

# Burn SMART

## A planned burning guide for small landholders

DFES recommends managing your fuel loads to help protect your property from bushfire.





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**Burn SMART – A planned burning guide for small landholders** replaces the Winter Burning Guide published in 2015.

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# About this guide

## This guide is for you if:

- You are a small landholder with a property under 2 hectares in size (1 hectare = 10,000 m<sup>2</sup>)
- You live in the Swan Coastal Plain, Jarrah Forest or Warren Biogeographic regions
- You want to conduct a planned burn of the surface fuels on your property in areas of forest, woodland or tall shrubland

The principles outlined in this guide can also be applied in other areas of Western Australia. Be sure to research recommended burn intervals relevant to your local vegetation.

We strongly recommend you consult your local government for additional information and advice.



**Image:** The biogeographic regions of Western Australia covered within this planned burning guide.

You may have heard of hazard or fuel reduction burns, burn offs, prescribed burns and controlled burns. These are all names for planned burns.

## Legal requirements

Under the *Bush Fires Act 1954*, local governments may issue notices that require landholders or occupiers of land to install and maintain firebreaks and reduce fuel areas around their boundaries and assets. This is to help prevent the start or spread of a bushfire. The requirements of these firebreak or hazard reduction notices vary depending on the size and location of the property. Landholders must manage their fuels according to the notice issued by their local government.

Local governments administer the periods of restricted, prohibited and unrestricted burning for specific times of the year. During the restricted period, a burn permit must be obtained prior to any burning taking place. No burning should be conducted by private landholders during the prohibited period unless permitted as per the provisions of the *Bush Fires Act 1954*. Local governments also declare harvest and vehicle movement bans which will affect burning. Planned burning may also be prohibited due to environmental health regulations. Local governments are the best source of information about such conditions in the local area.

The Department of Fire and Emergency Services (DFES) may declare a Total Fire Ban (TFB) for various local government areas, which prohibits the lighting of any fires in the open air and any other activities that may start a fire. TFBs are announced the day before (usually in the afternoon), or on the morning of the actual day. TFBs usually start at midnight and last for 24 hours. Fire Danger Ratings (FDR) can also override permits and burning periods. Visit [emergency.wa.gov.au](https://www.emergency.wa.gov.au) for TFB declarations and FDRs.

## Planned burning explained

Planned burning is the deliberate burning of a pre-determined area under the right environmental conditions to reduce fuel loads. Planned burns are done under mild and stable weather conditions so that the fire burns slowly and with low flame heights.

Planned burning is just one of several methods used to reduce fuel loads. Other methods include raking, slashing, ploughing and weed control.

When combined, these methods can:

- Maximise the effectiveness of your fuel management
- Reduce the impact of bushfire
- Assist in protecting life and property

## Why planned burning is done

Done properly, planned burning is an efficient way to remove the build-up of fuel over larger areas of land where other methods are too labour intensive. Used appropriately, a planned burn not only helps to safeguard lives and property in the event of a bushfire, but generally results in less environmental disturbance than other methods, benefiting many native plants and animals.

# Understanding fire behaviour

Understanding how a fire behaves is vital when preparing and executing a planned burn. Fire behaviour refers to the intensity (heat), speed and spread of a bushfire or planned burn.

Fire behaviour is largely influenced by three factors:

- The **fuel** available to burn
- The **topography** (or terrain) of the area
- Prevailing **weather** conditions

The following pages explore how each of these factors affects fire behaviour.

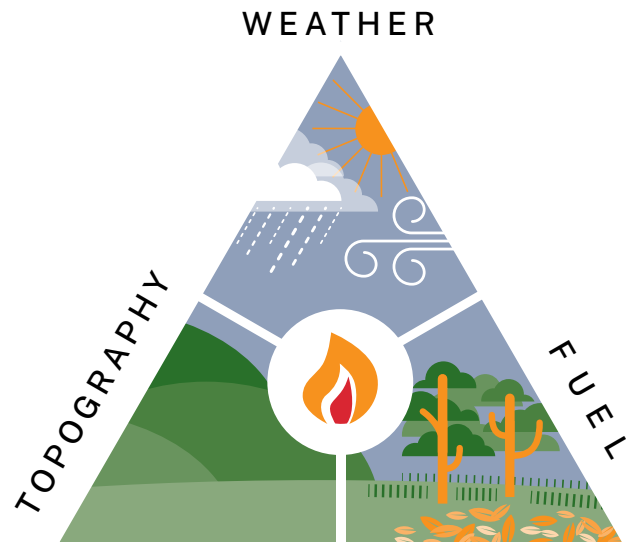


Image: The fire behaviour triangle.

## Factor 1: Fuel

Fuel is the vegetation and dead plant material that can burn in a fire. The type of fuel, the quantity of fuel (**total fuel loads**), how the fuel is arranged (**fuel layers**), and its condition (**fuel moisture**) are the most important characteristics of fuel to consider when planning a burn.

### Fuel loads

Total fuel loads consist of two types of fuels, shown in the table below.

Types of fuels		
<b>Coarse fuels</b> Describes fallen branches and logs	<b>Fine fuels</b> Describes leaves, twigs and bark and are split into two categories	
	<b>Dead vegetation</b> Less than 6 mm in thickness	<b>Live vegetation</b> Less than 3 mm in thickness

Of the two types of fuel loads, **fine fuels have the greatest influence on fire behaviour.**

Fine fuels ignite and burn more readily than coarse fuels.

Your planned burn will primarily target fine fuels at the surface and near surface layers.



## Fuel layers

Fuel accumulates in 'layers', depending on its height above the ground. The following are the important fuel layers to consider when planning a burn.

Fuel layers	
<b>Surface</b>	Commonly called litter layer, these fuels are made up of leaves, twigs, bark and other fine fuel lying on the ground.
<b>Near surface</b>	Consisting of live and dead fuel, these fuels include grass, low shrubs and suspended leaves, twigs or bark. These effectively touch the ground, but don't lie on it.
<b>Bark</b>	The bark on tree trunks and branches from ground to canopy. These can be a source of embers. Embers are burning leaves, twigs, bark and other debris carried in air heated by the fire and the wind.
<b>Elevated</b>	Fine fuels supported above the ground, including the foliage of taller shrubs, creepers and lower branches up to 2 metres in height. As these fuels are well-aerated, they can contribute to an increase in fire intensity and rate of spread.



**Image:** Fuel layers and bark.

Different vegetation types have different fuel characteristics.

Shrublands and woodlands with low tree cover usually have patchy surface fuels.

Forests usually have a deeper and more continuous surface layer of leaf litter.

## Fuel moisture

Fuel moisture affects how easily fuel will ignite and how much will burn. Fuel that is too moist won't burn. Fuel that is too dry will burn too easily and may escape to become a bushfire. It is vital you test the moisture content of fuel within the burn area before starting a planned burn. The best way to do this is to use the leaf moisture method.

### Leaf moisture method

The aim is to discover the angle at which a small flame either goes out or flares up. Be sure to test dead leaf samples from areas with different vegetation types and where fuel is in direct light and shade.

#### 1. Select dead leaves

Take dead leaves from the top and bottom of the litter layer.

#### 2. Find a safe place

Move to a place that is sheltered from wind and away from fuels.

#### 3. Light the leaf

Light the end of the first dead leaf and watch how it burns.

#### 4. Test new locations






Check if moisture levels vary across the burn area by testing in other locations.





## Understanding the results

How quickly and intensely a dead leaf sample burns offers a strong indication of its moisture level. This is valuable to consider when judging the potential success of a planned burn. Use these markers as a guide.

Wet	Damp	Moist	Dry	Very dry
				
<p><b>Leaf burns only when pointed straight down or does not burn at all</b></p> <p>If in the area to be burnt, the fuel is too moist to burn</p>	<p><b>Leaf burns when angled down but not when level</b></p> <p>If the leaf sample is from the:</p> <p><b>Top layer</b> The fire will burn slowly</p> <p><b>Bottom layer</b> The fuel moisture is okay</p> <p>Fires with damp fuels tend to need the wind and/or a slope to spread</p>	<p><b>Leaf burns when level but not when angled up</b></p> <p>If the leaf sample is from the:</p> <p><b>Top layer</b> The fire will burn at the upper level of intensity for a burn</p> <p><b>Bottom layer</b> The fuel moisture is okay</p>	<p><b>Leaf burns when angled up, but not if vertical</b></p> <p>If the leaf sample is from the:</p> <p><b>Top layer</b> The fire will burn at too high an intensity for a burn</p> <p><b>Bottom layer</b> The fuel is too dry to perform a burn</p>	<p><b>Leaf burns when angled straight up</b></p> <p>The fuel is too dry to burn</p>
Recommendations				
<p>Postpone planned burn until moisture levels drop</p>	<p>Proceed with planned burn</p>	<p>Proceed with planned burn, but exercise caution</p>	<p>Do not proceed with planned burn</p>	<p>Do not proceed with planned burn</p>

## Factor 2: Topography

Topography describes the physical features of a landscape, including the **slope** and **aspect**. Both slope and aspect can influence how a fire behaves.

### Slopes

Fires burning on slopes will behave differently from those on level ground. It is important to consider the slope in your burn area.

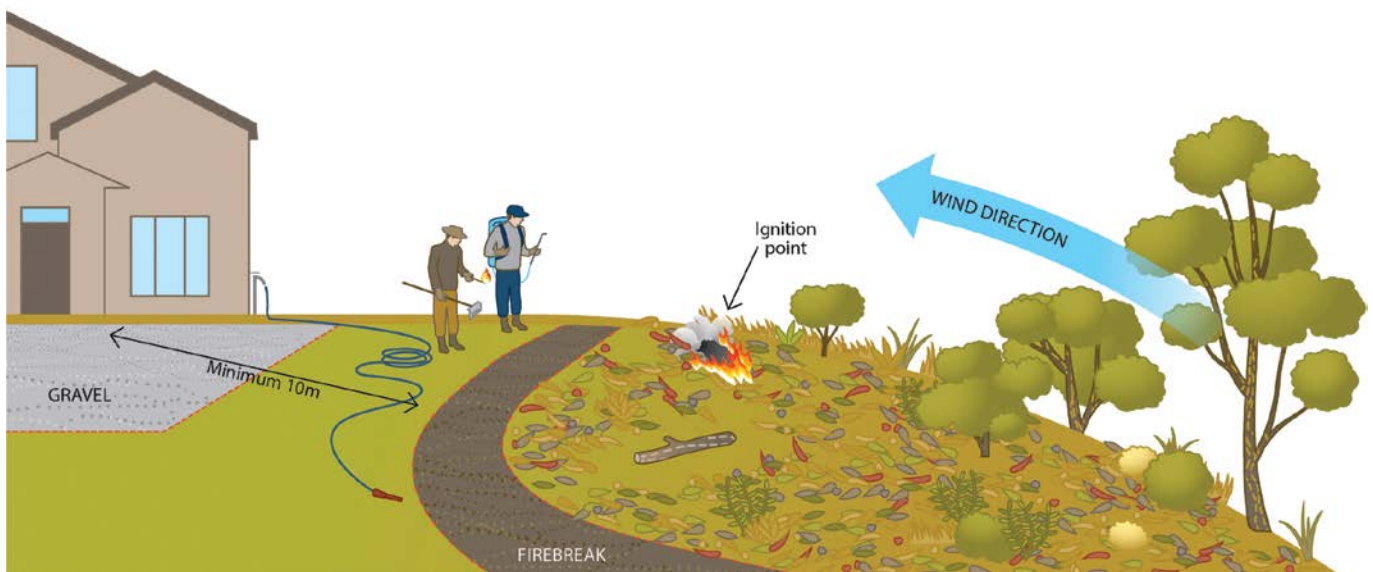
#### Upslope considerations

- Fires burn more rapidly when moving up a slope
- Winds may move more rapidly upslope, increasing the speed at which a fire can spread
- For every 10 degree increase in uphill slope, a fire will double its speed and intensity

#### Downslope considerations

- Fires tend to travel at slower speeds and be less intense as they move downhill

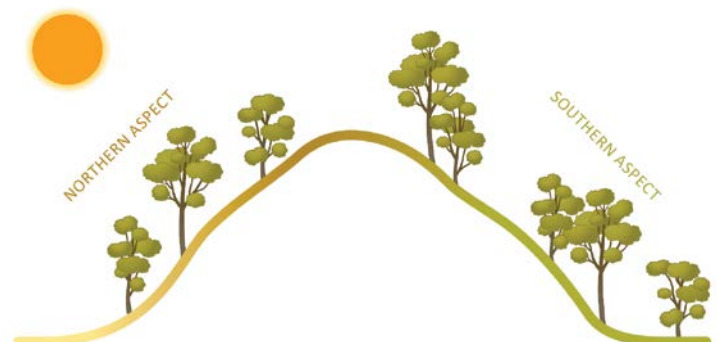
When undertaking a planned burn, fires should ideally be lit at the top of a slope to burn downwards and against the wind.



**Image:** Graphic of a planned burn started at the top of a slope and burning downwards against the wind.

### Aspect

Aspect is the direction the landscape faces. In Western Australia, northern and western aspects are exposed to more sun, making fuels drier and more readily burnt than those facing south or east.



**Image:** Graphic representation of a northern and southern aspect in Western Australia.

## Factor 3: Weather

Wind speed, wind direction and humidity are the main weather factors that affect fire behaviour. Knowing what the weather is likely to do in your region can help you predict the direction in which the fire will burn, and where the smoke will blow on the day of your burn.

### Before you conduct a planned burn, it is important you:

- Check your local weather forecast at [bom.gov.au/places/wa](http://bom.gov.au/places/wa)
- Check wind speed and direction and relative humidity in the days before, during and after the burn

### On the day of the burn, it is important you:

- Recheck local weather conditions at [bom.gov.au/places/wa](http://bom.gov.au/places/wa)
- Visually assess wind speed using the Beaufort Scale (see below)

### Planned burns are recommended when:

- Wind speeds are between 5 and 20 kilometres per hour
- The air is cool and moist (greater than or equal to 40% relative humidity)

### Planned burns are not recommended if:

- The wind speed is greater than 20 kilometres per hour
- Too much wind may make it hard to control the burn, increasing the likelihood of the fire escaping

### Exercise caution with planned burns if:

- There is too little wind and fuel is too moist to burn
- On still days fires may not spread, wind direction can be variable and smoke may linger

### It is important to note:

- Surface wind speeds at the burn site will be affected by the density of tree canopy cover
- Surface wind speeds may be lower in a forest where there is dense tree canopy cover
- Areas of tall shrubland or woodland that have low tree canopy cover might experience variable winds

Beaufort Scale		
Description	Average wind speed (km/h)	Estimating speed over land
Calm	Less than 1	Calm smoke rises vertically.
Light air	1-5	Direction of wind shown by smoke drift. Wind does not move wind vanes.
Light breeze	6-11	Wind felt on face, leaves rustle. Ordinary wind vane moved by wind.
Gentle breeze	12-19	Leaves and small twigs in constant motion. Wind extends light flag.
Moderate breeze	20-28	Raises dust and loose paper. Small branches moved.

Adapted from: Simpson, G.C., 1926. The velocity equivalents of the Beaufort Scale. Air Ministry Professional Notes, No 44. London

# Planning and conducting your burn

Undertaking a planned burn is a big responsibility. It involves recognising and managing all associated risks. In the wrong conditions, a planned burn can escape and become an uncontrollable fire. It is strongly recommended you plan and conduct a burn using these six stages.

## Stage 1: Develop a fuel management strategy

A fuel management strategy is a plan to manage the fuel loads on your property each year. Part of this strategy may involve a planned burn in conjunction with other methods such as raking, slashing, ploughing and weed control.

Developing a burn plan as part of your fuel management strategy will identify areas of vegetation that may be burned to ensure fuel loads are kept low on your property. The development of a burn plan involves the following steps:

### Sketch your property

In your sketch include buildings, driveways, fences, large trees, water sources and important things you want to protect from flames, radiant heat or embers. Your sketch should also include an Asset Protection Zone, which includes a minimum 3 metre dependable space. Complete your sketch at the back of this guide.

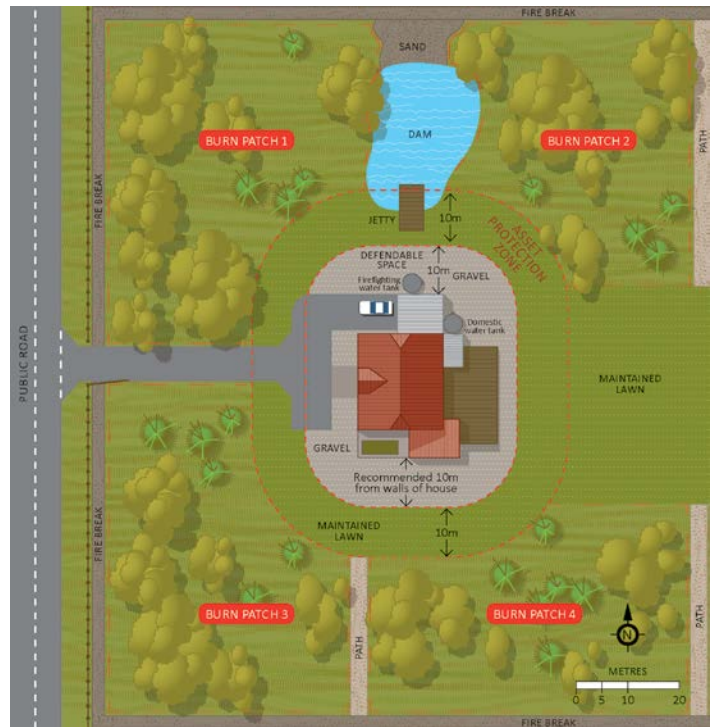


Image: Example of a property sketch.

### More on Asset Protection Zones

An Asset Protection Zone (APZ) is an area surrounding a building that is managed to reduce bushfire risk. Included in an APZ is a **defendable space**. A defendable space is an area adjoining the asset in which firefighting operations can be undertaken to defend the structure. Vegetation within this space should be kept at an absolute minimum and free from combustible items and obstructions.

More information on APZs can be found in the Guidelines for Planning in Bushfire Prone Areas version 1.3 - appendices on the Department of Planning, Lands and Heritage website ([dplh.wa.gov.au](http://dplh.wa.gov.au)).

### Identify burn patches

On your sketch, identify patches that can be burnt individually. Patches should be at least 10 metres from buildings or other assets. Be sure to include a minimum 1 metre separation from adjoining burn patches. Separations can include firebreaks, paths, roads, driveways, rock outcrops or any other landscaping that won't burn. Other methods, such as raking a pathway through leaf litter, may help to break up larger patches of vegetation into manageable areas.

## Firebreaks explained

A firebreak is an area clear of inflammable material (e.g. a raked path, a road or driveway) that separates a burn patch from buildings, sheds, fences and unburnt areas. To learn more about firebreak requirements, talk to your local government.

## Talk with your neighbours

Working with neighbours to coordinate a burn can make it smarter, safer and easier. For example, you could work with neighbours to mow long grasses and/or construct firebreaks to reduce the risk of a fire escaping. You may be able to help each other by burning together and sharing resources. Coordinating a burn with neighbours can also be beneficial if native vegetation is present across several properties.

## Stagger your burns

Plan to burn the patches separately over a number of years. Burning one area at a time will ensure that the burns are of a manageable size. It also ensures that wildlife have refuges in unburnt areas while burnt areas regenerate.

## Consider plant life cycles

Different vegetation types respond differently to fire and may require different intervals between burning. It may take a number of years for a plant to mature and produce enough seed to ensure germination after a fire. Consider the life cycles of native plants when planning which patches to burn.

Some fire-sensitive trees and shrubs should be excluded from burns to maintain their health. Examples include wandoo, gimlet, mallet, mallee, some acacias and banksias. Page 22 details the recommended minimum burn intervals for different vegetation types.

## Did you know?

When native plants are removed from the environment, they may be replaced by weeds such as introduced grasses. This may increase the flammability of the vegetation and consequently the risk of bushfire.

## Assess the fuels within each burn patch

Assess the fuels within each burn patch to determine which area you will burn in the first year. Your property fuel management strategy should prioritise burning areas around the property boundary and closest to buildings. Once you've identified these patches, prioritise those with the highest fuel loads. Refer to page 22 for the recommended burn intervals for maintaining manageable fuel loads.



## Stage 2: Prepare your burn patch

Now that you have identified a patch to burn, it's time to prepare the area and ensure you have the appropriate permissions, notifications and resources.

### Check local restrictions

Contact your local government for information on burning restrictions in your area. A permit to burn will be required during the restricted burning season.

### Organise support and nominate roles

Organise at least two able-bodied persons to undertake the planned burn. Nominate a person to be responsible for monitoring burn patches in the days following the burn.

### Create or clear firebreaks

Construct new firebreaks using an appropriate tool such as a rake. Remove any leaf litter and regrowth from existing firebreaks. Firebreaks are areas clear of inflammable material and at least 1 metre in width.

### Protect plants and trees

Rake leaf litter away from logs, individual plants and trees to protect them.

### Test water sources

Check that hoses are long enough to reach all points of the burn. If you use tank water, ensure the supply is adequate, remembering that if fire does take hold of heavy fuels, they can take hundreds of litres of water to extinguish.





## Stage 3: Before the burn

In the days leading up to a planned burn, be sure to:

### Check when it last rained

It is ideal to burn two days after significant rainfall (5 millimetres or greater), but no more than 10 days.

The Bureau of Meteorology has recent historical data at [bom.gov.au/climate/data](https://bom.gov.au/climate/data).

### Check your local weather forecast

Visit [bom.gov.au/places/wa](https://bom.gov.au/places/wa) and check for mild weather conditions in the days ahead. Do not conduct a burn if strong winds and dry conditions are forecast.

### Check your equipment

Ensure that all the equipment you'll need — metal rake, shovel, hose, water supply etc — are available and in good working order.

### Check your support

Confirm that the people helping you with the burn are still available. Contact the neighbours assisting with your burn, if applicable.

### Check in with your neighbours

Notify all neighbours (including those separated by a road, lane or waterway) no less than four days prior to burning so they don't mistake your burn for a bushfire. Notifying them means they can plan to avoid the smoke if necessary. Out of courtesy, you may want to remind neighbours on the day of the burn.



## Stage 4: Day of the burn

On the day that you plan to conduct the burn, you must:

### Check for fire bans

Visit [emergency.wa.gov.au](https://www.emergency.wa.gov.au) for up to date information on Total Fire Ban and Fire Danger Ratings in your area.

### Check for severe weather warnings

Visit [bom.gov.au/wa/warnings](https://www.bom.gov.au/wa/warnings) and check that the Bureau of Meteorology has not issued severe weather or strong wind warnings in your area on the day of or the day after your burn.

For example, winds that proceed a cold front can produce strong gusts of dry air.

### Check the sky is clear and not hazy

In clear conditions, smoke will disperse more quickly and is less likely to build up to hazardous levels. Do not burn if the Bureau of Meteorology has issued a smoke haze alert for the day of the burn ([bom.gov.au/wa/warnings](https://www.bom.gov.au/wa/warnings)), or if there is already significant smoke in the local area.

### Check wind and relative humidity

Search your location and check local wind speed, wind direction and relative humidity under *Detailed 3-Hourly Forecast* at [bom.gov.au/places/wa](https://www.bom.gov.au/places/wa). The wind needs to be relatively light (less than 20 kilometres per hour), with relative humidity greater than or equal to 40%.

### Call your local government

Notify them of your intent to burn, if required. If a permit has been issued, ensure burn conditions comply with those outlined on the permit and any additional notifications are completed.

### Check fuel moisture

Use the leaf moisture method (shown on pages 8-9) to see if fuel moisture levels are appropriate.

### Register your burn with DFES

Call the DFES Communications Centre on **(08) 9395 9209** to register your burn. This will prevent firefighters from being called out if smoke is reported.

### Conduct a pre-burn briefing

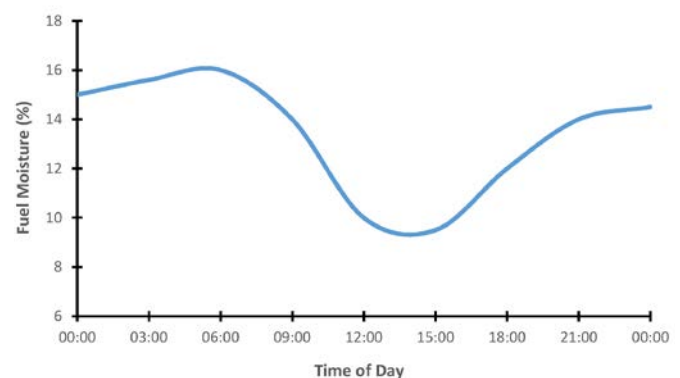
Gather everyone helping with your burn together and cover the following:

- What you want to achieve
- How it will be done
- What each person's role will be
- Hazards to look out for
- Ensuring escape routes and safety zones are identified and accessible
- What to do if something goes wrong, such as the burn escaping

### Consider what time of the day you start your burn

A good rule of thumb is to light the burn **after** the mid-afternoon, so that the fire is burning during the time when fuel moisture is rising, not falling.

During the day, fuel moisture typically peaks at about dawn and is lowest in the mid-afternoon. If fires are lit too early in the day, by mid-afternoon the fire may become too intense.



**If the above steps have been completed and the conditions are suitable, progress with your burn.**

## Stage 5: During the burn

### Wear appropriate equipment

Appropriate personal protective equipment includes:

- Long-sleeved cotton shirt
- Trousers and socks
- Wide-brimmed hat
- Eye protection
- Leather gloves
- Boots

### Light a test fire

Ensure the ignition point is within 3 metres of a firebreak, and check the wind is blowing towards the firebreak. Observe the test fire flame heights and rate of spread for at least 20 minutes.

### Proceed or postpone

If the height of the flames in your test area consistently exceeds 1 metre, the test fire should be immediately extinguished. Postpone your planned burn until the fuel or weather conditions are moister and/or milder.

If after 20 minutes the rate of spread is too slow and the test fire does not look like it will burn the entire area before evening, you may wish to ignite another point 15 to 20 metres away from the first one (within 3 metres and upwind of a firebreak).

Additional ignition points are more likely to be required where surface fuels are patchy, such as in woodlands and shrublands.

### Monitor the fire

The fire should burn slowly and self-extinguish by early evening when the weather becomes cooler and it is more difficult for fuels to keep burning.

### After the flames are out

When the area has burnt out, use a metal rake to move smouldering vegetation, branches and woody material towards the middle of the burn area to minimise the risk of escape. Water can also be used to fully extinguish the area.



### Monitor the area

Make sure the fire does not reignite. There should be no smoke, smouldering vegetation or glowing embers. Continue monitoring the area until it is fully extinguished and safe to depart.

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**If you lose control of your burn, call Triple Zero (000) immediately.**

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## Stage 6: After the burn

### Check the burn area the following day

Check to ensure the fire has not reignited. There should be no smoke, smouldering vegetation or glowing embers.

### Continue checking several times a day

Keep checking the burn patch for at least two days after the burn, or longer if weather conditions escalate. Larger fuels may continue to smoulder and potentially reignite.

### Keep monitoring the area

Until you are confident the burn is completely extinguished and safe, keep monitoring the area.

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**It is your responsibility to monitor the burn area until the fire is fully extinguished.**

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# Burn SMART checklist

## Stages 1 and 2: Planning the burn

Planning should be undertaken weeks or even months in advance of your planned burn.

Actions	Completed
Develop a fuel management strategy for your property. Sketch how you will divide your property into manageable burn patches. Refer to full instructions on pages 12-13.	<input type="checkbox"/>
Contact your local government for information on burning restrictions in your area. A permit to burn will be required during restricted burning season.	<input type="checkbox"/>
Prepare your burn patch. Refer to and complete the list of preparations on page 14.	<input type="checkbox"/>

## Stage 3: Before the burn

Actions	Completed
Confirm it has been two days but no more than 10 days since it last rained (5mm or greater). You can check at <a href="http://bom.gov.au/climate/data">bom.gov.au/climate/data</a> .	<input type="checkbox"/>
Check for mild weather conditions for the next several days at <a href="http://bom.gov.au/places/wa">bom.gov.au/places/wa</a> . Do not burn if strong winds and dry conditions are forecast.	<input type="checkbox"/>
Ensure all equipment is available and in good working order. Include a metal rake, shovel, hose or another source of water.	<input type="checkbox"/>
Confirm that the people helping you with the burn are still available.	<input type="checkbox"/>
Notify all neighbours no less than four days prior to burning. This includes neighbours separated by a road, lane or waterway.	<input type="checkbox"/>

## Stages 4 and 5: Day of the burn

Actions	Completed
Visit <a href="https://www.emergency.wa.gov.au">emergency.wa.gov.au</a> for current Total Fire Ban and Fire Danger Ratings in your area.	<input type="checkbox"/>
Visit <a href="https://www.bom.gov.au/wa/warnings">bom.gov.au/wa/warnings</a> to check that the Bureau of Meteorology has not issued a severe weather, strong wind warning or haze alert for your area.	<input type="checkbox"/>
Check your local weather forecast at <a href="https://www.bom.gov.au/places/wa">bom.gov.au/places/wa</a> . Wind speeds should be less than 20 kilometres per hour. Relative humidity should be greater than or equal to 40%.	<input type="checkbox"/>
Notify your local government of your intent to burn, if required. If a permit has been issued, ensure burn conditions comply with those outlined on the permit and any additional notifications are completed.	<input type="checkbox"/>
Complete the leaf moisture method on pages 8–9. Confirm fuel moisture levels are appropriate for a burn.	<input type="checkbox"/>
Call your neighbours and remind them that you're burning today.	<input type="checkbox"/>
Register your burn with the DFES Communications Centre on <b>(08) 9395 9209</b> .	<input type="checkbox"/>
Conduct a pre-burn briefing with everyone who will be helping with your burn.	<input type="checkbox"/>
Know the steps you need to take in Stage 5: During the burn shown on page 17.	<input type="checkbox"/>

If the above steps have been completed and conditions are suitable, progress with your burn.



## Stage 6: After the burn

Actions	Completed
<p>Check the burn area the following day to ensure the fire has not reignited. There should be no smoke, smouldering vegetation or glowing embers.</p>	<input type="checkbox"/>
<p>Thoroughly check the burn patch several times a day for at least two days after the burn. Check for longer if the weather becomes hotter, drier or windier. Larger fuels may continue to smoulder for several days and potentially reignite. Monitor the area until you are confident that the burn is completely extinguished.</p>	<input type="checkbox"/>

For more advice, consult your local government ([walga.asn.au/About-Local-Government/Online-Local-Government-Directory.aspx](http://walga.asn.au/About-Local-Government/Online-Local-Government-Directory.aspx)). Always check your local government requirements before conducting a burn.

# Recommended burn intervals

The burn intervals listed below are based on accepted practice and research to sustain ecosystems and maintain fuel loads within a manageable range. If the vegetation type on your property is not listed below, contact your local government or email [BushfireCoE@dfes.wa.gov.au](mailto:BushfireCoE@dfes.wa.gov.au).

Vegetation Type	Recommended burn interval (years)	Comments
<b>Banksia woodlands</b> Ecological communities dominated by banksia species ranging from tall open shrublands to low forests.	8+	50% of the fine fuel presents as live vegetation and will accumulate rapidly in the first six years after fire. Complementary mechanical fuel reduction should be considered between burns.
<b>Jarrah-Marri woodland/forest</b> A medium to tall forest (>30% canopy cover) or woodland (≤30%).	6	These vegetation types cover a large geographical range, a wide variety of climatic and geographic situations and are highly variable in structure.
<b>Karri forest</b> A very tall forest dominated by Karri.	4	This community produces fuel at approximately twice the rate of Jarrah-Marri forest. Karri trees have thin bark so are much less resilient to hotter burns and intense bushfires. Frequent low intensity burns are preferred.
<b>Kwongan shrubland</b> Low shrubland community, generally <2 metres tall (although often taller in patches), usually growing in deep sands. Kwongan communities are rich in smaller banksia species.	Not applicable	When in good condition these vegetation types generally have a limited surface fuel load, although elevated fuel loads can be quite high. For smaller private blocks (as covered by this guide), it is recommended that targeted mechanical methods be used to minimise the threat of bushfire e.g. slashing and mulching.
<b>Tuart forest</b> A tall forest dominated by Tuart with a sparse mid-story.	5+	This vegetation is highly susceptible to invasion by weeds if planned burns are conducted too frequently.
<b>Wandoo woodland</b> Open woodlands and forests.	6-16	Burn regimes can vary considerably for this vegetation type. It may have a grassy or dense shrubby understory on the Swan Coastal Plain and a low, open, shrubby understory within the Jarrah Forest Biogeographic region.
<b>Other ecological communities</b> There are other, generally smaller and often rarer, ecological communities not described above.	Variable depending on situations and management objectives	For information on managing fuel in these communities, contact your local government or the Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service's Land for Wildlife Program at <a href="http://dpaw.wa.gov.au/management/off-reserve-conservation/land-for-wildlife">dpaw.wa.gov.au/management/off-reserve-conservation/land-for-wildlife</a> .

# Useful resources

Resource	Information
<b>Online Local Government Directory</b> <a href="http://walga.asn.au/About-Local-Government/Online-Local-Government-Directory.aspx">walga.asn.au/About-Local-Government/Online-Local-Government-Directory.aspx</a>	For all Western Australian local government contact details.
<b>Department of Fire and Emergency Services</b> <a href="http://dfes.wa.gov.au/plannedburning">dfes.wa.gov.au/plannedburning</a>	For planned burning information, tools and resources.
<b>Emergency WA</b> <a href="http://emergency.wa.gov.au">emergency.wa.gov.au</a>	For current Total Fire Ban and Fire Danger Ratings in your area.
<b>Bureau of Meteorology – Warnings</b> <a href="http://bom.gov.au/wa/warnings">bom.gov.au/wa/warnings</a>	For information on severe weather, strong wind warnings and haze alerts in your area.
<b>Bureau of Meteorology – Forecasts</b> <a href="http://bom.gov.au/places/wa">bom.gov.au/places/wa</a>	For weather forecasts in your area.
<b>Bureau of Meteorology – Climate Data</b> <a href="http://bom.gov.au/climate/data">bom.gov.au/climate/data</a>	For historical records on climate measurements, including recent rainfall.
<b>Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service</b> <a href="http://dpaw.wa.gov.au/management/off-reserve-conservation/land-for-wildlife">dpaw.wa.gov.au/management/off-reserve-conservation/land-for-wildlife</a>	For information about the Land for Wildlife Program.

