

# GUIDELINES

for

## Asset Protection Zones



- **WHAT IS AN ASSET PROTECTION ZONE?**
- **WHERE CAN I PUT AN APZ?**
- **WHAT WILL THE APZ DO?**
- **COMPONENTS OF AN APZ**
- **RECOGNISING A BUSH FIRE HAZARD**
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- **LANDSCAPING AND BUSH FIRE HAZARD REDUCTION**
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**NSW RURAL FIRE SERVICE**

*...for our community*

## **GUIDELINES FOR ASSET PROTECTION ZONES**

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## INTRODUCTION

Bush fires are a natural and periodic event in the Australian bush. Many Australian plants and animals have adapted to fire over thousands of years and require fire as part of their life cycle. However, development adjacent to bushland areas has increased the risk of fire impacting on people and their assets. Fire management needs to strike a balance between the protection of life and property and the maintenance of ecological processes and systems.

In Australia, bush fires are inevitable and an essential aspect of the Australian landscape. However, the impact on property and life can be mitigated with responsible preparation and management of bush fire hazards. This is the responsibility of all land managers, as well as communities and individuals taking responsibility for their own fire safety.

The level of protection for life or whether or not a house or other assets survive a bush fire ultimately depends on the landowner and their level of preparedness against bush fire attack.

This guideline provides advice to private landowners to assist them in creating and maintaining an Asset Protection Zone (APZ) for residential buildings and other personal assets.

## WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is an area surrounding an asset, managed to reduce bush fire fuels to a level that will minimise the impact of fire on that asset. The APZ serves as a buffer zone between an asset and the bush fire hazard. The primary purpose of the APZ is to ensure that a progressive reduction of bush fire fuels occurs between the bush fire hazard and any habitable structures within the development.

## WHERE CAN I PUT AN APZ?

An APZ is located between your house and the bush fire hazard. An APZ may only be implemented on land with the land owners written consent. You cannot undertake any clearing of vegetation on a neighbours property, including National Park estate, Crown land or land under the management of your local council. The APZ should be located wholly within your land. If you believe that the land adjacent to your property is a bush fire hazard and may require clearing to create an APZ, you can lodge a complaint with the RFS your complaint be investigated and appropriate action will be taken if required.

## WHAT WILL THE APZ DO?

An APZ, if designed correctly and maintained regularly, will reduce the likelihood of:



Ember attack on the asset;



Damage to the built asset (eg. a house) from intense radiant heat;



A ground fire burning up to the walls of the house and setting fire to the house

The APZ should provide a safe point for firefighters and home owners to defend their property.

Within this area, bush fire fuels that could become a part of the fire should be minimised. When considering the level of clearing required, you need to keep in mind that the aim of the APZ is to ensure that fuels are discontinuous, that is, the vegetation does not provide a path for the transfer of fire to the asset from the surface to the tree canopy or through the canopy.



## RECOGNISING A BUSH FIRE HAZARD

Recognising that a bush fire hazard exists is the first step in developing an APZ for a property.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. A large area of continuous vegetation on sloping land may also increase the potential bush fire hazard.

The amount and structure of vegetation around a house will influence the severity of damage from a bush fire. Basically, the higher the available fuel loading the more intense a fire will be.

### Isolated areas of vegetation

Isolated areas of vegetation generally may not be considered an insignificant bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes the following vegetation:



Bushland areas of less than 1 hectare (100 metres x 100 metres) that are more than 100 metres from a high hazard area;



Strips of vegetation less than 20 metres wide e.g. road and river corridors;



Vegetation not mapped on your local council's Bush Fire Prone Land Map.

If you are not sure whether or not there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service District Office for further details.

**Isolated areas of  
vegetation may not  
be considered a  
significant bush fire  
hazard**



## CAUSE OF DAMAGE FROM BUSH FIRE

Houses can be ignited during bush fires by any of the following ways:

### a) Wind

The wind during a bush fire can be extremely strong. This may throw debris and branches of the trees that are too close causing damage to buildings (especially windows & roofs). This will create openings and make the structure more prone to ember attack.



### b) Embers

Embers (sparks) are the main cause of houses catching alight during bush fires. Extreme fire weather days are accompanied by strong to gale force winds, which carry burning debris. Embers gain entry to houses through broken windows or gaps in and around walls or roof cladding and ignite the contents. Embers can also lodge between and ignite horizontal timber decking, guttering, steps and windowsills. They can be blown up against and ignite timber used for supports, floor joists, posts and steps.



### c) Radiation

Radiant heat can crack windows, allowing embers to enter. Radiant heat also preheats the buildings and contents, increasing the risk of ignition by embers and flame. In severe situations this may cause such things as curtains and fabric furnishings to burst into flames.



### d) Flame contact

A significant risk to an asset is from ignition of vegetation growing directly against a dwelling, in turn igniting the dwelling through those areas described above.



People may also be adversely affected by smoke generated by bush fires, particularly in sensitive locations such as schools, nursing homes and hospitals.

## WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING AN APZ?

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the land owner/ manager. You cannot undertake any clearing of a neighbour's land without their agreement (this includes NPWS, councils etc.). All works must be undertaken wholly within the boundary of the affected property.

If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection 2001*. Any approvals required will have to be obtained as part of the Development Application process. *Planning for Bushfire Protection 2001* outlines the distance requirements for APZs around new dwellings including the requirements for an Inner and Outer Protection Area.

If you wish to create or maintain an APZ for an existing structure you may be required to obtain a Bush Fire Hazard Reduction Certificate or other environmental approval. The RFS offers a free environmental assessment and certificate issuing service. Contact the Fire Mitigation Officer at your local RFS Fire Control Centre to determine if you can use this approval process.

If you intend to use fire to remove the bush fire hazard from your property you may also need to obtain a fire safety Permit through the RFS or NSW Fire Brigades. The RFS document *Before You Light That Fire* explains when a permit is required.

## ASSET PROTECTION ZONE WIDTHS

The practical extent of APZs depends on the type of vegetation and slope of the land. Fires are more intense when they run uphill therefore, if the fuel is downslope of the house the distance of the APZ from the asset will need to be greater than if it is upslope of the asset.

### Calculating an APZ

The RFS Bush Fire Environmental Assessment Code allows for a maximum distance of clearing based on likely environmental impact. These distances (below) are based on the most common vegetation type found in NSW and are specifically for the stream lined assessment process required for the issue of a Bush Fire Hazard Reduction Certificate.

#### a) Residential Dwellings



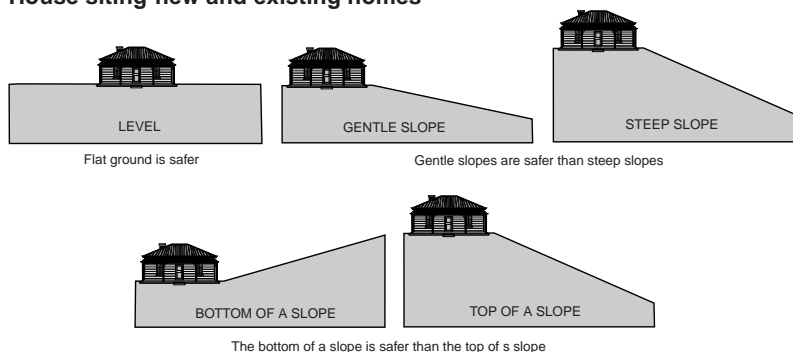
Bush Fire Environmental Assessment Code distances for APZ (distances are measured from the wall of the dwelling towards the hazard);

Slope	Distance
Hazard upslope (<math><18^\circ</math>)	20 metres
Hazard downslope $0^\circ-5^\circ$	25 metres
Hazard downslope $5^\circ-10^\circ$	30 metres
Hazard downslope $10^\circ-15^\circ$	40 metres
Hazard downslope $15^\circ-18^\circ$	50 metres

#### b) Other Buildings

APZs protecting other buildings and infrastructure such as farm sheds can be up to 10 metres.

#### House siting-new and existing homes





**Ground fuels such as fallen leaves, twigs and barks should be removed on a regular basis.**

## **MANAGING BUSH FIRE FUEL TO REDUCE BUSH FIRE HAZARDS**

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to manage bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not have to be as drastic as removing all vegetation. Environmentally this would be disastrous and often trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers by filtering embers and changing wind patterns.

**Bush fire fuels can be managed by:**

a) **Removal or pruning of trees, shrubs and understorey**

The management of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation. Vegetation can act as a windbreak and radiant heat barrier.

The majority of leaves and ground cover should be removed from the surface. Valuable native trees and shrubs should be retained as clumps or islands and should retain a covering of at least 20% of the area.

The pattern of cleaning should involve:

- Removing noxious and environmental weeds first;
- Removing highly flammable species such as species within the genus *Melaleuca* and *Leptospermum*.
- Removal of trees and shrubs less than 3 metres in height.
- Removal of significant native species last.

Refer to the landscaping section in this document for more detailed information.

b) **Raking or manual removal of fine fuels**

Ground fuels such as fallen leaves, twigs and barks should be removed on a regular basis. The most flammable fuel is dry vegetation, sticks and other debris less than 6mm in diameter.

c) **Mowing of grass**

Grass needs to be kept short.

d) **Slashing and trittrering**

Slashing and trittrering are economical methods of fuel reduction in an APZ. For slashing or trittrering to be effective, the cut material must be removed or allowed to rot down well before summer starts. Slashing and mowing may leave grass in rows thus increasing fuel in some places. Trittrering or turbo mowing also mulches the vegetation leaving the fuel where it is cut. Ensure you remove the clippings and dispose of them in a green waste bin where available or compost on site (it is illegal and dangerous to dump clippings in the bush).

When correctly applied, this method has the advantage of inhibiting the growth of weeds. Weeds should be completely removed, as they tend to be extremely flammable as well as growing and spreading at a fast rate.

e) **Ploughing and grading**

Ploughing and grading can produce effective firebreaks, however, these areas may need constant maintenance. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

f) **Burning (hazard reduction burning)**

Burning off (or hazard reduction burning) is a method of removing unwanted ground litter and bush fire hazards through the use of fire. Controlled burning or prescribed burning of vegetation is more often used by land management agencies for strategic bush fire management.

Before any vegetation is burned within an APZ, the type of fire should be determined i.e. is it a pile burn or is it a burn of an area of bushland (prescribed burn). The type of burn may determine the types of conditions to be imposed as part of any environmental approval.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the burn will get out of control. More bush fires result from escaped burning off work than from any other single cause. Planning for the use of fire must therefore ensure that it is effective and environmentally sound.

During the planning phase for a prescribed burn, there are many considerations such as smoke management, scorch height, frequency of burning and cut off points for the fire. For further information refer to the document entitled *Guidelines for Low Intensity Hazard Reduction Burning* (produced by the NSWRFSS).

g) **Pile Burning**

In some cases you may use pile burning to remove material that has been cleared in creating or maintaining an APZ. In areas where smoke regulations control burning in the open you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council to undertake the burning. In these areas you will need to justify why you cannot remove the material through the normal garbage collection system. For further information refer to the document *Guideline for Pile Burning*.

## **LANDSCAPING AND BUSH FIRE HAZARD REDUCTION**

Your home and garden can blend with the natural environment and be landscaped for fire protection at the same time.

To produce a garden that protects your home, it is necessary to plan the layout of the garden and to give consideration to features such as fire resistant plants, barriers and windbreaks.

### **Layout of gardens in an APZ**

The following advice is recommended when creating and maintaining garden that is part of an APZ:



Ensure that vegetation does not provide a path for the transfer of fire to the house;



Remove all noxious weeds. Local councils can provide a list of noxious weeds for their local government area and information on control options for different types of weeds. Refer to Appendix A for a list of weeds 'prohibited for sale' in Sydney.



Separate tree crowns by at least 2 metres so that the canopy is not continuous; and do not permit a canopy to overhang to within 5 metres of the dwelling.



Plant or clear vegetation into clumps rather than continuous rows;



Prune low branches 2 metres from the ground to prevent a ground fire from spreading into trees;



Locate vegetation far enough away so that plants will not ignite the house by direct flame contact or radiant heat emission;





Plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity or provide non flammable pathways directly around the curtilage of the dwelling;



Gardens should not directly abutt the dwelling. Where this does occur gardens should contain non-flammable plants and any mulch should be well watered;



Do not erect brush type fencing and do not plant "pencil pine" type trees, which are highly flammable.

## Removal of other materials

Woodpiles, wooden sheds, combustible material, storage areas, large areas/quantities of garden mulch, stacked flammable building materials etc should be stored away from the house. These areas should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

## Other protective features

You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

## Fire resistant plants

While the design of the garden is important, so too is the type of plant species selected. No plant is fireproof, however, many plants have features that minimise the extent to which they contribute to the spread of bush fires.

Given the right conditions, all plants will burn. Low to moderate fires scorch or burn plants, while severe bush fires cause more damage. In extreme circumstances, high-intensity fires can incinerate most plants and spread the fire further into the property bush fire protection area.

Fire resistant plants, which are hard to burn, have the following features:



High moisture content



High levels of salt



Low volatile oil content of leaves



Smooth barks without "ribbons" hanging from branches or trunks.

If possible, water plants during summer to maintain leaf moisture content. The higher the moisture content of the leaves, the less likely the plants are to ignite. Native plants from the local area are less likely to suffer from drought and these should be used in preference to introduced species.

Trees with loose, fibrous or stringy bark should be avoided in the APZ. These trees can easily ignite and encourage the ground fire to spread up to and then through the crown of the trees. Wind can carry burning bark, especially loose, flaky or ribbon bark, away to start new fires. When deciding which trees to plant in the APZ, it is recommended that you use trees that have smooth bark and are planted so that the final tree height and crown width complies with recommended separation distances.

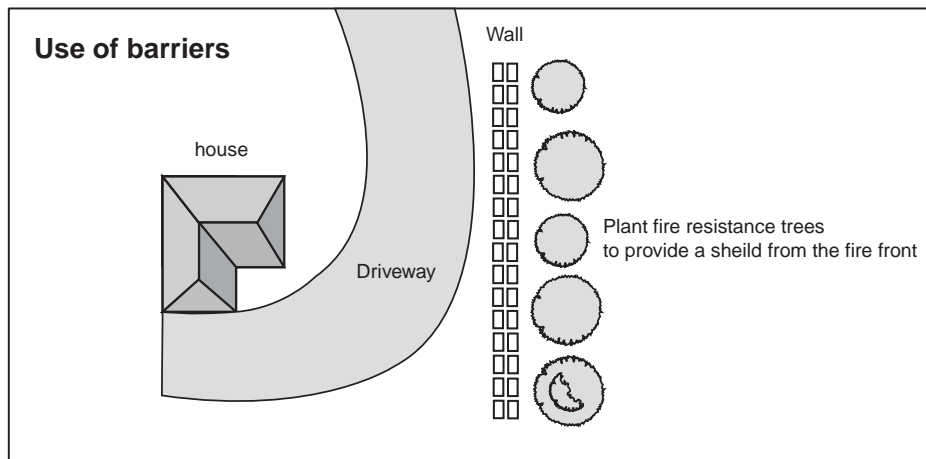
A combination of fire resistant plants and shrubs planted on your property will assist in reducing the spread of fire during bush fire incidents. As mentioned earlier, when choosing fire resistant plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant societies.

## Barriers

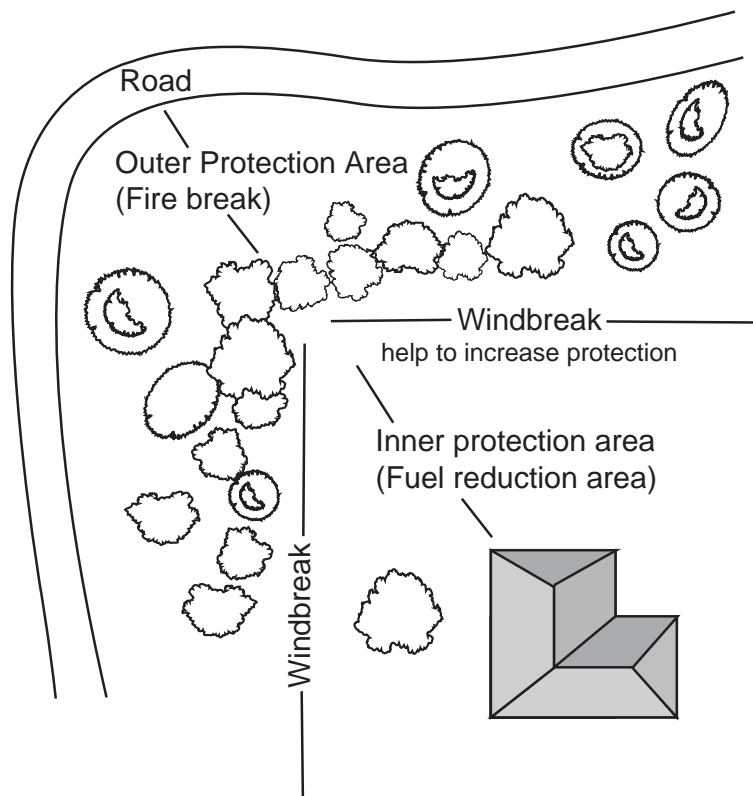
You can stop many embers (sparks) and slow down a bush fire by creating barriers around your assets.

Barriers may include stone, masonry walls and earth mounds or other non-combustible fencing. Such barriers will help protect assets from possible attack of burning embers, heat radiation and direct flame contact.



## Wind breaks

Rows of trees provide a more than useful windbreak, trapping embers and flying debris, which would otherwise reach the house.



Tree crowns will rarely carry fire without a significant fuel loading on the ground providing supporting fuel & heat.

By reducing the wind speed, a row of trees also slows the rate of spread of a bush fire and a dense foliage traps radiant heat, lowering bush fire intensity.

To be effective a windbreak should



*Be located on the side of the property from which extreme fire weather normally approaches.  
In NSW this is typically the northwest aspect.*



*Be of sufficient length (generally 100 metres minimum length if possible)*



*Be located at a distance of 1 to 3 times the height of fully grown trees if possible;*



*Use smooth barked eucalyptus or deciduous trees;*



*Allow 50-60% of the wind to pass through.*

Windbreaks should be located towards the outer edge of the APZ.

Ground fuel should be reduced around the windbreak so as to prevent any approaching bush fire from climbing into the crowns of the trees and spreading further.

## **HOW CAN I FIND OUT MORE?**

If you require any further information please contact:

- your local NSW Rural Fire Service District Office; or
- call the NSW RFS Education Line 1 800 654 443 (Monday to Friday, 9am to 5pm), or
- the NSW RFS website at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

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# APPENDIX A

## Which plants NOT to grow? (Species list)

Weeds should be completely removed, as they tend to be extremely flammable and grow and spread at a fast rate. Below is a list of weeds 'Prohibited from Sale' in Sydney. NSW Agriculture has a full list of weeds for each Local Government Area in the State.

### Noxious & Environmental Weeds

Common Name	Botanical Name	Locality
Lantana	Lanatan Cummara	All Sydney
Turkey Rhubarb	Acetosa sagitatta	North
Madeira Vine	Anredera cordifolia	All Sydney
Giant Reed	Arundo donax	All Sydney, Blue Mts
Bridal Creeper	Asparagus asparagoides	Blue Mts
Asparagus fern	A. densiflorus	North, Central, Coastal
Climbing Asparagus	A. plumosus	North, Central, Coastal
Cabomba	Cabomba spp.	All Sydney
Balloon Vine	Cardiospermum grandiflorum	North, South, Coastal
Camphor Laurel	Cinnamonum camphora	Blue Mts, North
Cotoneaster	Cotoneaster glaucophyllus	Coastal
	C. pannosus	Coastal
Montbretia	Crococsmia x crocosmiiflora	Blue Mts
Cape Ivy	Delairea odorat	North, Central, Coastal
Cockspur Coral Tree	Erythrina crista-galli	Coastal
Morning Glory	Ipomea cairica	North, South, Coastal
	I. indica	North, South, Coastal
Cape Broom	Genista monspessulana	North, Coastal, Central, Blue Mts
Kochia	Kochia scopari	All Sydney
Broadleaf Privet	Ligustrum lucidum	All Sydney
Narrowleaf Privet	L. sinens	All Sydney
Cat's claw Creeper	Macfadyena urguis-cati	North, Central, Coastal
Fishbone Fern	Nephrolepis cordifolia	Coastal
Rhizomatous Bamboo	Phyllostachys spp.	Blue Mts
Willow	Salix spp.	All Sydney
Senna	Senna pendula	Coastal
Wandering Jew	Tradescantia fluminensis	North, Coastal