Planning for Bushfire Risk Mitigation General Code

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Glossary

Asset Protection Zone: An area in and/or beside urban development that is designed and managed to reduce the risk of adverse impacts from bushfires on assets (public or privately owned).

Bushfire Hazard Map**:** Maps developed and prepared from local research to identify (current at 2004) risk levels at the existing urban edges. The Hazard Mapping is included in the Emergency Services Authority (ESA) Strategic Bushfire Management Plan (SBMP) Version 1.

Urban edge: The edges to the city, but not a defined or fixed distance. Includes urban and non-urban areas and may contain Outer, Inner and House Asset Protection Zones.

Urban interface: Where urban land uses meets non-urban land uses, the line between the Outer and Inner Asset Protection Zones.

Firewise: A term meaning the appropriate design and maintenance of buildings, residences, structures and gardens to resist the adverse impacts of bushfires.

1. Introduction

1.1 Purpose

This Code provides guidance to mitigate adverse impacts from bushfires in the ACT.

In particular, the Code addresses the planning and development processes. To ensure that there is a high level of compatibility between the ACT and NSW, this Code refers to the NSW Government's *Planning for Bushfire* .

This Code is one of many documents that informs planning and development in the ACT and is taken into account by the ACT Planning and Land Authority (Authority) when determining development applications and by certifiers determining building applications.

This Code is complementary to the ACT Emergency Services Authority's *Strategic Bushfire Management Plan Version 1* (SBMP), a strategic document outlining measures for the Prevention, Preparedness, Response and Recovery from bushfires in the ACT.

1.2 Aim

This Code seeks to ensure that bushfire risk is appropriately assessed and considered during the planning, development and construction in the ACT.

This Code seeks to balance bushfire risk mitigation with upholding Canberra's planning tradition of a city within a productive landscape, framed by hills and with generous open space provision for amenity, recreation and urban area separation.

[1] This document is currently under review.

2. Principles

This Code has been informed by two principles adopted by the ACT Government following the January 2003 bushfires and the introduction of the *Emergency Services Act 2004*.

2.1 Shared Responsibility

Mitigation of risk from natural hazards is an accepted and basic principle of urban planning in the ACT as elsewhere in Australia. The ACT Government's policy on bushfire risk reduction is one of shared responsibility between the Government and the public. That is, the responsibility for risk mitigation does not belong to the Government or private landowners alone.

This means that from the broad scale of our nature reserves and open spaces, down to the smaller scale of our home and workplace, we all share the responsibility to design, make and manage a safe living and working environment. Together the community and the Government are responsible for actions to reduce bushfire risks to property, assets and personal safety on their own land.

Land surrounding the urban area is managed for one or more core functions - production (agriculture/forestry), recreation and/or nature conservation. It is also recognised that there are human values such as landscape beauty ascribed to this land and that land management regimes are also to take account of these values.

The principle of shared responsibility for reducing bushfire risk affects all developments and adjoining lands. In some areas, such as those adjacent to nature conservation reserves, planning and construction standards may need to be modified to reduce the degree and extent of fuel reduction in adjacent areas. This may mean the use of options such as wider road reservations, larger blocks or greater building setbacks from continuous forest, woodland or grassland fuels.

2.2 Prevention, Preparedness, Response, Recovery

The risk management elements of *Prevention*, *Preparedness*, *Response* and *Recovery* as they apply to bushfires are the basis for the SBMP. This Code is focused on Prevention.

The ACT Planning and Land Authority is required to ensure that planning is responsible and adequate. Although the planning of the city has always taken bushfire risk into account, this Code responds to the need to overtly:

- take site specific conditions into account;
- use risk assessment in the opportunities and constraints analysis; and
- integrate the findings of the latest bushfire research.

3. Legislation and Regulation

The regulatory and legislative requirements applicable to planning in the ACT are outlined below.

3.1 The Building Code of Australia

The *Building Code of Australia* (BCA) is adopted in the ACT through the *Building Act 2004.* It contains provisions, which can be used for construction to resist bushfires in order to reduce the risk to life and minimise the risk of property loss in designated bushfire prone areas. These provisions generally include requirements for burning debris and ember protection, controls on the combustibility of exterior materials, and the protection of openings, such as windows and doors. The BCA specific 'deemed to comply' measure is the Australian Standard 3959 (Building in Bushfire Areas).

Bushfire protection provisions in the BCA apply to residential dwellings and accommodation buildings. It does not apply to non-residential buildings or to non-habitable buildings or other structures on residential land. In order for the mandatory bushfire provisions in the BCA to be formally triggered at the present time, a jurisdiction must declare, through a statutory mechanism, a *Bushfire Prone Area*.

3.2 Bushfire Prone Areas in the ACT

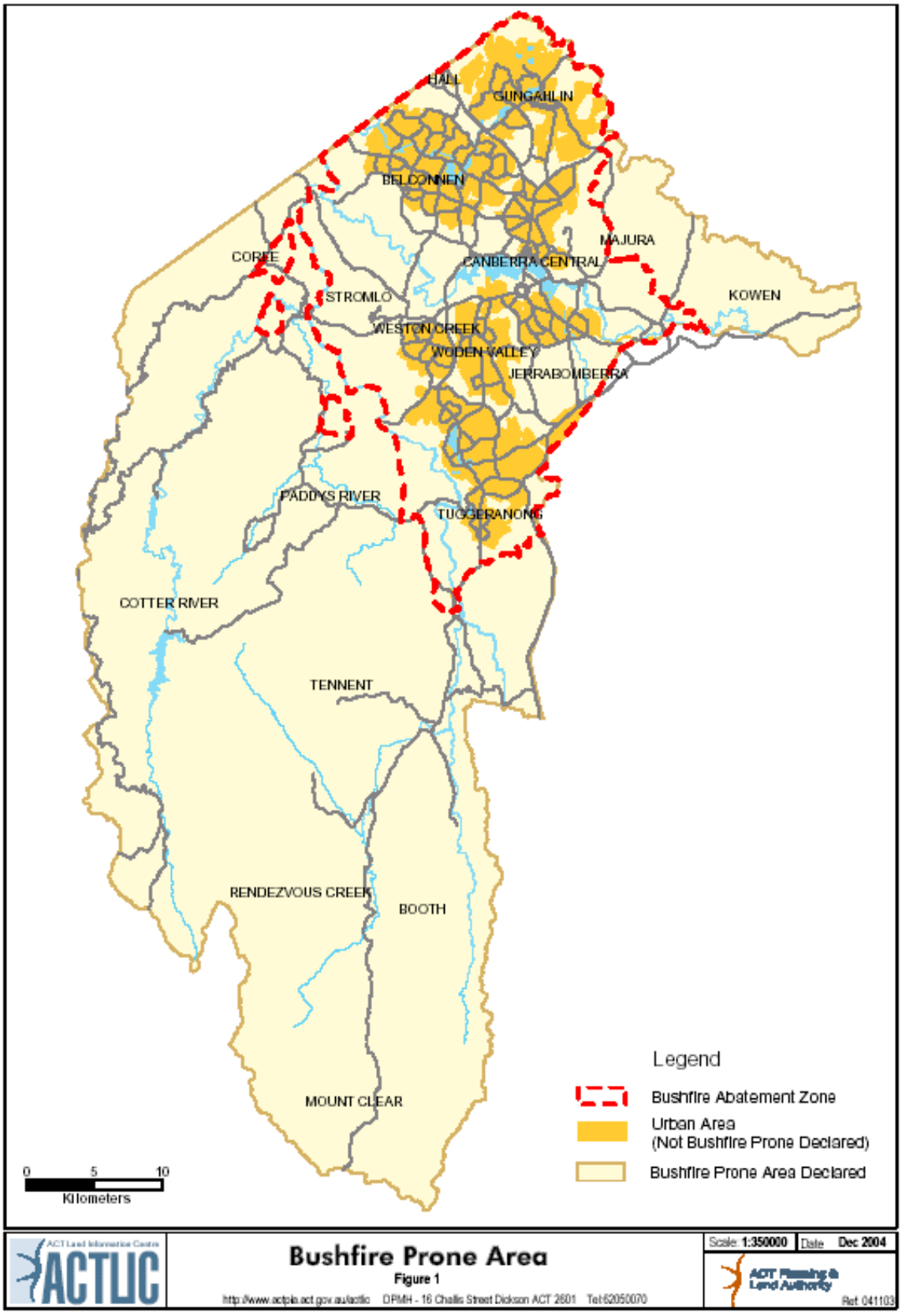
A *Bushfire Prone Area* for the ACT was declared through the *Building Regulations* and came into effect on 1 September 2004. Under the declaration, all parts of the ACT outside the defined urban area have been designated bushfire prone (refer Figure 1).

In Bush Fire Prone declared areas in Australia, development is required to meet the provisions of the BCA and AS3959.

At present in the ACT, if an area is not a declared Bushfire Prone Area, then building to a higher construction standard is voluntary.

However, Codes under the Territory Plan can require a site specific bushfire risk assessment to be undertaken during the planning/design process. This may result in mitigation measures being required in areas not declared Bushfire Prone.

Bushfire Prone Map



4. Application

4.1 New Urban Areas

New urban areas are usually those identified as part of the Canberra urban area (on the Territory Plan) but have not yet been developed, such as in parts of Gungahlin, Tuggeranong, West Belconnen.

As part of the planning process, a number of steps are undertaken before land is released and developed. These are:

- Structure Plan - broadly sets the Territory Plan's policy and principles of the area;
- Concept Plan - defines the specific planning framework and requirements for the area; and
- Estate Development Plan - details the subdivision design and lodged as a Development Application.

The Authority requires all new urban areas to achieve adequate levels of bushfire protection. This can be achieved through a range of measures including the spatial and structural design of the estate, the building standards and infrastructure provision and the design of the landscape within publicly owned areas.

4.1.1 Bushfire Risk Assessment

A bushfire risk assessment is required at the Structure Planning and/or Concept Planning stage, as one of many investigations undertaken to inform the planning outcome for an area.

The assessment is undertaken using the *Australian Standard For Risk Management* AS/NZS 4360 and AS 3959 and is based on the process outlined in the *NSW Planning for Bushfire Protection (2001) Document*. This assessment determines the level of bushfire risk from ember attack, radiant heat and flame contact. The assessment specifically considers the following matters:

- the SBMP and shared responsibility;
- site specific bushfire and environmental data;
- slope, terrain and vegetation;
- opportunities and constraints analysis of the area;
- flora and fauna conservation requirements;
- development shape and urban interface treatments;
- edge roads and access network for Emergency Services vehicles (including turning/passing areas for fire trails);
- infrastructure (water and power supply) with adequacy at the urban interface for peak emergency demand;
- cost and effectiveness of risk management options;
- land management regimes in the area adjacent to urban development and its suitability for fuel reduction;

- Asset Protection Zones (Inner, Outer and Home);
- identification of planning, engineering and construction controls;
- staging of development and the incremental urban edge;
- interim protection measures / land management before and during development; and
- intended public realm (landscape) management requirements post development.

In addition, a further Bushfire Risk Assessment may also be required at the Estate Development Plan (detail subdivision) stage to further refine and confirm any site specific requirements identified in the Concept Plan to be imposed on development.

4.1.2 Approvals

Where the Bushfire Risk Assessment is part of a Structure or Concept Plan, the assessment and its recommendations are required to be endorsed by the Authority, the Emergency Services Authority (ESA) and any other relevant Government Agency.

If the Bushfire Risk Assessment is part of the Estate Development Plan, the assessment and its recommendations are referred to the Emergency Services Authority for comment, ahead of the development application being determined by the Authority.

Risk mitigations measures, including higher building standards, may be imposed on development through lease and development conditions or a condition of development approval.

4.1.3 Site Specific Requirements

In recent times a number of bushfire risk assessments have been completed for new urban areas using the requirements of this Code. As a guide, the following describes the location and aims for Asset Protection Zones (Refer Figure 2), divisions of the urban edge for both urban planning and management purposes.

The Outer Asset Protection Zone is usually non-urban land such as nature reserve or grazing land, it is farthest away from homes and built assets. Fire fuel reduction measures are to be taken to reduce fire intensity and the availability of embers that may transported into urban areas during a fire event.

The Inner Asset Protection Zone is usually road reserve, parkland or nature reserve, and extends away from property boundaries. Fire fuels are to be maintained at low levels to reduce fire intensity so as to contribute to the defensible space for home-owners and emergency service efforts to minimise the ignition and ongoing combustion of homes and other structures during a bushfire.

The Home Asset Protection starts at the property boundary front or back and may extend over a number of properties within the suburb. Buildings in this Zone may be required to be constructed to higher standards in accordance with the Building Code of Australia. Landscape (including private gardens) should be designed and regularly maintained to minimise the possibility of ignition and ongoing combustion of buildings, structures and materials during a bushfire and ensure that homeowners and emergency services have the greatest chance of assisting in such an event.

The following are examples of risk management options, which have been incorporated into the concept plans and are likely to be required in new urban areas.

- Higher residential design and construction standards (minimum level 1 BCA) to be applied through lease and development conditions to buildings within first 100m of the Home Asset Protection Zone to mitigate against ember attack.

- Water Supply infrastructure to agreed capacity levels in the form of a ring main with greater provision of fire hydrants within the Inner Asset Protection Zone as well as adjacent urban area and provision for emergency vehicle (tanker) hardstand at hydrants.

- Emergency Access should be provided in the form of an out ring road or fire trail and access points which together with an edge road has a sealed width of 7.5m plus kerbs, indented parallel parking provision and a minimum hardstand area on the hazard side of 1.5m clear of retaining walls or stone pitched batters for passing of two emergency tankers. An additional clearance of 0.5m on both sides of the road is required to be kept clear of all street furniture including signs.

- Verge width to residential blocks a minimum of approximately 7m with dryland grass surface.

- Street trees species selected for low bark flammability characteristics.

[2] The Home Asset Protection Zone is an ACT requirement and is not used in NSW.

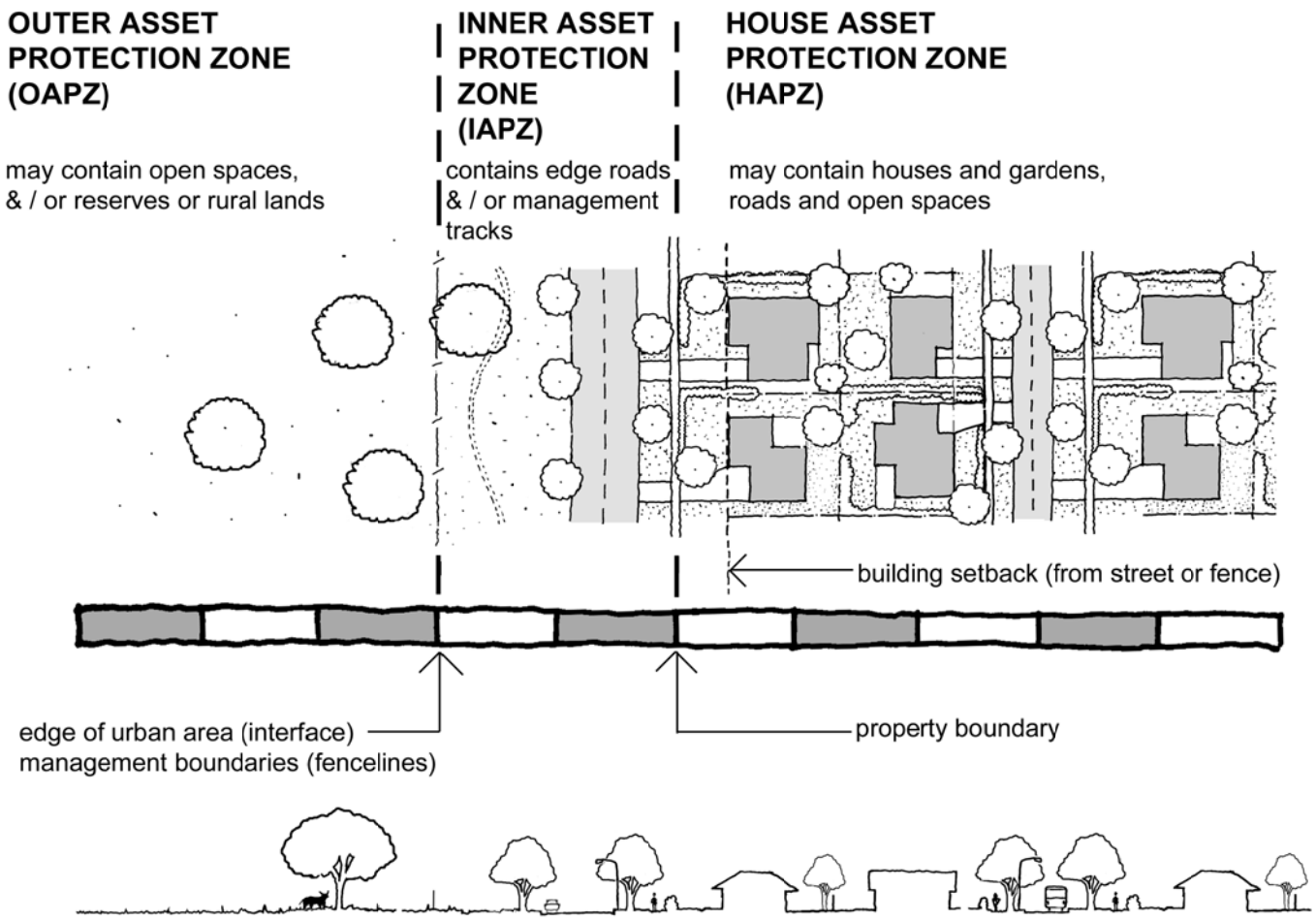


FIGURE 2 : ASSET PROTECTION ZONES

Distance of each zone varies depending upon specific risk assessment.

4.2 Outside the Urban Area

Areas outside the defined urban area (non-urban) of the ACT were declared Bushfire Prone on 1 September 2004, this includes bushland and agricultural (rural) areas (refer Figure 1).

All new Class 1, 2 and 3 buildings (i.e. new buildings, extensions and alterations creating new Class 1, 2 and 3 areas) are required to be designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes.

To determine the level of risk and required mitigation measures, a bushfire risk assessment is required in accordance with the BCA, consistent with AS3559, and the completed building work must comply with the BCA. In addition, a risk assessment is also required to be undertaken where the aggregated volume of the proposed alteration and any other alteration made to the Class 1, 2 and 3 building during the 3 years immediately before the day of the application for building approval of the alteration is made is more than 50% of the volume of the original building, where volume is measured by reference to roof and the outer walls.

Definitions of Class 1, 2 and 3 Buildings are located at Appendix A.

Design and construction of other built assets and their surrounds are recommended to be in a firewise manner.

4.2.1 Approvals

The bushfire risk assessment and its recommendations is required to be lodged with the Development Application (DA) for Class 1, 2 and 3 buildings together with any mitigation measures to the design and construction of the landscape (surrounds).

Following development approval, all documentation is required to be forwarded by the proponent to the certifier for building approval, consistent with the provisions of the BCA.

4.3 Existing Urban Areas

Whilst no existing urban area within Canberra is declared a Bushfire Prone Area, it is recommended that the threat posed by bushfires be considered in any redevelopment of an existing property or extension to an existing house. To assist the community, two *FIREWISE* information brochures have been prepared outlining techniques to reduce the risk to homes and gardens.

Bushfire Hazard Maps have been prepared for the existing urban edge showing a relative risk assessment current in 2004. The existing urban edge is classified according to the potential exposure to bushfire risk as “primary”, “secondary” or “lee” risk levels.

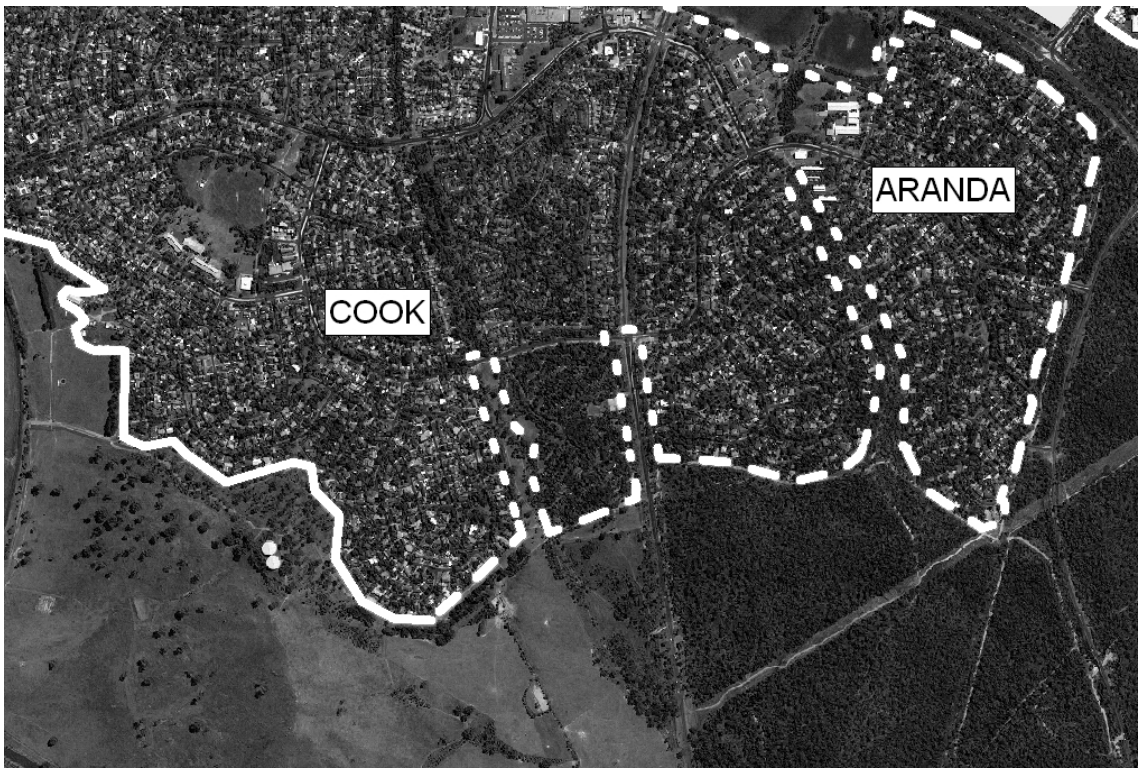


Figure 3: Bushfire Hazard Map

risk categories at urban edge shown with lines

primary (solid), secondary (long dash) and lee (short dash)

The Authority recommends that property within 100 metres of the “primary” and 50 metres of the “secondary” classification include bushfire risk mitigation measures as part of considerations and development application (DA) for redevelopment or extension. Such voluntary measures are to reduce the probability of house ignition and fire propagation by ember, radiant heat or flame contact.

Depending on the type of development (for example residential accommodation for institutional uses) and its location within the existing urban area, a Bushfire Risk Assessment may be required by the Authority as part of the planning process or Development Application process. If this is required the bushfire risk assessment is to be undertaken as for new urban areas.

APPENDIX A

Building Code of Australia Building Definitions

Class 1

One or more buildings, which in association constitute:
(a) Class 1a - a single dwelling being:
    (i) a detached house; or
    (ii) one or more attached dwellings, each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit; or
(b) Class 1b - a boarding house, guest house, hostel or the like with a total floor area not exceeding 300 m2 and in which not more than 12 persons would ordinarily be resident; which is not located above or below another dwelling or another Class of building other than a private garage.

Class 2

A building containing 2 or more sole-occupancy units each being a separate dwelling.

Class 3

A residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons, including:

(a) a boarding-house, guest house, hostel, lodging-house or backpackers accommodation; or

(b) a residential part of a hotel or motel; or

(c) a residential part of a school; or

(d) accommodation for the aged, children or people with disabilities; or

(e) a residential part of a health-care building which accommodates members of staff; or

(f) a residential part of a detention centre.

Information from Planning for Bushfire Protection, Planning NSW, 2001

The following Table (A3.3) is from the NSW equivalent (Planning for Bushfire Protection, Planning NSW, 2001) of this Code and is provided as a guide in determining bushfire risk. This information does not negate the need for a site specific bushfire risk assessment.

APPENDIX 3

Table A3.3 – New South Wales
Determination Of Category Of Bushfire Attack For A Site

Distance from vegetation	Less than 20m	From 20m but not greater than 30m			Greater than 30m but not greater than 50m			Greater than 50m but not greater than 80m			Greater than 80m but not greater than 100m		
Slope	All slopes	Greater than 15°	Greater than 5° but not greater than 15°	0 to 5°	Greater than 15°	Greater than 5° but not greater than 15°	0 to 5°	Greater than 15°	Greater than 5° but not greater than 15°	0 to 5°	Greater than 15°	Greater than 5° but not greater than 15°	0 to 5°
Vegetation	**Category of Bushfire Attack**												
Forest	FZ	FZ	FZ	Ext	FZ	Ext	High	Ext	Ext	Med	Ext	High	Low
Woodland	FZ	FZ	Ext	Med	Ext	High	Low	Ext	Low	Low	Med	Low	Low
Shrub/Heath	FZ	FZ	FZ	Ext	FZ	Ext	High	Ext	High	Med	High	High	Low
Mallee/Mulga	FZ	Med	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Rainforest	FZ	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Grassland	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Non-vegetated	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Bushfire attack categories:

Low = Low Medium = Med High = High Extreme = Ext Flame Zone = FZ

NOTES:

1. Categories of Bushfire Attack are based upon a Fire Danger Index (FDI) of 80 and fuel loads for NSW vegetation. The Table has been provided by NSW Rural Fire Service. The fire behaviour models are described in Appendix E to AS3959. Forest includes pine plantations but does not include rainforest.
2. The expected fire behaviour for each category is:

Low insignificant ember attack, radiation no greater than 14.5 kWm^{-2} or is greater than 100 metres from all woody vegetation.

Medium significant ember attack, radiation heat greater than 14.5 kWm^{-2} and no greater than 16 kWm^{-2}. (**Level 1** AS3959 – 1999)

High significant ember attack, possible flame contact, radiation heat greater than 16 kWm^{-2} and no greater than 21 kWm^{-2}. (**Level 2** AS3959 – 1999)

Extreme significant ember attack, possible flame contact, radiation heat greater than 21 kWm^{-2} and no greater than 31 kWm^{-2}. (**Level 3** AS3959 – 1999)

Flame Zone within the Flame Zone and/or greater than 31 kWm^{-2}, therefore construction outside the scope of AS3959 – 1999.

APPENDIX C

Further Reading

The following brochures have been prepared to assist the community

- Firewise Home Gardens (ACT Government)
- Firewise Home Design and Construction (ACT Government)

These brochures are available from the ACT Planning and Land Authority, its web site (www.actpla.act.gov.au) and are also distributed by the ACT Fire Brigade through their community programs.

The following list of useful references will assist in understanding planning for bushfire risk mitigation.

- Strategic Bushfire Management Plan for the ACT Version 1, Emergency Services Authority, ACT Government, January 2005. This is available through the web site www.esa.act.gov.au.
- Planning for Bushfire Protection, A Guide for Councils, Planners, Fire Authorities, Developers and home Owners, 2001, produced by NSW Rural Fire Service in collaboration with Planning NSW.
- Bushfires and the Bush Capital, A Guide for the ACT, October 2004, ACT Government.
- Landscape and Building Design for Bushfire Areas, Caird Ramsay and Lisle Rudolph, 2003, CSIRO publishing.

The Bushfire Hazard Maps of existing urban edge can be viewed at the ACT Planning and Land Authority or at the Emergency Services Authority upon request.