

A man wearing a wide-brimmed hat, a light green long-sleeved shirt, and khaki pants is raking leaves in a garden. He is wearing work gloves and black boots. The background shows a garden with green plants and pink flowers. The image is overlaid with a large orange semi-transparent rectangle containing text.

PREPARING YOUR PROPERTY

MAKE YOUR HOME BUSHFIRE READY

02

Everyone in Victoria who lives near bush, grassland or the coast needs to prepare their property for bushfire. Even if your plan is to leave early on fire risk days, you need to prepare your property.

A well-prepared house with adequate defensible space has a greater chance of surviving a bushfire. However, on Code Red fire risk days, homes are not designed or constructed to withstand fires in these conditions.

You also need to consider the materials that your house is constructed with. The closer you are to the bush, the less defensible space you have and the more you need to improve the fire resistant properties of your house. Information to guide you on construction and renovation can be found on the Building Commission's website www.buildingcommission.com.au

Fire behaviour

Every fire is different. Understanding how a fire behaves will help you to understand how to prepare your property.

Bushfires are influenced by

- Vegetation (fuel)
- Terrain
- Weather conditions

Vegetation (fuel)

For example:

- **Grass** can burn early and quickly on days of risk
- Types of **scrub** and **trees** drop leaves and twigs on the ground around them which, as fine fuels, give off far more heat when they burn
- **Bark** on trees, when fibrous and dry can result in other fuels above the bark being sparked by flames from a fire
- **Dry branches, twigs** and **leaves** and other fine fuels found on the ground can also burn easily.



Fine fuel



Grass is a fine fuel



Leaf litter



Bark can carry flames into trees



Vegetation and defensible space

Vegetation includes all the plants and foliage around your home. By managing the vegetation around your property you can create some space around your home that will reduce bushfire intensity. This is known as defensible space.

Defensible space helps protect your house from flames and radiant heat.

You need to look after vegetation around your house (for example, grass, plants and dry leaves) to maintain the space.

Remember, seek shelter if a bushfire passes through your property. Defensible space does not protect you from radiant heat.

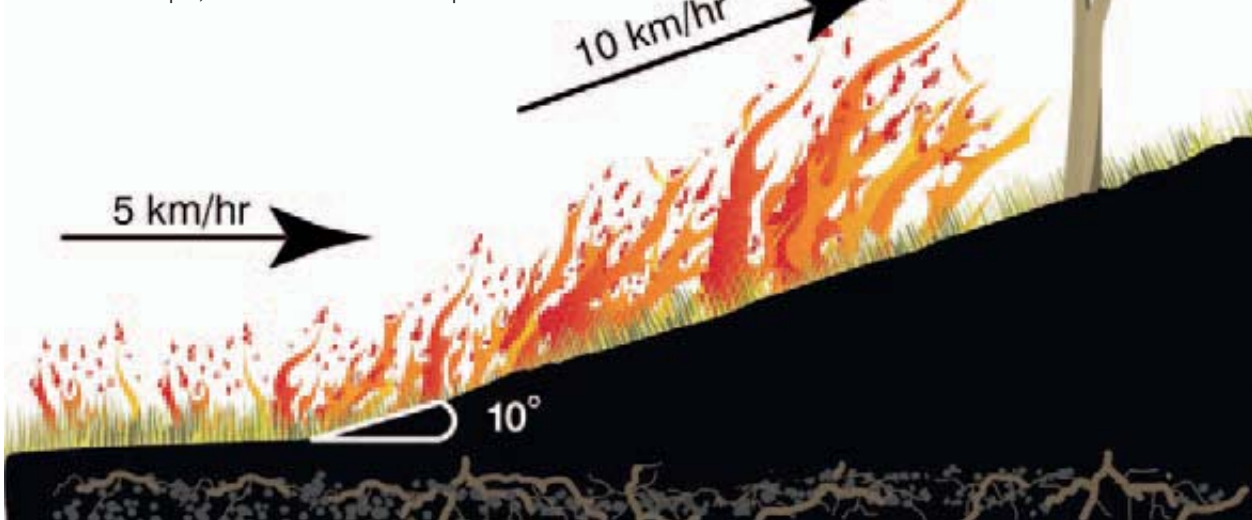
Terrain

Fires burning uphill

A fire will burn faster uphill. This is because the flames can reach more unburnt fuel in front of the fire. As a general rule, for every 10° slope, the fire will double its speed as it travels uphill. For example, if a fire is travelling at five kilometres an hour along flat ground and it hits a 10° slope it will double in speed to 10 kilometres an hour up that hill.

Fires burning downhill

The opposite applies to a fire travelling downhill. The flames reach less fuel, and less radiant heat pre-heats the fuel in front of the fire. For every 10° of downhill slope, the fire will halve its speed.



For every 10° of upslope the fire will double its rate of speed

Weather conditions

Bushfires often start on hot, dry and windy days. As the wind strengthens a fire can burn hotter because the wind pushes the flames into unburnt fuel.

The wind influences the:

- **Speed** at which a fire spreads
- **Direction** in which a fire travels and the size of the fire front
- **Intensity** of a fire by providing more oxygen
- Likelihood of **spotting** – burning pieces of leaves, twigs and bark (embers) are carried ahead of the fire by winds, causing new fires to ignite. These are known as spot fires.

A string of hot days will dry out vegetation making it easier to burn. This can be made even worse by underlying drought conditions. The drier the vegetation the easier it will burn.

A bushfire spreads as a result of burning embers (see page 4 of the *Am I At Risk?* section of this kit), radiant heat and direct flame contact.



Dry vegetation burns easily

How radiant heat and direct flame contact ignite houses

The heat that radiates from a bushfire is very intense. Radiant heat can ignite exposed surfaces without direct flame or even ember contact. Radiant heat can also crack or break windows, allowing embers to enter a building. Plastics such as wall cladding can distort or melt, exposing timber framing. Radiant heat is extremely dangerous to people if they are unprotected by a building or shelter.

The distance between the fire and the house will determine how much direct flame contact and/or radiant heat the house is subjected to. If the distance from the fire is doubled, the radiant heat load on the building can be reduced up to four times.

The chance of direct flame contacting a house is increased when vegetation close to a house is ignited and winds bend the flames closer toward the ground.

You can greatly reduce radiant heat and direct flame contact to your house by carefully managing the vegetation around your home.

Property preparation

You can reduce the impact of bushfire on your home by preparing your property. These preparations must begin well before the bushfire season. You should prepare your property even if your plan is to leave early on days of fire risk. This will give your house a greater chance of surviving a bushfire.

You will have to consider:

1. If you have adequate defensible space and how you will manage vegetation
2. How your house is best maintained and what improvements can be made
3. If your home is constructed or modified to withstand a bushfire.



ACTION

Read more about radiant heat on page 63 of the *Defending Your Property* section of this kit.



Radiant heat can ignite a house

1 Managing vegetation – Defendable space



ACTION

Complete the *Household Bushfire Self Assessment Tool* to determine the defendable space requirements for your property. There is a workbook version of the tool in Section 04 of this kit or visit www.cfa.vic.gov.au

You can also request a free of charge site visit from CFA to help understand your level of risk. For more information visit www.cfa.vic.gov.au or call 1800 240 667

As a general rule you may need much more defendable space if there is dense forest all around you. If you are surrounded by grass or manicured gardens you will need less.

How to get your defendable space ready

Your garden

- Cut tree branches that hang over your house
- Do not use plant mulch on your garden (use pebbles or rocks)
- Cut the grass
- Get rid of material that can catch fire (for example, dry grass, leaves, twigs)
- Keep woodpiles away from your house.



Defendable space reduces the impact of radiant heat and flame contact

Do you have lawn or grass and landscaped gardens?

You need a 10 metre space around your home. This is known as the inner zone.

- Shrubs must be less than one metre
- Do not have shrubs next to or under windows
- Grass should be less than 10 centimetres high
- Do not have tree branches in the 10 metre space



10 metre inner zone

The 10/30 right

Under the 10/30 right, no planning permit is required to make bushfire preparations around your home if you own your property and live outside the metropolitan area. (The 10/30 right does not apply in all councils and permits may still be required. Please check with your local council for details.)

The new planning exemptions give residents who own their property in certain areas the right to:

- Remove, destroy or lop any vegetation within 10 metres of a building used for accommodation
- Remove, destroy or lop any vegetation, except for trees (ie. ground fuel), within 30 metres of a building used for accommodation
- Remove, destroy or lop any vegetation for a combined maximum width of four metres either side of boundary fences.

You need to have prior written permission from the landowner for clearance on their side of the fence.

You might need to look after the plants and trees up to 100 metres from your property. This is known as the outer zone.

For example,

- Take out half the shrubs
- Keep grass short
- Make space between plants and trees.

Keep in mind that mature trees can help shield against radiant heat and embers and can play a useful role in the protection of your home against bushfires.

Managing vegetation

Managing the vegetation around your home has three main purposes:

- To help you and your home survive the passage of the fire front
- To reduce the chance of direct flame contact and radiant heat igniting your home
- To help you protect your home from ember attack.



Home located in forest environment



Home located in open environment

Whatever the type of vegetation that surrounds your home, you need to consider how it will burn during a bushfire. In general:

- Homes located in a dense forest are more likely to experience high intensity fires
- Homes located in more open country may experience lower intensity, but fast moving, grass fires
- If you live in a rural environment, also consider other property assets such as sheds or fences that you want to protect.

Using the layout of your property

Fire always follows a path where fuel is located. As well as managing the vegetation in the 10 metres around your home and further out around your property also consider:

- Fire does not spread easily over low-fuel areas. Driveways, pools, tennis courts, cultivated soil or gravelled areas, mown lawns, grazed paddocks, dams and natural water features can help reduce fire intensity
- When planning your fuel management, protect streamside vegetation and wetlands to help prevent sedimentation and protect habitat. These sites may be damp and less fire-prone and may not present a hazard.

Trees and bushfire

Trees are not the only threat to property during a bushfire. The fire front is often carried by undergrowth, such as shrubs and tall grasses. However loose, flaky or ribbon bark can contribute to ember attack.

Limit the ability of fire to spread into tree tops

What is growing under your trees? Consider how easily fire might be able to spread from the ground into the tree tops. Fine fuels that are continuous from ground to treetop (known as ladder fuels) can assist the spread of fire from the ground up into the treetops.

You can reduce fuel ladders by:

- Pruning shrubs so that their tops are well away from the lower branches of trees
- Pruning the lower branches of shrubs to separate the foliage from the surface fuels underneath



The bark on trees can contribute to ember attack

- Reducing accumulated debris such as loose flaky bark, dead twigs, leaves or needles from within the branches of plants.

Lawns and grass

- Grass needs to be kept less than 100 millimetres high. Over that height you risk it becoming a fuel ladder and sending flames to shrubs
- You don't need to cut green lawns any shorter than 50 millimetres otherwise you risk causing the grass to dry out
- Lawns between 50 millimetres – 100 millimeters in height shade the root zone, retain moisture, reduce evaporation rates and thereby reduce water consumption.

Remove weeds

Weeds are commonly found in residential bushland areas where they contribute significantly to bushfire risk. Give priority to removing and controlling them. Your council can help you identify weeds in your local area and provide ideas on how to remove them.

Mulching

Fine-based mulch such as wood chips or pea straw is a fine fuel and can ignite during ember attack. It is extremely dangerous if used within a 10 metre radius of your home, particularly if used under windows.

Instead:

- Use mulch alternatives such as pebbles, sand or rocks that are not flammable
- Weed matting, old carpet cut to fit around individual plants secured and fully covered with rocks, pebbles or soil also work well to retain soil moisture in garden beds
- Mulch your garden immediately after the fire season to allow it to break down over winter. Decomposed mulch will still provide good moisture retention during summer, and is less likely to ignite than more recently laid mulch
- If plant-based mulch is still dry at the beginning of the fire season, keep it wetted down or cover it with soil or sand during the fire season.

Burning off and fire restrictions

Burning off dried up fine fuels and cutting back vegetation is one way to prepare your property. If you are planning to burn off you must do so well before the fire restrictions come into force. For more information visit www.cfa.vic.gov.au

Plant selection

When planning your garden and property, consider the types of plants you use. No plant is completely fire-resistant; some are more flammable than others, but given the right conditions all plants will burn.

Your local council and/or the Department of Sustainability and Environment can provide information to help you select plants that are suitable for your local environment.

For more information visit www.dse.vic.gov.au



Burning off fine fuels

2 House maintenance and improvements

Roofs, windows, doors and decks

The following table identifies some of the key risk areas and tips on how you can help protect your home and surrounding buildings from ember attack.

Target Area	Treatment Options	Comment
ROOF Gaps in the roof pose a high risk to ember penetration	Sarking (reflective non-combustible sheeting)	Sarking is an effective treatment to prevent embers from entering through your roof. Unless installed at construction stage this can become very expensive.
	Gap sealing by using compressed mineral wool insulation	This can be a cheap and effective solution for existing homes. Careful installation is required to ensure all gaps are sealed. Sealing gaps is an effective defence against burning embers.
	Bushfire sprinklers	Sprinklers may help protect your house but have limitations. All openings on the roof must be protected for the duration of the ember attack. Sarking or gap sealing can be more effective.
WINDOWS Open and unscreened windows pose an extreme risk	Maintenance of window sills	Embers lodging on combustible window sills pose a high risk. Maintain paint on window sills so there is no flaking paint.
	Screened windows and sills	Installing wire mesh screens (not aluminum) with 1.5 millimetre holes over both the window and frame can prevent embers touching the glass or timber. This can also be an effective method for reflecting radiant heat.
	Seal gaps around window frames	This is an effective treatment for existing metal window frames. The sealant should be a fire retardant product.
	Sprinklers	Sprinklers may help protect your house but have limitations. You also need to ensure that full coverage of the window and frame is achieved.
	Shutters	Installing shutters over both the window and frame will protect windows from cracking from flying embers.



Target Area	Treatment Options	Comment
DOORS Open and unscreened doors pose an extreme risk. Embers lodging on combustible door sills and gaps around door frames pose a high risk.	Non-combustible door sill	Replacing combustible door sills with a non-combustible product will reduce the chance of an ember igniting.
	Screened doors	Installing metal screen doors over timber doors will reduce the chance of an ember igniting the door.
	Seal gaps around door frames	If the door is non-combustible then sealing the gaps around the door will prevent embers from entering into your home.
	Sprinklers	Sprinklers may help protect your house but have limitations. You also need to ensure full coverage of the door and frame.
DECKS Embers lodging on decks pose a very high risk of ignition	Non-combustible decking materials	Non-combustible decking material won't burn. Use concrete stumps, metal framing and fire retardant treated timber.
	Separation from the dwelling to prevent fire spread	If the deck is built with combustible material, non-combustible material should be placed between the deck and the house. This will reduce the possibility of the fire spread occurring between the deck and the house.
	Construct with gaps between decking materials	Leaving gaps between the decking timbers will allow most embers to fall through. However, there is still a possibility of embers igniting at timber junction points. Ensure there is no fuel under the decking and that you have access to put out any spot fires underneath.
	Sprinklers	Sprinklers may help protect your house but have limitations. You also need to ensure that full coverage of the decking is achieved.

The other protection for windows that can be considered is toughened glass. This will help the windows to withstand higher amounts of radiant heat.

3 Your home's structure and building design

To reduce the impact of embers on your home there are some important building improvements that are recommended. These measures will assist in ember proofing your house, making it more difficult for embers to enter the house or burn against the house.

The number of improvements will depend on the type of house you have. Research shows there are areas around your home that can contribute more to the overall bushfire risk than others. These include decks, windows, doors and roof areas.

Anywhere embers can lodge or enter your house can start a fire.

- **Is your house above-ground on stumps or on a concrete slab? Do you have a timber deck or verandah?** Protect underfloor spaces with non-combustible sheeting or metal mesh. This will prevent embers from landing under the house and starting small spot fires. Remove any combustible materials stored beneath the floor.
- **Is your house constructed from bricks, timber, cladding or a mixture?** Roughly sawn timber or badly maintained brick work can catch embers. Ensure any external timber cladding is regularly maintained and all gaps are sealed. Seal or repair any holes, cracks or damage to flooring and walls. Cover all external vents with metal mesh (not aluminium) and keep clear of debris to prevent embers from entering your home.
- **Are your window and door frames well sealed?** Place weather stripping around the inside of doors and windows to eliminate any gaps.
- **Do you have any skylights or evaporative coolers?** Make non-combustible fire screens to cover external skylights. Protect evaporative coolers with metal mesh screens. You will need to check with your evaporative cooler supplier to ensure the performance of the system is not compromised by installing the mesh.

By sealing all gaps around your house and roof, or installing wire mesh around larger areas that cannot be sealed, you will greatly reduce the risk of embers entering your house.

New standard for the construction of houses in response to bushfire risk

Following the 2009 bushfires the Victorian Government brought forward the introduction of the new Australian Standard AS3959-2009 – Design and construction of buildings in bushfire prone areas. This new standard will improve the defendability and resilience of homes at risk of bushfire.

The new building standard currently applies to all new homes to be built in Victoria.

New buildings across Victoria must now be assessed for bushfire attack level (BAL) rating. The BAL is determined by a number of factors including aspect, slope and the proximity and type of vegetation at the site.

Information about the Australian Standard is available from the Building Commission website www.buildingcommission.com.au

For more information about the construction of new homes or the modification of existing homes please:

- Contact your local council planning or building department for further information
- See the CFA publication, *Building in a Wildfire Management Overlay Applicant's Workbook 2010*. It is a guide to obtaining the necessary approvals. The Applicant's Kit is available on the CFA website www.cfa.vic.gov.au

Insurance cover



ACTION

As part of your preparation, check that you have adequate home and contents insurance.



Fire and the environment

Vegetation management outside your property

Private landholders must always obtain permission from their local council (or VicRoads for most main roads) for any works on roadsides, including fire management and planting.

Local residents do not need a permit to remove fallen wood from roadside areas scheduled for burns within two weeks of a planned burn.

DSE and Parks Victoria may undertake planned burns and build fuel breaks to manage vegetation on public land. A fuelbreak is a strip of land where vegetation has been reduced or removed.

Environmentally friendly ways of managing your fire safety

Identify the environmental assets that you would like to protect from fire or fuel reduction. These may include waterways, erosion-prone soils, shrubs that provide screening or bird habitat, hollow trees that provide nesting sites, rare species or bushland that you have regenerated.

Design your fire management using the following environmental management principles:

- Where practical, avoid damaging the environment, consider things you can do to help keep embers from entering your buildings before you consider vegetation removal
- Reduce the fuels by methods that avoid exposing the soil and encouraging weed growth. Consider raking and slashing fuels



Roadside burns are the responsibility of the roadside manager

- Offset or compensate changes to the natural environment by replacing vegetation removed with vegetation of the same type and quality elsewhere on your land.

Seek appropriate advice on managing your soil, vegetation and waterways from your local council or DSE.

Using fire

The use of fire, whether for ecological or fuel reduction purposes, is a complex and specialist tool. You should seek advice from your local council, CFA Regional Office or local Department of Sustainability (DSE) office.

