



Government of Western Australia  
Department of Fire & Emergency Services



# THE HOMEOWNER'S BUSHFIRE SURVIVAL MANUAL

September 2014 | Sixth Edition

# Don't let this happen to you ...



## **THE HOMEOWNER'S BUSHFIRE SURVIVAL MANUAL**

**September 2014 | Sixth Edition**

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# Introduction

This manual has been prepared to help you be better informed about bushfires. It draws together the best advice available on preventing fires and preparing for them. Many of the lessons have been learnt at the devastating cost of loss of possessions and even life itself.

It is hoped that you will consider how best to apply this information to your own property and help reduce fire damage and the associated human trauma during Western Australia's hot, fire-prone summers or dry seasons.

## You are in control

Whether you live in the city, town or rural property, the impact from bushfires is in your hands. How you prepare yourself, your family and your property (including your home) rests with you and will, in many instances, determine the outcome. This booklet sets out some useful hints on what to do on your property and how to better prepare it for bushfires.

You should prepare your home to survive a bushfire, even if you plan to leave early.<sup>1</sup> A well prepared and constructed house is more likely to survive a bushfire and ember attack than an unprepared one.

- A well prepared home can be easier for you and firefighters to defend.
- A well prepared home is less likely to put your neighbours' homes at risk.
- A well prepared home will give you more protection if a fire threatens suddenly and you cannot leave and have to take shelter within the home.

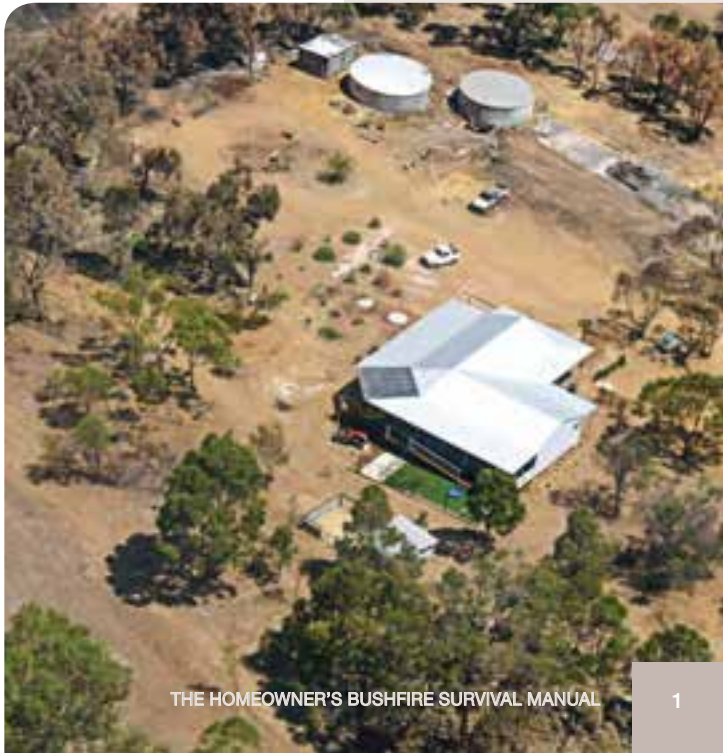
Fire prevention is a family business. There's a job for even the youngest child—such as raking up dead leaves or watering the lawn near the house to keep it green and safe. For older children, there's a lot to learn about fire safety—the role of trees and scrub in a fire; safety features like building protection zones and hazard separation zones and the likely pattern of fires in the area.

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Where the term summer is used it should be interpreted to include the dry season in the north of the State. Summer is used as a generic term to describe the bushfire season.

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You must prepare your property to give yourself and your home the best chance of survival.



# Bushfire behaviour and fuels

Any fire requires three elements to be present for it to ignite and continue to burn: oxygen, heat and fuel.

These three elements are described as the 'fire triangle'.

Remove one of these elements and the fire will stop.

## OXYGEN

When a frying pan catches fire, the flames will go out if you put the lid on the pan. In the same way, a bushfire needs oxygen to keep going—the more there is, the faster the fire burns. Strong winds not only force the fire along, but also increase air circulation and provide more oxygen. Therefore, any measure that reduces wind speed will reduce the intensity of the fire. In many instances trees can effectively shelter your house from wind.

Fires usually move faster in grassland than in forests because winds are stronger and the fuels are less dense allowing easy movement of oxygen through the grass. Grass fires are generally less intense than bushfires.

The prevailing afternoon breeze in summer presents the **most common threat** as it fans bushfires when fire fuel is at its driest during the day. Unstable atmospheric conditions that create less common north-west winds in summer can lead to the **most destructive bushfires**.

## HEAT

Bushfires generate unbelievable heat. Much of the heat goes up in the air, but a significant amount also radiates out at ground level. This 'radiant' heat spreads the fire by drying out vegetation so it will burn. Radiant heat can kill people, plants and animals. That's why during a fire you need to cover all bare skin with natural-fibre clothing—a shirt with long sleeves, long trousers and gloves. Keep a woollen blanket in the car so you can get under it, if trapped in a fire.

Although radiant heat can be fierce, it can easily be deflected by a non-combustible solid barrier, such as a wall or building. If you're caught in a bushfire, the safest place is inside a building, away from the radiant heat, particularly if the building is well prepared and has a minimum 20-metre Building Protection Zone.

Windbreaks and other barriers can slow the effects of radiant heat, which dries out unburnt vegetation, therefore helping to slow the blaze.



Oxygen, heat and fuel are described as the 'fire triangle'. If one of these components is removed the fire will stop.

Radiant heat can be deflected by a non-combustible solid barrier, such as a wall or building.

## FUEL

In summer and during the northern dry season, Australia is covered with vegetation that is fuel for fires—long dry grass, parched native shrubs, leaves and twigs. Without fuel and an ignition source, there would be no bushfires.

Fire prevention measures are largely based on reducing these fuels—by creating firebreaks, low intensity burning of forests and woodlands and the low intensity burning, mowing and slashing of long grasses before the fire season. When a bushfire is raging, firefighters often create breaks around it or burn back towards it, to starve the fire of fuel. Likewise, it is essential to remove fuel from around the house in order to reduce fire intensity and flame length.



Most of the fire safety measures in this book are based on reducing fuel, oxygen and/or heat in and around the house and guiding you as to how to enhance the survivability of the home through modifications to the building.



# Bushfire history — what we have learnt

## WHAT HAVE WE LEARNT FROM BUSHFIRES THAT HAVE OCCURRED IN THE PAST?

- Dwellingup 1961
- Ash Wednesday 1983
- Sydney 1994
- Wooroloo WA 1997
- Brookton WA 1997
- Sydney 2001
- NSW 2002
- Canberra 2002–03
- Alpine Fires 2002–03
- Eyre Peninsula 2005–06
- Toodyay 2009
- Black Saturday 2009
- Roleystone/Kelmscott 2011
- Margaret River 2011
- Parkerville, Mt Helena 2014

### We know that...

some houses are ill-prepared or built too close to a potential bushfire hazard and may not survive a bushfire. The construction standards, building protection zone and hazard separation zones need to match the potential bushfire threat for the predominant vegetation type and slope.

### We know that...

too many people do not take even the most simple precautions to protect their homes, allowing grass, twigs and dead leaves and shrubs to build up around buildings and in gutters.

### And we know that...

with sound planning and reasonable effort, houses in bushfire risk areas can be made safer from bushfires.



Roleystone/Kelmscott 2011.







Left: Margaret River 2011.

## HOW HOUSES CATCH ALIGHT

There are three ways bushfire attacks property:

- **Direct flame contact** commonly occurs when houses are situated close to a fire hazard.
- **Radiant heat** is the energy emitted from the fire and attacks buildings by heating and igniting flammable objects. Windows are particularly vulnerable to radiant heat.
- **Ember attack** occurs before, during and after a fire front passes. Embers such as burning bark are carried by the wind and dropped away from the main fire front, creating spot fires. Nearly all structural damage caused by a bushfire is due to ember attack. Embers can land in areas of vegetation or in the garden, next to leaf litter, under or in the gutters of the house and on wooden decks which, if not extinguished, can completely engulf the house.



Bushfire Protection Zones are designed to reduce the threat of all three of these bushfire risks to property. A suitable **hazard separation zone** will support the reduction of ember attack.

# Prepare your home

There are a number of measures that can be undertaken to increase the protection of your home in bushfire threat areas. Regardless of how old your home is, or to what standard your home is constructed, a Building Protection Zone is essential in increasing its chance of survival under bushfire attack.

Routine maintenance; constructing or retrofitting your home to meet the *Australian Standard 3959—Construction of buildings in bushfire-prone areas*; and addressing bushfire risks in accordance with the *Planning for Bushfire Risk Management Guidelines*<sup>2</sup> will ensure your house has the best bushfire protection.

## Building Protection Zone

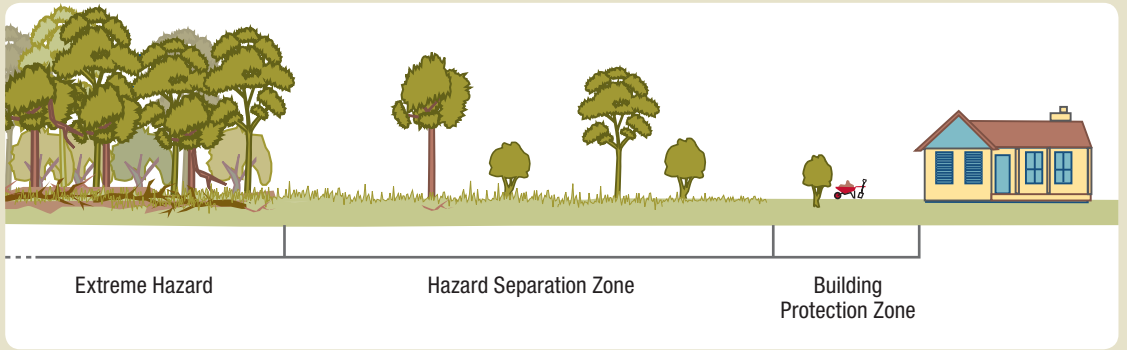
A Building Protection Zone (BPZ) is a buffer zone between a bushfire hazard and a building. In this zone fuel loads are minimised to reduce potential radiant heat levels, flame, ember and smoke attack.

An adequate BPZ will provide sufficient space and safety for firefighters and other emergency services to perform bushfire suppression activities. Managing and reducing fuel loads for a minimum of 20 metres around a building will increase its chances of survival from a bushfire. Create a BPZ, which has less than two tonne per hectare (t/ha) of fine fuel (<6 mm diameter for dead material and <3 mm diameter for live material) around your buildings and keep it maintained to this level.

Managing and reducing fuel loads for a minimum of 20 metres around a building will increase its chances of survival from a bushfire.

Within the BPZ, ensure:

- ✓ Tree crowns are a minimum of 10 metres apart.
- ✓ Trees are skirted or pruned up to a height of 2 metres.
- ✓ No tree is located within 2 metres of a building.
- ✓ Tree branches do not overhang the building.
- ✓ Ensure that there is a gap of at least 3 times the height (at maturity) of the shrub away from the building.
- ✓ Ensure shrubs aren't planted in clumps.
- ✓ Trees and shrubs do not have elevated dead material within the crowns.
- ✓ Lawns are kept short and green, where possible.
- ✓ Fences and sheds are constructed using non-combustible materials, but preferably not located in the BPZ.



An example of a good Building Protection Zone in bushfire area.

## CONSIDER SLOPE

The steeper the slope, the more fuel you'll need to clear. To create a BPZ around houses on steep sloping country, greater areas need to be cleared of fuel. If you reduce the amount of ground fuel in forest areas, the fire intensity and the likelihood of crowning 'treetop' fires will be reduced.

When considering slope, a BPZ should be provided around all buildings in bush fire hazard areas in accordance with the following standards:

Slope	Building Protection Zone radius
0° – 5°	20m
5° – 10°	20m
10° – 15°	25m
15° – 20°	30m
Over 20°	40m

See more about improving your Building Protection Zone (BPZ) and Hazard Separation Zone (HSZ) by preparing your garden and property on page 21.

# Understanding your risk

Understand the fire risk in your area by considering the following factors. The more high risk factors that apply to you, the more fire protection measures you're likely to need.

## **FIRE SEASON—HOW LONG?**

High risk areas have a long fire season with heavy available fuel loads. Low risk areas have a shorter fire season with little available fuel.

## **SLOPE—HOW STEEP?**

If you live on or near very steep slopes, it's a high risk area. The steeper the slope, the faster a fire will burn up it. A low risk area will have gentle slopes or be quite flat.

## **VEGETATION—HOW MUCH?**

Fires need fuel to burn. If you have a heavy coverage of long grass, forest and woodland-floor litter and flammable scrub nearby, you're in a high risk area. A low risk area would have little or no such fuel.

## **VEGETATION—HOW DRY?**

The drier the vegetation, the greater the fire hazard. The vegetation will naturally dry out through the summer, but it will also gain and lose moisture during the day. This is as a consequence of humidity and temperature changes—early mornings have the highest moisture content and mid-afternoon the lowest.

## **BUSHFIRES—HOW OFTEN?**

Some places have a history of bushfires. The more often fires have occurred in the past, the higher the potential risk.

## **ROADS—HOW GOOD?**

Low risk districts have many good roads providing easy movement through the area. High risk areas have a single, long dead end road, or roads that are easily blocked by falling trees.

Understand the fire risk in your area. If you live on or near very steep vegetated slopes, it's a high risk area.



# Routine maintenance — small jobs can save lives

Simple measures such as clearing the leaves out of your gutter and keeping your lawns mown short can make all the difference in protecting your home in the event of a bushfire. Here are some simple pointers that are just as useful for older houses as they are for newly built homes. These tasks need to be undertaken before and during the bushfire season to ensure your home is well prepared.



This section focuses on simple routine maintenance of your house.

- For additional protection measures see page 12.
- For detailed garden landscape and property maintenance see page 21.

## ROOFS AND GUTTERS

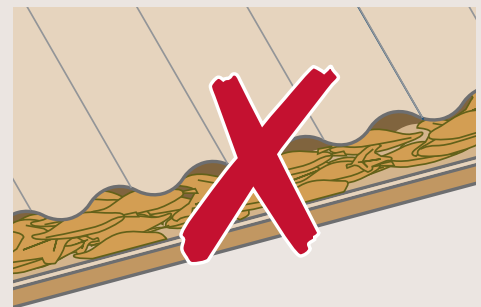
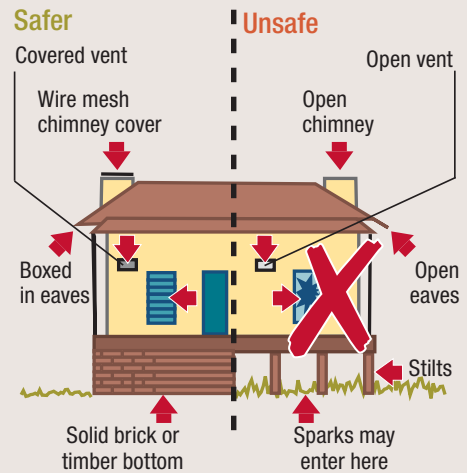
You should keep leaves clear of all gutters, roofing and downpipes both before and during the bushfire season to prevent fire entering through your roof. Consider installing metal leaf gutter guards to prevent litter build up. Check the roof for any broken tiles or dislodged roofing materials and ensure repairs are completed before the bushfire season. Don't have gaps that would allow embers into the roof space; if there are gaps seal them.

## EXTERNAL WALLS AND WINDOWS

Do a full inspection of your external walls to check they are in good condition. Check for gaps in the walls and block them. If there are any broken bricks, decaying timber or damaged cement sheeting, repair the wall so that embers cannot lodge in the gaps.<sup>3</sup>

## STEPS

Ensure that under steps, verandahs, patios and balconies there are no combustible materials. Clear out leaf litter and grass and don't store wood, rubbish, building materials or anything that might catch alight in a bushfire close to the building. Replace combustible welcome mats with non-combustible versions and move them back from the steps a short distance.



Keep gutters free of leaf litter.

## WATER

Check taps, hoses and hose reels are in good condition and fittings are tight and in good working order. Check pumps are fuelled and oiled and will start easily—you don't want to wait until you need to use the pump to find out it is broken. If you have a bushfire water spray system, ensure that is constructed to *AS 5414 – Bushfire water spray system standards (external sprinkler system)*, and test regularly before the start and during the fire season. Ensure there is adequate water supply to meet the needs of the job.

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For more information on water supply for bushfire protection, see page 33.

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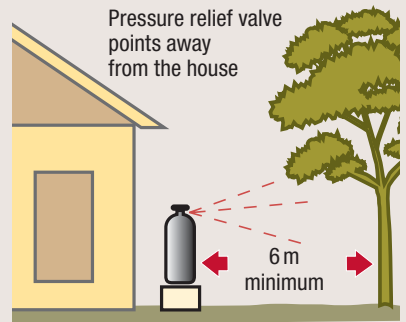
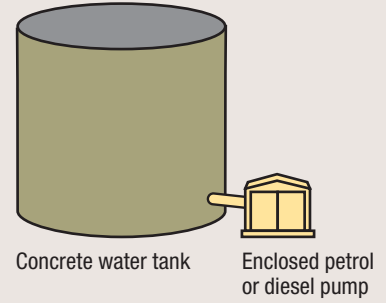
## ACCESS

Check driveways and access tracks are clear of trees and are in good condition for use by fire appliances. Ideally fire service access needs to be 6 metres wide (trafficable surface) with a 4 metre vertical clearance. If you have gates ensure they are in good working order and check that locks can be easily locked or unlocked with a key. Consider leaving your gates unlocked if a bushfire is in the area so that emergency services can gain easy access to protect your property.

## LP GAS CYLINDERS

Place LP gas cylinders on the side of the house furthest away from the likely direction of a bushfire. Do not place them under the verandah. Make sure the pressure relief valve is directed away from the house and that there is no flammable material in front of the valve for at least 6 metres. Set the cylinders on a concrete or brick base and fix them to a strong support. Turn the valve off as a fire approaches and if the cylinders are exposed to heat and it is safe to do so, hose them down with water to reduce the pressure.

### Water supply



Below: LP gas cylinders stored under a house—Roleystone 2011.





## PLASTIC PIPES HAVE MELTING MOMENTS

Exposed plastic water pipes and hoses may melt in the heat of a fire—just when you need them most. To avoid this:

- Bury plastic water pipes (PVC and poly pipes) at least 30 centimetres underground.
- Use metal hose fittings rather than plastic fittings.

## FIX THE FIRE TRAPS

Walk around your property imagining a bushfire is approaching in the middle of summer. Are there any fire traps you've overlooked?

Typical fire traps are:

- The woodheap—don't pile it against or near the house. Keep it a minimum of 20 metres from the house.
- All fuel containers need to be in a shed away from the house. Unless the shed is constructed to the appropriate bushfire attack level, it should not be within the BPZ.
- Have a firebreak around the shed.
- Rubbish—remove any timber and old junk lying around.
- Overhanging trees—prune branches that overhang the roof or touch the walls. Create a two metre wide gap between the tree and the wall or roof.
- Prune out dead material such as leaves and limbs in the shrubs.

### Fire traps



# House protection

## —upgrading of existing buildings

In a bushfire, most houses that are damaged or destroyed are from ember attack. Burning embers can travel long distances from the fire front—for example, in the Roleystone fire, a house 420 metres from the fire was destroyed.

Any gaps, cracks or areas where embers can lodge in or next to your home significantly reduce the building's ability to withstand bushfire attack.

Routine home and property maintenance is critical in preparing your home for the bushfire season each year however, even minimal building upgrades will significantly contribute to making more permanent improvements for bushfire protection.



DFES recommends that homes should be constructed to the appropriate potential bushfire attack level as described in the *Australian Standard 3959—Construction of buildings in bushfire-prone areas (AS3959)*. In many instances it is not possible to align the already constructed home to that required under the current *AS3959* unless there is retrofitting to achieve the appropriate level of protection.

### GAPS AND VENTS

**Minimal measures:** Seal all gaps around the house that are more than 3 mm wide with joining strips or flexible silicon-based sealant; install mesh flywire on vents made from corrosion resistant steel, bronze or aluminium.

**Additional measures:** Engage a relevant industry expert to install a sprinkler system to the outside of your house to the *AS 5414 – Bushfire water spray system standards (external sprinkler system)*.<sup>4</sup>

### WALLS

**Minimal measures:** Install sarking with a flammability index of not more than 5 behind weatherboards or other external cladding when they are being replaced for maintenance or other reasons.

**Additional measures:** Replace wall materials with non-combustible materials; install sarking with a flammability index of not more than 5 behind weatherboards or other external cladding for the entire house.<sup>4</sup>

### SUBFLOOR

**Minimal measures:** Removal of combustible materials under floors and keeping areas clear and accessible.

**Additional measures:** Enclose subfloor with non-combustible materials.<sup>4</sup>

### DOORS

**Minimal measures:** Install weather strips, draught excluders or draught seals at the base of side-hung doors.

**Additional measures:** Replace external doors with non-combustible or solid timber doors with minimum thickness of 35 mm and compliant with the requirements of *AS3959 Construction of buildings in bushfire-prone areas*; replace or over-clad parts of door frames less than 400 mm above the ground, decks and similar elements or fittings with non-combustible materials; install weather strips, draught excluders or draught seals at the base of side-hung doors.<sup>4</sup>





An example of a home damaged by embers entering through gaps in the roof.

## ROOFS

**Minimal measures:** Close in spaces between eaves that lead to the roof space; seal around roofing and roof penetration with non-combustible materials; install sarking with flammability index of not more than 5 beneath existing roofing when it is being replaced for maintenance or other reasons; install gutter and valley leaf guards that are non-combustible; use wire mesh capping on chimneys.

**Additional measures:** Replace fascia and roof materials with non-combustible materials; install sarking with flammability index of not more than 5 beneath existing roofing.<sup>4</sup>

## EVAPORATIVE AIR CONDITIONERS

If you live near bushland (within 500 metres) and have a roof mounted evaporative air conditioning unit, your home may have an increased risk of ember attack.

The filter pads in evaporative air conditioners are made from cellulose material and are therefore a potential source of fuel for travelling embers. If air conditioners draw in embers and the filter pads ignite, the unit may collapse into the roof and the fire may spread throughout the house.

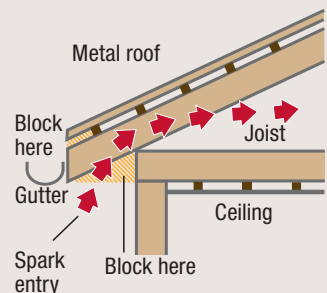
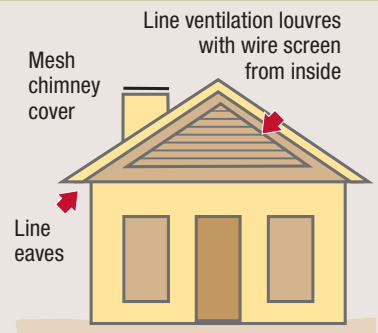
Install a non-combustible ember protection screen to your evaporative air conditioning unit using a unit cover, an external screen or an internal screen. DFES consider that external screens are the most effective option.

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For more information, see the *DFES Info Note on Ember Protection Screens* available on the DFES website.

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### Protect house



## SOLAR PANELS

Ensure that rooftop solar panels are fitted so that there is sufficient gap between the roof surface and solar panel such that burning embers cannot be caught underneath the panel.<sup>5</sup>

If you have a grid-connected solar system on your roof and you live in a bushfire threat area, there are some extra precautionary measures you can take. If you decide to leave early before the onset of bushfire (more than a day's notice) the following can be undertaken. In this situation you can follow the 'shutdown procedure' when leaving your house, which should be marked on your inverter or meter box:

1. Turn off the solar supply mains switch.
2. Turn off the normal supply mains switch.
3. Turn off the PV array isolator.

If you have a stand-alone solar system on your roof, you may have a battery storage that can also be disconnected prior to a bushfire threat. In this situation, you can take the following steps to shut down your stand-alone solar system and battery storage:

1. Turn off solar array.
2. Turn off inverter.
3. Follow battery shutdown procedures to isolate the battery bank.
4. Disable the generator from starting if it has auto start.

These above steps are only to be followed if you have a day or more advance warning that you will need to leave your house.

These steps are only to be followed if you have a day or more advance warning that you will need to leave your house.



**Remember:** Do not attempt to turn your solar power system back on after your house has been subject to bushfire attack—the attack could be embers, smoke, radiant heat or flame.

You should contact your Clean Energy Council accredited installer to have your system recommissioned. If your solar panels have suffered damage, attempting to turn them back on could result in a lethal electric shock.<sup>6</sup>



## WINDOWS

Ordinary wire flyscreens, fitted on external windows reduce radiant heat (which can shatter glass and melt the seals) and keep out burning embers.

**Minimal measures:** Install mesh with a maximum aperture of 2 mm, made from corrosion resistant steel, bronze or aluminium to all external doors and windows.

**Additional measures:** Install appropriately tested shutters to external doors and windows; replace glass with toughened or laminated safety glass; replace overhead glazing with 'Grade A' safety glass as described in *AS 3959* for your bushfire attack level (BAL).<sup>4</sup>

## EXTERNAL STRUCTURES

External structures such as sheds should be located outside the BPZ unless it is constructed to withstand the BAL and be more than 10 metres from the main dwelling.<sup>4</sup>

## DECKING

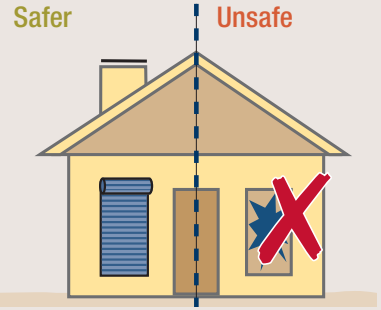
Decking should be compliant with *AS 3959* construction materials and standards for the potential BAL.<sup>4</sup>

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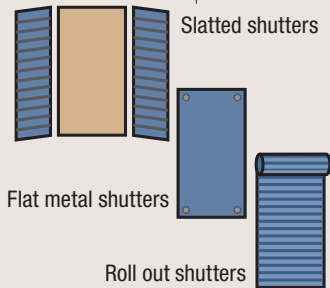
For more information on protection measures and appropriate materials, refer the *Australian Standard 3959—Construction of buildings in bushfire-prone areas*.

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## Protect windows



Protect windows with shutters



Below: Deck damage as a consequence of being constructed from inappropriate materials for the potential BAL.



# Building in bushfire threat areas

If you are going to build in an area that is a bushfire threat, then you are in the optimal position to assess your bushfire protection requirements prior to building and applying the appropriate measures to reduce your risk of bushfire attack on your home.

There may be existing features in the landscape that you can use to reduce the potential impact on your house in a bushfire, or there may be sites that have greater risks that will need to be carefully considered prior to purchasing.



From choosing your house site right through to house design and landscaping, DFES strongly recommends that the house be built to standards described in *Australian Standard 3959—Construction of buildings in bushfire-prone areas*, and bushfire risks are addressed in accordance with *Planning for Bushfire Risk Management Guidelines*.<sup>2</sup> The five key bushfire hazard management issues for new development are outlined below.

## FIVE KEY BUSHFIRE HAZARD ISSUES TO CONSIDER

The *Planning for Bushfire Risk Management Guidelines*<sup>2</sup> outline five key bushfire management issues that need to be considered when you are planning to build in a bushfire threat area:

1. Location
2. Vehicular access
3. Water
4. Siting of development
5. Design of development.<sup>2</sup>

### 1. LOCATION

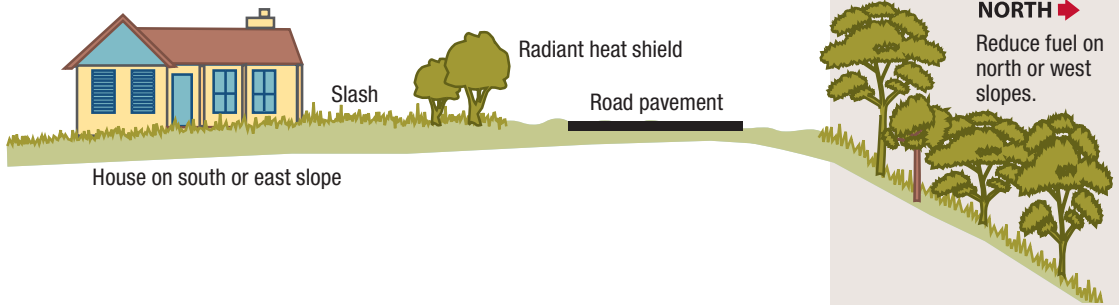
The location of a new development should be in areas where the bushfire hazard does not present an unreasonable level of risk to life and property. That is, the development is not located on land that is subject to extreme bushfire hazard by which appropriate bushfire attack level construction standards are hard to achieve or are excessively costly.

The lower the bushfire hazard, the less modifications are required to keep your home safe.

There may be existing features in the landscape that you can use to reduce the potential impact on your house in a bushfire, or there may be sites that have greater risks.

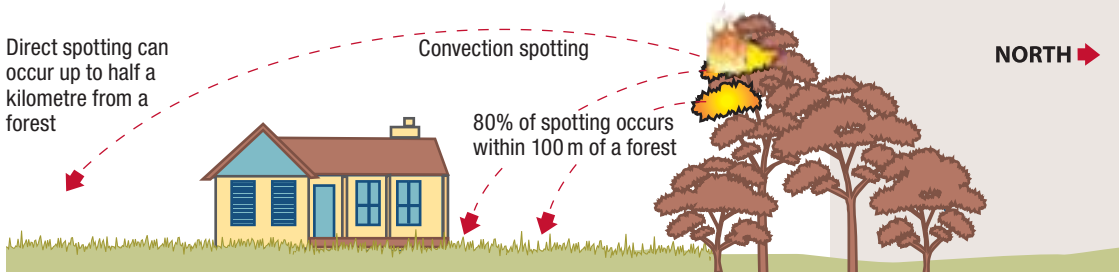
## Beware of hilltops

The steeper the slope, the faster a fire will travel up it, so it is risky to build on the top of hills or ridges. The lower down the hill, the safer you are. Flat country is the safest.



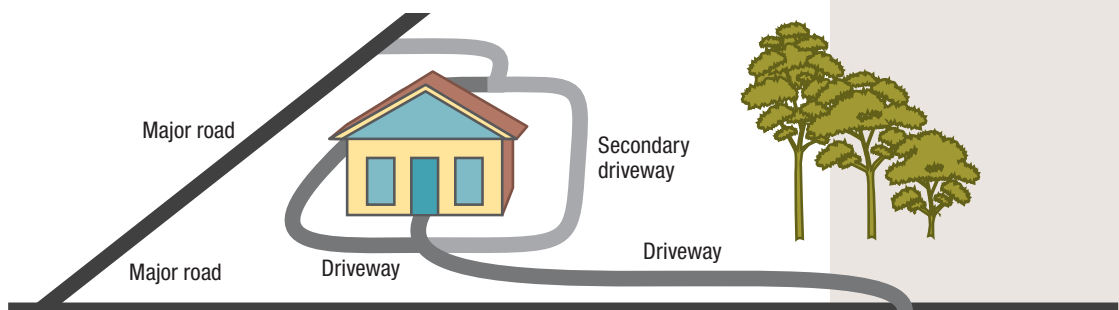
## Keep clear of forests and woodlands

Forest and woodland fires can cause 'ember attack' or 'spotting' (spot fires from burning embers—for example, bark and leaves) for an extended distance down wind, possibly up to half a kilometre. The greatest risk of spotting is closest to forests and woodlands which have a high fuel load. Grassland does have short distance spotting characteristics.



## 2. VEHICULAR ACCESS

Roads can easily be blocked by fire, smoke and falling trees. It is important to ensure that vehicular access into and out of your new house site is safe and easy to navigate in the event of a bushfire. The first way to address this is to make sure there are at least two ways in and out of your property that connect to a public road. Fire trails and access tracks may be established to separate the bushfire hazard from the house site and provide access within and around the edge of the site. Consider installing a fire gate between your property and any neighbouring properties so that you and the fire services have alternative access routes.



### 3. WATER

Access to adequate water supplies will enable life and property to be defended in the event of a bushfire. Where mains water supply is not available, or for extra water security, a water tank should be installed, preferably with a fuel powered pump attached. As well as being an alternative permanent supply of water, swimming pools and dams located close to the house can act as buffers between the house and bushfire hazard.

More information about water supply can be found on page 33.



As well as being an alternative permanent supply of water, swimming pools and dams located close to the house can act as buffers between the house and bushfire hazard.

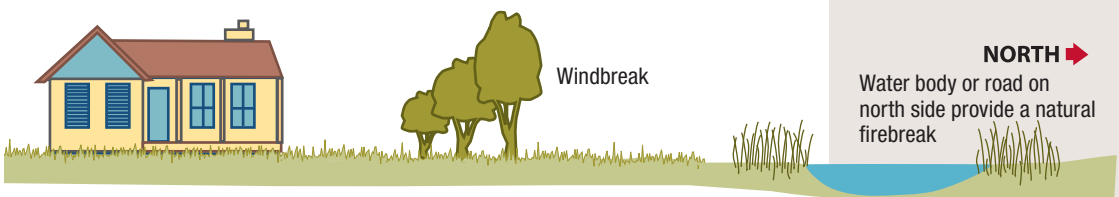
### 4. SITING OF DEVELOPMENT

The siting of your new house, including paths and landscaping, should be positioned such that it minimises the bushfire risk to life and property. Before you choose a site, weigh up its good and bad points. Is there a windbreak you can use to protect your house? Is there a nearby stream or dam? It may be preferable to build beside a body of permanent water so that the water is placed between the house and the likely direction of a bushfire. Be aware that if the water source dries out in summer it can provide extra fuel for the fire and increase the risk.

In steep, scrubby, fire-prone bushland you'll need extra fire protection. Remember, good siting is the key to protecting your new home from bushfires. Houses on ridges in bushland should be located on the opposite side to the likely direction of bushfires (see below). For this reason also reduce fuel regularly on the side of the ridge which faces the likely direction of bushfires.

The prevailing afternoon breeze in summer presents the **most common threat** as it fans bushfires when fuel is at its driest. Unstable atmospheric conditions that create less common north-west winds in summer can lead to the **most destructive bushfires**.

In a bushfire, most houses that are lost are from ember attack.



House is sited to take advantage of protection from the existing windbreak.

## 5. DESIGN OF DEVELOPMENT

Once you have chosen your house site, DFES strongly recommends that the house be built to standards described in *Australian Standard 3959—Construction of buildings in bushfire-prone areas*, and in accordance with *Planning for Bushfire Risk Management Guidelines*.<sup>2</sup>

In a bushfire, most houses are lost from ember attack. Apart from the direct flame and radiant heat of bushfires, buildings can be ignited by embers which catch on windowsills, in gaps and cracks, sheltered recesses and doorways or under loose roofing or verandahs. These embers start small fires that can go unnoticed and burn down a home from the inside out.

### Simple shape, single storey

The safest houses have smooth outside walls with no gaps or spaces and a low-pitched roof with no level changes. Single-level houses are generally safer than split level.

### Roofing materials

Metal sheeting is the best—it can withstand falling trees better than other roofing materials and it's easier to close off from embers. If you use tiles, they need to be well fitted (in accordance with *AS2050: Installation of roof tiles*), to minimise gaps and with fire-resistant sarking beneath them. Avoid roofing materials that catch fire easily like timber shingles, shakes and asphalt shingles. A low-profile roof reduces wind turbulence, so avoid or minimise level changes and valleys where leaves and debris can gather.

If your house is in dense bushland, it's worth taking extra measures to protect the rafters from burning. Ensure that you only use materials described in *AS3959* for the potential BAL on your home.

### Skylights and air conditioners

Plastic skylights may melt and glass skylights may break, letting the fire in. If you must have a skylight, use the materials described in *AS 3959* for your BAL and circumstances.

Evaporative air conditioners should be turned off after the pads have been made wet when a bushfire approaches so smoke and sparks are not drawn into the unit. Air conditioners containing flammable materials should be covered with a suitable ember protection screen to prevent entry of burning embers.

See the *DFES Info Note on Ember Protection Screens*.



Single level houses are generally safer than split level.



A low-profile roof reduces wind turbulence

## Under floor spaces

Houses on stilts can enable embers, radiant heat and flames into the spaces beneath the floor. These areas can be fire traps unless the area beneath the house is appropriately enclosed. Air turbulence and flammable material under the house can provide a fire with access to your flooring. The safest option is to build on a concrete slab. If stilts are a necessary part of your house design, keep the floor as close to the ground as possible. Enclose the under floor space and make sure no flammable materials build up under or in the subfloor.

## Use fire safe building materials

Houses made of brick, mud brick, fibro and weatherboard are all acceptable (paint on the weatherboard has to be kept in good condition) in some situations. Vinyl weatherboards, rough timber and some other claddings however, may cause problems in a fire by warping or catching sparks. Only use the materials described in *AS 3959* for the BAL assessed for your site and ensure the materials are used appropriately.

If possible, use bricks or other fire-resistant material at ground level around the walls. If you use cladding that may cause problems in a fire—increase the building protection zone by two or three times if possible, paying particular attention close to the house.

## Timber—rough is risky

If possible, steer clear of elevated timber decking, stairs or raised timber verandahs. If you do use them, remember that rough sawn timber catches dust, which is highly flammable.

Timber can be used safely if you:

- ✔ Use a dense hardwood timber like jarrah for exposed rafters and external timberwork.
- ✔ Give it a smooth or painted finish.
- ✔ Don't use flammable coatings or sealants like tar or resinous compounds, which may catch fire easily.
- ✔ Comply with the requirements of *AS 3959* for the BAL for your home.



For more information see the *Planning for Bushfire Risk Management Guidelines*<sup>2</sup> or contact your local government.





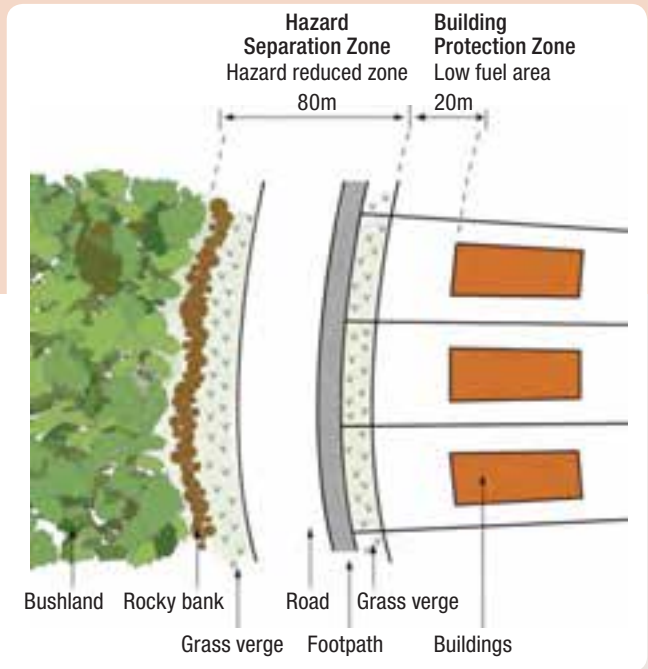
# Prepare your property

Along with choosing the right site for your new home and building or retrofitting to the appropriate construction standards for your bushfire attack level (BAL); you need to consider the landscaping design of your garden and property. The best bushfire planning can be undone by poor design and maintenance of the gardening landscape.

## Hazard Separation Zone

A Hazard Separation Zone (HSZ) is an area of reduced fuel adjacent to the Building Protection Zone (BPZ) of a house. Hazard Separation Zones assist in decreasing fire intensity and rate of spread and reducing the potential for crown or spot fires to develop close to the building.

The HSZ should be 80 m wide from the BPZ (particularly adjacent to forest or woodland) and kept to between 5 and 8 tonnes per hectare (t/ha) for jarrah/marri dominated forest and woodland, below 12–15t/ha in mallee heath and below 15t/ha in karri forest.



## General garden design

Highly flammable vegetation located too close to the house may expose a house to higher levels of radiant heat and flame contact during a bushfire. A well designed garden can increase your home's survivability, even if you plan to leave early.

It is necessary to plan the layout of your garden so that it does not contribute to the spread of bushfires.

There are four main ways to design or modify your garden to create a safer zone for your property during the bushfire season:

- Remove fuels.
- Landscape for safety.
- Selection and placement of plants.
- Use your trees.



# Remove fuels

The most important part of preparing your garden for the summer fire season is to remove fuels close to the house.



Fuel reduction activities include:

- Cutting all long grass and removing dead material from beneath and within shrubs and trees.
- Remove dead leaves and twigs from the gutters, under eaves and under the house.
- Move wood stacks, timber and rubbish away from the house.
- Do not store liquid fuels near the house (such as mower fuel).
- Mulched garden beds need to be kept damp so that the mulch itself does not become a fuel. It should be located away from vulnerable parts of the building (such as doors, windows and decks). Better alternatives to mulch include gravel, scoria, pebbles, shells or recycled crushed bricks.
- Use non-combustible pots and containers for plants that can be moved away from the house during the fire season.
- Other sources of fuel in a bushfire include objects such as caravans, sheds, barbeques and flammable outdoor furniture, which should be located away from the house.
- Shrubs should be placed 3 times their height at maturity away from the building.
- Shrubs should have the dead material pruned out of their crowns.



Heavy scrub fuels the fire.



Prune branches up to two metres off the ground to stop a ground fire spreading into tree tops.

# Landscape for safety

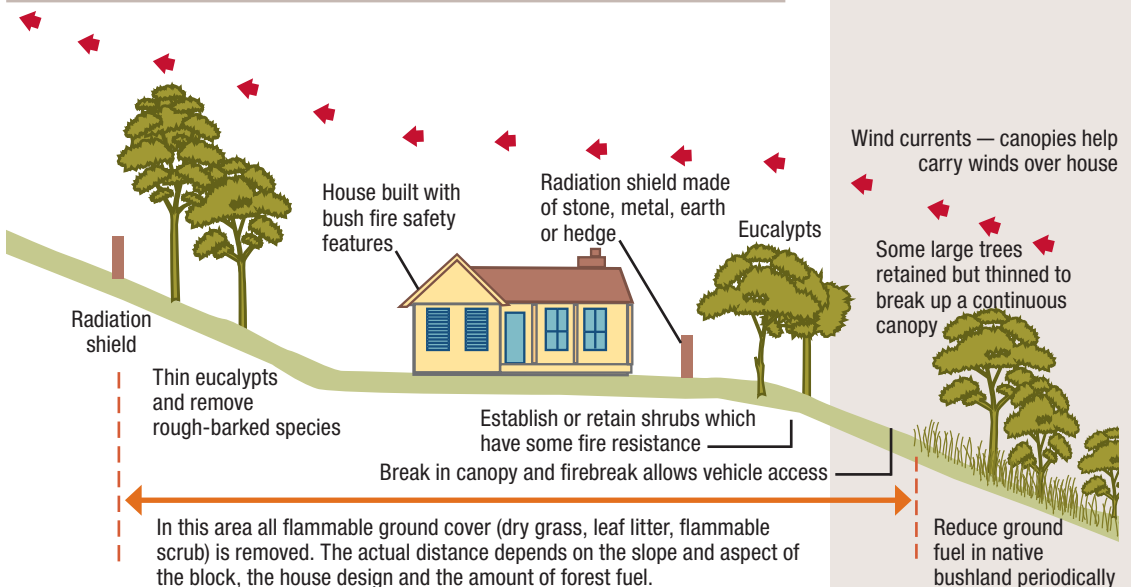
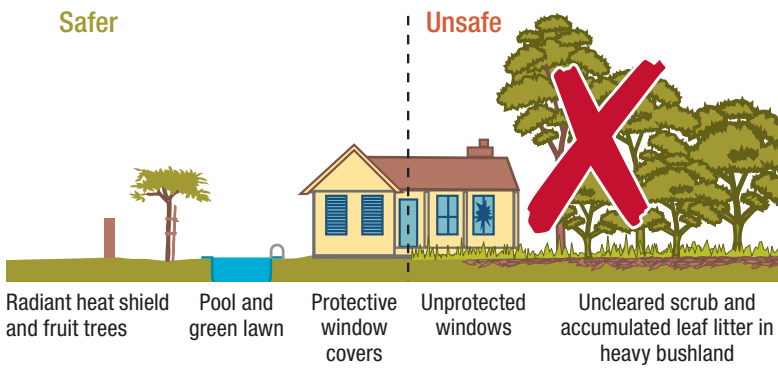
Plants and other flammable objects are potential fuels for bushfires and will compromise the protection of your house if placed inappropriately within the building protection zone.

You can build 'heat shields' and other features into the design of your garden to reduce fuel loads around your home.

- Use non-combustible materials such as stone, earth, concrete or galvanised iron for fences and retaining walls that can block radiant heat and embers.
- Use driveways or pathways made from materials such as concrete, gravel, clay or pebbles to provide separation between vegetation and your house.
- Green lawns can work as a low-risk ground cover close to the house, however it must be kept short and green as possible during the fire season.
- Design your garden so vegetable gardens, pools and patios are on the side of the house most at risk to bushfire.

See page 36 for more information about Firebreaks.

Build 'heat shields' and other features into the design of your garden to reduce bushfire fuel loads around your home.



# Selection and placement of plants

Although all plants will burn under the right conditions, low flammability plants may actually help to protect your home by:

- Shielding your house from strong winds.
- Catching burning embers before they reach your house.
- Reducing radiant heat levels.
- Reducing the likelihood of direct flame contact.

## PLANT SPACING

Fires spread easily when plants are placed close together because the radiant heat dries the surrounding vegetation enough for it to catch alight. A garden with continuous vegetation leading up to and surrounding the house will allow fire to spread from the garden to the house, placing the house at risk of catching alight.

Increasing separation between vegetation may include:

- Placing shrubs and other vegetation away from trees to reduce the likelihood of a 'fuel ladder' carrying fire from the ground into the canopy.
- Separating plantings so they do not form a continuous canopy and ensuring that these are separated by areas of low fuels (such as short, green lawns).
- Using paths, coarse mulch alternatives or short green lawns to separate garden beds and the house.
- Pruning branches, or 'skirting' trees to a minimum of 2 metres from the ground to increase vertical separation.
- Space at a distance three times the plant's height at maturity.

A garden with continuous vegetation leading up to and surrounding the house will allow fire to spread from the garden to the house.



## PLANT SPECIES

Some plants will burn easily and quickly while others may provide better protection for your home. Plants that provide the best protection in a fire contain plenty of water or salt in their leaves. Avoid plants containing volatile oils and those that have too many dead leaves and twigs.

DFES strongly encourages homeowners to contact their local nursery for advice, and recommends plants that have the following characteristics:

- grow in a predicted structure, shape and height for your particular area;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- are sparsely arranged;
- will not drop large amounts of leaves or limbs;
- have wide, flat and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and
- will not become a weed in the area.

## CHOOSE APPROPRIATE PLANTS

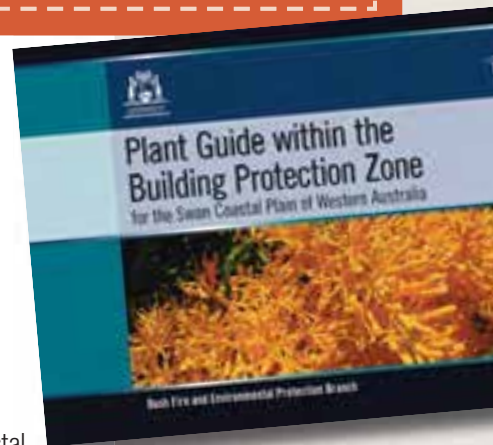
The DFES *Plant Guide within the Building Protection Zone for the Swan Coastal Plain of Western Australia* is a booklet designed as a planting guide for community members, gardeners, landscape designers and landscape managers throughout the Swan Coastal Plain, to protect houses from potential bushfires.

With this guide you will be able to choose and position plants at the appropriate distances from buildings to reduce the risk of bushfire damage. While specifically designed as a guide relevant to the Swan Coastal Plain, it may provide indicative species and separation planting options for the forest/urban interface zone to the east of the Swan Coastal Plain.

Plants in the garden may grow more vigorously than plants in their natural state due to increased moisture and nutrients.

## FRUIT AND VEGETABLES ARE FINE

A vegetable patch makes a good green firebreak, so locate it, if you can, on the side of the house most at risk from bushfires (consider fuel levels as well as threats caused by wind direction). Fruit trees give excellent fire protection—plant them around the house but keep the crowns at a minimum 2 metre distance from the building. If you're starting an orchard, locate it on the side of the house that receives the prevailing afternoon summer wind so it can act as a windbreak.



Fruit trees make a good firebreak.



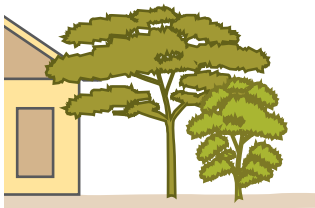
# Use your trees

Trees can be useful in a bushfire provided they are; carefully selected, properly maintained, and located at a safe distance from the house. Using appropriately placed trees as a wind break can reduce wind speed, absorb radiant heat, and filter burning embers. The trees should carry the hot fire laden winds up and over your house, but not catch fire. If they catch alight, you do not want them to spread fire to other trees or the house.

## TREE PLANTING AND MAINTENANCE GUIDELINES

- Maintain a minimum 2 metre gap between your house, other buildings, water supplies and trees.
- Do not allow branches to overhang the roof.
- Separate tree canopies by at least 10 metres.
- Avoid trees with loose, stringy or ribbon bark.
- Prune lower branches or 'skirt' trees to minimum of 2 metres above the ground to increase vertical fuel separation.
- Plant new trees at a safe distance from powerlines—the distance in metres should be 1.5 times the tree's mature height.
- Do not plant shrubs underneath trees.
- Periodically clean up in and under trees by removing dead leaves and litter—rake up leaves, remove hanging bark and dead branches.
- If your house is close to forest, make sure there's a good fuel reduced zone (up to 100 metres depending on the construction standard of your home) between the forest and your own trees.

### Unsafe



### Safer



For more information on using trees as windbreaks, see page 27.

Using appropriately placed trees as a windbreak can reduce wind speed, absorb radiant heat and filter burning embers.

# Windbreaks

## TREES AS WINDBREAKS

Windbreaks can be beautiful to look at and also useful for protecting houses, livestock and crops. Trees that are planted for windbreaks are most effective in a fire of low to moderate intensity and may:

- reduce wind speed;
- trap burning embers and flying debris; and
- absorb radiant heat.

Here's how they do it, and what you need to know to get the most from your windbreaks...

### WIND SPEED

When the wind hits a row of trees, it is slowed down and the trees are able to trap anything the wind is carrying. The amount of protection a windbreak can offer depends on the density of the trees.

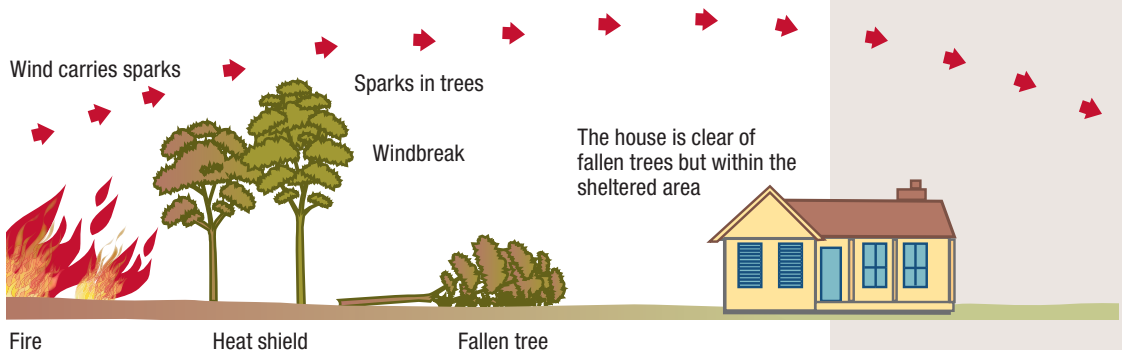
A dense windbreak will slow the wind speed initially but will leave a smaller area behind the break, causing turbulence and the movement of embers over the trees rather than trapping them. Greater wind speeds will move over a sparser wind break; however, it will divert the wind over a longer distance behind the break. If you're planting a windbreak around your home, 30–60% of the wind should be allowed to penetrate to achieve maximum effect of reducing speed whilst catching burning embers. You will need to manage the leaf litter from these trees, so they do not become a fire fuel.

### BURNING EMBERS

In a bushfire, the greatest risk to your home could be burning embers carried by the strong winds. Trees can catch many of these sparks and burning twigs before they reach the house, so long as the plantings are not too dense.

In general, plants with green leaves contain a greater quantity of water, and therefore are usually safe from catching fire from flying embers, unless there is too much dead material (twigs, leaves and loose bark) on the tree.

Trees that are planted for windbreaks are most effective in a fire of low to moderate intensity.



## RADIANT HEAT

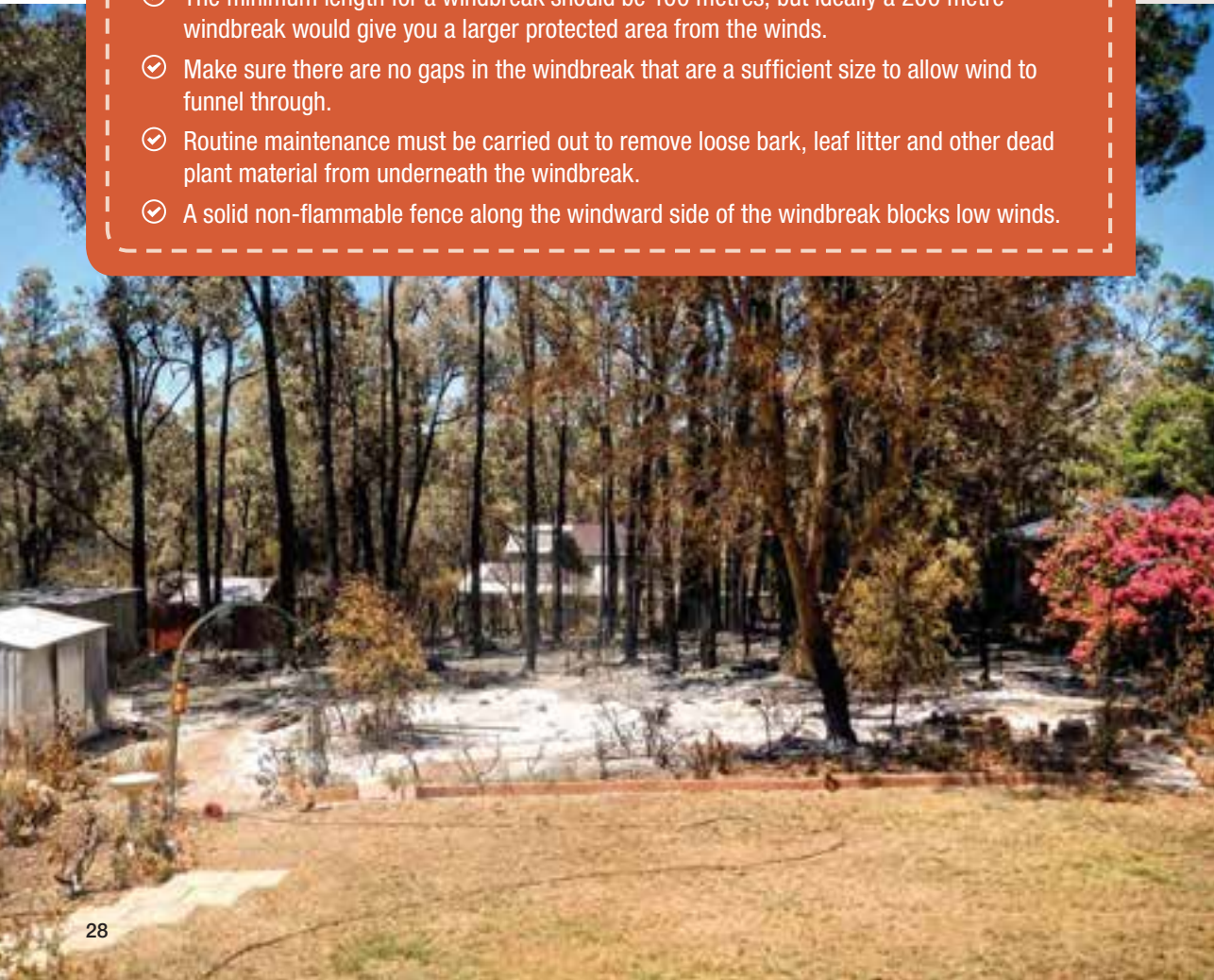
A row of trees provides dense foliage that acts as a shield from radiant heat. Under trees where roots have suppressed the grass, there is usually a bare area that acts as a natural firebreak, helping to slow down the flames. Therefore it is important to keep trees free of loose bark and other dead material. The area beneath the trees also must be kept free of fine, dead and aerated vegetation. The trees must be sufficiently far away from the house so they will not affect the building with radiant heat.



Remove dead leaves, loose bark and other litter.

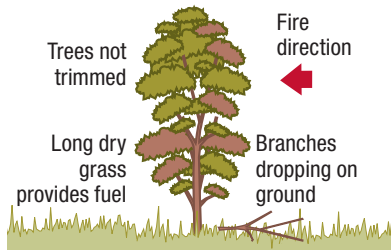
### GETTING THE MOST FROM TREES AS WINDBREAKS

- ✓ Ensure adequate separation between a building and the windbreak—do not place a wind break in the Building Protection Zone.
- ✓ Tree species should be carefully selected (highly flammable trees will become a fire hazard).
- ✓ Trees should be pruned or skirted to at least 2 metres from the ground.
- ✓ Wind breaks should be planted at right angles (90°) to the prevailing winds.
- ✓ Solid windbreaks can cause turbulence—a windbreak that allows approximately 30–60% of the wind to pass through is recommended.
- ✓ The minimum length for a windbreak should be 100 metres, but ideally a 200 metre windbreak would give you a larger protected area from the winds.
- ✓ Make sure there are no gaps in the windbreak that are a sufficient size to allow wind to funnel through.
- ✓ Routine maintenance must be carried out to remove loose bark, leaf litter and other dead plant material from underneath the windbreak.
- ✓ A solid non-flammable fence along the windward side of the windbreak blocks low winds.

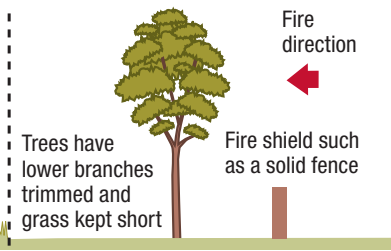




### This windbreak is likely to burn



### This windbreak is less likely to burn



## FENCES AS WINDBREAKS OR CLOSE TO THE HOME

A solid non-flammable fence along the windward side of the wind break blocks low winds and helps to protect the trees from burning.<sup>7</sup> CSIRO research into the performance of residential boundary fencing provided the following outputs:

- From a performance ranking, the Colorbond® steel fencing had an insignificant heat release, followed by new hardwood, old hardwood, old pine and new pine.
- Colorbond® steel fencing was the best performer due to non-combustible material; it maintained structural integrity as a heat barrier; and did not spread flames laterally or contribute to fire intensity.
- Closed-paling hardwood fencing maintained a radiant heat barrier during radiation-only exposures. Where flame contact of the fence occurred, flame emission from the fencing provided additional radiant heat on the structure.
- Open-paling hardwood fencing were effective in reducing radiation exposure, however they provided little barrier during direct flame contact.
- Treated pine has the lowest performance. The integrity of the fence was compromised under leaf litter attack with a potential increase in risk to the adjacent structure.<sup>7</sup>

# Tree and powerline safety

Trees and powerlines are a dangerous combination. Fires can start in a number of ways from trees and powerlines coming together:

- Branches shorting out between wires.
- Branches causing the lines to clash together.
- Power leaking down a tree.
- Small branches bridging across insulators in high winds.
- Lines brought down by falling trees.



## LEGAL RESPONSIBILITIES

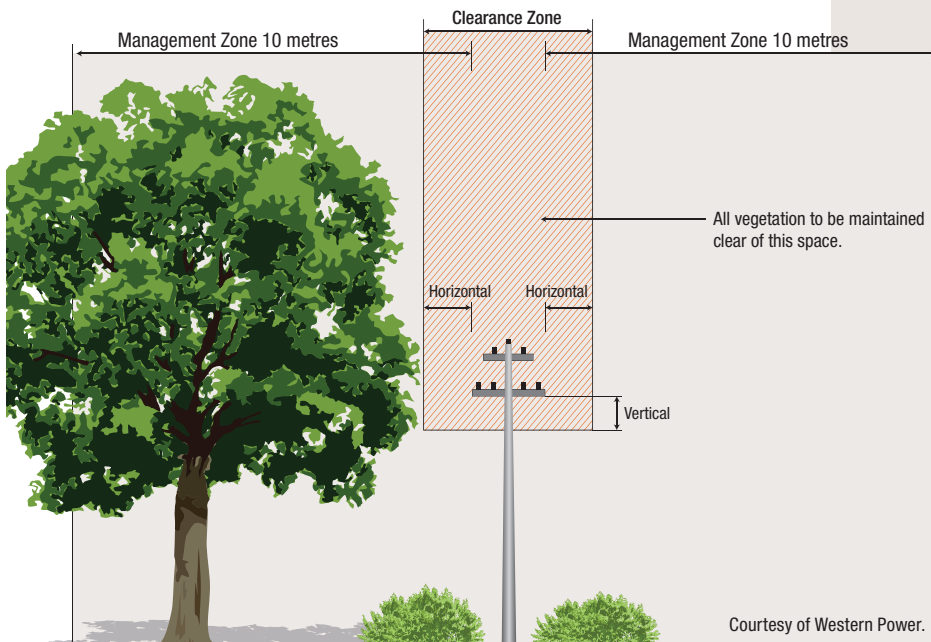
The owner/occupiers of land are responsible for keeping tree branches of any trees of their property at a safe distance from powerlines. If you are renting your home, you should contact your landlord to see if tree maintenance is covered in your rental agreement or if it is their responsibility. Local government and Western Power are responsible for the control of vegetation beyond the boundaries of private property, including street verges.

## SAFE DISTANCES IN RESIDENTIAL AREAS

The minimum recommended safe distance between trees and powerlines is 5 metres, although this distance may vary according to your area and distance between power poles. The minimum distance has been chosen to prevent tree branches coming into contact with powerlines under strong winds.

Please refer to [www.westernpower.com.au](http://www.westernpower.com.au) for specific clearances for your area.

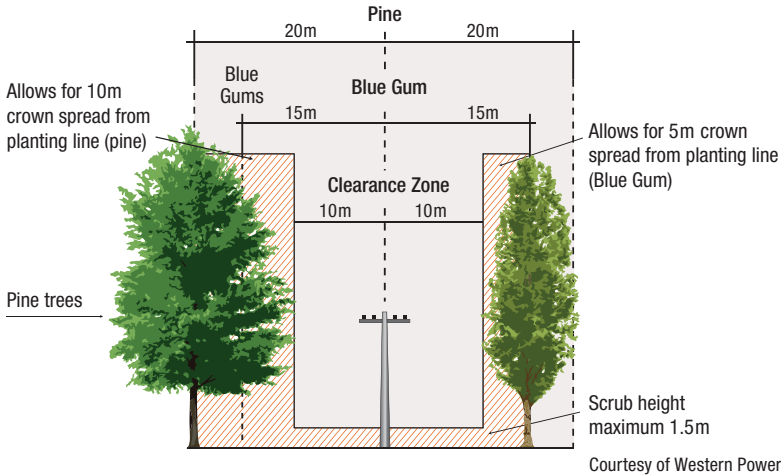
### Powerline clearance



## SAFE DISTANCES IN RURAL AREAS

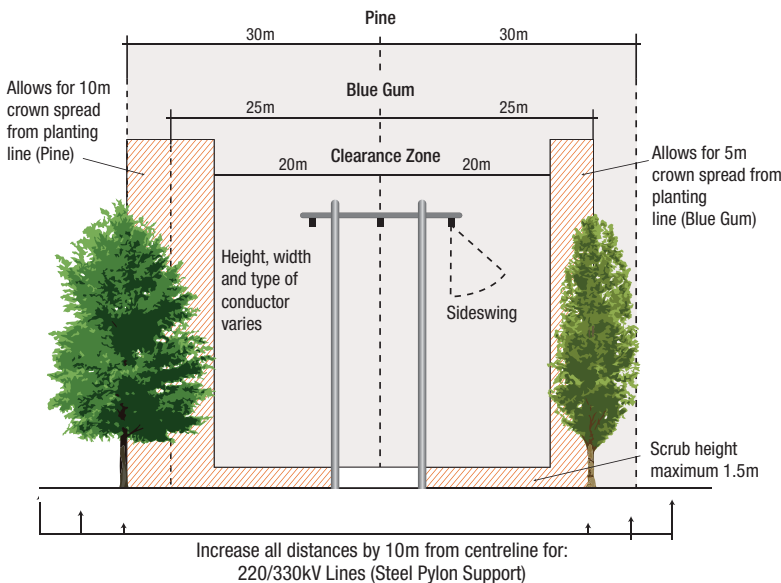
In rural areas, distribution lines with a single pole support require greater distances between vegetation and powerlines. The clearance is recommended to be 10 metres to the side of the single pole line. This distance from single pole distribution lines for plantations of Blue Gums and Pine trees increases (see diagram).

### Rural area distribution lines (single pole support)



For distribution lines that have double pole support (66/132 kV), the clearance zones are increased further with general clearance set at least 20 metres from the centre line and scrub height either side of the poles to be no higher than 1.5 metres. The clearances increase again for Blue Gums and Pine plantations. For high voltage Steel Pylon Support lines (220/330 kV) all distances need to be increased by 10 metres from the centreline (see diagram).

### 66/132 kV lines (double pole support)



## TREE PLANTING NEAR POWERLINES

If you consider the species you choose to plant on your property carefully, and locate them well away from powerlines, you will reduce the need for pruning to keep them clear of powerlines. If you can't avoid growing trees near powerlines, they should be species that grow to a maximum of 3 metres tall.

Visit [www.westernpower.com.au](http://www.westernpower.com.au) for more information on appropriate species to plant near powerlines.

## VEGETATION INSPECTIONS

Western Power regularly inspects vegetation close to powerlines across its entire network. If they consider that trees on your property are growing too close to their powerlines, Western Power will issue you with a notice to have these trees pruned. It is highly recommended that you use a professional tree arborist to prune branches that are on large trees or within the clearance zone of a powerline.



### IF YOU SEE A FALLEN POWERLINE

Contact Western Power immediately on 13 13 51 and notify nearby residents and passers-by of the danger.

It is highly recommended that you use a professional tree arborist to prune branches that are on large trees or within the clearance zone of a powerline.



# Water supply — vital for home protection

If you've made the right preparations, the garden hose can save your house in a bushfire. But you may need an emergency water supply because in most bushfires the mains water supply (if you have it) can fail and electric power supplies can be cut off. If you are planning to actively defend your home, you will need to have an adequate independent water supply.

Additionally it is strongly encouraged that farmers and landholders have water supplies available and accessible to emergency services.



## INDEPENDENT WATER SUPPLY

If your house is on reticulated mains water, you can run it through a storage tank, so that the tank is always full. If you use tanks for your domestic supply, make sure that a water supply for personal and home protection is always kept in reserve. A swimming pool or dam is fine if a diesel or petrol pump is available to use.

## WATER STORAGE TANKS

Water storage tanks should be made of concrete or steel and supply pipes should be flame and heat resistant. Exposed PVC pipes and fittings will melt in the heat of a bushfire to the water line. According to research conducted by the Bushfire Cooperative Research Centre, steel construction tanks perform best when exposed to bushfire conditions.<sup>8</sup>

Where possible, fittings, couplings and adaptors for the tank should match specifications for fitting onto fire trucks.

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More information can be found on the DFES website or by contacting your local government, Bushfire Brigade or Fire and Rescue for more information.

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## WATER PUMPS

If you lose mains power, you will need a generator or a petrol/diesel pump to power your water supply for actively defending your home. A generator will need to have more than a 1.5 kVA capacity to effectively power an electric pump, or you can use a small petrol or diesel pump to utilise your water supply and hoses effectively. Both pumps and generators will need to be shielded from the high radiant temperatures caused by bushfire. This can be done by enclosing them in a shed or inside another appropriate cover.

Remember to keep your pump and generator maintained throughout the year, particularly before and during bushfire season. Ensure everyone who is likely to stay and defend your property knows how to start and operate the pump and generator.

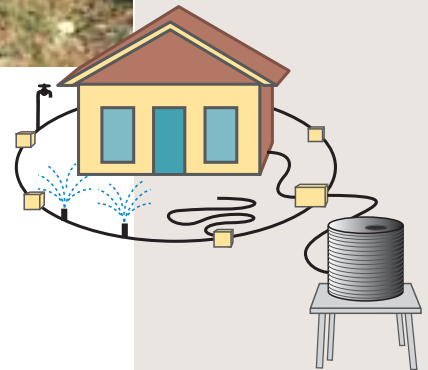
Remember to keep your pump and generator maintained throughout the year.



## GARDEN SPRINKLERS AND HOSES

Hoses from pumps should be long enough to reach all corners of the home and should be fitted with a nozzle able to deliver 30 to 100 litres per minute. Fire hoses should be durable, flexible and able to withstand high temperatures and UV exposure. Make sure you have enough hoses to cover the entire house. If they are plastic, you'll need to take them inside while the fire front passes, to prevent them melting.

Run the reticulation system in a loop right around the house. Place gate valves and hose couplings at each corner, so you can deliver the full force of water wherever you need it. If you have a garden sprinkler system, direct the sprays on those parts of the house most at risk—the windows, eaves, LP gas cylinder and verandah. Remember that plastic water pipes are likely to melt—use metal pipes or bury plastic pipes at least 30 cm underground.



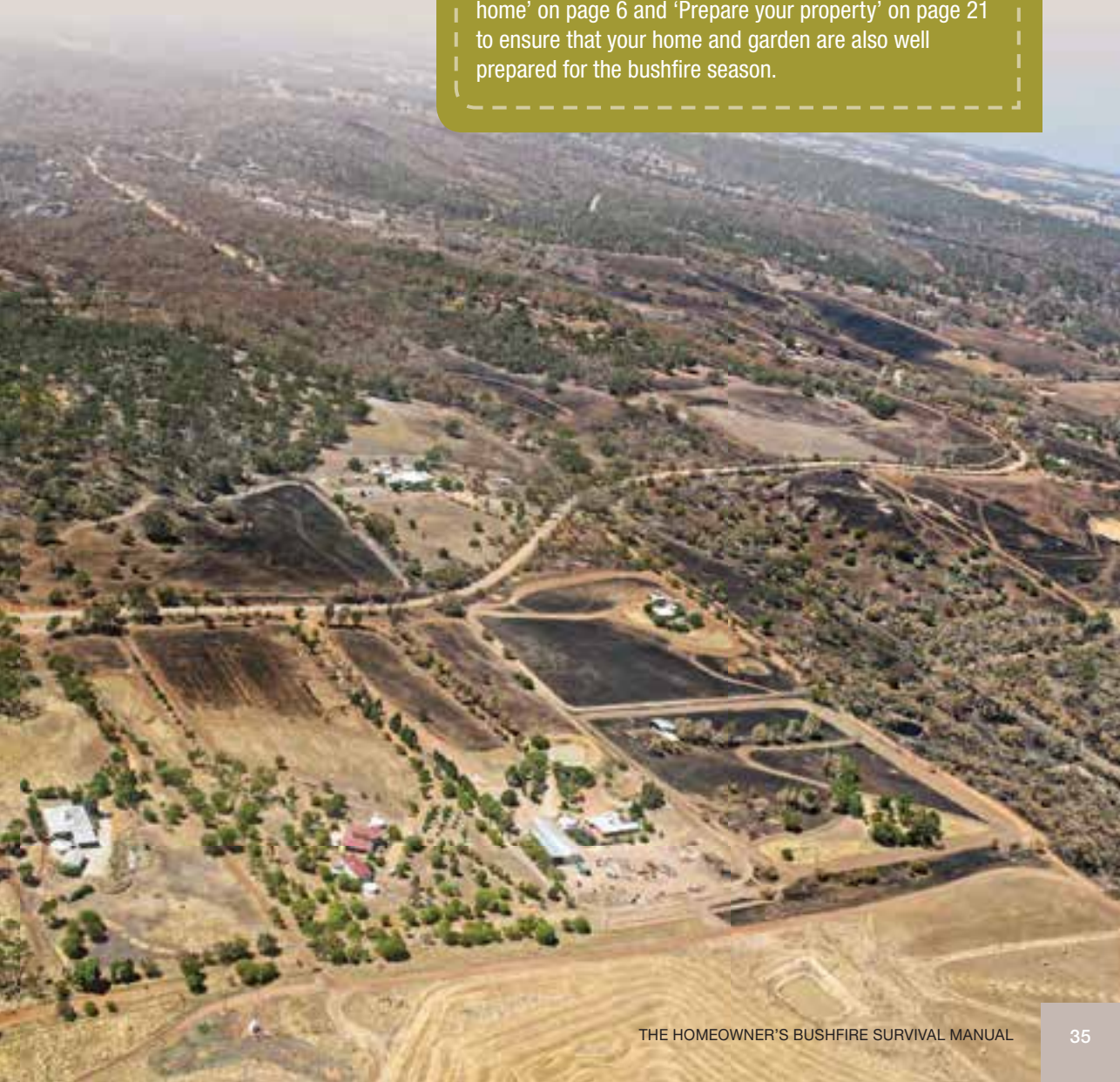
Use metal pipes or bury plastic pipes at least 30 cm underground.

# Prepare your rural property

The layout of your rural property can be used to protect the homestead and other nearby buildings. The following advice for rural landholders focuses on specific bushfire considerations for rural properties such as maintaining machinery and equipment, and protecting livestock and crops.

It also provides advice on taking measures to protect your rural property from the threat of bushfire attack and ensuring additional care is taken to prevent a bush or grassfire from starting on your land.

When considering the protection for your rural property, you should first consider the advice under 'Prepare your home' on page 6 and 'Prepare your property' on page 21 to ensure that your home and garden are also well prepared for the bushfire season.



# Reducing fuel loads around your assets

Ensure you have an adequate Building Protection Zone around your home (page 6) and equally consider the fuel loads around your farming assets such as sheds, fences, stables or pens. Increase the protection of these assets by removing vegetation in the immediate surrounds, raking up leaf litter and twigs and keeping grass cut or grazed short.

Options for reducing fuel loads may also include strategic grazing, slashing or herbicide use.

## STRATEGIC GRAZING

Grazing may be the cheapest or easiest way of reducing dry paddock grass, which may become a fire hazard. Consider heavily grazing house paddocks in spring and summer.

## MOWING OR SLASHING

Slashed grass must be removed to prevent it becoming a fire hazard. Slash any long grass near the house, along fence lines and access tracks or driveways.

## HERBICIDES

Chemical firebreaks may be an option in areas that may be prone to soil erosion. Applying herbicide after the plants have grown to a short height and when the roots have developed can assist in producing a firebreak and hold the soil together. Choose a chemical that is non-residual and will not cause environmental harm.

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Prescribed burning can also be useful in reducing fuels on your property, see page 39 for more information.

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Create a low fuel zone by mowing or slashing



# Firebreaks

Firebreaks usually have more than one purpose which may include:

- A mineral earth or reduced fuel break that helps prevent landscape fire entering your property.
- A mineral earth or reduced fuel break that helps prevent a fire starting on and leaving your property.
- Defined boundaries for prescribed burning.
- Access to critical areas so that fire suppression activities can be undertaken.

Firebreaks will not stop a major fire from spreading, but they can prevent small fires from escaping your property and landscape fires from entering. Most importantly, firebreaks provide safer access for yourself and firefighters to conduct fire suppression activities across your land.

Remember to allow for or manage the growth of trees, shrubs and grass when planning firebreaks.

Green summer crops can also provide a natural firebreak between the house and the most likely direction of bushfire.

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Contact your local government for your specific firebreak requirements.

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# Property access

**A number of measures need to be in place so that emergency services can locate and access your house and property in the event of a bushfire.**

Make sure your property is identifiable at the entrance by having clear signs at the front gate.

The width of access tracks (which may also be firebreaks) and gateways should consider the dimensions of fire trucks and tankers.

Also make sure you have more than one access road into and out of your property in case one of them becomes obstructed.

Consider the dimensions of fire trucks and tankers when making access tracks, gateways and firebreaks.

# Farm fire safety

## HARVESTERS

The most common cause of harvester fire is crop material collecting on hot engine components such as the manifold, exhaust or turbocharger. Many of these fires can be prevented by conducting regular maintenance and cleaning checks and having fire suppression equipment readily available on the machines. You should also have a two-way radio and/or mobile phones (where there is a service) on all harvesting machinery and back at the homestead, along with emergency contact numbers.

Under the *WA Bush Fires Act Regulations 1954* harvesting machinery cannot be operated during prohibited or restricted burning times unless an approved fire extinguisher is carried on the machine. Check with your local government for specific fire suppression equipment requirements during harvesting.

On Total Fire Ban days, you can continue your farming activities provided that your local government has not imposed a Harvest and Vehicle Movement Ban. It is up to you to be aware of any bans that are in place in your local government area when you are harvesting or operating a vehicle.

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For more information on fire-safe harvesting, see the *Stay Ahead of Crop Fires* brochure and the 'Safe Harvesting' checklist on the DFES website.

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It is up to you to be aware of any bans that are in place in your local government area when you are harvesting or operating a vehicle.



## ELECTRIC FENCING

If dry fuels are close to electric fences, a spark jumping from one wire to another can start a fire. Check that electric fences are clear of grass and other vegetation, and operate them according to the manufacturer's advice. Remember it's good fire safety practice to switch off electric fences during times of extreme fire danger.

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Also refer to 'Tree and powerline safety' on page 30.

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## FUEL SUPPLIES

Keep fuel (e.g. petrol and diesel) away from haystacks and buildings. For large amounts of flammable fuels, use elevated storages or underground tanks supported by a bund to prevent spills leaking into the environment. Drums of fuel should be stored in a fully enclosed shed well away from the house.

# Livestock

**Where will you put your stock in a bushfire? Cattle, sheep and other agricultural stock need protection and refuge from bushfires.**

Before the fire season, plan a refuge for your stock:

- ✔ Maintain a heavily grazed refuge area where stock can be moved to during a bushfire—this could be the centre of a ploughed paddock, a grazed or green paddock or laneway.
- ✔ Consider a central laneway that will assist in stock relocation.
- ✔ If appropriate, leave internal gates open so that stock may move about freely to safety from the effects of the fire.
- ✔ Ensure they have access to drinking water and if possible a dam or creek where they can seek relief from radiant heat.
- ✔ Identify a stock relocation area (if different from the refuge area) where they can be fed after the fire has passed.

It is good fire safety practice to switch off electric fences during times of extreme fire danger.

Maintain a heavily grazed refuge area where stock can be moved to during a bushfire—this could be the centre of a ploughed paddock, a grazed or green paddock or laneway.

# Prescribed burning

Because Western Australia is so fire-prone, each summer there are restrictions or prohibitions on the lighting of fires in the open air. Prohibited burning times for a given area of the State are declared by the Minister and commonly operate within the bushfire season in the South of the State but vary in the North West, corresponding with the dry season during the Northern Winter. Restricted burning times for a given area of the State may be declared by the FES Commissioner whereby an appropriate permit will be required for burning to occur.

Check with your local government to ascertain the fire prohibition and restriction periods that apply to your district.

## Restricted or prohibited periods



### **DURING THESE PERIODS WHERE RESTRICTIONS ARE IN FORCE, YOU MUST NOT:**

- ⊘ Dispose of any burning tobacco, cigarette, cigar or match in circumstances that are likely to set fire to bush. Do not throw it from a vehicle under any circumstances.
- ⊘ Operate a tractor or self-propelled harvester unless its exhaust system is well maintained, fitted with a spark arrester and discharges exhaust emissions vertically upwards.
- ⊘ Light a campfire or cooking fire within three metres of a log or stump or unless there is a cleared area of at least three metres around the fire. Such fires are automatically prohibited on days when the fire danger forecast for the particular area is 'very high' or 'extreme'. Some local governments prohibit camp or cooking fires for part of the year.
- ⊘ Leave the fire unattended. Always extinguish the fire with water or earth before leaving.
- ⊘ Light a fire to burn bush, grass, stubble or undergrowth without a written permit.
- ⊘ Use welding apparatus of any kind, or power operated cutting discs of any kind unless there is at least one fire extinguisher situated at the site and all instructions issued by a local government fire control officer are complied with.



Your local governments may restrict or prohibit the above activity further.

# Total Fire Bans

On days when the Minister has declared a total fire ban for a defined area of the State, a person shall not light, maintain or use a fire in the open or carry out an activity that causes or is likely to cause a fire. This ban includes fires for which a permit has already been issued, campfires, cooking fires (including pizza ovens), barbecue fires, incinerators and rubbish fires.

# Controlled burning on your property

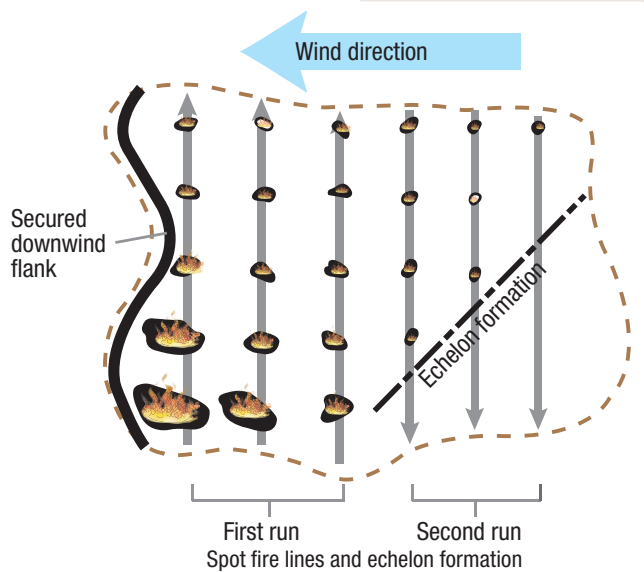
You will need a permit during the 'Restricted Burning Period,' so check who your local government representative is for your area. It's important to comply with the conditions of the permit.

Whether or not you have a permit, it's illegal to burn off on days of Very High, Severe, Extreme or Catastrophic fire danger.

Whether or not you have a permit, it's illegal to burn off on days of Very High, Severe, Extreme or Catastrophic fire danger.

Where you have the authority and expertise to burn on your own property, strip burning with spot ignition is best—but take great care by keeping the burn area small and always under control.

- Comply with permit conditions and seek advice from your local government.
- Plough or have a firebreak around the area to be burnt, have sufficient and appropriate firefighting equipment at hand (knapsack spray and hand tools and/or a firefighting unit), and burn back into the wind.
- Have a clear written plan of where you intend to burn and the results you are aiming to achieve. This will help you to determine the equipment you will need, the time of day to undertake the lighting and the ignition method (strip and spot distances) to carry out the burn safely.
- Advise your neighbours of any possible smoke hazards. Ensure that smoke from the burn does not produce a smoke nuisance for your neighbours and others.
- You'll need enough people with you to keep the fire under constant control.
- Mop-up standards must be adhered to—that is, ensuring that the fire is not left unattended until it is completely out.
- Consult with your local fire brigade—they may be able to help.



Example of best practice burning plan to follow for your property.

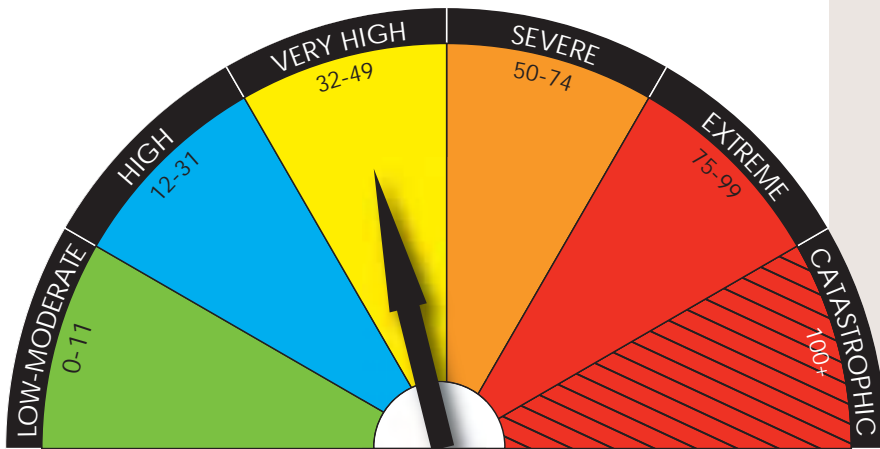
## BURNING GARDEN REFUSE OR RUBBISH

Below are some general garden refuse burning guidelines.

Your local government area may further restrict or entirely prohibit the burning of garden refuse so you must check with your local council before proceeding.

You may not burn garden refuse during the limited burning times unless it is burned in an approved incinerator or on the ground according to the restrictions below.

- The incinerator must be designed and constructed so as to prevent the escape of sparks and burning material and is not situated closer than 2 metres from a fence or building unless your local government has given you written permission. There must be no other flammable material within 2 metres.
- If burning garden refuse on the ground, there must be no other flammable material within 5 metres of the fire. The fire must be lit between 6.00 pm and 11.00 pm and be completely extinguished before midnight on the same day.
- Whether you are burning in an incinerator or on the ground, at least one person must be present until the fire is completely extinguished.
- No fires may be lit on days when the fire danger forecast for the area is Very High, Severe, Extreme or Catastrophic or a Total Fire Ban has been declared.



No fires may be lit on days when the fire danger forecast for the area is Very High, Severe, Extreme or Catastrophic or a Total Fire Ban has been declared.

# Leave early or stay and defend?



One of the key decisions you need to make when developing your Bushfire Survival Plan is the decision to stay and actively defend a well prepared home or leave early for a safer place.

Homeowners need appropriate information about their property, preparation and surrounding vegetation to prepare a Bushfire Survival Plan and make an informed decision about whether they will leave early or stay and defend.

Key factors to be taken into account include:

- How well the home is constructed, maintained, prepared and equipped to withstand a bushfire;
- Contingency plans in case the fire is more intense than expected or things don't go to plan; and
- The physical, mental and emotional fitness required by people to cope with the impact of a bushfire.

A home and surrounds that looks well prepared under normal conditions may suddenly look ill-prepared when a bushfire is approaching on a hot, windy summer's day. This must be considered when determining whether to stay and defend your property or whether to leave early.



In any case, it is important that you **know the triggers** that cause you to act even before a fire starts.

Finding out tomorrow's Fire Danger Rating (FDR) is the best trigger. It should be the first step in activating your Bushfire Survival Plan and choosing to leave early or stay and actively defend.



# Know your triggers

It is important that you use triggers that cause you to act even before a fire starts.

It is likely that your actions will change depending on the Fire Danger Rating (FDR) so you should consider what FDR will trigger a change in action.

Your trigger may be different to your neighbour as it needs to work for you and your family's situation.

## FIRE DANGER RATING

Fire Danger Ratings are used to advise people about the Bureau of Meteorology forecast weather conditions, providing advice on the level of bushfire threat for a particular area or day. Understanding the FDR categories and what they mean to you will help you to make decisions about what to do if a bushfire starts. When the rating is high, the threat of a bushfire increases.

When the FDR is Extreme or Catastrophic for your area it means any fires that start are likely to be so fierce that even a well prepared, well constructed and actively defended home may not survive a fire.

## TOTAL FIRE BAN

The declaration of a **Total Fire Ban** (TFB) is another prevention measure that occurs when extreme fire weather conditions are expected or when widespread fires are seriously stretching firefighting resources. A TFB is declared by the Minister following consultation with DFES and local governments.

When a TFB is declared it prohibits the lighting of any fires in the open air and any other activities that may start a fire. The ban includes all open air fires for the purpose of cooking or camping. It also includes incinerators, welding, grinding, soldering or gas cutting and in some local government areas will restrict harvesting and vehicle movements.

When a Total Fire Ban is declared it prohibits the lighting of any fires in the open air and any other activities that may start a fire.


# Bushfire Warning Systems

Once a fire has started, the Department of Fire and Emergency Services (DFES) may issue a range of warnings to inform the community during significant incidents threatening lives and property.

Warning information can be provided in the form of **community alerts**. Community alerts may use:

- **Bushfire Warning Levels** which are community alerts that reflect the increasing risk to life and property and the decreasing amount of time that you have to act before the fire arrives.
  - **Advice:** means that a fire has started but there is no immediate danger, this is general information to keep you informed and up to date with developments.
  - **Watch and Act:** means that a fire is approaching and conditions are changing, you need to leave or prepare to actively defend to protect you and your family.
  - **Emergency Warning:** means that you are in danger and you need to take immediate action to survive as you will be impacted by fire. An emergency warning may be supported with the SEWS siren.
  - **All Clear:** means that the danger has passed and the fire is under control, but you need to remain vigilant in case the situation changes. It may still not be safe to return home.
- **Standard Emergency Warning Signal (SEWS)** during emerging situations of extreme danger. It is an alert siren signal that can be played on public media such as radio, television, public address systems and mobile sirens which is followed by an urgent safety message.
- **Emergency Alert** when lives may be in danger in your neighbourhood, an alert may be sent as a voice message on your landline, based on your address, or via a text message to your mobile phone, based on the service address.

ALERT LEVEL
<p style="text-align: center;"><b>ADVICE</b></p> <p style="text-align: center;"><b>Be aware and keep up to date</b></p> <p style="text-align: center;">Issued at <b>11am</b> and <b>4pm</b> unless the situation changes</p>
<p style="text-align: center;"><b>WATCH AND ACT</b></p> <p style="text-align: center;"><b>Put your preparations into action – do not wait and see</b></p> <p style="text-align: center;">Issued <b>every two hours</b> unless the situation changes</p>
<p style="text-align: center;"><b>EMERGENCY WARNING</b></p> <p style="text-align: center;"><b>Take immediate action to survive – you will be impacted by fire</b></p> <p style="text-align: center;">Issued <b>every hour</b> unless the situation changes</p>
<p style="text-align: center;"><b>ALL CLEAR</b></p> <p style="text-align: center;"><b>Take care to avoid any dangers and keep up to date</b></p> <p style="text-align: center;">Issued when the threat has passed</p>

 <b>BUSHFIRE WARNINGS: WHAT SHOULD YOU DO?</b>		
ALERT LEVEL	WHEN WILL IT BE ISSUED?	WHAT SHOULD YOU DO?
<p><b>ADVICE</b></p> <p><b>Be aware and keep up to date</b></p> <p>Issued at <b>11am</b> and <b>4pm</b> unless the situation changes</p>	<ul style="list-style-type: none"> <li>• When a fire has started but there is no immediate danger</li> <li>• There is no threat to lives and homes</li> <li>• The fire is likely to be small and may be causing smoke near homes</li> <li>• Firefighters will be able to control the fire</li> </ul>	<p><b>You need to be aware</b></p> <ul style="list-style-type: none"> <li>• Stay alert and monitor your surroundings by watching for signs of a bushfire, especially smoke and flames</li> <li>• Check the Fire Danger Rating for your area</li> <li>• Close all doors and windows</li> </ul>
<p><b>WATCH AND ACT</b></p> <p><b>Put your preparations into action – do not wait and see</b></p> <p>Issued <b>every two hours</b> unless the situation changes</p>	<ul style="list-style-type: none"> <li>• When a fire is approaching and conditions are changing</li> <li>• There is a possible threat to lives and homes</li> <li>• The fire will be out of control. There may be smoke and embers around your home and roads</li> <li>• Firefighters will be working with machines to put in containment lines to stop the fire spreading</li> </ul>	<p><b>You need to leave or get ready to defend</b></p> <ul style="list-style-type: none"> <li>• Put your bushfire survival plan into action</li> <li>• If you have decided to leave for a safer place, leave now and take your survival kit with you</li> <li>• Leave well before roads are closed and full of smoke</li> </ul>
<p><b>EMERGENCY WARNING</b></p> <p><b>Take immediate action to survive – you will be impacted by fire</b></p> <p>Issued <b>every hour</b> unless the situation changes</p>	<ul style="list-style-type: none"> <li>• When there is immediate danger and the fire will impact your home</li> <li>• There is a threat to lives and homes</li> <li>• The fire will be out of control and moving very fast. This is the highest level of warning</li> <li>• Firefighters will find it difficult to control the fire and it will take significant firefighting resources and a change in conditions to bring it under control</li> <li>• A siren sound called the Standard Emergency Warning Signal (SEWS) may be used to get your attention on radio and television</li> </ul>	<p><b>You need to act immediately to survive</b></p> <ul style="list-style-type: none"> <li>• If you have not left yet and the way is clear leave immediately for your safer place and take your survival kit with you</li> <li>• If you have not prepared your home, it is too late to do it now. Your safest option is to leave for a safer place, if the way is clear</li> <li>• Do not relocate at the last minute in a vehicle or on foot as this is deadly, leave immediately if the way is clear</li> </ul>
<p><b>ALL CLEAR</b></p> <p><b>Take care to avoid any dangers and keep up to date</b></p> <p>Issued when the threat has passed</p>	<ul style="list-style-type: none"> <li>• When the danger has passed and the fire is under control</li> <li>• Firefighters will be working to put the last bits of the fire out and make the area safe</li> <li>• It may still not be safe to return home. Emergency services will advise when you can go home</li> </ul>	<p><b>You need to be careful</b></p> <ul style="list-style-type: none"> <li>• Remain vigilant in case the situation changes</li> <li>• When driving in the fire area you should take extreme caution and drive slowly</li> <li>• Dangers like smoke, fallen trees and downed power lines may be on roads and emergency services will still be working in the area</li> </ul>



# Leaving for a safer place

Many people plan to leave for a safer place but leave it too late. You need to identify and agree on a trigger with your family that will prompt you to leave early, and have a backup plan in case you cannot leave in time.


## YOU MAY PREFER TO LEAVE FOR A SAFER PLACE IF:

- ✓ you are not confident about the fire safety of your house;
- ✓ you are worried about young children, elderly people or someone who is sick;
- ✓ you suspect you could not cope with the stress of fighting the fire;
- ✓ you know it is safe to leave and you have a firm destination; and
- ✓ you act the moment you know there is danger and know which access roads are open or affected by fire—do not wait and see.

## If you have decided to leave for a safer place, you must do so early.

- Know the local bushfire warning system (such as your local ABC and 6PR radio station) and tune in when travelling.
- It is extremely dangerous to leave when roads are closed and full of smoke.
- Bushfires move quickly—make sure you and your family know where your safer place is, how you will get there and when you will go.
- Families with children or occupants who are sick, elderly or with a disability need to leave especially early.
- You need to act the moment you know there is danger—do not wait and see.
- Driving is very dangerous and stressful during a bushfire with smoke making it hard to see, fallen trees over the road and powerlines down.
- In the fire area, keep all the windows wound up, and don't get out of the car.
- The speed of the fire could also trap you and burn your vehicle. Cars do not protect you well from radiant heat.
- Put woollen blankets (wet if possible) and drinking water in the car and take pets and emergency kit with you.

If you are not able to leave early, staying and sheltering may be your safest option. You will need to actively defend your property regardless of what you planned to do. Preparing your property will give you and your home the best chance of survival.



You need to act the moment you know there is danger—do not wait and see.

# Actively defending your home

Do not underestimate what is required to maintain your house as a place of safety during a bushfire. Your house is your best protection in a bushfire **only** if it is well constructed, maintained and prepared. Actively defending your property will take huge physical and mental effort for many hours before, during and after the fire and conditions will be unbearably hot.

## YOU MAY PREFER TO ACTIVELY DEFEND IF:

- ✓ you are confident your home is well prepared and maintained;
- ✓ you have sufficient emergency water supplies and equipment;
- ✓ you think you and your family could deal with the stress and tension of the fire; and
- ✓ you and your family are in good health.



Research by the Bushfire CRC suggests that you will have a good chance of saving your home if you are fit and healthy, stay and actively defend and make sure the home is well prepared for the approaching bushfire.<sup>9</sup>

Most homes lost in bushfires ignite from burning embers that occur immediately before, during or up to several hours after the main fire front has passed. By extinguishing any spot fires caused by these embers, appropriately prepared people can save a building that would otherwise be lost in a fire.

Staying with a well prepared house could also be safer than trying to get away on roads blocked by smoke and fire. If you decide to **leave for a safer place you must go early**—you should never ‘wait and see what happens’. Evacuation at the last minute ahead of a bushfire is dangerous due to smoke, noise, heat, flames, emergency vehicles and panic on the road. It is much safer for people to stay in their homes than flee as the fire approaches.

Research suggests that you will have a good chance of saving your home if you are fit and healthy, and if you stay to actively defend, and the home has been well prepared for the approaching bushfire.

Staying with a well prepared house could be safer than trying to get away on roads blocked by smoke and fire. If you decide to leave for a safer place you must go early.



## IF YOU DECIDE TO STAY AND ACTIVELY DEFEND:

- ✔ You need the right equipment, protective clothing for all household members and a property prepared to the highest level (see below).
- ✔ A defensible space around your home (BPZ) can provide protection from radiant heat but will not keep you safe from ember attack or spot fires.
- ✔ You will need to put out any spot fires that start long after the fire has passed, remain vigilant and keep checking for them.
- ✔ There may be many spot fires at once and you will need to prioritise these. Anyone who cannot help you to defend your home should relocate to a safer place well before the bushfire threatens.
- ✔ When the Fire Danger Rating (FDR) is catastrophic, extreme or severe it may not be possible to actively defend your home. On these days fires can be so bad that even homes prepared to the highest level and constructed to bushfire protection levels, that are actively defended, will not survive.
- ✔ Being involved in a bushfire can have a serious and long lasting psychological and emotional impact. Think about your long-term wellbeing.

## PROTECTIVE CLOTHING

### ✔ WEAR

- Natural fibres.
- Long-sleeved shirts.
- Long trousers, jeans or overalls, sturdy leather shoes or boots (not elastic sides), wool or cotton socks.
- Hats and gloves.
- Eye protection.

### ❌ DO NOT WEAR

- Singlets.
- T-shirts.
- Short-sleeved shirts.
- Shorts.
- Dresses or skirts.
- Sandals or thongs.
- Stockings or synthetic socks.



## ✔ MATERIALS

Clothes should be made of:

- Pure wool.
- Heavy cotton drill or denim—not synthetics.

## ✔ OUTSIDE THE HOUSE

While outside the house, or fighting the fire, wear:

- A wide-brimmed or hard hat.
- Goggles or glasses.
- Gloves.
- A moistened mask to filter ash and other particles—and protect your face by wetting it with water.

## THE RIGHT EQUIPMENT

Some of the equipment you'll need to protect your home will probably be on hand already. Other items may need to be bought but are not generally expensive, except for the water pump.

Here's what you need:

- **Torch**—make sure it works and that you have spare batteries.
- **Hoses**—one hose for each water outlet. You'll need enough hose to reach all corners of the house and out to the edge of the building protection zone.
- **Knapsack spray or mop**— used for small spot fires.
- **Buckets**—have plenty around the house. Don't use water on the roof if the power is on.
- **Ladder**—ideally, you'll need two (one for inside and one for outside) that are long enough to reach the roof.
- **Fuel-powered water pump** (preferably diesel fuel)—keep it in working order and in a safe place so it is not at risk from the fire. This is only required if you have your own water source.
- **Gloves**—sturdy, leather, garden variety, not rubber or synthetic.
- **Shovels, hoes and rakes**—at least one of each.
- **Blankets and towels**—woollen blankets and cotton towels, for blocking sparks under doors, and for heat protection. Keep them wet.
- **Drinking water**—make sure that you have plenty of clean drinking water available in a suitable container.



## PROTECTING THE HOUSE: WHEN THE FIRE ARRIVES

- Close all doors, windows and shutters and bring outdoor furniture inside.
- Remove the highly flammable door mats and other flammable material near doors or crevices outside the building.
- Keep sprinklers on within the Building Protection Zone on high risk parts of the house e.g. windows, eaves, gas bottles.
- Fill outside gutters. If time permits, block up the mouth of downpipes and fill gutters with water.
- Soak towels and rugs in water and lay along the doorways to keep sparks and smoke out.
- Soak blankets and keep them ready for protection against radiant heat. Keep buckets of water and mops handy.
- As the fire approaches, turn off the mains electricity and gas supply to the house, and move people into the fire refuge area inside the house, if you have one.
- Keep checking for spot fires around the house, and put them out.
- Keep checking each room of the house as the fire passes outside.
- If possible, check for any embers that may have entered the roof space. Be mindful that the roof cavity may have live powerlines running through it.
- If a fire takes hold in the house, move people into another safe area, if you have one.



## AFTER THE FIRE

- Once the fire front has passed, remain dressed in protective clothing and check the house thoroughly for spot fires both inside (check the roof space) and outside for several hours.
- Check for embers or signs of smoke inside the ceiling and from furniture, bedding and crevices in windows and walls.
- Check under the floor if possible.
- Hose trees and shrubs near the house.
- Check garage and sheds for small fires.

Most homes lost in bushfires ignite from burning embers that occur immediately before, during or up to several hours after the main fire front has passed.

Once the fire front has passed, remain dressed in protective clothing and check the house thoroughly for spot fires both inside (check the roof space) and outside for several hours.



# Where to go as a last resort

**During a bushfire the safest place to be is well away from the fire. However, your home may be a safer place, but only if you have prepared prior to the fire season and followed the advice in this book.**

**To remain with your well prepared home is safer than being out in the open and it's better than trying to make a dash by car through the fire front on roads blocked by emergency traffic, falling trees or covered in dense smoke.**

## SAFER PLACE

As a last resort, a safer place is a local open space or building where people may go to seek shelter from a bushfire. This may include an area already burnt, where the fire has passed through such as a paddock.

Use of a safer place may be your back-up plan when:

- Your bushfire survival plan has failed.
- You are unable to continue driving away from the fire.
- Your plan was to stay and actively defend but the scale of the fire means your home cannot withstand the fire.
- Your home is no longer a safe place to shelter.

Once you have arrived at your safer place you need to:

- Look and listen for fire information by whatever means of communication you have—on radio, your mobile phone and internet etc.
- Continually monitor the surrounding conditions.
- If you are sheltering in a building as the fire approaches make sure all doors and windows are sealed. When the fire has passed and if safe, check for spot fires and embers outside. Put these out if possible.
- If you are sheltering in an open space, as the fire approaches, seek protection from radiant heat and embers. Attempt to cover any exposed skin with blankets or clothing. You should lie flat on the ground as the fire front approaches.

## A REFUGE IN THE HOUSE

Review your home's potential to be a 'fire safer' place. Have you filled in all the gaps (between the eaves, under the house and in any nooks and crannies) to keep out sparks? How good is the water supply? Have you put shutters or metal flywire on the windows? Do you have a suitable building protection zone?

If you feel confident your house would be safe in a fire, you are fit and have considered the health and wellbeing of all family members, make plans to use it as your fire refuge. If you remain, after the fire front has passed—and this may only take 5–10 minutes—you'll be on hand to put out any little fires that have started around the house, before they have time to take hold. Spot fires have been found to be the primary way by which bushfires destroy homes.

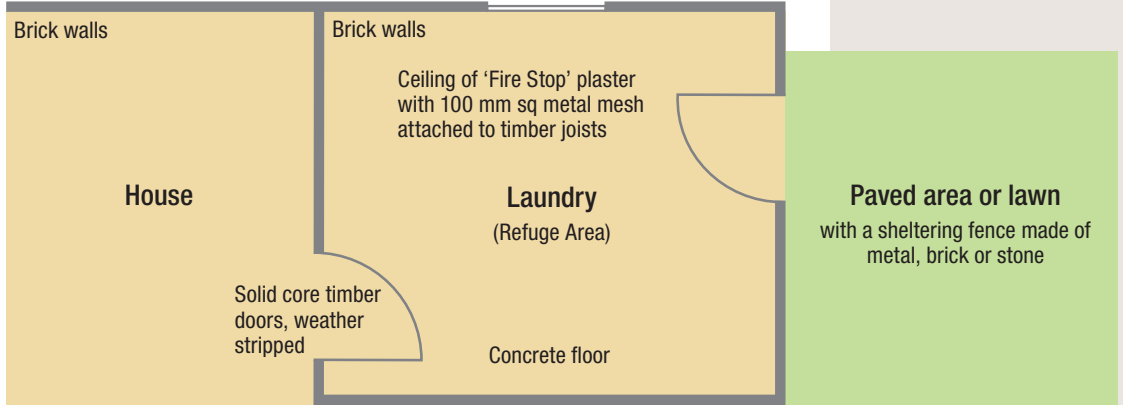
If you are sheltering in an open space, as the fire approaches, seek protection from radiant heat and embers as best you can.

During the approach of a bushfire, you should patrol the interior of your house to put out any spot fires caused by embers entering broken windows or ceiling cavities. Attending immediately to any small fires inside the house can save your home and those within it.

If a fire becomes uncontrollable inside your house, sheltering inside it is courting disaster. Preparation, patrolling and quick action may prevent the house from burning uncontrollably, at least until the fire front has passed.

### An example of a laundry used as a fire refuge.

Small window of wired glass or fitted with a shutter which can be closed from the inside.



Embers have been found to be the primary way by which bushfires destroy many homes.



# Prepare your Home and Property Checklist

Don't leave it until summer to try to make your property safe from fire.  
Many jobs can be done at cooler times of the year.

Here's a checklist of things to do. Details about most of them are given elsewhere in this book.

## LONG-TERM PRECAUTIONS

- Prepare firebreaks. ....
- Make the house safe—fit wire screens and shutters and fill gaps. ....
- Develop and maintain a minimum 20-metre building protection zone. ....
- Develop and maintain a suitable hazard separation zone. ....
- Provide an emergency water supply. ....
- Discuss fire prevention with your neighbours—is your locality safe? ....
- Discuss your preparedness with your neighbours. ....

## AUTUMN AND WINTER (MAY–AUGUST)

- Tree pruning—remove lower branches, check that powerlines are clear. ....
- Reduce fuel levels around the house—clear long grass, leaves, twigs and flammable shrubs. ....
- Petrol and other fuels—store in a suitable shed away from the home. ....
- Make sure your personal and home protection equipment is in good order.
- Overhaul the emergency water pump. ....
- Make sure everyone in the family knows what to do in a fire. ....

## SPRING (SEPTEMBER–NOVEMBER)

- Move woodpile and stacked timber away from the house. ....
- Keep the grass short—on farms, keep grazing pressure high on areas near the house. ....
- Prune the dead material from the shrubs in the building protection zone. ....
- Clean out gutters, remove debris from roof. ....
- Create firebreaks. ....
- Prepare an emergency kit, including a plan. ....
- Decide whether to stay and actively defend your property in the event of a fire  
or leave for a safer place. ....

## EARLY SUMMER (DECEMBER ONWARDS)

- Water lawns, trees and shrubs near the house to keep them green. ....
- Re-check personal and home protection gear, screens, water supplies and gutters. ....



# Bushfire Management in WA

There are several government agencies with some responsibility for the prevention, preparedness, response and recovery of bushfires in Western Australia. The main agencies are Department of Fire and Emergency Services, Department of Parks and Wildlife and Local Governments, other emergency service agencies and also some private fire brigades and landholders.

Table 1. Bushfire Management arrangements as outlined in State Emergency Management Plan for Fire, WESTPLAN – FIRE, DFES (August 2013)<sup>10</sup>

	Department of Fire and Emergency Services (DFES)	Department of Parks and Wildlife (DPaW)	Local Government (LG)
Prevention	<ul style="list-style-type: none"> <li>• Declaration of restricted and prohibited burning times, including Total Fire Bans.</li> <li>• Development and implementation of community engagement and education programs.</li> <li>• Contribute to the development of bushfire risk management planning.</li> </ul>	<ul style="list-style-type: none"> <li>• Bushfire planning and mitigation on all DPaW managed land.</li> <li>• Contribute to the development of bushfire risk management planning.</li> </ul>	<ul style="list-style-type: none"> <li>• Bushfire planning and mitigation on all LG managed land.</li> <li>• Prescription and enforcement of bushfire prevention measures on all private land within their LG.</li> <li>• Imposition of harvest and movement of vehicle bans.</li> <li>• Day to day administration, enforcement and firebreak notices under the <i>Bush Fires Act 1954</i>.</li> </ul>
Preparedness	<ul style="list-style-type: none"> <li>• Provide and maintain firefighting infrastructure, equipment, plans and programs, including training for firefighters and volunteers.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide and maintain DPaW firefighting equipment and procedures, including training for DPaW staff.</li> </ul>	<ul style="list-style-type: none"> <li>• Training of bushfire brigades.</li> <li>• Ensure there are relocation centres available.</li> <li>• Participate in joint exercises with other emergency service authorities.</li> </ul>
Response	<ul style="list-style-type: none"> <li>• Response to all bushfires on lands within prescribed Fire Districts or where volunteer units are established.</li> <li>• Authorise bushfire liaison officers to coordinate DFES operational fire response.</li> <li>• Control of all level 3 fires—those which are complex and threatening life and property.</li> <li>• Manage standards and disseminations of public warnings and bushfire public information.</li> </ul>	<ul style="list-style-type: none"> <li>• Respond to bushfires on all DPaW managed land.</li> <li>• Provide assistance to DFES and/or LG where capable.</li> </ul>	<ul style="list-style-type: none"> <li>• Respond to bushfires on lands including unmanaged reserves and unmanaged crown land outside Gazetted Fire Districts and DPaW managed land.</li> <li>• Provide assistance to DFES and/or DPaW where capable.</li> </ul>
Recovery	<ul style="list-style-type: none"> <li>• Responsible responding agencies are expected to initiate recovery during response, however full recovery ultimately rests with the landowner.</li> </ul>		

# Emergency Contact Numbers

<b>POLICE, FIRE, AMBULANCE (life threatening emergencies):</b>	<b>000 (TTY 106)</b>
Insurance Company:	
Policy Number:	
Local Council:	
Bank:	
Local GP/Doctor:	
School:	
Work:	
Vet:	
Water Supplier:	
Electricity Supplier:	
Gas Supplier:	
Neighbours/Family/Friends:	
Neighbours/Family/Friends:	
Neighbours/Family/Friends:	
Department of Fire and Emergency Services Info Line:	<b>13 DFES (13 3337)</b>
The frequency of our local ABC Radio:	
Our Fire Ban District:	
Local Fire Brigade:	
Local Police Station:	
Local Ambulance:	

## REFERENCES

- <sup>1</sup> New South Wales Rural Fire Service (2013) 'Bush Survival Plan.' (Government of New South Wales: Sydney).
- <sup>2</sup> Department of Planning ('in press') 'Planning for Bushfire Risk Management Guidelines.' (Government of Western Australia: Perth).
- <sup>3</sup> Bowditch PA, Sargeant AJ, Leonard JE, Macindoe L (2006) 'Report on Window and Glazing Exposures to Laboratory-Simulated Bush Fires.' (Bushfire Cooperative Research Centre: Melbourne, Victoria).
- <sup>4</sup> New South Wales Rural Fire Service (2011) 'Best Practice Guide to Bush Fire Protection – Upgrading of existing Buildings.' (Government of New South Wales: Sydney).
- <sup>5</sup> Backstorm R (2012) 'Determination of the Efficacy of Screens to prevent Ignition of Debris Accumulation Under Rack Mounter PV Modules Installed on Roofs and Impact on Module Operating Temperatures.' (UL: Northbrook, Illinois).
- <sup>6</sup> Clean Energy Council (2014) Fire and flood emergency situations.  
Available at <https://www.solaraccreditation.com.au/consumers/fires-and-floods.html>
- <sup>7</sup> Leonard JE, Bianchi R, White N, Bicknell A, Sargeant A, Reisin F, Cheng M (2006) 'Research and investigation into the performance of residential boundary fencing systems in bush fires.' (Bushfire Cooperative Research Centre: Melbourne, Victoria).
- <sup>8</sup> Leonard, JE (2010) 'Tanks on trial: performance of rainwater tanks in bushfire conditions.' (Bushfire Cooperative Research Centre: Melbourne, Victoria).
- <sup>9</sup> Bushfire Cooperative Research Centre (2006) 'Fire Note: The Stay and Defend your Property or Go Early Policy.' (Melbourne, Victoria).
- <sup>10</sup> Department of Fire and Emergency Services (2013) 'State Emergency Management Plan for Fire (WESTPLAN – FIRE).' (Government of Western Australia: Perth).

# THE HOMEOWNER'S BUSHFIRE SURVIVAL MANUAL

On your property, fire safety starts with you. You are in control. It's in your hands to reduce fire risks around the home and create an environment that will help protect you in a fire. This book sets out some useful hints on what to do for those living in rural, semi-rural or bushland areas.

The Homeowner's Bushfire Survival Manual has been prepared to help you become better informed about bushfires. It draws together the best advice available on preventing and preparing for bushfires.



## MORE INFORMATION

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Alerts and Warnings, Fire Danger Ratings, Total Fire Bans  
Department of Fire and Emergency Services (DFES) [dfes.wa.gov.au](http://dfes.wa.gov.au)  
13 DFES (13 3337)  
[twitter.com/dfes\\_wa](https://twitter.com/dfes_wa)

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Bushfires and prescribed burns in DPaW managed lands  
(e.g. National Parks and State Forest)  
Department of Parks and Wildlife (DPaW) [dpaw.wa.gov.au](http://dpaw.wa.gov.au)  
9219 8000

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Fire Danger Ratings and Weather  
Bureau of Meteorology [bom.gov.au/weather/wa](http://bom.gov.au/weather/wa)

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Road Conditions and Closures  
Main Roads [mainroads.wa.gov.au](http://mainroads.wa.gov.au)  
138 138

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Suspicious or Criminal Activity  
Crimestoppers [wa.crimestoppers.gov.au](http://wa.crimestoppers.gov.au)  
1800 333 000