

ALLENBY PARK FIRE REGIME MANAGEMENT PLAN



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This report is based upon best practise management and ecological principles. Concerns have been raised that sufficient resources may not be available to implement this plan in its entirety.

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Glossary of Terms

APZ	An Asset Protection Zone (APZ) is an area around a development offering protection to reduce the bush fire hazard. It can consist of an Inner Protection Area (IPA) and an Outer Protection Area (OPA). Hazard reduction techniques can include slashing, raking, bush regeneration and burning.
Biodiversity fire regime thresholds	These thresholds are a range of appropriate fire frequency intervals, intensities and seasons to sustain the ecology of each vegetation community. Where fire regimes are outside the threshold, significant declines in species populations can be expected, particularly if the fire regime prevails over greater than 50% of the community area.
Ecosystem	An interactive system between living organisms (plants and animals) and their non living surroundings.
FEZ	Fire Exclusion Zones (FEZ) are areas that contain fire intolerant species. Fires in these areas should be avoided and quick fire suppression should occur in the case of fire.
Fine fuels	Bark, grass, leaves and twigs less than six millimetres in diameter.
Fire regime	The history of fire in a particular area, including the frequency, intensity and season of burning.
Fuel	Any material capable of being ignited and sustaining fire. Such as grass, live vegetation, leaf litter and bark. Generally measured in tonnes per hectare of dry weight.
Hazard reduction	Works designed to attain planned resource management objectives, primarily the reduction of fire threat. Activities include: <ul style="list-style-type: none"> • Manual and mechanical thinning of vegetation (NOT broad scale clearing) • Controlled burning of a predetermined area, carried out under specified weather and environmental conditions
Inter-fire period	The period of time between successive burns.
IPA	Inner Protection Areas (IPA) are parts of an Asset Protection Zone (APZ). They are designed to eliminate the threat of fire radiation to the development, and use techniques such as slashing, shrub clearing, and construction of barriers or hazard reduction burning to reduce fuel loads.

LMZ	Land Management Zones (LMZ) are broader areas of the landscape, which do not satisfy the criteria for Strategic Fire Management Zones (SFMZ) or Asset Protection Zones (APZ). Fire in these areas should be managed to meet conservation objectives for species, habitats, populations and cultural heritage values.
Minimum Fire Threshold	The minimum fire frequency permitted before a decline in biodiversity is expected.
Maximum Fire Threshold	The maximum fire frequency permitted before a decline in biodiversity is expected.
OPA	Outer Protection Areas (OPA) are parts of an Asset Protection Zone (APZ). They are designed to reduce the speed and intensity of an approaching bush fire. Techniques such as hazard reduction burning or selective shrub clearing are used to reduce fuel load.
Prescribed burning	A controlled burn to a predetermined area, carried out under specified weather and environmental conditions, designed to achieve planned resource management objectives.
Quick succession	Events occurring within five years of each other.
SFAZ	Strategic Fire Advantage Zones (SFAZ) are usually adjacent to, and compliment, Asset Protection Zones (APZ). They are managed to protect community assets and ecological sustainability.
Treatment Area	Area of land subject to removal or reduction of fuel by manual or mechanical means, or by prescribed burning.
Wildfire	An unplanned fire.

Executive Summary

Allenby Park is located in Sydney's Northern Beaches district, within the suburbs of Brookvale, Beacon Hill and Allambie Heights. Covering approximately 55 hectares of predominantly bushland. The area provides habitat for a number of flora and fauna species including threatened species; *Tetratheca glandulosa* and the Powerful Owl (*Ninox strenua*).

Whilst no endangered ecological communities are mapped within the park, vegetation communities of regional significance, including Forest Oak Forest and Coachwood Rainforest may be found.

Internal uses within the park include educational and recreational activities such as bushwalking and picnics. The park also contains a large parcel of Sydney Water land, located in the north-western corner. The southern section of the park is disjointed, with options for remnant consolidation being recommended within LandArc (2000).

Surrounding land uses include low density urban development and industrial estates.

Access within the park is considered to be insufficient to allow adequate response to fire events. Due to ecological constraints, the existence of slopes over 15 degrees and past planning decisions, retrospective implementation of fire trails within APZ areas is considered impractical within some areas. As such access is to be managed by:

- Maintenance / upgrading of existing roads
- Identification / creation and use of proposed fire access areas
- APZ management to allow effective personnel access as required

The Management Plan divides the park into management zones which include Asset Protection Zones (APZ), Fire Exclusion Zones (FEZ), Land Management Zones (LMZ) and Strategic Fire Advantage Zones (SFAZ). Existing tracks, natural features and cleared areas have been used for fire management boundaries where available, with proposed management zones covering both Council managed and privately owned land.

The Plan contains a Prescribed Operations Schedule that specifies treatments, timing and other characteristics. It prescribes numerous hazard reduction works, including both manual and fire hazard reduction, between 2006 and 2015, as well as fire exclusion / quick suppression, and consideration of weed control within planned activities.

1 Introduction

Eco Logical Australia was contracted by the Warringah Council in March 2004 to prepare a 10 year Fire Management Plan from 2006 to 2016 for Allenby Park.

1.1 Park Outline

Allenby Park is located in Sydney's Northern Beaches district, within the suburbs of Brookvale and Allambie Heights. The park is approximately 55 hectares in area, most of which supports native vegetation. See Figure 1 for site location.

The park has high conservation value, containing valuable habitat for a range of native species. Educational and recreational activities such as bushwalking and picnics form the primary uses within the park. Other internal uses include a large parcel of Sydney Water land, located in the north-western corner.

Surrounding land uses include low density urban development and industrial estates.

The southern section of the park is disjointed, with options for remnant consolidation being recommended within LandArc (2000). Vegetated areas adjacent to the southern park boundaries contain the same internal and adjacent land uses as the rest of the park, with the addition of the Northern Sydney Institute of TAFE.

The park comprises crown reserve (74%), community land (22%) and other state government owned land (4%) (see LandArc (2000) for further tenure information). Management of the park is undertaken by Warringah Council.

1.2 Management Plan Objectives

- To provide recommendations for:
 - New fire management zones
 - Suitable alternatives for fuel management
 - Strategies to protect the existing infrastructure located within the park
 - Strategies to protect persons and property within, or immediately adjacent to the park
- Creation of:
 - Comprehensive fire history for the park
 - A plan that is acceptable to and can be implemented by Council and the NSW Rural Fire Service (RFS)
 - An ecological based strategy for fuel management, incorporating the requirement for:
 - Mosaic burn patterns
 - Fire regimes inline with vegetation community thresholds, endangered ecological communities and identified threatened species, as well as locally or regionally significant species
 - A strategy to enable the effective planning of Hazard Reduction (HR) burns with regard to:
 - Endangered ecological communities
 - Endangered populations
 - Threatened, locally or regionally significant species

- Aboriginal sites and culturally significant features known to exist within the park
- Assets and infrastructure

1.3 Report Structure

The Fire Management Plan for Allenby Park comprises two separate documents:

- 1) This report
- 2) An A0 sized poster showing a series of relevant maps and tables

This report identifies the fire management framework, identifies and assesses fire related issues and risks within the park and provides an operational schedule and performance measures. It is intended that this written report is used in conjunction with the "Allenby Park Fire Regime Management Poster" (Appendix 7, ELA 2006).

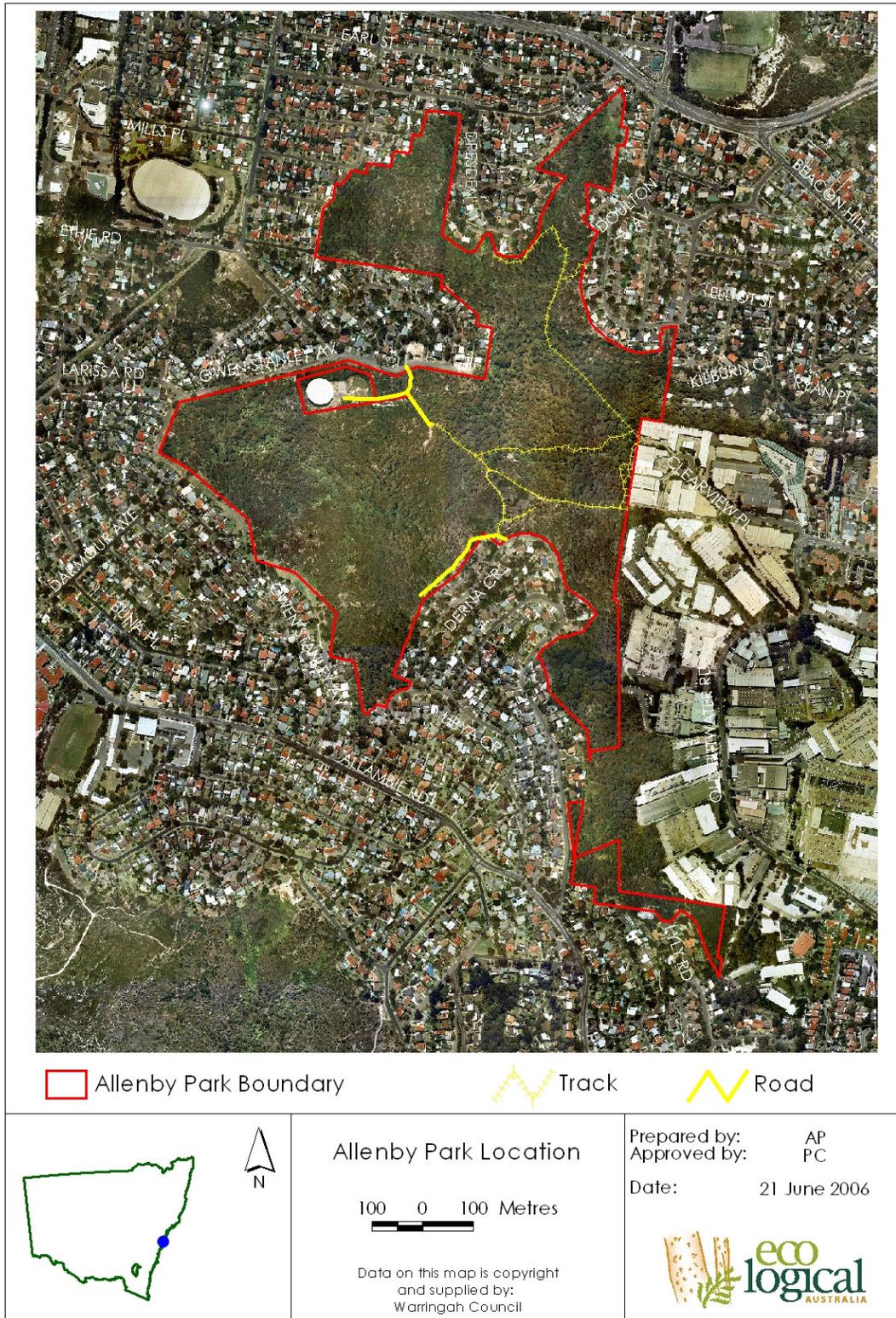
1.4 Assumptions

Vegetation fuel loads and structure were derived from Vegetation Mapping by P & J Smith (2003). Whilst limited opportunistic on-ground validation of vegetation communities was undertaken, it was assumed that this mapping was generally accurate.

Fire history for the 2005 – 2006 fire season was obtained from the Rural Fire Service only. Following discussions with Council and the RFS it is assumed that no other fires occurred within the park during this period.

The existence of drainage / sewerage infrastructure within the park has been identified but not mapped or recorded within Operation Tables. Identification of these assets should be obtained through Council GIS during HR planning.

Figure 1 Site Location



2 Legislative and Planning Instruments

Fire management activities on the site are constrained by numerous Acts, plans and guidelines. The most relevant documents are reviewed below.

A majority of the legislation and planning instruments listed below impact HR planning requirements. Further information regarding this process may be seen in the 'Warringah Local Government Area Hazard Reduction Guidelines' (Appendix 4).

2.1 Crown Lands Act 1989 & Local Government Act 1993

This Plan of Management will meet the requirements of the Local Government Act 1993, with regards to:

- Defining objectives and performance targets
- Stating the means by which objectives and performance targets will be met
- Stating the means by which performance will be measured
- Observing the requirements of any threat abatement plans and recovery plans made under the Threatened Species Conservation Act 1995

Allenby Park is managed as "Community land" under this Act and has a current Plan of Management (LandArc 2000 – see below for review).

All plans of management for this park require consideration of the Crown Lands Act 1989. This includes the requirement that the following principles be followed:

- Environmental protection principles are observed in relation to the management and administration of Crown land
- Natural resources of Crown land (including water, soil, flora, fauna and scenic quality) are conserved wherever possible
- Where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity
- Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principles

2.2 Allenby Park Plan of Management

This plan was adopted on the 28 November 2000, as required under the *Local Government Act, 1993*, and provides a frame work for managing Allenby Park including strategies and work schedules.

The park addresses management of the following issues:

- Land management
- Biodiversity management
- Catchment management
- Weed management, bush regeneration and rehabilitation
- Bush fire management

- Visitor management

With reference to fire management the plan recommends:

- Coordination with RFS to implement community education programs
- Continued implementation of building and development protocols for adjoining properties appropriate to the level of threat
- Integration of environmental and biodiversity programs
- Promotion of an interdisciplinary approach to management emphasising flexibility in determination of Asset Protection Zones

2.3 Management Strategy for Weed Control and Fire Management Access Zones¹

This document, created in 1996, sets out aims and objectives for the management of fire and weeds within the Warringah Council Local Government Area (LGA).

Fire management objectives include:

- Ensuring that fire management access zones are of dimensions that can be maintained in the long term
- Ensuring that methods of construction and maintenance of fire management access zones are environmentally sensitive
- Carrying out of community education in conjunction with Fire Control, and of fire hazard reduction techniques
- Co-ordinating with Fire Control on the fire hazard reduction issues

These objectives have been considered during the creation of this plan.

2.4 Rural Fires Act 1997

The objectives of the Rural Fires Act (RF Act) 1997 are to provide for:

- The prevention, mitigation and suppression of fires
- Coordination of bush fire fighting and prevention
- Protection of people and property from fires
- Protection of the environment

The RF Act requires the creation of a Bush Fire Co-ordinating Committee and a Bush Fire Risk Management Plan (outlined below).

Obligations are imposed on Council and other land management agencies to:

- Protect life and property
- Prevent fire from leaving land vested in or under its control
- Implement the provisions of Bush Fire Management Plans

¹ Council has acknowledged that this document is outdated and that changes are required to bring it up to current standards.

2.5 Warringah Pittwater Bush Fire Risk Management Plan

Required under Section 52 of the RF Act, the Warringah Pittwater Bush Fire Risk Management Plan (WPBFMC 2000) outlines the importance of bush fire management zones to assist in reducing bush fire risk and damage to assets. The plan also emphasises fire management priorities. Where areas are faced with an extreme bush fire risk, it will be given the highest management priority and allocation of resources.

The plans are required to consider threatened species conservation and may restrict or prohibit the use of fire and other fire hazard reduction activities. This is particularly relevant for threatened species habitat.

The responsibility to implement asset protection is placed on the owners of the land which is subject to the bush fire threat. It is also Council's responsibility to ensure that the owners or occupiers of private property have taken the required steps to reduce bush fire hazards on their land. This can be enforced by the RFS through Section 66 of the RF Act.

Council is responsible for environmental assessment of land prior to commencing any fire management activities (on Council owned or managed land). This is achieved through issuing a Bush Fire Hazard Reduction Certificate, obtained under the Environmental Planning and Assessment Act 1979 (EP&A Act), or through the Bush Fire Environment Assessment Code (RFS 2006).

2.6 Bush Fire Environment Assessment Code

This code provides a stream-lined environmental assessment process for use in determining applications for Bush Fire Hazard Reduction Certificates and provides standards for the conduct of HR works for areas zoned under the Bush Fire Risk Management Plan (WPBFMC 2000).

The code consists of and refers to standards and guidelines that relate to the conduct and planning of managed hazard reduction activities.

Requirements for the code are specified under Section 100J of the RF Act, including land restrictions and exclusions for environmentally sensitive areas (Sections 2 and 3, RFS 2006).

The land covered by Allenby Park is mapped as a Land Management Zone (LMZ) under the Bush Fire Risk Management Plan (WPBFMC 2000). The existing Bush Fire Environment Assessment Code (RFS 2006) does apply to this park, with restrictions within areas of Coachwood Rainforest.

2.7 Planning for Bush Fire Protection 2001

Planning for Bush Fire Protection (PBP), prepared by the Rural Fire Service and Planning NSW is the key bush fire planning document for the state. The document identifies requirements and strategies for new developments to help protect them from bush fire hazards. It details the location and depth of asset protection zones,

fire trails and perimeter roads, water supply and building standards in bush fire risk areas.

2.8 National Parks and Wildlife Act 1974

Aboriginal and cultural heritage sites are protected under this Act, as well as threatened flora, fauna and endangered ecological plant communities. The Department of Environment and Conservation (DEC) are named as the responsible authority under the Act, which extends to the protection of items outside the reserve system.

2.9 Environment Protection & Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act), stipulates that approval from the Commonwealth Environment Minister is required if a development is likely to have a significant impact on matters considered to be of National Environmental Significance.

The Atlas of NSW Wildlife (DEC 2004) was utilised to identify known threatened flora within 5km and threatened fauna within 10km of the park.

2.10 Environmental Planning and Assessment Act 1979

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for the state, providing a framework for the overall environmental planning and assessment of development proposals and activities.

2.11 Threatened Species Conservation Act 1995

The NSW *Threatened Species Conservation Act 1995* (TSC Act) aims to protect and encourage the recovery of threatened species, populations and communities listed under the Act. The TSC Act is integrated with the EP&A Act and requires consideration of whether a development or an activity (such as mechanical hazard reduction) is likely to significantly affect threatened species, populations and ecological communities or their habitat.

Threatened flora within 5km and threatened fauna within 10km of the park have been identified (see Appendix 2) and the fire ecology requirements of those species considered.

2.12 Noxious Weed Act 1993

This Act requires Council to control noxious weeds and destroy notifiable weeds within areas under its control; and ensure that private landholders do the same.

Management of noxious weeds should be considered as a component of fire planning.

2.13 Rivers and Foreshores Improvement Act 1948

The NSW *Rivers and Foreshores Improvement Act 1948* (RFI Act) aims to provide effective controls on activities that could harm sensitive waterway and foreshore

environments. The Act has provisions that require a permit for excavations, fill and other works within 40m of the top of the bank for rivers, estuaries and lakes as it is recognised that they can have significant detrimental environmental impacts on habitat, water quality, flooding and erosion. This Act exempts 'local authorities' from the need to obtain a permit.

A Part 3a permit would be required under the RFI Act for works listed above. The RFI Act is soon to be repealed and replaced by the *Water Management Act, 2002*, but the provisions under this Act are likely to be similar to the RFI Act. A notable exception however, is that 'local authorities' will no longer be exempt from the need to obtain a permit.

2.14 State Environmental Planning Policy 19 (SEPP 19) – Bushland in Urban Areas

SEPP 19 is designed to protect bushland in public open space zones and reserves, as part of preservation for natural heritage, or for recreational, educational and scientific purposes. It ensures that bush preservation is given a high priority when local environmental plans for urban development are prepared. Under SEPP 19 'bushland' means land on which there is vegetation that is either a remainder of the natural vegetation of the land or, if altered, is still representative of the structure and floristic of the natural vegetation.

Future Hazard Reduction work must address this legislation.

3 Bush Fire Risk

3.1 Bush fire History

Fire history mapping including both Wildfire and Hazard Reduction burning was supplied by Warringah Council and the NSW Rural Fire Service. Field validation was undertaken to increase the reliability of the data. This was undertaken within two assessment periods, completed in January 2005 and June 2006. Spatial accuracy for data was found to be low, particularly for older fires. Small spot fires mapped outside the park or outside the primary burn area were not included in the analysis.

Additional fire history data was assessed, including:

- Digital data from the Department of Environment and Conservation (incorporated into fire mapping, post site validation)
- Written data from the NSW Fire Brigade, consisting of records for Hazard Reduction burning over the last 5 years and unplanned vegetation fires for the past 10 years (provided to Council)

Fire history data from all sources ranged in date from 1952 to 2006.

Fire history mapping prior to 2000 was often not undertaken or consisted of approximate desktop estimates. As such past fire history data may be incomplete.

An analysis of available mapped fire history data showed that 80% of Allenby Park has been burnt since 1952. The most recent fire event in 2005, was the result of arson, and resulted in areas of Fire Exclusion Zone (consisting of Coachwood Rainforest) being burnt. Past fires seem to have been concentrated in the north, especially around the park boundaries.

See "Allenby Park Fire Regime Management Poster" (Appendix 7, ELA 2006) for a map of recorded fire history.

3.2 Fuel Load Assessment

An assessment of fuel loads has been undertaken in ArcView GIS, using a program add-on to predict fuel loads, based on vegetation type and time since fire. This software, prepared for NPWS (Conroy, 1994), uses fuel accumulation curves for structural vegetation types. The information was then analysed in relation to time since last fire to provide an estimate of fuel loads across the study area.

This information has been used to assist in the identification of priority areas for hazard reduction burns. As new fires occur and vegetation regenerates, fuel loads will vary.

Fuel modelling has been based on fire history data from 1952 to the 2006 fire season and Warringah Vegetation Mapping (P & J Smith 2003) (See Figure 2).

Predicted fuel loads for the park are shown in Figure 3.

It should also be noted that high levels of weed infestation currently occur within the park. Existence of these weeds have the potential to alter fuel loads and fire response.

3.2.1 Limitations

The following is a basic list of the limitations of the fuel model:

- The model is based on topography, vegetation mapping and fire history. Any inaccuracies or gaps in the data will be persistent throughout the fuel model
- Current fire history records do not include any indication of fire intensity. The model assumes a starting fuel load of 0 tonnes per hectares. After any fire this is unlikely and, in the case of a cool burn, much of the available fuel may remain
- Fire history records before the mid 1980s were not systematically recorded
- Years of drought and very poor ridge-top soil conditions may result in a much slower rate of vegetation growth and fuel accumulation
- Areas of rainforest, cleared and highly disturbed vegetation were excluded from the fuel load assessment
- In some areas manual Hazard Reduction (HR) works have not been mapped. This has resulted in higher fuel load predictions than that which is actually on the ground

3.2.2 Algorithms

The following vegetation fuel classes are used:

- 1 = grass (not included in model at this stage)
- 2 = shrub / heathland
- 3 = woodland
- 4 = open forest
- 5 = rainforest (not included in model)
- 0 = cleared, disturbed, not vegetated, swamp, reedland, saltmarsh (Not included in model)

The following fuel accumulation algorithms are used:

$$\text{Shrubland: } F = 40 - (e^{-0.01169 * T} * 36.6345)$$

$$\text{Woodland: } F = 22.3 - (e^{-0.1634 * T} * 16.878)$$

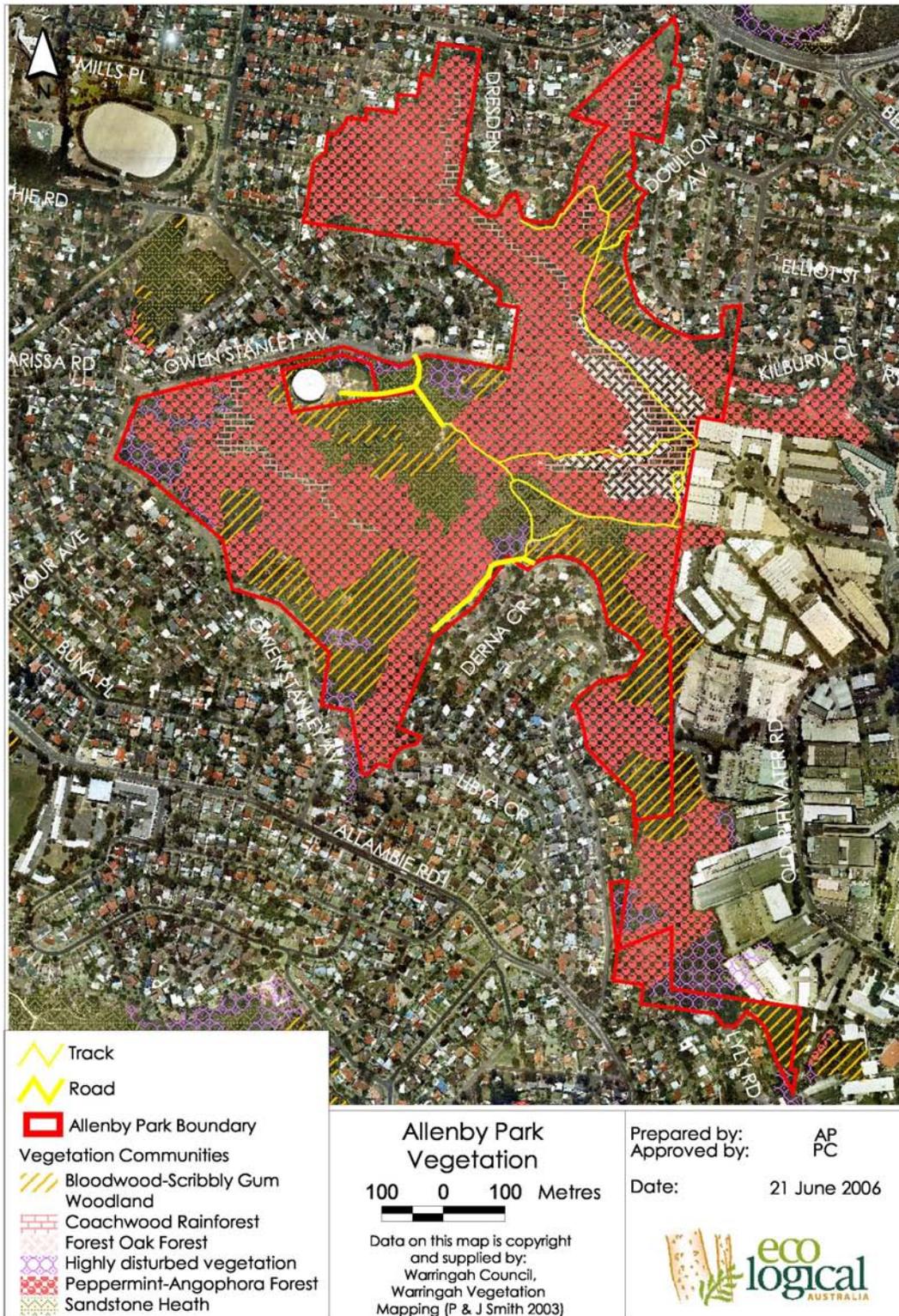
$$\text{Forests: } F = 23 - (e^{-0.112 * T} * 16.346)$$

Where:

F = Fuel Load in tonnes/hectare

T = Time since last fire (in years)

Figure 2 Vegetation Communities



3.3 Assets at Risk from Fire

3.3.1 Built and Cultural Assets

Built assets within the park include play equipment located within Wedgewood Reserve (within Allenby Park), timber bridges, boardwalks, powerlines, drainage infrastructure, Sydney Water infrastructure including a water tank and associated structures and picnic facilities located within bushland areas of the park.

Identification of cultural assets including known European and Aboriginal heritage sites have been undertaken using information from the Aboriginal Heritage Information Management System (AHIMS – DEC 2004a), Council data and the parks management plan (LandArc, 2000). This information has been provided in digital GIS format and is intended to flag known cultural heritage issues for consideration during the Environmental Impact Assessment (EIA) process.

No known items of European heritage were identified. One Aboriginal heritage site (artwork) has been recorded within the south precinct of the park.

3.3.2 Natural Heritage Assets

Information on natural heritage values has been sourced from the following:

- Atlas of NSW Wildlife (DEC 2004)
- Warringah Vegetation Mapping (P & J Smith 2003, supplied in digital format by Council)
- Warringah Natural Area Survey: Vegetation communities and Plant Species (P & J Smith 2003)
- Allenby Park Plan of Management (LandArc 2000)

3.3.2.1 Vegetation Communities

No EPBC Act listed communities or any considered as Endangered Ecological Communities (EECs) under the TSC Act occur within the park. Communities of regional significance, including Forest Oak Forest and Coachwood Rainforest, have however been mapped within Allenby Park.

Table 1 contains a list of communities, their legal status in NSW, and their priority within Warringah LGA (P & J Smith 2003). See Figure 2 for vegetation communities, Appendix 1 for an explanation of vegetation priority.

Table 1 Vegetation Communities of Allenby Park

Vegetation Community	State Legislative Status (TSC Act 1995)	LGA Priority
Bloodwood-Scribbly Gum Woodland	Not listed	3
Coachwood Rainforest	Not listed	1
Forest Oak Forest	Not listed	1
Peppermint-Angophora Forest	Not listed	3
Sandstone Heath	Not listed	3

3.3.2.2 Managed Regeneration Areas

Consideration should be given to the vulnerability of bush regeneration areas within the park at HR planning stage as well as during wildfire response, where possible.

3.3.2.3 Threatened Flora and Fauna

A search of the Atlas of NSW Wildlife was conducted for:

- Threatened flora listed under the TSC Act 1995, and flora indicated by P & J Smith (2003) as being nationally, regionally or locally significant. Search area was within 5km of the Park; and
- Threatened fauna listed under the TSC Act 1995, and fauna indicated by P & J Smith (2005) as being nationally, regionally or locally significant. Search area was within 10km of the Park.

Species identified within the above proximity may be seen in Appendixes 2 – 3 and includes:

- 41 threatened fauna species
- 44 national, regional or locally significant fauna species
- 6 threatened flora species
- 20 national, regional or locally significant flora species

Threatened species identified within the park include, *Tetratheca glandulosa* and the Powerful Owl (*Ninox strenua*).

Fire requirements for threatened species identified within the park were considered during creation of the operational schedule. These included requirements identified within relevant recovery plans for each species.

Protection of locally and regionally significant species as well as threatened species identified as occurring outside the park is aimed at maintaining the structure and floristic integrity of the plant communities within which they occur.

Additional management requirements for all species identified should be considered during HR planning including fire intensity, burn season, escape routes and internal burning boundaries to ensure protection of breeding areas and habitat.

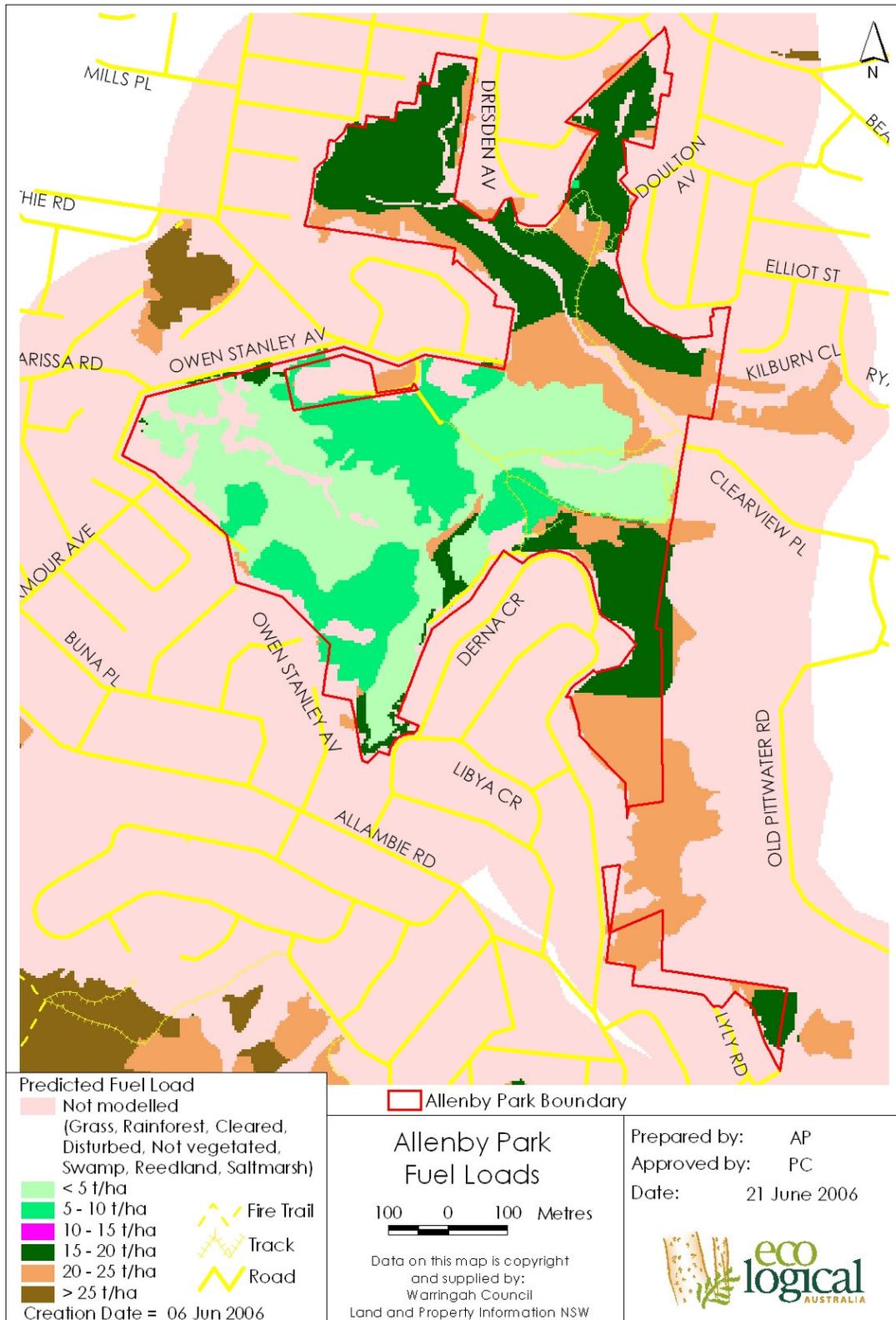
Fire ecology requirements of threatened flora within 5km and threatened fauna within 10km of the park have been assessed and provided to Council within the Warringah Reserve Threatened Flora/Fauna Fire Ecology spreadsheets (ELA 2005a, ELA 2005b).

Additional information including species habitat distribution/condition and population age (for flora species), is required to enable effective HR planning. As such, field assessment at HR planning stage is recommended.

To assist in future management, it is recommended that Council obtain mapping of:

- Potential refuge areas for amphibians, reptiles and mammals (considering the existence of barriers such as fences)
- Distribution and abundance of habitat features for which protective measures can be implemented, including:
 - Ephemeral areas
 - Hollow bearing trees/ significant stands

Figure 3 Predicted Fuel Loads



4 Fire Management Issues

4.1 Fire Management Boundaries

The park boundary used within this plan has been compiled from both cadastral and park management boundaries (as proposed by LandArc 2000). Areas where the park management boundary (as proposed by LandArc 2000) is seen to deviate outside the cadastral boundary have been included.

Normally a fire management plan would only apply to the subject park. Large areas of contiguous vegetation adjacent to Allenby Park have been included within planned management zones in order to provide logical management and increase both asset and ecological protection.

4.2 Management Responsibilities

Fire management within the areas is co-ordinated on a landscape scale by the Warringah Pittwater Bush Fire Management Committee (WPBFMC). This committee is responsible for providing a coordinated, agreed approach to major issues in preparing plans for operations, and bush fire risk management within the district and is made up of Warringah Council, DEC and other key stakeholders.

Overall management of the park is the sole responsibility of Warringah Council. The NSW Fire Brigade is responsible for fire suppression efforts in the park and for mapping any fires that occur. Council however does delegate responsibility to the NSW Rural Fire Service for management of all private land within Warringah and may also engage them to undertake hazard reduction works where required on public land under the responsibility of the NSW Fire Brigade.

This plan has divided the park into a number of different management zones. Those adjoining or including private/commercial properties may require landowner's co-operation. Council have no responsibility for land not under their management.

4.3 Fire Trails and Tracks

Access within the park is considered to be insufficient to allow adequate response to fire events. Due to ecological constraints, past planning decisions and the existence of slopes over 15 degrees, retrospective implementation of fire trails within APZ areas is considered impractical within some areas. As such access is to be managed by:

Maintenance / upgrading of existing roads

The following access roads should be upgraded/maintained in accordance with the requirements for Planning for Bush Fire Protection (PBP) (RFS 2001), where feasible:

- Access roads, within the park, near Owen Stanley Avenue, providing access to Sydney Water infrastructure located within APZ 1, LMZ 2 and LMZ 3
- The access road, at Derna Crescent

There are concerns relating to existing access at Doulton Avenue and the road south west of Dresden Ave, due to their inability to be enlarged, narrow width and lack of turning area.

Identification / creation and use of proposed fire access areas

Approximate locations for proposed fire access areas have been created from Aerial Photograph Interpretation and have been provided to Council in digital format (see Figure 6).

Proposed fire access areas identified, include locations where access to the park may be obtained for the purpose of fire management. A number of these areas include public roads / land, for which no additional management actions are required. Other areas fall within private lands. In order to allow for effective, long term management of access to these areas, for the purpose of fire management, it is recommended that:

- Firstly Council negotiate in principle agreements for access by the RFS and Council for the purpose of fire management
- Secondly more formalised long term agreements be sought, such as 88b covenants (under the Conveyancing Act 1919)

It is recommended that Council commence negotiations with relevant landholders in 2006 to achieve this outcome.

Should new trails be created, fire trail requirements under Planning for Bush Fire Protection (PBP) (RFS 2001) should be adhered to where feasible.

APZ management to allow effective personnel access as required

APZ areas, not directly accessible to fire trails, roads or proposed fire access areas, should be managed to allow effective personnel access as required.

The grassed area within APZ 2 provides potential access to vehicles during appropriate weather / ground conditions. Vehicular access to these areas should be maintained.

Signage maps showing trails within the park are recommended. This is supported by the parks Plan of Management (LandArc 2000).

Fire trail management should be undertaken in accordance with the Bush Fire Coordinating Committees' Policy (no. 1/03), Guidelines for the Classification of Fire Trails and Guidelines for Fire Trail Signage (BFCC 2003). Additionally a Fire Trail Register is maintained by the BFMC.

4.4 Introduced Species Management

Weed management

The Park contains areas of high weed infestation. An example of this can be seen near Owen Stanley Avenue .

Interactions between fire and weed species include:

- Increased fuel levels, with some weed species being particularly flammable
(Eg. Pampas grass)

- Decreased likelihood of effective burn intensities, due to fire retardant species (Eg. Privet and mesic species)
- Potential for weed mortality by fire
- Encouraged proliferation of weeds, due to seed stimulation and ecological conditions post fire

To ensure appropriate weed management, weed control should be considered during HR planning. This should include an assessment of:

- Removal of weed species over natives during creation of APZ areas
- Pre-fire weed preparation requirements. Factors to consider include weed type, species, moisture content and desired fire intensity

Management of weeds within APZ areas must incorporate ecological, stabilisation, and fire considerations.

Appropriate techniques are to be employed to prevent weed dispersal by mowers etc. and the removal of dead vines from trees, as these features can act as wicks for fire to spread into canopy.

Feral fauna management

Fire may increase the impact of feral fauna species through a reduction in protective ground cover for prey species. As such, control of feral species should be considered during HR planning works.

No evidence of feral species was observed during field surveys.

4.5 Fire Management Zones

The Fire Management Zones used in this plan are based on those used in the Warringah Pittwater Bush Fire Risk Management Plan (WPBFMC 2000). The description, aims and prescription for these zones is described below.

4.5.1 Asset Protection Zones (APZ)

Description

- Area surrounding a development and managed to reduce bush fire hazard
- Often has inner protection area (IPA) and outer protection area (OPA)
- APZ widths and fuel reduction treatment will be determined by slope and existing nature of assets
- Reduction techniques will include:
 - raking and slashing
 - bush regeneration, involving initial weed removal and long term weed management. This method should be combined with hand removal of ground fuels and manual removal of shrub and middle story layers
 - burning

Aims

- To protect human life and property

- To protect highly valued assets

Prescriptions

- To maintain reduced ground fuel loads and maintain understorey to less than 50cm in height, with discontinuous shrub and canopy layers, by:
 - removal/ suppression of weeds
 - thinning of regrowth
 - hand removal
 - raking and slashing
- Trees should not over-hang buildings
- APZ areas may be burnt as appropriate dependant on management issues

4.5.2 Land Management Zone (LMZ)

Description

- Broader areas of the landscape, incorporating those areas not satisfying the criteria for inclusion in Strategic Fire Management Zones or Asset Protection Zones
- Reduction techniques will include:
 - burning
 - weed control

Aims

- Protection of natural and cultural heritage values
- Maintenance of ecological processes

Prescription

- Fire management to meet conservation objectives for species, habitats, populations and cultural heritage values, including:
 - control of breaches in minimum fire thresholds and address maintenance of fire age (vegetation age) mosaic, including maximum fire thresholds
 - implementation of cultural heritage and threatened species management within areas where cultural heritage and threatened species sites are known or likely to occur

4.5.3 Strategic Fire Advantage Zones (SFAZ)

Description

- Usually adjacent to and complementing asset protection zones
- Managed to protect community assets and ecological sustainability

- Reduction techniques will include:
 - burning
 - manual fuel reduction techniques such as raking, slashing, hand removal of ground fuels and manual removal of shrub and canopy layers; emphasis placed on weed species where appropriate
 - weed control

Aims

- To restrict fire movement into and out of parks
- Reduce the speed and intensity of fire
- Reduce the potential for spot fire development

Prescription

- A general prescription for maximum fire fuel loading within a range of 8 – 18 tonnes per hectare
- To be managed consistently with the following applications:
 - to provide fuel reduced areas which enable the protection of assets by fire fighters when Asset Protection Zones are not in place
 - to complement Asset Protection Zones where insufficient protection is provided
 - to provide fuel reduced zones in areas of high ignition potential (eg. along roads, rail lines, power lines etc.) to slow the development of fires, reduce their spread, and provide for safe suppression
 - to provide strategically located fuel reduced areas to reduce the vulnerability of assets which are susceptible to fire
 - to attain a fire regime consistent with the requirements for the preservation of biodiversity within vegetation communities

4.5.4 Fire Exclusion Zones (FEZ)

Description

- Areas containing fire intolerant species and assets

Aims

- To exclude fires (both wildfires and hazard reduction burning) due to the presence of fire intolerant assets, including:

- o fire intolerant vegetation communities
- o riparian buffers
- o cultural/historic sites

Prescription

- Exclude fire and undertake rapid suppression of unplanned fires to maintain fire intolerant species and assets.

4.6 Biodiversity Fire Regime Thresholds

Biodiversity fire regime thresholds are intended to ensure there is no loss of biodiversity through senescence or insufficient recruitment as a result of fires being too frequent. Additionally, varying inter-fire periods across the landscape ensures greater heterogeneity of lifecycles and growth stages, enhancing habitat value.

Minimum and maximum inter-fire periods have been defined for vegetation communities known to occur within the park. These are shown in Table 3.

Revegetation areas within the park have not been included within this assessment process. Due to the potentially young age of these communities it is noted that prescribed biodiversity thresholds may have detrimental effects. Such factors are to be considered during future HR planning conducted prior to burning.

An evaluation of fire history and biodiversity fire regime thresholds for mapped vegetation communities has been undertaken for the entire Park. The current fire threshold status and resultant ecological fire requirements for vegetation within the park have been determined and may be seen in Figures 4 and 5 respectively. An explanation of these categories can be seen in Table 2.

The information above has been considered in determining the operation schedule (see Section 5).

Where the minimum inter-fire threshold has not been reached (i.e. it has not been burnt too frequently), an indication of the number of burns permitted within the life of the plan has been provided.

Fire should be excluded from areas where the minimum inter-fire threshold has been reached.

Where the minimum inter-fire threshold has been exceeded (that is, it has been burnt too frequently), strategies to facilitate recovery should be implemented. These may include:

- If wildfire occurs, the area burnt should be minimised through immediate response and rapid suppression
- Use of prescribed burning to reduce the threat of wildfire whilst maintaining varying fire ages

When identifying if an area has breached, reached or not reached its minimum inter-fire threshold, the precautionary approach was adopted. It was not possible, with the data available, to identify whether a fire had occurred at the start or end of a calendar year. This is due to the fact that some fires are recorded by fire season, which actually occurs over 2 calendar years. Therefore, when calculating the minimum inter-fire threshold, areas on the fringe of the threshold were included. For

example, if an area had a minimum threshold of >2 fires in <5 years, and was burnt in 1999, and 2004, we would identify this area as having reached its minimum threshold, even though the fires may have actually occurred 6 years apart (eg. January 1999 and December 2004). This precautionary approach means areas for future burning were not identified if they were on the verge of reaching their minimum threshold.

Where frequent fire is identified in a Recovery Plan as a threatening process, relevant pre-existing Threat Abatement Plans should be implemented.

Table 2 Ecological Threshold and Ecological Fire Requirement Explanation

Ecological Thresholds	Explanation	Ecological Fire Requirements
Threshold breached	This includes areas of vegetation where fire frequency has either been too infrequent, or too frequent for the maintenance of optimum biodiversity, as recommended within vegetation community fire thresholds.	<p>Ecological Fire Requirements</p> <ul style="list-style-type: none"> • Actions for areas will depend upon whether the minimum threshold (i.e. burnt too frequently) or the maximum threshold (i.e. not burnt frequently enough) has been reached. <p><u>Minimum threshold breached:</u> Suppression priority. Exclude prescribed burning for a minimum of 10 years in forest, heathland / tall shrubland and woodland.</p> <p>For other community types prevent successive fires until community is within threshold.</p> <p><u>Maximum threshold breached:</u> Prescribed burning to be undertaken ensuring sufficient areas of old age class communities are left within the park. Managed as for Prescribed Fire Management Zone (see Section 5.1).</p>
Threshold reached	This includes areas of vegetation where fire occurrence has reached the limit of identified vegetation community fire thresholds.	<p><u>Minimum threshold reached:</u> Prevent successive fires until community is within threshold.</p> <p><u>Maximum threshold reached:</u> Monitor vegetation community to determine age distribution. Prescribed burning may be undertaken, ensuring sufficient areas of old-age class communities are left within the park. Managed as for Prescribed Fire Management Zone (see Section 5.1).</p>
Threshold not reached	This includes areas of vegetation where fire has occurred at a frequency within the identified vegetation community fire thresholds.	An indication of the number of fires permitted within the life of the plan before threshold is reached is provided.

Ecological Thresholds	Explanation	Ecological Fire Requirements
Nearing maximum, no fire recorded	This includes areas of vegetation where a fire has not been recorded in the data provided. Area should be managed to ensure that a mosaic of fire ages within the area exist.	<ul style="list-style-type: none"> • Actions for areas will depend upon whether the minimum threshold (i.e. burnt too frequently) or the maximum threshold (i.e. not burnt frequently enough) has been reached. <p>Prescribed burning to be undertaken, ensuring sufficient areas of old age class communities are left within the park. Managed as for assigned fire management zone - see Section 5.1).</p>
Threshold not reached (reached >10 years ago) Or Threshold not reached (reached 10 years ago)	This includes areas of vegetation where a fire has occurred at a frequency within the identified vegetation fire thresholds, however the threshold was reached in the past (i.e. >10 or 10 years ago).	An indication of the number of fires permitted within the life of the plan before threshold is reached is provided.
Threshold not reached (breached >10 years ago)	This includes areas of vegetation where a fire has occurred at a frequency within the identified vegetation fire thresholds, however the threshold was breached in the past (i.e. >10 years ago).	An indication of the number of fires permitted within the life of the plan before threshold is reached is provided.
Not addressed	This includes water bodies and areas mapped as highly disturbed or cleared vegetation. These areas have no identified vegetation community fire thresholds.	Not applicable.

Figure 4 Vegetation Fire Threshold

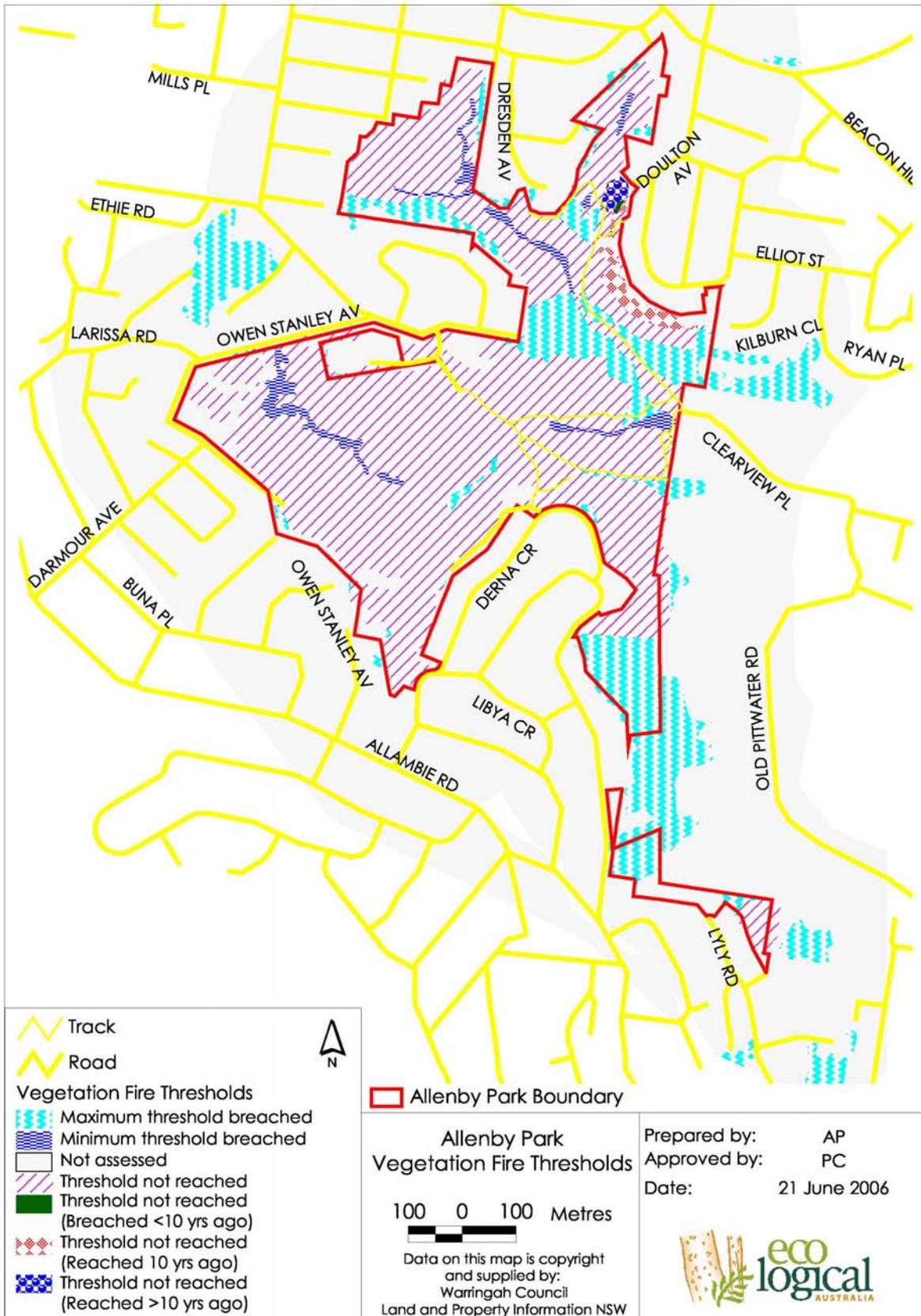


Figure 5 Ecological Fire Requirements

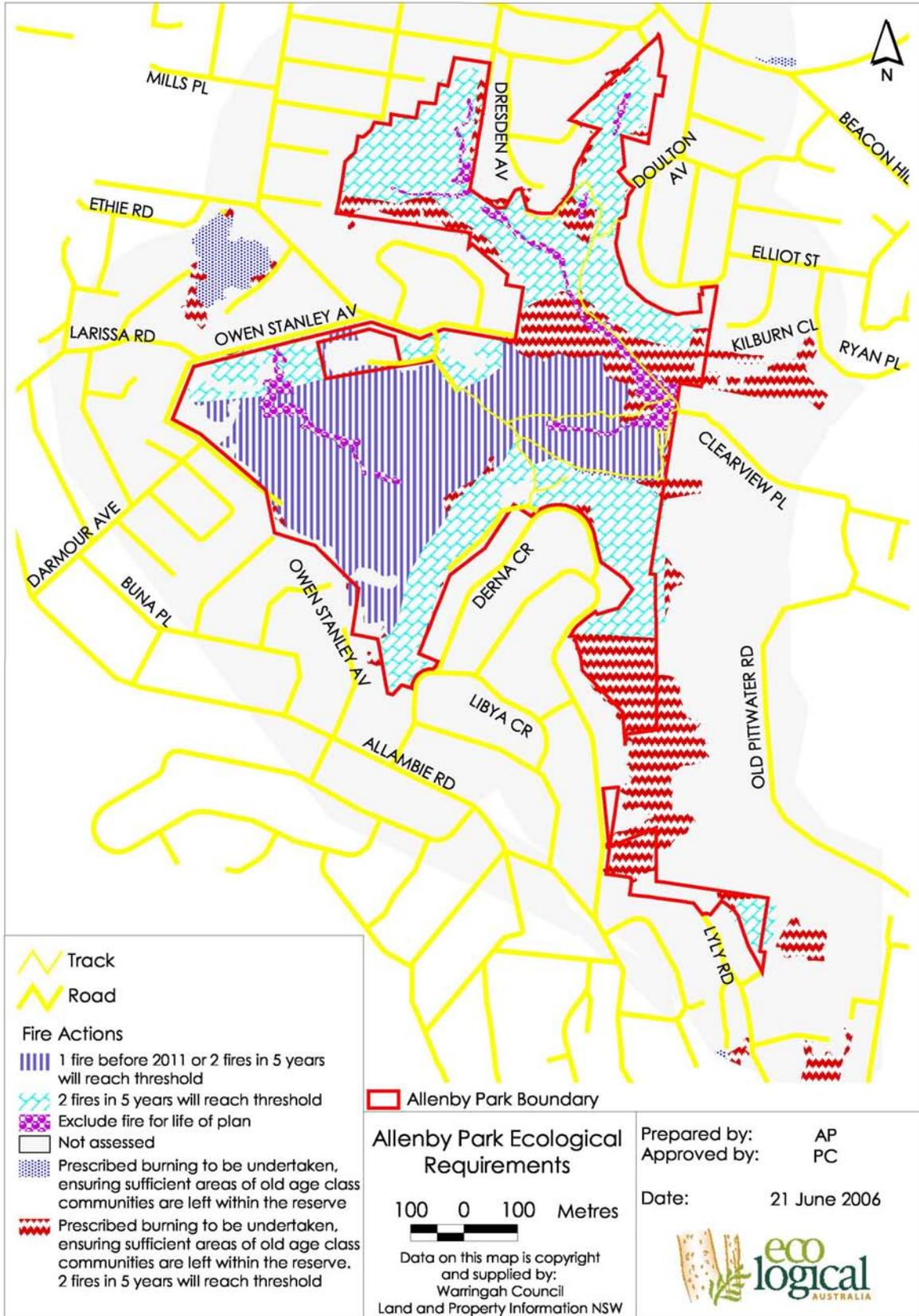


Table 3 Biodiversity Fire Regime Thresholds for Vegetation Communities identified within Allenby Park

Vegetation community	Priority	Minimum Fire Interval	Maximum Fire Interval	Fire Restrictions	Reference
Bloodwood-Scribbly Gum Woodland	3	> 2 successive fires in < 5yr intervals	>30	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	(Bradstock NPWS 1996 cited in Conacher Travers Pty Ltd 2002), (WPBFMC 2000)
Coachwood Rainforest	1	No fires acceptable	No fires acceptable	-	(NPWS 2003)
Forest Oak Forest	1	> 2 successive fires in < 5yr intervals	>30	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	(Bradstock NPWS 1996 cited in Conacher Travers Pty Ltd 2002), (WPBFMC 2000)
Peppermint-Angophora Forest	3	> 2 successive fires in < 5yr intervals	>30	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	(Bradstock NPWS 1996 cited in Conacher Travers Pty Ltd 2002), (WPBFMC 2000)
Sandstone Heath	3	>2 in quick succession in 8 yr interval, 3 in quick succession each 15 to 30yrs interval	>30	-	(WPBFMC 2000)

5 Operational Schedule

The operational schedule is explained below and is made up of the:

- Prescribed Fire Management Zones; and
- Prescribed Works Schedule.

This may be seen:

- Figure 6 and 7;
- Table 4; and
- The “Allenby Park Fire Regime Management Poster” (Appendix 7, ELA 2006).

5.1 Prescribed Fire Management Zones

The following fire management zones have been applied (see Figure 6, Section 4.5):

- Asset Protection Zones (APZ)
- Strategic Fire Advantage Zones (SFAZ)
- Land Management Zones (LMZ)
- Fire Exclusion Zones (FEZ)

Given the nature of this site it is not considered possible to provide adequate Asset Protection Zones in accordance with PBP whilst still maintaining the ecological value of the park. Accordingly a 20m wide APZ has been recommended for residential areas. With the exception of an Aboriginal Childrens Home at the end of Lyly Road, no special protection developments, such as schools, hospitals or retirement villages occur along the park boundaries.

It is not practical to implement APZ's in areas where slopes exceed 18 degrees. Due to the topography of site there will be instances where the achievable APZ will be less than 20 metres. In such areas the APZ is to be implemented to the maximum extent possible that does not require clearing of slopes greater than 18 degrees.

In order to minimise impacts and to allow for effective management, existing tracks, natural features and cleared areas have been used for fire management boundaries where available.

5.2 Prescribed Works Schedule

The prescribed works schedule lists the actions required by Council to facilitate implementation of this Plan's objectives.

Prescribed burning within **LMZ** has been proposed for areas where biodiversity fire regime thresholds have been exceeded (that is, if the vegetation has not been burned for a long time and is in danger of senescing and losing biodiversity values). These recommendations are included in Section 4.6.

In order to maintain **SFAZ** within prescribed fuel load limits whilst maintaining ecological integrity:

- Dominant vegetation types were identified within each SFAZ

- The maximum prescribed fuel load for each SFAZ was then entered into the fuel accumulation model to provide a guide for required burn year
- The burn year was evaluated against identified ecological fire thresholds (see 4.6) and known threatened species fire intervals (see ELA 2005a and ELA 2005b)

Due to practicality and potential ecological impacts, it has been agreed by all parties that SFAZ 5 and SFAZ 3 only be burnt once within the life of the plan. This may result in fuel exceeding ELA's recommended fuel prescription for maximum fine fuel loading within a range of 8 – 18 tonnes per hectare.

Water quality within the park should be protected by the restricting, or limiting the intensity, of fire from within 20m of watercourses where possible.

Figure 6 Prescribed Fire Management Zones

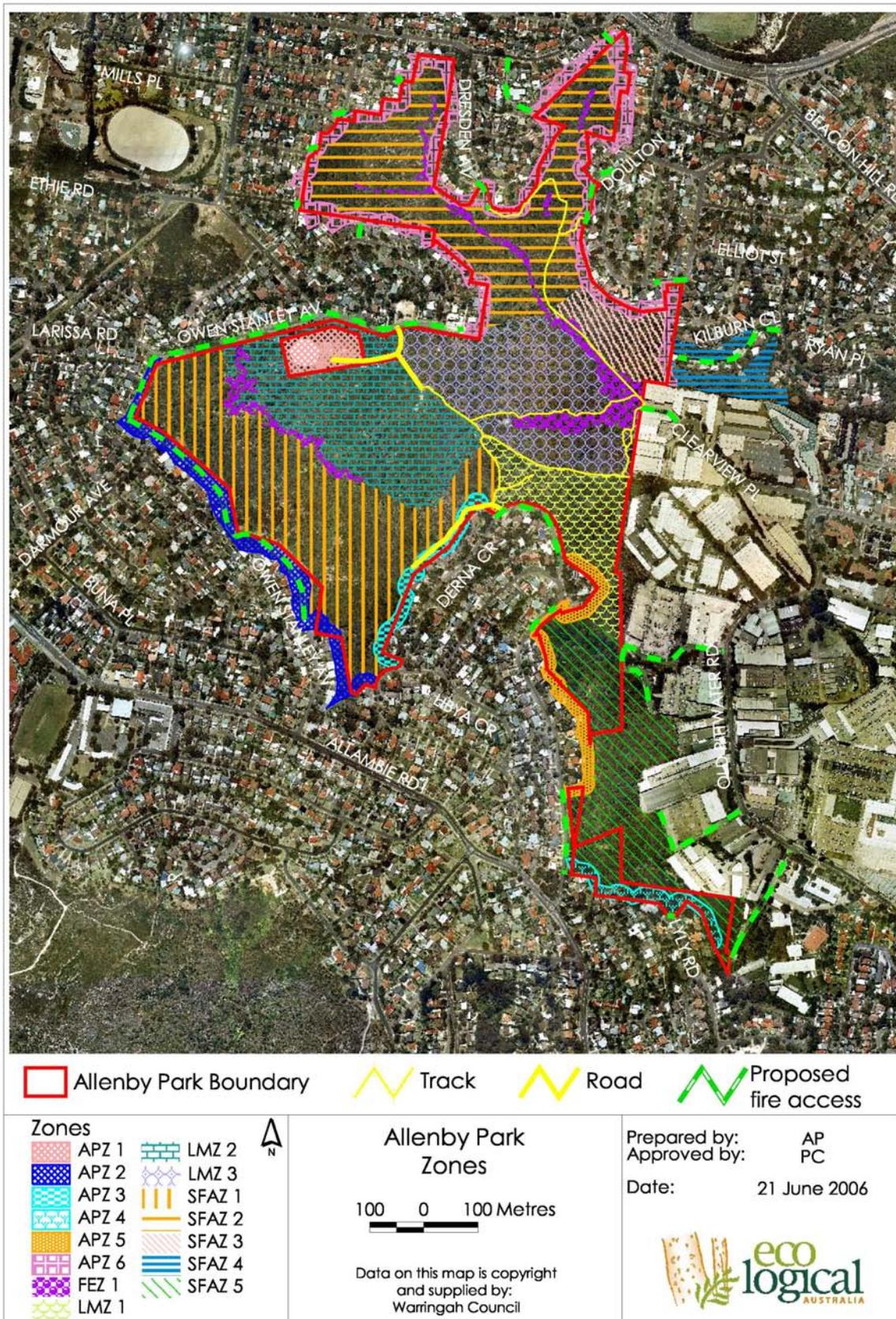


Figure 7 Prescribed Works Schedule

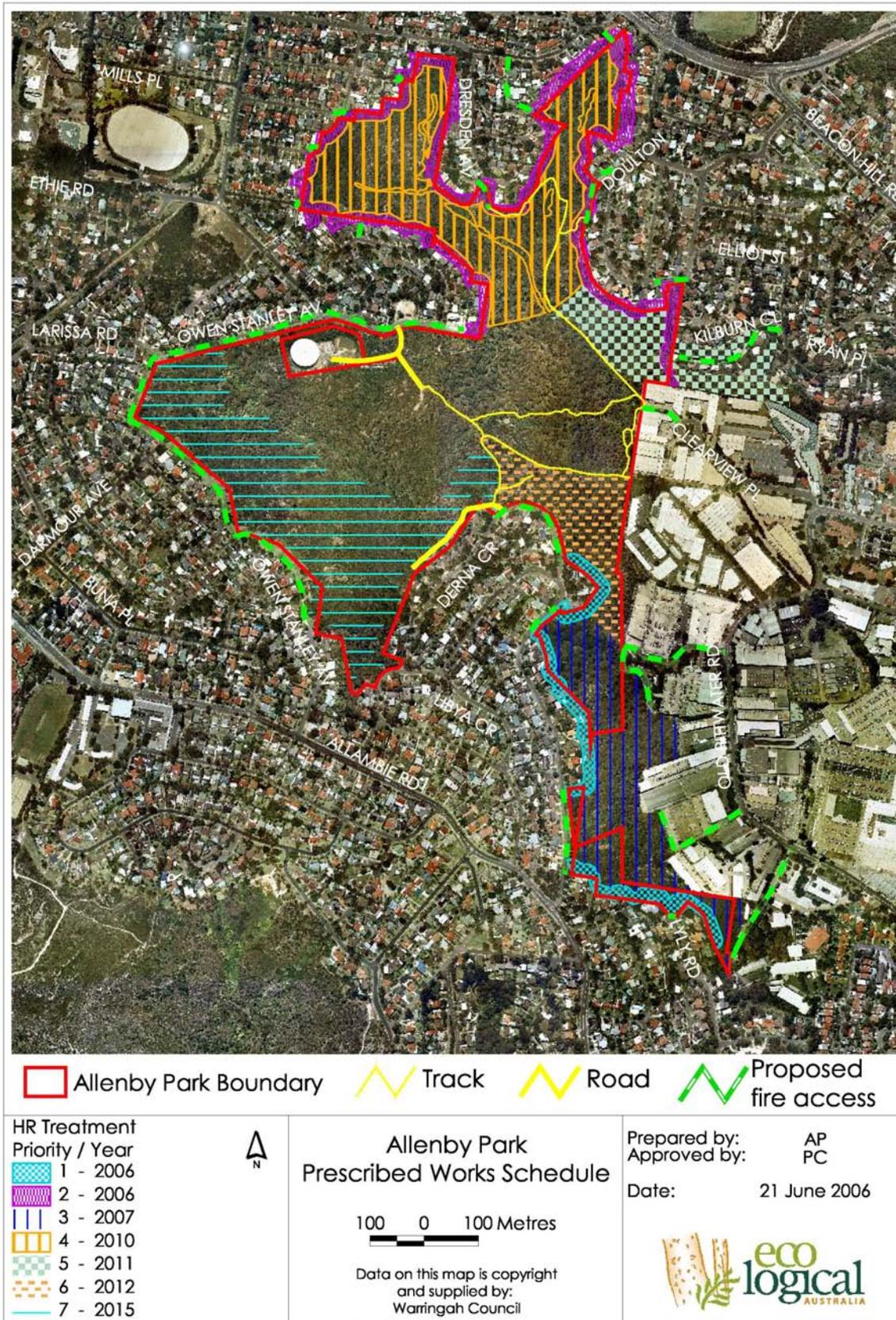


Table 4 Operation Schedule for Allenby Park

Name	Zone Type	Treatment	Management	HR Treatment Priority *	HR Treatment Year	Assets	Threatened Species and Endangered Ecological Communities [▲]	Aboriginal or cultural sites	Land Tenure	APZ Widths
APZ 1	APZ	Initial weed removal and long term weed suppression, slashing/hand removal of fuels within areas of build up	-	-	Subject to Council FMAZ program priorities ♦	Sydney Water infrastructure, Road	-	-	Sydney Water	20m
APZ 2	APZ	Initial weed removal and long term weed suppression, slashing/hand removal of fuels within areas of build up	-	-	Subject to Council FMAZ program priorities ♦		-	-	Unmade Crown Road Reserve; Crown Land; Private	20m
APZ 3	APZ	Initial weed removal and long term weed suppression, slashing/hand removal of fuels within areas of build up	-	-	Subject to Council FMAZ program priorities ♦	Road	-	-	Crown Land; Private	20m

Name	Zone Type	Treatment	Management	HR Treatment Priority *	HR Treatment Year	Assets	Threatened Species and Endangered Ecological Communities [▲]	Aboriginal or cultural sites	Land Tenure	APZ Widths
APZ 4	APZ	Initial weed removal and long term weed suppression, slashing/hand removal of fuels within areas of build up	-	1	2006		-	-	Community Land; Crown Land; Private	20m
APZ 5	APZ	Initial weed removal and long term weed suppression, slashing/hand removal of fuels within areas of build up	-	1	2006		-	-	Crown Land; Private	20m
APZ 6	APZ	Initial weed removal and long term weed suppression, slashing/hand removal of fuels within areas of build up	Contains Coachwood Rainforest, exclude fire from this community for life of plan	2	2006	Track	-	-	Community Land; Crown Land; Other Land; State Government Owned Land; Private	20m

Name	Zone Type	Treatment	Management	HR Treatment Priority *	HR Treatment Year	Assets	Threatened Species and Endangered Ecological Communities [▲]	Aboriginal or cultural sites	Land Tenure	APZ Widths
FEZ 1	FEZ	Exclude fire/quick suppression	-	-	-	Track	-	-	Crown Land; Community Land, Unmade Crown Road Reserve, Other State Government Owned Land	-
LMZ 1	LMZ	Burning	-	6	2012	Track, powerlines	-	-	Crown Land	-
LMZ 2	LMZ	-	-	-	-	Road, powerlines	Powerful Owl	-	Crown Land	-
LMZ 3	LMZ	Burning	Area to be managed for the maintenance of Forest Oak Forest: <i>Allocasuarina torulosa</i> important food resource for Glossy Black-cockatoo	-	-	Track, road, timber bridge and board walks, Sydney Water infrastructure, powerlines	-	-	Crown Land	-
SFAZ 1	SFAZ	Burning	-	7	2015	-	-	-	Crown Land; Unmade Crown Road Reserve	-

Name	Zone Type	Treatment	Management	HR Treatment Priority *	HR Treatment Year	Assets	Threatened Species and Endangered Ecological Communities [▲]	Aboriginal or cultural sites	Land Tenure	APZ Widths
SFAZ 2	SFAZ	Burning	-	4	2010	Track, timber bridge and board walks	<i>Tetratheca glandulosa</i>	-	Community land; Other State Government Owned Land	-
SFAZ 3	SFAZ	Burning	Area to be managed for the maintenance of Forest Oak Forest: <i>Allocasuarina torulosa</i> important food resource for Glossy Black-cockatoo	5	2011	Track, boardwalks	-	-	Crown Land; Community Land	-
SFAZ 4	SFAZ	Burning	-	5	2011	-	-	-	Crown Land; Community Land	-
SFAZ 5	SFAZ	Burning	-	3	2007	-	-	Aboriginal art	Crown Land; Community Land	-

* Year of burn may vary due to weather and environmental conditions and resource availability

◆ Fire Management Access Zone (FMAZ) priorities dependent on available funds

Note:

- No significant flora or fauna found within the park
- Significant vegetation communities including Coachwood Rainforest occur within APZ 6, FEZ 1, LMZ 2 -3 and SFAZ 1 -3. Another significant vegetation communities, Forest Oak Forest occurs within FEZ 1, LMZ 3, SFAZ 2 -3

6 Performance measures

6.1 Environmental Assessment of Scheduled Works

All works proposed within the fire management plan will be assessed for environmental and heritage impacts at the HR planning stage. This will be conducted either under the EP&A Act through a REF or under the Bush Fire Environmental Assessment Code (See Section 2.7). The "Warringah Local Government Area Hazard Reduction Guidelines" (Appendix 4) may be used to assist this process.

6.2 Monitoring Fire Regimes and Changes to Biodiversity

Fire records should be updated as fire incidents occur.

Alteration to fire threshold status resultant from fire occurrences after June 2006 should be assessed annually and at the beginning of HR planning to determine potential management requirements.

This assessment should involve a comparison of required and actual vegetation community and threatened species thresholds and require:

- Updated fire records
- Determination of fire age
- Consideration of required threshold
- Assessment of current threshold status

Assessment of vegetation community threshold status was undertaken in 2006 (see Section 4.6) and is included within:

- Figure 4 and 5
- Digital data provided to Council.

6.3 Fire Management Plan Review

The goal of this plan is to guide the management of fire in Allenby Park for the next 10 years and to provide a sustainable balance between asset protection and ecosystem management.

Prescribed works schedule assessment

Assessment of the prescribed works schedule (Section 5.2) and the Warringah Reserve Threatened Flora/Fauna Fire Ecology spreadsheets (ELA 2005a, ELA 2005b) should be undertaken on an annual basis and during HR planning. This should include:

- Incorporation of additional developments in the management of native flora and fauna with respect to fire
- Alterations in fire thresholds (see Section 6.2)

Fire management plan evaluation

It is recommended that an evaluation of this plan be conducted at the end of 10 years. The evaluation should involve stakeholder (RFS and DEC) assessment and include:

Quantitative assessment:

- Minimum fire thresholds not exceeded
- Number of hectares burnt outside ecological threshold for HR and wildfires
- Maintenance of a mosaic of fire age (vegetation age)
- Maintenance of fuel free and fuel reduced APZ's
- All activities proposed within the Prescribed Work Schedule accepted by the NSW Rural Fire Service (RFS)

Qualitative assessment:

- Provision of effective and user friendly instructional guidelines to enable other planning processes. Including:
 - Proficient/successful HR planning
 - Prevention of fire damage to infrastructure
 - Prevention of fire damage to threatened, locally or regionally significant species, endangered populations or endangered ecological communities
 - Protection of Aboriginal and culturally significant sites from fire damage
 - Visit current social attitudes to determine success of proposed management strategies
 - Evaluate feasibility and practicality of prescribed operational schedule

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Appendix 1 – Vegetation Priority Explanation

Priority 1	EEC (under <i>TSC Act 1995</i>), or represent potentially important habitat for threatened flora or fauna species (listed under <i>TSC Act 1995</i>). Particularly if the community is absent or poorly represented in Garigal and Ku-ring-gai Chase National Parks.
Priority 2	Important for conservation of biodiversity at the local level. Communities with a restricted distribution in the Warringah LGA and are absent or poorly represented in Garigal and Ku-ring-gai Chase National Parks. Stands of these communities warrant first priority if they support populations of threatened fauna or flora species.
Priority 3	Communities that are well represented in Garigal and Ku-ring-gai Chase National Parks and common in Warringah. Stands of these communities warrant first priority if they support populations of threatened fauna or flora species.

Source: P & J Smith 2003

Appendix 2 – Known Threatened Flora Within 5km and Threatened Fauna Within 10km of Allenby Park

Table 1: Known threatened flora within 5km of Allenby Park*

Scientific Name	Common Name	Recorded Within Park
<i>Acacia bynoeana</i>	Bynoe's Wattle	
<i>Genoplesium baueri</i>		
<i>Grevillea caleyi</i>		
<i>Pimelea curviflora</i> var. <i>curviflora</i>		
<i>Syzygium paniculatum</i>		
<i>Tetratheca glandulosa</i>		X

* **Source:** DEC 2004

Table 2: Known threatened fauna within 10km of Allenby Park*

Scientific Name	Common Name	Recorded Within Park
<i>Botaurus poiciloptilus</i>	Australasian Bittern	
<i>Esacus neglectus</i>	Beach Stone-curlew	
<i>Ixobrychus flavicollis</i>	Black Bittern	
<i>Thalassarche melanophris</i>	Black-browed Albatross	
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bent-wing Bat	
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	
<i>Puffinus carneipes</i>	Flesh-footed Shearwater	
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	
<i>Calidris tenuirostris</i>	Great Knot	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	
<i>Charadrius leschenaultii</i>	Greater Sand Plover	
<i>Litoria aurea</i>	Green and Golden Bell Frog	
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	
<i>Phascolarctos cinereus</i>	Koala	
<i>Charadrius mongolus</i>	Lesser Sand Plover	
<i>Puffinus assimilis</i>	Little Shearwater	
<i>Sterna albifrons</i>	Little Tern	
<i>Tyto novaehollandiae</i>	Masked Owl	
<i>Arctocephalus forsteri</i>	New Zealand Fur-seal	
<i>Macronectes halli</i>	Northern Giant-Petrel	
<i>Pandion haliaetus</i>	Osprey	
<i>Haematopus longirostris</i>	Pied Oystercatcher	
<i>Ninox strenua</i>	Powerful Owl	X
<i>Pseudophryne australis</i>	Red-crowned Toadlet	
<i>Xanthomyza phrygia</i>	Regent Honeyeater	
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	
<i>Calidris alba</i>	Sanderling	
<i>Thalassarche cauta</i>	Shy Albatross	
<i>Phoebetria fusca</i>	Sooty Albatross	
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	
<i>Sterna fuscata</i>	Sooty Tern	
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	
<i>Macronectes giganteus</i>	Southern Giant-Petrel	
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	
<i>Lathamus discolor</i>	Swift Parrot	
<i>Diomedea exulans</i>	Wandering Albatross	
<i>Gygis alba</i>	White Tern	
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	

* Source: DEC 2004

Appendix 3 – Known Significant Flora Within 5km and Significant Fauna Within 10km of Allenby Park

Table 1 Known significant flora within 5km of Allenby Park*

Scientific Name	Common Name	Significance
<i>Angophora crassifolia</i>		Nationally significant species
<i>Angophora hispida</i>		Biogeographically significant
<i>Arthrochilus prolixus</i>	Dwarf Apple	Threatened in northern Sydney
<i>Boronia fraseri</i>		Nationally significant species
<i>Boronia thujona</i>		Biogeographically significant
<i>Callistemon salignus</i>		Threatened in Warringah
<i>Crowea saligna</i>	Willow Bottlebrush	Biogeographically significant
<i>Darwinia diminuta</i>		Nationally significant species
<i>Darwinia procera</i>		Nationally significant species
<i>Eucalyptus luehmanniana</i>		Nationally significant species
<i>Eucalyptus robusta</i>	Yellow-top Ash	Threatened in northern Sydney
<i>Eucalyptus stricta</i>	Swamp Mahogany	Threatened in northern Sydney
<i>Gonocarpus salsoloides</i>	Mallee Ash	Nationally significant species
<i>Grevillea speciosa</i>		Biogeographically significant
<i>Hibbertia nitida</i>	Red Spider Flower	Nationally significant species
<i>Lomandra brevis</i>		Nationally significant species
<i>Melaleuca thymifolia</i>		Threatened in northern Sydney
<i>Melichrus procumbens</i>		Threatened in northern Sydney
<i>Persoonia pinifolia</i>	Jam Tarts	Biogeographically significant
<i>Rulingia hermanniifolia</i>	Pine-leaved Geebung	Nationally significant species

* **Source:** DEC 2004

* No significant species recorded within the park

Table 2 Known significant fauna within 10km of Allenby Park *

Scientific Name	Common Name	Significance
<i>Anous stolidus</i>	Common Noddy	Migratory
<i>Antechinus swainsonii</i>	Dusky Antechinus	Threatened in northern Sydney
<i>Apus pacificus</i>	Fork-tailed Swift	Migratory
<i>Arenaria interpres</i>	Ruddy Turnstone	Migratory
<i>Boiga irregularis</i>	Eastern Brown Tree Snake	Threatened in northern Sydney
<i>Calidris ruficollis</i>	Red-necked Stint	Migratory
<i>Charadrius bicinctus</i>	Double-banded Plover	Migratory
<i>Chlidonias leucopterus</i>	White-winged Black Tern	Migratory
<i>Diplodactylus vittatus</i>	Eastern Stone Gecko	Threatened in northern Sydney
<i>Egretta sacra</i>	Eastern Reef Egret	Migratory
<i>Furina diadema</i>	Red-naped Snake	Threatened in northern Sydney
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Migratory
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler	Migratory
<i>Heteroscelus incanus</i>	Wandering Tattler	Migratory
<i>Hirundapus caudacutus</i>	White-throated Needletail	Migratory
<i>Lialis burtonis</i>	Burton's Snake-lizard	Threatened in Warringah
<i>Limnodynastes dumerillii</i>	Bullfrog	Threatened in northern Sydney
<i>Limnodynastes tasmaniensis</i>	Spotted Marsh Frog	Threatened in northern Sydney
<i>Limosa lapponica</i>	Bar-tailed Godwit	Migratory
<i>Monarcha melanopsis</i>	Black-faced Monarch	Migratory
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Migratory
<i>Notechis scutatus</i>	Mainland Tiger Snake	Threatened in northern Sydney
<i>Numenius madagascariensis</i>	Eastern Curlew	Migratory
<i>Origma solitaria</i>	Rockwarbler	Biogeographically Significant
<i>Philomachus pugnax</i>	Ruff	Migratory
<i>Phyllurus platurus</i>	Broad-tailed Gecko	Biogeographically Significant
<i>Plegadis falcinellus</i>	Glossy Ibis	Migratory
<i>Pluvialis squatarola</i>	Grey Plover	Migratory
<i>Pogona barbata</i>	Eastern Bearded Dragon	Threatened in Warringah
<i>Pseudophryne bibronii</i>	Bibron's Toadlet	Threatened in northern Sydney
<i>Puffinus griseus</i>	Sooty Shearwater	Migratory
<i>Puffinus pacificus</i>	Wedge-tailed Shearwater	Migratory
<i>Puffinus tenuirostris</i>	Short-tailed Shearwater	Migratory
<i>Rattus lutreolus</i>	Swamp Rat	Threatened in northern Sydney
<i>Rhipidura rufifrons</i>	Rufous Fantail	Migratory
<i>Sericornis magnirostris</i>	Large-billed Scrubwren	Threatened in northern Sydney
<i>Stercorarius longicaudus</i>	Long-tailed Jaeger	Migratory
<i>Stercorarius parasiticus</i>	Arctic Jaeger	Migratory
<i>Stercorarius pomarinus</i>	Pomarine Jaeger	Migratory
<i>Sterna caspia</i>	Caspian Tern	Migratory
<i>Sterna hirundo</i>	Common Tern	Migratory
<i>Sterna paradisaea</i>	Arctic Tern	Migratory
<i>Tringa nebularia</i>	Common Greenshank	Migratory
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Migratory

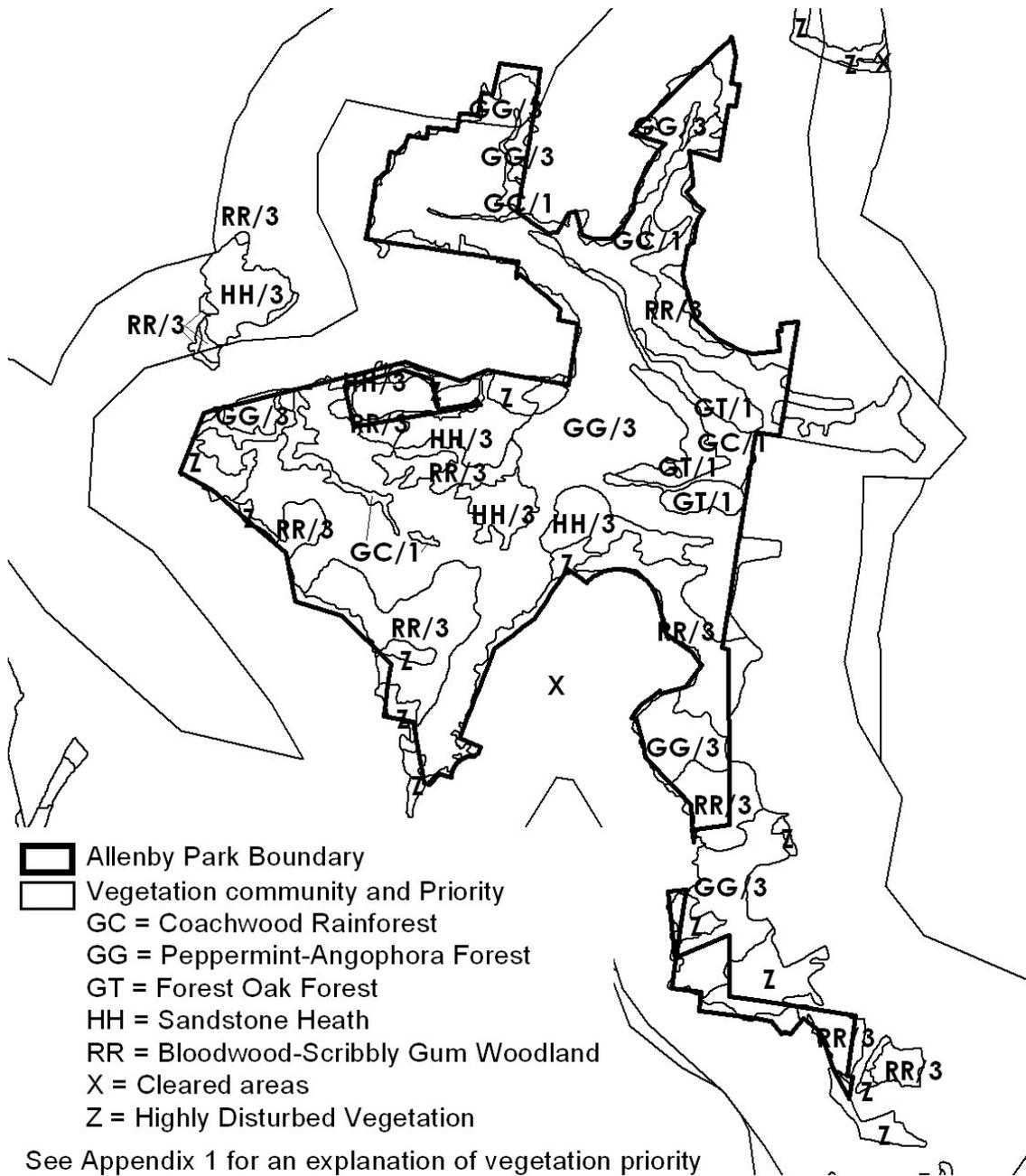
* **Source:** DEC 2004

* No significant species recorded within the park

Appendix 4 – Warringah Local Government Area Hazard Reduction Guidelines

Appendix 5 – Fire Management Plan Methodology

Appendix 6 – Vegetation Community Overlay



Appendix 7 – Allenby Park Fire Regime Management Poster