.8	34.9	90.5	5.3
C2 - Woodland	88.5	3.3	78.7	1.6
C3 - Woodland	96.0	0.4	78.5	0.5
C4 - Scrubland	74.4	40.1	100.0	0.0
Vegetation Type (Regime C)	% Burnt Once in the last 10 years	% Burnt 2 or more times in the last 10 years	% Not burnt in the last 10 years but burnt in the last 25 years'	% Not burnt in 25 years
1 - Sheltered Dry Hawkesbury Forest	66.0	14.3	21.6	9.5
2a - Exposed Hawkesbury Woodland	66.8	16.6	24.9	7.5
2b - Dwarf Apple Low Open Woodland	65.9	32.2	48.9	0.0
A7 - Scrubland	66.7	0.0	0.0	30.6
B5 - Open Forest	98.3	0.0	0.0	1.7
B6 - Open Forest / Woodland	65.4	14.6	22.4	18.1
C1 - Forest / Open Forest	81.1	6.1	7.5	2.7
Vegetation Type (Regime D)	% Burnt Once in the last 10 years	% Burnt 2 or more times in the last 10 years	% Not burnt in the last 10 years but burnt in the last 40 years'	% Not burnt in 40 years
3a - Hawkesbury-Narrabeen Sheltered Forest	74.9	5.4	67.7	10.4
3b - Sheltered Forest on Rich Soil	66.3	17.2	80.1	4.0
6b - Swamp Woodland on Perched Sands	78.6	18.4	92.2	3.1
D1 - Forest	31.8	0.0	37.2	62.8
D2 - Forest	63.7	37.7	43.5	0.0
A2 - Herbland / Sedgeland	22.2	1.9	12.5	72.0
A3 - Forest	51.4	5.0	13.6	43.6
A4 - Reedland / Rushland / Sedgeland	67.3	0.0	21.7	30.5
A5 - Low Forest / Scrubland	38.6	0.4	7.6	58.4
A6 - Forest	91.3	2.4	17.8	5.1
B2 - Forest	65.1	1.4	50.1	25.7
B3 - Forest / Open Forest	75.3	8.8	78.3	2.8
B4 - Open Forest	68.2	19.8	50.9	9.1

Vegetation Type (Regime E)	% Burnt Once in fire history	% Burnt 2 or more times in fire history	% Not burnt in fire history
A1 - Closed Forest / Low Woodland	2.7	2.3	94.9
B1 - Forest	19.9	80.1	0.0

The records within Table 21 indicate that the following vegetation communities have been extensively burnt (>50% of total community) more than once in the last 8 years; 2b - Dwarf Apple Low Open Woodland (regime C), 6a - Woodland on Perched Sands (regime B) and C4 - Scrubland (regime B). This is an indication that areas of these vegetation communities have exceeded fire regime guidelines, and been burnt too frequently.

D1 - Forest (regime D). community has not been extensively burnt in the last 40 years. This indicates that areas of the community may be approaching the upper threshold of the fire regime guidelines.

Fire regime is a combination of frequency, season and intensity. No records of fire intensity have been analysed therefore this list of communities are only an indication of the vegetation communities at risk to inappropriate fire regimes.

4.6.4 Effects of Management for Human Protection and Strategic Wildfire Control on Biodiversity

Areas affected by management within Strategic Fire Control Zones represent 12.2% of the reserve. Prescribed burning in these areas will be strategically staged to provide sufficient time between fire events to prevent species decline. This may not be achievable if fuel loads become too dangerous to protect life and property.

Most vegetation communities (some are represented outside the reserve boundary, such as aquatic habitat) are represented in Heritage Management Zones that will be managed to conserve biodiversity, following the guidelines within Table 16, Desirable Fire Frequency for Varying Vegetation Communities.

4.6.5 Fire Regime Strategies for Biodiversity Conservation

Having regard to the strategies required to conserve threatened flora and fauna species, the overall fire management strategies for Yengo NP, Dharug NP and Parr SRA should be to:

- Limit the extent of all wildfires by responding quickly to all fire events with sufficient suppression resources.
- Exclude fire from zones containing threatened flora species or inappropriate fire regimes, throughout the duration of this Plan.
- Where possible initiate burning regimes that allow fire thresholds to be maintained for each vegetation community and/ or species.

- Encourage and assist where possible fuel mitigation in appropriate Off-Park areas to allow effective property protection.
- Carry out mitigation requirements which do not involve burning.
- Monitor weed occurrences within riparian and peripheral zones after fire events.

Where possible, the above mentioned guidelines should be implemented in combination with species specific guidelines (outlined below) designed for the management of threatened flora and fauna species in a landscape influenced by fire. The implementation of integrated guidelines is encouraged whenever the occurrence of a threatened species, population or community is concurrent with a planned fire related activity.

Flora

The information provided in Table 22 is not only a guide to the conservation of flora species in their own right it also serves as a guide to the maintenance of fauna habitat. It is the intention that the guidelines presented in Tables 19 and 20 for the conservation of flora communities will apply to the conservation of fauna species occupying one or more of the identified habitats. Table 22 outlines the fire management regimes for particular endangered and vulnerable flora species.

**Table 22
Fire Regimes / Strategies For Conservation Of Plant Species**

Status	Species	Common Name	Community	Management Guide *
Vulnerable	<i>Calistemon linearifolius</i>	Genus referred to as bottlebrush	Riparian areas within Dry Sclerophyll	Interval of 10-20 years should allow adequate seed storage and adequate rootstock resistance.
Vulnerable	<i>Dillwynia tenuifolia</i>	Genus commonly referred to as egg and bacon pea.	4a, 5	Interval of 10-15 years should allow adequate seed storage and adequate fuel quantities to produce moderate to high intensity fires needed to germinate dormant seeds.
Vulnerable	<i>Kennedia retrorsa</i>	Genus commonly referred to as running peas.	3e, 2a	Interval of 15-20 years should allow adequate seed storage and adequate fuel quantities to produce moderate to high intensity fires needed to germinate dormant seeds.
Vulnerable	<i>Lasiopetalum joyceaea</i>	Genus commonly referred to as Tobacco bush	2a	Interval of 10-15 years should allow adequate seed storage. Moderate intensity fires should be applied.
Vulnerable	<i>Melaleuca groveana</i>	Genus commonly referred to as tea tree, paperbarks	4a, 2a, 4b	Interval of 12-25 years should allow adequate seed storage and adequate rootstock resistance. Fuel levels should be adequate to produce moderate to high intensity fires.
Vulnerable	<i>Olearia cordata</i>	Genus commonly referred to as daisy bush.	2a, 1, 4b	Interval of 12-15 years should allow adequate rootstock resistance. Autumn fires should be avoided (time of regeneration).
Endangered	<i>Persoonia hirsuta</i>	Hairy Geebung	2a	Interval of 10-15 years should allow adequate seed storage. Moderate intensity fires should be applied.
Vulnerable	<i>Pomaderris brunnea</i>		Alluvial Woodland.	Interval of 10-15 years should allow adequate seed storage.

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Status	Species	Common Name	Community	Management Guide *
				Moderate intensity fires, Mosaic burning should be applied.
Vulnerable	<i>Prostanthera cineolifera</i>	Genus commonly referred to as mint bush	1	Interval of 10-15 years should allow adequate seed storage. Moderate intensity fires should be applied.
Endangered	<i>Prostanthera junonis</i> (sp. Somersby)	Genus commonly referred to as mint bush.	1	Interval of 10-15 years should allow adequate seed storage and rootstock resistance. Moderate intensity fires should be applied.
Vulnerable	<i>Tetradlea glandulosa</i>	Black eyed susan.	1, 2a, 2b, B3, C1, C2, C3.	Interval of 10-15 years should allow adequate seed storage. Moderate intensity fires should be applied.
Vulnerable	<i>Velleia perfoliata</i>		Sandstone heaths. 1, 2a.	Interval of 10-15 years should allow adequate seed storage and maintain surrounding community. Fire intensity should be kept low to moderate.
Vulnerable	<i>Zieria involucreta</i>		1, 2a, 3d.	Interval of 10-15 years should allow adequate seed storage and maintain surrounding community. Fire intensity should be kept low to moderate.

* - Adapted from Maryott-Brown & Wilks (1993), Gill *et al* (1981).

Fauna

The major long-term impact that fire has on fauna is the reduction of population size through changes in vegetation structure and floristics (habitat). Fire diminishes shelter / breeding sites and reduces or eliminates natural foraging resources for some fauna species.

Of additional importance is the post-fire period. This is when most individual animals are under greatest threat for survival, as many animals and invertebrates have developed avoidance behaviour to survive the most intense of wildfires.

The key characteristics of fire regimes which impact on animals are frequency, season and extent / patchiness. These characteristics are listed in Table 23 below.

Table 23
Key Characteristics of Fire Regimes Which Impact upon Fauna

<i>Frequency</i>	The frequency of fires will determine the complexity and therefore the habitat value of the understorey, with frequent fires increasing exposure to predation and climatic influences, and promoting the potential loss of food and shelter resources.
<i>Season</i>	Fires occurring during the breeding season could adversely affect some species by killing offspring or preventing breeding. Reduction of vegetation density may increase the exposure of the young of some species to predation.
<i>Extent Patchiness</i>	Burns which are limited or patchy will provide a range of ages of vegetation which will provide a greater variety of food and shelter sources, enabling utilisation of an area by a greater number of animal species. Areas not burnt also act as important refuges for wildlife to congregate in, providing shelter and food sources for survivors, from which recolonisation of the burnt areas can occur.

Knowledge of the fire-ecology on resident fauna species within the Reserves is currently insufficient in some cases and unpredictable in other cases to confidently formulate comprehensive fire-regime-thresholds for the management of fauna species.

However research has given valuable guidelines to enable management practices for fauna ecology that allow a high degree of confidence in not causing significant impact upon fauna species. The grouping of animals in fire management planning does not allow the protection of all native species.

The basic management regime for all fauna species is to ensure the maintenance of vegetative cover and structure (habitat).

It is desirable that any individual fire (or series of fires at about the same time - e.g. within a year) should not completely burn the entire representation of a particular community type or at most, the entire Reserve area.

Of particular concern is the protection of habitat for rare and threatened fauna. Threatened species are of major concern as their vulnerability to extinction and the need to ensure their chances of long-term survival are maximised.

Table 24 is a list of fire management guidelines for rare and threatened fauna that are known to occur within the Park. These guidelines are intended to augment the management of fire regimes for flora communities in those restricted localities where these species are known to occur.

The guidelines provided for the management of fauna species within this plan will be subject to the TSC Act, 1995 (NSW). This Act provides the framework to protect and encourage the recovery of threatened species, populations and ecological communities.

The development of Recovery Plans is a requirement under the Act to ensure the appropriate management and planning for the conservation of threatened species. As these Recovery Plans are developed there may be a need to adjust the fire management guidelines provided in this plan.

Table 24
Fire Management Guidelines for
Conservation of Threatened Fauna Species

Legal Status	Species	Community	Management*
Vulnerable	Giant Burrowing Frog <i>Heleioporus australiacus</i>	1, 2a, C1	Protect riparian areas from wildfire. Maintain surrounding habitat community thresholds (Tables 19 and 20) applying low intensity prescription burns, avoiding spring to summer. Monitor predation, baiting if required.
Vulnerable	Giant Barred Frog <i>Mixophyes iteratus</i>	4b	Protect rainforest areas from any fire. Maintain surrounding habitat community thresholds (Tables 19 and 20) applying low intensity prescription burns.
Vulnerable	Red-crowned Toadlet <i>Pseudophryne australis</i>	1, 2a, 4b, C1, C2, B5.	Maintain habitat community thresholds (Tables 19 and 20) applying low intensity prescription burns. Impact of timing unknown.

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Legal Status	Species	Community	Management*
			Monitor predation, baiting if required.
Vulnerable	Broad-headed Snake <i>Hoplocephalus bungaroides</i>	1, 2a, 6a, B5,	Adept climber. Maintain habitat community thresholds (Tables 19 and 20) applying low intensity prescription burns, avoiding spring to summer. Prescription burns should aim to achieve a mosaic of age classes within habitat communities across the reserves.
Vulnerable	Heath Monitor <i>Varanus rosenbergi</i>	2a	Maintain habitat community thresholds (Tables 19 and 20) applying low intensity prescription burns, avoiding termite mound habitat between November to February. Prescription burns should aim to achieve a mosaic of age classes within habitat communities across the reserves.
Vulnerable	White-crowned Snake <i>Cacophis harriettae</i>	B5	Maintain habitat community thresholds (Tables 19 and 20) applying low intensity prescription burns, avoiding late summer to early Autumn. Prescription burns should aim to achieve a mosaic of age classes within habitat communities across the reserves. Monitor predation, baiting if required.
	<i>Avifauna General</i>		Maintain habitat community thresholds (Tables 19 and 20) Prescription burn regimes should aim to achieve a mosaic of age classes within habitat communities across the reserves. Prevent all known or potential habitats from being impacted by one fire event. Conduct bush regeneration where appropriate.
Vulnerable	Australasian Bittern <i>Botaurus poiciloptilus</i>	B5	Aquatic species. Not expected to be impacted on by fire.
Vulnerable	Barking Owl <i>Ninox connivens</i>	C2	Avifauna general. Prescribed burns should avoid July to November within known or potential nesting habitat.
Vulnerable	Black Bittern <i>Ixobrychus flavicollis</i>	4b, C2, B5	Aquatic species. Not expected to be impacted on by fire.
Endangered	Flock Bronzewing <i>Phaps histrionica</i>	B5	Avifauna general. Prescribed burns should avoid July to November within known or potential nesting habitat.
Vulnerable	Glossy Black-cockatoo <i>Calyptorhynchus lathami</i>	1, 2a, 3b, 3d, 4b, 5, 6a, 6b, C1, C2, B5, A2, B6, C3	Avifauna general. Prescription burns should be kept low intensity during March to August within known or potential nesting habitat.
Endangered	Gould's Petrel <i>Pterodroma leucoptera</i>	B5	Avifauna general. Non breeding resident between June and December.
Vulnerable	Grass Owl <i>Tyto capensis</i>	2a	Avifauna general. Non breeding resident.
Vulnerable	Little Shearwater <i>Puffinus assimilus</i>	2a	Aquatic species. Not expected to be impacted on by fire.
Vulnerable	Masked Owl <i>Tyto novaehollandiae</i>	1, 2a, 4b, B3, B5, A6	Avifauna general. Prescription burns should be kept low intensity during Autumn to Winter within known or potential nesting habitat.
Vulnerable	Osprey <i>Pandion haliaetus</i>	Hawkesbury River and riparian areas.	Avifauna general. Prescription burns should be kept low intensity during July to September within known or potential nesting habitat.
Vulnerable	Painted Honeyeater <i>Grantiella picta</i>	Open forests and woodland with mistletoe.	Avifauna general. Prescribed burns should avoid October to March within known or potential nesting habitat.
Vulnerable	Powerful Owl <i>Ninox strenua</i>	1, 2a, 4b, C1, B5	Avifauna general. Prescribed burns should avoid June to September within known or potential nesting habitat.
Vulnerable	Red-tailed Black-cockatoo <i>Calyptorhynchus banksii</i>	Communities with <i>Allocasuarina</i> sp. Present.	Avifauna general. Prescription burns should be kept low intensity during July to October within known or potential nesting habitat.
Endangered	Regent Honeyeater <i>Xanthomyza phrygia</i>	1, 2a, 3a, 4b	Avifauna general. Non breeding Winter visitor. Avoid burning habitat communities before <i>Eucalyptus robusta</i> flowering.
Vulnerable	Sooty Owl <i>Tyto tenebricosa</i>	C2, B5	Avifauna general. Prescription burns should be kept low intensity during April to June within known or potential nesting habitat.
Vulnerable	Turquoise Parrot <i>Neophema pulchella</i>	1, 2a, 4b, 6a, 6b	Avifauna general. Prescribed burns should avoid late Winter to Summer within known or potential nesting habitat.

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Legal Status	Species	Community	Management*
	<i>Mammals general</i>		<i>Maintain habitat community thresholds (Tables 19 and 20) Prescription burn regimes should aim to achieve a mosaic of age classes within habitat communities across the reserves. Prevent all known or potential habitats from being impacted by one fire event. Conduct bush regeneration where appropriate.</i>
Vulnerable	Tiger Quoll <i>Dasyurus maculatus</i>	4b, B5	Mammals general. Low intensity prescribed burns within known or potential den habitats recommended.
Endangered	Eastern Quoll <i>Dasyurus viverrinus</i>	Dry sclerophyll, scrub and heathland	Mammals general. Low intensity prescribed burns within known or potential den habitats recommended.
Vulnerable	Brush-tailed Phascogale <i>Phascogale tapoatafa</i>	B5	Mammals general. Low intensity prescribed burns within known or potential habitats recommended between June and January.
Vulnerable	Koala <i>Phascolarctos cinereus</i>	1, 2a, 2b, 3d, 4b, 5	Mammals general. Low to Moderate intensity prescribed burns within known or potential habitats recommended.
Vulnerable	Yellow-bellied Glider <i>Petaurus australis</i>	1, 2a, 4b, 6a, 6b	Mammals general. Low intensity prescribed burns within known or potential habitats recommended.
Vulnerable	Squirrel Glider <i>Petaurus norfolcensis</i>	1, 4b, B3	Mammals general. Low intensity prescribed burns within known or potential habitats recommended.
Vulnerable	Brush-tailed Rock Wallaby <i>Petrogale penicillata</i>	1, 2a, 3a, 4a, 4b, 5	Mammals general.
Vulnerable	Yellow-bellied Sheath-tail-Bat <i>Saccolaimus flaviventris</i>	2a	Mammals general. Forages above canopy. Low intensity prescribed burns within known or potential habitats recommended especially in summer.
Vulnerable	Eastern Little Mastiff-bat <i>Mormopterus norfolkensis</i>	1, C1	Mammals general. Forages above canopy and on ground. Low intensity prescribed burns within known or potential habitats recommended.
Vulnerable	Large Pied Bat <i>Chalinolobus dwyeri</i>	2a, 4b	Mammals general. Forages below the canopy. Low intensity prescribed burns within known or potential habitats recommended.
Vulnerable	Common Bent-wing Bat <i>Miniopterus schreibersii</i>	1, 2a, 4b, B5	Mammals general. Protect known or potential nursery caves from close fire events.
Vulnerable	Large-footed Mouse-eared Bat <i>Myotis adversus</i>	B5	Protect riparian areas within habitat communities from fire events. Apply mammals general to adjacent communities.
Vulnerable	Greater Long-eared Bat <i>Nyctophilus timoriensis</i>	1	Mammals general. Low intensity prescribed burns within known or potential habitats recommended.
Vulnerable	Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>	1, 2a, 4b, C3	Mammals general. Low intensity prescribed burns within known or potential habitats recommended.

* - Adapted from Strahan (1989), Simpson and Day (1996), Pizzey and Knight (1997), Cogger (1996), Robinson (1996), Gill *et al* (1981) and NPWS GIS databases.

4.7 Aboriginal Heritage

Prior to any planned fire event, the NPWS Aboriginal sites register should be consulted.

Damage to significant sites can occur through the use of heavy machinery, fire fighting efforts and inappropriate fire. In known site locations, scarred trees / art sites should be protected by the implementation of low intensity burns.

Damage to sites can be avoided by adhering to procedures outlined in the *Fire Management Manual* and by applying Operational Guidelines.

Consultation with the Aboriginal Lands Council prior to any hazard reduction should be undertaken.

Plant and vehicles should be managed to ensure no damage occurs to Aboriginal sites.

4.8 Historic Heritage

It is considered that operational activities should not adversely affect historical sites within the Reserves. In the event of a wildfire, suppression or prescribed burning operation within sites containing historical heritage, the following management strategies should be followed;

- No access trail, management trail or helicopter pad construction (helipad) will be constructed over any known sites of historical value.
- Any known cultural heritage site that exists within a prescribed burn area will be assessed and protection measures taken to minimise any possible adverse effects from fire on that site.
- During wildfire suppression operations in the Park, any trail or helipad construction activity will be assessed by a Service Officer, and the Incident Management Team will be made aware of any cultural site within close proximity to the construction area.
- Operations staff on ground at any construction area, whether a trail or helipad, will be instructed to avoid damaging the cultural heritage site.

4.9 Smoke Management

The generation of smoke from fire events can cause impacts on the community and the environment. It is intended that all controlled fire events should endeavour to reduce the exposure of smoke to the community.

Hazard reductions should be undertaken during climatically favourable periods that allow for the swift dispersal of smoke from the vicinity of the fire.

Draft NPWS Operational Guidelines for smoke management are attached to this plan as Appendix 3. These guidelines are based on the Environmental Protection Authority (EPA) requirements for smoke management in a fire event. Consideration should also be made to the Bush Fire Coordinating Committee Policy 3/01 *Bushfire Smoke Management*.

4.10 Summary of Operational Guidelines

A recognised incident control system will be used in all incidents within the Reserves, including fire. This ICS is based on the Australian Inter-agency Incident Management System (AIIMS). This ICS has been adopted by many other fire management authorities to ensure that a uniform method of management is attained. Issues such as determining the chain of command,

sphere of responsibility and language usage is consistent prior to the start of any fire.

The high priority given to fire management in the National Parks and Wildlife Service is evident in the detail of policies and plans as well as the substantial allocation of resources for equipment, staff training, and staff commitment to undertake fire management. Fire related duties take precedence over all other management activities during the fire season. Table 25 below lists the operational guidelines to be used within Yengo National Park, Parr State Recreation Area and Dharug National Park.

Table 25
Operational Guidelines for Prescribed Burning and Wildfire
Suppression* within the Reserves

Area / Resource	Operational Guidelines
Threatened Flora Species	<ul style="list-style-type: none"> • Brief all fire fighting personnel involved in control line construction on the exact location and route • Exclude all sites containing threatened flora where the fire free interval has not reached the lower threshold level • Where species occur close to trails, track maintenance should be avoided near these species locations.
Threatened Fauna Species	<ul style="list-style-type: none"> • Consider baiting after a fire event to minimise the effect of predators upon native fauna species
Vegetation Communities where the lower threshold value is below the lower threshold limit	<ul style="list-style-type: none"> • Prevent / minimise burns within this area
Vegetation Communities where the upper threshold value is near or above the upper threshold limit	<ul style="list-style-type: none"> • Undertake burns within these areas, taking into consideration: <ol style="list-style-type: none"> 1. The fire is to be contained within a specified fire management zone 2. Maintain burning to create a mosaic in similar vegetation communities 3. Consult neighbours and stakeholders prior to conducting a fire
Aboriginal Site Locations	<ul style="list-style-type: none"> • Brief all fire fighting personnel on the location and maximum intensity of fire permitted within a specified distance of the site
Historic Sites	<ul style="list-style-type: none"> • Brief all fire fighting personnel on the location and any potential impact on the site • Approvals required for use of earthmoving machinery and some restrictions on heavy vehicles • Sites on State Heritage Register require excavation permits, REFs and NSW Heritage Office Approvals
Earth Moving Machinery	<ul style="list-style-type: none"> • Restrict use on slopes greater than 25% • Generally rehabilitate all re-opened tracks during a fire event immediately after the fire • Incorporate erosion control measures • Restrict use in areas containing Aboriginal / Cultural heritage sites
Fire Fighting Chemicals	<ul style="list-style-type: none"> • Restrict use in and surrounding wetlands, waterways and sensitive areas • Restrict use where alternate methods are available (See Fire Management Manual) • Saltwater bombing is permitted in all areas
Visitor Safety	<ul style="list-style-type: none"> • The Park may be closed to the public in the event of fire fighting activities being carried out within the Park or in extreme fire danger periods

The NPWS Interim Policy on Wildfire Suppression includes additional policies (Table 26) that should be addressed, along with Operational Guidelines, during Fire Suppression Events;

Table 26.
Policies for Wildfire Suppression Within the Reserves

Activity	Policy Guidelines
Priorities	<ul style="list-style-type: none"> • Wildfire suppression will be achieved by the most suitable strategies taking into account the prevailing seasonal conditions and forecast weather, predicted fire behaviour, fire fighter safety, assets and values at risk and the impact of strategies on biodiversity, cultural heritage and the social and economic environment. • The priorities of the Service in wildfire suppression are: <ul style="list-style-type: none"> ◆ the safety of all incident personnel ◆ the effective protection of human life and community assets ◆ the conservation of biodiversity ◆ the conservation of cultural heritage ◆ the cost effectiveness of strategies ◆ the achievement of community support. • Selected suppression strategies will be cost effective, will protect human life and community assets and aim to minimise environmental disturbance.
Safety	<ul style="list-style-type: none"> • The safety of personnel engaged in wildfire suppression must be the primary consideration at all times. • The incident controller has the overall responsibility for the safety of firefighting personnel but all commanders and leaders are responsible for those under their supervision
Access	<ul style="list-style-type: none"> • Where temporary access for firefighting vehicles is required, wherever possible existing tracks will be used and the construction of new trails avoided. • Where access into remote areas is necessary for personnel and equipment, wherever possible aircraft should be used for transport and support in preference to new fire trail construction.
Control Line Construction	<ul style="list-style-type: none"> • Wherever possible existing built and natural fire advantages will be used instead of the construction of new control lines. • Where construction of control lines is required, wherever possible use of heavy earth moving equipment will be avoided. Handtools, air blowers or slashers will be preferentially employed. • Where construction by heavy earth moving equipment is necessary, wherever possible side cutting should be avoided, a NPWS approved operator should be used and construction work should be under the direct supervision of an NPWS officer at all times.
Backburning	<ul style="list-style-type: none"> • Where backburning and burning out are necessary the area burnt will be the minimum necessary to achieve wildfire suppression objectives. • Backburning will be conducted in such a way that the danger of the fire escaping pre-determined boundaries is minimised and the safety of firefighters is not compromised.
Rehabilitation	<ul style="list-style-type: none"> • The need for post fire rehabilitation will be assessed by the incident Controller as part of the incident management process. • Where necessary urgent rehabilitation works should be undertaken during incident de-escalation, particularly the closure and drainage requirements of temporary access trails. • Where necessary a detailed rehabilitation plan will be prepared by the Regional Manager of the area in which the fire suppression operation occurred, and will address issues such as: <ul style="list-style-type: none"> ◆ animal welfare ◆ soil stability ◆ water quality ◆ pest and weed species invasion ◆ impact on native flora and fauna ◆ impact on cultural heritage sites ◆ damage to assets eg. Roads, gates, buildings and signs ◆ damage to neighbour's assets eg. Fencing, pasture, plantations, crops ◆ need for post fire monitoring eg. Retardant - foam used in specific areas ◆ need for aerial or satellite photography of the fire ground.

4.10.1 Guidelines for Cooperative Fire Fighting Arrangements

Cessnock, Gosford, Hawkesbury and Singleton Bush Fire Management Committees operate in accordance with co-ordinated fire fighting policies based on the Policy Statement of the Co-ordinating Committee and the Manual of Procedures for Co-ordinated Fire Fighting. The first response to an observed bushfire within the Reserves may be made by any authority.

The responding authority will take immediate steps to advise the NPWS of the fire and what action is to be taken. All bush fire suppression activities will, as far as practicable, be carried out in consultation with a senior officer from the NPWS.

Under the *Rural Fires Act 1997* the National Parks and Wildlife Service is a Fire Authority with statute responsibility for fuel management and fire suppression on its lands. Under s38(2) of the *Rural Fires Act 1997* (NSW) the Rural Fire District Fire Control Officer has overall responsibility for suppression of fires within the district and for the protection and saving of life and property in case of fire.

However, s38(4) states that when fires occur on 'managed land' the Fire Control Officer must comply with the conditions set out by the responsible authority of that land in any relevant Bush Fire Management Plan or 'other relevant plan' of the authority responsible for the managed land. The Yengo NP, Parr SRA and Dharug NP Draft Fire Management Plan is such a plan.

The Service will continue to work closely with the Rural Fire Service in its fuel management prescribed burning programs and fire suppression operations.

In the event of wildfire in the Park:

- The respective local Rural Fire Service Brigades are often the authority in closest proximity to the Park and are therefore best able to provide a rapid response with personnel and equipment to a report of a bushfire.
- The local Rural Fire Service Brigade or other authority on report of a fire within a National Park must make every effort to contact the NPWS.
- All members of all fire fighting agencies involved in the incident are use the guidelines in Table 25 and Suppression Policies (Table 26) as a framework for cooperative fire management.

5. FIRE MANAGEMENT ASSETS

5.1 Fire Management Access

Fire management trails include roads and trails (walking and vehicular) that can be used for fire management and control operations. The classification system for trails is summarised in Table 27. The existing track and trail network is shown in Map 13.

Within Yengo National Park, Parr State Recreation Area and Dharug National Park, there are 72 major fire trails amounting to 402.7 kilometres. The NSW NPWS and local councils will carry out trail maintenance works.

Each of the trails within Yengo National Park, Parr State Recreation Area and Dharug National Park have been classified using the following classification system as shown in Table 27. Table 28 provides a list of all fire trails inclusive of the classification, length and condition.

Table 27
Trail Classification Within the Reserves

Trail Classification	Description
1	Highway
2	Sealed Major public Road
3	Sealed Minor Public Road
4	Unsealed Public Road
5	4WD Public Road
6	Walking Track (off Park)
7	(Park) Sealed Road
8	(Park) Unsealed Road
9	(Park) 4WD Road
10	(Park) 2WD Management Access
11	(Park) 4WD Management Access
12	(Park) Walking Track
13	Closed Track
14	Horse Trail
15	Other Authorities Access
16	Private Access
Track Category	Description
R1	Average grade <= 7%
R2	8 - 14 % grade
R3	15 % or greater grade



LEGEND

-  Park Boundary
-  Fire Trail
-  Road

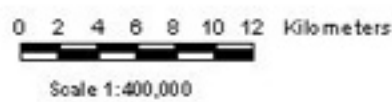


TABLE 28
Trails Within and Adjacent to the Reserves

Track	Section	Length (km)	ASSETS		Park	Tanker	Category	Notes
			Category	Condition				
Bagnells Creek track	No survey		-	Poor	Yengo		16	Track over grown runs in & out of park
Bala Range track	Boree track to helipad	10.00	R2	Fair	Yengo	Y	11	* impassable due to fallen timber
Boree track	Leads off Bala Range Track	-	-	Poor	Yengo	N	13	* impassable due to fallen timber
Boree track	Wallabadah loop to Yengo int	2.70	R1	Good	Yengo	Y	9	Council maintained road
Boree track	Devils Rock to Bala Range Track	2.20	R1	Fair	Yengo	Y	9	This track is open to the public
Boree track	Yengo int to Yengo Creek Rd	7.40	R2	Good	Yengo	Y	9	Council maintained road
Boree track	Int Mt Simpson Track to Devils Rock	5.00	R2	Fair	Yengo	Y	9	Erosion present on sections of this track
Boree track	Int Mt Simpson to Walla/loop int	2.80	R1	Fair	Yengo	Y	9	Council maintained road
Doyles Creek track	Webbs Creek track to end	2.50	R2	Fair	Parr	Y	9	-
Doyles Hollow track	Int left arm to end	3.60	R2	Good	Parr	Y	13	-
Dubbo Gully track	Int to gate	1.10	R2	Fair	Dharug	Y	11	Main access to park
Dubbo Gully track	Waratah Rd to int	4.80	R2	Fair	Dharug	Y	11	Main access to park
Dubbo Gully track	Gate to int O.G.N.R.	4.30	R2	Good	Dharug	Y	11	Main access to park
Eastern Commission	P/boundary to Wisemans Ferry Rd	0.60	R3	Fair	Dharug	Y	15	-
Eastern Commission	P/boundary to p/boundary	16.00	R2	Fair	Dharug	Y	15	-
Eastern Commission	Oyster Shell Rd to p/boundary	1.00	R3	Poor	Dharug	Y	15	-
Finches line	O.G.N.R. to end	4.00	R1	Poor	Dharug	N	4	Approval to maintain required
Finchley track	O/Yengo creek to p/boundary	1.10	R2	Fair	Yengo	Y	4	-
Finchley track	P/boundary to Yengo track int	8.30	R2	Fair	Yengo	Y	4	-
Garland Valley Trail		6.0	R1	Fair	Yengo	Y	11	
Gorricks Creek track	Gorricks Run to h/pad	2.90	R2	Good	Yengo	Y	11	Access to helipad
Gorricks Run	Womerah track to end	16.00	R2	Good	Yengo	Y	11	Tanker access approx 14km only
Grahames Trail		14.0	R2	Fair	Yengo	N	16	
Grono North	Int pierces quarry to end	3.70	R2	Good	Parr	Y	11	May require annual clearing
Grono South	Wheel Barrow Ridge Rd to end	4.40	R1	Good	Parr	Y	11	May require annual clearing or slashing

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Track	Section	Length (km)	ASSETS		Park	Tanker	Category	Notes
			Category	Condition				
Gunderman Creek Track	Wisemans Ferry Rd to end	2.60	R1	Poor	Dharug	N	16	Requires annual slashing
Howes Range Track	**closed ***	-	-	Poor	Parr	N	13	Track closed in 1994
Howes Track	Big Yengo to U/hunter boundary	7.20	R2	Fair	Yengo	Y	9	Earth works required
Left Arm Track	Int Wheel Barrow Ridge Rd to end	11.50	R1	Good	Parr	Y	11	-
Little Boree track	Boree Track to end	-	-	Poor	Yengo	N	13	No survey due to fallen timber
Mellong Track	Putty Road to Howes Range	9.70	R1	Good	Parr	Y	11	Silt traps required
Mill Creek House Road	Gate to end	0.30	R1	Fair	Dharug	Y	16	Roads run to service property
Mill Creek House Road	Wise/ferry rd to gate	0.40	R1	Good	Dharug	Y	16	Road runs to service property
Mill creek entry rd	Wise/ferry to camp area	2.50	R1	Fair	Dharug	Y	16	Road to depot 6m roads to camp areas 4m
Mt Simpson track	Georges Downs Drive to p/boundary	4.80	R2	Good	Yengo	Y	15	-
Mt Simpson track	P/ boundary to Boree track	4.90	R2	Good	Yengo	Y	15	-
North Link Trail		4.5	R3	Fair	Yengo	N	11	
Northern Yengo Perimeter Trail		40.0	R1	Fair	Yengo	Y	16	
Old Bulga Road		15.0	R3	Fair	Yengo	Y	11	
Old great north rd	Ten Mile Hollow to int Western Commission	3.90	R2	Poor	Dharug	Y	10	Requires fill & approval to maintain
Old great north rd	Int Dubbo Gully Track to Ten Mile Hollow	2.00	R2	Good	Dharug	Y	10	No Cat1 on Clares Bridge. Cat7 only.
Old great north rd	Devines Hill to Finches Line	0.50	R2	Poor	Dharug	N	11	Approval to maintain required
Old great north rd	Devines Hill	1.80	R2	Poor	Dharug	N	10	Approval to maintain required, Weight restriction 13 ton
Old great north rd	Devines Hill to Western Commission Track	8.00	R2	Poor	Dharug	N	11	Approval to maintain required
Old great north rd	Dubbo Gully Track to Mogo Road	24.10	R2	Poor	Gosford Council	N	15	Requires major works
Old Settlers Trail		28.0	R2	Good	Yengo	N	5	
Pierces quarry track	Putty rd to quarry	10.00	R2	Good	Parr	Y	11	-
Quart pot creek track	Finchley track to end	-	-	-	Yengo	-	11	No survey track may link with stockyard creek
Roses run east	P/boundary to end	2.00	R1	Poor	Dharug	N	11	Veg on track requires slashing

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Track	Section	Length (km)	ASSETS			Park	Tanker	Category	Notes
			Category	Condition					
Roses run west	Wisemans ferry rd to p/boundary	0.20	R1	Fair	Dharug	N	11	Requires annual slashing	
Roses run west	P/boundary to old house	2.10	R1	Fair	Dharug	N	11	Requires annual slashing	
Rush creek track	Int Pierces Quarry to end	4.90	R1	Good	Parr	Y	11	May require annual clearing	
Sandy creek track	Yengo track to first creek	6.50	R2	Poor	Yengo	N	9	Requires reasonable amount of work	
Shephards Gully Road		2.50	R2	Poor	Yengo	N	11	Requires approval to maintain	
Simpson track	O.G.N.R. to creek	3.60	R2	Fair	Dharug	Y	11	May require some clearing	
South Link Trail		6.5	R2	Fair	Yengo	N	11		
Stockyard creek track	Yengo track to end	3.30	R2	Poor	Yengo	N	15	Track runs to private property	
Sullivans arm track	Mogo Creek Rd to Wrights Creek	8.80	R2	Fair	Yengo	Y	11	May require brush up in 1995	
Sullivans arm track	Wright's Creek track to O.G.N.R.	4.30	R2	Poor	Yengo	Y	11	Requires more roll over drains and fill	
Terraborra nth	Womerah track to end	6.50	R2	Good	Parr	Y	11	May require annual clearing	
Terraborra sth	Putty rd to end	8.30	R1	Good	Parr	Y	11	-	
U/Yengo Creek Road	Boree t int to Finchley t int	2.40	R2	Fair	Yengo	Y	15	-	
Wallabadah loop track	Boree track to p/boundary	3.30	R1	Good	Yengo	Y	11	Council Maintained	
Wallabadah loop track	P/boundary to p/boundary	6.50	R2	Poor	Yengo	Y	16	Access to private property/ Private maint'	
Wallabadah loop track	P/boundary to Yengo track	2.50	R1	Good	Yengo	Y	11	Main access to private property	
Wat Budda Dhamma	O.G.N.R. to O.G.N.R.	4.20	R2	Fair	Dharug	Y	-	Fire break property protection	
Waterhole track	Sullivans arm track to end	-	-	Poor	Yengo	N	13	Impassable due to fallen timber	
Webbs creek 215 track	Webbs creek track to end	1.10	R2	Good	Parr	Y	9	-	
Webbs creek track	Wheel barrow ridge to end	7.70	R2	Good	Parr	Y	9	-	
Western commission	Nit O.G.N.R. to Wise/Ferry Rd	12.00	R2	Good	Dharug	Y	10	Requires grading only	
Wheel barrow ridge	Int Bicent to Greens Rd	9.00	R1	Good	Parr	Y	4	-	
Wheel barrow ridge	Nit Greens Rd to start seal	11.00	R1	V.good	Parr	Y	4	-	
Wheel barrow ridge rd	Seal to putty rd	2.70	R1	V. Good	Parr	Y	4	-	
Womerah creek track	Gorricks run to end	2.00	R2	Good	Yengo	Y	11	-	
Womerah track	Power line to p/bound butlers crossing	5.80	R2	Good	Yengo	Y	9	May require some clearing	
Womerah track	Heartbreak camp to power line	12.70	R2	Good	Yengo	Y	11	-	
Womerah track	Elim Youth Camp to Gorricks Run	7.20	R1	Good	Yengo	Y	11	-	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Track	Section	Length (km)	ASSETS		Park	Tanker	Category	Notes
			Category	Condition				
Womerah track	Gorricks run to heartbreak camp	20.90	R2	Good	Yengo	Y	11	-
Womerah track	Putty rd to youth camp	1.20	R1	Good	Yengo	Y	11	-
Woodburys Diatram Track	P/boundary to p/boundary				Dharug		16	No survey access to private quarry
Wrights Creek power line	Wrights creek track to end	5.60	R2	Fair	Yengo	N	11	Requires clearing and draining
Wrights creek track	Int power line track to Wrights Creek Rd	2.10	R2	Poor	Yengo	Y	4	Requires rollover drains on all slopes
Wrights creek track	Sullivans Arm Track to Wrights Creek power line	14.50	R2	Poor	Yengo	Y	16	Requires rollover drains on all slopes
Yengo creek rd	George Downs Dr to Boree int	2.50	R2	Good	Yengo	Y	15	Main access road to Yengo N.P
Yengo track	Boree t int Finchley	11.20	R1	Fair	Yengo	Y	4	-
Yengo Trail		7.1	R1	Fair	Yengo	Y	4	

5.2 Fire Management Utilities

Fire management utilities include infrastructure that assists in the detection and control of wildfire, and assists in fire management operations. This includes three fire towers, dams and maintained watering points as well as helipad sites.

Fire equipment is a NPWS shared resource across the state. It should be noted that additional NPWS equipment could be sourced from nearby areas and across the state.

Table 29 lists the fire management utilities and facilities that can be utilised in the event of a fire within Yengo National Park, Parr State Recreation Area and Dharug National Park.

Table 29

**Utilities and Equipment held by the Central Coast Hunter Range Region
of the National Parks and Wildlife Service**

Utility	Location
Aviation Aviation Unit Mast trailer 11 000 Litre buoywall Arms software Helipads Emergency Helipads	Girrakool Workshop, Somersby Girrakool Workshop, Somersby Girrakool Workshop, Somersby NPWS District Office Bucketty Works Depot Bulga Works Depot Colo Heights Works Depot Erina Works Depot Mill Creek Works Depot Identify emergency helipads
Fire Detection Lookouts	Bucketty Tower
Boating 6 m aluminium punt 3.4 m aluminium runabout	Girrakool Workshop, Somersby Girrakool Workshop, Somersby
Communications VHF Radio System Mobile radios 9 GRN radios 45 Midland handhelds & chargers	Repeaters: Canoelands, Poppong, Mangrove Mountain Base Radios: District Office, Girrakool, Bucketty, Munmorah, Mill Creek, Bulga All NPWS vehicles Various command vehicles NPWS District Office, personal issue to staff
Plant and Equipment <i>Bulldozer</i> Boggie tipper 1.5 tonne tipper with hiab crane <i>Skid steer loader with backhoe attachment</i> <i>4WD tractors / slashers</i>	NPWS depot (subject to availability)
Weather Systems Innovative Research Remote Weather Stations <i>Manual Weather Stations</i> <i>Internet Weather Stations</i> <i>Metfax</i>	Kariong, Kulnura, Charmhaven, Gwandalan Girrakool, Mil Creek, Munmorah District Office District Office
Watering Points For helicopters For vehicles	Major waterbodies Mangrove Dam St Albans Common Wright's Creek Hawkesbury River Macdonald River Mogo Creek St Albans Common Wright's Creek Hawkesbury River Macdonald River Mogo Creek Wollombi Brook

Utility	Location
Fire Equipment 2 Cat 1 Tankers 3000 Litre bulk water cart (4WD) 12 Slip-on units 9 Command vehicles Incendiary shot gun, and injection / ancillary equipment Catering unit Mibec (mobile camp for 30)	NPWS depot (various)

5.2.1 Aviation

Aircraft are increasingly being used in the management of fires within New South Wales. Fixed wing aircraft are used in the detection and mapping of fires as well as the transportation of fire fighting personnel and equipment to strategic locations. Helicopters on the other hand, are used in the transportation of fire fighting personnel onto the fireground as well as being used in the ignition and control of fires by way of aerial platform operations (NPWS, 2001).

Helicopters are useful vehicles for water bombing of fires and the aerial ignition of fires in prescribed burning operations. Waterbombing and aerial ignition of fires is used by the NSW National Parks and Wildlife Service to aid in the control of fires. Waterbombing aids in the 'knocking down' of fire in areas that are either too remote or unsafe to enter and apply direct fire fighting methods (NPWS, 2001).

Aerial ignition is the technique of igniting backburns and prescribed burns with the use of incendiaries dropped from an aircraft (NPWS, 2001). This method is used by the NPWS to control large scale fires when weather conditions and fire control lines are suitable. Aerial ignition will often occur in conjunction with ground ignition from control lines. Aerial ignition by helicopters, allows for a larger area to be burnt much faster and at a lower intensity (NPWS, 2001).

One other important aspect in fire management is emergency helipads that can be utilised as pick up and drop off points for fire fighting personnel. Emergency helipad locations should be mapped for quick reference by emergency fire fighting personnel.

The Bush Fire Coordinating Committee Policy 4/01 *Aviation Support to Firefighting* is relevant.

5.3 Fire Management Facilities

Control Room

The NPWS offices at Gosford and Bulga have a dedicated Control Room as part of the Incident Control System for Yengo and Dharug National Parks and Parr State Recreation Area. All RFS centres and the Operations Centre at Kariong can be utilised as control rooms if required.

Radio Network

Key vehicles from all of the respective fire fighting authorities have compatible radio / phone systems with other authorities. Portable radios are also available to all NPWS staff. Table 30 highlights the main radio systems and channels utilised by various fire fighting authorities.

Table 30.
**Main Radio Systems and Channels Utilised by Various
Fire Fighting Authorities**

Authority	PMR (main)	PMR (other)	GRN	VHF
Gosford LGA RFS	107	97, 100, 104, 113	181	
Wyong LGA RFS	22	58	193	
Cessnock LGA RFS	Broken Back	Warralong Sugarloaf	194	
Hawkesbury LGA RFS	Kurrajong	Grassy Hill Wisemans Ferry	183	
Muswellbrook LGA RFS			197	
Singleton LGA RFS	Poppong	Putty	199	
NPWS Mangrove Mountain				27
NPWS Poppong				4
NPWS				21
NPWS Poppong				22

The NPWS uses a VHF radio system that is compatible with State Forests but not with GRN/PMR systems. The NPWS command vehicles have GRN and VHF systems.

Detection

Detection and reporting of fires in and near Yengo and Dharug National Parks and Parr State Recreation Area is carried out by Park neighbours, local fire brigades, the Rural Fire Service and Service staff. Four fire towers currently exist for use within the Reserves, situated at Bucketty Junction, Scandens Ridge, Mandalong and Mt Warralong. Many other vantage points are available around the reserves.

Aircraft will be used as necessary during periods of high to extreme fire danger, or when a number of fires are burning. Regular fire patrolling will be undertaken during periods of high to extreme fire danger. The level of surveillance will take into account the co-operative arrangements made with the Rural Fire Service and the Fire Control Officer.

6. WORKS SCHEDULE

6.1 Biodiversity Works Schedule

Within the life of this plan, the following research and monitoring activities are practically achievable and should be considered as a high priority;

- The responses of fauna to fire - research is especially needed within the realm of invertebrates and lower vertebrates, especially in relation to their habitat requirements.

Future research and monitoring into the following areas should be considered for Yengo and Dharug National Parks and Parr State Recreation Area, in the following areas;

- The responses of individual flora species and vegetation communities to fire.
- Analyse trends in fire ignition points and wildfire paths in order to aid the creation of strategies that will help prevent and mitigate wildfires
- The long term responses of both individuals and populations of fauna species to specific fire regimes over a period of time.
- The requirements for refuge, post-fire dispersal and re-colonisation of animal species which may have been depleted by a fire in the short term, with an outcome of creating fire thresholds of fire size and shape they may require for conservation purposes.
- Develop a computer-based system for the continual updating of all fires that occur within the Park and the effects these fires have upon biodiversity thresholds and prescribed burning requirements.
- Investigate the need to burn those areas that are currently not within the biodiversity thresholds of that area.
- Create a fuel accumulation curve for the vegetation communities within the Park in order to aid fuel reduction activities.
- Review and evaluate the current recommended vegetation fire regime guidelines.

6.1.1 Fire Mapping and Database Management

Fire history data for the Park will be stored and maintained on 1:25,000 map sheets, in the Regions' Geographical Information System (Arcview) and EXCEL databases at the Central Coast Hunter Range Region office of the NSW National Parks and Wildlife Service.

6.1.2 Monitoring Fuel

Fuel sampling will be required to occur pre and post fuel reduction activities and recorded into a database for future reference. Fuel sampling will be

carried out according to the current method used by the Service. Objectives of the fuel monitoring program will be to:

- Measure and record the effectiveness of prescribed burns
- Allow for prioritisation of prescribed burns to take place
- Determine the accumulation rate and distribution of fuels within different fuel groups

Fuel sampling techniques are to be reviewed as new research is undertaken within this area of fire management.

6.1.3 Monitoring Fire Regimes and Changes to Biodiversity

Mapping of all fires, both planned and unplanned, will be required to ensure that information is available for effective analysis. The involvement of research agencies other than the NPWS may be required due to resource deficiencies. The co-operation of universities should be encouraged for their capability to contribute to the research and analysis of fire regimes and or changes to biodiversity.

6.2 Operations Works Schedule

The operational works schedule specifies the proposed activities in prescribed burning for strategic management, asset protection and heritage management. The ability of the Service and assisting organisations to implement each planned burn will be influenced by seasonal conditions, resources and wildfire events. Details for each zone are contained in Appendix 2.

6.2.1 Prescribed Burning

Formal prescribed burning will be required within Yengo and Dharug National Parks and Parr State Recreation Area. Table 31 outlines the annual works that are to be undertaken within the Park. The program will be submitted for approval to the Cessnock, Gosford, Hawkesbury and Singleton Bush Fire Management Committees.

6.2.2 Fire Radiation Zones

Fire radiation zones will be maintained as part of each Asset Protection Zone. Fuel reduction will need to be carried out by the private landholder and should be in accordance with recommendations outlined by the Rural Fire Service and the NSW Fire Brigades. Methods such as mowing and slashing, burning or raking may be used.

6.3 Infrastructure Works Schedule

The works schedule specifies the proposed activities primarily involved with access and management. The ability of the Service and assisting organisations to implement each activity will be predominantly influenced by seasonal conditions, wildfire events, research, resources and finance.

6.3.1 Fire Management Access

Trail maintenance within Yengo and Dharug National Parks and Parr State Recreation Area will be undertaken by the NSW National Parks and Wildlife Service's Plant Crew or by contractors allocated by the National Parks and Wildlife Service.

**Table 31
Trail Maintenance Work within the Reserves**

Trail	Section	Maintenance Standard	Maintenance Work Required	Year	Authority
Simpson East	Eastern Boundary of SFMZ 20	Light Tanker* ¹	Slash/ Grade	2003	NPWS
Bagnells Creek track	No survey	Light Tanker* ¹	Review condition / grade if required	2001	NPWS
Bala Range track	Boree track to helipad	Heavy Tanker* ²	Remove Fallen Tree/ Review condition / grade if required	2002	NPWS
Boree track	Leads off Bala Range Track	Heavy Tanker* ²	Remove Fallen Tree/ Review condition / grade if required	2001	NPWS
Boree track	Wallabadah loop to Yengo int	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Boree track	Devils Rock to Bala Range Track	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Boree track	Yengo int to Yengo Creek Rd	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Boree track	Int Mt Simpson Track to Devils Rock	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Boree track	Int Mt Simpson to Walla/loop int	Heavy Tanker* ²	Review condition / grade if required	2002	CCC/ NPWS
Doyles Creek track	Webbs Creek track to end	Heavy Tanker* ²¹	Review condition / grade if required	2002	NPWS/ ELCOM
Doyles Hollow track	Int left arm to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Dubbo Gully track	Int to gate	Heavy Tanker* ²	Review condition / grade if required	2002	GCC
Dubbo Gully track	Waratah Rd to int	Heavy Tanker* ²	Review condition / grade if required	2002	GCC
Dubbo Gully track	Gate to int O.G.N.R.	Heavy Tanker* ²	Review condition / grade if required	2003	GCC
Eastern Commission	P/boundary to p/boundary	Heavy Tanker* ²	Review condition / grade if required	2002	Transgrid
Finches line	O.G.N.R. to end	Light Tanker* ¹	Historic site / careful slashing only. Approvals required	2001	NPWS
Finchley track	O/Yengo creek to p/boundary	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Finchley track	P/boundary to Yengo track int	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Garland Valley Trail	-	Heavy Tanker* ²	Review condition / grade if required	2002	NPWS
Gorricks Creek track	Gorricks Run to h/pad	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Gorricks Run	Womerah track to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Grahames	-	Heavy	Review condition / grade if	2003	CCC

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Trail	Section	Maintenance Standard	Maintenance Work Required	Year	Authority
Trail		Tanker* ²	required		
Grono North	Int pierces quarry to end	Heavy Tanker* ²	Review condition / Slash/ grade if required	2003	NPWS
Grono South	Wheel Barrow Ridge Rd to end	Heavy Tanker* ²	Review condition / Slash/ grade if required	2003	NPWS
Gunderman Creek Track	Wisemans Ferry Rd to end	Light Tanker* ¹	Review condition / Slash/ grade if required	2001	NPWS
Howes Range Track	Big Yengo to U/hunter boundary	Heavy Tanker* ²	Review condition / grade if required	2001	NPWS
Howes Track	Int Wheel Barrow Ridge Rd to end	Heavy Tanker* ²	Review condition / grade if required	2002	NPWS
Howes Track	Western Park Boundary to Big Yengo	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Left Arm Track	Boree Track to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Little Boree track	Putty Road to Howes Range	Heavy Tanker* ²	Review condition / grade if required	2001	CCC
Mellong Track	Gate to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Mill Creek House Road	Wise/ferry rd to gate	Heavy Tanker* ²	Review condition / grade if required	2002	GCC
Mill Creek House Road	Wise/ferry to camp area	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Mill creek entry rd	Georges Downs Drive to p/boundary	Heavy Tanker* ²	Review condition / grade if required	2002	NPWS
Mt Simpson track	P/ boundary to Boree track	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Mt Simpson track	Simpson Track from Ten Mile Hollow to park Boundary	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
North Link Trail	-	Light Tanker* ¹	Review condition / grade if required	2002	NPWS
Northern Yengo Perimeter Trail	-	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Old Bulga Road	-	Light Tanker* ¹	Review condition / grade if required	2002	NPWS
Old great north rd	Int Dubbo Gully Track to Ten Mile Hollow	Heavy Tanker* ² (Not on Clares Bridge)	Review condition / grade if required	2001	GCC
Old great north rd	Top of Devines Hill to Finch's Line	Heavy Tanker* ² (Devines Hill 13 Ton Limit)	Do not grade, will damage surface protection works	2003	NPWS
Old great north rd	Devines Hill	Heavy Tanker* ²	Do not grade, will damage surface protection works	2001	NPWS
Old great north rd	Dubbo Gully Track to Mogo Road	Light Tanker* ¹	Do not grade, may damage historic features	2001	GCC
Old great north rd	Putty rd to quarry	Heavy Tanker* ²	Review condition / grade if required	2001	NPWS
Old Great North Rd	Ten Mile Hollow to int Western Commission Track	Heavy Tanker	Seek advice prior to any grading	2003	NPWS
Old Great	Top Devines	Light Tanker	No Grading		NPWS

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Trail	Section	Maintenance Standard	Maintenance Work Required	Year	Authority
North Rd	Hill to int of Western Commission Track				
Old Settlers Trail	-	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Pierces quarry track	Finchley track to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Quart pot creek track	P/boundary to end	Light Tanker* ¹	Review condition / grade if required	2001	GCC
Roses run east	Wisemans ferry rd to p/boundary	Light Tanker* ¹	Review condition / Slash/ grade if required	2001	NPWS
Roses run west	P/boundary to old house	Light Tanker* ¹	Review condition / Slash/ grade if required	2002	Private
Roses run west	Int Pierces Quarry to end	Light Tanker* ¹	Review condition / Slash/ grade if required	2002	NPWS
Rush creek track	Yengo track to first creek	Heavy Tanker* ²	Review condition / Slash/ grade if required	2003	NPWS
Sandy creek track	O.G.N.R. to creek	Light Tanker* ¹	Review condition / grade if required	2001	NPWS
Shepherds Gully Track		Light Tanker	No grading		NPWS
Simpson track	Yengo track to end	Light Tanker* ¹	Review condition / Slash/ grade if required	2002	NPWS
South Link Trail	-	Heavy Tanker* ²	Review condition / Slash/ grade if required	2002	NPWS
Stockyard creek track	Mogo Creek Rd to Wrights Creek	Light Tanker* ¹	Review condition / grade if required	2001	NPWS
Sullivans arm track	Wright's Creek track to O.G.N.R.	Heavy Tanker* ²	Review condition / grade if required	2002	NPWS
Sullivans arm track		Heavy Tanker* ²	Review condition / grade if required	2001	NPWS
Terraborra nth	Womerah track to end	Heavy Tanker* ²	Review condition / Slash/ grade if required	2003	NPWS
Terraborra sth	Putty rd to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
U/Yengo Creek Road	Boree t int to Finchley t int	Heavy Tanker* ²	Review condition / grade if required	2002	CCC
Wallabada h loop track	Boree track to p/boundary	Light Tanker* ¹	Review condition / grade if required	2003	NPWS
Wallabada h loop track	P/boundary to p/boundary	Light Tanker* ¹	Review condition / grade if required	2001	NPWS
Wallabada h loop track	P/boundary to Yengo track	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Wat Budda Dhamma	O.G.N.R. to O.G.N.R.	Light Tanker* ¹	Review condition / grade if required	2002	NPWS
Waterhole track	Sullivans arm track to end	Heavy Tanker* ²	Review condition / grade if required	2001	NPWS
Webbs creek 215 track	Webbs creek track to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Webbs creek track	Wheel barrow ridge to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Western commission	Nit O.G.N.R. to Wise/Ferry Rd	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS/ ELCOM

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Trail	Section	Maintenance Standard	Maintenance Work Required	Year	Authority
Wheel barrow ridge	Int Bicent to Greens Rd	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Wheel barrow ridge	Nit Greens Rd to start seal	Heavy Tanker* ²	Review condition / grade if required	2005	HCC
Wheel barrow ridge rd	Seal to putty rd	Heavy Tanker* ²	Review condition / grade if required	2005	HCC
Womerah creek track	Gorricks run to end	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Womerah track	Power line to p/bound butlers crossing	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Womerah track	Heartbreak camp to power line	Heavy Tanker* ²	Review condition / Slash/ grade if required	2003	NPWS
Womerah track	Elim Youth Camp to Gorricks Run	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Womerah track	Gorricks run to heartbreak camp	Heavy Tanker* ²	Review condition / grade if required	2003	NPWS
Womerah track	Putty rd to youth camp	Heavy Tanker* ²	Review condition / grade if required	2003	HCC
Woodbury s Diatram Track	P/boundary to p/boundary	Heavy Tanker* ²	Review condition / grade if required	2001	NPWS
Wrights Creek power line	Wrights creek track to end	Heavy Tanker* ²	Review condition / grade if required	2002	NPWS
Wrights creek track	Int power line track to Wrights Creek Rd	Heavy Tanker* ²	Review condition / grade if required	2001	NPWS/ Private
Wrights creek track	Sullivans Arm Track to Wrights Creek power line	Heavy Tanker* ²	Review condition / grade if required	2001	NPWS
Yengo creek rd	George Downs Dr to Boree int	Heavy Tanker* ²	Review condition / grade if required	2003	CCC
Yengo track	Boree t int Finchley	Heavy Tanker* ²	Review condition / grade if required	2002	NPWS

*¹ Light tanker – suitable for slip –on 4WDs, category 7 and 9 tankers.

*² Heavy tanker – suitable for category 1 and 2 tankers.

6.3.2 Fire Management Utilities

Prior to the fire season each year, NPWS staff will need to ensure that access to and extraction from suitable watering points is possible to a standard that is suitable for fast extraction by vehicles or helicopters.

Radio coverage can be relatively poor at times within the Reserves due to the topography of the area. Maintenance of radio systems should be carried out prior to the fire season each year, and communications equipment should be kept in good working order throughout the fire season.

6.3.3 Fire Management Facilities

Prior to each fire season, the incident management facility will be reviewed. The logistics and planning response box contents will be checked. Staff will

be required to participate in training exercises, to ensure that all staff and personnel are familiar with the current incident procedures and facilities.

6.4 Summary Table of Works to be Undertaken Annually

Table 32 sets out a five year schedule for operational works to be undertaken during the hazard reduction burning season. The current planning schedule is from 2000 to 2004. The program will then be reviewed for the 2005 season.

Conditions will change over the planning period, particularly the fire history and weather conditions. Zones in the schedule may not require treatment if burnt by wildfire or if adjoining areas have been burnt. NPWS staff, RFS or neighbours may identify that additional burns are required in addition to this schedule. Adverse weather will often delay a prescribed burn program. A more detailed annual prescribed burn program will be prepared for each Bush Fire District which will consider these issues.

**Table 32
Annual Works Schedule**

Name	Zone	Proposed Prescribed Burning Works					Outside life of plan **
		2000	2001	2002	2003	2004	
Putty	SFMZ 1						✓
Stockyard Creek	SFMZ 2						✓
Finchley	SFMZ 3						✓
Blaxland	SFMZ 4						✓
Bagnells Creek	SFMZ 5						✓
Moore	SFMZ 6						✓
Yango West	SFMZ 7						✓
Yango	SFMZ 8						✓
Yango South	SFMZ 9						✓
Blaxlands Arm	SFMZ 10						✓
Noulanans Arm	SFMZ 11						✓
Wallabadah	SFMZ 12						✓
Joes Flat	SFMZ 13						✓
Big Wallabadah	SFMZ 14						✓
Lemon Tree Arm	SFMZ 15						✓
Little Boree	SFMZ 16						✓
Garden Arm	SFMZ 17						✓
Boree	SFMZ 18						✓
Bala	SFMZ 19						✓
Simpson	SFMZ 20						✓
Mogo	SFMZ 21						✓
Bailey	SFMZ 22						✓
Yondi	SFMZ 23						✓
Perrys Crossing	SFMZ 24						✓
Broad Arm	SFMZ 25						✓
Fernances	SFMZ 26						✓
Little Melon	SFMZ 27						✓
Bailey	SFMZ 28						✓
Upper Macdonald East	SFMZ 29						✓
Upper	SFMZ 30					✓	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Name	Zone	Proposed Prescribed Burning Works					
		2000	2001	2002	2003	2004	Outside life of plan **
Macdonald west							
Womerah North	SFMZ 31				✓		
Womerah South	SFMZ 32			✓			
Keif	SFMZ 33				✓		
Womerah	SFMZ 34						✓
St Albans Common	SFMZ 35						✓
St Albans	SFMZ 36						✓
Wrights Creek	SFMZ 37						✓
Wrights Creek Ford	SFMZ 38						✓
Googoorewon	SFMZ 39						✓
Webbs Creek	SFMZ 40						✓
Coblers Peg	SFMZ 41			✓			
Bakers Gulley	SFMZ 42						✓
Books Point	SFMZ 43				✓		
Books Ferry	SFMZ 44						✓
Lower Macdonald west	SFMZ 45						✓
Lower Macdonald north	SFMZ 46	✓					
Lower Macdonald east	SFMZ 47		✓				
Mile Ridge	SFMZ 48						✓
Colo Heights	SFMZ 49						✓
Wheelbarrow Ridge west	SFMZ 50						✓
Wheelbarrow Ridge east	SFMZ 51						✓
Colo	SFMZ 52						✓
Greens Swamp	SFMZ 53						✓
Mount Andrew	SFMZ 54						✓
Wiggins Farm	SFMZ 55						✓
Leets Vale	SFMZ 56						✓
Webbs Creek South	SFMZ 57						✓
Leets Vale east	SFMZ 58						✓
Roses Creek	SFMZ 59						✓
Mill Creek	SFMZ 60						✓
Starkey	SFMZ 61						✓
Gunderman	SFMZ 62						✓
Hawkesbury	SFMZ 63						✓
Cohens	SFMZ 64						✓
Breakfast Creek	SFMZ 65						✓
Spencer	SFMZ 66						✓
Scotchmans south	SFMZ 67						✓
Scotchmans north	SFMZ 68						✓
Dinner Creek	SFMZ 69						✓
Screech Owl	SFMZ 70						✓
Windra Park	SFMZ 71						✓
Mangrove Creek	SFMZ 72						✓
Great North Road	SFMZ 73						✓
Old Bulga Road	HMZ 1						✓
Mount Isobel	HMZ 2						✓
Cody Creek	HMZ 3						✓
Howes Valley	HMZ 4						✓
Werong Creek	HMZ 5						✓
Calore Range	HMZ 6						✓
Burrowell	HMZ 7						✓

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Name	Zone	Proposed Prescribed Burning Works					
		2000	2001	2002	2003	2004	Outside life of plan **
Mount Yengo	HMZ 8						✓
Burragurra	HMZ 9						✓
Wollombi	HMZ 10						✓
Little Wallabadah	HMZ 11						✓
Mount Finch	HMZ 12						✓
Wirroo Creek	HMZ 13						✓
Howes Swamp	HMZ 14						✓
Bala Range	HMZ 15						✓
Mogo Creek	HMZ 16						✓
Womerah Creek	HMZ 17						✓
Wrights Creek	HMZ 18						✓
Gooraba Creek	HMZ 19						✓
Doyles Hollow	HMZ 20						✓
Upper Mangrove	HMZ 21						✓
Wisemans Ferry	HMZ 22						✓
Gunderman	HMZ 23						✓
Spencer	HMZ 24						✓

** Outside the life of plan refers to dates that burning should be targeted for and thus they are outside the scope of the current plan.

Note: In some cases (within each zone) there may be more than one burn implemented within the one year.

7. PLAN ADMINISTRATION

7.1 Management of Works

The works programmed for the next five years will be identified in the NPWS Region Operation Plan. This lists all management works to be conducted in all conservation Reserves in the National Parks and Wildlife Service, Central Coast Hunter Range Region.

Works performance will be monitored by the Central Coast Hunter Range Regional Manager and the Fire Management Officer of the NPWS. An annual report on the works will be completed, which will be submitted to:

- Cessnock Bush Fire Management Committee
- Gosford Bush Fire Management Committee
- Hawkesbury Bush Fire Management Committee
- Singleton Bush Fire Management Committee

7.2 Environmental Assessment of Scheduled Works

An Environmental Impact Assessment (EIA) has been prepared for activities described within fire management works schedules (section 6.2 - 6.4). The EIA has been prepared according to the general guidelines *'Is an EIS required' (as amended by the NPWS)*. The relevant sections of the EIA will be forwarded to the Conservation, Programs and Planning Division, Central Directorate for determination.

7.3 Plan Review

This plan will be placed on public display for a period of three months for community comment. There may be need to review fire management strategies as further information and research into the management of flora and fauna develops. To ensure that regular reviews are undertaken, this fire plan has an operation life span of 5 years. At the completion of this time period, the plan will be reviewed via a similar process as outlined above.

7.4 Implementation and Evaluation

There are a number of ways to evaluate the effectiveness of this plan. The monitoring of the issues outlined below will determine the level of success from the implementation of this plan. It will also prove how effectively the actions recommended by this plan have reduced the impact of adverse fire events and management. The issues which will govern this plan's success are:

- The implementation of *'Community Fire Guard'* in the residential settlements of St Albans, Colo Heights, Spencer and private inholdings.

- The undertaking of '*community awareness programs*' in areas of recreational usage such as the Old Great North Road.
- The instigation of a visitor usage monitoring program to establish current usage rates in the Park.
- Increased surveillance in days of very high to extreme fire danger either through patrols, neighbourhood assistance or other direct methods.
- The need to promulgate *suppression policies* that can be implemented by the local fire fighting organisation in the absence of the Service staff.
- The maintenance of reduced hazardous fuel levels in strategic locations associated with the residential settlements of St Albans, Colo Heights, Spencer and private inholdings also along the Putty Road.

7.5 Life and Property Protection

The achievement of these objectives will be evaluated by:

- successful registration of the Plan with the Cessnock Bush Fire Management Committee, Gosford Bush Fire Management Committee, Hawkesbury Bush Fire Management Committee and the Singleton Bush Fire Management Committee
- in co-operation with the Cessnock Bush Fire Management Committee, Gosford Bush Fire Management Committee, Hawkesbury Bush Fire Management Committee and the Singleton Bush Fire Management Committee the provision of public education on fire prevention, preparedness and response for residents of the study area
- collection and maintenance of accurate fire history records and an evaluation of trends
- upgrading and maintenance of the tracks within the Reserves to the identified standard.

7.6 Maintenance of Biodiversity

The achievement of these objectives will be evaluated by:

- accurate recording of all planned and wildfires
- comparing fire history with the fire regimes identified within each zone to determine the adherence to the prescription
- the incidence of fire in the fire sensitive vegetation and or locations
- the recovery of other recently burned vegetation communities
- the success of neighbourhood relations and in particular the incidence of arson activities of accidental fire ignitions that impact upon the Park
- the installation of fire advantages where identified in this plan

7.7 Further Research

In the process of developing this plan it has become apparent that there are major deficiencies of knowledge that must be addressed if fire is to be managed to conserve the biodiversity within the Park.

The fire management research priorities for the Park include the following;

- knowledge of animal / fire responses to varying fire regimes, particularly the lower vertebrates and invertebrates, especially in relation to habitat characteristics and threatened species.

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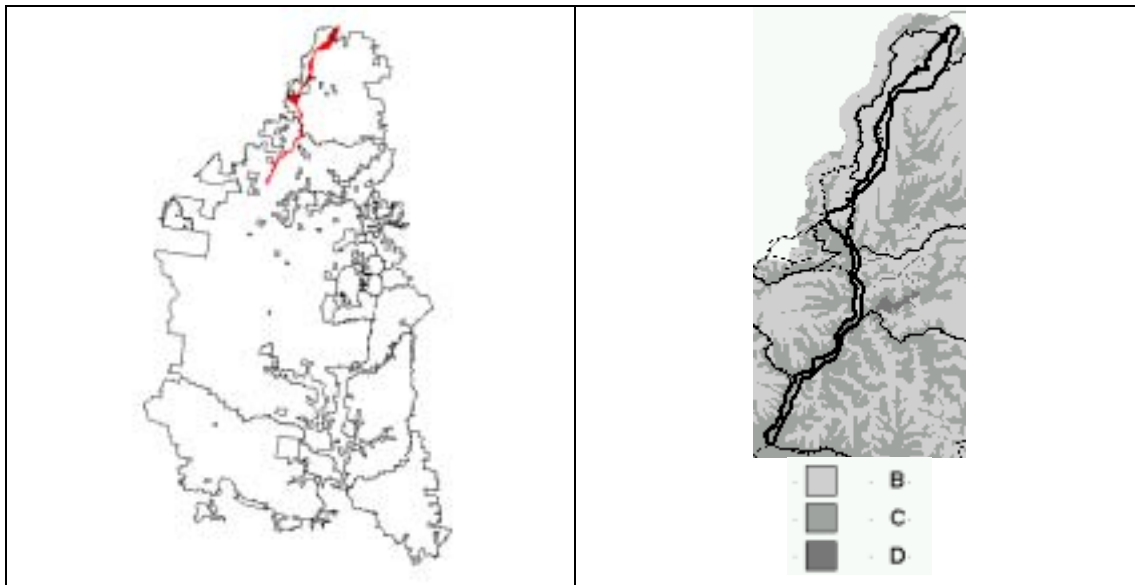
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APPENDIX 1 FIRE ZONE SPECIFICATIONS

Zone	Sub-Zone (if applicable)	Suppression Objective	Prevention & Mitigation Objectives	Strategies (Methods)	Width	Comments
Asset Protection	<i>at present no sub-zones</i>	<ul style="list-style-type: none"> to protect residential areas, crops, plantations, utilities, camping areas, day use areas, urban interface, cultural heritage assets, etc. 	<ul style="list-style-type: none"> to instigate, where appropriate, community education and community fireguard programmes 	<ul style="list-style-type: none"> fuel managed by slashing, selective shrub clearing, construction of radiation barriers, trail construction or burning 	as per DBFS (1991)	<ul style="list-style-type: none"> should operate in conjunction with Community Fireguard
Strategic Fire Management	Strategic Wildfire Control	<ul style="list-style-type: none"> to assist in the strategic control and containment of wildfires to reduce wildfire intensity and spotting intensity 	<ul style="list-style-type: none"> promotion of the Services fire management and fuel management activities 	<ul style="list-style-type: none"> burning suppress or contain fires inconsistent with the fire prescription fuel managed by slashing, selective shrub clearing, construction of radiation barriers, trail construction 	100-3000 metres	
Heritage Area Fire Management (Land Management)	Special Area Management	<ul style="list-style-type: none"> to prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime 	<ul style="list-style-type: none"> promotion of awareness of the special values requiring protection in these areas 	<ul style="list-style-type: none"> burning suppress or contain fires inconsistent with the fire prescription 	appropriate for the protection of the heritage item	<ul style="list-style-type: none"> management of the heritage item may be subject to a plan of management, conservation plan or a species recovery plan the zone may be delineated where the surrounding area requires a different fire regime
	Heritage Area Management	<ul style="list-style-type: none"> to apply fire prescriptions consistent with broad area biodiversity objectives or relevant status 	<ul style="list-style-type: none"> promotion of awareness of the special values requiring protection in these areas 	<ul style="list-style-type: none"> burning suppress or contain fires inconsistent with the fire prescription 	variable	
Fire Exclusion	<i>at present no sub-zones</i>	<ul style="list-style-type: none"> to rapidly suppress all fires that occur within this zone for the duration of the zones existence 	<ul style="list-style-type: none"> promotion of awareness of the values threatened by any potential fire that will occur within the lifetime of the zones existence 	<ul style="list-style-type: none"> rapid suppression of all fires 	variable	

APPENDIX 2 FIRE MANAGEMENT ZONES

PUTTY STRATEGIC FIRE MANAGEMENT ZONE 1



Characteristics of Zone						
Area in Hectares 1519		% of Study Area 0.6			Predominant Aspect 0 - 170° (67.7%)	
Fire Protection Zone Strategic Fire Management		Major Assets Reserves			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historical		Aboriginal Sites Recorded Carved Tree			Historic Sites Recorded Old Convict Road	
% of Zone Burnt at Various Frequencies	Unburnt 16.3	1 Time 20.4	2 Times 37.3	3 Times 25.3	4 Times 0.7	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1997/98 15.5		Jan94 31.7		1991/92 26.7
Bushfire Behaviour Potential (% of Zone)		High 80.6		Moderate 18.5		Low 0.4
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	184.7		12.2		C	
2a - Exposed Hawkesbury Woodland	291.5		19.2		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	20.6		1.4		D	
3b - Sheltered Forest on Rich Soils	7.5		0.5		D	
3c - Grey Box Open Forest	16.9		1.1		B	
4a - Exposed Narrabeen Woodland	147.2		9.7		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	614.0		40.4		B	
5 - Northern Escarpment Woodland	234.4		15.4		B	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Red Crowned Toadlet Glossy Black Cockatoo Squirrel Glider Large Pied Bat	
Threatened Flora	<i>Dillwynia tenuifolia</i>	
Fire Advantages	Bulga Creek Werong Creek Old Bulga road	Old Convict Road Howes Valley Track

Background

- The Putty road is a known source of accidental ignitions, this zone will prevent any unplanned fires originating from the Putty Road and Wollemi NP from gaining intensity and impacting on the Reserve areas.
- This zone has a variable aspect and steep slopes associated with the Hunter Range and Bulga Creek.
- Many large fire events including 1997/98 and Jan 94 impacted 15.5% and 31.7% respectively of this zone.
- There are species issues in the zone relative to the Red Crowned Toadlet, Glossy Black Cockatoo, Squirrel Glider, Large Pied Bat and *Dillwynia tenuifolia*.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from the Old Bulga Road and Putty Road, some 100 to 200 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Bulga Creek, Wilks Creek and Werong Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

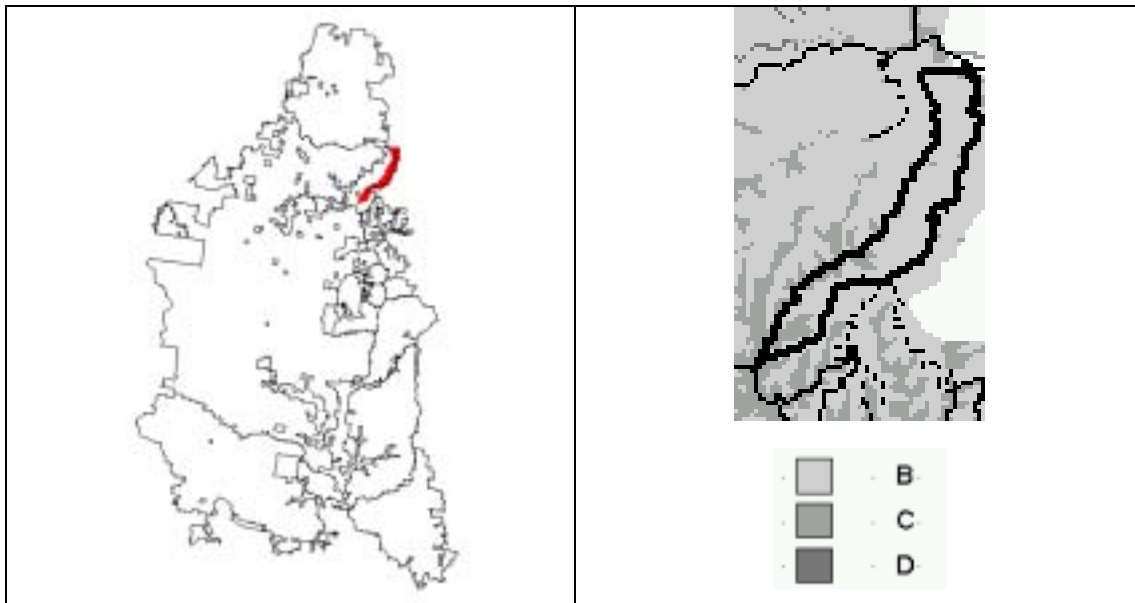
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Old Bulga Road and Putty Road, some 100 to 200 metres deep.
- Avoid fuel loads greater than 15 t/ha within 40 metres off ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

STOCKYARD CREEK STRATEGIC FIRE MANAGEMENT ZONE 2



Characteristics of Zone						
Area in Hectares 1272		% of Study Area 0.5			Predominant Aspect 0 - 170° (65.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.9	1 Time 3.4	2 Times 54.6	3 Times 41.2	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 93.3		1990/91 96.6		1979/80 46.2	
Bushfire Behaviour Potential (% of Zone)	High 80.7		Moderate 16.5		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	56.2		4.4		C	
2a - Exposed Hawkesbury Woodland	137.8		10.8		C	
3d - Rough -barked Apple Woodland on alluvium	44.1		3.5		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	991.8		78.0		B	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Unsealed Public Road – UN19 Unsealed Public Road – UN5 Stockyard Creek Track Stockyard Creek Bagnells Creek Little Creek

Background

- Dwellings located along Stockyard Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a predominantly east to south east aspect with a predominant ridge line along the western boundary.
- Many large fire events including Jan94 and 1990/91 impacted 93.3% and 96.6% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Dinner Creek and Screech Owl Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

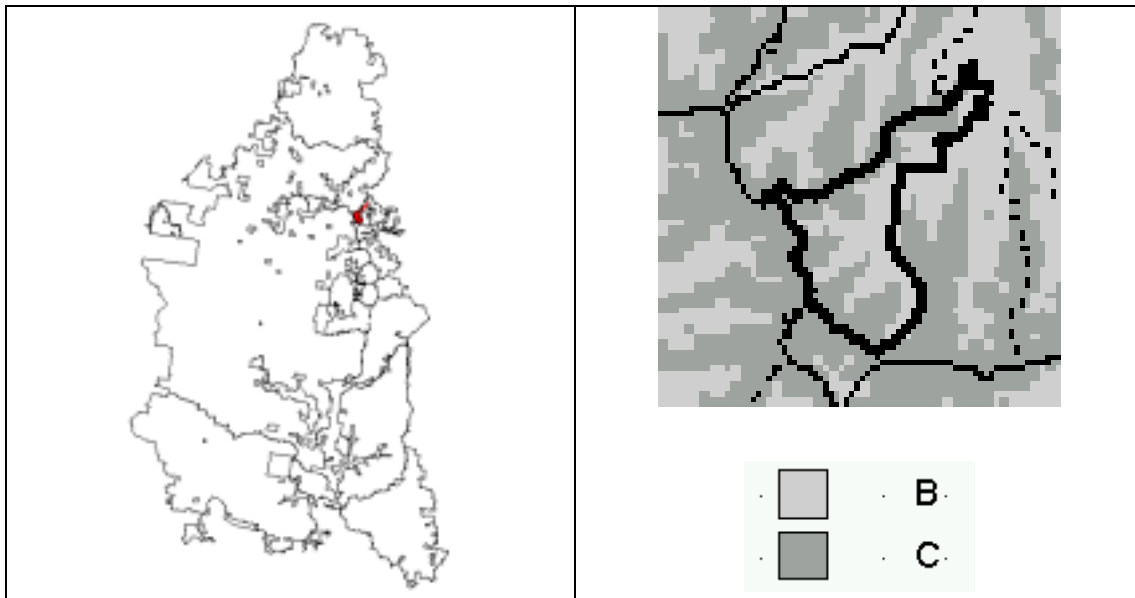
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement an incendiary drop along the ridge.
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

FINCHLEY STRATEGIC FIRE MANAGEMENT ZONE 3



Characteristics of Zone						
Area in Hectares 301.1		% of Study Area 0.1			Predominant Aspect 0 - 170° (64.4%)	
Fire Protection Zone Strategic Fire Management		Major Assets Dwellings along Stockyard Creek			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 4.2	1 Time 0.0	2 Times 10.7	3 Times 46.1	4 Times 35.5	5 Times 10.6
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 95.8		1991/92 10.7		1990/91 95.8	
Bushfire Behaviour Potential (% of Zone)	High 81.7		Moderate 18.3		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	18.7		6.2		C	
2a - Exposed Hawkesbury Woodland	128.4		42.7		C	
3d - Rough-barked Apple Woodland on alluvium	33.7		11.2		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	120.1		39.9		B	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala
Threatened Flora	Nil
Fire Advantages	Stockyard Creek Stockyard Creek Trail (private and open) Finchley Track Yengo Trail

Background

- This zone will prevent any unplanned fires gaining intensity and potentially impacting on the conservation values of the Reserve and residents along Bagnells Creek and Yango Creek.
- This zone has a predominantly north-west and south-east aspect with predominant ridge lines running from the south-west to the north-east.
- Many large fire events including Jan 94 and 1990/91 impacted 95.8% and 95.8% respectively of this zone.
- There are species issues in the zone relative to the Koala.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Stockyard Creek Trail (private and open), some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Stockyard Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

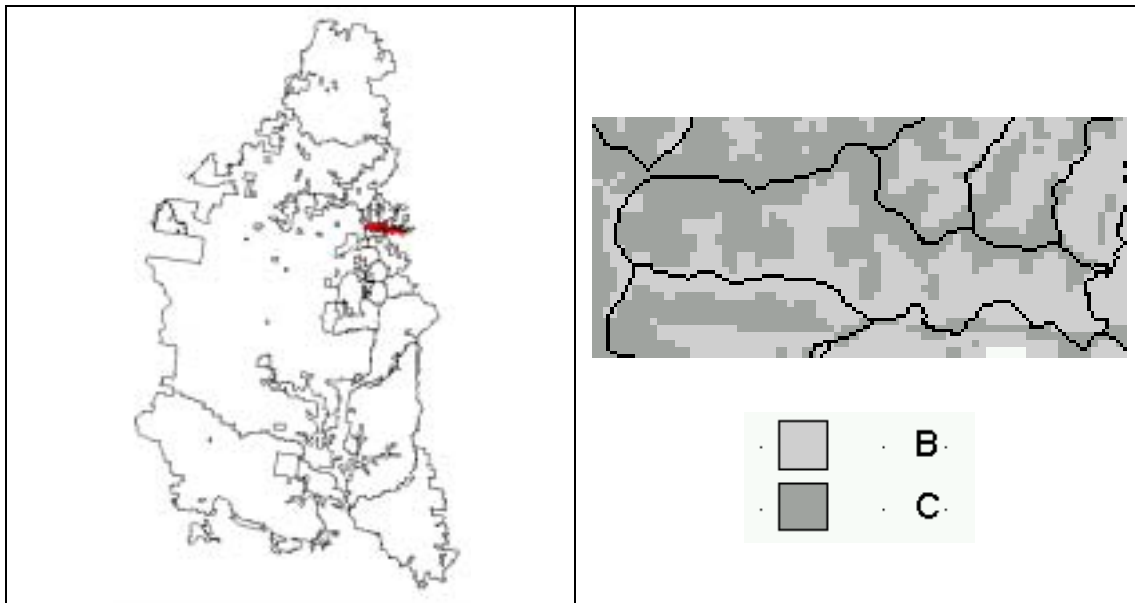
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from Stockyard Creek Trail (private and open), some 100 to 200 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BLAXLAND STRATEGIC FIRE MANAGEMENT ZONE 4



Characteristics of Zone						
Area in Hectares 653.1		% of Study Area 0.2			Predominant Aspect 0 - 170° (42.9%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 8.4	1 Time 44.2	2 Times 40.9	3 Times 6.5	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 88.4		1990/91 4.9		1989/90 3.3	
Bushfire Behaviour Potential (% of Zone)	High 87.7		Moderate 11.3		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	93.7		14.4		C	
2a - Exposed Hawkesbury Woodland	225.0		34.4		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	322.2		49.3		B	
Unclassified	12.2		1.9		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Powerful Owl
Threatened Flora	Nil
Fire Advantages	Yango Creek Finchley Track Unsealed Public Road – UN10 Unsealed Public Road – UN12

Background

- Dwellings located along Yango Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes associated with the Hunter Range and Yango Creek.
- Many large fire events including Jan 94 and 1990/91 impacted 88.4% and 4.9% respectively of this zone.
- There are species issues in the zone relative to the Powerful Owl.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from the Finchley Track, some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Yango Creek and tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

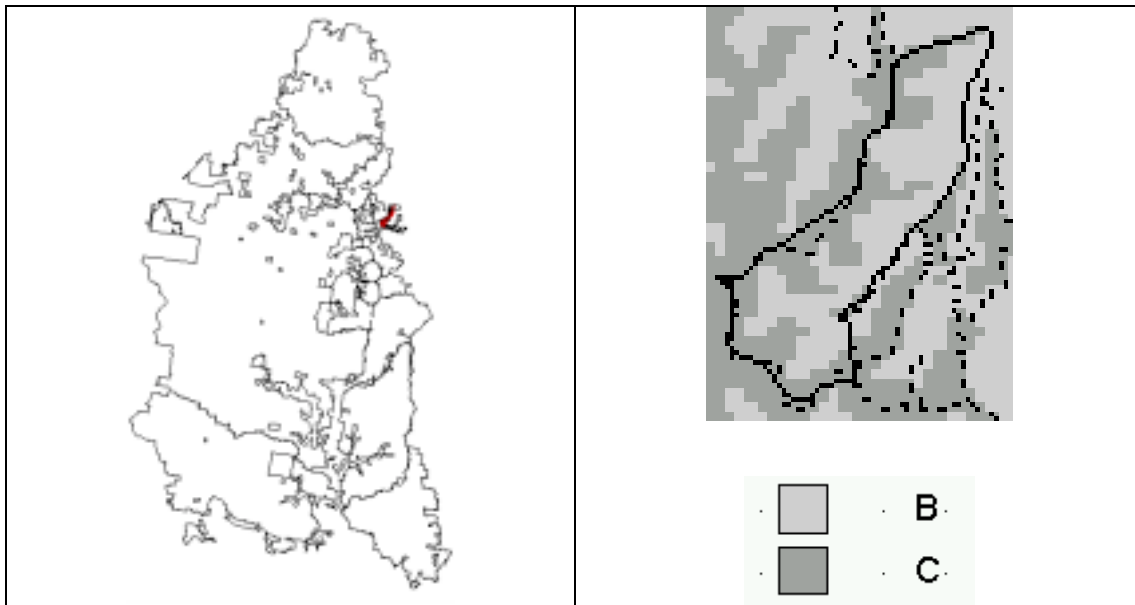
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Finchley Track, some 100 to 200 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BAGNELLS CREEK STRATEGIC FIRE MANAGEMENT ZONE 5



Characteristics of Zone						
Area in Hectares 307.7		% of Study Area 0.1		Predominant Aspect 0 - 170° (67.8%)		
Fire Protection Zone Strategic Fire Management		Major Assets Dwellings along Bagnells Creek		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 6.2	1 Time 3.5	2 Times 79.9	3 Times 10.4	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 93.8		1991/92 7.0		1982/83 48.9	
Bushfire Behaviour Potential (% of Zone)	High 75.3		Moderate 23.3		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	15.9	5.2		C		
2a - Exposed Hawkesbury Woodland	117.2	38.1		C		
3d - Rough-barked Apple Woodland on alluvium	18.7	6.1		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	150.2	48.8		B		
Unclassified	5.6	1.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Bagnells Creek Finchley Track Quart Pot Creek Trail Private Access – UN15 Private Access – UN224

Background

- Dwellings located along Bagnells Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a predominantly east to south-east aspect with a predominant ridge line running along the western boundary.
- Many large fire events including Jan 94 and 1982/83 impacted 93.8% and 90.3% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn or an incendiary drop from the ridge along the western boundary (Quart Pot Creek Trail), some 100 to 200 metres deep, would be the best option for maintaining this zone as a buffer and minimising the potential spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Bagnells Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

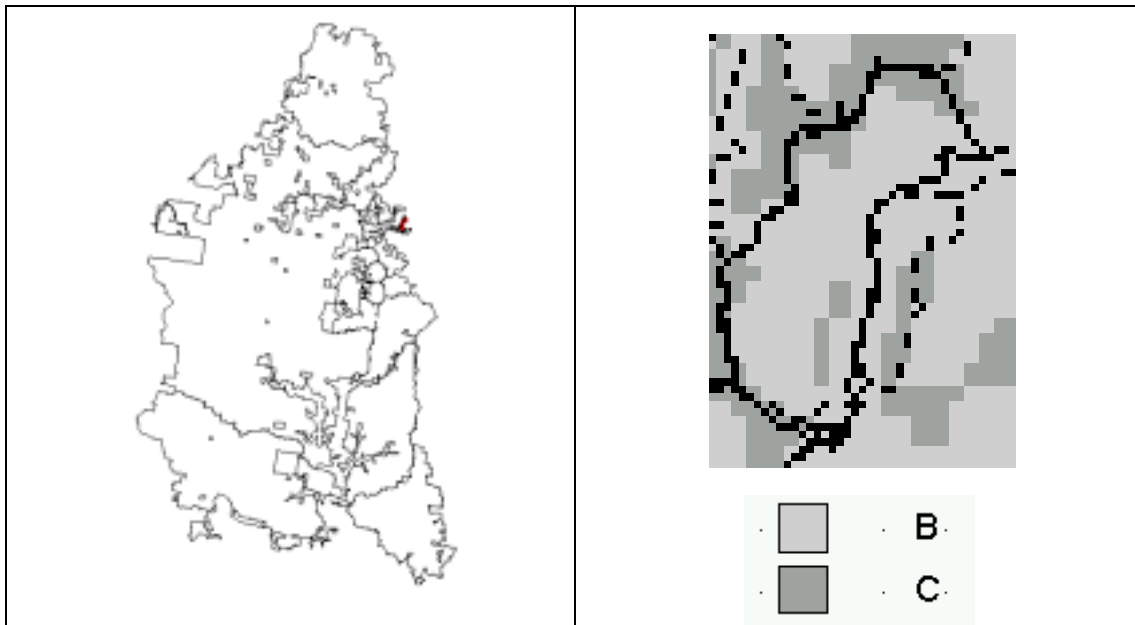
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn or an incendiary drop from the ridge along the western boundary, some 100 to 200 metres deep.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

MOORE STRATEGIC FIRE MANAGEMENT ZONE 6



Characteristics of Zone						
Area in Hectares 153		% of Study Area 0.1			Predominant Aspect 0 - 170° (63.1%)	
Fire Protection Zone Strategic Fire Management		Major Assets Dwellings along Yango Creek			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 9.2	1 Time 41.9	2 Times 48.9	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan 94 90.8		1982/83 48.9			
Bushfire Behaviour Potential (% of Zone)	High 75.0		Moderate 20.2		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	3.7	2.5		C		
2a - Exposed Hawkesbury Woodland	19.7	12.9		C		
3d - Rough-barked Apple Woodland on alluvium	23.4	15.3		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	100.3	65.6		B		
Unclassified	5.8	3.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Dry Arm Finchley Track Bagnells Creek Track Unsealed Public Road	4WD Road – UN223 Private Access – UN221 Private Access – UN224

Background

- Dwellings located along Dry Arm are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a predominantly east to south-east aspect with a predominant ridge line running along the western boundary.
- Many large fire events including Jan 94 and 1982/83 impacted 90.8% and 48.9% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn or an incendiary drop from the ridge along the western boundary (Unsealed Public Road – UN3, Private Access – UN224, 4WD Road – UN223, Private Access – UN221) some 100 to 200 metres deep, would be the best option for maintaining this zone as a buffer and minimising the potential spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Dry Arm.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

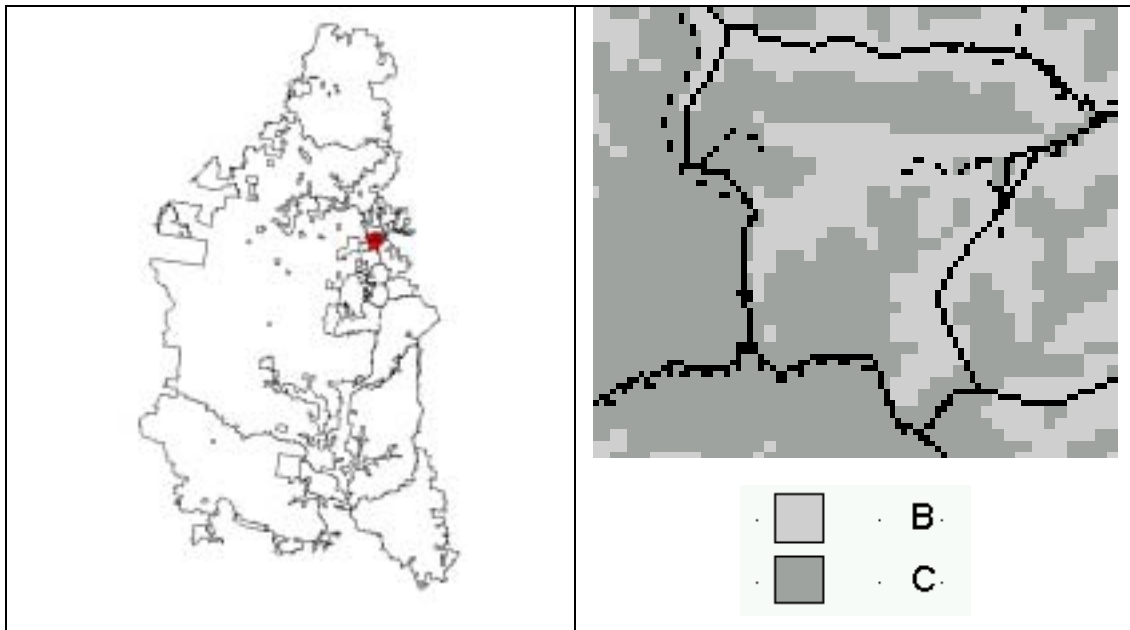
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn or an incendiary drop from the ridge along the western boundary (Unsealed Public Road – UN3, Private Access – UN224, 4WD Road – UN223, Private Access – UN221) some 100 to 200 metres deep.
- Avoid fuel loads greater than 15 t/ha within 40 metres off ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

YANGO WEST STRATEGIC FIRE MANAGEMENT ZONE 7



Characteristics of Zone						
Area in Hectares 535.6		% of Study Area 0.2			Predominant Aspect 0 -170° (56.8%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Dwellings along Yango Creek			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 4.2	1 Time 55.9	2 Times 39.9	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 95.8		1979/80 39.9			
Bushfire Behaviour Potential (% of Zone)	High 80.3		Moderate 17.9		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	107.8		20.1		C	
2a - Exposed Hawkesbury Woodland	160.3		29.9		C	
3d - Rough -barked Apple Woodland on alluvium	13.1		2.5		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	244.0		45.6		B	
Unclassified	10.3		1.9		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Yango Creek Yango Track Unsealed Public Road – UN10 Unsealed Public Road – UN34	Unsealed Public Road – UN11 Private Access – UN98 Private Access – UN99 Yengo Trail

Background

- Dwellings located along Yango Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes associated with the Hunter Range and Yango Creek.
- Many large fire events including Jan 94 and 1979/80 impacted 95.8% and 39.9% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Unsealed Public Road – UN10, Unsealed Public Road – UN34, Unsealed Public Road – UN11 and Private Access – UN99 some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Yango Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

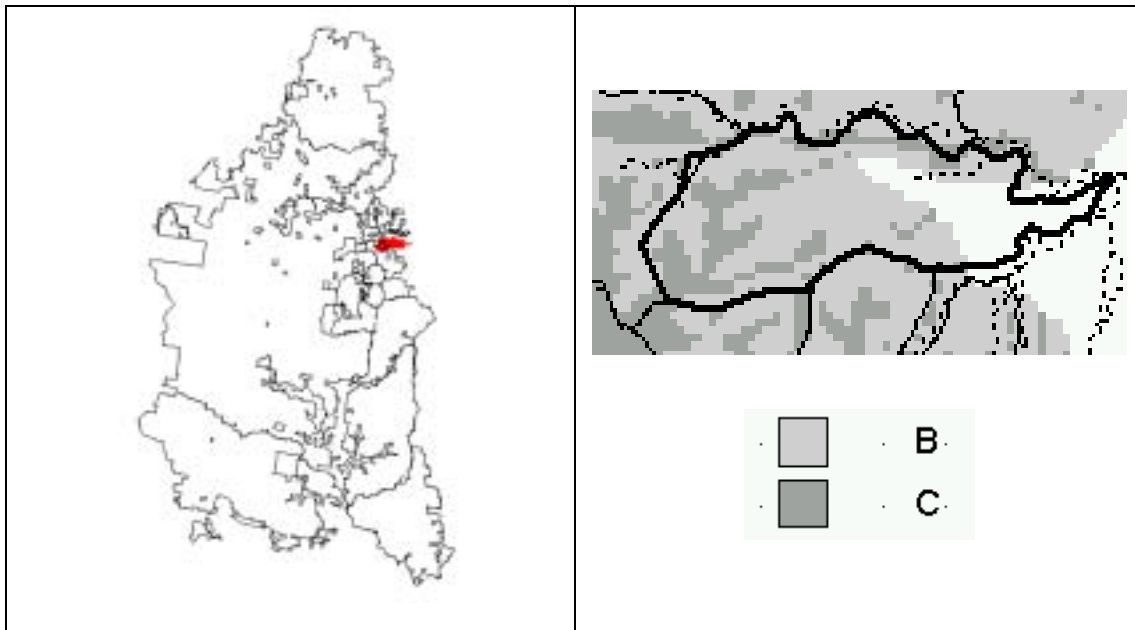
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from Unsealed Public Road – UN10, Unsealed Public Road – UN34, Unsealed Public Road – UN11 and Private Access – UN99 some 100 to 200 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

YANGO STRATEGIC FIRE MANAGEMENT ZONE 8



Characteristics of Zone						
Area in Hectares 774.0		% of Study Area 0.3			Predominant Aspect 0 - 170° (51.0%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Shacks			Cultural Resources None recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 4.7	1 Time 95.3	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 95.3					
Bushfire Behaviour Potential (% of Zone)	High 61.0		Moderate 11.0		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	17.8	2.3		C		
2a - Exposed Hawkesbury Woodland	113.4	14.7		C		
3d - Rough -barked Apple Woodland on alluvium	26.2	3.4		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	421.8	54.5		B		
Unclassified	194.7	25.2		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Regent Honeyeater	
Threatened Flora	Nil	
Fire Advantages	Unsealed Public Road – UN10 Yango Creek Yango Creek Road Boree Track	Finchley Track Unsealed Public Road – UN101 Unsealed Public Road – UN102

Background

- Dwellings located along Yango Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes.
- The large fire event in Jan 94 impacted 95.3% of this zone.
- There are species issues in the zone relative to the Regent Honeyeater.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Yango Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

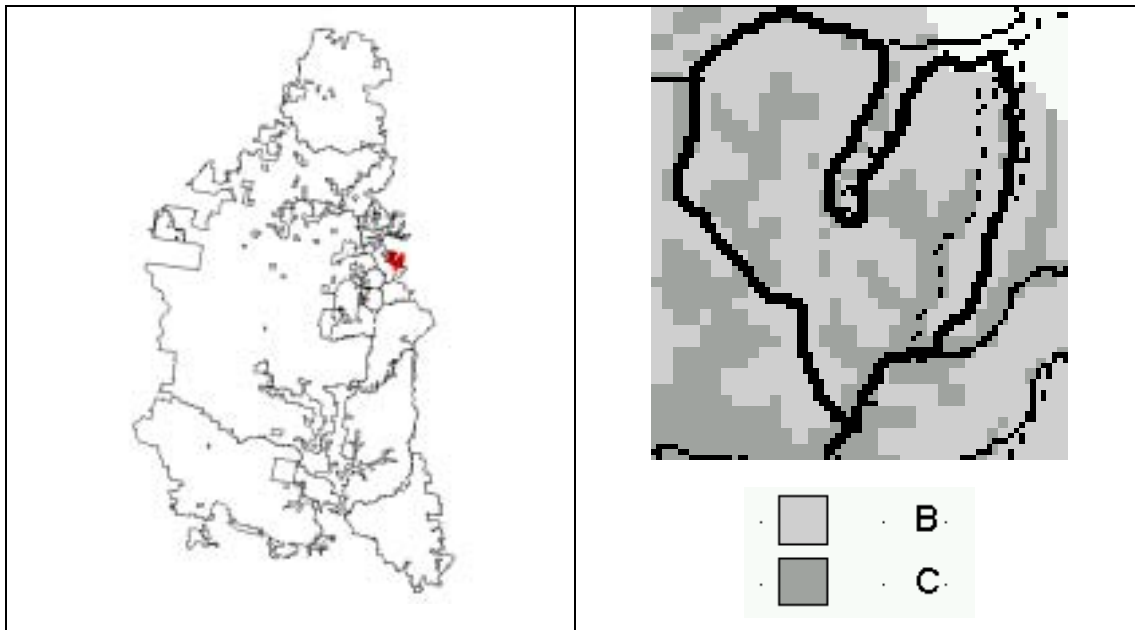
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

YANGO SOUTH STRATEGIC FIRE MANAGEMENT ZONE 9



Characteristics of Zone						
Area in Hectares 532.7		% of Study Area 0.2			Predominant Aspect 0 - 170° (49.3%)	
Fire Protection Zone Strategic Fire Management		Major Assets Sheds, Dwellings along Blaxlands Arm			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 1.7	1 Time 72.2	2 Times 26.1	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 98.3		1993/94 26.1			
Bushfire Behaviour Potential (% of Zone)	High 81.6		Moderate 14.1		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	19.7		3.7		C	
2a - Exposed Hawkesbury Woodland	135.0		25.3		C	
3d - Rough -barked Apple Woodland on alluvium	6.6		1.2		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	346.9		65.1		B	
Unclassified	24.6		4.6		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Boree Track Yango Creek Tributaries Private Access – UN102 Private Access – UN103 Private Access – UN143

Background

- Dwellings located along Private Access – UN102 and Blaxlands Arm are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes.
- Two large fire events Jan 94 and 1993/94 impacted 98.3% and 26.1% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from both sides of Private Access – UN143, some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Yango Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

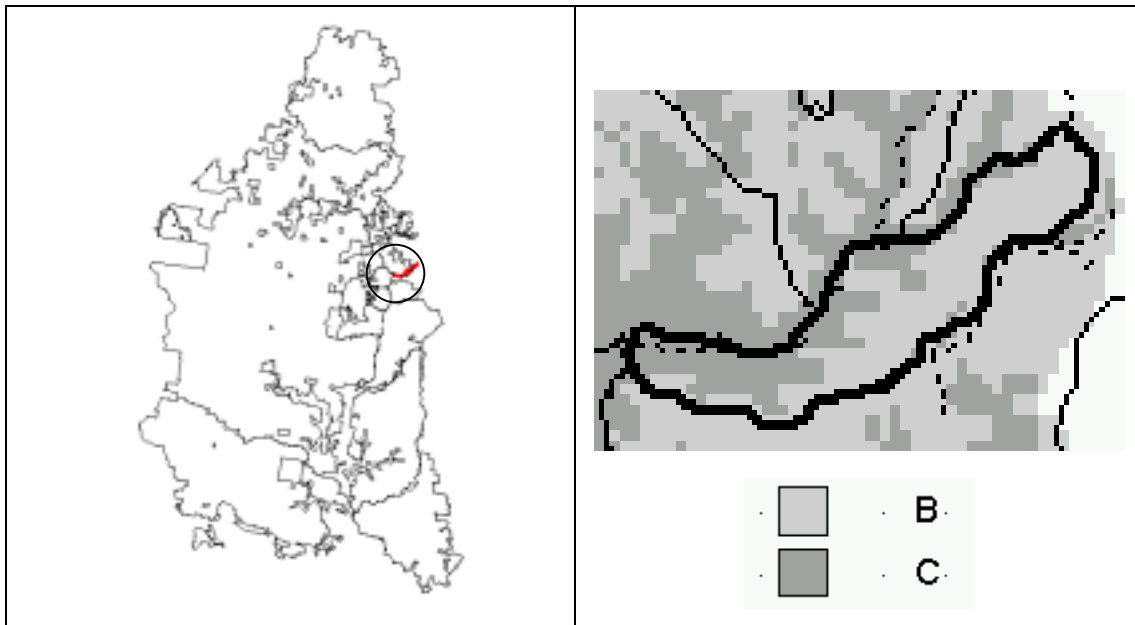
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- a strip burn from both sides of Private Access – UN143, some 100 to 200 metres deep and an incendiary drop along the ridges
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BLAXLANDS ARM STRATEGIC FIRE MANAGEMENT ZONE 10



Characteristics of Zone						
Area in Hectares 312.1		% of Study Area 0.1			Predominant Aspect 0 - 170° (62.9%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Unidentified Building			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.7	1 Time 99.3	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 99.3					
Bushfire Behaviour Potential (% of Zone)	High 83.1		Moderate 15.2		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	59.1	18.9		C		
2a - Exposed Hawkesbury Woodland	46.9	15.0		C		
3d - Rough-barked Apple Woodland on alluvium	9.4	3.0		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	188.4	60.4		B		
Unclassified	8.4	2.7		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala Yellow Bellied Glider
Threatened Flora	Nil
Fire Advantages	Boree Track Blaxlands Arm Private Access – UN57

Background

- Dwellings located along Balxlands Arm and Wollombi Brook are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a predominantly south to south-east aspect with a predominant ridge line running along the north western boundary.
- The large fire event in Jan 94 impacted 99.3% of this zone.
- There are species issues in the zone relative to the Koala and Yellow Bellied Glider.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn south east or incendiary drop from the ridge along the north western boundary (Boree Track) some 100 to 200 metres deep, would be the best option for maintaining this zone as a buffer and minimising the potential spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Blaxlands Arm and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

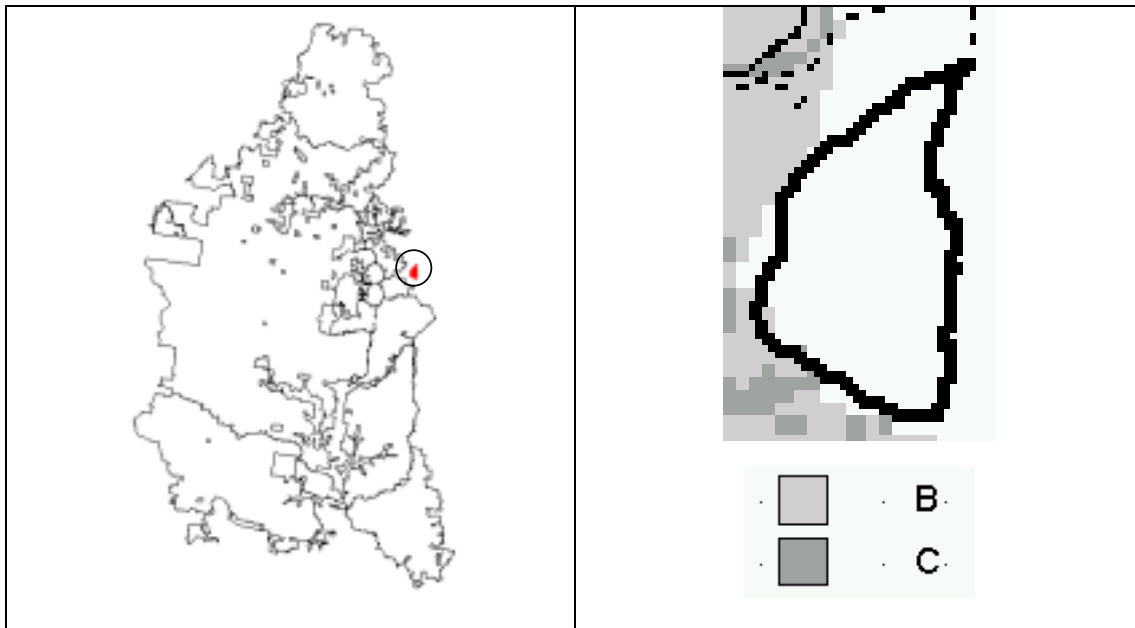
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn south east or incendiary drop from the ridge along the north western boundary (Boree Track) some 100 to 200 metres deep.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

NOULANANS ARM STRATEGIC FIRE MANAGEMENT ZONE 11



Characteristics of Zone						
Area in Hectares 210.5		% of Study Area 0.1		Predominant Aspect 0 - 170° (56.1%)		
Fire Protection Zone Strategic Fire Management		Major Assets Caravan		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 0.0	2 Times 96.5	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 96.5		1990/91 96.5			
Bushfire Behaviour Potential (% of Zone)	High 159		Moderate 32		Low 0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	8.0	3.8		C		
2a - Exposed Hawkesbury Woodland	55.0	26.1		C		
3d - Rough-barked Apple Woodland on alluvium	20.0	9.5		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	109.0	51.8		B		
Unclassified	18.5	8.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Noulanans Arm Escarpments Private Access – UN107

Background

- Dwellings located along Balxlands Arm and Wollombi Brook are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes.
- Two large fire events in Jan 94 and 1990/91 impacted 96.5% and 96.5% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn west from Private Access – UN107, some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Noulanans Arm and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

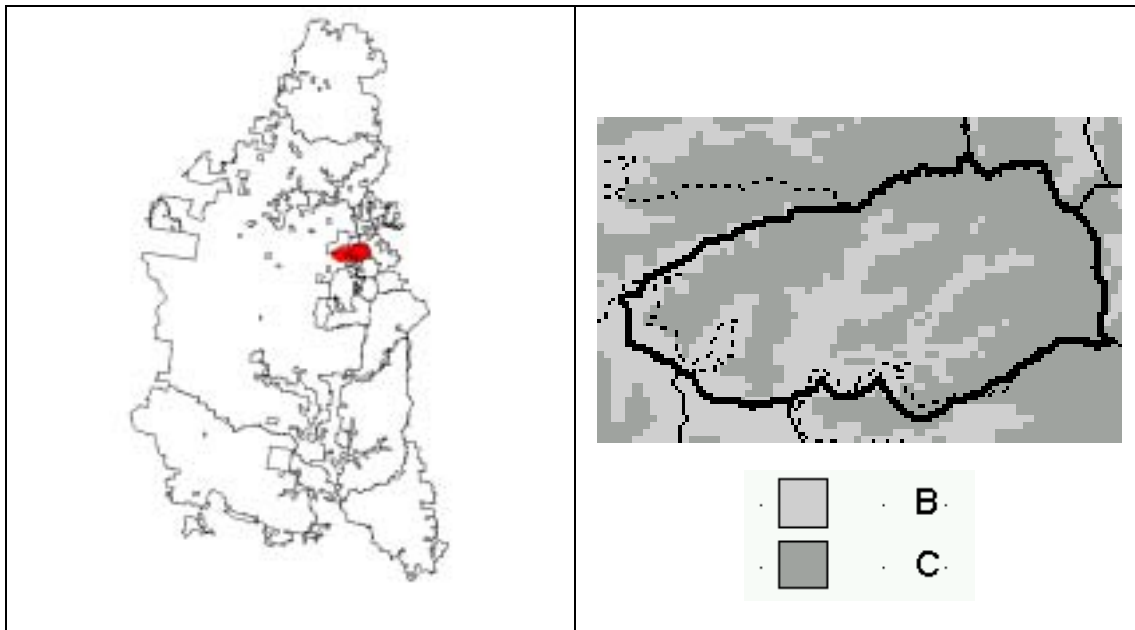
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn west from Private Access – UN107, some 100 to 200 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WALLABADAH STRATEGIC FIRE MANAGEMENT ZONE 12



Characteristics of Zone						
Area in Hectares 1262.3		% of Study Area 0.5			Predominant Aspect 220 - 360° (48.4%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Shacks, Yards, Towers			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Axe grinding groove			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 0.0	2 Times 9.3	3 Times 90.7	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 100.0		1990/91 93.1		1979/80 99.1	
Bushfire Behaviour Potential (% of Zone)	High 88.3		Moderate 10.4		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	368.4		29.2		C	
2a - Exposed Hawkesbury Woodland	470.6		37.3		C	
3d - Rough -barked Apple Woodland on alluvium	28.1		2.2		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	376.4		29.8		B	
Unclassified	18.7		1.5		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Yellow Bellied Glider	
Threatened Flora	Nil	
Fire Advantages	Yango Track Sandy Creek Loop Track Wallabadah Loop Trail Wallabadah Creek Loop Trail	Wallabadah Creek Little Wallabadah Creek Stockyard Arm

Background

- Dwellings located around Little Wallabadah are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect and steep slopes.
- Three large fire events in Jan 94 1990/91 and 1979/80 impacted 100%, 93.1 and 99.1% respectively of this zone.
- There are species issues in the zone relative to the Yellow Bellied Glider.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from and into the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Wallabadah Creek, Little Wallabadah Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

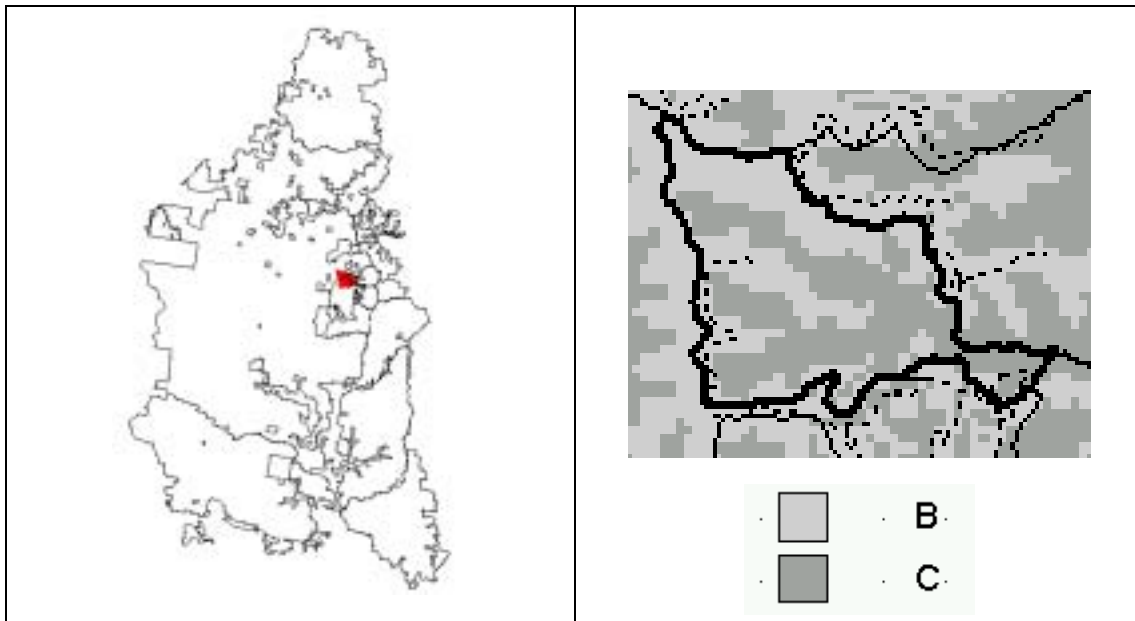
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement an incendiary drop along the ridges covering a depth of 100-200 metres.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

JOES FLAT STRATEGIC FIRE MANAGEMENT ZONE 13



Characteristics of Zone						
Area in Hectares 647.1		% of Study Area 0.2		Predominant Aspect 0 - 170° (43.1%)		
Fire Protection Zone Strategic Fire Management		Major Assets Shack, Sheds, House/shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.9	1 Time 5.0	2 Times 94.1	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 95.8		1979/80 95.8			
Bushfire Behaviour Potential (% of Zone)	High 85.4		Moderate 12.4		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	75.9	11.7		C		
2a - Exposed Hawkesbury Woodland	240.7	37.2		C		
3d - Rough-barked Apple Woodland on alluvium	4.7	0.7		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	321.1	49.6		B		
Unclassified	4.7	0.7		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Wallabadah Creek Loop Track Little Boree Track Wallabadah Loop Track Boree Creek Wallabadah Creek

Background

- Dwellings located within Boree and Little Wallabadah are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a predominantly north and south aspect with a predominant ridge line running from the west to the east.
- Two large fire events in Jan 94 and 1979/80 impacted 95.8% and 95.8% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from and into the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Big Boree Creek and Wallabadah Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

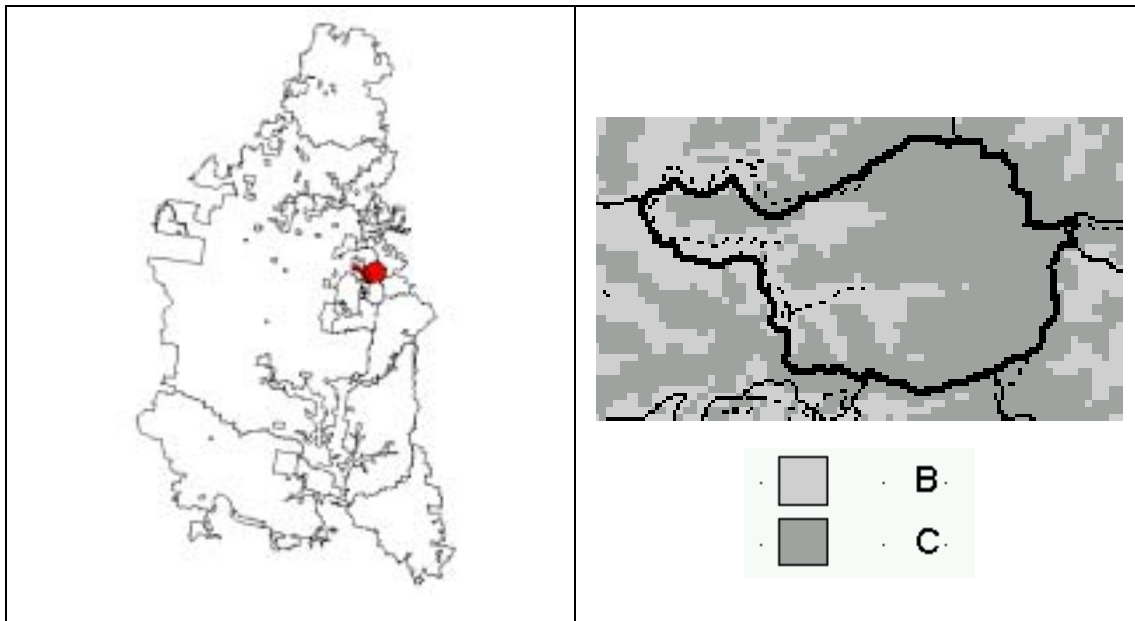
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BIG WALLABADAH STRATEGIC FIRE MANAGEMENT ZONE 14



Characteristics of Zone						
Area in Hectares 992.5		% of Study Area 0.4			Predominant Aspect 220 - 360° (45.7%)	
Fire Protection Zone Strategic Fire Management		Major Assets House, Shack, Shed, Yards, Caravan			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 5.2	1 Time 2.2	2 Times 92.6	3 Times 0	4 Times 0	5 Times 0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		Jan94 94.8		1979/80 89.4		
Bushfire Behaviour Potential (% of Zone)		High 81.8		Moderate 17.1		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	425.6		42.9		C	
2a - Exposed Hawkesbury Woodland	315		31.7		C	
3d - Rough-barked Apple Woodland on alluvium	18.7		1.9		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	220.3		22.2		B	
Unclassified	12.9		1.3		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala Brush-tailed Rock-wallaby Greater Broad-nosed Bat
Threatened Flora	Nil
Fire Advantages	Rileys Arm Yango Track Boree Track Wallabadah Loop Trail

Background

- Wallabadah and Little Wallabadah are known sources of accidental ignitions, this zone will prevent any unplanned fires originating from these areas from gaining intensity and impacting on the Reserve areas.
- This zone has a variable aspect and steep slopes with predominant ridges in an east to west pattern.
- Two large fire events in Jan 94 and 1979/80 impacted 94.8% and 89.4% respectively of this zone.
- There are species issues in the zone relative to the Koala, Brush-tailed Rock-wallaby and Greater Broad-nosed Bat.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a perimeter strip burn from Boree Track, Wallabadah Loop Trail and Yango Track, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Wallabadah Creek and Rileys Arm.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

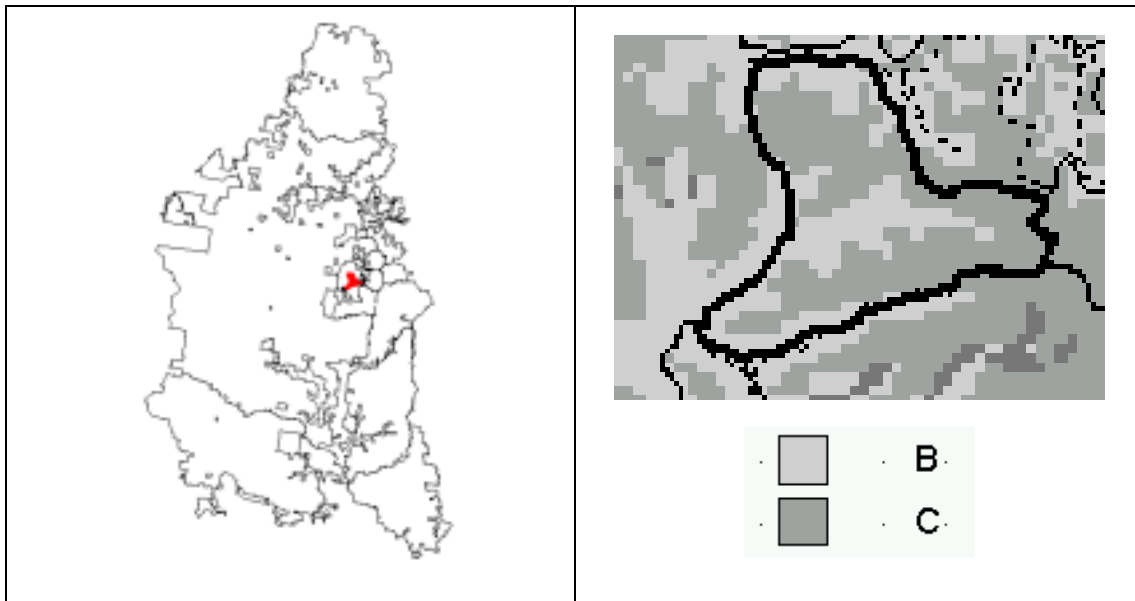
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a perimeter strip burn from Boree Track, Wallabadah Loop Trail and Yango Track, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges and Trails.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LEMON TREE ARM STRATEGIC FIRE MANAGEMENT ZONE 15



Characteristics of Zone						
Area in Hectares 453.4		% of Study Area 0.2			Predominant Aspect 220 - 360° (46.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Shed			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 2.4	2 Times 28.3	3 Times 69.2	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 100.0		1987/88 100.0		1979/80 75.4	
Bushfire Behaviour Potential (% of Zone)	High 84.4		Moderate 12.7		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	82.5		18.2		C	
2a - Exposed Hawkesbury Woodland	185.6		40.9		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	176.9		39.0		B	
Unclassified	8.4		1.9		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Lemon Tree Arm Spring Arm Boree Spring Arm Kittle Boree Track Wallabadah Creek Loop Track

Background

- Dwellings located in the community of Boree are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes with predominant ridges in an east to west pattern.
- Two large fire events in Jan 94 and 1987/88 impacted 100.0% and 100.0% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from the eastern and north eastern boundary (Little Boree Track), some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Spring Arm, Lemon Tree Arm and Boree Arm.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

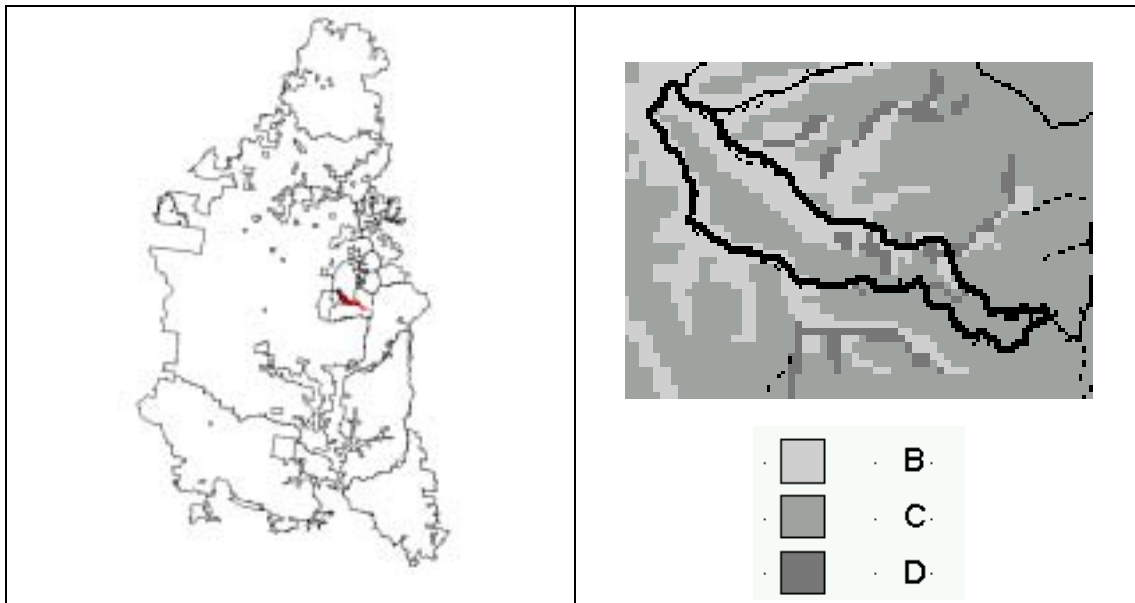
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the eastern and north eastern boundary (Little Boree Track), some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the Track and ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LITTLE BOREE STRATEGIC FIRE MANAGEMENT ZONE 16



Characteristics of Zone						
Area in Hectares 384.9		% of Study Area 0.1		Predominant Aspect 0 - 170° (53.3%)		
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock Engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 55.5	2 Times 33.3	3 Times 11.1	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 99.9		1990/91 11.1		1987/88 44.4	
Bushfire Behaviour Potential (% of Zone)	High 79.7		Moderate 18.9		Low 0.9	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	77.8	20.2		C		
2a - Exposed Hawkesbury Woodland	122.8	31.9		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	8.4	2.2		D		
3b - Sheltered Forest on Rich Soils	14.1	3.7		D		
3d - Rough -barked Apple Woodland on alluvium	17.8	4.6		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	141.6	36.8		B		
Unclassified	2.4	0.6		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Little Boree Creek Back Arm Private Access – UN398 4WD Road – UN76 4WD Management Access – UN75

Background

- Dwellings located along Little Boree Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a predominantly north-east aspect with a predominant ridge line running from the north-west to the south-east.
- Three fire events including Jan 94, 1990/91 and 1987/88 impacted 99.9%, 11.1% and 44.4% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from 4WD Road – UN76 and 4WD Management Access – UN75, some 40 to 80 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Little Boree Creek, Back Arm and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

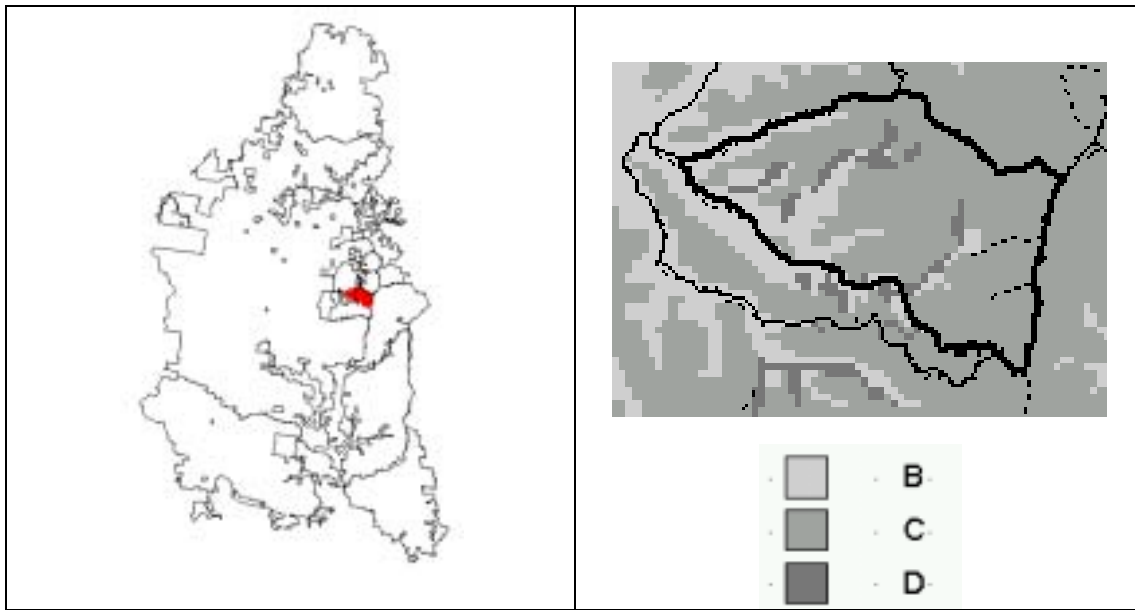
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from 4WD Road – UN76 and 4WD Management Access – UN75, some 40 to 80 metres deep and an incendiary drop along the ridge.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

GARDEN ARM STRATEGIC FIRE MANAGEMENT ZONE 17



Characteristics of Zone						
Area in Hectares 954.1		% of Study Area 0.3		Predominant Aspect 220 - 360° (49.7%)		
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Sheds		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock Engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 2.2	2 Times 97.8	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 100.0		1987/88 98.6			
Bushfire Behaviour Potential (% of Zone)	High 82.1		Moderate 16.8		Low 0.8	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	351.4	36.8		C		
2a - Exposed Hawkesbury Woodland	361.8	37.9		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	37.5	3.9		D		
3b - Sheltered Forest on Rich Soils	27.2	2.8		D		
3c - Grey Box Open Forest				B		
3d - Rough -barked Apple Woodland on alluvium	14.1	1.5		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	162.2	17.0		B		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala	
Threatened Flora	Nil	
Fire Advantages	Boree Track Little Boree Track Private Access – UN398 Private Access – UN399 Little Boree Creek	Spring Arm Garden Arm Escarpments 4WD Management Access – UN75

Background

- Dwellings located along Little Boree Creek are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes with predominant ridges in an north-east to south-west pattern.
- Two large fire events in Jan 94 1987/88 impacted 100.0% and 98.6% respectively of this zone.
- There are species issues in the zone relative to the Koala.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from the perimeter (Boree Track, Little Boree Track, Private Access – UN398, Private Access – UN399 and 4WD Management Access – UN75) some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Little Boree Creek, Garden Arm and Spring Arm and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

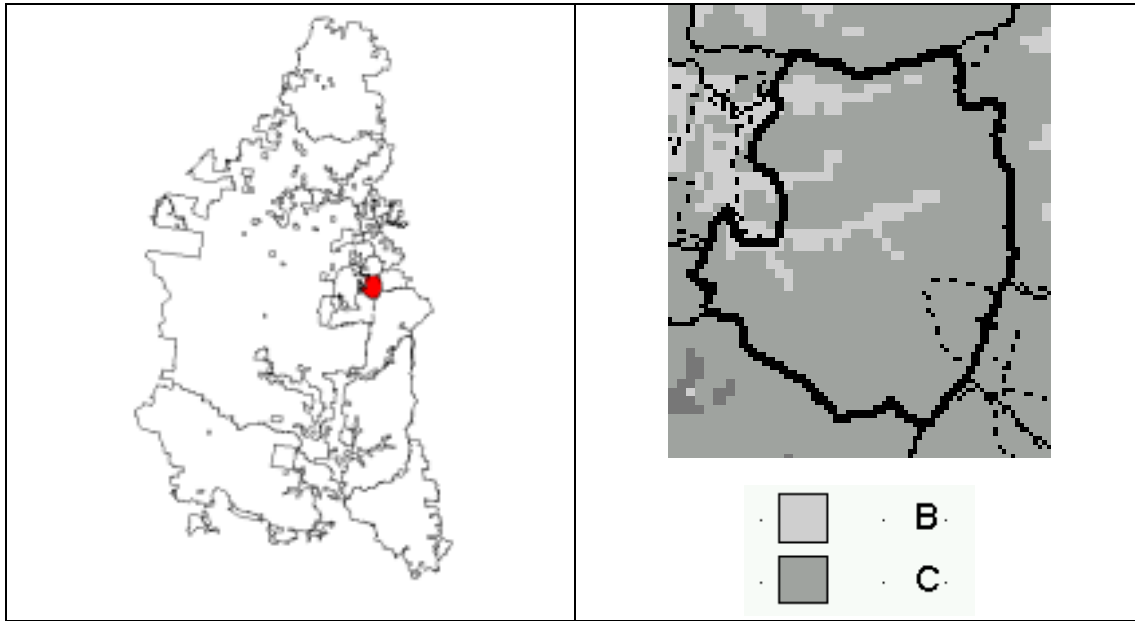
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the perimeter (Boree Track, Little Boree Track, Private Access – UN398, Private Access – UN399 and 4WD Management Access – UN75) some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the Tracks and ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BOREE STRATEGIC FIRE MANAGEMENT ZONE 18



Characteristics of Zone						
Area in Hectares 790.2		% of Study Area 0.3		Predominant Aspect 220 - 360° (48.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets House		Cultural Resources Potential helipad		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock Engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 100.0	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan94 100.0					
Bushfire Behaviour Potential (% of Zone)	High 79.6		Moderate 20.2		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	337.5		42.7		C	
2a - Exposed Hawkesbury Woodland	369.4		46.7		C	
3d - Rough-barked Apple Woodland on alluvium	15.9		2.0		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	60.9		7.7		B	
Unclassified	6.5		0.8		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala Glossy Black Cockatoo	
Threatened Flora	<i>Velleia perfoliata</i>	
Fire Advantages	Boree Creek Wallabadah Loop Trail Little Boree Track	Escarpments Boree Track Unsealed Public Road – UN71

Background

- The community of Boree is a source of accidental ignitions, this zone will prevent any unplanned fires originating from the Boree community from gaining intensity and impacting on the Reserve areas.
- This zone has a variable aspect and steep slopes with predominant ridges in an east to west pattern.
- One large fire event in Jan 94 impacted 100.0% of this zone.
- There are species issues in the zone relative to the Koala, Glossy Black Cockatoo and *Velleia perfoliata*
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Boree track, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Boree Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

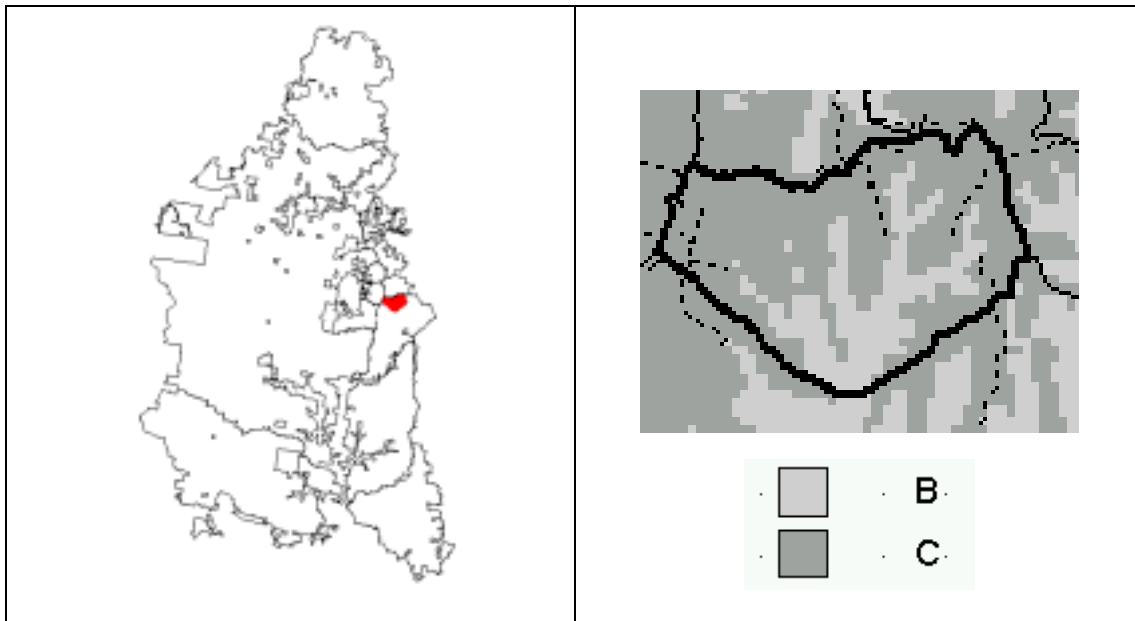
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from Boree track, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the Boree Track and ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BALA STRATEGIC FIRE MANAGEMENT ZONE 19



Characteristics of Zone						
Area in Hectares 752.8		% of Study Area 0.3		Predominant Aspect 0 - 170° (48.4%)		
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Axe grinding Groove, Burial Site, Rock Engraving, Stone Arrangement		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.6	1 Time 92.3	2 Times 7.1	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		Jan 94 99.4		1991/92 7.1		
Bushfire Behaviour Potential (% of Zone)		High 78.5		Moderate 21.2		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	304.7		40.5		C	
2a - Exposed Hawkesbury Woodland	250.3		33.2		C	
3d - Rough -barked Apple Woodland on alluvium	15.9		2.1		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	181.9		24.2		B	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala
Threatened Flora	Nil
Fire Advantages	Mt Simpson Track Boree Track Closed Track – UN91 Closed Track – UN87 Closed Track – UN89 Escarpments

Background

- Dwellings located along the Mt Simpson Track to the east of this zone are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes and escarpments.
- Two large fire events in Jan 94 and 1991/92 impacted 99.4% and 7.1% respectively of this zone.
- There are species issues in the zone relative to the Koala.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a perimeter strip burn (Mt Simpson Track, Boree Track, Closed Track – UN91, Closed Track – UN87 and Closed Track – UN89), some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of numerous unnamed streams.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

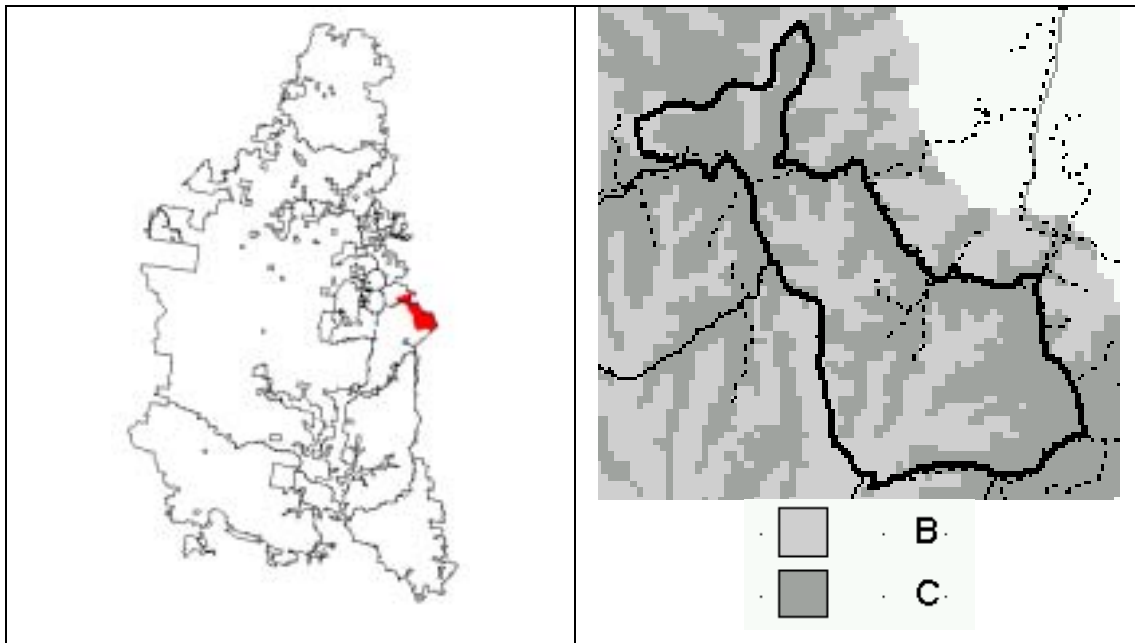
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a perimeter strip burn (Mt Simpson Track, Boree Track, Closed Track – UN91, Closed Track – UN87 and Closed Track – UN89), some 40 to 80 metres deep and an incendiary drop.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the tracks and ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

SIMPSON STRATEGIC FIRE MANAGEMENT ZONE 20



Characteristics of Zone						
Area in Hectares 1283.1		% of Study Area 0.5		Predominant Aspect 220 - 360° (49.3%)		
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 27.5	2 Times 72.5	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		Jan94 100.0		1991/92 11.7		1979/80 61.6
Bushfire Behaviour Potential (% of Zone)		High 82.4		Moderate 15.0		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	431.2		33.6		C	
2a - Exposed Hawkesbury Woodland	376.9		29.4		C	
3d - Rough -barked Apple Woodland on alluvium	30.9		2.4		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	407.8		31.8		B	
Unclassified	36.3		2.8		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala	Turquoise Parrot
Threatened Flora	Nil	
Fire Advantages	Mt Simpson Track Old Great North Road Closed Track – UN78 George Downs Drive Closed Track – UN87	Closed Track – UN83 Escarpments Mogo Creek and Tributaries Closed Track – UN136

Background

- Dwellings located within Bucketty and on the Mt Simpson Track are potentially at risk to extreme fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes with predominant ridges in an north-east to south-west pattern.
- Two large fire events in Jan 94 and 1979/80 impacted 100.0% and 61.6% respectively of this zone.
- There are species issues in the zone relative to the Koala and Turquoise Parrot.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- There is a need for a fire trail along the eastern boundary of this zone north of the Mt Simpson Track.
- Ideally a perimeter strip burn (Old Great North Road, Closed Track – UN78, George Downs Drive, Closed Track – UN87, Closed Track – UN83 and Closed Track – UN136, Proposed Eastern Boundary Track north of Mt Simpson Track), some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Mogo Creek, Noulans Arm and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

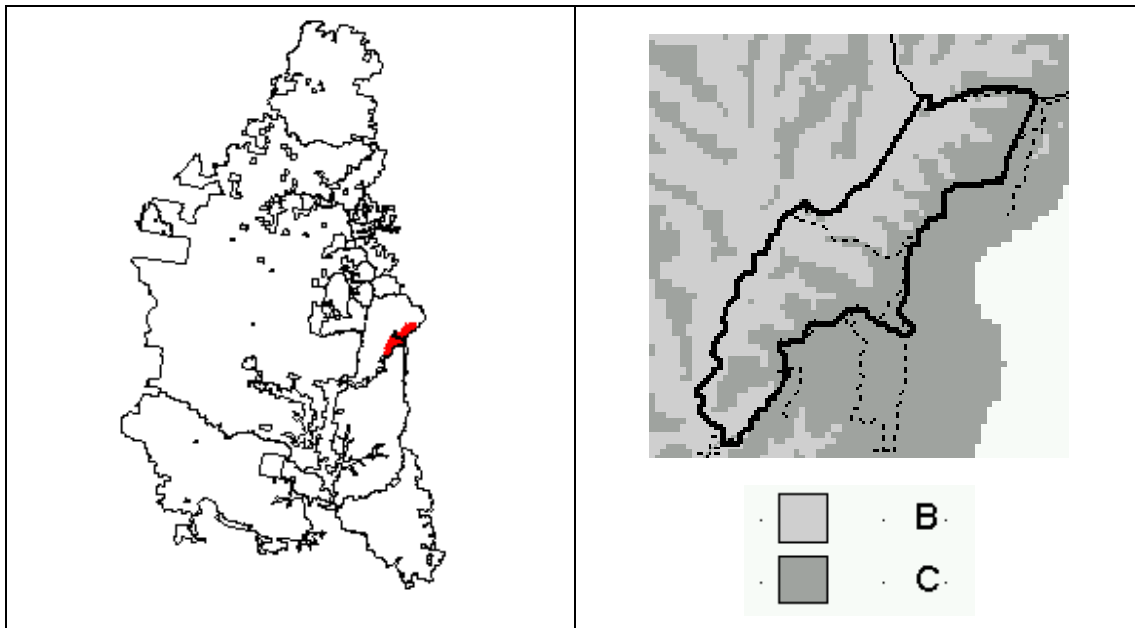
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Upgrade/ Create fire trail along the eastern boundary of this zone north of the Mt Simpson Track.
- Implement a perimeter strip burn (Old Great North Road, Closed Track – UN78, George Downs Drive, Closed Track – UN87, Closed Track – UN83 and Closed Track – UN136, Proposed Eastern Boundary Track north of Mt Simpson Track), some 100 to 200 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the tracks and ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

MOGO STRATEGIC FIRE MANAGEMENT ZONE 21



Characteristics of Zone						
Area in Hectares 919.5		% of Study Area 0.3		Predominant Aspect 220 - 360° (50.5%)		
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded		Cultural Resources Potential Helipad		
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Rock engraving		Historic Sites Recorded Old Great North Road		
% of Zone Burnt at Various Frequencies	Unburnt 4.3	1 Time 16.7	2 Times 59.9	3 Times 23.7	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan 94 100		1998/89 26.4		1979/80 96.3	
Bushfire Behaviour Potential (% of Zone)	High 86.6		Moderate 12.5		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	151.9	16.5		C		
2a - Exposed Hawkesbury Woodland	277.5	30.2		C		
2b - Dwarf Apple Low Open Woodland	0.9	0.1		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	485.5	52.8		B		
Unclassified	4.6	0.6		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Turquoise Parrot Masked Owl	
Threatened Flora	Nil	
Fire Advantages	Mogo Creek Old Great North Road Mogo Creek Track	4WD Management Access – UN344 Closed Track – UN78

Background

- Mogo Creek Community, Mangrove Creek Dam Water Catchment and Mogo Picnic are potentially at risk to fire event originating from Yengo National Park.
- This zone has a variable aspect and steep slopes with predominant ridges in a south-east to north-west pattern.
- Three large fire events in Jan 94, 1988/89 and 1979/80 impacted 100%, 26.4% and 96.3% respectively of this zone.
- There are species issues in the zone relative to the Turquoise Parrot and Masked Owl
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from the Old Great North Road and Mogo Creek Road, some 100 to 200 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) from the remainder of the Reserves.
- A strip burn around the Mogo Camping area and Mogo Creek Community some 100-200 metres will reduce the potential of unplanned fires spreading from or into these areas.
- A strip burn from both sides of 4WD Management Access – UN344 some 40 metres deep will create better access potential and a strategic division of this zone.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Mogo Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

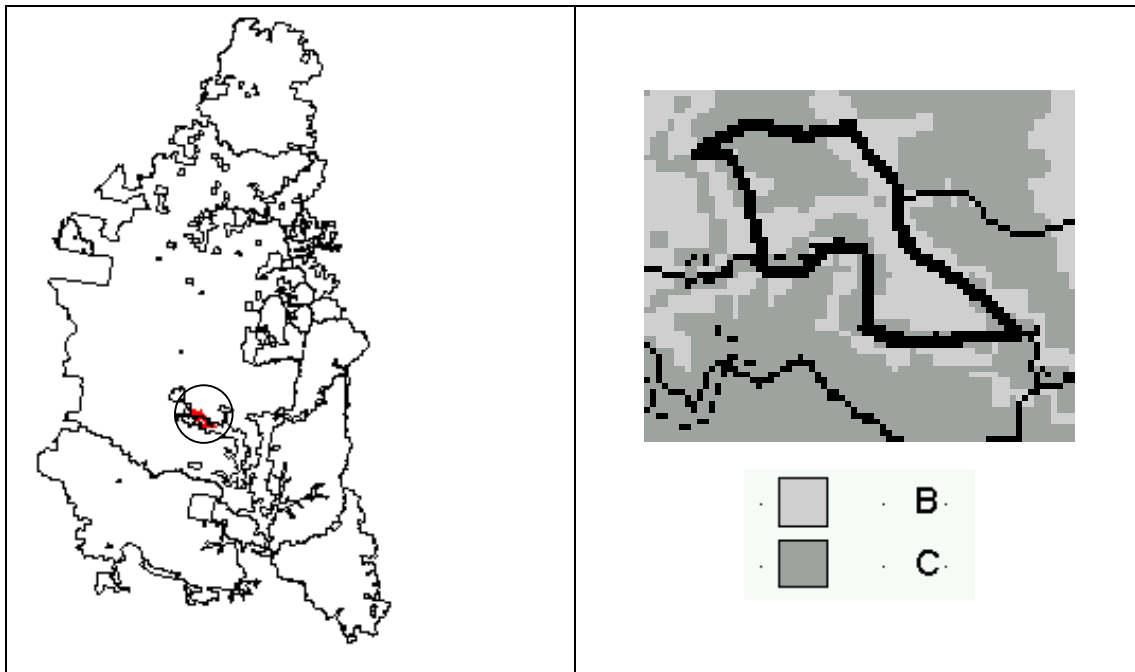
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Old Great North Road and Mogo Creek Road, some 100 to 200 metres deep and an incendiary drop along the ridges.
- Implement a strip burn around the Mogo Camping area and Mogo Creek Community some 100-200 metres
- Implement a strip burn from both sides of 4WD Management Access – UN344 some 40 metres deep
- Avoid fuel loads greater than 15 t/ha within 40 metres off the tracks and ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BAILEY STRATEGIC FIRE MANAGEMENT ZONE 22



Characteristics of Zone						
Area in Hectares 377.2		% of Study Area 0.1		Predominant Aspect 0 - 170° (46.4%)		
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 29.2	1 Time 28.3	2 Times 2.8	3 Times 39.7	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1995/96 42.5		1987/88 68.0			
Bushfire Behaviour Potential (% of Zone)	High 71.6		Moderate 8.5		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	45.9	12.2		C		
2a - Exposed Hawkesbury Woodland	56.2	14.9		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	195.0	51.7		B		
Unclassified	80.0	21.2		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Macdonald River Bailey Creek Macdonald Road

Background

- Dwellings located along the Macdonald River are potentially at risk to extreme fire events originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly south-west aspect with a predominant ridge line running from the north-west to the south-east.
- Two large fire events in 1995/96 1987/88 impacted 42.5% and 68.0% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2005.
- Ideally a strip burn from the rear of properties along the Macdonald River, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Limited fire advantages along the northern boundary of this zone.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Bailey Creek, Jurd Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

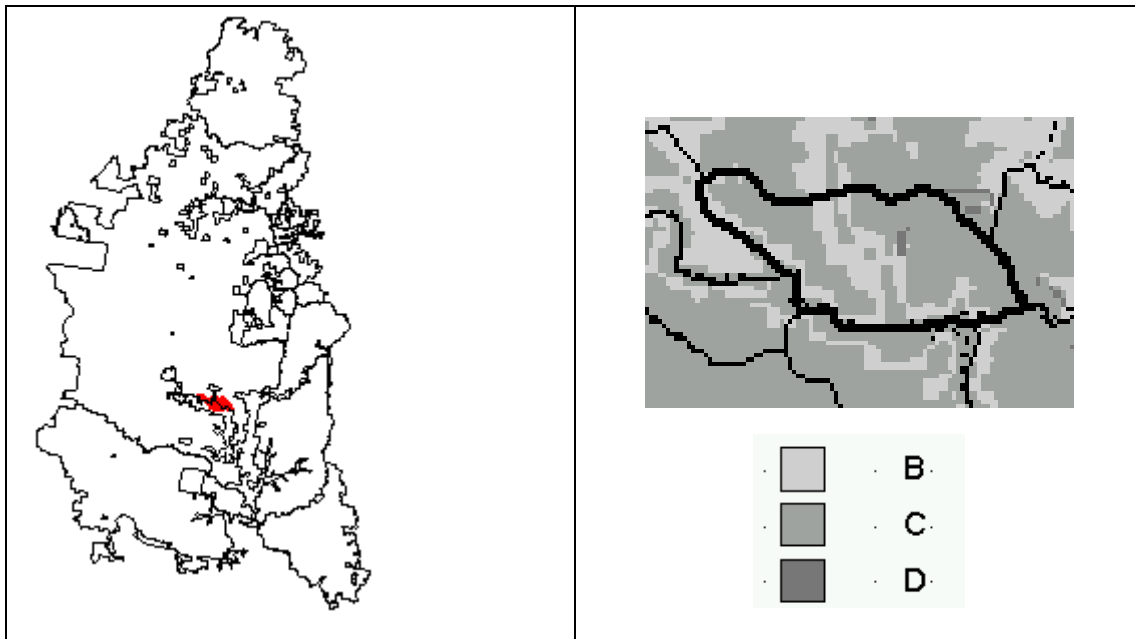
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along the Macdonald River, some 40 to 80 metres deep and an incendiary drop along the ridges. Preferably during climatic conditions where north to north-east winds dominate.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

YONDI STRATEGIC FIRE MANAGEMENT ZONE 23



Characteristics of Zone						
Area in Hectares 810.8		% of Study Area 0.3		Predominant Aspect 220 - 360° (38.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets Unidentified buildings		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 44.6	1 Time 27.7	2 Times 25.0	3 Times 2.6	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1994/95 18.5		1992/93 10.5		1987/88 38.2	
Bushfire Behaviour Potential (% of Zone)	High 82.4		Moderate 5.3		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	264.2	32.6		C		
2a - Exposed Hawkesbury Woodland	216.4	26.7		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	2.8	0.3		D		
3b - Sheltered Forest on Rich Soils	1.9	0.2		D		
4b - Narrabeen - Hawkesbury Ironbark Forest	231.8	28.6		B		
Unclassified	93.7	11.6		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Macdonald River Thompson Creek and tributaries Bailey Creek Macdonald Road Horse Trail – UN238

Background

- Dwellings located along the Macdonald River are potentially at risk to extreme fire events originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly south-west aspect with a predominant ridges running from the north-west to the south-east.
- Two fire events in 1994/95 and 1987/88 impacted 18.5% and 38.2% respectively of this zone. 44.6% of this zone has been Unburnt since at least 195/76.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2005.
- Ideally a strip burn from the rear of properties along the Macdonald River, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Limited fire advantages along the northern boundary of this zone.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Bailey Creek, Thompson Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

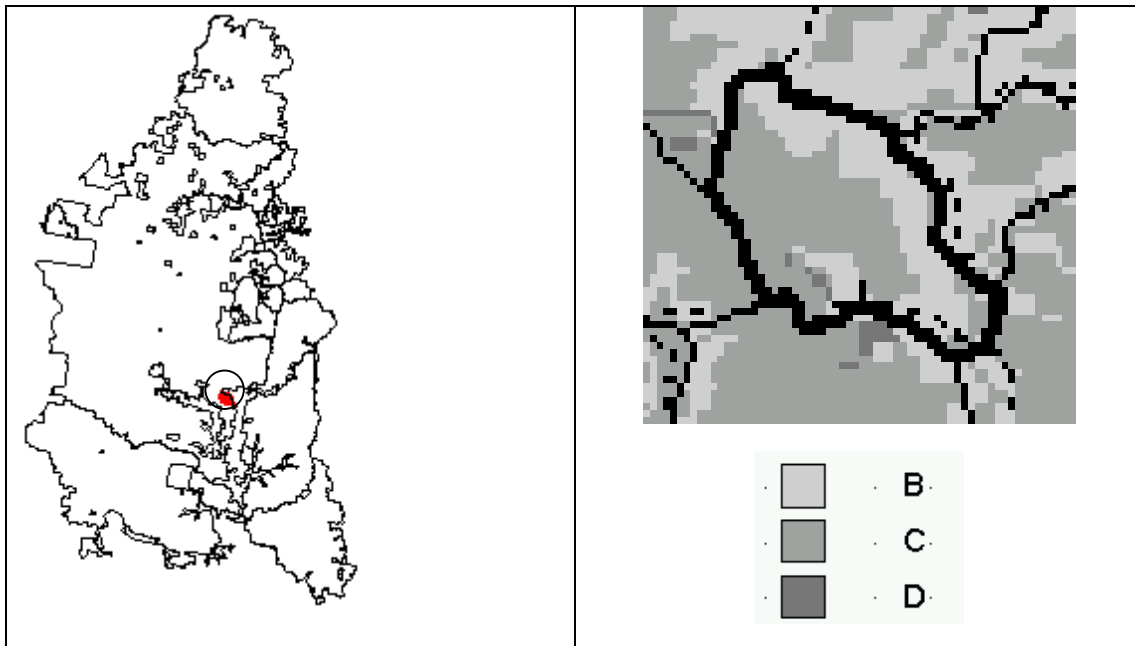
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along the Macdonald River, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Implement controlled burning during climatic conditions where north to north-east winds dominate.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

PERRYS CROSSING STRATEGIC FIRE MANAGEMENT ZONE 24



Characteristics of Zone						
Area in Hectares 455.9		% of Study Area 0.2		Predominant Aspect 0 - 170° (64.7%)		
Fire Protection Zone Strategic Fire Management		Major Assets House		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with deposit, Rock Engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 81.2	1 Time 16.4	2 Times 2.3	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 2.3		1993/94 11.7		1992/93 4.7	
Bushfire Behaviour Potential (% of Zone)	High 83.7		Moderate 10.4		Low 0.2	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	65.6	14.4		C		
2a - Exposed Hawkesbury Woodland	173.4	38.0		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	4.7	1.0		D		
3d - Rough -barked Apple Woodland on alluvium	17.8	3.9		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	170.0	37.3		B		
Unclassified	24.4	5.3		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Auburn Creek Broad Arm Mogo Creek Horse Trail – UN238

Background

- Dwellings located within the tributary to Mogo Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly south-west and north-east aspect with a predominant ridge line running from the north-west to the south-east.
- Fire events in 1997/98 and 1993/94 impacted 2.3% and 11.7% respectively of this zone.
- 81.2% of this zone has not been burnt since at least 1975/76.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Auburn Creek, Mogo Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

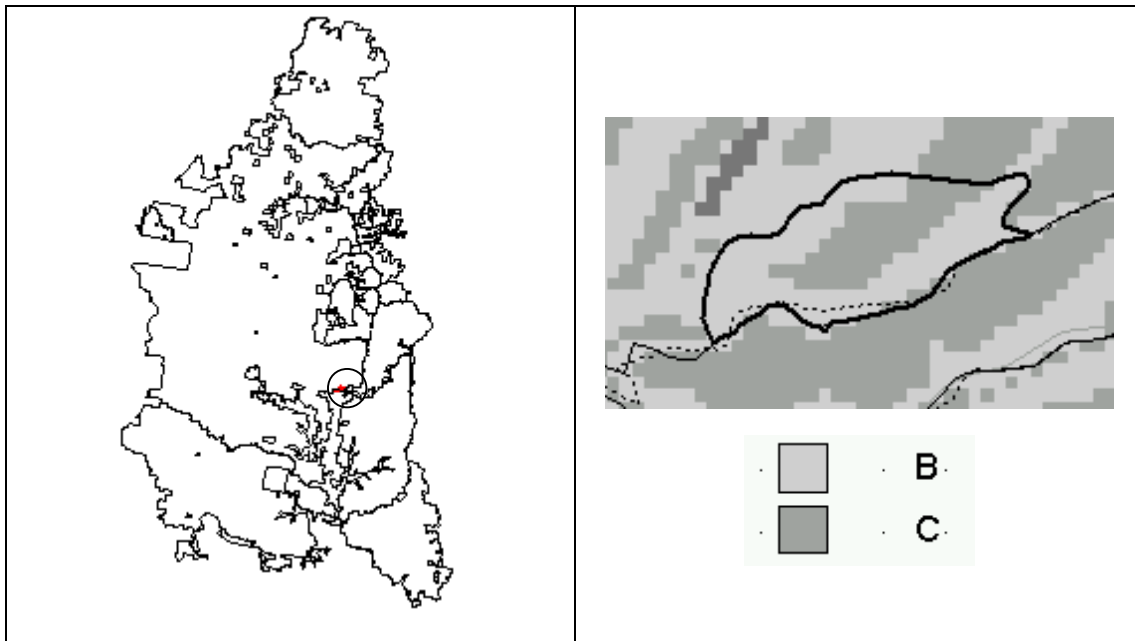
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BROAD ARM STRATEGIC FIRE MANAGEMENT ZONE 25



Characteristics of Zone						
Area in Hectares 190.5		% of Study Area 0.1			Predominant Aspect 220 - 360° (46.4%)	
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 95.4	2 Times 4.6	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		Jan 94 89.8		1979/80 95.4		N/A
Bushfire Behaviour Potential (% of Zone)		High 93.8		Moderate 5.8		Low 0.0
Structural Vegetation Type	Hectares within Zone	% within Zone			Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	29.1	15.3			C	
2a - Exposed Hawkesbury Woodland	38.4	20.2			C	
3d - Rough -barked Apple Woodland on alluvium	6.6	3.4			B	
4b - Narrabeen - Hawkesbury Ironbark Forest	115.3	60.5			B	
Unclassified	1.1	0.6			N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Broad Arm Broad Arm tributary Boree Track

Background

- Dwellings located along Boree Track are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly north-west and south-east aspect with a predominant ridge line running from the north-east to the south-west.
- Two large fire events in Jan 94 and 1979/80 impacted 89.8% and 95.4% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Broad Arm and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

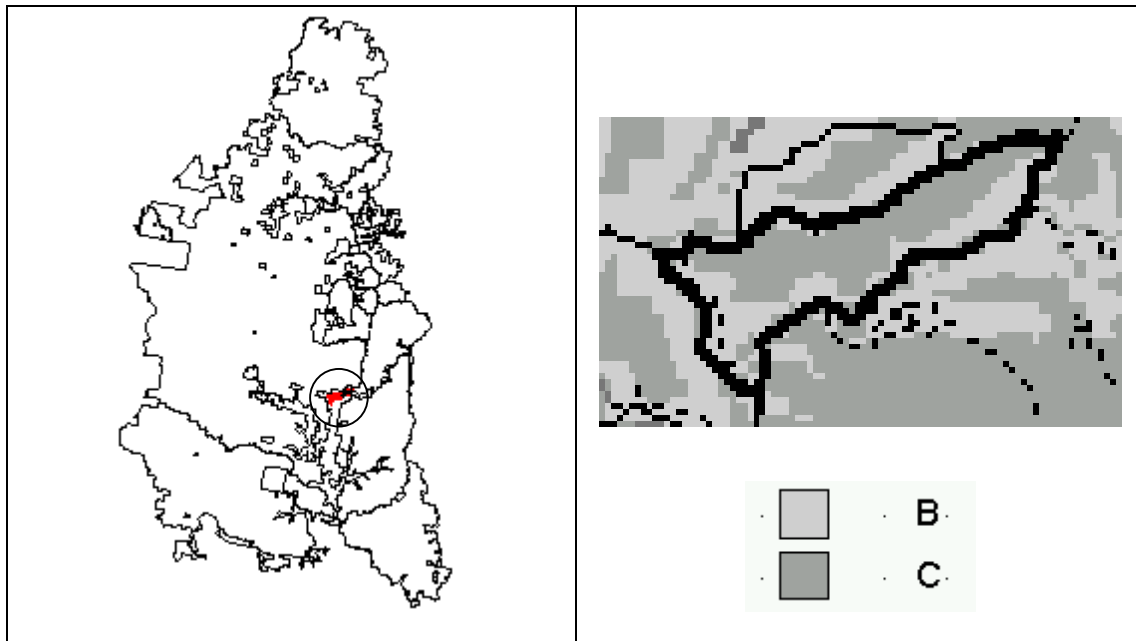
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

FERNANCES STRATEGIC FIRE MANAGEMENT ZONE 26



Characteristics of Zone						
Area in Hectares 447.7		% of Study Area 0.2			Predominant Aspect 0 - 170° (43.2%)	
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified), House, Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 27.8	2 Times 72.1	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		Jan 94 45.4		1979/80 59.7		N/A
Bushfire Behaviour Potential (% of Zone)		High 86.7		Moderate 8.1		Low 0.0
Structural Vegetation Type	Hectares within Zone	% within Zone			Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	98.4	22.0			C	
2a - Exposed Hawkesbury Woodland	130.3	29.1			C	
3d - Rough -barked Apple Woodland on alluvium	36.6	8.2			B	
4b - Narrabeen - Hawkesbury Ironbark Forest	155.6	34.8			B	
Unclassified	26.8	6.0			N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Mogo Creek Boree Track Mogo Creek Road

Background

- Dwellings located along Mogo Creek, Boree Track and Auburn Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a variable aspect and steep slopes with a predominant ridge in a north-east to south-west pattern.
- Two large fire events in Jan 94 and 1979/80 impacted 45.4% and 59.7% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a perimeter strip burn from the rear of properties, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Broad Arm, Mogo Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

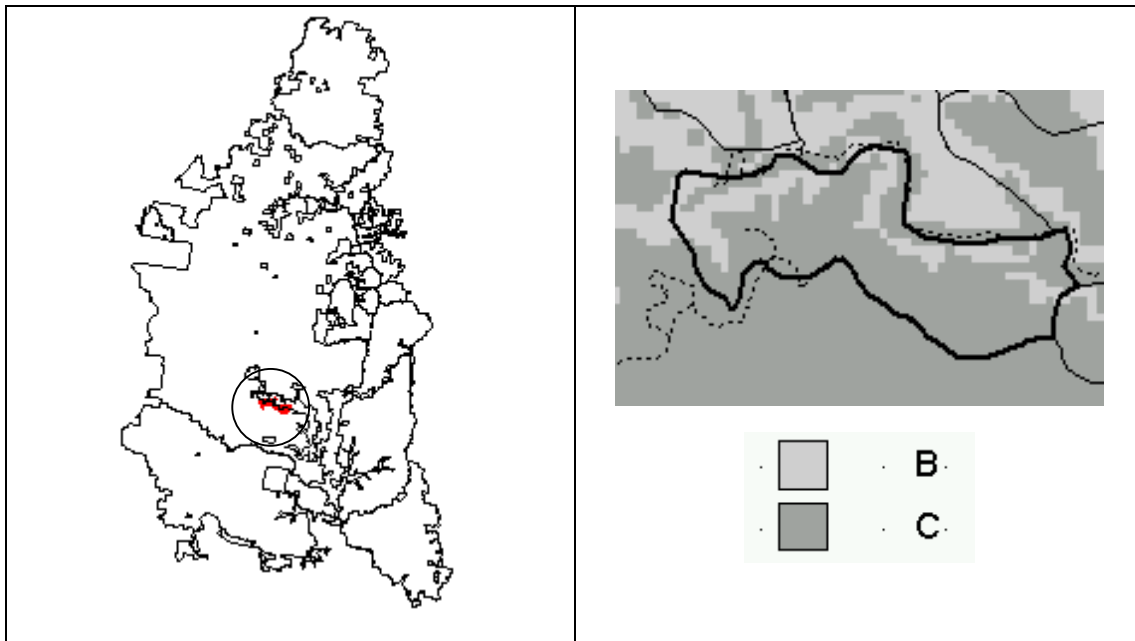
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a perimeter strip burn from the rear of properties, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LITTLE MELON STRATEGIC FIRE MANAGEMENT ZONE 27



Characteristics of Zone						
Area in Hectares 576.3		% of Study Area 0.2			Predominant Aspect 0 - 170° (60.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 83.3	1 Time 16.7	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1992/93 1.9		1991/92 14.8		
Bushfire Behaviour Potential (% of Zone)		High 75.8		Moderate 7.8		Low 0.0
Structural Vegetation Type	Hectares within Zone	% within Zone			Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	52.5	9.1			C	
2a - Exposed Hawkesbury Woodland	309.0	52.2			C	
4b - Narrabeen - Hawkesbury Ironbark Forest	133.8	23.2			B	
Unclassified	89.1	15.5			N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Macdonald River Little Melon Creek Gorricks Creek Track

Background

- Dwellings located along the Macdonald River are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly north aspect with a predominant ridge line running from the west to east.
- Two fire events in 1992/93 and 1991/92 impacted 1.9% and 14.8% respectively of this zone.
- 83.3% of this zone has not been burnt since at least 1975/76.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn from the Gorricks Creek Track, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Little Melon Creek, Gorricks Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

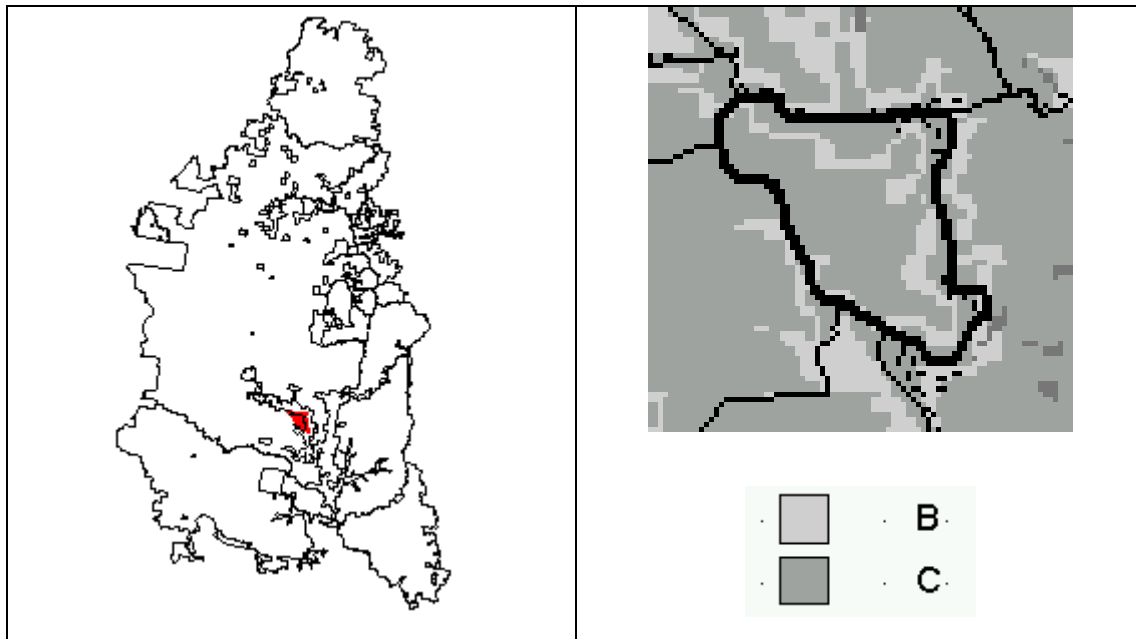
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Gorricks Creek Track, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BAILEY STRATEGIC FIRE MANAGEMENT ZONE 28



Characteristics of Zone						
Area in Hectares 696.5		% of Study Area 0.3			Predominant Aspect 0 - 170° (54.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Rock engraving, Stone arrangement			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 87.7	1 Time 12.3	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1991/92 9.2		1989/90 3.1			
Bushfire Behaviour Potential (% of Zone)	High 65.9		Moderate 4.9		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	19.0	2.5		C		
2a - Exposed Hawkesbury Woodland	120.0	15.5		C		
3d - Rough-barked Apple Woodland on alluvium	43.0	5.5		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	539.0	69.6		B		
Unclassified	53.0	6.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Brush tailed Rock Wallaby
Threatened Flora	Nil
Fire Advantages	Macdonald River Gorricks Creek

Background

- Dwellings located along the Macdonald River are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly north-east aspect with a predominant ridge line running from the north-west to the south-east.
- Two fire events in 1991/92 1989/90 and impacted 9.2% and 3.1% respectively of this zone.
- 87.5% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to Brush-tailed Rock Wallaby
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn from the rear of properties along the Macdonald River, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Limited fire advantages along the south-western boundary of this zone.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Gorricks Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

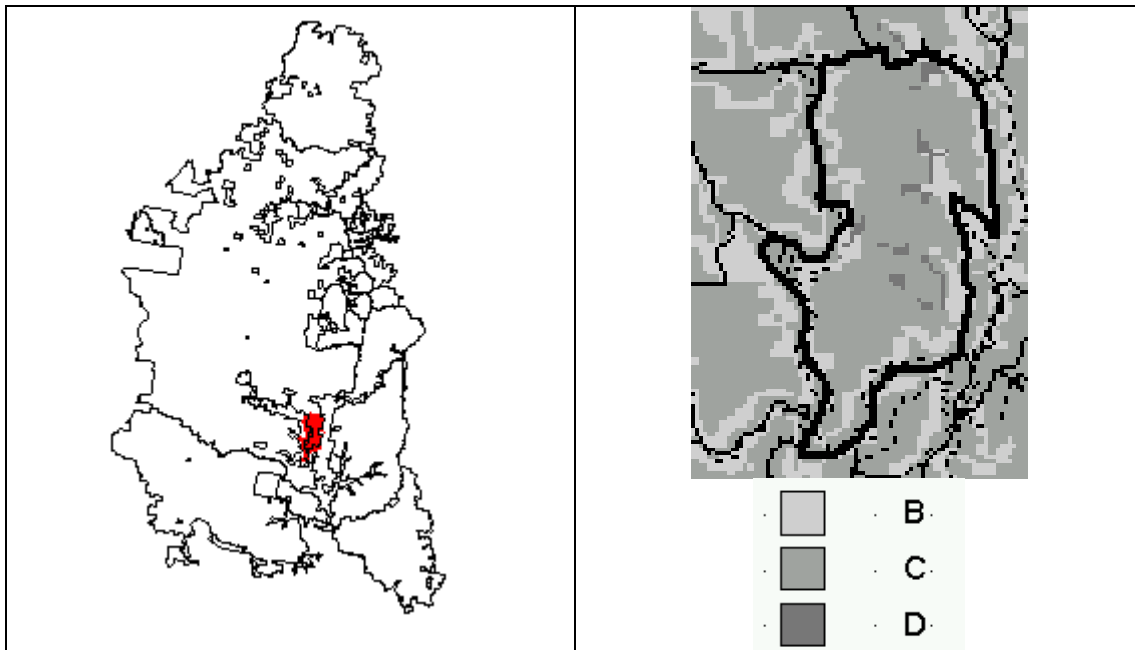
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along the Macdonald River, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Implement controlled burning during climatic conditions where north to south-west winds dominate.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

UPPER MACDONALD EAST STRATEGIC FIRE MANAGEMENT ZONE 29



Characteristics of Zone						
Area in Hectares 1632		% of Study Area 0.6		Predominant Aspect 0 - 170° (46.7)		
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified), Houses, Sheds		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Shelter with deposit, Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 71.8	1 Time 7.2	2 Times 17.7	3 Times 3.9	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 21.0		1992/93 9.8		1991/92 1.3	
Bushfire Behaviour Potential (% of Zone)	High 77.3		Moderate 10.9		Low 0.3	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	317.8	19.5		C		
2a - Exposed Hawkesbury Woodland	695.6	42.6		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	47.8	2.9		D		
3b - Sheltered Forest on Rich Soils	15.9	1.0		D		
3d - Rough -barked Apple Woodland on alluvium	1.9	0.1		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	359.9	22.1		B		
Unclassified	193.1	11.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Grass Owl Yellow-bellied Glider Brush-tailed Rock-wallaby	
Threatened Flora	Nil	
Fire Advantages	Mogo Creek MacDonald Creek MacDonald Road	UN274 Track Horse trail – UN238 Escarpments

Background

- Dwellings located along MacDonald and IN274 Track are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect and steep slopes associated with the Hunter Range and Bulga Creek.
- This zone has a variable aspect and steep slopes with predominant ridges in a north to south pattern.
- Fire events including 1997/98 and 1992/93 impacted on 21% and 9.8% respectively of this zone.
- 71.8% of this zone has not been burnt since at least 1995/96.
- There are species issues in the zone relative to the Grass Owl, Yellow-bellied Glider and Brush-tailed Rock-wallaby,
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from the rear of properties along the Macdonald River, Mogo River and MacDonald Road (where appropriate) some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Bulga Creek, Wilks Creek and Werong Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

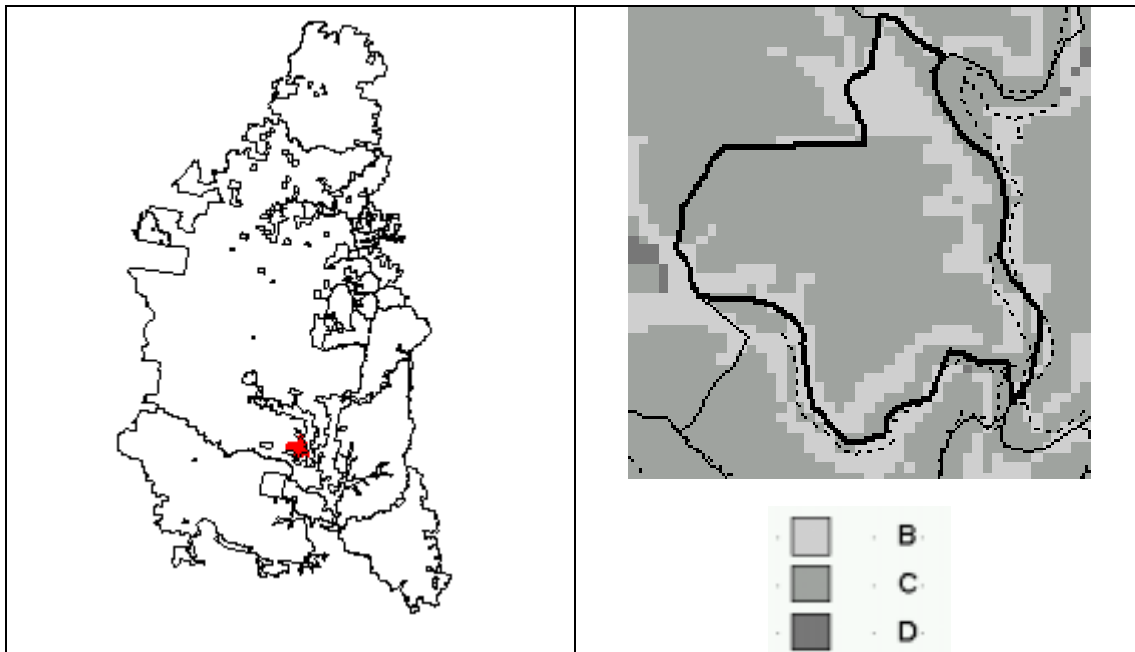
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along the Macdonald River, Mogo River and MacDonald Road (where appropriate) some 40 to 80 metres deep and an incendiary drop along the ridges
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

UPPER MACDONALD WEST STRATEGIC FIRE MANAGEMENT ZONE 30



Characteristics of Zone						
Area in Hectares 770.2		% of Study Area 0.3		Predominant Aspect 0 - 170° (53.8%)		
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Sheds		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit, Rock engraving, Stone arrangement		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 22.3	1 Time 77.7	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1977/78 77.7		N/A		N/A	
Bushfire Behaviour Potential (% of Zone)	High 79.4		Moderate 8.7		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	187.5		24.3		C	
2a - Exposed Hawkesbury Woodland	268.1		34.8		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	210.9		27.4		B	
Unclassified	103.7		13.5		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Womerah Creek MacDonald River Gorricks Creek Escarpments

Background

- Dwellings located along Womerah Creek and MacDonald River are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a variable aspect and steep slopes
- One fire events in 1977/78 impacted 77.7% respectively of this zone.
- 22.3% of this zone has not been burnt since at least 1975/76.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2007.
- Ideally a strip burn from the rear of properties along Womerah Creek, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Womerah Creek, Gorricks Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

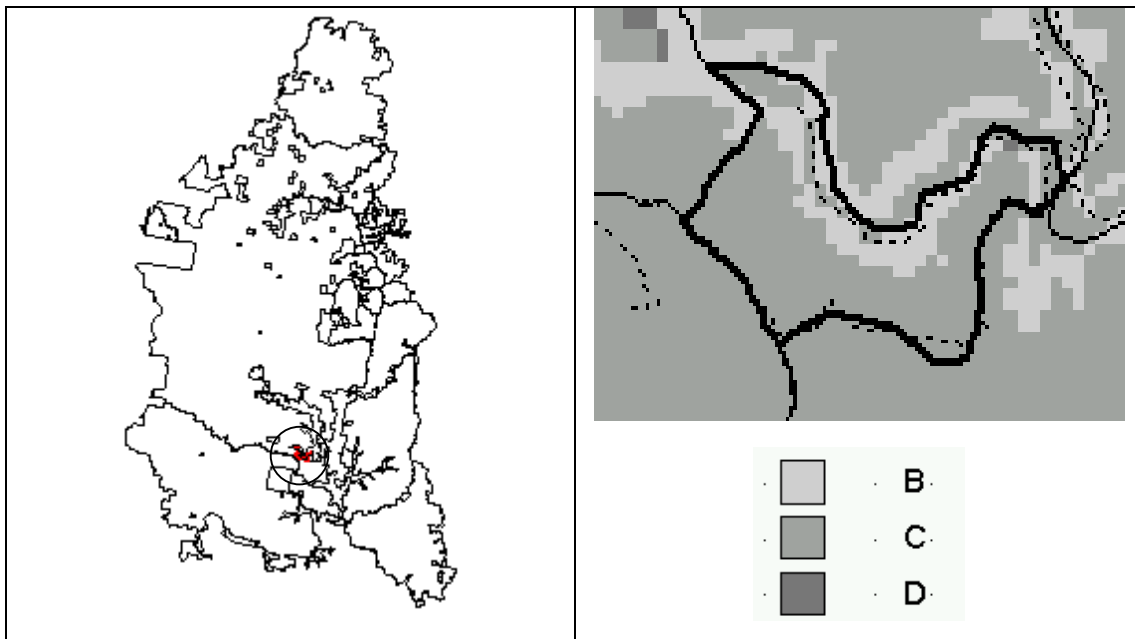
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along Womerah Creek, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WOMERAH NORTH STRATEGIC FIRE MANAGEMENT ZONE 31



Characteristics of Zone						
Area in Hectares 378.5		% of Study Area 0.1		Predominant Aspect 0 - 170° (57.6%)		
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Sheds		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 71.8	1 Time 28.2	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1977/78 28.2				
Bushfire Behaviour Potential (% of Zone)		High 75.2		Moderate 12.5		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	68.4		18.1		C	
2a - Exposed Hawkesbury Woodland	172.2		45.5		C	
3b - Sheltered Forest on Rich Soils	0.9		0.2		D	
4b - Narrabeen - Hawkesbury Ironbark Forest	87.2		23.0		B	
Unclassified	49.7		13.1		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala
Threatened Flora	Nil
Fire Advantages	Womerah Creek Private Access – UN273 Merechnies Track Womerah Track/ Milk Can Hill Escarpment

Background

- Dwellings located along Womerah Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly north-west to north-east aspect with a predominant ridge line running from the north-west to the north-east.
- One fire events in 1977/78 impacted 28.2% of this zone.
- 71.8% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Koala
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2007.
- Ideally a strip burn from the Merechnies Track, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Womerah Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

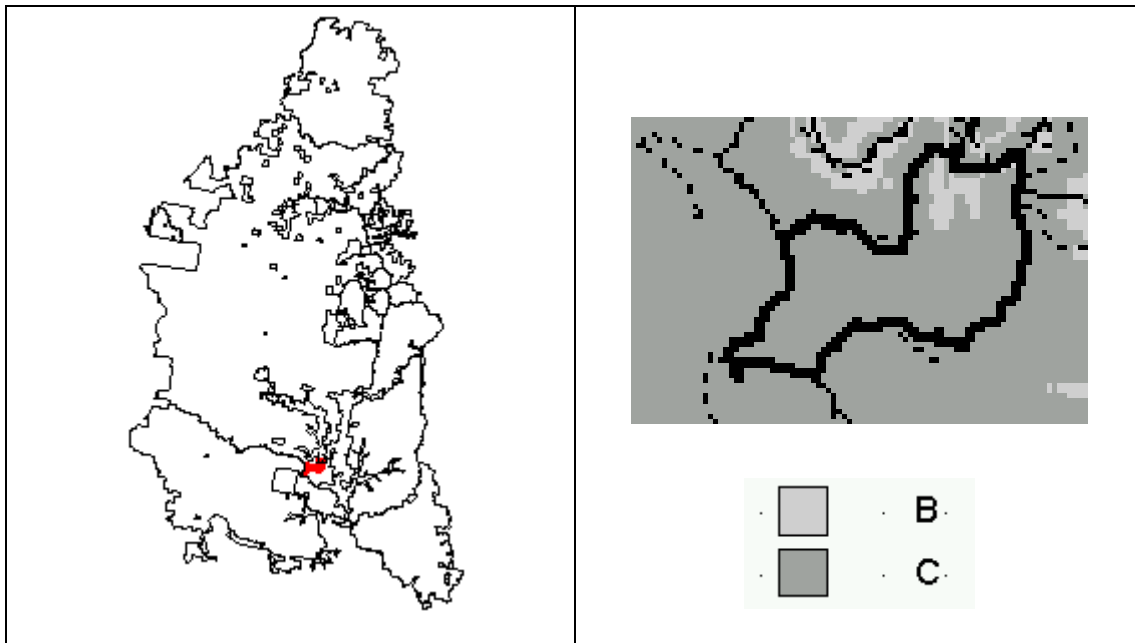
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Merechnies Track, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WOMERAH SOUTH STRATEGIC FIRE MANAGEMENT ZONE 32



Characteristics of Zone						
Area in Hectares 615.3		% of Study Area 0.2			Predominant Aspect 0 - 170° (48.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets House, Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 77.4	1 Time 20.8	2 Times 1.7	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1991/92 5.2		1989/90 1.7		
Bushfire Behaviour Potential (% of Zone)		High 83.7		Moderate 13.1		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	264.4		43.0		C	
2a - Exposed Hawkesbury Woodland	289.7		47.1		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	42.2		6.9		B	
Unclassified	19.1		3.1		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala	
Threatened Flora	<i>Tetratheca glandulosa</i>	
Fire Advantages	MacDonald River Escarpments Bridale Track	Womerah Track/ Milk Can Hill Merechnies Track

Background

- Dwellings located along the MacDonald River are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park
- This zone has a variable aspect and steep slopes associated with the MacDonald River and Tributary Valley
- One fire event in 1989/90 impacted 1.7% of this zone
- 77.4% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Koala *Tetratheca glandulosa*.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn from the Bridale Track and Womerah Track/ Milk Can Hill, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Limited fire advantages along the south-western boundary of this zone.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of MacDonald River and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

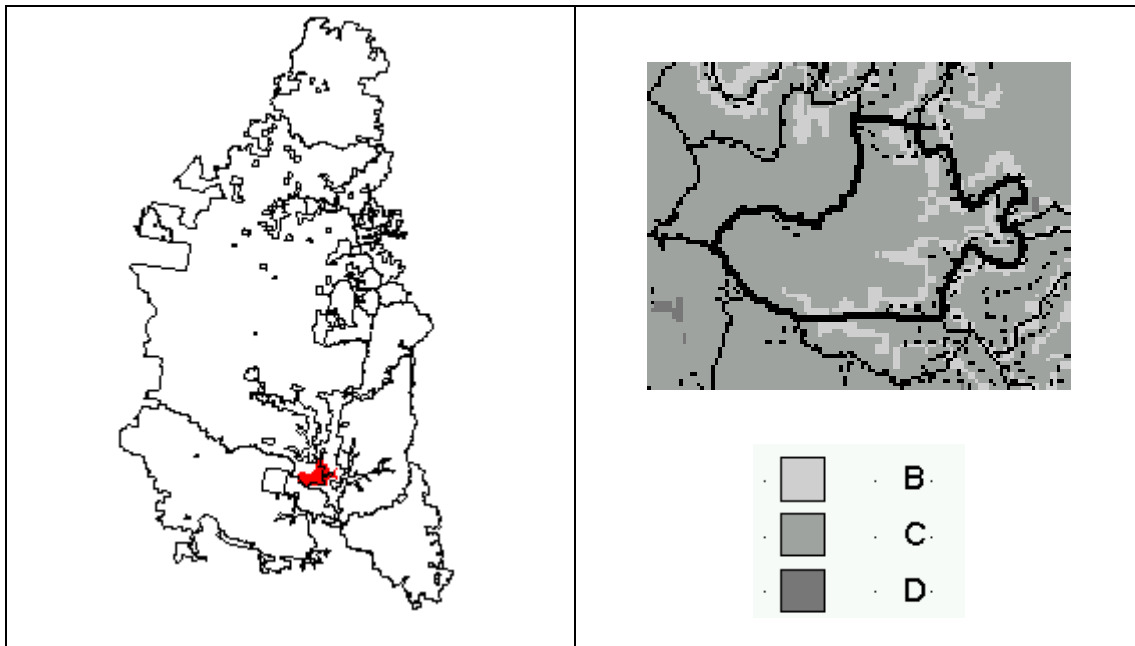
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Bridale Track and Womerah Track/ Milk Can Hill, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

KIEF STRATEGIC FIRE MANAGEMENT ZONE 33



Characteristics of Zone						
Area in Hectares 1257.3		% of Study Area 0.5			Predominant Aspect 0 - 170° (59.9%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified), Houses, Sheds			Cultural Resources Kief Trig	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit, Rock engraving			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 57.5	1 Time 30.6	2 Times 5.1	3 Times 6.0	4 Times 0.9	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1996/97 2.6		1994/95 8.5		1991/92 12.7
Bushfire Behaviour Potential (% of Zone)		High 69.8		Moderate 12.0		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	390.0		31.0		C	
2a - Exposed Hawkesbury Woodland	408.7		32.5		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	209.0		16.6		B	
Unclassified	249.6		19.9		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala	
Threatened Flora	<i>Tetratheca glandulosa</i>	
Fire Advantages	Bridale Track Kief Trig Track MacDonald Road Escarpments	4wd Public Road – UN266 Flemings Creek and tributaries

Background

- Dwellings located along the MacDonald River and the community of St Albans are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park
- This zone has predominantly south-east aspect and steep slopes with predominant ridges in a north-west to south-east pattern.
- Many fire events including 1996/97 and 1991/92 impacted 2.6% and 12.7% respectively of this zone.
- 57.5% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Koala and *Tetratheca glandulosa*
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2007.
- Ideally a strip burn from the Bridale Track, and the rear of properties associated with St Albans south some 40 to 80 metres deep and an incendiary drop along the ridges. This would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Flemings Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

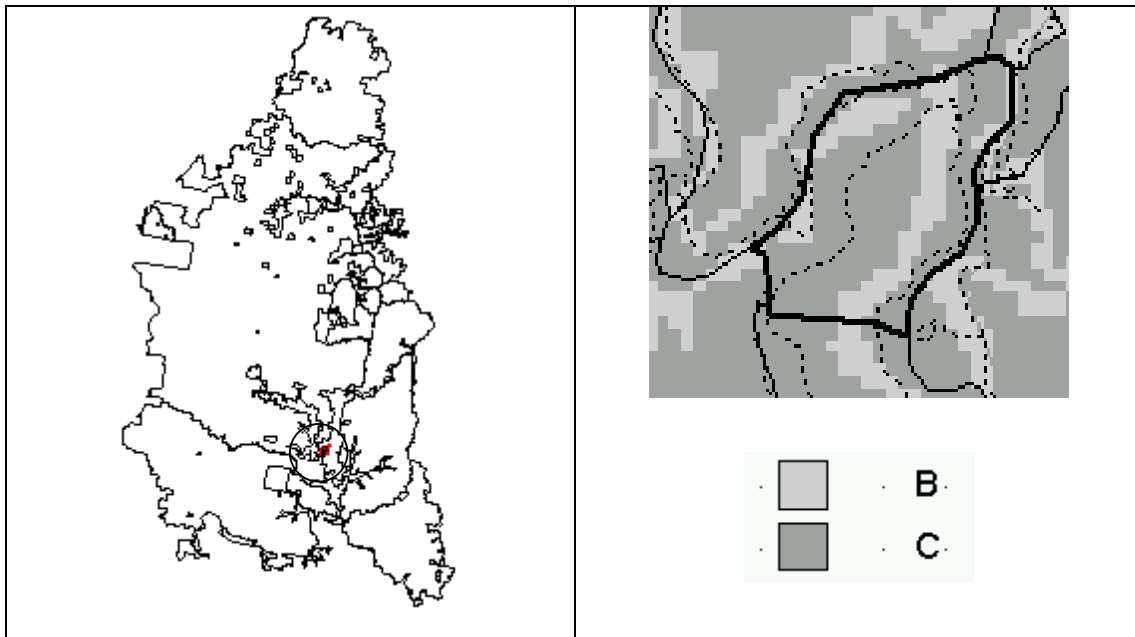
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Bridale Track, , and the rear of properties associated with St Albans south some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WOMERAH EAST STRATEGIC FIRE MANAGEMENT ZONE 34



Characteristics of Zone						
Area in Hectares 278.8		% of Study Area 0.1			Predominant Aspect 0 - 170° (55.8%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified), Houses, Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 23.4	1 Time 26.8	2 Times 46.0	3 Times 3.8	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1994/95 49.8		1989/90 30.7		N/A	
Bushfire Behaviour Potential (% of Zone)	High 67.1		Moderate 7.9		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	36.6	13.1		C		
2a - Exposed Hawkesbury Woodland	83.6	30.0		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	80.8	29.0		B		
Unclassified	77.8	27.9		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Bridale Track MacDonald River and tributaries MacDonald Road Horse Trail – UN257 High Swamp

Background

- Dwellings located along MacDonald River are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly north-west and south-east aspect with a predominant ridge line running from the south-west to the north-east.
- Large fire events in 1994/95 and 1989/90 impacted 49.8% and 30.7% respectively of this zone.
- 23.4% of this zone has not been burnt since at least 1975/76.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn around the full perimeter (MacDonald Road and Bridale Track) and the rear of dwellings, some 40 to 80 metres deep and an incendiary drop along the ridges. This would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of MacDonald River tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

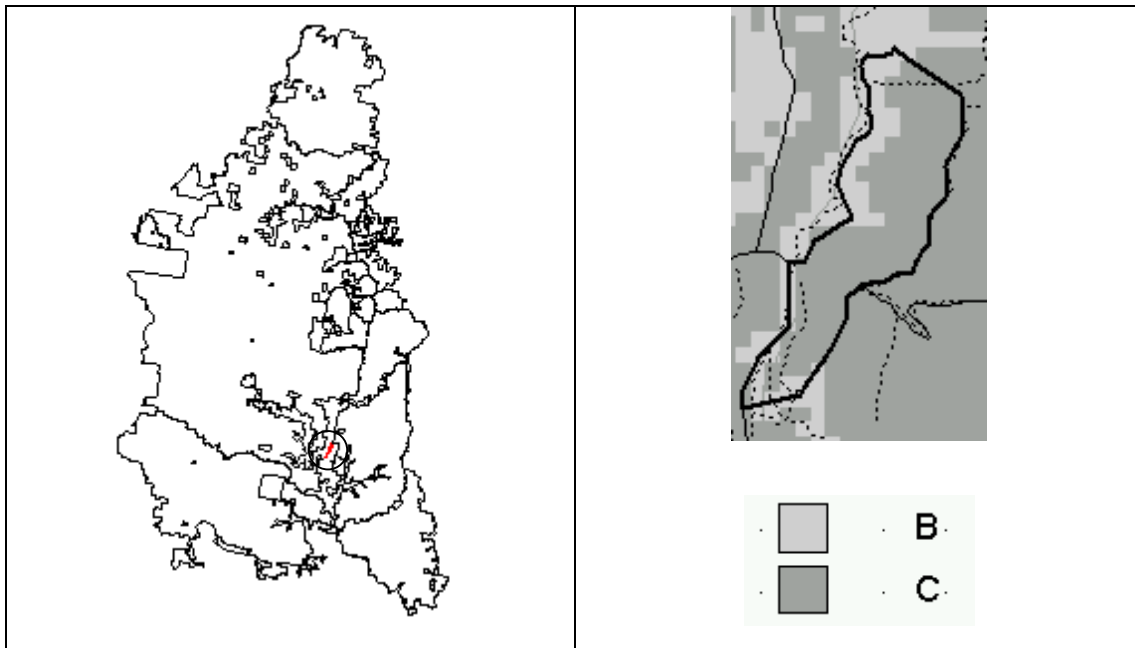
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Old Bulga Road, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Implement controlled burning during climatic conditions where north to north-east winds dominate.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

St ALBANS COMMON STRATEGIC FIRE MANAGEMENT ZONE 35



Characteristics of Zone						
Area in Hectares 121.4		% of Study Area 0.04			Predominant Aspect 220 - 360° (76.4%)	
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 11.9	1 Time 0.0	2 Times 88.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1994/95 88.1		N/A		N/A
Bushfire Behaviour Potential (% of Zone)		High 95.4		Moderate 3.6		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	28.1		23.2		C	
2a - Exposed Hawkesbury Woodland	62.8		51.7		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	27.2		22.4		B	
Unclassified	3.3		2.7		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Regent Honeyeater Koala	
Threatened Flora	Nil	
Fire Advantages	MacDonald River Mogo Creek Horse Trail – UN254 4wd Public Road – UN266 Mogo Creek Road	Private Access – UN267 Private Access – UN270 Private Access – UN271

Background

- Dwellings located along 4wd Public Road – UN266 and Private Access UN 271 are potentially at risk to extreme fire event originating from Parr State Recreation Area and Yengo National Park.
- This zone has a predominantly west north -west aspect
- One large fire event in 1994/95 impacted 88.1% of this zone.
- There are species issues in the zone relative to Regent Honeyeater and Koala.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a perimeter strip burn (behind properties along Mogo Creek Road and 4wd Public Road – UN266) some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian areas
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

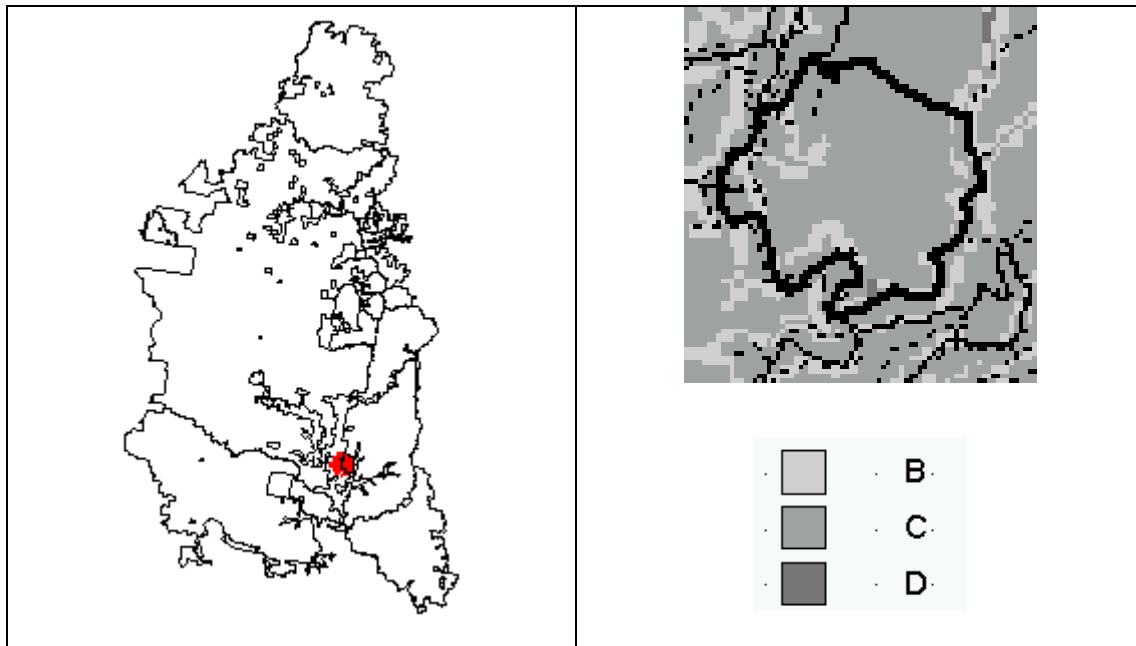
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a perimeter strip burn (behind properties along Mogo Creek Road and 4wd Public Road – UN266) some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

St ALBANS STRATEGIC FIRE MANAGEMENT ZONE 36



Characteristics of Zone						
Area in Hectares 959.8		% of Study Area 0.4			Predominant Aspect 0 - 170° (47.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets St Albans community, House/shed			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 24.3	1 Time 72.4	2 Times 3.3	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1994/95 2.2		1990/91 73.5		1989/90 1.1
Bushfire Behaviour Potential (% of Zone)		High 77.0		Moderate 6.0		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	262.5		27.3		C	
2a - Exposed Hawkesbury Woodland	384.4		40.0		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	4.7		0.5		D	
3b - Sheltered Forest on Rich Soils	0.9		0.1		D	
4b - Narrabeen - Hawkesbury Ironbark Forest	150.8		15.7		B	
Unclassified	156.6		16.3		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo	
Threatened Flora	<i>Olearia cordata</i> <i>Prostanthera cineolifera</i>	
Fire Advantages	Escarpments Wellums Creek and tributaries Mogo Creek Road Swamp	Long Wellums Track Settlers Road Private Access 268 Private Access 269 Wellums Lake

Background

- Dwellings located within the settlement of St Albans and along Mogo Creek Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect and steep slopes with predominant ridges in a north-east to south-west pattern.
- One significant fire events in 1990/91 impacted 73.5% respectively of this zone.
- 24.3% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Glossy Black Cockatoo, *Olearia cordata* and *Prostanthera cineolifera*.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2005.
- Ideally a strip burn from the rear of properties along Mogo Creek Road, Private Access 268, Long Wellums Track and Private Access 269, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Wellums Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

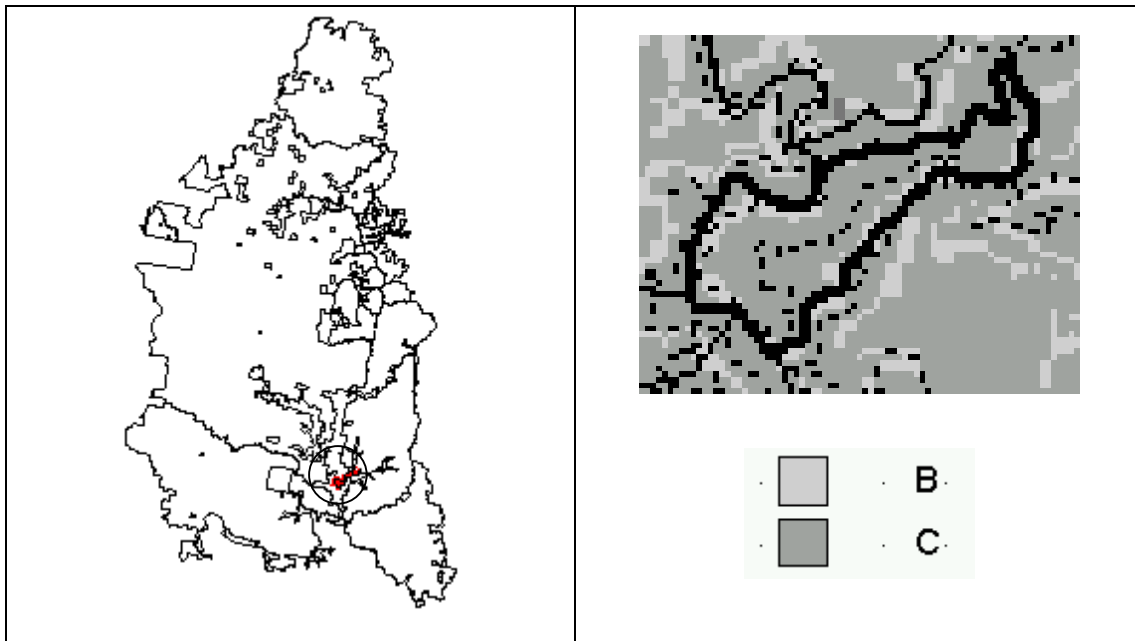
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along Mogo Creek Road, Private Access 268, Long Wellums Track and Private Access 269, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WRIGHTS CREEK STRATEGIC FIRE MANAGEMENT ZONE 37



Characteristics of Zone						
Area in Hectares 460.0		% of Study Area 0.2		Predominant Aspect 0 - 170° (45.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified), Houses		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 53.5	1 Time 46.5	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1989/90 46.5					
Bushfire Behaviour Potential (% of Zone)	High 57.0		Moderate 3.6		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	30.9	6.7		C		
2a - Exposed Hawkesbury Woodland	141.6	30.8		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	103.0	21.8		B		
Unclassified	187.3	40.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Regent Honeyeater Yellow bellied Glider	
Threatened Flora	Nil	
Fire Advantages	Settlers Road Wrights Creek and Tributaries Wrights Creek Track	Wrights Creek Road Blue Hill Track Powerline Easement Wellum Lake

Background

- Dwellings located along Wrights Creek and Macdonald River are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly north-west and south-east aspect with a predominant ridge line running from the south-west to the north-east.
- One fire events in 1989/90 impacted 46.5% of this zone.
- 53.5% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Regent Honeyeater and Yellow bellied Glider.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2000.
- Ideally a strip burn from Mogo Creek Road and Wrights Creek Road, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Wrights Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

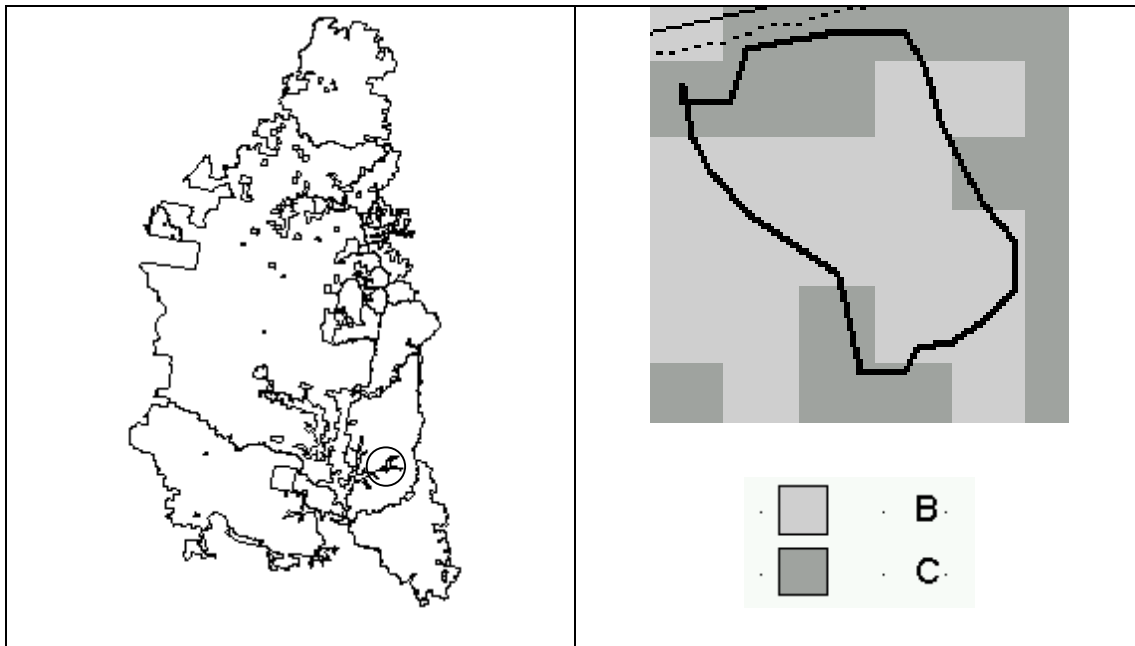
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a Ideally a strip burn from Mogo Creek Road and Wrights Creek Road, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WRIGHTS CREEK FORD TRATEGIC FIRE MANAGEMENT ZONE 38



Characteristics of Zone						
Area in Hectares 10.7		% of Study Area 0.004		Predominant Aspect 220 - 360° (56.0%)		
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified)		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 100	1 Time	2 Times	3 Times	4 Times	5 Times
Year of Last 3 Fires (WF/PB) % of Zone Burnt						
Bushfire Behaviour Potential (% of Zone)		High 41.2		Moderate 51.5		Low 0.0
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	0.66	6.2		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	7.5	70.1		B		
Unclassified	3.2	29.6		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Wrights Creek and Tributaries Wrights Creek Road Orchards

Background

- This area is a source of accidental ignitions, this zone will prevent any unplanned fires from gaining intensity and impacting on the Reserve areas. Dwelling located around Wrights Creek Ford are potentially at risk to extreme fire events.
- This zone has variable aspect with a predominant ridge line running from the south-east to the north-west.
- No recorded age classes within this zone.
- Ideally a strip burn off the ridge line, some 40 to 80 metres deep, would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Limited fire advantages on the south east boundary.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Wrights Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

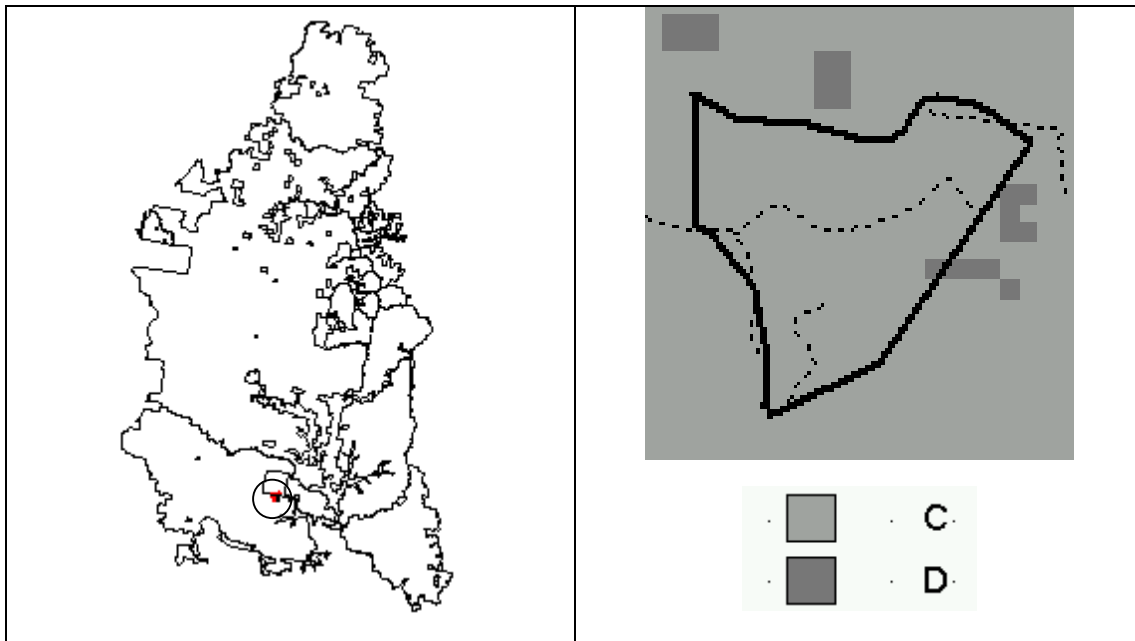
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn off the ridge line, some 40 to 80 metres deep.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

GOOGOOREWON STRATEGIC FIRE MANAGEMENT ZONE 39



Characteristics of Zone						
Area in Hectares 162.6		% of Study Area 0.1			Predominant Aspect 0 - 170° (65.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets House/Shed			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 19.7	2 Times 0.0	3 Times 67.2	4 Times 6.6	5 Times 6.6
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1997/98 85.4		1994/95 6.6		1986/87 10.8
Bushfire Behaviour Potential (% of Zone)		High 80.0		Moderate 6.8		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	53.4		32.9		C	
2a - Exposed Hawkesbury Woodland	86.2		53.0		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	0.9		0.6		D	
Unclassified	21.9		13.5		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Horse Track – UN286 Horse Track – UN287 Unsealed Public Road – UN307 Webbs Creek

Background

- This area is a source of accidental ignitions, this zone will prevent any unplanned fires from gaining intensity and impacting on the Reserve areas. Dwelling located along Webbs Creek are potentially at risk to extreme fire events.
- This zone has a predominantly north aspect with a predominant ridge line running from the east to west
- Two significant fire events in 1997/98 and 1984/85 impacted 85.4% and 100% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2008.
- Ideally a strip burn off the Horse Trail along the ridge line, some 40 to 80 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Webbs Creek tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

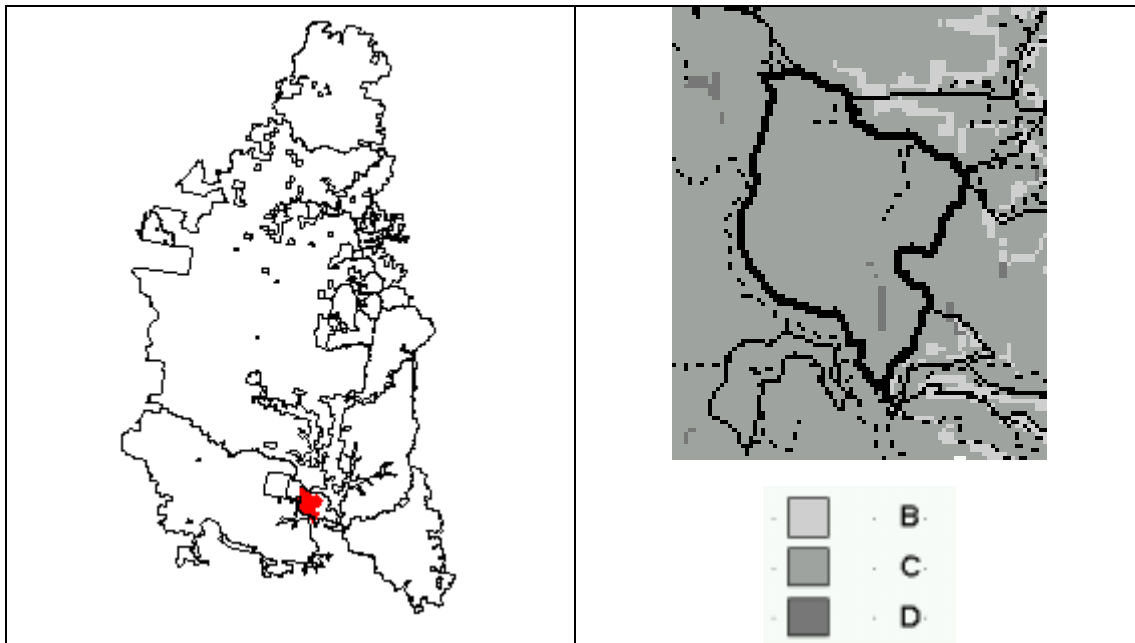
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn off the Horse Trail along the ridge line, some 40 to 80 metres deep.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WEBBS CREEK NORTH STRATEGIC FIRE MANAGEMENT ZONE 40



Characteristics of Zone						
Area in Hectares 1145		% of Study Area 0.4			Predominant Aspect 220 - 360° (47.7%)	
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit, Rock engraving			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 97.2	1 Time 2.8	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1991/92 2.8					
Bushfire Behaviour Potential (% of Zone)	High 86.0		Moderate 12.9		Low 0.1	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	710.6	62.1		C		
2a - Exposed Hawkesbury Woodland	412.5	36.0		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	9.4	0.8		D		
Unclassified	12.5	1.1		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Webbs Creek and Tributaries Womerah Track / Milk Can Hill Escarpments	Closed Track – UN261 Closed Track – UN262 Walking Track – UN320

Background

- Dwellings located along Weebs Creek and the community of Lower Macdonald are potentially at risk to extreme fire event originating from the reserves.
- This zone has a variable aspect and steep slopes with predominant ridges in a south-east to north-west pattern.
- One fire event in 1991/92 impacted 2.8% of this zone.
- 97.2% of this zone has not been burnt since at least 1975/76.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn along Womerah Track / Milk Can Hill (to maintain access) some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Webbs Creek tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

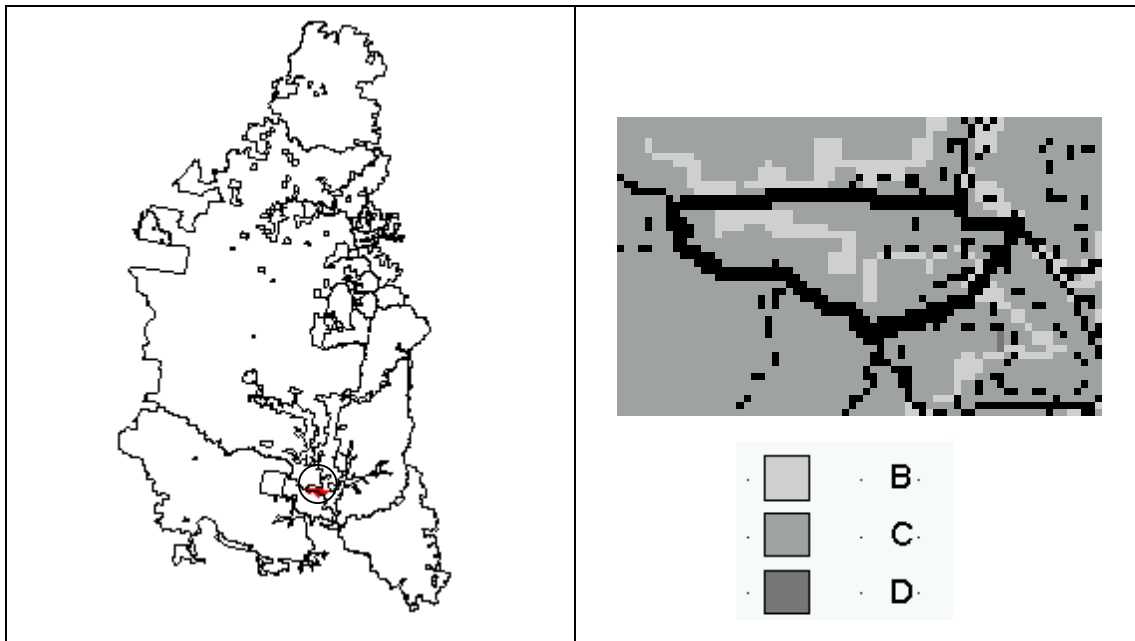
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn along Womerah Track / Milk Can Hill (to maintain access) some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

COBLERS PEG STRATEGIC FIRE MANAGEMENT ZONE 41



Characteristics of Zone						
Area in Hectares 271.2		% of Study Area 0.1			Predominant Aspect 0 - 170° (69.4%)	
Fire Protection Zone Strategic Fire Management		Major Assets House, Yards			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 88.2	1 Time 11.8	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1997/98 3.9		1989/90 7.9		
Bushfire Behaviour Potential (% of Zone)		High 66.3		Moderate 2.8		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	30.0		11.1		C	
2a - Exposed Hawkesbury Woodland	103.1		38.0		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	48.7		18.0		B	
Unclassified	89.4		32.9		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo Brush-tailed Rock-wallaby
Threatened Flora	Nil
Fire Advantages	Flemings Creek and Tributaries Flemings Creek Swamp Womerah Track / Milk Can Hill Macdonald Creek Road Escarpments

Background

- Dwellings located along Macdonald Creek Road and Central Macdonald Public School are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a predominantly northerly aspect with a predominant ridge line running from the east to west.
- Small fire events in 1997/98 and 1989/90 impacted 3.9% and 7.9% respectively of this zone.
- 88.2% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Glossy Black Cockatoo, Brush-tailed Rock-wallaby.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn from the Womerah Track / Milk Can Hill and the rear of properties along Macdonald Creek Road, some 40 to 80 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Incendiary drop should be done in conjunction with zone 42.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Flemings Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

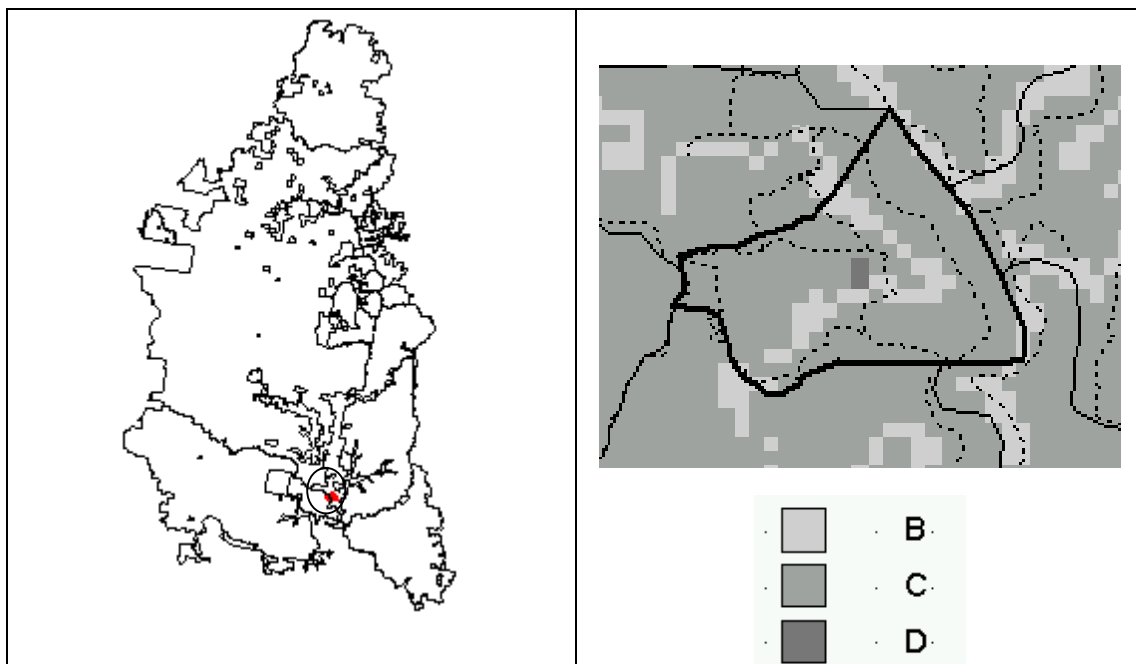
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the Womerah Track / Milk Can Hill and the rear of properties along Macdonald Creek Road, some 40 to 80 metres deep and an incendiary drop along the ridge
- Incendiary drop in conjunction with zone 42.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BAKERS GULLY STRATEGIC FIRE MANAGEMENT ZONE 42



Characteristics of Zone						
Area in Hectares 223.2		% of Study Area 0.1			Predominant Aspect 0 - 170° (73.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Shed			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit, Stone arrangement			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 52.1	1 Time 14.4	2 Times 33.5	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 47.9		1989/90 33.5			
Bushfire Behaviour Potential (% of Zone)	High 45.5		Moderate 4.9		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	55.3		24.8		C	
2a - Exposed Hawkesbury Woodland	23.4		10.5		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	0.9		0.4		D	
3b - Sheltered Forest on Rich Soils	0.9		0.4		D	
4b - Narrabeen - Hawkesbury Ironbark Forest	32.0		14.3		B	
Unclassified	110.6		49.6		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala	
Threatened Flora	Nil	
Fire Advantages	Bakers Gully and wetlands Womerah Track / Milk Can Hill	Bakers Creek / Robo's Track Escarpments Macdonald Creek Road

Background

- Dwellings located along Macdonald Creek Road and Central Macdonald Public School are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a predominantly south east aspect with a predominant ridge line running west to east along the northern boundary.
- Two fire events in 1997/98 and 1989/90 impacted 47.9% and 33.5% respectively of this zone.
- 52.1% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Koala.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a strip burn from the rear of properties along Macdonald Creek Road, some 40 to 80 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- Incendiary drop should be done in conjunction with zone 41.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Bakers Gully and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

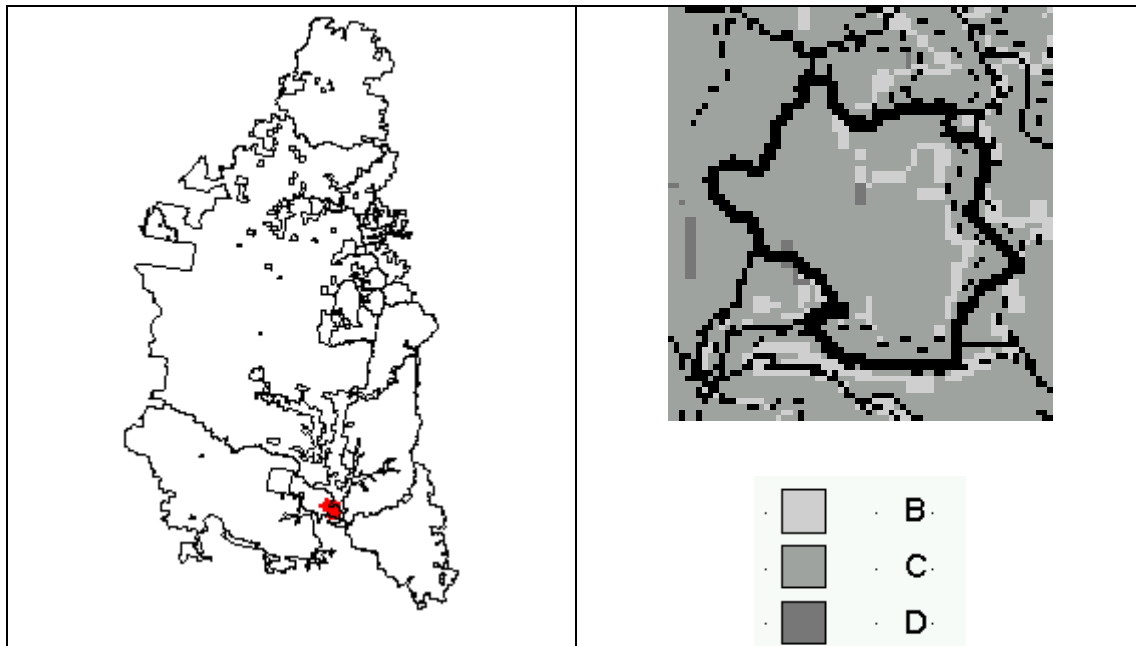
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along Macdonald Creek Road, some 40 to 80 metres deep and an incendiary drop along the ridge
- Incendiary drop should be done in conjunction with zone 41.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BOOKS POINT STRATEGIC FIRE MANAGEMENT ZONE 43



Characteristics of Zone						
Area in Hectares 726.1		% of Study Area 0.3			Predominant Aspect 0 - 170° (57.9%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Rock engraving			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 70.6	1 Time 28.0	2 Times 1.5	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1991/92 16.2		1989/90 14.7		
Bushfire Behaviour Potential (% of Zone)		High 64.6		Moderate 9.1		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	178.1		24.5		C	
2a - Exposed Hawkesbury Woodland	270.0		37.2		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	3.7		0.5		D	
3b - Sheltered Forest on Rich Soils	1.9		0.3		D	
4b - Narrabeen - Hawkesbury Ironbark Forest	68.0		9.3		B	
Unclassified	204.4		28.1		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	<i>Tetratheca glandulosa</i>	
Fire Advantages	Womerah Track / Milk Can Hill Macdonald Creek Road Bakers Creek / Robo's Track	Macdonald River and tributaries Bakers Gully and associated wetlands Escarpments

Background

- Dwellings located along Macdonald Creek Road are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a variable aspect and steep slopes with predominant ridges in an north-west to south east pattern.
- Two fire events in 1991/92 and 1989/90 impacted 16.2% and 14.7% respectively of this zone.
- 70.6% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the *Tetratheca glandulosa*.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn from the rear of properties along Macdonald Creek Road and Womerah / Milk Can Hill Track (to maintain access), some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Macdonald River tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

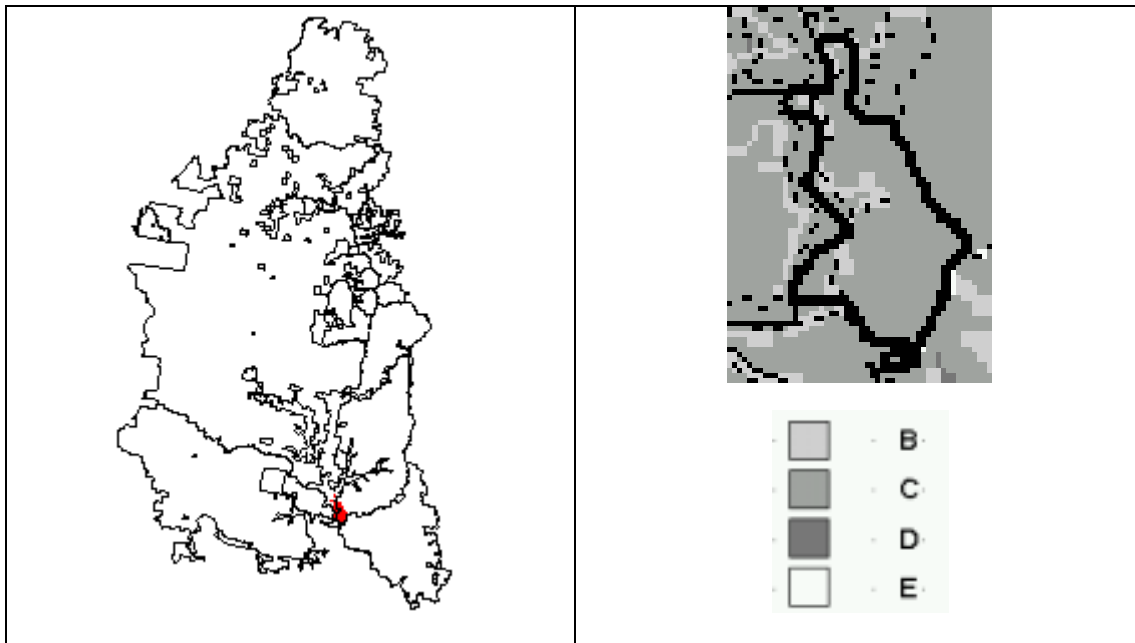
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along Macdonald Creek Road and Womerah / Milk Can Hill Track (to maintain access), some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BOOKS FERRY STRATEGIC FIRE MANAGEMENT ZONE 44



Characteristics of Zone						
Area in Hectares 495.2		% of Study Area 0.2		Predominant Aspect 220 - 360° (55.6%)		
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified)		Cultural Resources None recorded		
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Shelter with deposit		Historic Sites Recorded Old Great North Road		
% of Zone Burnt at Various Frequencies	Unburnt 18.0	1 Time 0.0	2 Times 21.6	3 Times 19.4	4 Times 21.6	5 Times 19.4
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 77.7		Jan94 2.2		1991/92 47.5	
Bushfire Behaviour Potential (% of Zone)	High 84.0		Moderate 4.9		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	227.8	46.0		C		
2a - Exposed Hawkesbury Woodland	145.3	29.3		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	65.6	13.3		B		
Unclassified	56.9	11.5		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Macdonald River and tributaries and wetlands Old Great North Road Shepards Gully Road	Settlers Road Escarpments Horse Trail – UN300 Private Access – UN312

Background

- Dwellings located along Settlers Road and Private Access – UN312 are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a predominantly west aspect with a predominant ridge line running north to south.
- Many large fire events including 1997/98, 1991/92 and 1990/91 impacted 77.7%, 47.5% and 41.0% respectively of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a strip burn from the rear of properties along Settlers Road the Old Great North Road and Horse Trail – UN300, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Shepards Gully and Macdonald River tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

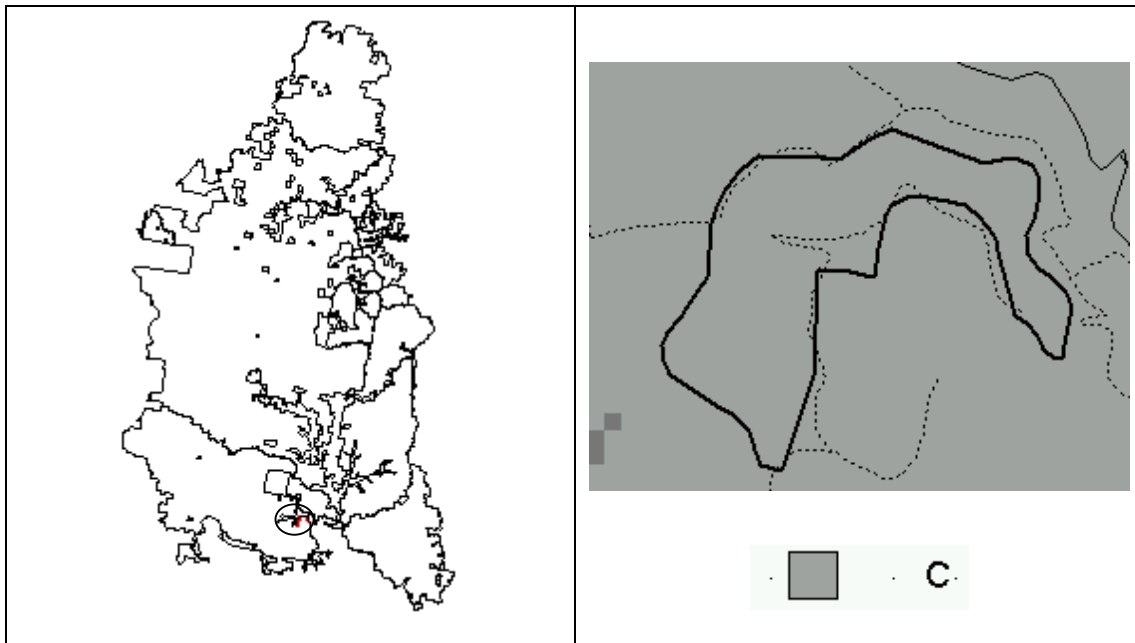
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties along Settlers Road the Old Great North Road and Horse Trail – UN300, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LOWER MACDONALD WEST STRATEGIC FIRE MANAGEMENT ZONE 45



Characteristics of Zone						
Area in Hectares 172.7		% of Study Area 0.1		Predominant Aspect 220 - 360° (53.0%)		
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified), House/Shed, Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 6.2	2 Times 0.0	3 Times 68.0	4 Times 25.7	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1997/98 100.0		1993/94 37.1		1989/90 6.2
Bushfire Behaviour Potential (% of Zone)		High 92.0		Moderate 3.2		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	57.2		33.1		C	
2a - Exposed Hawkesbury Woodland	103.1		59.7		C	
Unclassified	12.4		7.2		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Brush-tailed Rock-wallaby
Threatened Flora	Nil
Fire Advantages	Webbs Creek and Tributaries Doyles Hollow and Tributaries Private Access – UN288 Webbs Creek Track Escarpments

Background

- Dwellings located along Private Access – UN288 and Webbs Creek Track are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a variable aspect and steep slopes with predominant ridges in a south-east to north-west pattern.
- Many large fire events including 1997/98, 1993/94 and 1984/85 impacted 100%, 37.1% and 100% respectively of this zone.
- There are species issues in the zone relative to the Brush-tailed Rock-wallaby.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a strip burn from the rear of properties (Private Access – UN288 and Webbs Creek Track), some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Webbs Creek and Doyles Hollow and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

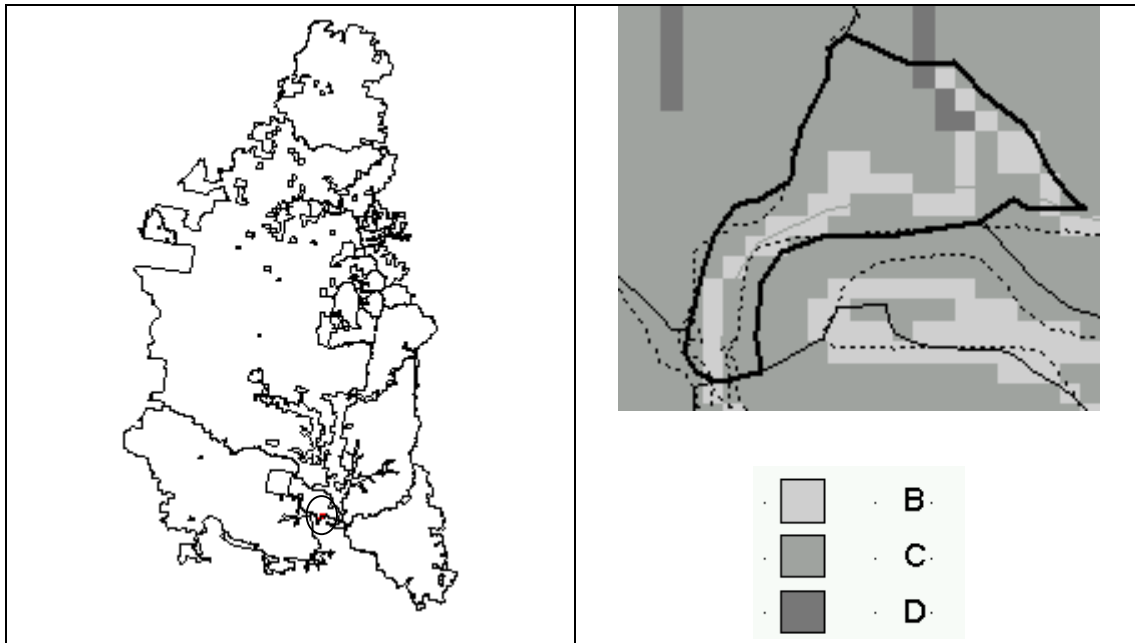
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from the rear of properties (Private Access – UN288 and Webbs Creek Track), some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

**LOWER MACDONALD NORTH
STRATEGIC FIRE MANAGEMENT ZONE 46**



Characteristics of Zone						
Area in Hectares 106.7		% of Study Area 0.04		Predominant Aspect 0 - 170° (67.77%)		
Fire Protection Zone Strategic Fire Management		Major Assets Sheds		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 100.0	1 Time	2 Times	3 Times	4 Times	5 Times
Year of Last 3 Fires (WF/PB) % of Zone Burnt						
Bushfire Behaviour Potential (% of Zone)	High 66.2	Moderate 11.4		Low 1.0		
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	2.8	2.6		C		
2a - Exposed Hawkesbury Woodland	39.4	36.9		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	1.9	1.8		D		
3b - Sheltered Forest on Rich Soils	1.9	1.8		D		
4b - Narrabeen - Hawkesbury Ironbark Forest	29.9	28.0		B		
Unclassified	30.9	29.0		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Macdonald River Womerah Track / Milk Can Run 4WD Public Road – UN266

Background

- Dwellings located along 4WD Public Road – UN266 are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a variable aspect and steep slopes associated with the Hunter Range and Bulga Creek.
- This zone has a variable aspect and steep slopes with predominant ridges in an east to west pattern.
- This zone has a predominantly south-east aspect with a predominant ridge line running from the north-west to the south-east.
- No recorded fire events in this zone.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a strip burn from Womerah Track / Milk Can Run and 4WD Public Road – UN266, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Macdonald River tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

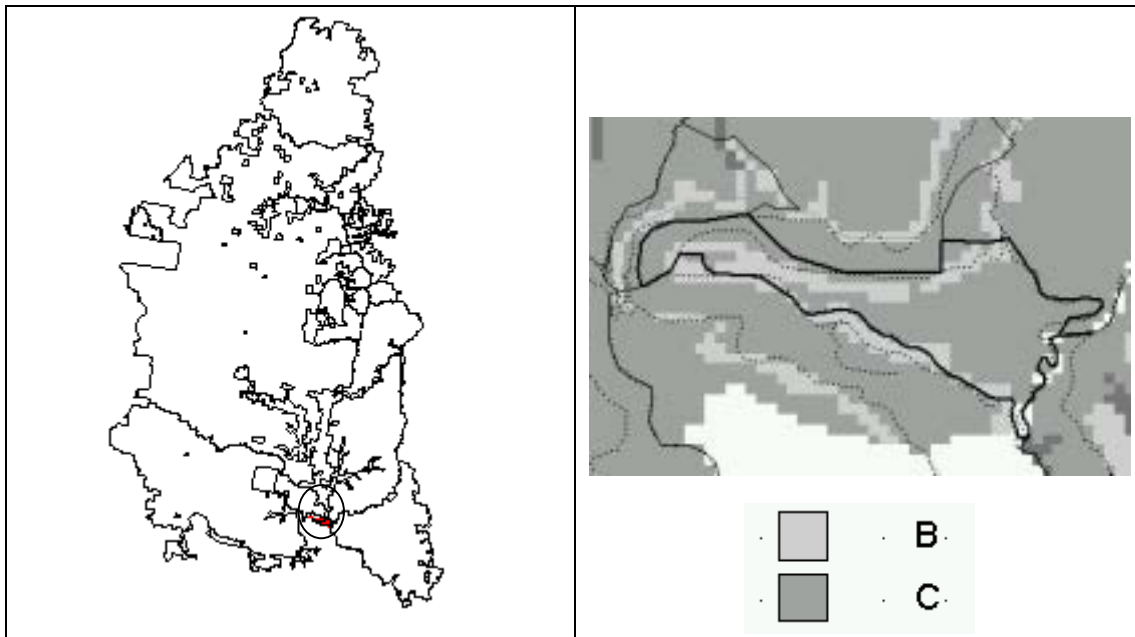
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from Womerah Track / Milk Can Run and 4WD Public Road – UN266, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Implement controlled burning during climatic conditions where north to north-east winds dominate.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LOWER MACDONALD EAST STRATEGIC FIRE MANAGEMENT ZONE 47



Characteristics of Zone						
Area in Hectares 292.8		% of Study Area 0.1		Predominant Aspect 220 - 360° (44.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Shelter with deposit, Water Hole/well		Historic Sites Recorded Old Great North Road		
% of Zone Burnt at Various Frequencies	Unburnt 81.8	1 Time 3.6	2 Times 7.3	3 Times 0.0	4 Times 7.3	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 3.7		Jan94 3.7		1991/92 14.6	
Bushfire Behaviour Potential (% of Zone)	High 68.6		Moderate 4.9		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	82.5		28.2		C	
2a - Exposed Hawkesbury Woodland	60.9		20.8		C	
4b - Narrabeen - Hawkesbury Ironbark Forest	69.4		23.7		B	
Unclassified	79.0		27.0		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo Tiger Quoll	
Threatened Flora	Nil	
Fire Advantages	Macdonald River and tributaries and wetlands Old Great North Road Shephards Gully Road	Shephards Gully Settlers Road Escarpments

Background

- Dwellings located within the community of Lower Macdonald are potentially at risk to extreme fire event originating from the reserve areas.
- This zone has a predominantly north and south aspect with a predominant ridge line running from the east to west.
- Many small fire events including 1997/98, Jan 94 and 1991/92 impacted 3.7% 3.7% and 14.6% respectively of this zone.
- 81.8% of this zone has not been burnt since at least 1975/76.
- There are species issues in the zone relative to the Glossy Black Cockatoo and Tiger Quoll.
- The desirable ecological fire regime for this site will be compromised by not applying another burn by the year 2005.
- Ideally a perimeter strip burn from the rear of properties along Settlers Road, Old Great Northern Road and Shephards Gully Road, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Shephards Gully and tributaries and Macdonald River tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

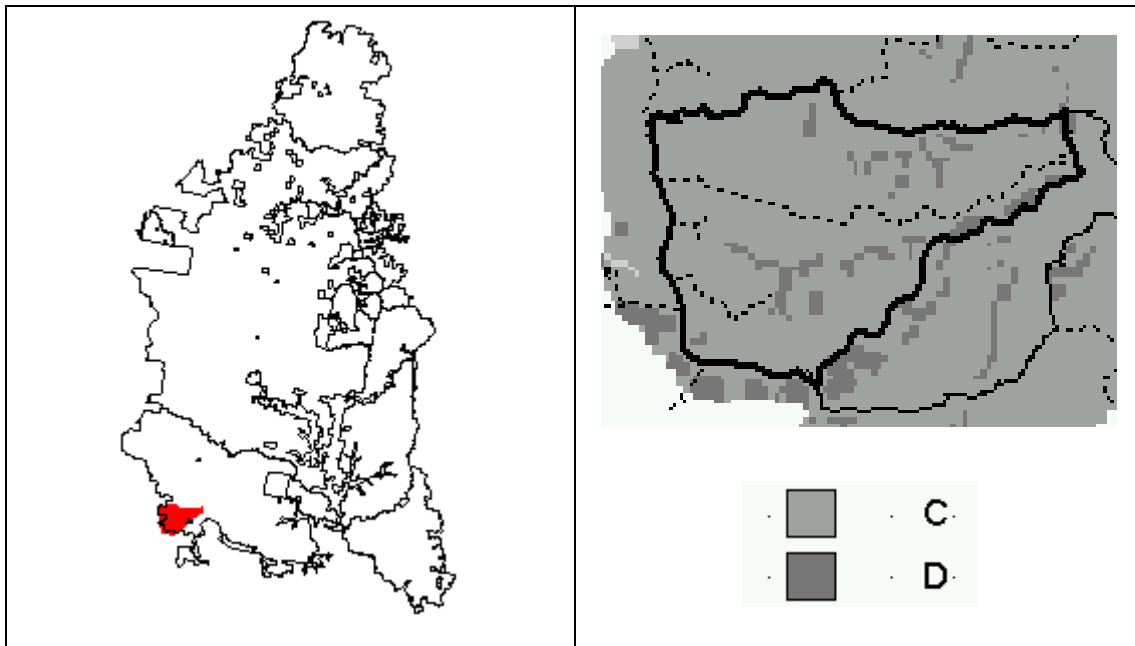
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a perimeter strip burn from the rear of properties along Settlers Road, Old Great Northern Road and Shephards Gully Road, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres off the ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

MILE RIDGE STRATEGIC FIRE MANAGEMENT ZONE 48



Characteristics of Zone						
Area in Hectares 1934.9		% of Study Area 0.7			Predominant Aspect 0 - 170° (52.3%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Sheds, House/Shed			Cultural Resources None recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 1.2	1 Time 0.2	2 Times 1.8	3 Times 65.6	4 Times 20.5	5 Times 11.3
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 90.2%		1991/92 0.8%		1990/91 18.4%	
Bushfire Behaviour Potential (% of Zone)	High 63.5		Moderate 26.5		Low 1.6	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	947.8		49.0		C	
2a - Exposed Hawkesbury Woodland	619.6		32.0		C	
2b - Dwarf Apple Low Open Woodland	63.7		3.3		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	148.1		7.7		D	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo Turquoise Parrot Koala	
Threatened Flora	Nil	
Fire Advantages	Putty Road Mile Ridge Road Pierces Track	Grono North Barina Drive Rush Creek Powerline Easements

Background

- This zone has a large interface with dwellings associated with the community of Colo Heights, and properties along Putty Road.
- This zone has a predominant east-west ridge line (Mile Ridge) creating north and south aspects with a steep slope.
- The large unplanned fire event in 1997 impacted 98.6% of this zone.
- There are species issues in the zone relative to the Glossy Black Cockatoo (*Allocaeusuarina sp.*) Turquoise Parrot and Koala.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a strip burn from the Mile Ridge Road (to maintain access) and Pierces Track (to maintain access), some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Rush Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

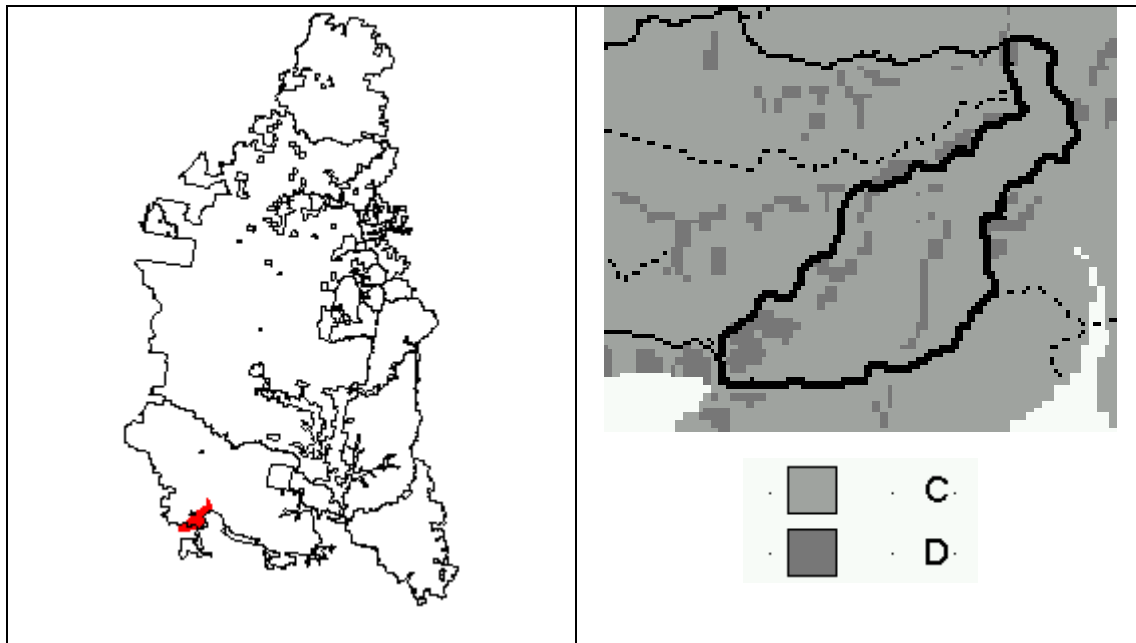
Actions

- Implement a strip burn from the Mile Ridge Road (to maintain access) and Pierces Track (to maintain access), some 40 to 80 metres deep and an incendiary drop along the ridges.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Promote Community Fireguard through Rural Fire Service.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity.
- Continual safe use of road access and egress during a fire event.

COLO HEIGHTS STRATEGIC FIRE MANAGEMENT ZONE 49



Characteristics of Zone						
Area in Hectares 890.6		% of Study Area 0.3		Predominant Aspect 220 - 360° (49.4%)		
Fire Protection Zone Strategic Fire Management		Major Assets Houses, Sheds, building (unidentified)		Cultural Resources None recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 8.9	1 Time 33.2	2 Times 29	3 Times 4.3	4 Times 17.8	5 Times 5.8
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 36.1%		1991/92 6.6%		1986/87 45.0%	
Bushfire Behaviour Potential (% of Zone)	High 65.6		Moderate 20.4		Low 5.7	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	240.0	26.9		C		
2a - Exposed Hawkesbury Woodland	428.4	48.1		C		
2b - Dwarf Apple Low Open Woodland	30	3.4		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	108.7	12.2		D		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala	
Threatened Flora	Nil	
Fire Advantages	Wheelbarrow Ridge Rush Creek Barina Drive	Grono South Unsealed Public Road – UN290

Background

- This zone has an interface with dwellings associated with the community of Colo Heights.
- This zone has a predominant north east – south west ridge line creating variable north west and south east aspects with a steep slope.
- Only 8.9% of this zone has remained Unburnt since the 77/78 fire season.
- There are species issues in the zone relative to the Koala
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a strip burn from the Old Bulga Road, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.
- The burn program should use a strip burning down to the fire trail and or 40 metres from Barina Drive. This strategy may be difficult to implement and should be assessed in the prescribed burning plan whether or not fire fighter safety issues may require a significant adjustment to this recommendation. The use of fire advantages such as ephemeral drainage lines and or Rush creek are available.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Rush Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species

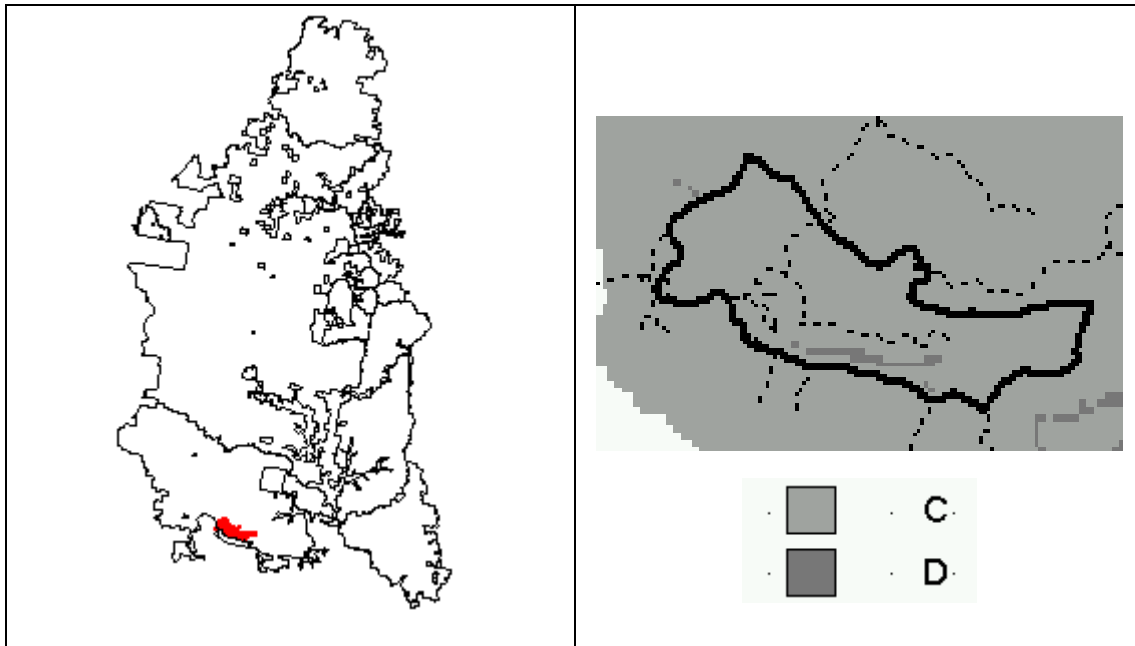
Actions

- Implement a strip burn program from Barina Drive for a depth of 40-80 metres, where possible in year 2007
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Promote Community Fireguard through Rural Fire Service
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity.
- Continual safe use of road access and egress during a fire event.

**WHEELBARROW RIDGE WEST
STRATEGIC FIRE MANAGEMENT ZONE 50**



Characteristics of Zone						
Area in Hectares 1005		% of Study Area 0.4			Predominant Aspect 0 - 170° (50.0%)	
Fire Protection Zone Strategic Fire Management		Major Assets Houses			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 2.2	1 Time 4.3	2 Times 68.9	3 Times 24.8	4 Times 0	5 Times 0
Year of Last 3 Fires (Unplanned) % of Zone Burnt		1997/98 93.5%		1992/93 0.1%		1989/90 0.5%
Bushfire Behaviour Potential (% of Zone)		High 72.0		Moderate 24.3		Low 0.9
Structural Vegetation Type		Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)
1 - Sheltered Dry Hawkesbury Forest		519.3		51.7		C
2a - Exposed Hawkesbury Woodland		404.0		40.2		C
2b - Dwarf Apple Low Open Woodland		29.1		2.9		C
3a - Hawkesbury - Narrabeen Sheltered Forest		27.2		2.7		D

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	NIL
Threatened Flora	NIL
Fire Advantages	Wheel Barrow Ridge Rd Doyles Hollow Doyles Hollow Track Left Arm Track Rush Creek and Tributaries

Background

- This zone has a significant interface with Wheel Barrow Ridge Rd with several dwellings located adjacent to the south-western edge.
- This zone has a variable aspect that ranges between north, north east and east. Slope ranges from level ridgetops to steep gullies.
- There are no species issues in the zone.
- A significant fire event in 1997/8 impacted 93.7 % of this zone leaving only 6.7 % of this area Unburnt.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a road side strip along Wheel Barrow Ridge Rd and un358 some 40 metres deep would be the best option for minimising the spread of fire (particularly from accidental ignition) into the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Rush Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

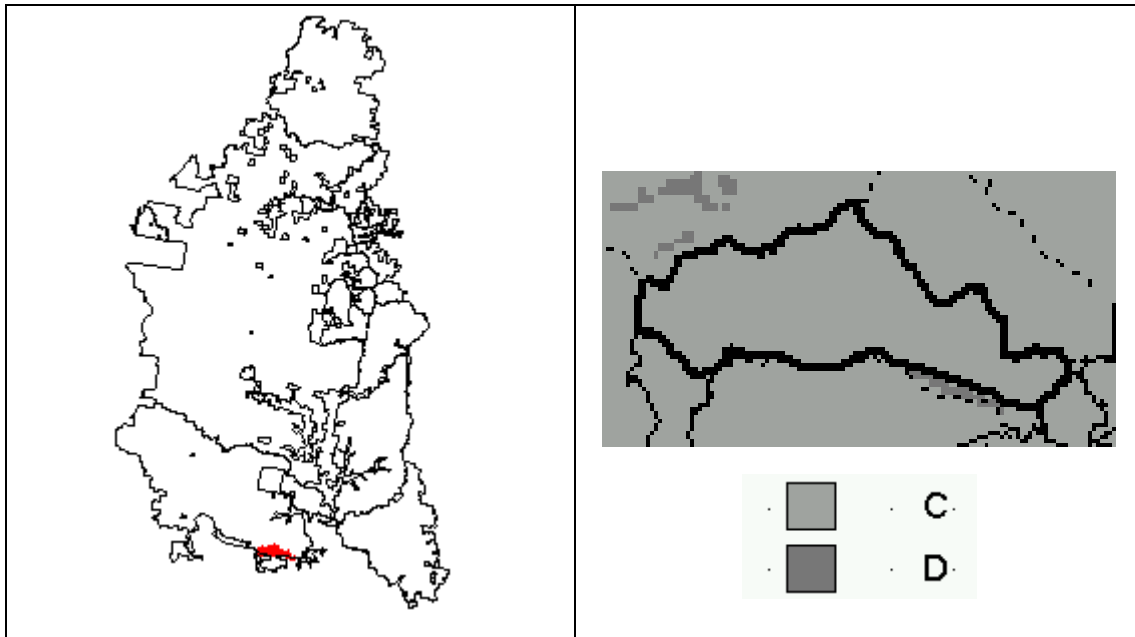
Actions

- Implement a strip burn program along Wheel Barrow Ridge Rd and un358 for a depth of 40 metres, where possible in year 2001
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity
- Continual safe use of road access and egress during a fire event.

**WHEELBARROW RIDGE EAST
STRATEGIC FIRE MANAGEMENT ZONE 51**



Characteristics of Zone						
Area in Hectares 786.6		% of Study Area 0.3		Predominant Aspect 0 - 170° (45.0%)		
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 7.1	1 Time 0.3	2 Times 92.6	3 Times 0.2	4 Times 0.5	5 Times 0
Year of Last 3 Fires (Unplanned) % of Zone Burnt		1997/98 74.0%		1996/97 19.6		N/A
Bushfire Behaviour Potential (% of Zone)		High 84.1		Moderate 10.9		Low 0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	434.0		55.2		C	
2a - Exposed Hawkesbury Woodland	317.8		40.4		C	
Unknown	34.8		4.4		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala
Threatened Flora	Nil
Fire Advantages	Wheelbarrow Ridge Rd/FireTrail Greens Creek/ Swamp

Background

- This zone forms a buffer between the southern most portions of the park and the bulk of the park, with Greens Creek/Swamp and Wheelbarrow Ridge Rd forming the southern boundary and Wheelbarrow Ridge FireTrail/WebbsCr fire trail forming the bulk of the northern boundary .There are clusters of dwellings located in both the south-western and south-eastern corners of the zone
- This zone has a predominantly southerly aspect with a number of steep gullies running from north to south.
- Significant fire events in 1996/97 and 1997/98 impacted 18.9 % and 73.9 % respectively of this zone
- There are species issues in the zone relative to the Koala
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2007.
- Ideally a road side strip along Wheel Barrow Ridge Rd/fire trail and the perimeter track/trails un358 some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

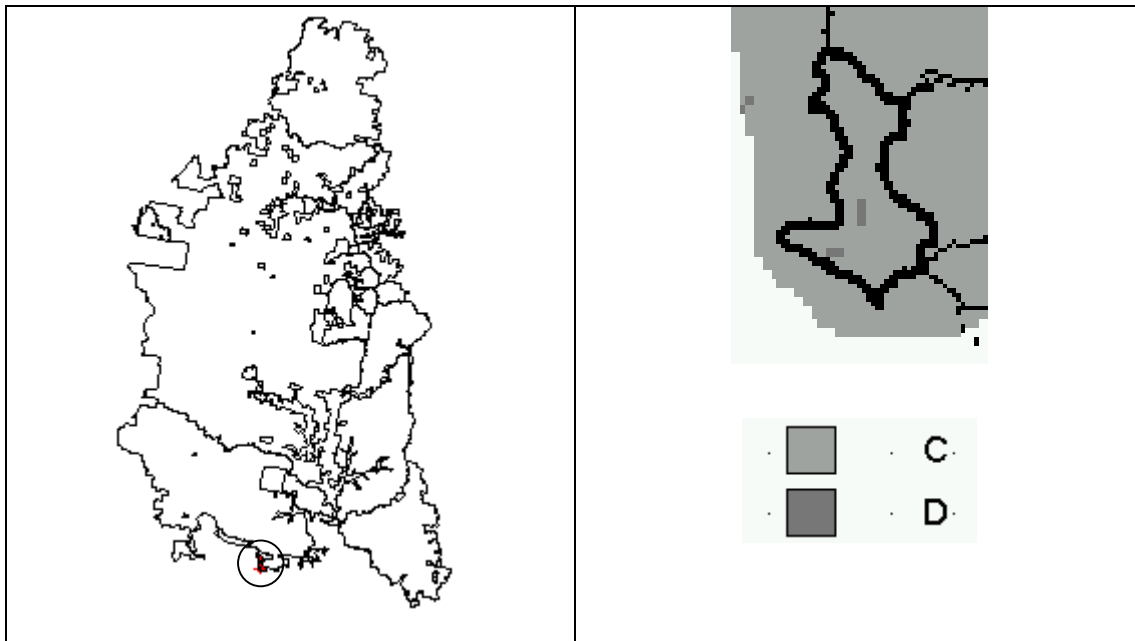
Actions

- Implement a strip burn program around the perimeter for a depth of 40-80 metres,
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of Koala

COLO STRATEGIC FIRE MANAGEMENT ZONE 52



Characteristics of Zone						
Area in Hectares 243.9		% of Study Area 0.1			Predominant Aspect 0 - 170° (45.2%)	
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 95.1	1 Time 0.5	2 Times 4.9	3 Times 0	4 Times 0	5 Times 0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 4.9		N/a		N/a	
Bushfire Behaviour Potential (% of Zone)	High 84.1		Moderate 9.9		Low 0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	120.9	49.6		C		
2a - Exposed Hawkesbury Woodland	105.9	43.4		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	4.7	1.9		D		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Wheelbarrow Ridge Rd Colo River Wet Creek line

Background

- This zone forms a natural buffer on the southern most portion of the park with Wheelbarrow Ridge Rd forming the eastern boundary and Colo River forming the southern boundary .There are clusters of dwellings located in both the south-western corner and south of the zone
- This zone has a predominantly southerly aspect with a dominant steep gully system running from north to south.
- Significant fire events in 1997/98 impacted only 4.9 % of this zone leaving the remainder Unburnt in the past 20 years.
- Ideally a road side strip along Wheel Barrow Ridge Rd some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the park.
-

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.

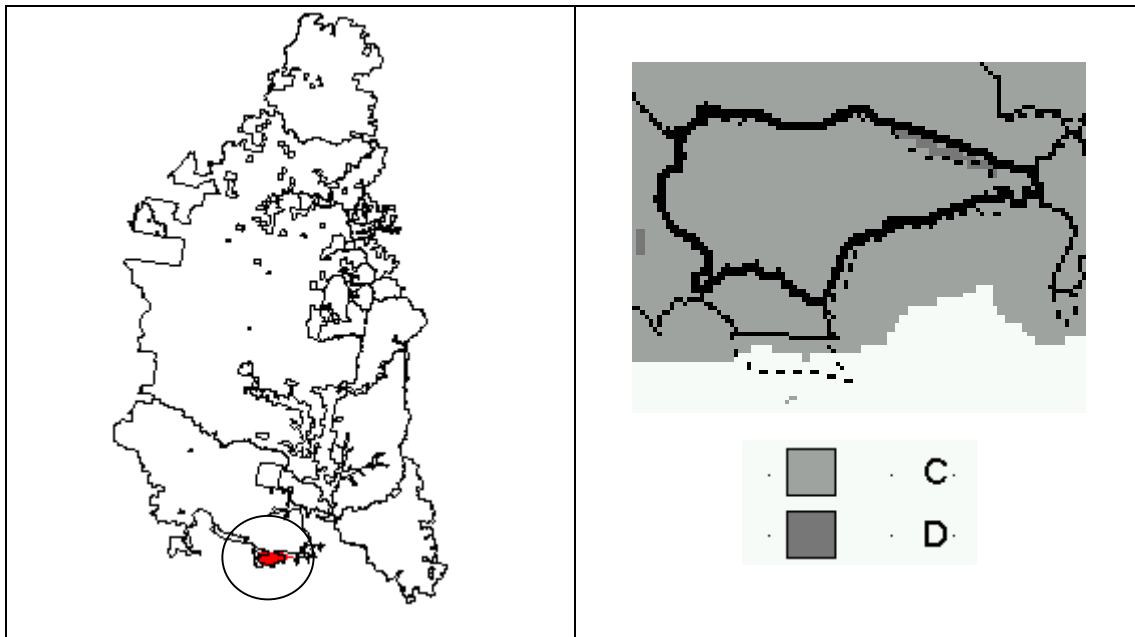
Actions

- Implement a strip burning program along the Wheelbarrow Ridge Rd. perimeter for a depth of 40-80 metres,
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

GREENS SWAMP STRATEGIC FIRE MANAGEMENT ZONE 53



Characteristics of Zone						
Area in Hectares 667.3		% of Study Area 0.2		Predominant Aspect 0 - 170° (50.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets Sheds		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit, Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 15	1 Time 80.2	2 Times 2.7	3 Times 2.9	4 Times 0	5 Times 0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 5.2%		1990/91 82.5%		N/A	
Bushfire Behaviour Potential (% of Zone)	High 68.1		Moderate 15.5		Low 1.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	283.1	42.4		C		
2a - Exposed Hawkesbury Woodland	263.4	39.5		C		
6b - Swamp Woodland on Perched Sands	17.8	2.67		D		
Unknown	102.2	15.3		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Wheelbarrow Ridge Road Greens Creek/ Swamp/Road/walking track

Background

- Dwellings located on the north west bank of the Hawkesbury River and are potentially at risk to extreme fire event originating from Parr State Recreation Area.
- This zone has a predominantly north-south aspect with a predominant ridge line traversing the zone from west to east.
- A Significant fire event in 1990/91 impacted 79.8 % of this zone
- Ideally a road side strip along Wheel Barrow Ridge Rd/fire trail and the perimeter roads track and trails, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Undertake fuel reduction works on perimeters of the zone to achieve reduced fire intensity and safe access and egress.
- Maintain roads and trails.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

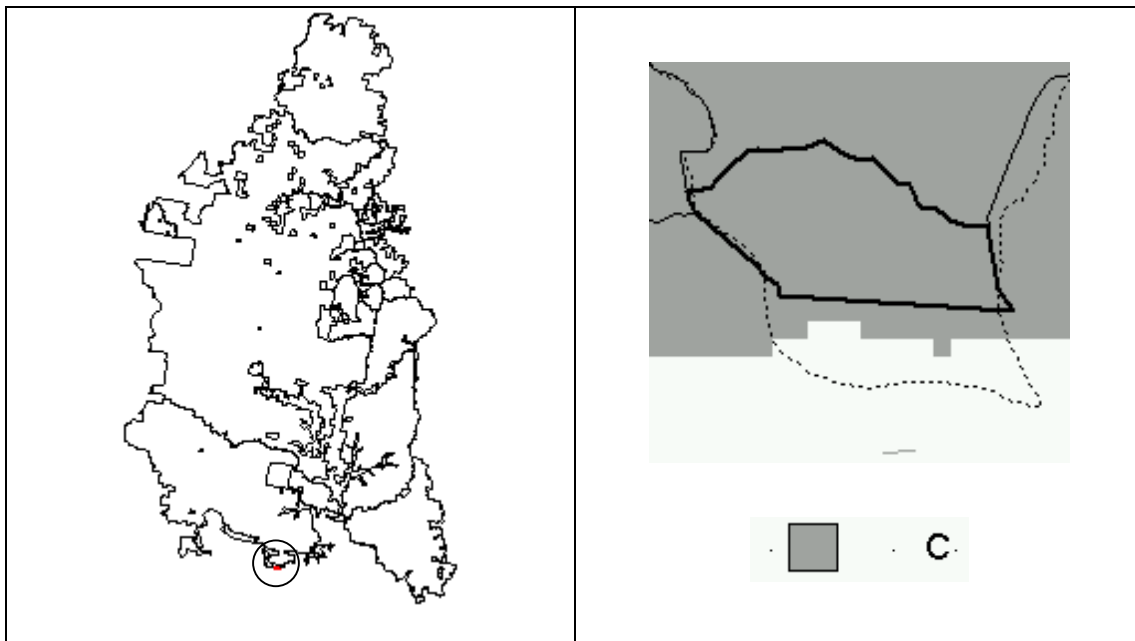
Actions

- Implement a strip burn program around the perimeter for a depth of 40-80 metres,
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

MOUNT ANDREW STRATEGIC FIRE MANAGEMENT ZONE 54



Characteristics of Zone						
Area in Hectares 98.5		% of Study Area 0.04		Predominant Aspect 0 - 170° (52.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets House		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 66.1	1 Time 31.5	2 Times 0	3 Times 0	4 Times 0	5 Times 0
Year of Last 3 Fires (Unplanned) % of Zone Burnt		1990/91 33.9%		N/A		N/A
Bushfire Behaviour Potential (% of Zone)		High 80.6		Moderate 10.1		Low 0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	38.4		39		C	
2a - Exposed Hawkesbury Woodland	47.8		48.5		C	
Unknown	12.3		12.5		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Colo River Wheelbarrow Ridge Road

Background

- Dwellings located on the western bank of the Hawkesbury River and the northern bank of the Colo River are potentially at risk to extreme fire event originating from Parr State Recreation Area.
- This zone has a predominantly north-east and south-west aspect with a predominant ridge line traversing the zone from north-west to south-east.
- A Significant fire event in 1990/91 impacted 33.9 % of this zone, the remainder has been Unburnt since at least the 1974/75 fire season.
- Ideally a road side strip along the perimeter roads, track and trails, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Undertake fuel reduction works on perimeters of the zone to achieve reduced fire intensity and safe access and egress.
- Maintain roads and trails.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

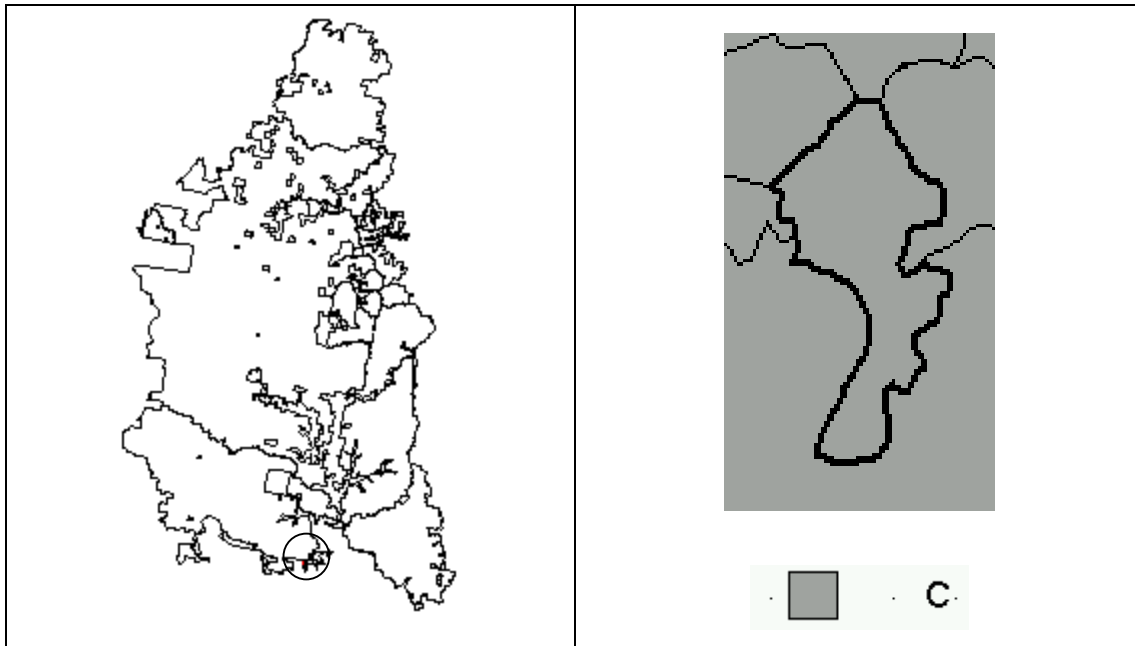
Actions

- Implement a strip burn program around the perimeter for a depth of 40-80 metres,
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WIGGINS FARM STRATEGIC FIRE MANAGEMENT ZONE 55



Characteristics of Zone						
Area in Hectares 94.9		% of Study Area 0.03			Predominant Aspect 220 - 360° (49.0%)	
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 100%	1 Time	2 Times	3 Times	4 Times	5 Times
Year of Last 3 Fires (Unplanned) % of Zone Burnt	N/A		N/A		N/A	
Bushfire Behaviour Potential (% of Zone)	High 89.5		Moderate 7		Low 0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	30.9		32.6		C	
2a - Exposed Hawkesbury Woodland	61.9		65.2		C	
Unknown	3.5		3.7		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Wheelbarrow Ridge Road Unnamed gully in the north west corner Unsealed Public Road - Un357

Background

- Dwellings located on the banks of the Hawkesbury River are potentially at risk to extreme fire event originating from Parr State Recreation Area.
- This zone has a predominantly south-west aspect with a predominant ridge line traversing the zone from north to south.
- No significant fire events have been recorded for this zone.
- Ideally a road side strip along the perimeter roads, track and trails, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Undertake fuel reduction works on perimeters of the zone to achieve reduced fire intensity and safe access and egress
- Maintain roads and trails.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

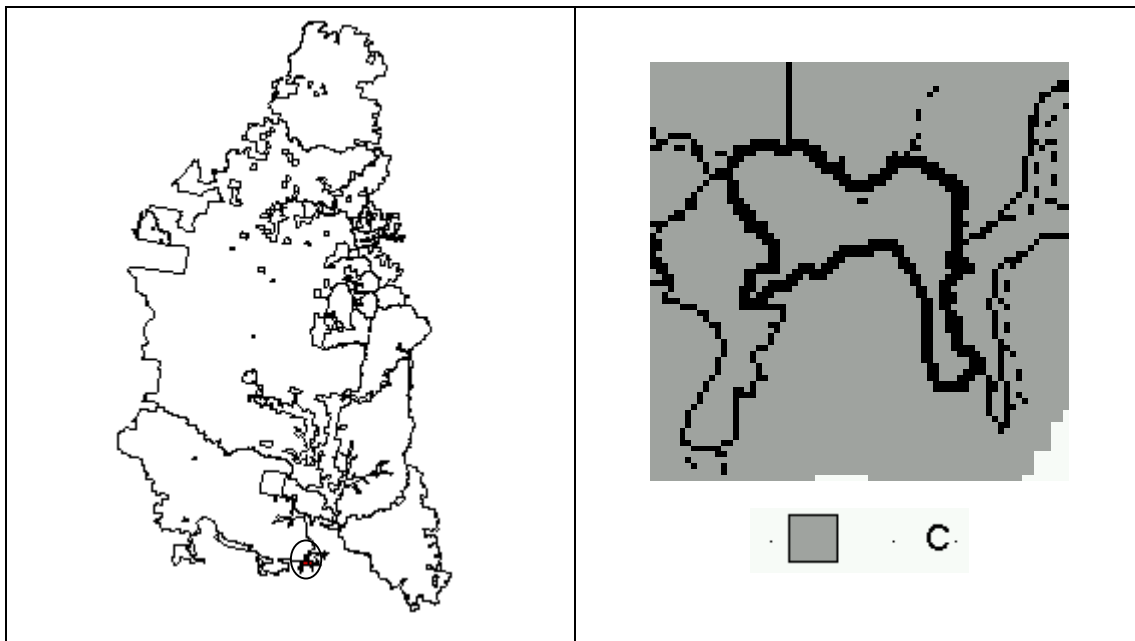
Actions

- Implement a strip burn program around the perimeter for a depth of 40-80 metres, where possible in year 2001.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LEETS VALE WEST STRATEGIC FIRE MANAGEMENT ZONE 56



Characteristics of Zone						
Area in Hectares 137.5		% of Study Area 0.1		Predominant Aspect 220 - 360° (39.4%)		
Fire Protection Zone Strategic Fire Management		Major Assets House		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 100	1 Time 0	2 Times 0	3 Times 0	4 Times 0	5 Times 0
Year of Last 3 Fires (Unplanned) % of Zone Burnt						
Bushfire Behaviour Potential (% of Zone)	High 77.8		Moderate 4		Low 0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	80.6	58.6		C		
2a - Exposed Hawkesbury Woodland	30.9	22.5		C		
Unknown	26	18.9		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Wheelbarrow Ridge Road Unsealed Public Road - Un357

Background

- Dwellings located on the banks of the Hawkesbury River are potentially at risk to extreme fire event originating from Parr State Recreation Area.
- This zone has a predominantly south-west aspect with a predominant ridge line across the northern boundary from the west to east.
- No significant fire events have been recorded for this zone.
- Ideally a road side strip along the perimeter roads, track and trails, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Undertake fuel reduction works on perimeters of the zone to achieve reduced fire intensity and safe access and egress
- Maintain roads and trails.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

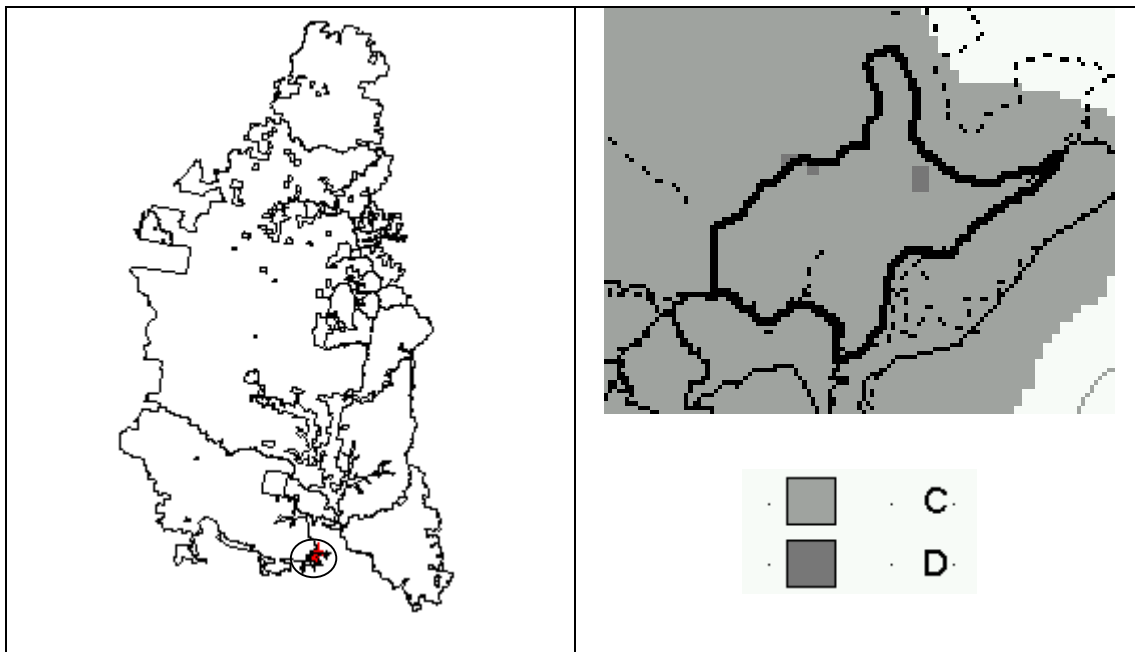
Actions

- Implement a strip burn program around the perimeter for a depth of 40-80 metres,
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WEBBS CREEK SOUTH STRATEGIC FIRE MANAGEMENT ZONE 57



Characteristics of Zone						
Area in Hectares 414.9		% of Study Area 0.2			Predominant Aspect 220 - 360° (51.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Axe grinding groove			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 2.6	1 Time .6	2 Times 91.1	3 Times 4.9	4 Times	5 Times
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 96.8		1990/91 4.9		N/A	
Bushfire Behaviour Potential (% of Zone)	High 75.2		Moderate 15.4		Low 0.0	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	121.9		29.4		C	
2a - Exposed Hawkesbury Woodland	251.2		60.6		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	6.6		1.6		D	
Unknown	26		18.9		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Koala
Threatened Flora	Nil
Fire Advantages	Webbs Creek Doyles Creek Wheelbarrow Ridge Road Hunter Trig Track Unsealed Public Road – UN349

Background

- Dwellings located on the banks of Webbs Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area.
- This zone has a predominantly north-west and south-east aspect with a predominant ridge line associated with Mount Hunter running from the south-west to the north-east.
- No significant fire events have been recorded for this zone.
- Two major wild fires in 97/98 and 90/91 impacted 97.4 % of this zone leaving 2.6 % of this area Unburnt.
- The preferred fire regime for this site will be compromised by the application of another burn prior to the year 2007
- There are species issues in the zone relative to the Koala.
- Ideally a road side strip along Unsealed Public Road (UN349), some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Undertake fuel reduction works on perimeters of the zone to achieve reduced fire intensity and safe access and egress.
- Maintain roads and trails.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

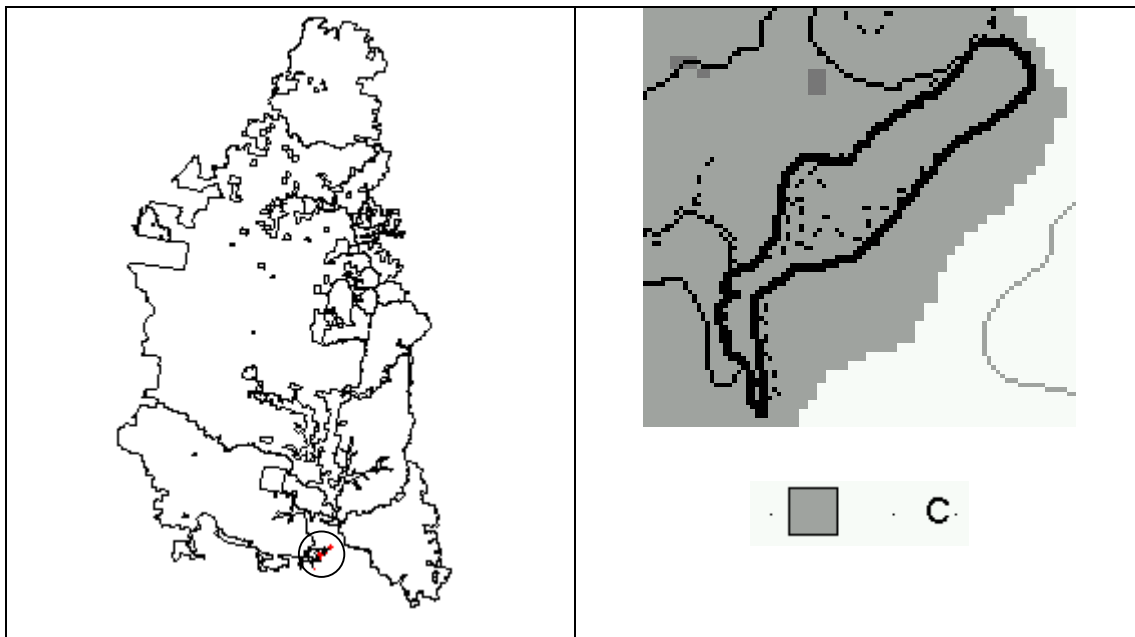
Actions

- Implement a strip burn program from Unsealed Public Road (UN349), west for a depth of 40-80 metres.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

LEETS VALE EAST STRATEGIC FIRE MANAGEMENT ZONE 58



Characteristics of Zone						
Area in Hectares 251.5		% of Study Area 0.1		Predominant Aspect 0 - 170° (67.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets Houses		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Midden, Shelter with art, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 7.1	1 Time 3.3	2 Times 41.2	3 Times 49.8	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 89.1		1993/94 53.6		N/A	
Bushfire Behaviour Potential (% of Zone)	High 64.9		Moderate 15.8		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	101.2	40.3		C		
2a - Exposed Hawkesbury Woodland	92.8	36.9		C		
Unknown	57.5	22.9		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Wheelbarrow Ridge Road Unsealed Public Road – UN349 Private Access – UN350

Background

- Dwellings located on the banks of the Hawkesbury River are potentially at risk to extreme fire event originating from Parr State Recreation Area.
- This zone has a predominantly north-west and south-east aspect with a predominant ridge line running from the south-west to the north-east.
- Two wild fires in 97/98 and 93/94 impacted 92.9 % of this zone leaving 7.1 % of this area Unburnt.
- The preferred fire regime for this site will be compromised by the application of another burn prior to the year 2007
- Ideally a road side strip along the perimeter roads, track and trails, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Undertake fuel reduction works on perimeters of the zone to achieve reduced fire intensity and safe access and egress
- Maintain roads and trails.
- Avoid activities within riparian area of Rush Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

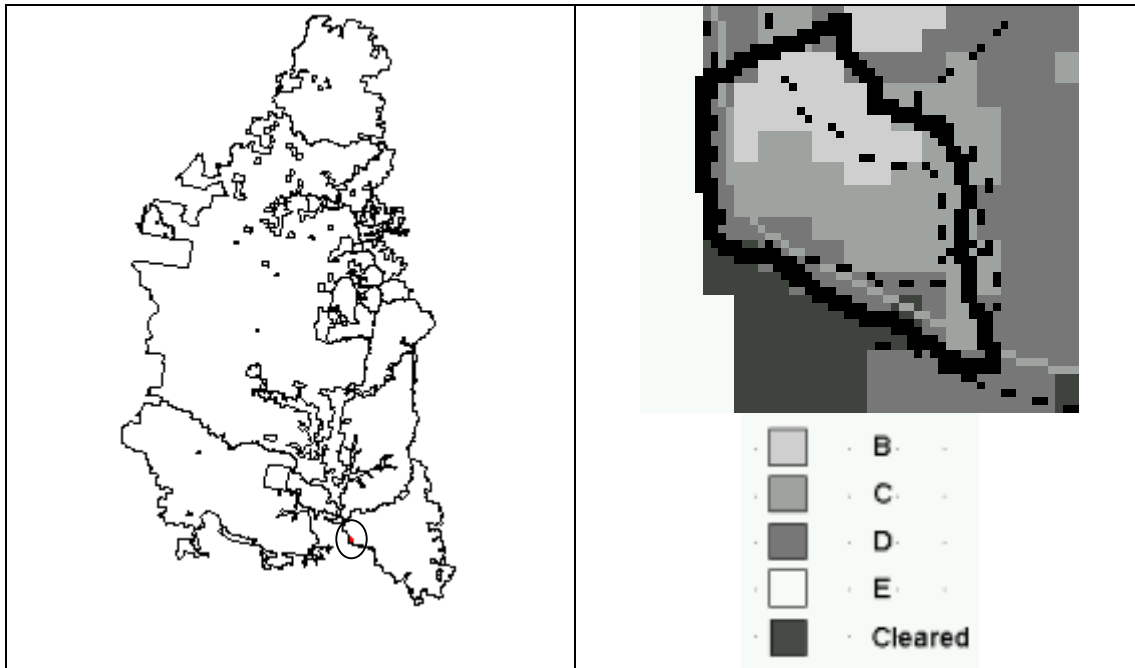
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn program around the perimeter for a depth of 40-80 metres
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Promote Community Fireguard through Rural Fire Service
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

ROSES CREEK STRATEGIC FIRE MANAGEMENT ZONE 59



Characteristics of Zone						
Area in Hectares 75.4		% of Study Area 0.03		Predominant Aspect 0 - 170° (45.0%)		
Fire Protection Zone Strategic Fire Management		Major Assets House/shed		Cultural Resources None Recorded		
Cultural Sites Recorded Historic		Aboriginal Sites Recorded Nil		Historic Sites Recorded Old Great North Road		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 1.6	2 Times 7.9	3 Times 39.5	4 Times 35.1	5 Times 15.8
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 52.1		1990/91 3.2		1988/89 39.5	
Bushfire Behaviour Potential (% of Zone)	High 82.4		Moderate 4.4		Low 13.2	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A5 - Low Forest/ Scrubland	1.9	2.5		D		
B3 - Forest/ Open Forest	8.4	11.2		D		
B4 - Open Forest	13.9	18.4		D		
B5 - Open Forest	10.2	13.5		C		
C1 - Forest / Open Forest	20.5	27.2		C		
C2 - Woodland	18.6	24.7		B		
Cleared	1.9	2.5		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Roses Creek Wisemans Ferry Road Rosesrun West 4wd Management Access- UN 414

Background

- Dwellings located along Wisemans Ferry Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect as a result of being located around a mountain area
- The large fire event in January 1994 impacted 77.5% of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a road side strip from 4wd Management Access- UN 414 and Wisemans Ferry Road, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Maintain roads and trails.
- Avoid activities within riparian area of Bulga Creek, Wilks Creek and Werong Creek and associated tributaries.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

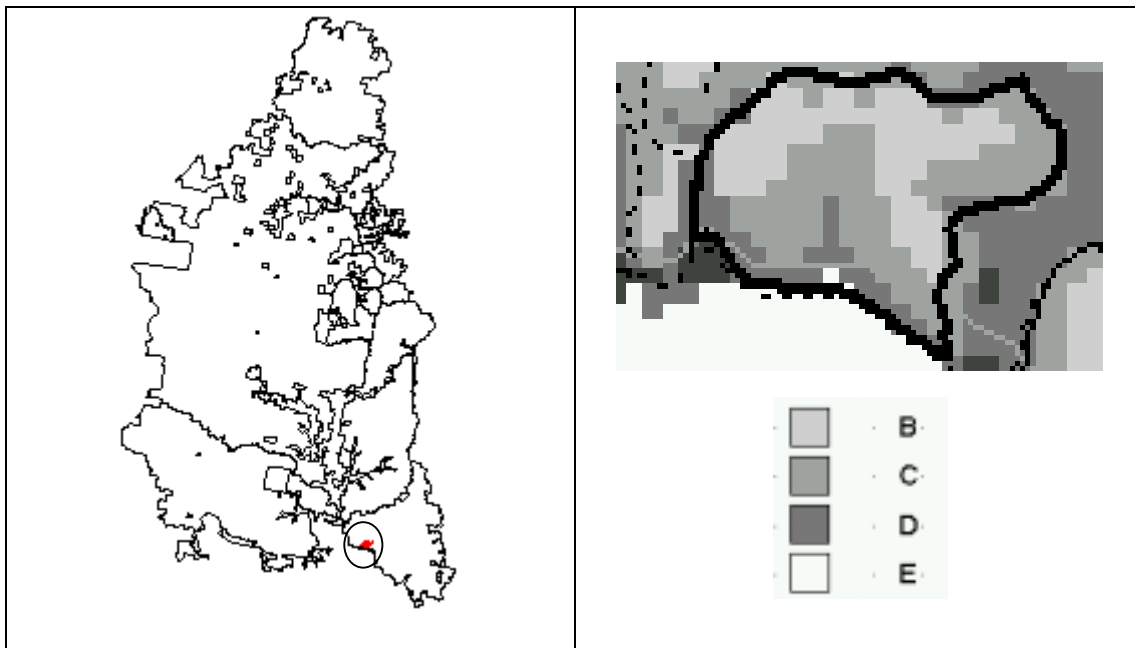
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn program around the perimeter (Rear of properties on Wisemans Ferry Road and 4wd Management Access- UN 414) for a depth of 40-80 metres
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

MILL CREEK STRATEGIC FIRE MANAGEMENT ZONE 60



Characteristics of Zone						
Area in Hectares 187.2		% of Study Area 0.1			Predominant Aspect 0 - 170° (50.1%)	
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Rock engraving			Historic Sites Recorded Hazel Dell Holiday Camp	
% of Zone Burnt at Various Frequencies	Unburnt 3.2	1 Time 1.9	2 Times 25.5	3 Times 70.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 94.2		1978/79 68.1		N/A	
Bushfire Behaviour Potential (% of Zone)	High 80.1		Moderate 17.1		Low 2.4	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
A1 - Closed Forest/ Low woodland	0.9		0.5		E	
B3 - Forest/ Open Forest	31.3		16.7		D	
B5 - Open Forest	20.0		10.7		C	
C1 - Forest / Open Forest	71.2		38.1		C	
C2 - Woodland	63.7		34.1		B	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Yellow Bellied Glider Eastern Little Mastiff-Bat Large-footed Mouse-eared Bat	
Threatened Flora	Nil	
Fire Advantages	Hawkesbury River Wisemans Ferry Road Mill Creek	Western Commission Track Escarpments Unnamed Creek

Background

- Dwellings located along Wisemans Ferry Road and Mill Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect as a result of being located around a mountain area.
- The large fire event in January 1994 impacted 96.8% of this zone.
- There is 0.9 hectares of fire intolerant A1 – Closed Forest/ Low woodland within this zone.
- There are species issues in the zone relative to the Yellow Bellied Glider, Eastern Little Mastiff-Bat and the Large-footed Mouse-eared Bat.
- The preferred fire regime for this site will be compromised by the application of another burn prior to the year 2004
- Ideally a road side strip from Mill Creek and Wisemans Ferry Road, some 40 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from A1 – Closed Forest/ Low woodland.
- Avoid activities within riparian area
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

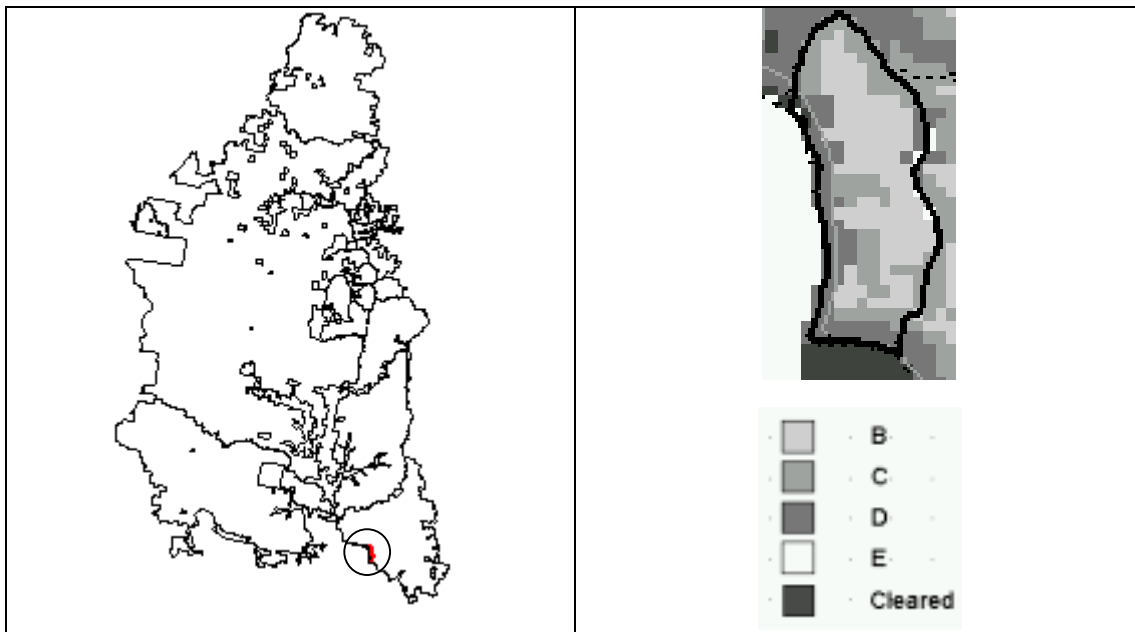
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn program around the perimeter (Rear of properties on Wisemans Ferry Road and Rear of properties on Mill Creek) for a depth of 40-80 metres
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

STARKEY STRATEGIC FIRE MANAGEMENT ZONE 61



Characteristics of Zone						
Area in Hectares 242.5		% of Study Area 0.1		Predominant Aspect 220 - 360° (47.0%)		
Fire Protection Zone Strategic Fire Management		Major Assets House/Sheds		Cultural Resources Mill Creek Depot Mill Creek Camping Area		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 1.5	2 Times 80.8	3 Times 17.7	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 100		1988/89 0.5		1985/86 6.4	
Bushfire Behaviour Potential (% of Zone)	High 90.0		Moderate 7.3		Low 2.7	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A4 - Reedland/ Rushland/ Sedgeland	0.9	0.4		D		
B1 - Forest	2.8	1.2		E		
B2 - Forest	8.4	3.5		D		
B3 - Forest/ Open Forest	4.7	1.9		D		
B4 - Open Forest	41.2	17.0		D		
B5 - Open Forest	29.1	12.0		C		
C1 - Forest / Open Forest	37.5	15.5		C		
C2 - Woodland	113.4	46.8		B		
Cleared	1.9	0.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo	
Threatened Flora	Nil	
Fire Advantages	Hawkesbury River Mill Creek Mill Creek Road	Wisemans Ferry Road Escarpments Unnamed Creek (eastern boundary)

Background

- Dwellings located along Wisemans Ferry Road, Mill Creek Camping Area and Mill Creek Depot are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly east and west aspect with a predominant ridge line running from the south to north.
- The large fire event in January 1994 impacted 100% of this zone.
- There is 2.8 hectares of fire intolerant B1 – Forest (rainforest complex) within this zone.
- There are species issues in the zone relative to the Glossy Black Cockatoo.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Mill Creek Road, some 40 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from B1 – Forest (rainforest complex)
- Avoid activities within riparian area of unnamed Creek
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

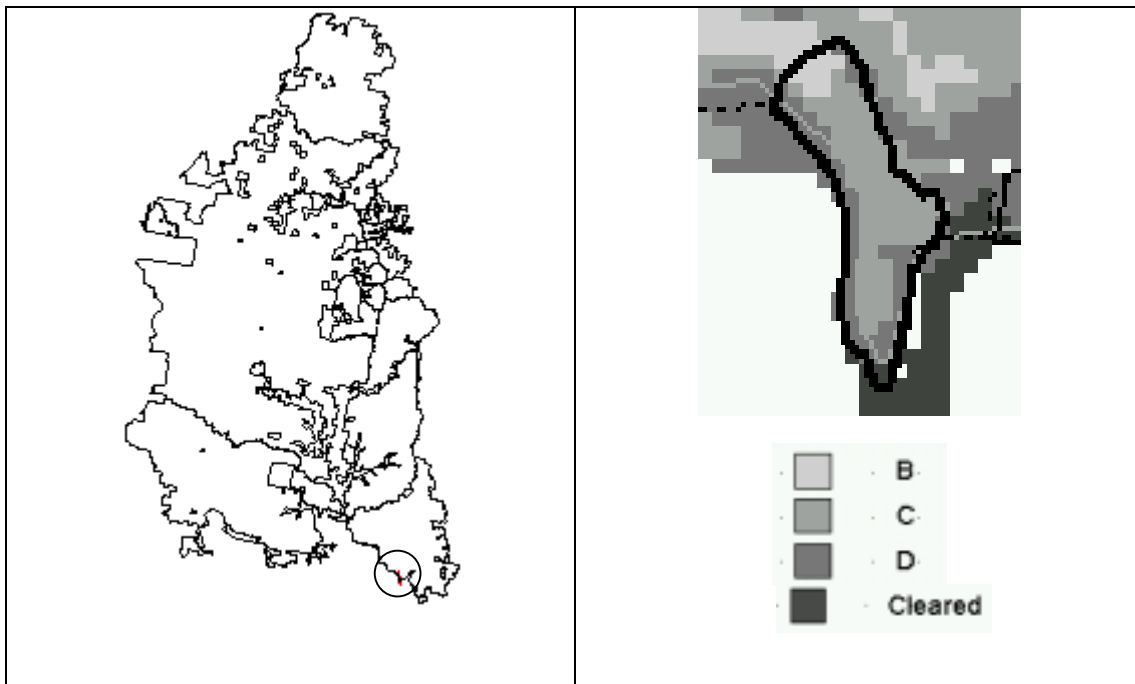
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving a strip burn from Mill Creek Road and an incendiary drop along the ridge
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

GUNDERMAN STRATEGIC FIRE MANAGEMENT ZONE 62



Characteristics of Zone						
Area in Hectares 105.1		% of Study Area 0.04			Predominant Aspect 0 - 170° (59.1%)	
Fire Protection Zone Strategic Fire Management		Major Assets House/Shed			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.2	1 Time 1.1	2 Times 78.3	3 Times 20.4	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 97.5		1986/87 21.5		1978/79 1.1	
Bushfire Behaviour Potential (% of Zone)	High 76.6		Moderate 11.5		Low 7.3	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A3 - Forest	0.9	0.9		D		
A4 - Reedland/ Rushland/ Sedgeland	0.9	0.9		D		
A7 - Scrubland	0.9	0.9		C		
B3 - Forest/ Open Forest	15.0	14.3		D		
B4 - Open Forest	22.5	21.4		D		
B5 - Open Forest	16.9	16.1		C		
C1 - Forest / Open Forest	35.6	33.9		C		
C2 - Woodland	8.4	8.0		B		
Cleared	1.9	1.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Gunderman Creek Escarpment Unnamed Creek (north east boundary)

Background

- Dwellings located along Wisemans Ferry Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly north-east and south-west aspect with a predominant ridge line running from the north-west to south-east.
- The large fire event in January 1994 impacted 97.5% of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridge line would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Maintain roads and trails.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

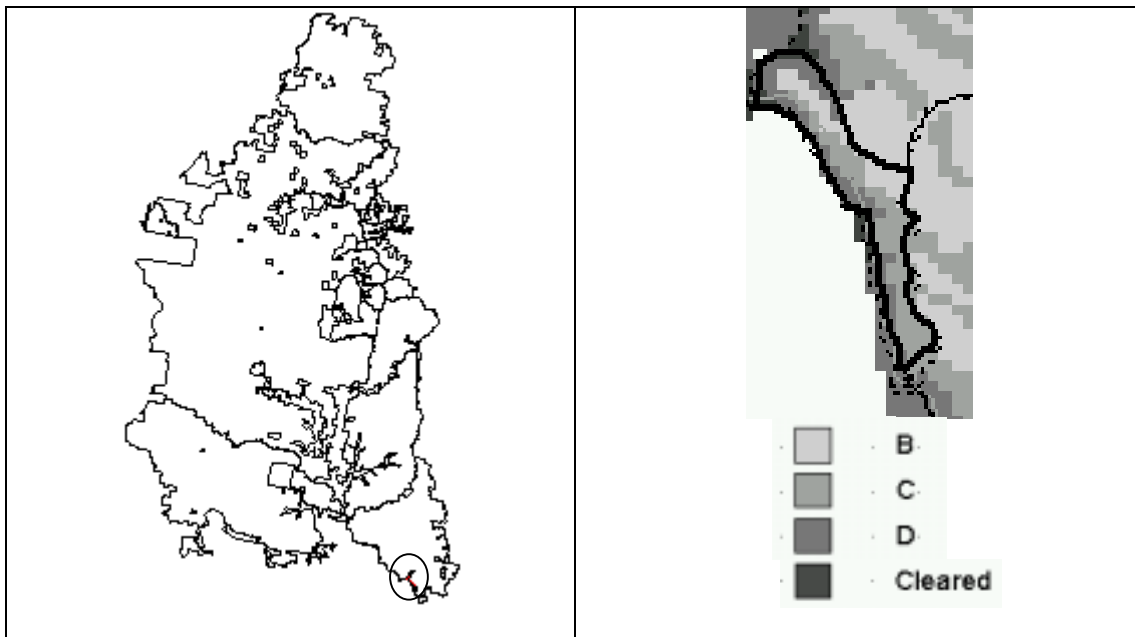
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn program involving an incendiary drop from the ridge line for a depth of 40-80 metres.
- Avoid fuel loads greater than 15 t/ha within 40 metres of Ridge
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

HAWKESBURY STRATEGIC FIRE MANAGEMENT ZONE 63



Characteristics of Zone						
Area in Hectares 112.3		% of Study Area 0.04		Predominant Aspect 220 - 360° (63.4%)		
Fire Protection Zone Strategic Fire Management		Major Assets House/Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 1.3	1 Time 2.1	2 Times 59.4	3 Times 11.7	4 Times 23.3	5 Times 2.1
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 96.6		1986/87 5.3		1985/86 31.9	
Bushfire Behaviour Potential (% of Zone)	High 92.3		Moderate 3.9		Low 2.9	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
B3 - Forest/ Open Forest	26.2	23.4		D		
B4 - Open Forest	10.3	9.2		D		
C1 - Forest / Open Forest	45.9	40.9		C		
C2 - Woodland	25.3	22.5		B		
Cleared	3.7	3.3		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Gunderman Creek Eastern Commission Track Gunderman Track East Escarpment

Background

- Dwellings located along Wisemans Ferry Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly west to south-west aspect and a predominant ridge line running from the north-west to south-east in the northern section of this zone.
- The large fire event in January 1994 impacted 96.6% of this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Eastern Commission Track, some 40 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Maintain roads and trails.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

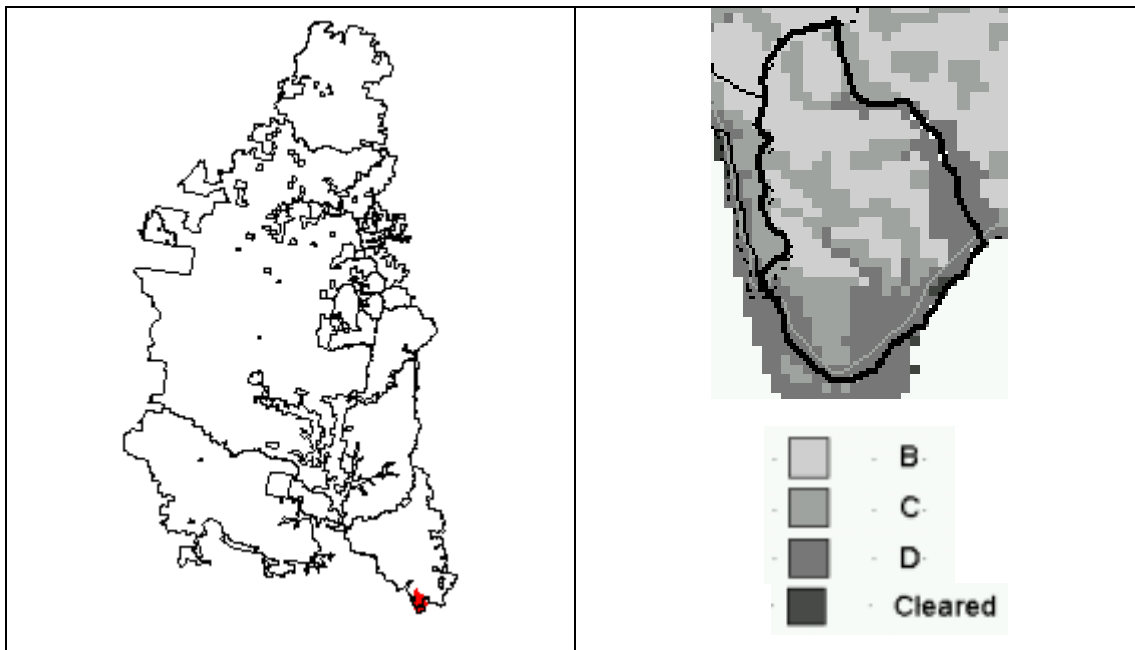
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving a strip burn west from the Eastern Commission Track and an incendiary drop along the ridge.
- Avoid fuel loads greater than 15 t/ha within 40 metres of Ridge
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

COHENS STRATEGIC FIRE MANAGEMENT ZONE 64



Characteristics of Zone						
Area in Hectares 496.6		% of Study Area 0.2		Predominant Aspect 0 - 170° (60.8%)		
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified), House/Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Rock engraving		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.4	1 Time 1.0	2 Times 1.2	3 Times 18.7	4 Times 67.4	5 Times 8.4
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 88.8		1990/91 6.0		1989.90 78.7	
Bushfire Behaviour Potential (% of Zone)	High 75.1		Moderate 19.5		Low 5.3	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A1 – Closed Forest/ Low woodland	0.9	0.2		E		
A2 - Herbland/ Sedgeland	4.7	0.9		D		
A3 - Forest	0.9	0.2		D		
A5 - Low Forest/ Scrubland	2.8	0.6		D		
A6 - Forest	7.5	1.5		D		
B1 - Forest	3.7	0.8		E		
B3 - Forest/ Open Forest	23.4	4.7		D		
B4 - Open Forest	96.4	19.4		D		
C1 - Forest / Open Forest	160.3	32.3		C		
C2 - Woodland	193.1	38.9		B		
Cleared	2.8	1.8		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Allens Creek Cohens Creek Eastern Commission Track

Background

- Dwellings located along Wisemans Ferry Road, and Allens Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect with steep slopes.
- The two large fire events in January 1994 and 1989/90 impacted 88.8% and 78.7% respectively of this zone.
- There is 0.9 hectares of fire intolerant A1 – Closed Forest / Low woodland within this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from A1 – Closed Forest / Low woodland
- Avoid activities within riparian area of Allens Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

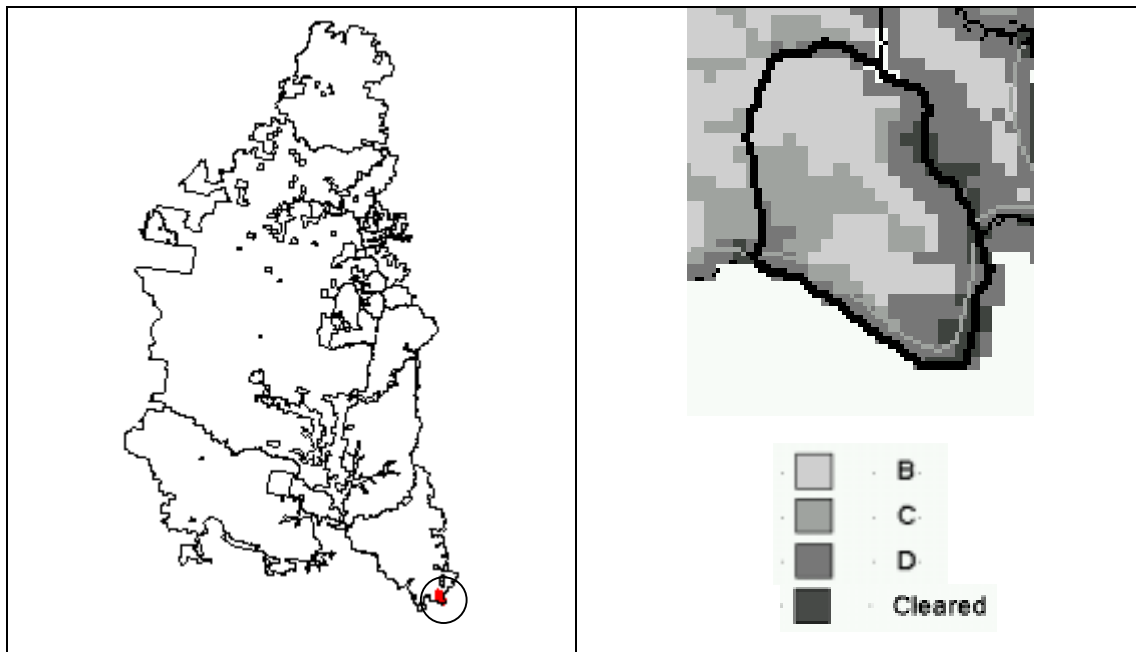
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving an incendiary drop along the ridges
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

BREAKFAST CREEK STRATEGIC FIRE MANAGEMENT ZONE 65



Characteristics of Zone						
Area in Hectares 279.1		% of Study Area 0.1			Predominant Aspect 0 - 170° (60.1%)	
Fire Protection Zone Strategic Fire Management		Major Assets Spencer community, House / Shed, building (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Rock engraving, Stone arrangement			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 0.4	2 Times 7.7	3 Times 10.2	4 Times 21.8	5 Times 45.7
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 99.1		1993/94 58.1		1989/90 3.4	
Bushfire Behaviour Potential (% of Zone)	High 76.3		Moderate 14.6		Low 8.7	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
B1 - Forest	1.9		0.7		E	
B3 - Forest/ Open Forest	26.2		9.4		D	
B4 - Open Forest	56.2		20.2		D	
C1 - Forest / Open Forest	63.7		22.8		C	
C2 - Woodland	106.6		38.2		B	
C4 - Scrubland	2.8		1.0		B	
Cleared	21.6		7.7		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Hawkesbury River Breakfast Creek

Background

- Dwellings located along Wisemans Ferry Road, and Breakfast Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect with steep slopes.
- Many large fire events including January 1994, 1993/94 and 1980/81 impacted 99.1%, 58.0% and 66.0% respectively of this zone.
- There is 1.9 hectares of fire intolerant B1 – Forest (rainforest complex) within this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from B1 – Forest (rainforest complex).
- Avoid activities within riparian area of Breakfast Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

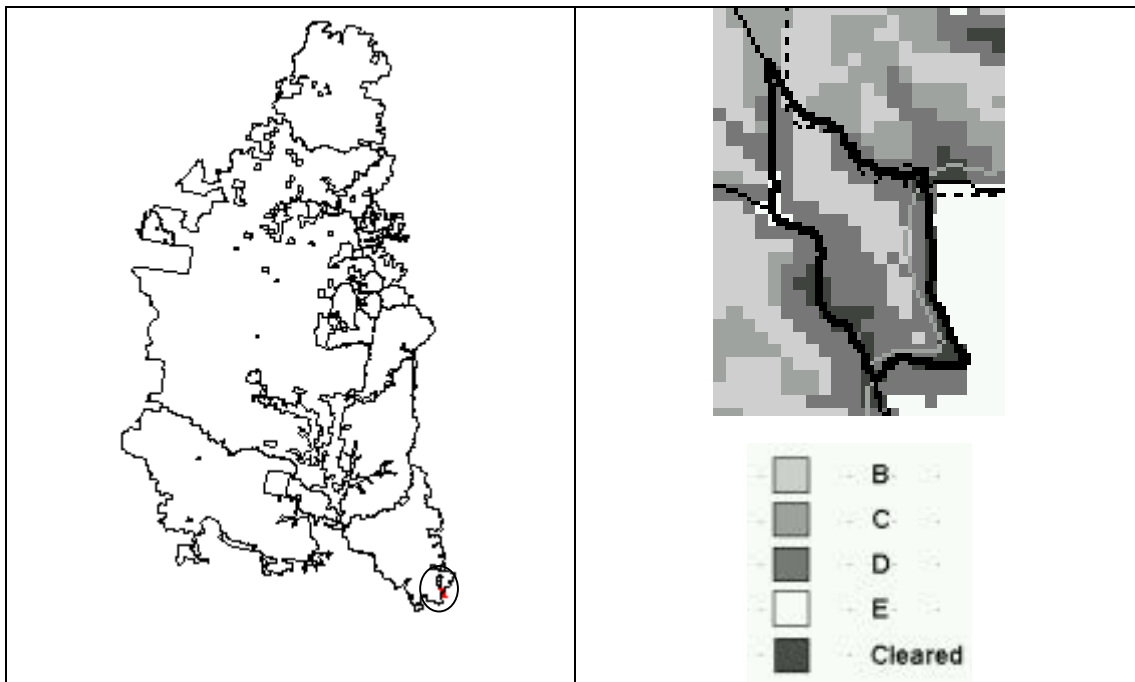
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving an incendiary drop along the ridges
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridges.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

SPENCER STRATEGIC FIRE MANAGEMENT ZONE 66



Characteristics of Zone						
Area in Hectares 153.3		% of Study Area 0.1		Predominant Aspect 0 - 170° (50.8%)		
Fire Protection Zone Strategic Fire Management		Major Assets Spencer community, House/Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Midden, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.5	1 Time 9.3	2 Times 20.2	3 Times 57.5	4 Times 10.1	5 Times 1.6
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1996/97 2.3		1995/96 0.8		Jan94 93.3	
Bushfire Behaviour Potential (% of Zone)	High 61.2		Moderate 19.7		Low 19.4	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
A3 – Forest	0.9		0.6		D	
A5 – Low Forest/ Scrubland	5.6		3.7		D	
B1 – Forest	1.9		1.2		E	
B3 – Forest/ Open Forest	54.4		35.5		D	
B4 – Open Forest	22.5		14.7		D	
C2 – Woodland	46.9		30.6		B	
Cleared	19.7		12.8		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Hawkesbury River Mangrove Creek	Breakfast Creek Woodburys Diatreme Track.

Background

- Dwellings located along Wisemans Ferry Road, and Breakfast Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly north-east and south-west aspect and a predominant ridge line running from the north-west to south-east with steep slopes.
- Many large fire events including Jan94 and 1980/81 impacted 93.3 % and 62.2% respectively of this zone.
- There is 1.9 hectares of fire intolerant B1 – Forest (rainforest complex) within this zone.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Wisemans Ferry Road and Woodburys Diatreme Track, some 40 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from B1 – Forest (rainforest complex).
- Avoid activities within riparian area of Breakfast Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

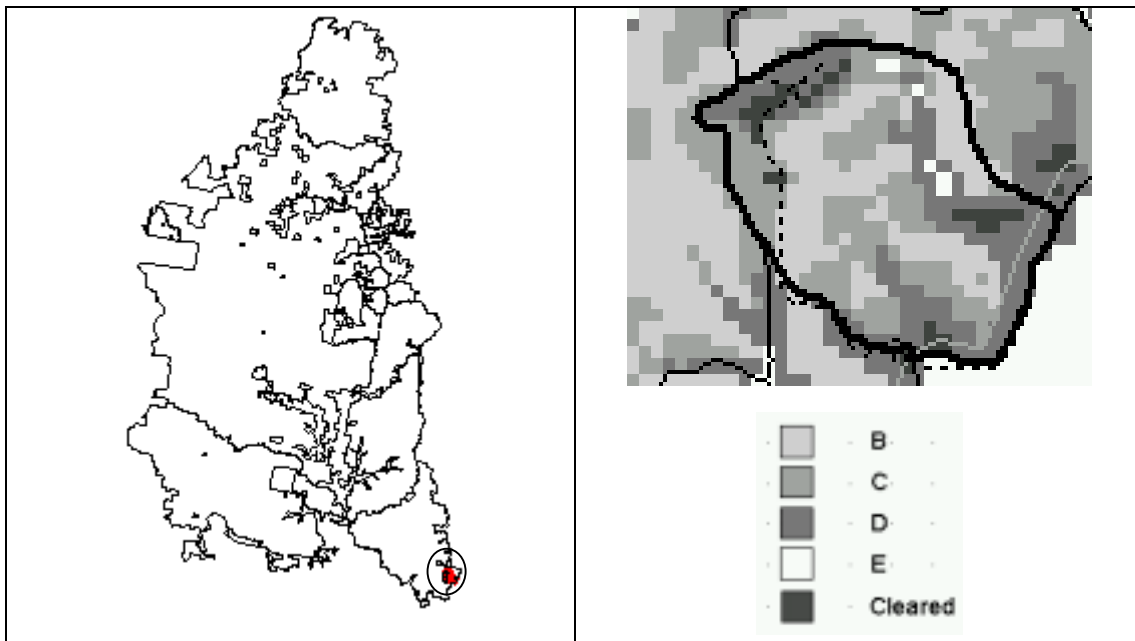
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving a strip burn from Woodburys Diatreme Track and the rear of properties on Wisemans Ferry Road, some 40 metres deep and an incendiary drop along the ridge.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadway and ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

SCOTCHMANS STRATEGIC FIRE MANAGEMENT ZONE 67



Characteristics of Zone						
Area in Hectares 432.9		% of Study Area 0.2		Predominant Aspect 0 - 170° (52.9%)		
Fire Protection Zone Strategic Fire Management		Major Assets House/Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0	1 Time 1.7	2 Times 14.9	3 Times 25.6	4 Times 56.2	5 Times 1.6
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1997/98 2.1		Jan 1994 100		1990/91 76.7	
Bushfire Behaviour Potential (% of Zone)	High 63.3		Moderate 25.5		Low 11.2	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A2 - Herbland/Sedgeland	4.7	1.1		D		
A3 - Forest	6.6	1.5		D		
B1 - Forest	5.6	1.3		E		
B3 - Forest/ Open Forest	74.1	17.1		D		
B4 - Open Forest	11.2	2.6		D		
C1 - Forest / Open Forest	143.2	33.1		C		
C2 - Woodland	116.2	26.9		B		
C4 - Scrubland	14.1	3.2		B		
D2 - Forest	29.1	6.7		D		
Cleared	28.1	6.5		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Woodburys Diatreme Track Wisemans Ferry Road	Mangrove Creek Scotchmans Creek

Background

- Dwellings located along Wisemans Ferry Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly north-east and south west aspect with a predominant ridge line running from the north-west to south-east with steep slopes.
- Many large fire events including Jan94 and 1990/91 impacted 100 % and 76.7% respectively of this zone.
- There is 5.6 hectares of fire intolerant B1 - Forest.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Wisemans Ferry Road and Woodburys Diatreme Track, some 40 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from B1 – Forest.
- Avoid activities within riparian area of Scotchmans Creek
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

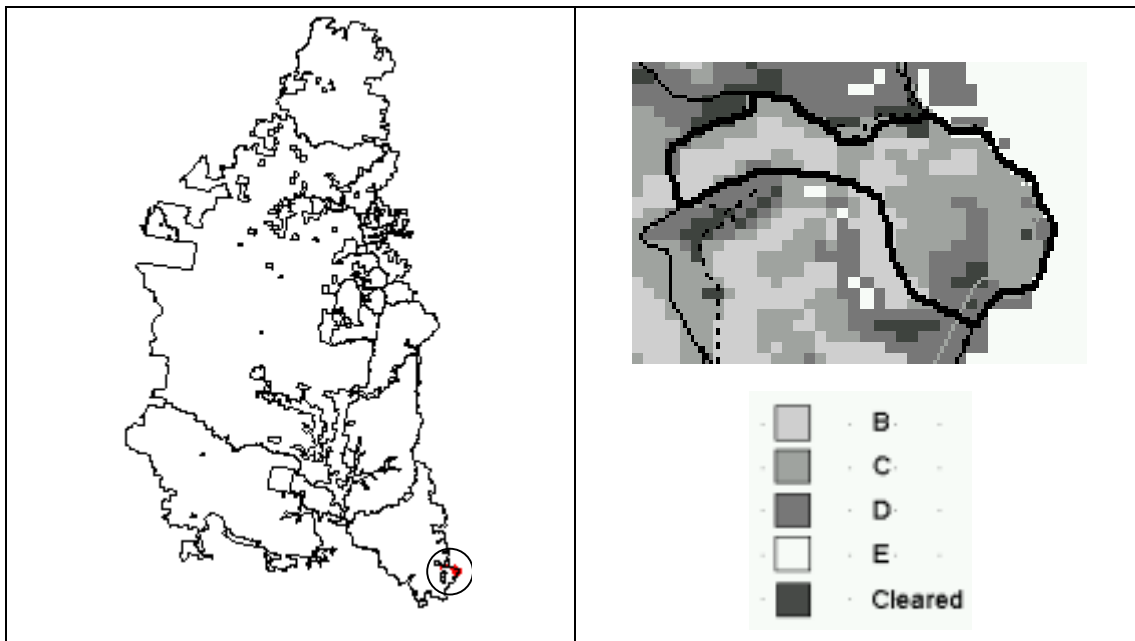
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving strip burn from Woodburys Diatreme Track and from the rear of properties along Wisemans Ferry Road, some 40 metres deep and an incendiary drop along the ridge.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadways and ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

NEVER FAIL STRATEGIC FIRE MANAGEMENT ZONE 68



Characteristics of Zone						
Area in Hectares 274.9		% of Study Area 0.1		Predominant Aspect 0 - 170° (63.7%)		
Fire Protection Zone Strategic Fire Management		Major Assets House/Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Midden, Shelter with art, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.7	1 Time 0.9	2 Times 8.7	3 Times 14.7	4 Times 42.5	5 Times 22.5
Year of Last 3 Fires (Unplanned) % of Zone Burnt	1996/97 1.3		Jan94 95.4		1993/94 8.7	
Bushfire Behaviour Potential (% of Zone)	High 61.2		Moderate 18.7		Low 19.4	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A1 - Closed Forest/ Low woodland	4.7	1.7		E		
A2 - Herbland/ Sedgeland	11.2	4.1		D		
B2 - Forest	2.8	1.0		D		
B3 - Forest/ Open Forest	0.9	0.3		D		
B4 - Open Forest	25.3	9.2		D		
B6 - Open Forest/ Woodland	78.9	28.7		C		
C1 - Forest / Open Forest	68.6	25.0		C		
C2 - Woodland	63.7	23.2		B		
C4 - Scrubland	1.9	0.7		B		
D2 - Forest	2.8	1.0		D		
Cleared	14.1	5.1		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil	
Threatened Flora	Nil	
Fire Advantages	Mangrove Creek Wisemans Ferry Road Dinner Creek	Private Access UN410 Torbay Creek

Background

- Dwellings located along Wisemans Ferry Road and Dinner Creek are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly north-east aspect and a predominant ridge line running from the west to east with steep slopes.
- Many large fire events including Jan94 and 1990/91 impacted 95.4 % and 57.7% respectively of this zone.
- There is 4.7 hectares of fire intolerant A1 – Closed Forest/ Low woodland.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Wisemans Ferry Road and Private Access UN410, some 40 metres deep and an incendiary drop along the ridge would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from A1 – Closed Forest/ Low woodland.
- Avoid activities within riparian area of Dinner Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

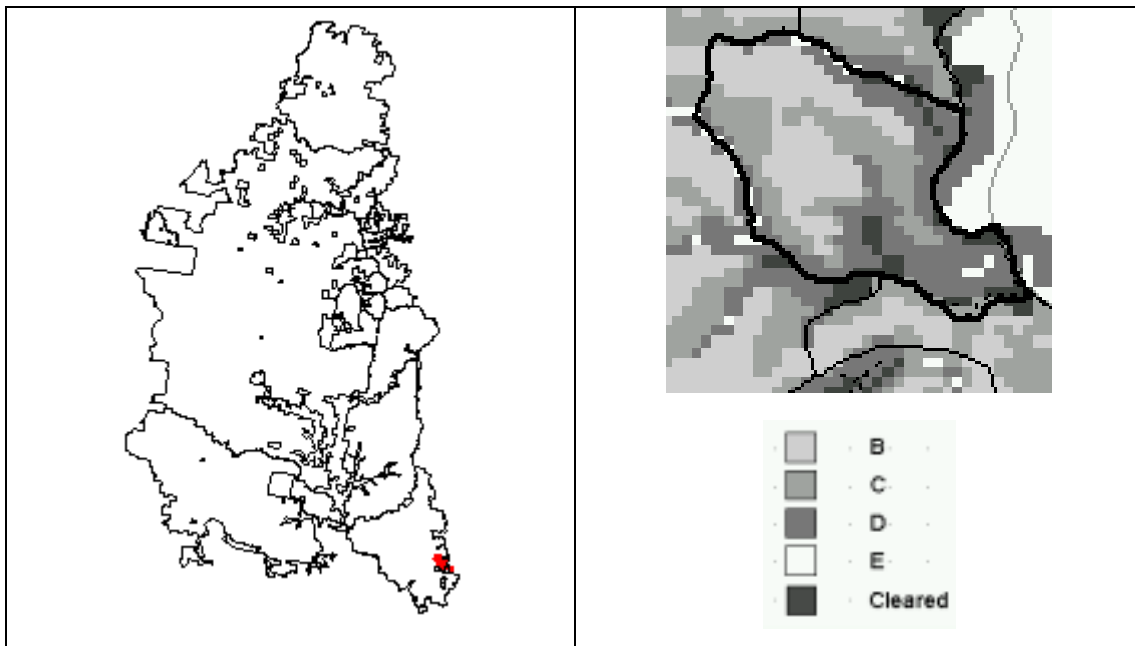
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a burn program involving strip burn from Private Access UN410 and from the rear of properties along Wisemans Ferry Road, some 40 metres deep and an incendiary drop along the ridge.
- Avoid fuel loads greater than 15 t/ha within 40 metres off roadways and ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Promote Community Fireguard through Rural Fire Service.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

DINNER CREEK STRATEGIC FIRE MANAGEMENT ZONE 69



Characteristics of Zone						
Area in Hectares 486.0		% of Study Area 0.2		Predominant Aspect 0 - 170° (56.1%)		
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Midden, Axe grinding groove		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 1.4	1 Time 10.1	2 Times 9.3	3 Times 43.2	4 Times 32.9	5 Times 2.5
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 88.5		1993/94 0.7		1991/92 18.9	
Bushfire Behaviour Potential (% of Zone)	High 51.3		Moderate 26.6		Low 20.7	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
A1 - Closed Forest/ Low woodland	2.8		0.6		E	
A3 - Forest	30.9		6.4		D	
A4 - Reedland/ Rushland/ Sedgeland	10.3		2.1		D	
B1 - Forest	6.6		1.4		E	
B2 - Forest	97.5		20.1		D	
B3 - Forest/ Open Forest	25.3		5.2		D	
B6 - Open Forest/ Woodland	30.9		6.4		C	
C1 - Forest / Open Forest	99.4		20.4		C	
C2 - Woodland	115.3		23.7		B	
C3 - Woodland	23.4		4.8		B	
Cleared	42.2		8.7		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Mangrove Creek Oyster Shell Road Dinner Creek Screech Owl Creek

Background

- Dwellings located along Oyster Shell Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect with steep slopes.
- Many large fire events including Jan94 and 1991/92 impacted 88.5% and 18.9% respectively of this zone.
- There is 2.8 hectares of fire intolerant A1 – Closed Forest/ Low woodland.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from A1 – Closed Forest/ Low woodland.
- Avoid activities within riparian area of Dinner Creek and Screech Owl Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

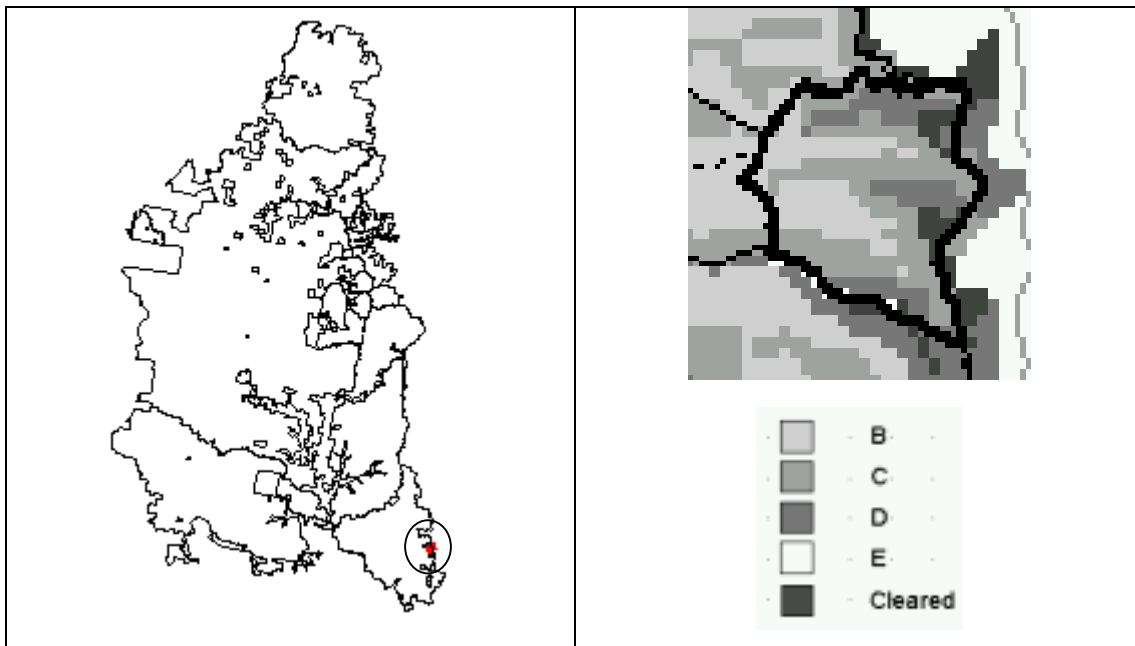
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a an incendiary drop along the ridges
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

SCREECH OWL STRATEGIC FIRE MANAGEMENT ZONE 70



Characteristics of Zone						
Area in Hectares 271.0		% of Study Area 0.1			Predominant Aspect 0 - 170° (61.5%)	
Fire Protection Zone Strategic Fire Management		Major Assets Buildings (unidentified), house/shed			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Axe grinding groove			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 1.0	1 Time 14.1	2 Times 16.3	3 Times 46.2	4 Times 15.8	5 Times 2.2
Year of Last 3 Fires (Unplanned) % of Zone Burnt		1996/97 1.8		1993/94 13.6		1991/92 69.5
Bushfire Behaviour Potential (% of Zone)		High 57.3		Moderate 27.7		Low 15.1
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
A3 - Forest	1.9		0.7		D	
A5 - Low Forest/ Scrubland	1.9		0.7		D	
A6 - Forest	6.6		2.4		D	
B1 - Forest	0.9		0.3		E	
B2 - Forest	44.1		16.3		D	
B6 - Open Forest/ Woodland	60.9		22.5		C	
C1 - Forest / Open Forest	62.8		23.2		C	
C2 - Woodland	44.1		16.3		B	
C3 - Woodland	26.2		9.7		B	
Cleared	19.7		7.3		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo, Powerful Owl, Giant Burrowing Frog
Threatened Flora	Nil
Fire Advantages	Mangrove Creek Oyster Shell Road Screech Owl Creek Eastern Commission Track

Background

- Dwellings located along Oyster Shell Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect with steep slopes.
- Many large fire events including 1993/94 and 1991/92 impacted 13.6% and 69.5% respectively of this zone.
- There is 0.9 hectares of fire intolerant B1 – Forest (Rainforest complex).
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2001.
- Ideally a strip burn from Eastern Commission Track, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from B1 – Forest (rainforest complex).
- Avoid activities within riparian area of Screech Owl Creek and Birdseye Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

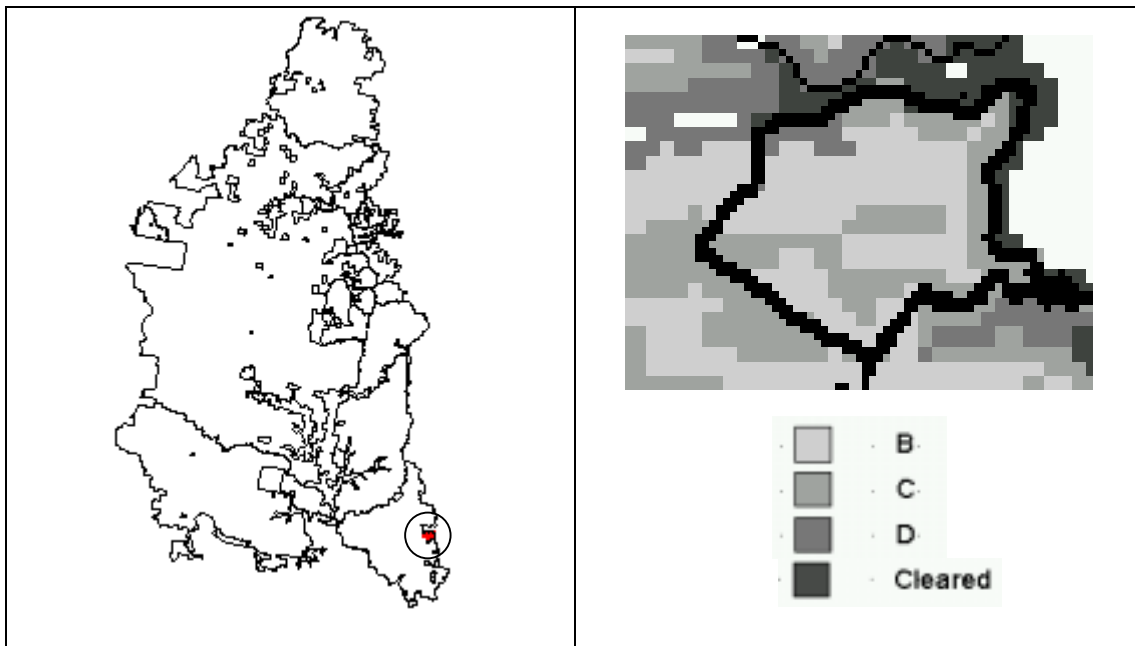
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from Eastern Commission Track, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

WINDRA PARK STRATEGIC FIRE MANAGEMENT ZONE 71



Characteristics of Zone						
Area in Hectares 225.3		% of Study Area 0.1			Predominant Aspect 0 - 170° (58.6%)	
Fire Protection Zone Strategic Fire Management		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 1.1	2 Times 1.6	3 Times 95.8	4 Times 1.6	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 96.8		1980/81 98.9		1975/76 2.7	
Bushfire Behaviour Potential (% of Zone)	High 80.8		Moderate 15.7		Low 3.4	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
B2 - Forest	11.2		5.0		D	
B6 - Open Forest/Woodland	44.1		19.6		C	
C1 - Forest / Open Forest	51.6		22.9		C	
C2 - Woodland	84.4		37.4		B	
C3 - Woodland	29.1		12.9		B	
Cleared	4.7		2.1		N/A	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo
Threatened Flora	Nil
Fire Advantages	Mangrove Creek Sugee Bag Creek Oyster Shell Road Eastern Commission Track Unsealed Public Road – UN407

Background

- Dwellings located along Oyster Shell Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect with steep slopes.
- Many large fire events including Jan94 and 1980/81 impacted 96.8% and 98.9% respectively of this zone.
- There are species issues in the zone relative to the Glossy Black Cockatoo.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally a strip burn from Unsealed Public Road – UN407, some 40 to 80 metres deep and an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Sugee Bag Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

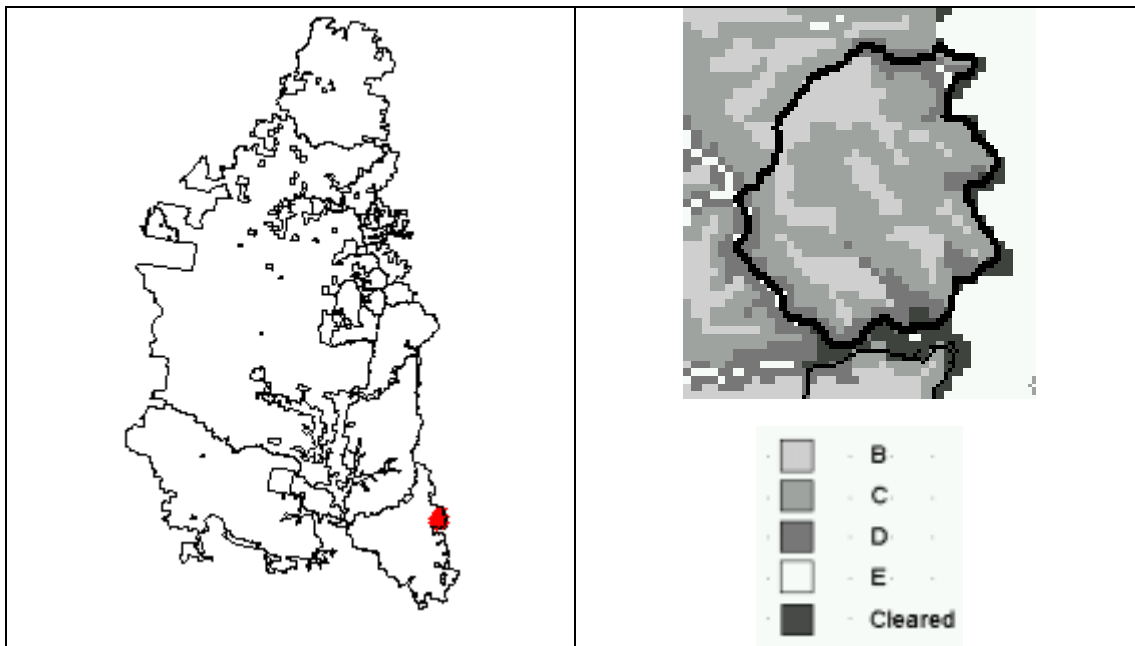
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a strip burn from Unsealed Public Road – UN407, some 40 to 80 metres deep and an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

MANGROVE CREEK STRATEGIC FIRE MANAGEMENT ZONE 72



Characteristics of Zone						
Area in Hectares 717.4		% of Study Area 0.3			Predominant Aspect 0 - 170° (57.0%)	
Fire Protection Zone Strategic Fire Management		Major Assets Building (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Axe grinding groove			Historic Sites Recorded Simpsons Track	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 29.6	2 Times 64.5	3 Times 6.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt	Jan94 14.1		1981/82 63.8			
Bushfire Behaviour Potential (% of Zone)	High 70.0		Moderate 24.1		Low 5.8	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
B1 - Forest	1.9	0.3		E		
B2 - Forest	113.3	15.8		D		
B6 - Open Forest/Woodland	51.6	7.2		C		
C1 - Forest / Open Forest	334.7	46.6		C		
C2 - Woodland	185.6	25.9		B		
C3 - Woodland	9.4	1.3		B		
Cleared	17.8	2.5		N/A		

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Mangrove Creek Sugee Bag Creek Oyster Shell Road Simpsons Track

Background

- Dwellings located along Oyster Shell Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a variable aspect with steep slopes.
- Many large fire events including Jan94 and 1981/82 impacted 14.1% and 63.8% respectively of this zone.
- There is 1.9 hectares of fire intolerant B1 – Forest (rainforest complex)
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2004.
- Ideally an incendiary drop along the ridges would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into and from the remainder of the Reserves.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Exclude activities from B1 – Forest (rainforest complex)
- Avoid activities within riparian area of Sugee Bag Creek.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

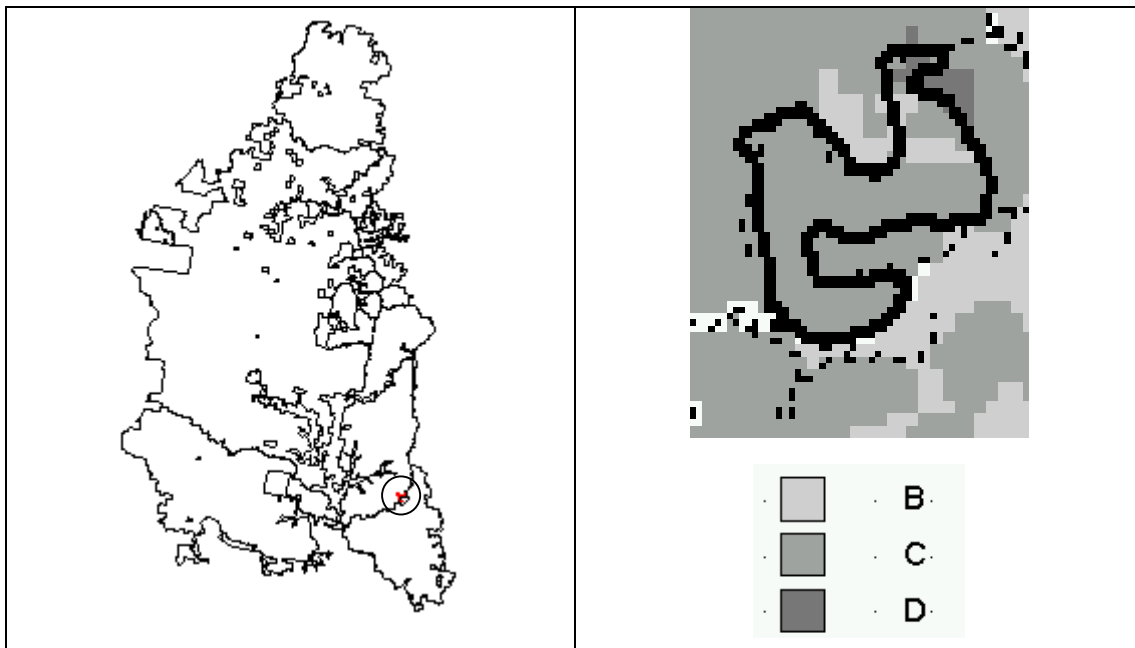
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a an incendiary drop along the ridges.
- Avoid fuel loads greater than 15 t/ha within 40 metres of ridge.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

GREAT NORTH ROAD STRATEGIC FIRE MANAGEMENT ZONE 73



Characteristics of Zone						
Area in Hectares 167.6		% of Study Area 0.1			Predominant Aspect 0 - 170° (69.2)	
Fire Protection Zone Strategic Fire Management		Major Assets House/shed			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art			Historic Sites Recorded Old Great North Road, Clares Bridge	
% of Zone Burnt at Various Frequencies	Unburnt 0.4	1 Time 3.6	2 Times 96.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (Unplanned) % of Zone Burnt		1991/92 95.3		1976/77 98.9		
Bushfire Behaviour Potential (% of Zone)		High 71.7		Moderate 25.7		Low 2.6
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	85.1		50.8		C	
2a - Exposed Hawkesbury Woodland	15.9		9.5		C	
C1 - Forest / Open Forest	50.6		30.2		C	
C2 - Woodland	11.2		6.7		B	
D1 - Forest	4.7		2.8		D	

Yengo NP, Parr SRA and Dharug NP Fire Management Plan

Threatened Fauna	Nil
Threatened Flora	<i>Tetratheca glandulosa</i> , <i>Acacia matthewii</i>
Fire Advantages	Ten Mile Hollow Great North Road Private Access – UN179 4WD Management Access – UN180

Background

- Structures located along the Old Great North Road are potentially at risk to extreme fire event originating from Parr State Recreation Area, Yengo National Park and Dharug National Park.
- This zone has a predominantly south-east aspect with a ridge line along the eastern boundary.
- Many large fire events including 1991/92 and 1976/77 impacted 95.3% and 98.9% respectively of this zone.
- There are species issues in the zone relative to the *Tetratheca glandulosa*.
- The desirable ecological fire regime for this site will be compromised by the application of another burn prior to the year 2002.
- Ideally a road side strip burn along the Old Great North Road and the perimeter roads track and trails (Private Access – UN179 and 4WD Management Access – UN180), some 40 to 80 metres deep would be the best option for maintaining this zone as a buffer and minimising the spread of fire (particularly from accidental ignition) into the remainder of the park.

Objectives

- To protect properties and residents from fire.
- To assist in the strategic control and containment of wildfires.
- Reduce the potential for unplanned fires to spread into and from the Reserves.
- To assist in the reduction of wildfire intensity and spotting intensity within the zone.
- To provide safe and rapid firefighting access into the zone.
- To protect threatened species.

Strategies

- Implement burn program that reduces fire intensity, reduces fire spread and provides safe access and egress.
- Avoid activities within riparian area of Ten Mile Hollow.
- Avoid burning the entire zone in one activity, creating a mosaic of age classes within zone.
- Maintain roads and trails.
- Educate land owners in fuel management techniques for private properties.
- Undertake pre burn-area check to ascertain habitat zone for threatened species.

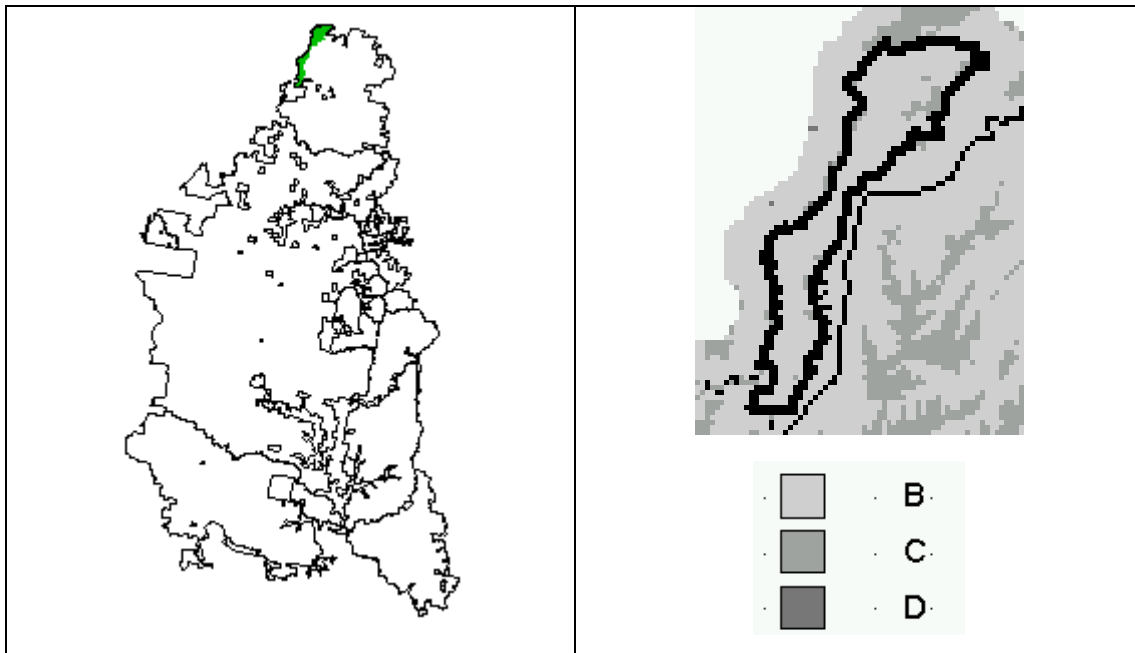
Actions

- Undertake pre burn-area check to ascertain habitat zone for threatened species.
- Implement a road side strip burn along the Old Great North Road and the perimeter roads track and trails (Private Access – UN179 and 4WD Management Access – UN180), some 40 to 80 metres.
- Avoid fuel loads greater than 15 t/ha within 40 metres of access ways.
- Annually review fuel loads and desirable ecological fire regime to determine the need for prescribed burns.
- Document accurate details of fire perimeter, success, intensity, ignition points, size and date.
- Implement liaison / education program for land holders.
- Maintain fire trails as per Table 31.

Performance Indicators

- Prevention of loss of assets and life.
- Reduction of wildfire and spotting intensity and spread.
- Continual safe use of road access and egress during a fire event.

OLD BULGA ROAD HERITAGE MANAGEMENT ZONE 1



Characteristics of Zone						
Area in Hectares 1272.8		% of Study Area 0.59			Predominant Aspect 220 - 360° (59.1%)	
Fire Protection Zone Heritage Management Zone		Major Assets Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Scarred tree			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 34.5	1 Time 44.0	2 Times 5.4	3 Times 16.1	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 15.5		1991/92 20.4		1990/91 1.1	
Bushfire Behaviour Potential (% of Zone)	High 92.4		Moderate 7.5		Low 0.1	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	9.4	0.7		C		
2a - Exposed Hawkesbury Woodland	64.7	5.1		C		
3b - Sheltered Forest on Rich Soils	1.9	0.1		D		
3c - Grey Box Open Forest	3.7	0.3		B		
4a - Exposed Narrabeen Woodland	260.6	20.5		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	719.0	56.5		B		
5 - Northern Escarpment Woodland	210.9	16.6		B		
Unclassified	2.6	0.2		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Large Pied Bat	
Threatened Flora	Nil	
Fire Advantages	Putty Road Bulga Creek Old Bulga Road	Parsons Creek Darkey Creek

Background

- Fire history records for this zone, reveal that only 34.5% has remained unburnt since at least 1976. Of this 1272.8 hectares, 15.5% was burnt in 1993/94 whilst 20.4% was burnt in 1991/92. The remaining portion of the zone was burnt in the period 1976 to 1991.
- Three fire regime categories were identified for this zone, namely B, C, and D.
- Threatened species including, Large Pied Bat occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3c, 4a, 4b and 5).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3b).
- To protect threatened species as per NPWS Operational Guidelines for the Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

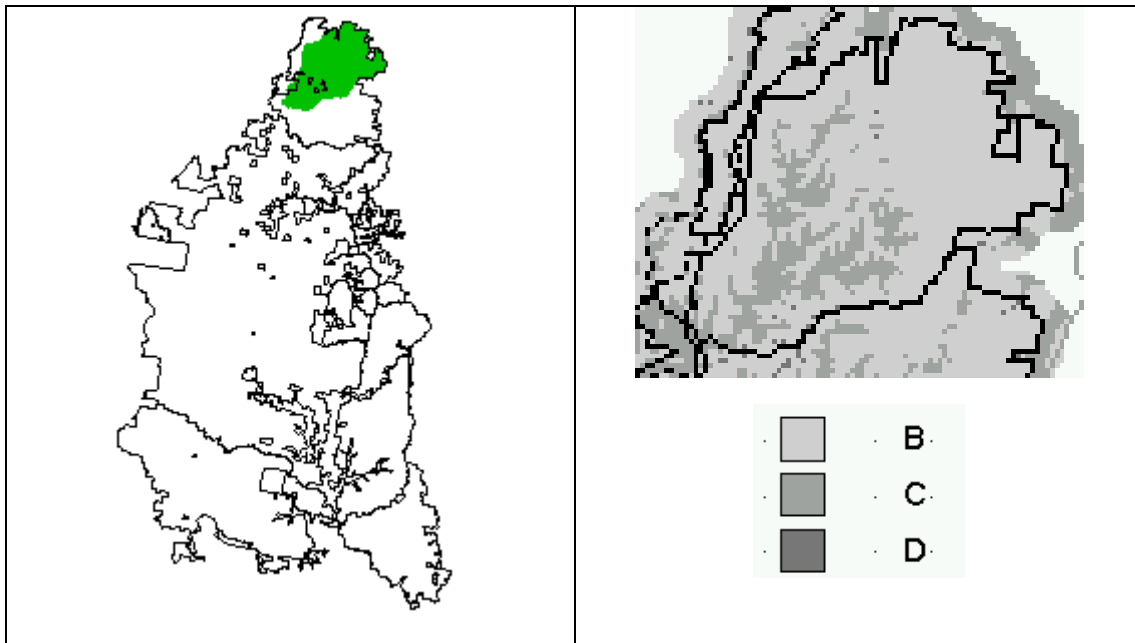
Actions

- Avoid fire within (1, 2a, 3b, 3c, 4a, 4b and 5) communities until at least the year 2008.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Large Pied Bat

MOUNT ISOBEL HERITAGE MANAGEMENT ZONE 2



Characteristics of Zone						
Area in Hectares 10586.5		% of Study Area 4.94		Predominant Aspect 0 - 170° (48.6%)		
Fire Protection Zone Heritage Management Zone		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Midden, Shelter with art		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 3.4	1 Time 35.9	2 Times 53.7	3 Times 7.1	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1991/92 96.0		1979/80 61.3		
Bushfire Behaviour Potential (% of Zone)		High 84.6		Moderate 14.8		Low 0.1
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	1593.7		15.1		C	
2a - Exposed Hawkesbury Woodland	399.4		3.8		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	0.9		0.0		D	
3b - Sheltered Forest on Rich Soils	75.0		0.7		D	
3c - Grey Box Open Forest	13.1		0.1		B	
4a - Exposed Narrabeen Woodland	2200.2		20.8		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	4162.2		39.3		B	
5 - Northern Escarpment Woodland	2098.0		19.8		B	
Unclassified	46.0		0.4		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Squirrel Glider Brush-tailed Rock Wallaby
Threatened Flora	<i>Melaleuca groveana</i>
Fire Advantages	Wollombi Brook Drews Creek Bulga Creek

Background

- Fire history records for this zone, reveal that only 3.4% has remained unburnt since at least 1976. Of this 10586.5 hectares, 96.0% was burnt in 1991/92 whilst 61.3% was burnt in 1979/80.
- Three fire regime categories were identified for this zone, namely B, C and D
- Threatened species including, Glossy Black-Cockatoo, Squirrel Glider, Brush-tailed Rock-wallaby, and *Melaleuca groveana*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3c, 4a, 4b and 5).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

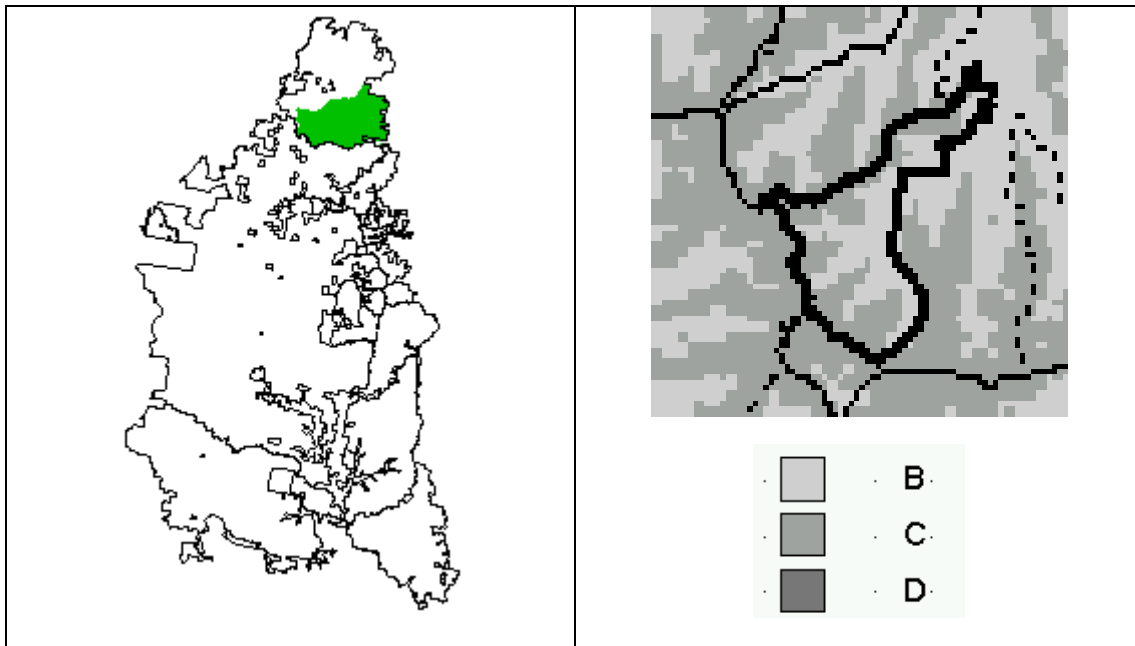
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3c, 4a, 4b and 5) communities until at least the year 2008.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Squirrel Glider, Brush-tailed Rock-wallaby, and *Melaleuca groveana*

CODY CREEK HERITAGE MANAGEMENT ZONE 3



Characteristics of Zone						
Area in Hectares 7831.8		% of Study Area 3.66			Predominant Aspect 0 - 170° (50.0%)	
Fire Protection Zone Heritage Management Zone		Major Assets None Recorded			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Rock engraving, Stone arrangement, Shelter with art			Historic Sites Recorded Old Convict Road	
% of Zone Burnt at Various Frequencies	Unburnt 0.9	1 Time 21.8	2 Times 60.9	3 Times 15.5	4 Times 0.9	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1993/94 0.4		1992/93 0.7		1991/92 5.2
Bushfire Behaviour Potential (% of Zone)		High 82.5		Moderate 15.6		Low 0.9
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	760.3		9.7		C	
2a - Exposed Hawkesbury Woodland	502.5		6.4		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	105.9		1.4		D	
3b - Sheltered Forest on Rich Soils	213.7		2.7		D	
4a - Exposed Narrabeen Woodland	2240.5		28.6		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	3936.3		50.3		B	
Unclassified	72.6		0.9		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Brush-tailed Rock-Wallaby
Threatened Flora	<i>Melaleuca groveana</i>
Fire Advantages	Old Convict Road Wollombi Brook Drews Creek Cody Creek

Background

- Fire history records for this zone, reveal that only 0.9% has remained unburnt since at least 1976. Of this 7831.8 hectares, 5.2% was burnt in 1991/92 whilst 97.0% was burnt in 1979/80.
- Three fire regime categories were identified for this zone, namely B, C and D.
- Threatened species, including Brush-tailed Rock-wallaby and *Melaleuca groveana* occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (4a and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

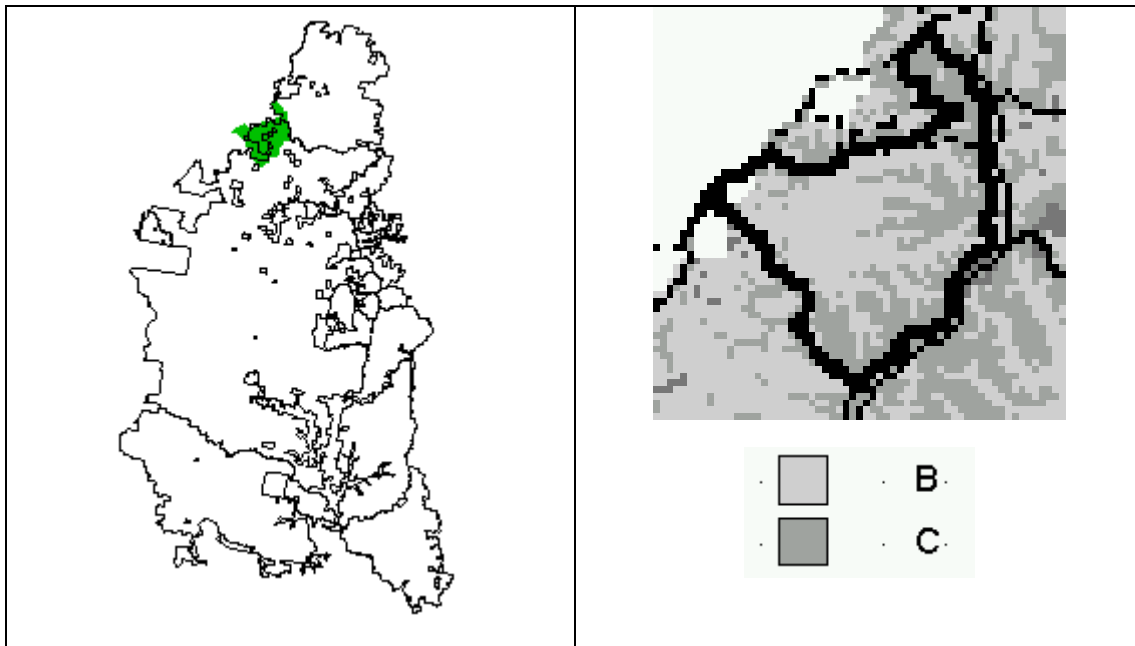
Actions

- Avoid fire within (3b) communities until at least the year 2003.
- Encourage fire within (1, 2a, 3a, 4a and 4b) if unburnt by 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Brush-tailed Rock-wallaby and *Melaleuca groveana*.

HOWES VALLEY HERITAGE MANAGEMENT ZONE 4



Characteristics of Zone						
Area in Hectares 3621.2		% of Study Area 1.69			Predominant Aspect 220 - 360° (43.3%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Quarry, Shelter with art, Shelter with deposit			Historic Sites Recorded Old Convict Road	
% of Zone Burnt at Various Frequencies	Unburnt 11.0	1 Time 9.1	2 Times 6.0	3 Times 72.0	4 Times 1.9	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1993/94 85.3		1991/92 0.8		1990/91 73.9
Bushfire Behaviour Potential (% of Zone)		High 84.2		Moderate 12.9		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	486.0		13.4		C	
2a - Exposed Hawkesbury Woodland	1162.0		32.1		C	
3d - Rough-barked Apple Woodland on alluvium	209.0		5.8		B	
4a - Exposed Narrabeen Woodland	2.0		0.1		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	1712.0		47.3		B	
Unclassified	50.2		1.4		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Red-crowned Toadlet Koala Squirrel Glider	
Threatened Flora	Nil	
Fire Advantages	Howes Trail Howel Valley Track Old Convict Road	Putty Road Howes Valley Creek

Background

- Fire history records for this zone, reveal that only 11% has remained unburnt since at least 1976. Of this 3621.2 hectares, 85.3% was burnt in 1993/94 whilst 73.9% was burnt in 1990/91. The remaining portion of the zone was burnt in the period 1976 to 1991.
- Two fire regime categories were identified for this zone, namely B and C.
- Threatened species, including Red-crowned Toadlet, Koala and Squirrel Glider, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d, 4a and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

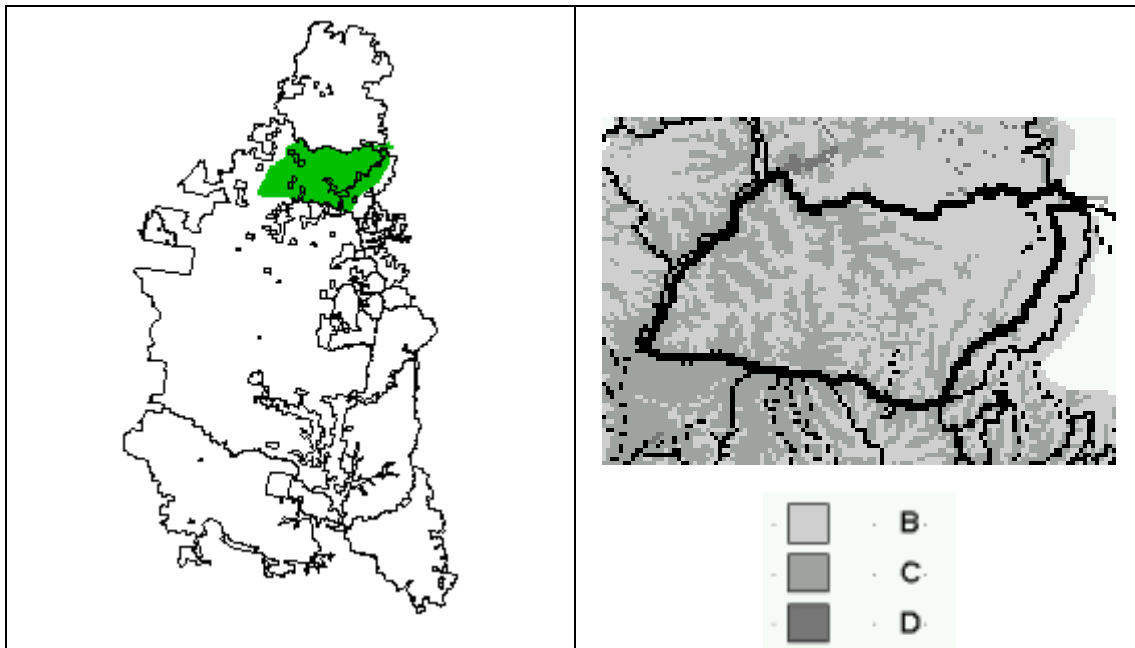
Actions

- Avoid fire within (1, 2a, 3d, 4a and 4b.) communities until at least the year 2007.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Red-crowned Toadlet, Koala and Squirrel Glider.

WERONG CREEK HERITAGE MANAGEMENT ZONE 5



Characteristics of Zone						
Area in Hectares 12719.8		% of Study Area 5.94		Predominant Aspect 0 - 170° (47.9%)		
Fire Protection Zone Heritage Management Zone		Major Assets Sheds, Yards, Caravan		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Rock engraving, Stone arrangement, Shelter with art, Shelter with deposit		Historic Sites Recorded Old Convict Road		
% of Zone Burnt at Various Frequencies	Unburnt 0.1	1 Time 0.8	2 Times 77.7	3 Times 21.0	4 Times 0.3	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1993/94 99.0		1992/93 0.6		1990/91 25.0
Bushfire Behaviour Potential (% of Zone)		High 84.9		Moderate 13.3		Low 0.0
Structural Vegetation Type		Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)
1 - Sheltered Dry Hawkesbury Forest		1172.7		9.2		C
2a - Exposed Hawkesbury Woodland		3855.7		30.3		C
3a - Hawkesbury - Narrabeen Sheltered Forest		14.1		0.1		D
3b - Sheltered Forest on Rich Soils		12.2		0.1		D
3c - Grey Box Open Forest		1.9		0.0		B
3d - Rough -barked Apple Woodland on alluvium		65.6		0.5		B
4a - Exposed Narrabeen Woodland		90.9		0.7		B
4b - Narrabeen - Hawkesbury Ironbark Forest		7287.7		57.3		B
Unclassified		219.1		1.7		N/A

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Black Bittern Koala	
Threatened Flora	<i>Olearia cordata</i>	
Fire Advantages	Howes Valley Track Yengo Track	Yengo Trail Stockyard Creek

Background

- Fire history records for this zone, reveal that only 0.1% has remained unburnt since at least 1976. Of this 12719.8 hectares, 99% was burnt in 1993/94 whilst 25.0% was burnt in 1990/91. The remaining portion of the zone was burnt in the period 1976 to 1991.
- Three fire regime categories were identified for this zone, namely B, C and D.
- Threatened species including, Black Bittern, Koala and *Olearia cordata*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3c, 3d, 4a and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

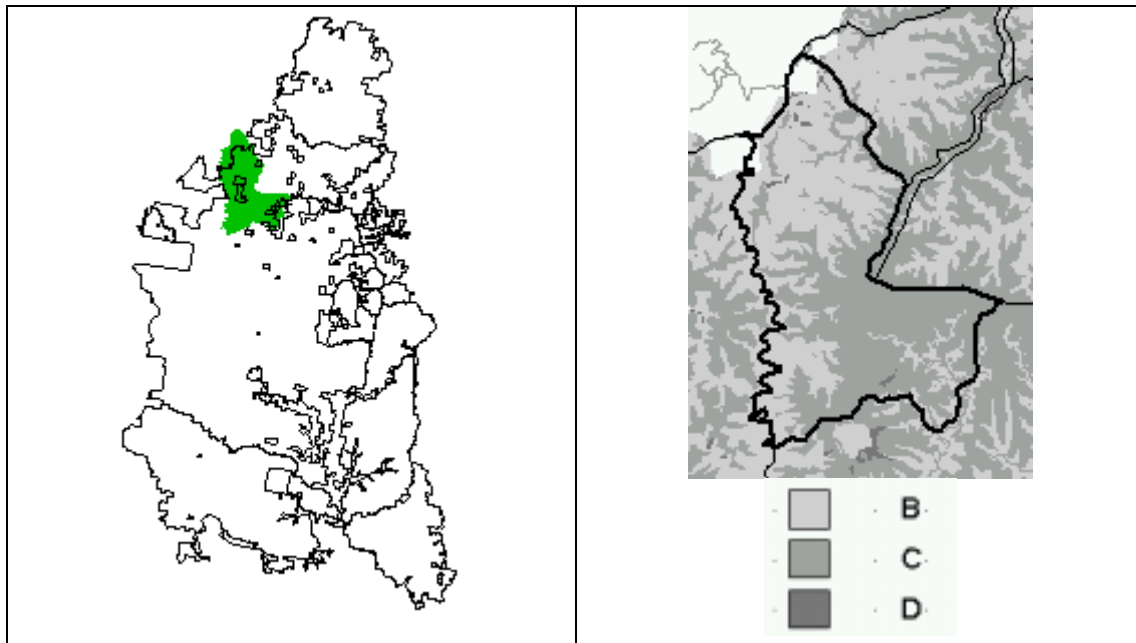
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3c, 3d, 4a and 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Black Bittern, Koala and *Olearia cordata*.

CALORE RANGE HERITAGE MANAGEMENT ZONE 6



Characteristics of Zone						
Area in Hectares 8439.9		% of Study Area 3.94		Predominant Aspect 220 - 360° (44.4%)		
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, Yards, Caravan, House/Shack		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with art		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 1.1	1 Time 9.7	2 Times 48.1	3 Times 35.8	4 Times 5.3	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 91.2		1990/91 4.9		1989/90 0.3	
Bushfire Behaviour Potential (% of Zone)	High 88.2		Moderate 10.0		Low 0.2	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	1683.0		19.9		C	
2a - Exposed Hawkesbury Woodland	2485.0		29.4		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	15.0		0.2		D	
3b - Sheltered Forest on Rich Soils	65.0		0.8		D	
3c - Grey Box Open Forest	63.0		0.7		B	
3d - Rough-barked Apple Woodland on alluvium	187.0		2.2		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	3805.0		45.1		B	
6a - Woodland on Perched Sands	9.0		0.1		B	
Unclassified	127.9		1.5		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Regent Honeyeater	
Threatened Flora	Nil	
Fire Advantages	Howes Trail Howes Valley Track Putty Road	The Bullock Run Wollombi Arm Trail MacDonald River

Background

- Fire history records for this zone, reveal that only 1.1% has remained unburnt since at least 1976. Of this 843.9 hectares, 91.2% was burnt in 1993/94 whilst 84.8% was burnt in 1979/80.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Regent Honeyeater occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3c, 3d, 4b and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a)
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad are biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

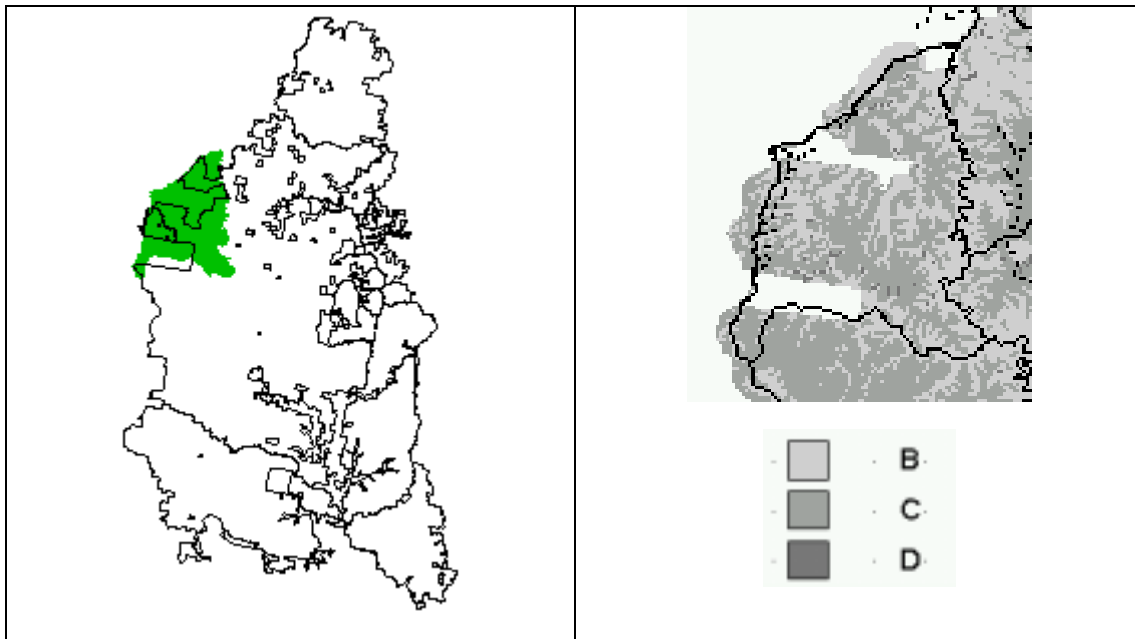
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3c, 3d, 4b, and 6a.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species, Regent Honeyeater.

BURROWELL HERITAGE MANAGEMENT ZONE 7



Characteristics of Zone						
Area in Hectares 16050.0		% of Study Area 7.49			Predominant Aspect 0 - 170° (51.4%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Shacks, Sheds, Yards, caravan			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Shelter with art, Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 2.5	1 Time 10.6	2 Times 46.0	3 Times 35.7	4 Times 5.3	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 100		1990/91 4.9		1986/87 59.5	
Bushfire Behaviour Potential (% of Zone)	High 76.8		Moderate 16.4		Low 4.3	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	1807.0		11.3		C	
2a - Exposed Hawkesbury Woodland	6432.0		40.1		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	57.0		0.4		D	
3b - Sheltered Forest on Rich Soils	84.0		0.5		D	
3d - Rough -barked Apple Woodland on alluvium	1290.0		8.0		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	4854.0		30.2		B	
6a - Woodland on Perched Sands	1060.0		6.6		B	
6b - Swamp Woodland on Perched Sands	61.0		0.4		D	
Unclassified	405.0		2.5		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Turquoise Parrot Powerful Owl Regent Honeyeater
Threatened Flora	<i>Persoonia hirsuta</i>
Fire Advantages	MacDonald River Putty Road

Background

- Fire history records for this zone, reveal that only 2.5% has remained unburnt since at least 1976. Of this 16050.0 hectares, 100% was burnt in 1993/94 whilst 59.5% was burnt in 1986/87.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Glossy Black-Cockatoo, Turquoise Parrot, Powerful Owl, Regent Honeyeater and *Persoonia hirsuta* occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d, 4b and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a, 3b and 6b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

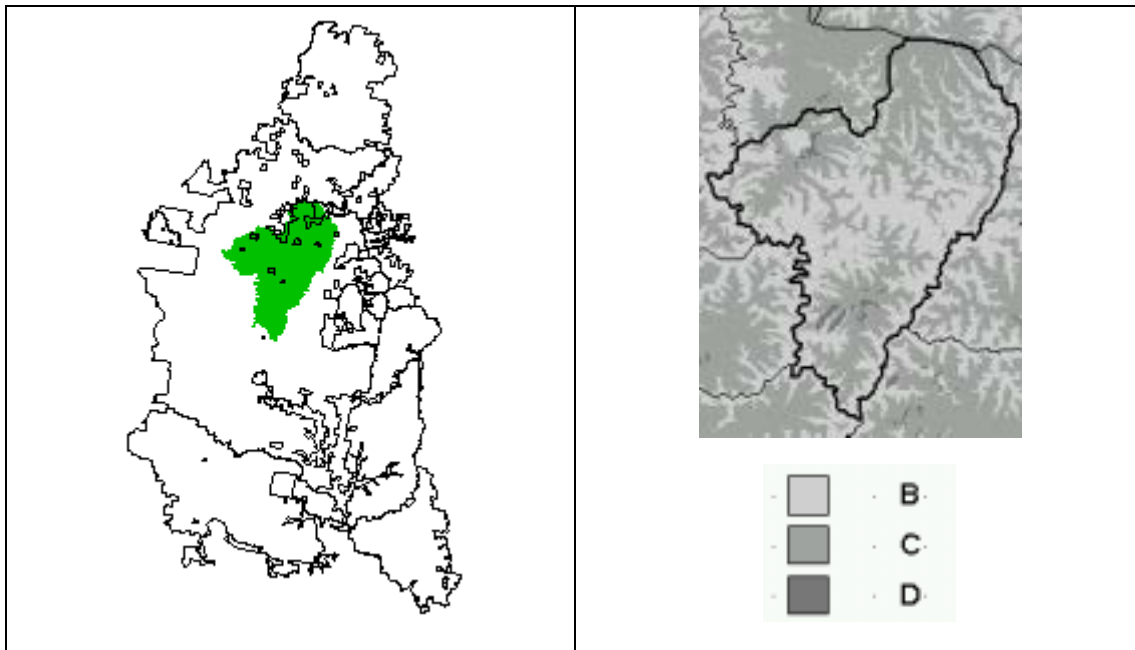
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3d, 4b, 6a, 6b.) communities until at least the year 2007.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Turquoise Parrot, Powerful Owl, Regent Honeyeater and *Persoonia hirsuta* occur within this zone.

MOUNT YENGO HERITAGE MANAGEMENT ZONE 8



Characteristics of Zone						
Area in Hectares 15961.0		% of Study Area 7.45		Predominant Aspect 0 - 170° (47.6%)		
Fire Protection Zone Heritage Management Zone		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with art, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.6	1 Time 14.8	2 Times 64.9	3 Times 16.0	4 Times 3.5	5 Times 0.2
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 93.8		1991/92 0.1		1990/91 13.9	
Bushfire Behaviour Potential (% of Zone)	High 83.7		Moderate 15.3		Low 0.1	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	1843.0		11.5		C	
2a - Exposed Hawkesbury Woodland	5188.7		32.5		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	222.2		1.4		D	
3b - Sheltered Forest on Rich Soils	13.1		0.1		D	
3c - Grey Box Open Forest	157.5		1.0		B	
3d - Rough-barked Apple Woodland on alluvium	188.4		1.2		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	8193.2		51.3		B	
Unclassified	150.8		0.9		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Large Pied Bat
Threatened Flora	<i>Olearia cordata</i>
Fire Advantages	Yengo Track Wollombi Arm Trail Yengo Creek

Background

- Fire history records for this zone, reveal that only 0.6% has remained unburnt since at least 1976. Of this 15961.0 hectares, 93.8% was burnt in 1993/94 whilst 80.9% was burnt in 1979/80.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Large Pied Bat and *Olearia cordata* occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3c, 3d and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

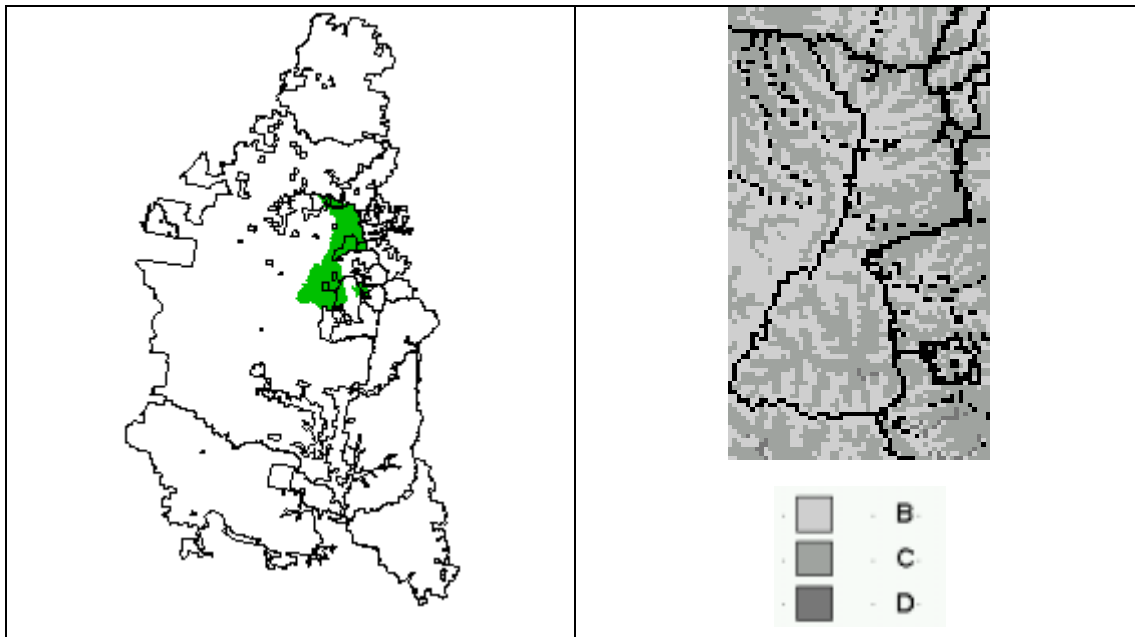
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3c, 3d and 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Large Pied Bat and *Olearia cordata*

BURRAGURRA HERITAGE MANAGEMENT ZONE 9



Characteristics of Zone						
Area in Hectares 7503.8		% of Study Area 3.5			Predominant Aspect 220 - 360° (44.1%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, Yards, Building (unidentified), Caravan			Cultural Resources Camping Ground	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Axe grinding groove			Historic Sites Recorded nil	
% of Zone Burnt at Various Frequencies	Unburnt 1.7	1 Time 12.9	2 Times 27.3	3 Times 35.3	4 Times 20.6	5 Times 2.2
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 100.0		1992/93 0.2		1991/92 0.5	
Bushfire Behaviour Potential (% of Zone)	High 88.1		Moderate 11.3		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	1063.1	14.2		C		
2a - Exposed Hawkesbury Woodland	2728.9	36.4		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	10.3	0.1		D		
3b - Sheltered Forest on Rich Soils	1.9	0.0		D		
3c - Grey Box Open Forest				B		
3d - Rough -barked Apple Woodland on alluvium	114.4	1.5		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	3534.2	47.1		B		
Unclassified	51.5	0.7		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Powerful Owl Koala	
Threatened Flora	Nil	
Fire Advantages	Yengo Track Yengo Trail Sandy Creek Loop Track	Wallabadah Creek Loop Track Wallabadah Creek

Background

- Fire history records for this zone, reveal that only 1.7% has remained unburnt since at least 1976. Of this 7503.8 hectares, 100% was burnt in 1993/94 whilst 48.2% was burnt in 1990/91.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Powerful Owl and Koala, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3c, 3d and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

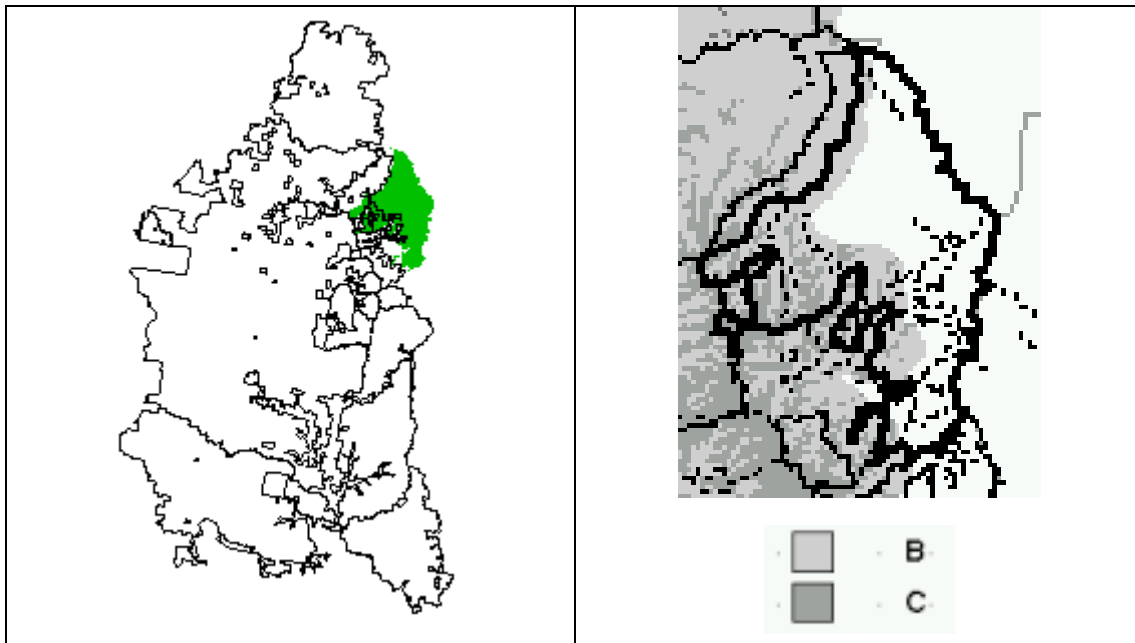
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3c, 3d and 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Powerful Owl and Koala,

WOLLOMBI HERITAGE MANAGEMENT ZONE 10



Characteristics of Zone						
Area in Hectares 9765.1		% of Study Area 4.56			Predominant Aspect 0 - 170° (50.5%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Shacks, Sheds, Yards, Building (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with art, Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 9.1	1 Time 33.4	2 Times 33.6	3 Times 17.5	4 Times 4.9	5 Times 1.5
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1997/98 0.1		1996/97 0.4		1994/95 5.2
Bushfire Behaviour Potential (% of Zone)		High 83.5		Moderate 6.3		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	407.0		4.2		C	
2a - Exposed Hawkesbury Woodland	1223.0		12.5		C	
3d - Rough -barked Apple Woodland on alluvium	329.0		3.4		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	6804.0		69.7		B	
Unclassified	1002.1		10.3		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo Powerful Owl Regent Honeyeater Koala
Threatened Flora	Nil
Fire Advantages	George Downes Drive Stockyard Creek Trail Quart Pot Creek Trail Wollombi Brook

Background

- Fire history records for this zone, reveal that only 9.1% has remained unburnt since at least 1976. Of this 9765.1 hectares, 88.4% was burnt in 1993/94 whilst 35.5% was burnt in 1979/80.
- Two fire regime categories were identified for this zone, namely B and C.
- The threatened species, Glossy Black-Cockatoo, Powerful Owl Regent Honeyeater and Koala, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad are biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

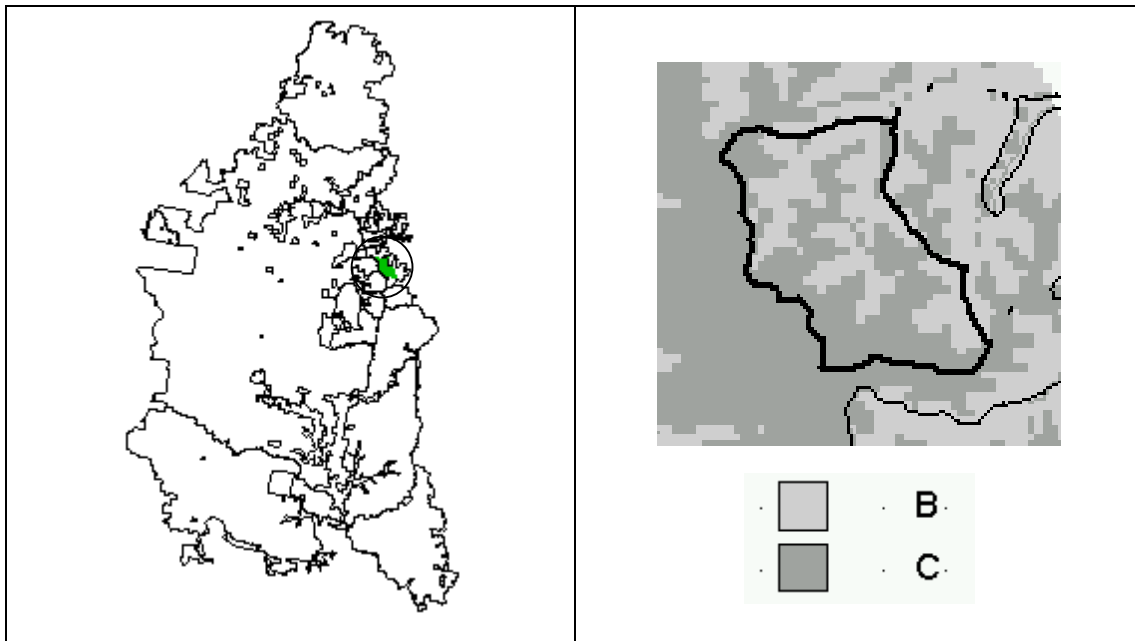
Actions

- Avoid fire within (1, 2a, 3d and 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Powerful Owl Regent Honeyeater and Koala.

LITTLE WALLABDAH EAST HERITAGE MANAGEMENT ZONE 11



Characteristics of Zone						
Area in Hectares 629.3		% of Study Area 0.29		Predominant Aspect 0 - 170° (57.7%)		
Fire Protection Zone Heritage Management Zone		Major Assets None Recorded		Cultural Resources None Recorded		
Cultural Sites Recorded Nil		Aboriginal Sites Recorded Nil		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 2.3	1 Time 97.7	2 Times 0.0	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1993/94 100.0				
Bushfire Behaviour Potential (% of Zone)		High 74.7		Moderate 21.9		Low 0.0
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	193.4	30.7		C		
2a - Exposed Hawkesbury Woodland	143.4	22.8		C		
4b - Narrabeen - Hawkesbury Ironbark Forest	271.9	43.2		B		
Unclassified	20.6	3.3		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Yellow-bellied Glider Brush-tailed Rock-wallaby
Threatened Flora	Nil
Fire Advantages	Yango Track Boree Track

Background

- Fire history records for this zone, reveal that 0% has remained unburnt since at least 1976. Of this 9765.1 hectares, 100% was burnt in 1993/94.
- Two fire regime categories were identified for this zone, namely B and C.
- The threatened species, Yellow-bellied Glider and Brush-tailed Rock-wallaby, occur within this zone

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

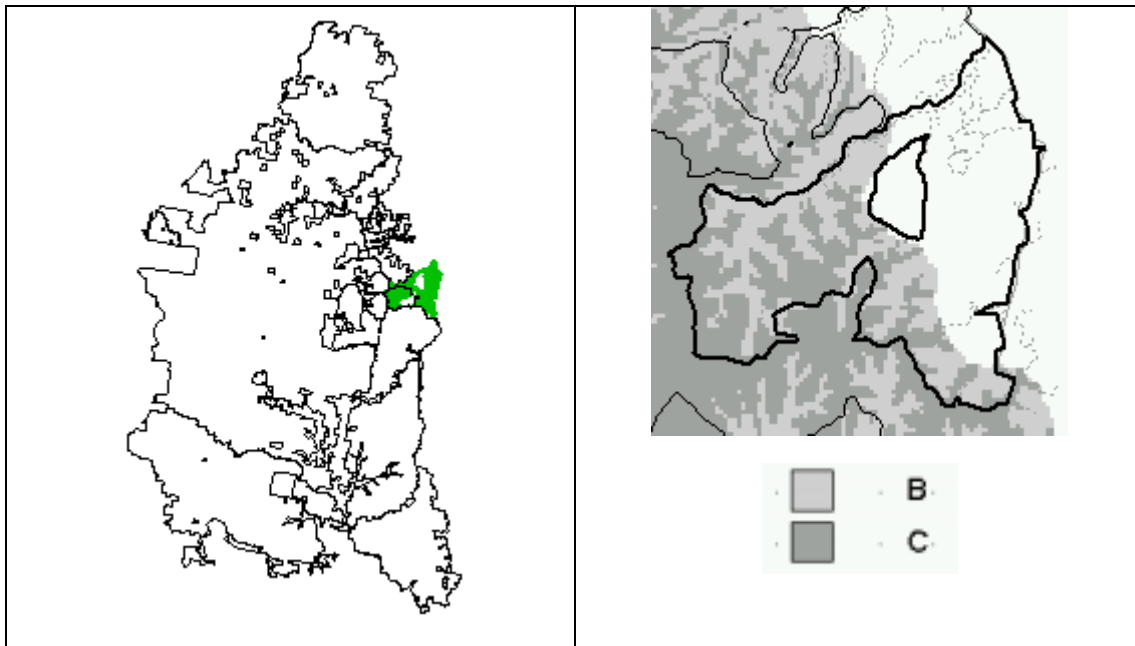
Actions

- Avoid fire within (1, 2a, 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species, Yellow-bellied Glider and Brush-tailed Rock-wallaby.

MOUNT FINCH HERITAGE MANAGEMENT ZONE 12



Characteristics of Zone						
Area in Hectares 3493.4		% of Study Area 1.63			Predominant Aspect 0 - 170° (51.1%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Shacks, Sheds, Buildings (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with art, Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.3	1 Time 90.3	2 Times 9.4	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1993/94 97.3		1991/92 2.7		1990/91 6.3
Bushfire Behaviour Potential (% of Zone)		High 87.7		Moderate 8.4		Low 0.0
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	480.0		13.7		C	
2a - Exposed Hawkesbury Woodland	717.0		20.5		C	
3d - Rough -barked Apple Woodland on alluvium	179.0		5.1		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	1977.0		56.6		B	
Unclassified	140.4		4.0		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Koala Glossy Black Cockatoo
Threatened Flora	<i>Velleia perfoliata</i>
Fire Advantages	Boree Track Mount Simpson Track Private Access UN57 George Downs Drive Wallabadah Loop Track

Background

- Fire history records for this zone, reveal that only 0.3% has remained unburnt since at least 1976. Of this 3493.4 hectares, 97.3% was burnt in 1993/94.
- Two fire regime categories were identified for this zone, namely B and C.
- The threatened species, Koala, Glossy Black Cockatoo and *Velleia perfoliata*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

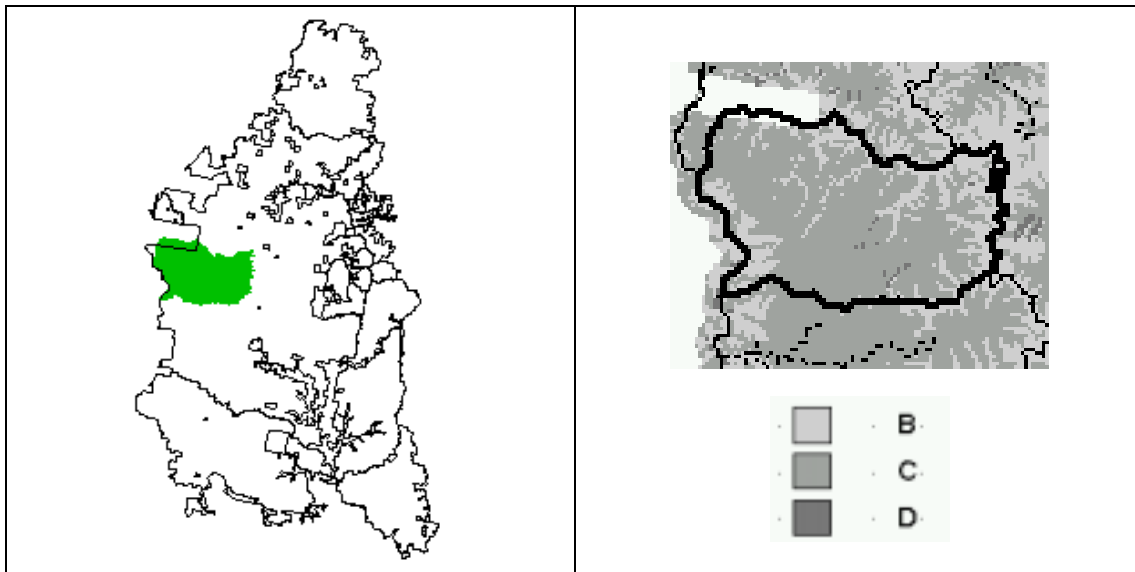
Actions

- Avoid fire within (1, 2a, 3d and 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species, Koala, Glossy Black Cockatoo and *Velleia perfoliata*.

WIRROO CREEK HERITAGE MANAGEMENT ZONE 13



Characteristics of Zone						
Area in Hectares 12537.2		% of Study Area 5.85		Predominant Aspect 0 - 170° (49.7%)		
Fire Protection Zone Heritage Management Zone		Major Assets Shed/Caravan		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with pad, Abraded grooves, Axe grinding groove		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.7	1 Time 20.4	2 Times 49.1	3 Times 22.3	4 Times 4.1	5 Times 3.3
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 90.2		1991/92 11.7		1986/87 11.7	
Bushfire Behaviour Potential (% of Zone)	High 76.8		Moderate 19.8		Low 2.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	2424.2	19.3		C		
2a - Exposed Hawkesbury Woodland	6541.5	52.2		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	75.0	0.6		D		
3b - Sheltered Forest on Rich Soils	7.5	0.1		D		
3d - Rough -barked Apple Woodland on alluvium	170.6	1.4		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	2473.0	19.7		B		
6a - Woodland on Perched Sands	690.9	5.5		B		
6b - Swamp Woodland on Perched Sands	3.7	0.0		D		
Unclassified	150.7	1.2		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black Cockatoo Turquoise Parrot Brush-tailed Rock-wallaby
Threatened Flora	Nil
Fire Advantages	Putty Road Macdonald River Wirroo Creek Toorwai Creek

Background

- Fire history records for this zone, reveal that only 0.7% has remained unburnt since at least 1976. Of this 12537.2 hectares, 90.2% was burnt in 1993/94 whilst 45.7% was burnt in 1979/80.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Glossy Black-Cockatoo, Turquoise Parrot and Brush-tailed Rock-wallaby occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d, 4b and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

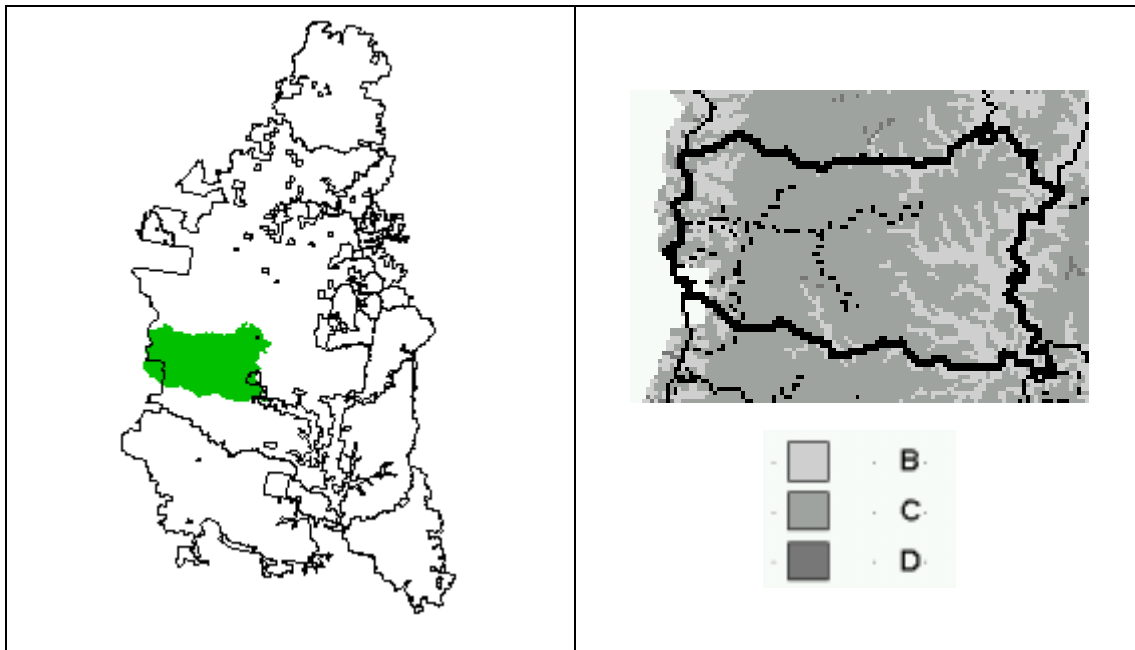
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3d, 4b, 6a and 6b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Turquoise Parrot and Brush-tailed Rock-wallaby.

HOWES SWAMP HERITAGE MANAGEMENT ZONE 14



Characteristics of Zone						
Area in Hectares 15107.0		% of Study Area 7.05			Predominant Aspect 0 - 170° (49.2%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Shacks, Building (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with art			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 11.6	1 Time 45.6	2 Times 17.7	3 Times 17.5	4 Times 7.6	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1993/94 37.2		1991/92 36.9		1987/88 0.5	
Bushfire Behaviour Potential (% of Zone)	High 83.3		Moderate 13.5		Low 2.5	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	5706.0		37.8		C	
2a - Exposed Hawkesbury Woodland	5216.0		34.5		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	12.0		0.1		D	
3d - Rough-barked Apple Woodland on alluvium	30.0		0.2		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	3006.0		19.9		B	
6a - Woodland on Perched Sands	982.0		6.5		B	
6b - Swamp Woodland on Perched Sands	65.0		0.4		D	
Unclassified	90.0		0.6		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Heath Monitor Broad-headed Snake Glossy Black Cockatoo	Turquoise Parrot Powerful Owl Yellow-bellied Glider
Threatened Flora	<i>Olearia cordata</i> <i>Zieria involucreta</i>	
Fire Advantages	Putty Road Macdonald River Toorwai Creek	Melon Creek Howes Valley Track Melon Track

Background

- Fire history records for this zone, reveal that only 11.6% has remained unburnt since at least 1976. Of this 15107.0 hectares, 37.2% was burnt in 1993/94 whilst 36.9% was burnt in 1991/92. The remaining portion of the zone was burnt in the period 1976 to 1991.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Heath Monitor, Broad-headed Snake, Glossy Black-Cockatoo, Turquoise Parrot, Powerful Owl, Yellow-bellied Glider, *Olearia cordata* and *Zieria involucreta*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d, 4b and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 6b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

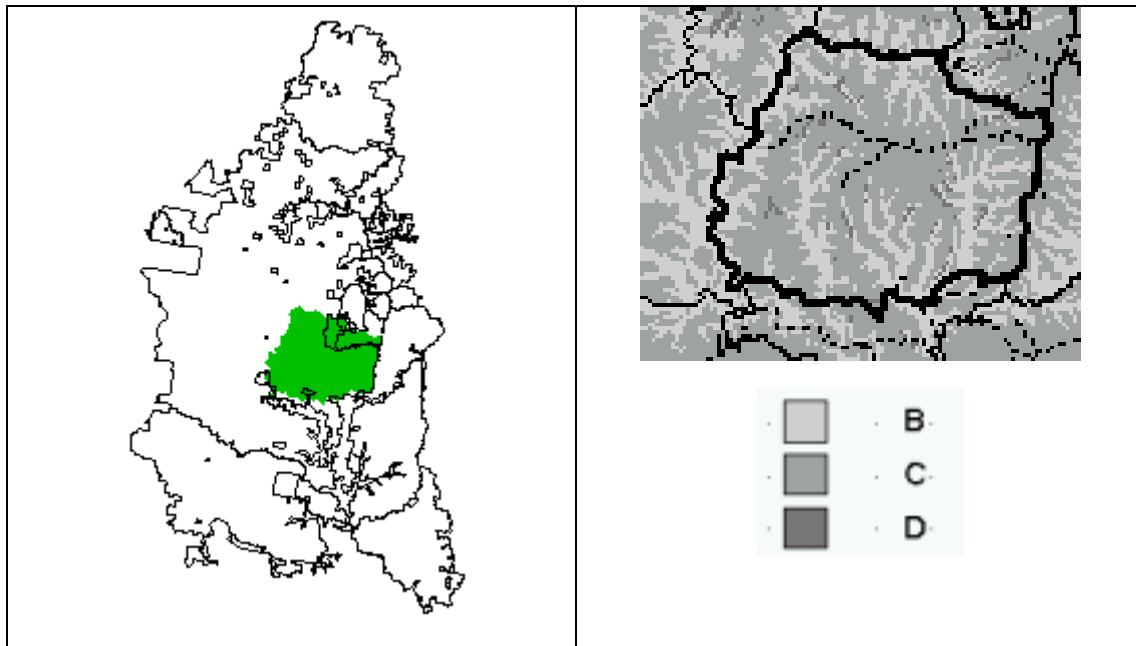
Actions

- Avoid fire within (1, 2a, 3a, 3d, 4b, 6a and 6b.) communities until at least the year 2008.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Heath Monitor, Broad-headed Snake, Glossy Black-Cockatoo, Turquoise Parrot, Powerful Owl, Yellow-bellied Glider, *Olearia cordata*, *Zieria involucreta*.

BALA RANGE HERITAGE MANAGEMENT ZONE 15



Characteristics of Zone						
Area in Hectares 15770.8		% of Study Area 7.36		Predominant Aspect 0 - 170° (45.0%)		
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, House/Shed		Cultural Resources Mt Lockyer Lookout		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Stone arrangement, Shelter with art, Axe grinding groove		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 19.5	1 Time 30.2	2 Times 47.8	3 Times 2.5	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1995/96 1.3		1993/94 59.0		1992/93 0.1	
Bushfire Behaviour Potential (% of Zone)	High 87.4		Moderate 12.1		Low 0.2	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	5491.5	34.8		C		
2a - Exposed Hawkesbury Woodland	4845.6	30.7		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	268.1	1.7		D		
3b - Sheltered Forest on Rich Soils	119.1	0.8		D		
3d - Rough -barked Apple Woodland on alluvium	31.9	0.2		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	495.5	31.4		B		
Unclassified	62.1	0.4		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Masked Owl Koala Large Pied Bat
Threatened Flora	<i>Velleia perfoliata</i>
Fire Advantages	Boree Track Bala Range Track Macdonald Creek Little Boree Creek Mogo Creek

Background

- Fire history records for this zone, reveal that only 19.5% has remained unburnt since at least 1976. Of this 15770.8 hectares, 59.0% was burnt in 1993/94 whilst 1.3% was burnt in 1995/96. The remaining portion of the zone was burnt in the period 1976 to 1993.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Glossy Black-Cockatoo, Masked Owl, Koala, Large Pied Bat, *Velleia perfoliata*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

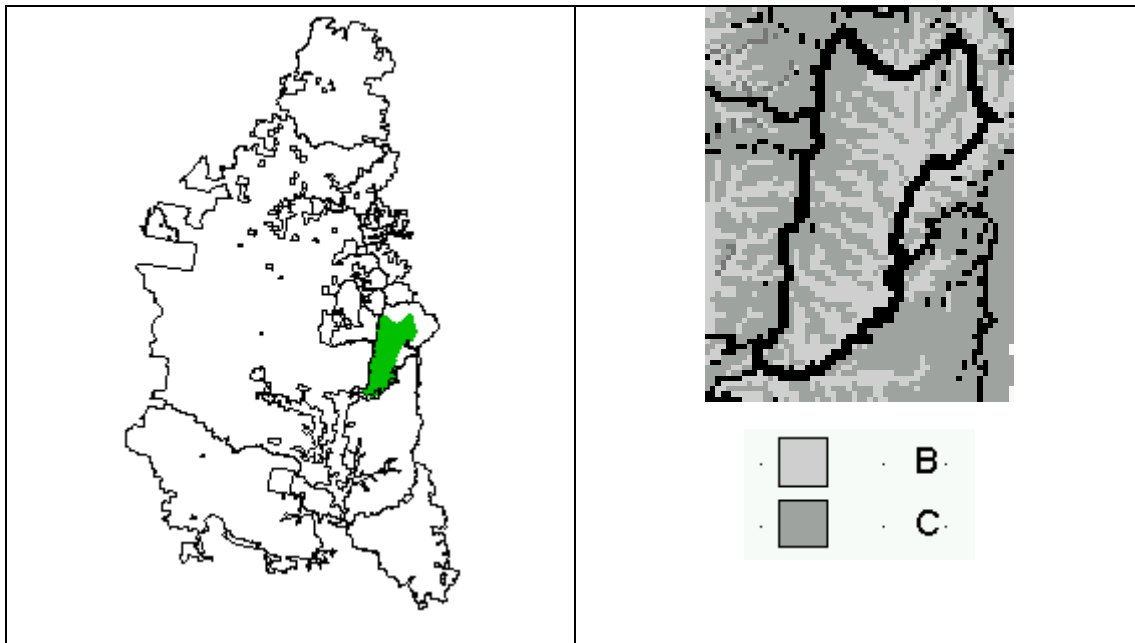
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3d and 4b.) communities until at least the year 2008.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Masked Owl, Koala, Large Pied Bat and *Velleia perfoliata*.

MOGO CREEK HERITAGE MANAGEMENT ZONE 16



Characteristics of Zone						
Area in Hectares 4964.6		% of Study Area 2.32		Predominant Aspect 0 - 170° (55.0%)		
Fire Protection Zone Heritage Management Zone		Major Assets Sheds, Building (unidentified)		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Stone arrangement, Shelter with art, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 4.1	1 Time 16.0	2 Times 79.9	3 Times 0.0	4 Times 0.0	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1996/97 0.1		Jan 94 100		1991/92 0.1	
Bushfire Behaviour Potential (% of Zone)	High 78.7		Moderate 20.8		Low 0.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	1027.4	20.7		C		
2a - Exposed Hawkesbury Woodland	1310.5	26.4		C		
3d - Rough -barked Apple Woodland on alluvium	82.5	1.7		B		
4b - Narrabeen - Hawkesbury Ironbark Forest	2517.0	50.7		B		
Unclassified	62.1	0.4		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Koala Brush-tailed Rock-wallaby
Threatened Flora	<i>Zieria involucrata</i>
Fire Advantages	Boree Track Mogo Creek Road Mogo Creek

Background

- Fire history records for this zone, reveal that 0% has remained unburnt since at least 1976. Of this 4964.6 hectares, 100% was burnt in January 1994.
- Two fire regime categories were identified for this zone, namely B and C.
- The threatened species, Glossy Black-Cockatoo, Koala, Brush-tailed Rock-wallaby, *Zieria involucrata*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d and 4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

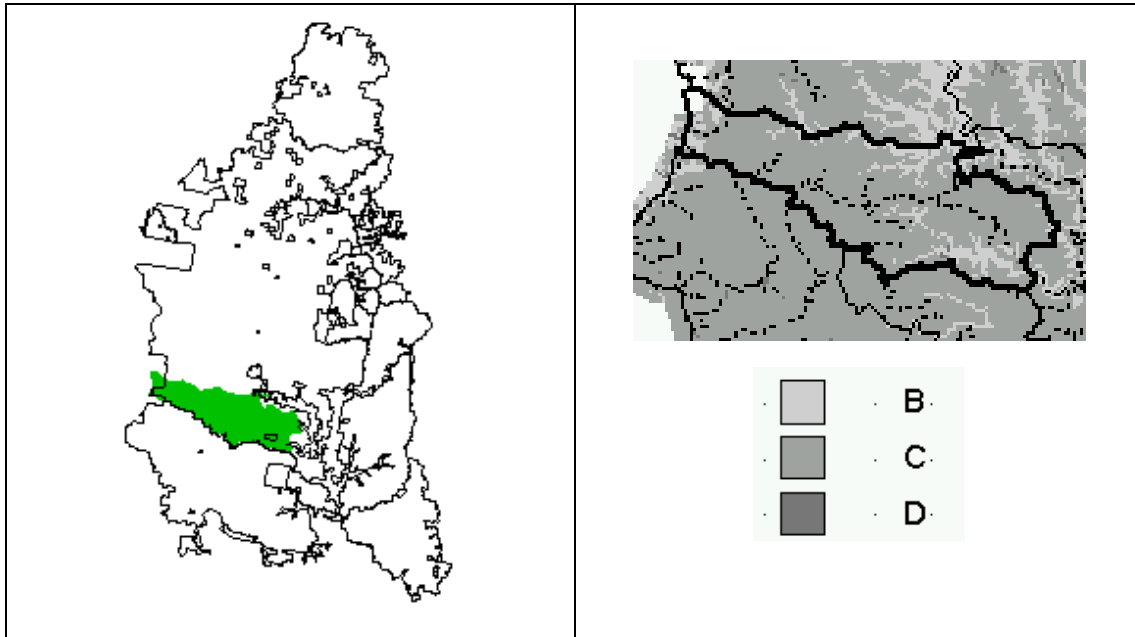
Actions

- Avoid fire within (1, 2a, 3d, 4b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Koala, Brush-tailed Rock-wallaby and *Zieria involucrata*.

WOMERAH CREEK HERITAGE MANAGEMENT ZONE 17



Characteristics of Zone						
Area in Hectares 12142.0		% of Study Area 5.67			Predominant Aspect 0 - 170° (51.1%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, Caravan			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Shelter with art, Axe grinding groove			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 15.6	1 Time 21.3	2 Times 8.7	3 Times 36.2	4 Times 15.9	5 Times 2.4
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 26.1		1994/95 0.6		1993/94 44.7	
Bushfire Behaviour Potential (% of Zone)	High 80.4		Moderate 16.2		Low 1.1	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	5154.0		42.4		C	
2a - Exposed Hawkesbury Woodland	5178.0		42.6		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	26.0		0.2		D	
3b - Sheltered Forest on Rich Soils	15.0		0.1		D	
3d - Rough barked Apple Woodland on alluvium	36.0		0.3		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	1264.0		10.4		B	
6a - Woodland on Perched Sands	271.0		2.2		B	
6b - Swamp Woodland on Perched Sands	36.0		0.3		D	
Unclassified	162.0		1.3		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Turquoise Parrot Koala Large Pied Bat	
Threatened Flora	<i>Zieria Involucrata</i> <i>Lasiopetalum joyceae</i>	
Fire Advantages	Putty Road Womerah Track Gorricks Creek Track	Melon Creek Womerah Creek

Background

- Fire history records for this zone, reveal that only 15.6% has remained unburnt since at least 1976. Of this 12142.0 hectares, 26.1% was burnt in 1997/98 whilst 44.7% was burnt in 1993/94.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Glossy Black-Cockatoo, Turquoise Parrot, Koala, Large Pied Bat, *Zieria involucrata*, *Lasiopetalum joyceae*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d, 4b and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1 and 2a).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a, 3b and 6b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

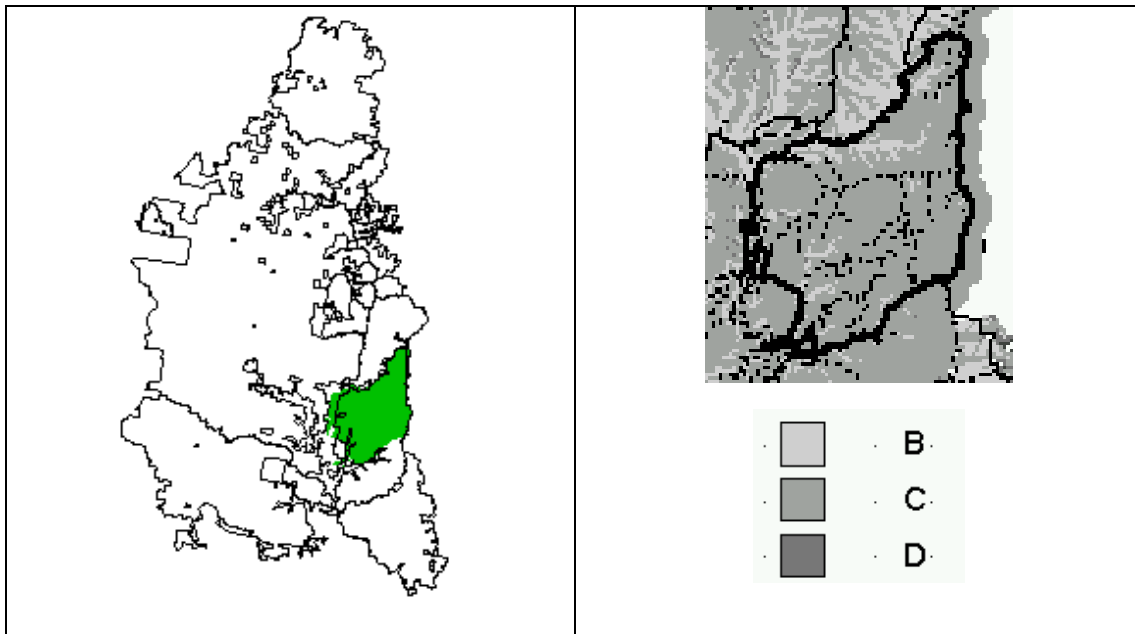
Actions

- Avoid fire within (1, 2a, 3a, 3b, 3d, 4b, 6a, 6b.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Turquoise Parrot, Koala, Large Pied Bat, *Zieria involucrata* and *Lasiopetalum joyceae*.

WRIGHTS CREEK HERITAGE MANAGEMENT ZONE 18



Characteristics of Zone						
Area in Hectares 12575.4		% of Study Area 5.87			Predominant Aspect 0 - 170° (44.3%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, buildings (unidentified)			Cultural Resources Camping ground	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Rock engraving, Stone arrangement, Open camp site, Shelter with art, Axe grinding groove, Shelter with deposit			Historic Sites Recorded Circuit Flat Bridge, Old Great North Road	
% of Zone Burnt at Frequencies	Unburnt 19.9	1 Time 32.5	2 Times 33.9	3 Times 12.6	4 Times 1.0	5 Times 0.1
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 4.6		1996/97 0.1		1994/95 3.9	
Bushfire Behaviour Potential (% of Zone)	High 81.8		Moderate 13.4		Low 1.4	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	5825.3		46.3		C	
2a - Exposed Hawkesbury Woodland	4439.7		35.3		C	
2b - Dwarf Apple Low Open Woodland	480.9		3.8		C	
3a - Hawkesbury - Narrabeen Sheltered Forest	12.2		0.1		D	
3b - Sheltered Forest on Rich Soils	26.2		0.2		D	
3d - Rough-barked Apple Woodland on alluvium	76.9		0.6		B	
4b - Narrabeen - Hawkesbury Ironbark Forest	1259.0		10.0		B	
6a - Woodland on Perched Sands	36.6		0.3		B	
Unclassified	418.6		3.3		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Giant Barred Frog Glossy Black-Cockatoo Turquoise Parrot Powerful Owl	Regent Honeyeater Koala Yellow-bellied Glider Brush-tailed Rock-wallaby
Threatened Flora	<i>Olearia cordata</i> <i>Tetradlea glandulosa</i>	
Fire Advantages	Mogo Creek Road Great North Road Sullivans Creek Track Wrights Creek Track	Wrights Creek Mogo Creek Little Mogo Creek

Background

- Fire history records for this zone, reveal that only 19.9% has remained unburnt since at least 1976. Of this 12575.4 hectares, 54.7% was burnt in 1993/94 whilst 20.9% was burnt in 1990/91.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Giant Barred Frog, Glossy Black-Cockatoo, Turquoise Parrot, Barking Owl, Powerful Owl, Regent Honeyeater, Koala, Yellow-bellied Glider, Brush-tailed Rock-wallaby, *Olearia cordata*, *Tetradlea glandulosa*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (3d, 4b and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1, 2a and 2b).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a and 3b).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

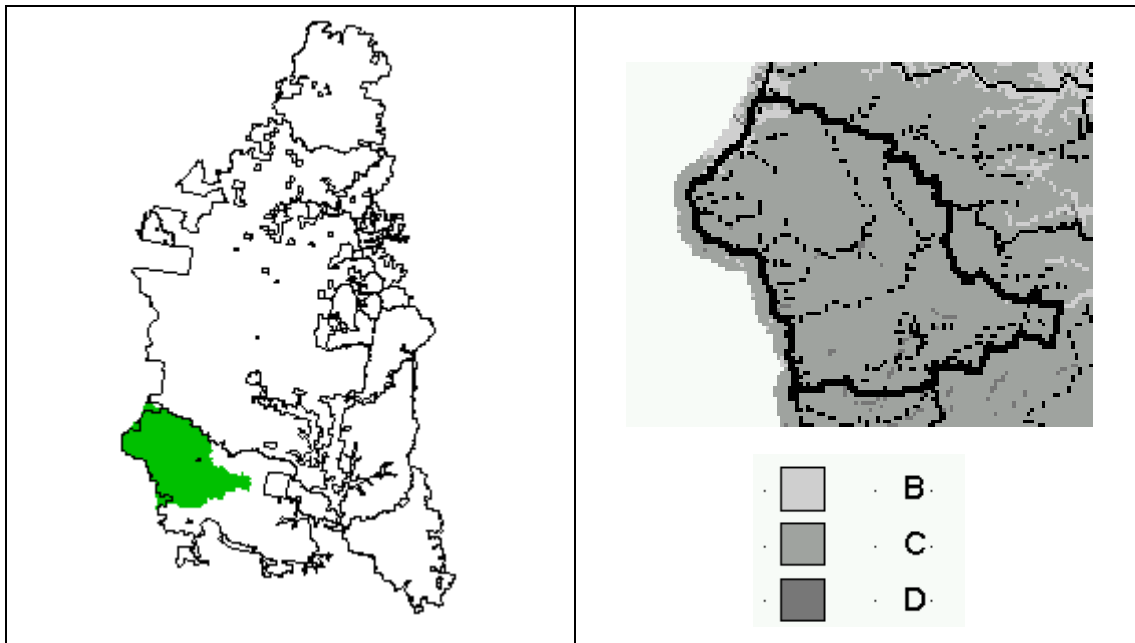
Actions

- Avoid fire within (1, 2a, 2b, 3a, 3b, 3d, 4b, 6a.) communities until at least the year 2008.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Giant Barred Frog, Glossy Black-Cockatoo, Turquoise Parrot, Barking Owl, Powerful Owl, Regent Honeyeater, Koala, Yellow-bellied Glider, Brush-tailed Rock-wallaby, *Olearia cordata* and *Tetradlea glandulosa*.

GOORABA CREEK HERITAGE MANAGEMENT ZONE 19



Characteristics of Zone						
Area in Hectares 15088.0		% of Study Area 7.04			Predominant Aspect 0 - 170° (50.2%)	
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, Yards, Building (unidentified), Tower			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Water hole/well, Stone arrangement, Shelter with art, Shelter with deposit			Historic Sites Recorded Nil	
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 2.5	2 Times 8.1	3 Times 48.7	4 Times 35.5	5 Times 5.1
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 78.8		1996/97 1.0		1994/95 0.5	
Bushfire Behaviour Potential (% of Zone)	High 77.0		Moderate 20.4		Low 1.0	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	8330.1	55.2		C		
2a - Exposed Hawkesbury Woodland	5984.6	39.7		C		
2b - Dwarf Apple Low Open Woodland	134.1	0.9		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	138.7	0.9		D		
4b - Narrabeen - Hawkesbury Ironbark Forest	35.6	0.2		B		
6a - Woodland on Perched Sands	205.3	1.4		B		
6b - Swamp Woodland on Perched Sands	7.5	0.0		D		
Unclassified	252.0	1.6		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Broad-headed Snake Glossy Black-Cockatoo Turquoise Parrot Koala Eastern Little Mastiff-bat Large Pied Bat	
Threatened Flora	<i>Velleia perfoliata</i>	
Fire Advantages	Putty Road Terrabara South Pierces Track Womerah Track	Grono North Rush Creek Track Terrabara North Webbs Creek

Background

- Fire history records for this zone, reveal that only 0.0% has remained unburnt since at least 1976. Of this 15088.0 hectares, 78.8% was burnt in 1997/98 whilst 18.4% was burnt in 1993/94.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Broad-headed Snake, Glossy Black-Cockatoo, Turquoise Parrot, Koala, Eastern Little Mastiff-bat, Large Pied Bat, *Velleia perfoliata*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (4b, and 6a).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1, 2a and 2b).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad are biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

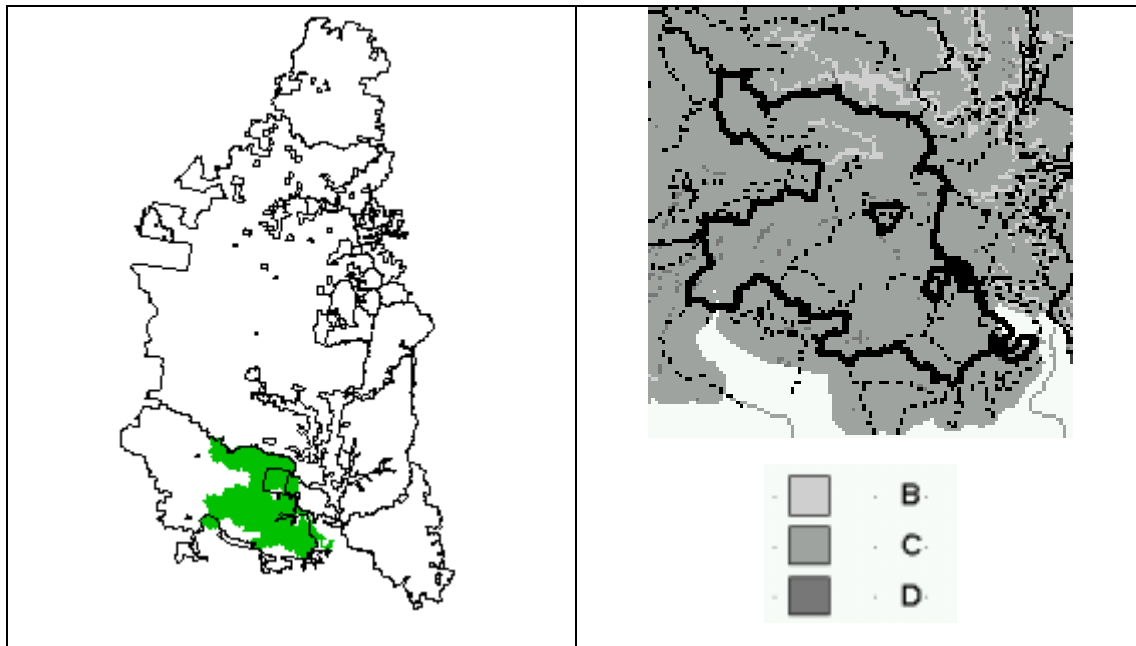
Actions

- Avoid fire within (1, 2a, 2b, 3a, 4b, 6a, 6b.) communities until at least the year 2012.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Broad-headed Snake, Glossy Black-Cockatoo, Turquoise Parrot, Koala, Eastern Little Mastiff-bat, Large Pied Bat and *Velleia perfoliata*.

DOYLES HOLLOW HERITAGE MANAGEMENT ZONE 20



Characteristics of Zone						
Area in Hectares 15564.1		% of Study Area 7.26		Predominant Aspect 0 - 170° (48.7%)		
Fire Protection Zone Heritage Management Zone		Major Assets Houses, Sheds, Yards, House/ Shed, Building (unidentified)		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Open cam site, Shelter with art, Axe grinding groove, Shelter with deposit		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 5.5	1 Time 6.8	2 Times 30.4	3 Times 48.5	4 Times 8.5	5 Times 0.4
Year of Last 3 Fires (WF/PB) % of Zone Burnt	1997/98 85.8		1996/97 0.6		1994/95 0.4	
Bushfire Behaviour Potential (% of Zone)	High 78.2		Moderate 15.0		Low 0.6	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
1 - Sheltered Dry Hawkesbury Forest	7696.4	49.4		C		
2a - Exposed Hawkesbury Woodland	6140.2	39.5		C		
2b - Dwarf Apple Low Open Woodland	375.0	2.4		C		
3a - Hawkesbury - Narrabeen Sheltered Forest	230.6	1.5		D		
4b - Narrabeen - Hawkesbury Ironbark Forest	191.2	1.2		B		
Unclassified	930.6	6.0		N/A		

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Heath Monitor Black Bittern Glossy Black-Cockatoo	Masked Owl Koala Brush-tailed Rock-wallaby
Threatened Flora	<i>Zieria involucrata</i> <i>Lasiopetalum joyceae</i> <i>Tetratheca glandulosa</i>	
Fire Advantages	Womerah Track Milk Can Hill Left Arm Track	Rush Creek Webbs Creek Doyles Hollow

Background

- Fire history records for this zone, reveal that only 5.5% has remained unburnt since at least 1976. Of this 15564.1 hectares, 85.8% was burnt in 1997/98 whilst 2.6% was burnt in 1991/92.
- Three fire regime categories were identified for this zone, namely B, C and D.
- The threatened species, Heath Monitor, Black Bittern, Glossy Black-Cockatoo, Masked Owl, Koala, Brush-tailed Rock-wallaby, *Zieria involucrata*, *Lasiopetalum joyceae*, *Tetratheca glandulosa*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category community (4b).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1, 2a and 2b).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

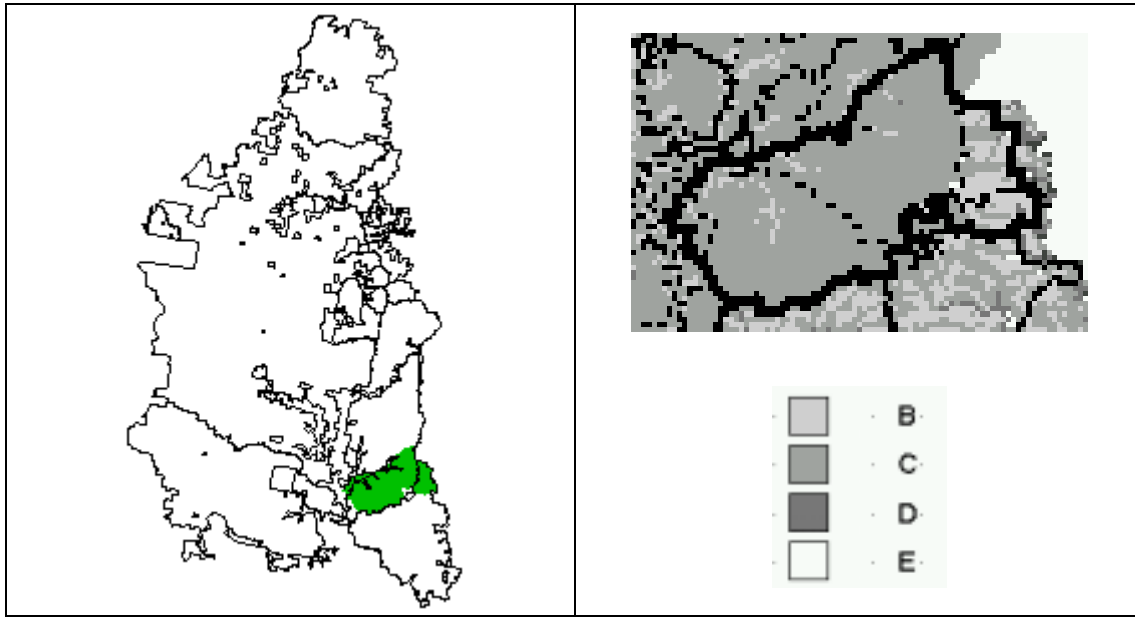
Actions

- Avoid fire within (1, 2a, 2b, 3a, 4b.) communities until at least the year 2012.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Heath Monitor, Black Bittern, Glossy Black-Cockatoo, Masked Owl, Koala, Brush-tailed Rock-wallaby, *Zieria involucrata*, *Lasiopetalum joyceae*, and *Tetratheca glandulosa*.

UPPER MANGROVE HERITAGE MANAGEMENT ZONE 21



Characteristics of Zone						
Area in Hectares 6757.6		% of Study Area 3.15			Predominant Aspect 0 - 170° (45.4%)	
Fire Protection Zone Heritage Management Zone		Major Assets Buildings (unidentified)			Cultural Resources None Recorded	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Rock engraving, Open camp site, Shelter with art, Axe grinding groove, Shelter with deposit			Historic Sites Recorded Man on Horse 1815, Simpsons Track, Old Great North Road, timber culverts and guardrail remnants	
% of Zone Burnt at Various Frequencies	Unburnt 8.0	1 Time 18.6	2 Times 41.4	3 Times 23.4	4 Times 5.1	5 Times 3.4
Year of Last 3 Fires (WF/PB) % of Zone Burnt		1997/98 55.2		Jan 94 7.1		1993/94 22.9
Bushfire Behaviour Potential (% of Zone)		High 83.2		Moderate 11.4		Low 0.4
Structural Vegetation Type		Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)
1 - Sheltered Dry Hawkesbury Forest		2858.3		42.3		C
2a - Exposed Hawkesbury Woodland		2136.4		31.6		C
3a - Hawkesbury - Narrabeen Sheltered Forest		12.2		0.2		D
4b - Narrabeen - Hawkesbury Ironbark Forest		309.4		4.6		B
B1 - Forest		9.4		0.1		E
B2 - Forest		52.5		0.8		D
B6 - Open Forest/Woodland		6.6		0.1		C
C1 - Forest / Open Forest		376.9		5.6		C
C2 - Woodland		578.4		8.6		B
C3 - Woodland		63.7		0.9		B
C5 - Heathland		8.4		0.1		B
D1 - Forest		12.2		0.2		D
Unclassified		333.3		4.9		N/A

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Red-crowned Toadlet Little Shearwater Glossy Black-Cockatoo Yellow-bellied Glider Greater Broad-nosed Bat	
Threatened Flora	<i>Tetratheca glandulosa</i>	
Fire Advantages	Great North Road 8 Mile Track Simpson Track	Creek Road Wrights Creek Road

Background

- Fire history records for this zone, reveal that only 8.0% has remained unburnt since at least 1976. Of this 6757.6 hectares, 55.2% was burnt in 1997/98 whilst 22.9% was burnt in 1993/94.
- Four fire regime categories were identified for this zone, namely B, C, D and E.
- The threatened species, Red-crowned Toadlet, Little Shearwater, Glossy Black-Cockatoo, Yellow-bellied Glider, Greater Broad-nosed Bat, *Tetratheca glandulosa*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (4b, C2, C3 and C5).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1, 2a, B6 and C1).
- Fire regimes of at least 10 years are to be maintained within the D category communities (3a, B2 and D1).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

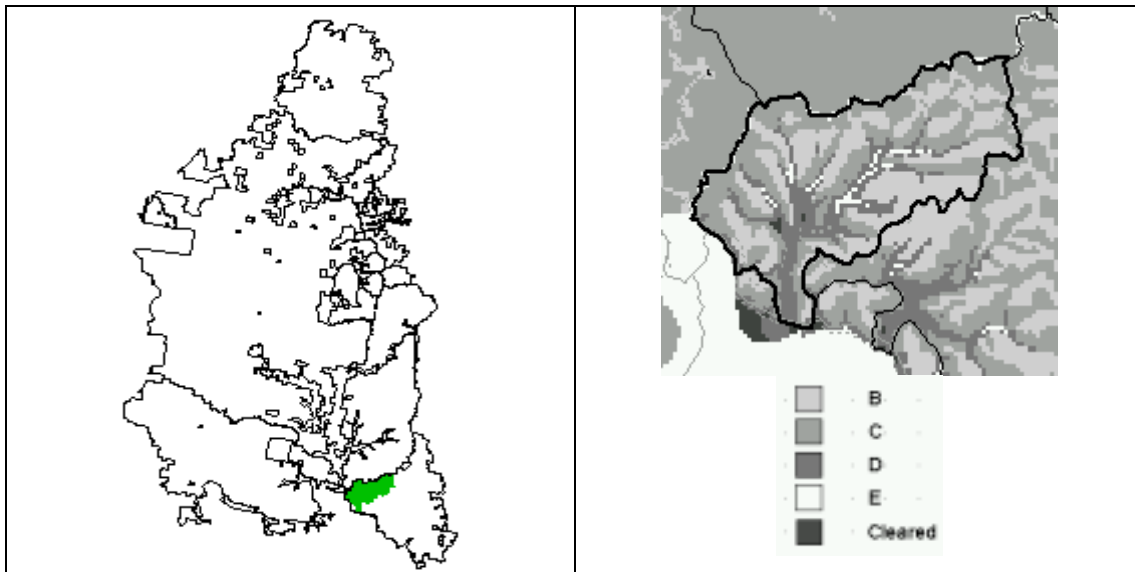
Actions

- Avoid fire within (1, 2a, 3a, 4b, B1, B2, B6, C1, C2, C3, C5, D1.) communities until at least the year 2012.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Red-crowned Toadlet, Little Shearwater, Glossy Black-Cockatoo, Yellow-bellied Glider, Greater Broad-nosed Bat and *Tetratheca glandulosa*.

WISEMANS FERRY HERITAGE MANAGEMENT ZONE 22



Characteristics of Zone						
Area in Hectares 2333.6		% of Study Area 1.09		Predominant Aspect 0 - 170° (44.0%)		
Fire Protection Zone Heritage Management Zone		Major Assets House/Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Shelter with deposit		Historic Sites Recorded Roses Run Occupation Site, Old Butchers Shop, Old Great North Road, timber culverts and guardrail remnants		
% of Zone Burnt at Various Frequencies	Unburnt 1.1	1 Time 22.8	2 Times 10.5	3 Times 42.7	4 Times 19.3	5 Times 3.5
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan 94 72.3		1993/94 69.9		1991/92 0.6	
Bushfire Behaviour Potential (% of Zone)	High 75.2		Moderate 15.4		Low 8.4	
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Sheltered Dry Hawkesbury Forest	1.9		0.1		C	
2a - Exposed Hawkesbury Woodland	0.9		0.0		C	
A3 - Forest	7.5		0.3		D	
A4 - Reedland/Rushland/ Sedgeland	4.7		0.2		D	
A5 - Low Forest/ Scrubland	85.3		3.7		D	
A6 - Forest	15.9		0.7		D	
A7 - Scrubland	8.4		0.4		C	
B1 - Forest	44.1		1.9		E	
B3 - Forest/ Open Forest	303.7		13.0		D	
B4 - Open Forest	5.6		0.2		D	
B5 - Open Forest	60.9		2.6		C	
B6 - Open Forest/ Woodland	10.3		0.4		C	
C1 - Forest / Open Forest	865.3		37.1		C	
C2 - Woodland	878.4		37.6		B	
Cleared	10.3		0.4		N/A	
Unclassified	30.3		1.3		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Koala	
Threatened Flora	<i>Tetratheca glandulosa</i>	
Fire Advantages	Great North Road Western Commission Track Roses Run East	Roses Run West Roses Creek Wisemans Ferry Road

Background

- Fire history records for this zone, reveal that only 1.1% has remained unburnt since at least 1976. Of this 2333.6 hectares, 72.3% was burnt in January 1994 whilst 69.9% was burnt in 1993/94. The remaining portion of the zone was burnt in the period 1976 to 1993.
- Four fire regime categories were identified for this zone, namely B, C, D and E.
- The threatened species, Glossy Black-Cockatoo, Koala, *Tetratheca glandulosa*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category community (C2).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1, 2a, A7, B5, B6 and C1).
- Fire regimes of at least 10 years are to be maintained within the D category communities (A3, A4, A5, A6, B3, B4, D1 and D2).
- All fires are to be excluded within the E category community (B1).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

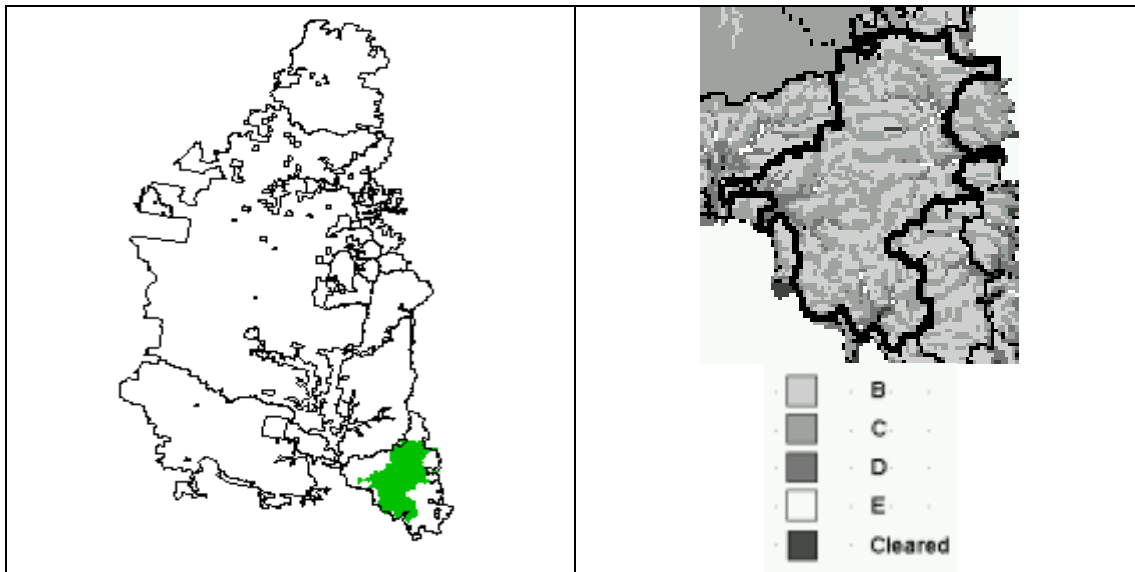
Actions

- Avoid fire within (1, 2a, A3, A4, A5, A6, A7, B3, B4, B5, B6, C1, C2.) communities until at least the year 2010.
- Prevent and Suppress any fire within sensitive B1 community (Fire Regime Category E).
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Koala and *Tetratheca glandulosa*.

GUNDERMAN HERITAGE MANAGEMENT ZONE 23



Characteristics of Zone						
Area in Hectares 7387.5		% of Study Area 3.45			Predominant Aspect 0 - 170° (48.4%)	
Fire Protection Zone Heritage Management Zone		Major Assets House/Shed, Buildings (unidentified)			Cultural Resources Camping Grounds Lookout, Mill Creek Depot	
Cultural Sites Recorded Aboriginal and Historic		Aboriginal Sites Recorded Shelter with art, Axe grinding groove, Shelter with deposit, Rock engraving, Stone arrangement, shelter with midden			Historic Sites Recorded Meisterham House Ruin, Old Log Site, Old House, Mill of Mill Creek, Simpsons Track, Old Great North Road	
% of Zone Burnt at Various Frequencies	Unburnt 0.5	1 Time 1.1	2 Times 37.5	3 Times 57.5	4 Times 3.3	5 Times 0.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt		Jan 94 92.1		1993/94 92.8		1992/93 0.4
Bushfire Behaviour Potential (% of Zone)		High 77.2		Moderate 17.8		Low 4.7
Structural Vegetation Type	Hectares within Zone		% within Zone		Fire Regime Required (Refer to Table 16)	
1 - Hawkesbury Forest	9.4		0.1		C	
2a - Woodland	24.4		0.3		C	
A3 - Forest	37.5		0.5		D	
A4 - Reedland/	14.1		0.2		D	
A5 - Scrubland	27.2		0.4		D	
A6 - Forest	46.9		0.6		D	
A7 - Scrubland	32.8		0.4		C	
B1 - Forest	84.4		1.1		E	
B2 - Forest	240.2		3.2		D	
B3 - Forest/ Open Forest	195.9		2.7		D	
B4 - Open Forest	131.2		1.8		D	
B5 - Open Forest	58.1		0.8		C	
B6 - Woodland	85.3		1.2		C	
C1 - Forest / Open Forest	3177.0		43.0		C	
C2 - Woodland	2869.5		38.8		B	
C3 - Woodland	251.2		3.4		B	
Cleared	83.4		1.1		N/A	
Unclassified	18.3		0.2		N/A	

Yengo NP, Parr SRA and Dharug NP DRAFT Fire Management Plan

Threatened Fauna	Glossy Black-Cockatoo Powerful Owl Masked Owl Sooty Owl	Yellow-bellied Glider Squirrel Glider Large-footed Mouse-eared Bat Greater Broad-nosed Bat
Threatened Flora	<i>Tetratheca glandulosa</i>	
Fire Advantages	Wisemans Ferry Road Western Commission Track Eastern Commission Track	Mill Creek Gunderman Creek Sugee Bag Creek Simpsons Track

Background

- Fire history records for this zone, reveal that only 0.5% has remained unburnt since at least 1976. Of this 7387.5 hectares, 92.1% was burnt in January 1994 whilst 92.8% was burnt in 1993/94. The remaining portion of the zone was burnt in the period 1976 to 1993.
- Four fire regime categories were identified for this zone, namely B, C, D and E.
- The threatened species, Glossy Black-Cockatoo, Powerful Owl, Masked Owl, Sooty Owl, Yellow-bellied Glider, Squirrel Glider, Large-footed Mouse-eared Bat, Greater Broad-nosed Bat and *Tetratheca glandulosa*, occur within this zone.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (C2 and C3).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (1, 2a, A7, B5, B6 and C1).
- Fire regimes of at least 10 years are to be maintained within the D category communities (A3, A4, A5, A6, B2, B3 and B4).
- All fires are to be excluded within the E category communities (B1).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

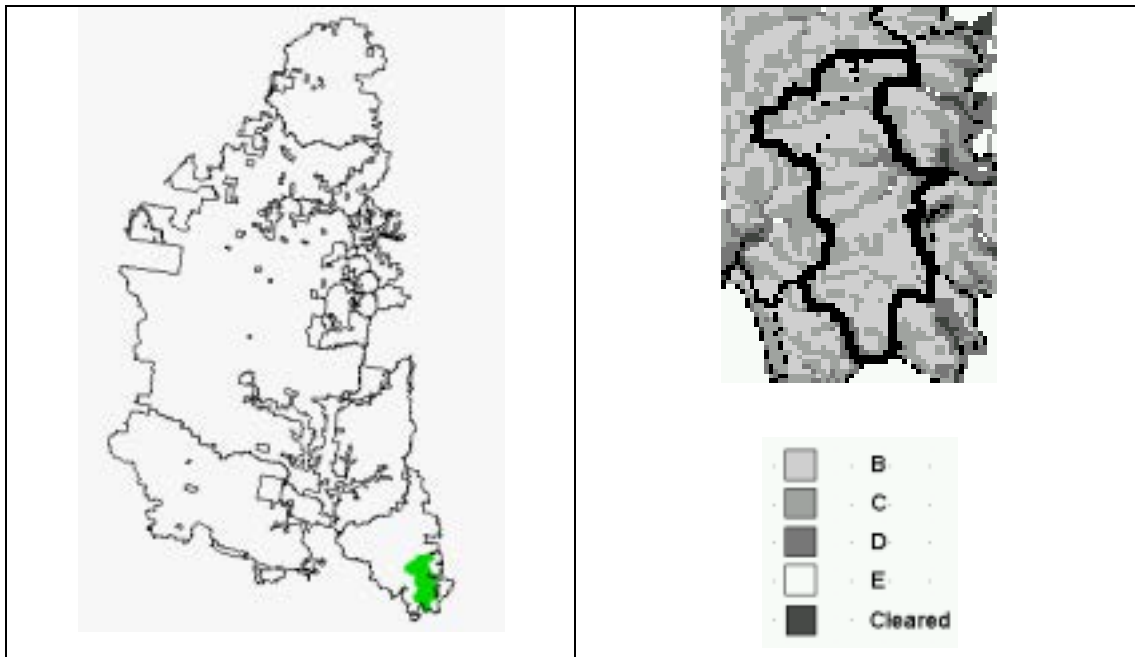
Actions

- Avoid fire within (1, 2a, A3, A4, A5, A6, A7, B1, B2, B3, B4, B5, B6, C1, C2, C3.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.
- The presence of reproducing specimens of threatened species; Glossy Black-Cockatoo, Powerful Owl, Masked Owl, Sooty Owl, Yellow-bellied Glider, Squirrel Glider, Large-footed Mouse-eared Bat, Greater Broad-nosed Bat and *Tetratheca glandulosa*.

SPENCER HERITAGE MANAGEMENT ZONE 24



Characteristics of Zone						
Area in Hectares 1893.7		% of Study Area 0.88		Predominant Aspect 0 - 170° (55.7%)		
Fire Protection Zone Heritage Management Zone		Major Assets Spencer community, House/ Shed		Cultural Resources None Recorded		
Cultural Sites Recorded Aboriginal		Aboriginal Sites Recorded Rock engraving, Stone arrangement, Shelter with art, Axe grinding groove		Historic Sites Recorded Nil		
% of Zone Burnt at Various Frequencies	Unburnt 0.0	1 Time 1.4	2 Times 0.7	3 Times 64.2	4 Times 29.6	5 Times 5.0
Year of Last 3 Fires (WF/PB) % of Zone Burnt	Jan 94 90.5		1993/94 92.0		1991/92 13.7	
Bushfire Behaviour Potential (% of Zone)	High 75.6		Moderate 21.8		Low 2.6	
Structural Vegetation Type	Hectares within Zone	% within Zone		Fire Regime Required (Refer to Table 16)		
A2 - Herbland/ Sedgeland	0.9	0.0		D		
A3 - Forest	1.9	0.1		D		
A6 - Forest	1.9	0.1		D		
B1 - Forest	15.9	0.8		E		
B2 - Forest	71.2	3.8		D		
B3 - Forest/ Open Forest	53.4	2.8		D		
B6 - Open Forest/ Woodland	0.9	0.0		C		
C1 - Forest / Open Forest	681.5	36.0		C		
C2 - Woodland	943.1	49.8		B		
C3 - Woodland	106.9	5.6		B		
D2 - Forest	0.9	0.0		D		
Cleared	13.1	0.7		N/A		
Unclassified	1.9	0.1		N/A		

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Threatened Fauna	Nil
Threatened Flora	Nil
Fire Advantages	Wisemans Ferry Road Eastern Commission Track Dinner Creek

Background

- Fire history records for this zone, reveal that only 0.0% has remained unburnt since at least 1976. Of this 1893.7 hectares, 90.5% was burnt in January 1994 whilst 92.0% was burnt in 1993/94.
- Four fire regime categories were identified for this zone, namely B, C, D and E.

Objectives

- Fire regimes of 8 to 25 years are to be maintained within the B category communities (C2 and C3).
- Fire regimes of 10 to 25 years are to be maintained within the C category communities (B6 and C1).
- Fire regimes of at least 10 years are to be maintained within the D category communities (A2, A3, A6, B2, B3, and D2).
- All fires are to be excluded within the E category community (B1).
- To protect threatened species as per NPWS Operational Guidelines for The Reserves (Table 25).
- To avoid a decline in biodiversity by excluding fire from the zone for sufficient periods to allow for recovery from past fire regimes.
- To prevent permanent damage or destruction of natural or heritage items, areas or values by an inappropriate fire regime.
- To apply fire prescriptions consistent with broad area biodiversity objectives.

Strategies

- Suppress or contain fires inconsistent with fire prescription.
- Permanently exclude fire from sensitive communities (Fire Regime Category E).
- Fire should not exceed more than 20-25% of the zone at any one time where practicable.
- Maintain roads and trails.

Actions

- Avoid fire within (A2, A3, A6, B1, B2, B3, B6, C1, C2, C3, D2.) communities until at least the year 2010.
- Document accurate details of all fires that occur within this zone, detailing: fire perimeter, success, intensity, ignition points, size and date.
- Maintain fire trails as per Table 31.

Performance Indicators

- Maintenance of species biodiversity within the zone.
- Continual safe use of road access and egress during a fire event.

APPENDIX 3 INTERIM SMOKE MANAGEMENT GUIDELINES

03/96 SMOKE MANAGEMENT GUIDELINES - DRAFT NSW NPWS.

1.0 Introduction

Smoke from bushfires can cause significant impacts on our community particularly in major urban areas such as Sydney, Wollongong and Newcastle where bushfire smoke combines with other emissions. Bushfire smoke can reduce visibility along highways, close airports, cause loss of revenue to tourist resorts and aggravate pulmonary conditions. Strong justification is required for using the atmosphere as a receptor of large amounts of smoke emissions. A balanced approach which weights the benefits of burning against the impacts of higher levels of atmospheric pollution is required.

It is possible to reduce the impact of smoke from prescribed burns on the community by adopting simple policies and procedures within reserve fire management plans and Section 41AB plans. AARFA (1992) in fact recommended that "Appropriate smoke management guidelines be developed and applied to the development of prescribed burning strategies". Given the increasing importance that our community is placing on air quality issues there is a need for fire managers to develop a pragmatic approach of integrating both smoke management and fire management objectives. The service needs to recognise this issue when preparing and implementing fire management practices. The practices below are considered to be best practice in this area.

2.0 Best Practice Approach to Smoke Management

- 2.1 Land managers and fire authorities ensure that effective and prescriptive smoke management policies for smoke management are included within fire operational and fuel management plans and that appropriate indicators are developed to assist in measuring and monitoring performance ;
- 2.1 Smoke sensitive areas (e.g. urban areas, schools, wilderness areas, retirement villages and hospitals) need to be identified within reserve fire management plans and Section 41AB plans and policies and strategies are in place to reduce the impact of smoke on these areas;
- 2.3 Smoke management techniques are included within crew leader and ICS training modules (e.g.. as part of the Prescribed Burning and ICS Planning Officer training modules);
- 2.1 Appropriate prescriptions for fuel moisture content (FMC) should be detailed within the fuel management plans to minimise smoke emissions (i.e. FMC of c. 10 - 12% in fine fuels) and these prescriptions are complied with on 95% of occasions. This may involve burning during drier periods of the year where more resources have to be directed to containment strategies;

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- 2.1 Appropriate prescriptions for wind speed and direction need to be detailed within fuel management plans which minimise the impact of smoke emissions on sensitive areas and that these prescriptions are complied with on 95% of occasions;
- 2.1 Appropriate prescriptions for weather patterns need to be detailed within fuel management plans so as to minimise the coincidence of burning on days of high brown haze and photochemical smog risk;
- 2.1 Prescribed burns should be implemented to ensure the proficient use of backing fires (i.e. moderate to high intensity but with low rates of spread) as an operational technique to control smoke emissions;
- 2.1 Prescribed burns should be implemented to ensure rapid ignition of the area to be treated to minimise the smouldering phase of combustion
- 2.1 Alternative hazard management and risk management options which minimise smoke emissions will be considered particularly in smoke sensitive areas (e.g. slashing, selective shrub removal, construction of radiation barriers etc.);
- 2.1 Crews will be briefed before implementation of prescribed burns and suppression of wildfires on appropriate smoke management techniques. Aggressive mop-up is requested and applied so as to minimise the smouldering phase of combustion;
- 2.1 Debris will be removed from bushland areas (e.g. tires, dumped rubbish etc.) before burns are commenced and areas where rubbish and backyard clippings have accumulated on urban-bushland fringe are avoided by fire crews;
- 2.1 Neighbours and residents of sensitive areas within the air catchment will be notified well in advance of prescribed burns and back-burns (where possible) and are requested to assist with the removing of accumulated debris. Managers of hospitals and retirement villages within the catchment will be well informed of the proposed burns and wildfires;
- 2.1 Prescribed burning programs should wherever possible be timed so as to avoid periods of the year in which smoke will adversely impact on outdoor leisure and recreation activities (e.g. school holiday periods and during special events). These periods should be detailed within the reserve fire management plans and Section 41AB plans and;
- 2.1 Close liaison is maintained with the Bureau of Meteorology and DBFS Regional Officer so as to minimise opportunities for the smoke plumes impacting on sensitive areas; to minimise the cumulative impact burning on days when temperature inversions are anticipated and to minimise the cumulative impacts of a number of prescribed burns within the same catchment.



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