South Coast
48b Princes Highway
Fairy Meadow NSW 2519

Macarthur
Suite 1, 39 Elyard Street
Narellan NSW 2567

Southern Highlands
Shop 3, 184 Bong Bong Road
Bowral NSW 2576

P 1300 368 534
e bushfire@localgroup.com.au
w http://www.localgroup.com.au
abn 30 735 366 565

Sutherland
Suite 5, 15 Surf Road
Cronulla NSW 2230

Central Coast
Suite 1, 21 Babilla Close
Beresfield NSW 2322

Norwest
Suite 21, 5 Inglewood Place
Baulkham Hills NSW 2153

Northside
Shop 2A, 20 Waterloo Street
Narrabeen NSW 2101

BUSHFIRE RISK ASSESSMENT REPORT

SITE ADDRESS
Lot 381 DP 574654 House No.: 1048-1058 Castlereagh Road CASTLEREAGH NSW 2749

OWNER/S
Kijko

BUIDER
McDonald Jones Homes Level 4, 62 Norwest Boulevard BAULKHAM HILLS NSW 2153

ASPECT
North

PROPOSAL
Construction of a dwelling

CONTENTS

1.0 EXECUTIVE SUMMARY

As required by Penrith City Council a bushfire risk assessment of the proposed dwelling has been carried out in accordance with the procedures and requirements outlined in the documents *Planning for Bushfire Protection* (2019) as issued by the NSW Rural Fire Service. A summary of the findings of this assessment is provided below. Subject to the recommendations proposed in this report, the proposed development has the potential to reasonably address and comply with the aims and objectives of *Planning for Bushfire Protection* (2019).

SITE ADDRESS
Lot 381 DP 574654 House No.: 1048-1058 Castlereagh Road CASTLEREAGH NSW 2749

IDENTIFIERS	
Latitude:	-33.662174
Longitude:	150.671453

ASPECT
North

VEGETATION TYPE							
NORTH	Managed Land	**EAST**	Managed Land	**SOUTH**	Managed Land	**WEST**	Managed Land

EFFECTIVE SLOPE							
NORTH	0-5° Downslope	**EAST**	N/A	**SOUTH**	N/A	**WEST**	N/A

FIRE DANGER INDEX
100

ASSET PROTECTION ZONE SETBACKS			
ELEVATION	**ASSET PROTECTION ZONE**	**INNER PROTECTION AREA**	**OUTER PROTECTION AREA**
NORTH	0m	0m	0m
EAST	0m	0m	0m
SOUTH	0m	0m	0m
WEST	0m	0m	0m

SETBACK TO VEGETATION							
NORTH	>140m	**EAST**	>140m	**SOUTH**	>140m	**WEST**	>140m

BUSHFIRE ATTACK LEVEL							
NORTH	BAL-LOW	**EAST**	BAL-LOW	**SOUTH**	BAL-LOW	**WEST**	BAL-LOW

2.0 PROJECT BRIEF

We have been engaged by McDonald Jones Homes Pty Ltd to assess the threat posed to the subject development in the event of a bushfire. Current fire maps prepared by Penrith City Council in accordance with the requirements of Section 10.3 of the *Environmental Planning and Assessment Act 1979* (as amended) (EPAA) indicate that the proposed development is situated within a 'Bushfire Prone Area' (BPA).

The aims of this report are:

- To identify the Bushfire Attack Level (BAL) to which the proposed dwelling may be exposed;
- To determine the construction requirements associated with the assessed BAL as defined in *AS3959-2018: Construction of buildings in bushfire prone areas;* and
- To recommend 'deemed-to-satisfy' solutions for meeting the performance criteria of bush fire protection measures indicated in *Planning for Bush Fire Protection* (2019)

This report will supplement the Statement of Environmental Effects submitted to Penrith City Council as part of the Development Application. It has been prepared in accordance with the procedures and requirements contained within the NSW Rural Fire Service (RFS) document *Planning for Bushfire Protection* (2019).

The report relies upon the following information:

- Inspection of the site;
- Details of the proposed dwelling provided by McDonald Jones Homes Pty Ltd (See Appendices)

3.0 THE PROPOSED DEVELOPMENT

The proposed development is a dwelling that includes a living/dining area, kitchen, bedrooms with bathrooms and garage. The construction of the dwelling will include a slab, with frames and roof covering on trusses. A veneer with roof covering with fascia and guttering will form the façade of the dwelling.

A rainwater tank is to be located on site to collect rainwater from the roof area. This water will be used in accordance with the requirements of the BASIX certificate prepared for the development.

4.0 SITE ASSESSMENT

The site is located in suburb of Castlereagh within Penrith City Local Government Area and is situated on Castlereagh Road, that will provide access to the property. The site immediately borders onto similar sized, managed allotments on the northern, southern and western boundaries of the allotment. The eastern boundary is adjacent to the public roadway. There was no vegetation measured to be within 140 metres of the proposed dwelling, so no bushfire protection measures are required for the proposed dwelling.

The subject allotment is rectangular in shape, with the site having a downward slope from the front of the property to the rear. At the time of the site inspection there were existing structures on the site, with the plans supplied being consistent with the conditions on the allotment.

All aspects of the site are adjacent to similar allotments that will be built on or public infrastructure assets such as roadways and footpaths. These properties and assets present reduced vegetation forms (i.e. maintained lawns and gardens) as well as areas of non-vegetation (i.e. dwellings, roads, paths, ancillary structures) and as such, are not considered to harbour any predominant vegetation formations which are described in the *Planning for Bushfire Protection* (2019). Any future developments within this area should also come under the relevant planning codes and restrictions in accordance with the appropriate planning policy and should present similar landscaping to the surrounding developments with ongoing management by the property owners.

Figure 1 shows the allotment boundaries of the subject lot in the context of the subdivision. There was no predominant vegetation located within 140 metres of the proposed dwelling.

Figure 1 – Boundaries of the subject allotment and the larger subdivision context (SixMaps 2020)

4.1 Asset Protection Zones

Planning for Bushfire Protection (2019) recommends that an Asset Protection Zone (APZ) be established and maintained on the hazard side of buildings in bushfire prone areas. For this assessment, *Section A1.10 of Planning for Bush Fire Protection (2019)* outlines that low threat vegetation is not required to be considered. As such, an APZ is not required as part of this development.

4.1.1 Vegetation Type

The predominant vegetation formations located within 140m of the proposed development have been determined in accordance with the provisions of Appendix A1.2 of the *NSW RFS Planning for Bushfire Protection* (2019) and Keith (2004) and are provided in Table 4.11.1.

Table 4.1.1 Vegetation Type

NORTH	Managed Land	**EAST**	Managed Land	**SOUTH**	Managed Land	**WEST**	Managed Land

There were no prominent vegetation formations within 140 metres of the proposed dwelling. Figures 3-6 of this report were taken during a site inspection on 27th May 2021 and support the opinion provided above. No bushfire protection measures are required as a result.

Figure 3: Northern Aspect

Figure 4: Eastern Aspect

Figure 5: Southern Aspect

Figure 6: Western Aspect

4.1.2 Effective Slope

The intensity and rate spread of fires burning uphill increases markedly with increasing slope. This is reflected in an increase in the fire hazard index for a particular fuel type with an increasing slope. Similarly the rate of spread and intensity of fires decreases when they burn downhill.

Table 4.1.2 below outlines the general slope for 100m underneath the vegetation which affects proposed dwelling. No prominent vegetation was determined to be effecting the proposed development during the site inspection on the 27th May 2021, making the need to determined effective slope unnecessary.

Table 4.1.2 Effective Slope

NORTH	N/A	**EAST**	N/A	**SOUTH**	N/A	**WEST**	N/A

4.1.3 Fire Danger Index

The fire danger index (FDI) for the subject site has been determined in accordance with the provisions of Appendix A1.6 of *Planning for Bushfire Protection (2019)* and is provided in Table 4.1.3. This subject site is located within the 'Greater Sydney Region', being within the Penrith City Local Government Area (LGA).

Table 4.1.3 Fire Danger Index

100

4.1.4 Detemination of Asset Protection Zones

There was no vegetation measured to be within 140 metres of the proposed site. As a result, no APZ is required to be put in place.

Table 4.1.4 Asset Protection Zone Setbacks

ELEVATION	ASSET PROTECTION ZONE	INNER PROTECTION AREA	OUTER PROTECTION AREA
NORTH	0m	0m	0m
SOUTH	0m	0m	0m
EAST	0m	0m	0m
WEST	0m	0m	0m

4.2 Bushfire Attack Level

4.2.1 Vegetation Types

The methodology for the classification of the vegetation type used for determining the bushfire attack level is the same as that used in the assessment of the Asset Protection Zone. As such refernce is drawn to Section 4.1.1 of this report. The results of this assessment are provided in Table 4.1.1.

4.2.2 Effective Slope

The methodology for the identification of the effective slope beneath the vegetation used for determining the bushfire attack level is the same as that used in the assessment of the Asset Protection Zone. As such refernce is drawn to Section 4.1.2 of this report. The results of this assessment are provided in Table 4.1.2.

4.2.3 Fire Danger Index

The methodology for the classification of the Fire Danger Index used for determining the bushfire attack level is the same as that used in the assessment of the Asset Protection Zone. As such refernce is drawn to Section 4.1.3 of this report. The results of this assessment are provided in Table 4.1.3.

4.2.4 Determination of Bushfire Attack Level

The setbacks to the predominant vegetation at each elevation is indicated in Table 4.2.4.

These distances were measured at the time of undertaking the site inspection using a laser measuring unit and measuring wheel, then subsequently validated against plans provided as part of the application.

Table 4.2.4 Setback to Vegetation

NORTH	140m	**EAST**	140m	**SOUTH**	140m	**WEST**	140m

No vegetation was measured within 140 metres to any elevation of the proposed dwelling. All elevations of the proposed dwelling were determined as BAL-LOW.

Table 4.2.5 Bushfire Attack Level

NORTH	BAL-LOW	**EAST**	BAL-LOW	**SOUTH**	BAL-LOW	**WEST**	BAL-LOW

4.2.5 Construction standards

Table 4.2.5	Bushfire Attack Level						
NORTH	BAL-LOW	**EAST**	BAL-LOW	**SOUTH**	BAL-LOW	**WEST**	BAL-LOW

The construction requirements for a BAL-LOW rating are given within Sections 3 and 4 of *AS 3959-2018*: *Construction of Buildings in Bushfire Prone Areas (2018)* and where relevant, *Section 7.5* of *Planning for Bush Fire Protection (2019)*.

The assessed BAL requires compliance with Construction Guidelines outlined in Sections 3 and 4 of *AS 3959-2018: Construction of buildings in bushfire-prone areas/the Nash Standard.*

5.0 SPECIFICATIONS AND REQUIREMENTS

No bushfire protection measures are required for developments with no vegetation present within 140 metres of the proposed dwelling. As such, there are no specifications and requirements required by *Planning for Bush Fire Protection (2019)* for this development.

6.0 RECOMMENDATIONS

Even though *Planning for Bush Fire Protection (2019)* does not require any specifications and requirements to this development the following prevetantive measures are still recommended:

1. Store combustabile materials as far from the dwelling as possible.

7.0 CONCLUSION

In conclusion, construction standards for building within bushfire-prone areas are set out in Australian Standard *AS 3959–2018: Construction of Buildings in Bushfire Prone Areas*. *Planning for Bushfire Protection* (2019) provides a procedure for determining the category of bushfire attack and the appropriate level of construction. It is considered that the proposed dwelling is at potential risk warranting a **BAL-LOW construction**; hence the following requirements should be adhered to:

- All of the elevations of the proposed dwelling are to be constructed so as to comply with a **BAL-LOW rating** as defined by *AS 3959-2018*.

Further, the following recommendations are also provided to the development:

- Store combutabile materials as far from the dwelling as possible.

Table 7.0	**Bushfire Attack Level**						
NORTH	BAL-LOW	**EAST**	BAL-LOW	**SOUTH**	BAL-LOW	**WEST**	BAL-LOW

In making any determination under Section 4.14 of the Environmental Planning and Assessment Act, 1979 (as amended) it is recommended that the Consent Authority should give consideration to the recommendations contained in this report.

Craig Hardy
MBA
M.App.Sc.(Env.Toxicology)
B.App.Sc.(Env.Health)
Accredited Certifier – Building Surveying A2 – 0167
BPAD-D Certified Practitioner – 24168

ASSOCIATIONS
Fire Protection Association of Australia
Association of Accredited Certifiers
Australian Institute of Building Surveyors

June 2021

8.0 REFERENCES

- Keith, D.A, & New South Wales. Department of Environment and Conservation & New South Wales. National Parks and Wildlife Service (2004) *Ocean shores to desert dunes : the native vegetation of New South Wales and the ACT*, Hurstville, NSW Dept. of Environment and Conservation (NSW)
- Nearmap Pty Ltd (2020) *PhotoMaps by Nearmap.* Available: http://maps.au.nearmap.com/. Last accessed 2nd June 2021
- NSW Rural Fire Service (2005) *Standards for Asset Protection Zones*. NSW Rural Fire Service, Lidcombe NSW – Available: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf
- NSW Rural Fire Service (2019) *Planning for Bushfire Protection; A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. NSW Rural Fire Service, Lidcombe NSW.
- NSW State Government. (2020). *SixMaps.* Available: https://maps.six.nsw.gov.au/. Last accessed 2nd June 2021
- Standards Australia (2018) *Australian Standard AS 3959–2018*: *Construction of Buildings in Bushfire-Prone Areas*. SAI Global Ltd, Sydney.

9.0 APPENDICES

1. Site prepared by McDonald Jones Homes Pty Ltd, job no. 844110, Dated 04/04/2021.
2. Standards for Asset Protection Zones as issued by the NSW Rural Fire Service in 2005.

Proposed Siting of your McDonald Jones Home

McDonald Jones Homes Pty Ltd | 9B Huntingdale Drive Thornton NSW 2322 | Phone: 1300 555 382 | mcdonaldjoneshomes.com.au

Customer: 844110 KIJKO
Site Address: 1048 Castlereagh Road
Locality: CASTLEREAGH (2749), NSW
Home Design: HERMITAGE GRANDE (H-HRMCLAS15420)

Date: 04/04/2021
Estate:
Planning:
DP Number:

BUILDING DIMENSIONS:

WIDTH 38.880M

DEPTH: 15.340M

Consultant: Andrew Dimovski
Email: AndrewD@mcdonaldjones.com.au

Scale: 1:800 @ A3

Customer Signature (1) _____ Date (1) _____ Customer Signature (2) _____ Date (2) _____

(Geo Plan ID: 334873)

standards

for asset protection zones

protection

NSW RURAL FIRE SERVICE

STANDARDS FOR ASSET PROTECTION ZONES

INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

WHAT WILL THE APZ DO?

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

- direct flame contact on the asset;
- damage to the built asset from intense radiant heat; and
- ember attack on the asset.

WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

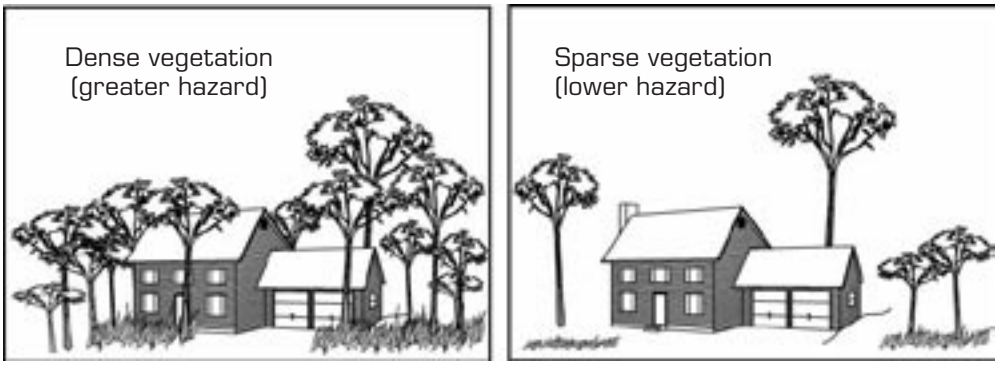
STEP 1. DETERMINE IF AN APZ IS REQUIRED

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

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.



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

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR 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 landowner.

Subdivided land or construction of a new dwelling
If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

Existing asset
If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

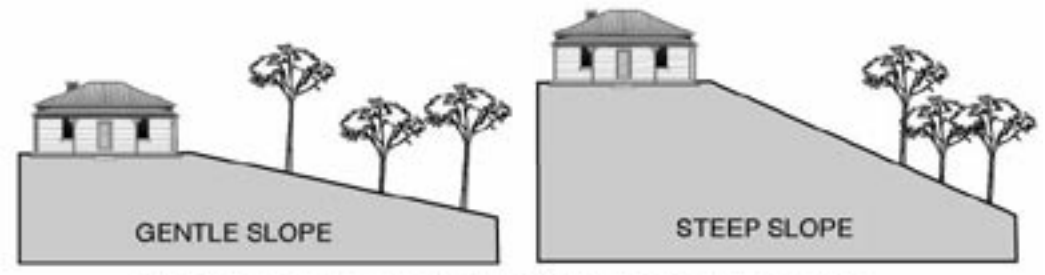
If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

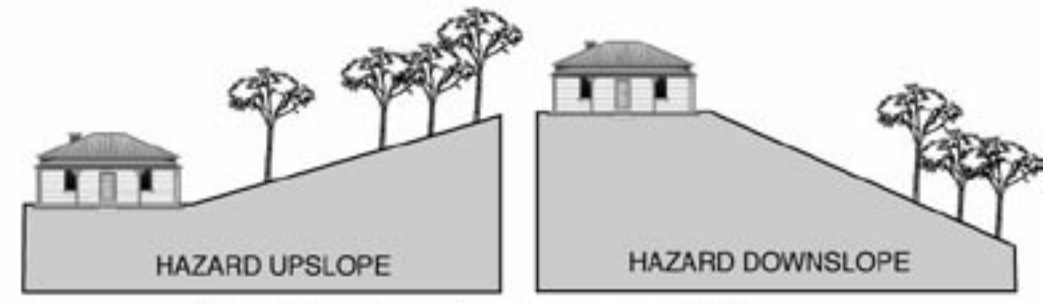
STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset.



Gentle slopes require a smaller APZ distance than steep slopes



A hazard downslope will require a greater APZ distance then a hazard upslope of the asset

Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

Subdivided land or construction of a new dwelling
If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

Existing asset
If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ

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

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, 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. Some ground cover is also needed to prevent soil erosion.

Fuels can be controlled by:

1. raking or manual removal of fine fuels
Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.

Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

2. mowing or grazing of grass
Grass needs to be kept short and, where possible, green.

3. removal or pruning of trees, shrubs and understorey
The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

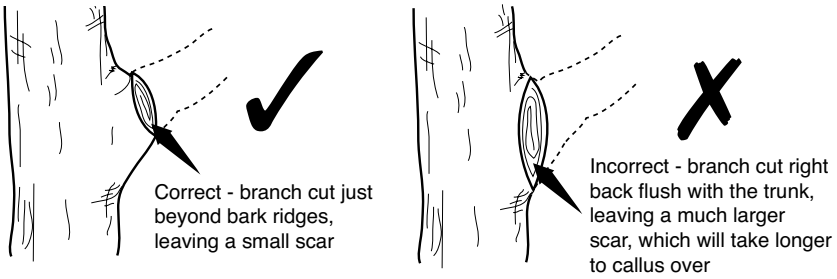
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at **www.agric.nsw.gov.au/noxweed/;**
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3 Remove or thin understorey plants, trees and shrubs less than three metres in height

The removal of significant native species should be avoided.

Prune in acordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.



There are three primary methods of pruning trees in APZs:

1. Crown lifting (skirting)
Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

2. Thinning
Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

3. Selective pruning
Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees*) for more information on tree pruning.

4. Slashing and trittering
Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

5. Ploughing and grading
Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

6. Burning (hazard reduction burning)
Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

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 fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning,* or contact your local RFS for advice.

7. Burning (pile burning)
In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning.*

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 for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.

STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

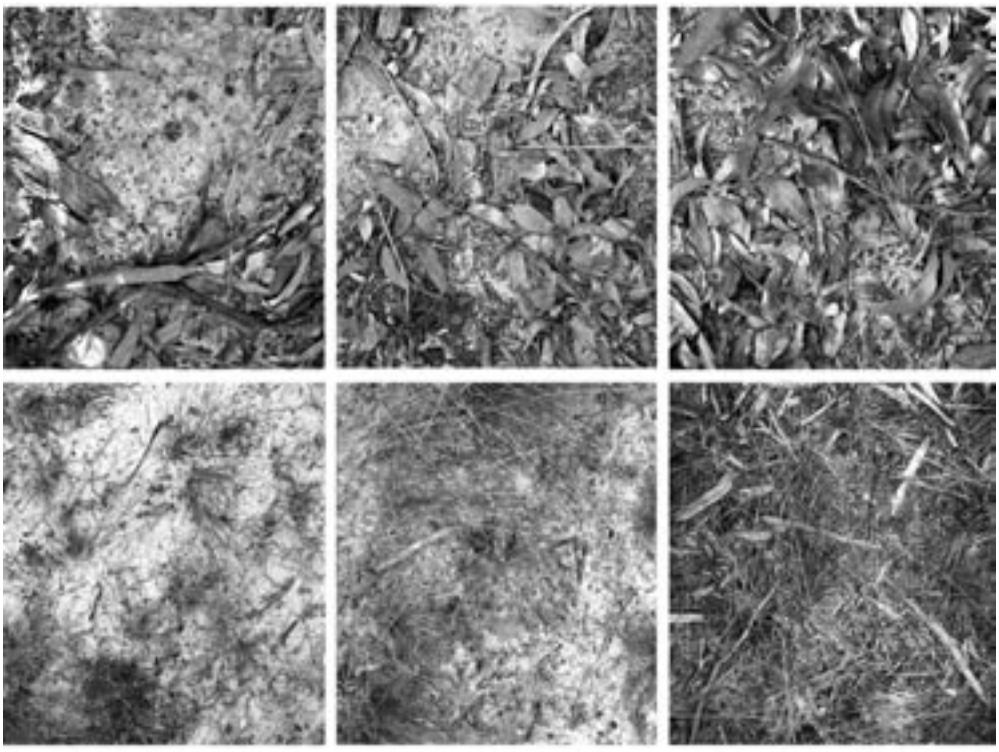
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

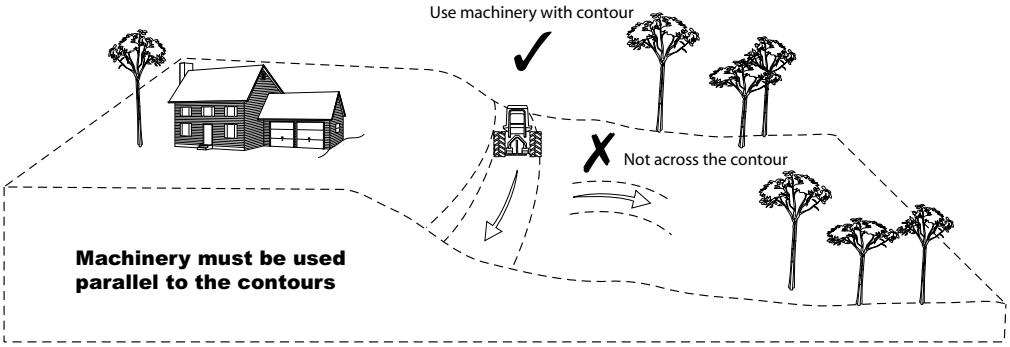
When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



50% **75%** **100%**

Ground Cover

To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.

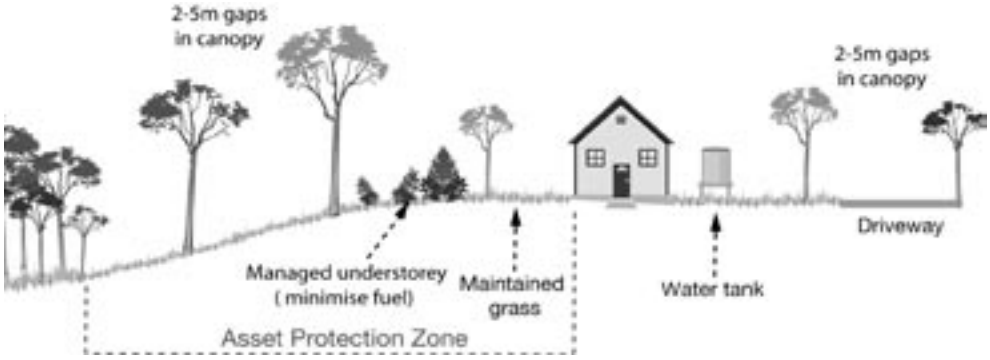


STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

Layout of gardens in an APZ
When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset 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. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.



Removal of other materials
Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items 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.

PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, 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; and
- dense crown and elevated branches.

When choosing less flammable 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 society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees.*

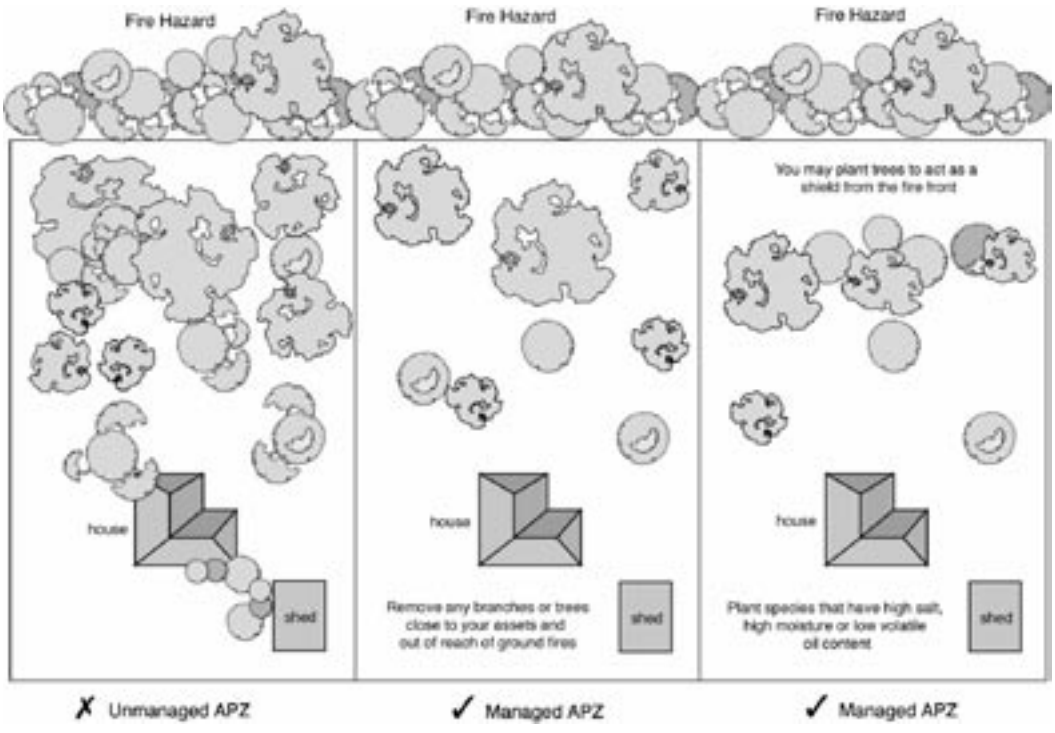
WIND BREAKS

Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.



HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at **www.rfs.nsw.gov.au.**

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre. Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737 (Monday to Friday, 9am to 5pm), or
- the NSW RFS website at **www.rfs.nsw.gov.au.**

Produced by the NSW Rural Fire Service, Locked Mail Bag 17, GRANVILLE, NSW 2142. Ph. 1800 679 737
www.rfs.nsw.gov.au

Printed on 100% Recycled Cyclus Offset paper.