



A guide to **prescribed burning**







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Introduction

Why we burn

Prescribed burns are used to reduce fuel loads across strategic areas of public and private land to help limit the spread and intensity of bushfires and protect communities.

Low fuel areas created by burns provide safer areas for fire fighters to work from. As well as protecting people and property, prescribed burns are used to manage vegetation and promote biodiversity.



Peri-urban areas at risk of bushfire



Strategic burn planning to protect houses





Prescribed burning is also used for environmental outcomes such as protecting animal habitats, assisting the regeneration of plant species and to aid in the control of weeds.

The germination of many native plant species is promoted by fire.

Some species of native animals prefer regenerating vegetation after fire while others like long unburnt habitat.

Prescribed burning aims to manage the landscape so that there are a mix of habitats available for different animals.

Bushfire fuel

Bushfire fuels are made up of the living and dead vegetation that burns and carries a fire. Fuels can be characterised by type, size, quantity, arrangement and moisture content.

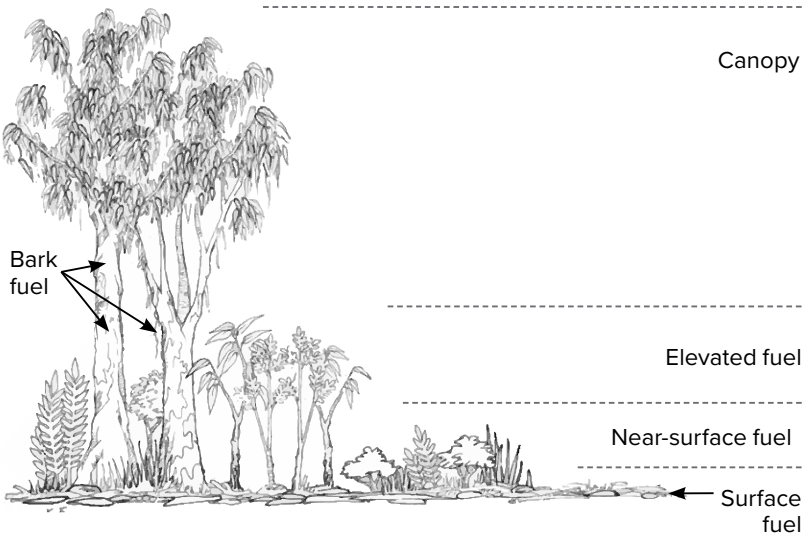
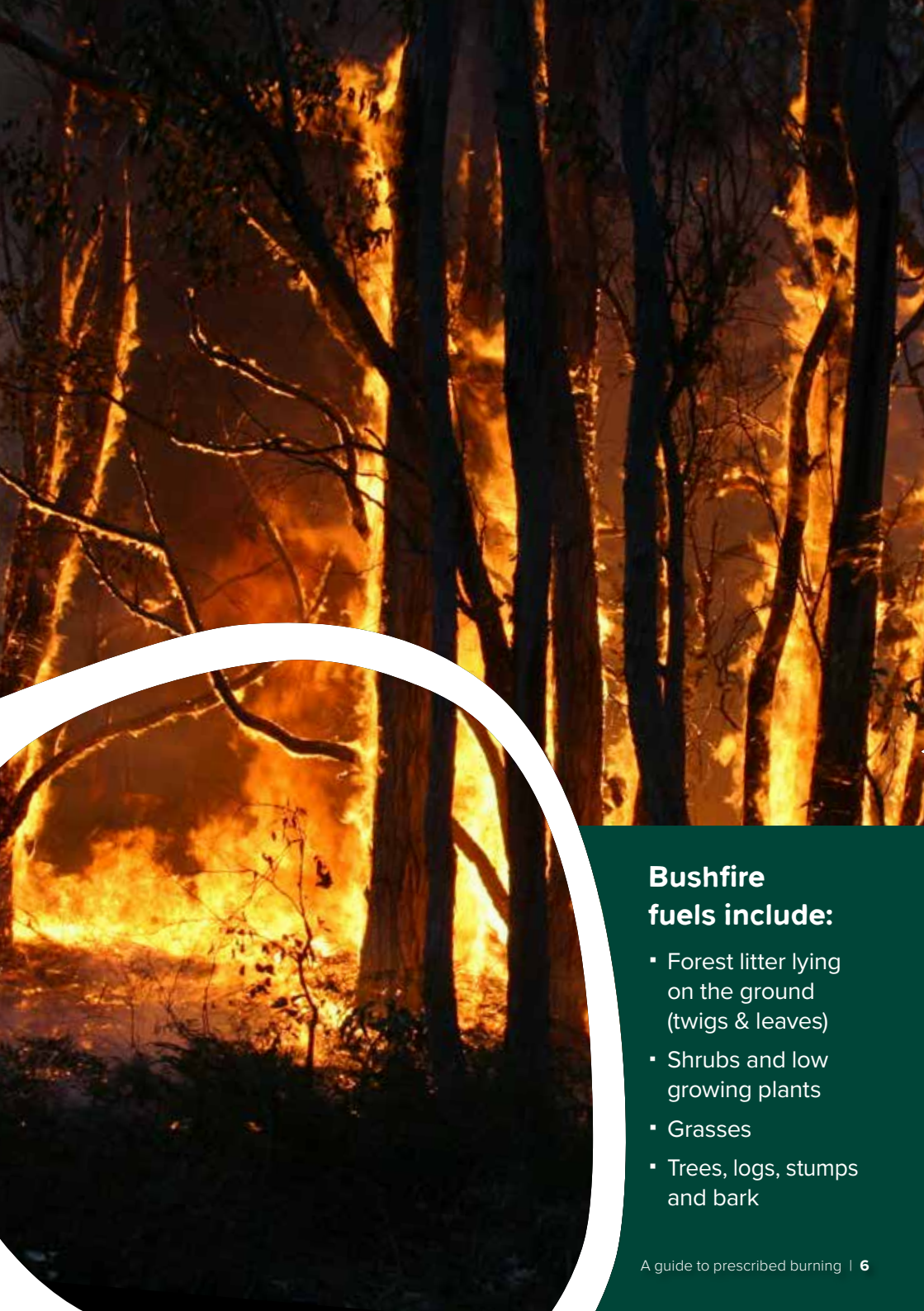


Figure 1: Fuel layers and bark



Bushfire fuels include:

- Forest litter lying on the ground (twigs & leaves)
- Shrubs and low growing plants
- Grasses
- Trees, logs, stumps and bark



Elevated fuels

These might be shrubs or small trees

Bark fuels

Rough or loose bark on tree trunks and branches.

Fine fuels

On the ground such as bark and leaf litter



Fine fuels

Fine fuels are defined as any dead or live plant material less than 6mm wide, or smaller than your little finger.

This includes fallen bark, leaf litter, grass, tussocks, heath and some shrubs. These fuels dry out fast and heat up quickly as a fire approaches, which means they catch alight and burn easily.

Fine fuels carry the fire forward, making them the most dangerous of all the fuel types. This is the main fuel type targeted in prescribed burns.

Coarse fuels

Larger fuels such as tree branches and fallen logs take longer to catch alight and therefore they don't carry the fire, however once they have caught they burn for some time after the front has passed.

Bark fuels

Wind can carry burning bark fragments long distances and create spot fires ahead of the main fire. This can make controlling a bushfire extremely difficult.

Burning the bark of rough-barked trees in a prescribed burn reduces:

- the risk of spotfires during a bushfire,
- the risk of ember attack on properties and
- the intensity of bushfires in that area for a longer period of time than burning fine fuels alone.



Thick, stringy-bark burns readily, even in mild conditions, and this does not negatively impact the trees. Even though the flames in this burn are low, the bark is still burning up the tree trunks



LOW fuel

Fuel loads

Before conducting a prescribed burn, staff will measure the fuel load present at the site.

This helps us estimate the bushfire risk, and will also give information about what fire behaviour to expect when it burns.



MODERATE fuel

HIGH fuel



VERY HIGH-EXTREME fuel

Fire behaviour

Is affected by:

- Fuel type (eg. coarse, fine), connectivity and dryness
- Climatic conditions (wind, temperature, humidity)
- Slope



MODERATE intensity fire behaviour



HIGH intensity fire behaviour



What is Prescribed burning?

Prescribed burning is defined as the process of planning and applying fire to a predetermined area, under specific environmental conditions, to achieve a desired outcome.

In South Australia they are referred to as prescribed burns because they follow a 'prescription' with a number of conditions that must be met.

To burn safely and effectively the right combination of:

- fuel load
- fuel moisture
- temperature
- relative humidity
- and wind speed

must be determined for each site. These factors, along with the site's slope, will determine the intensity and speed at which a site will burn.



Achieving the desired fire behaviour by burning in the prescribed conditions

Portable weather stations can be used to give accurate on-site information

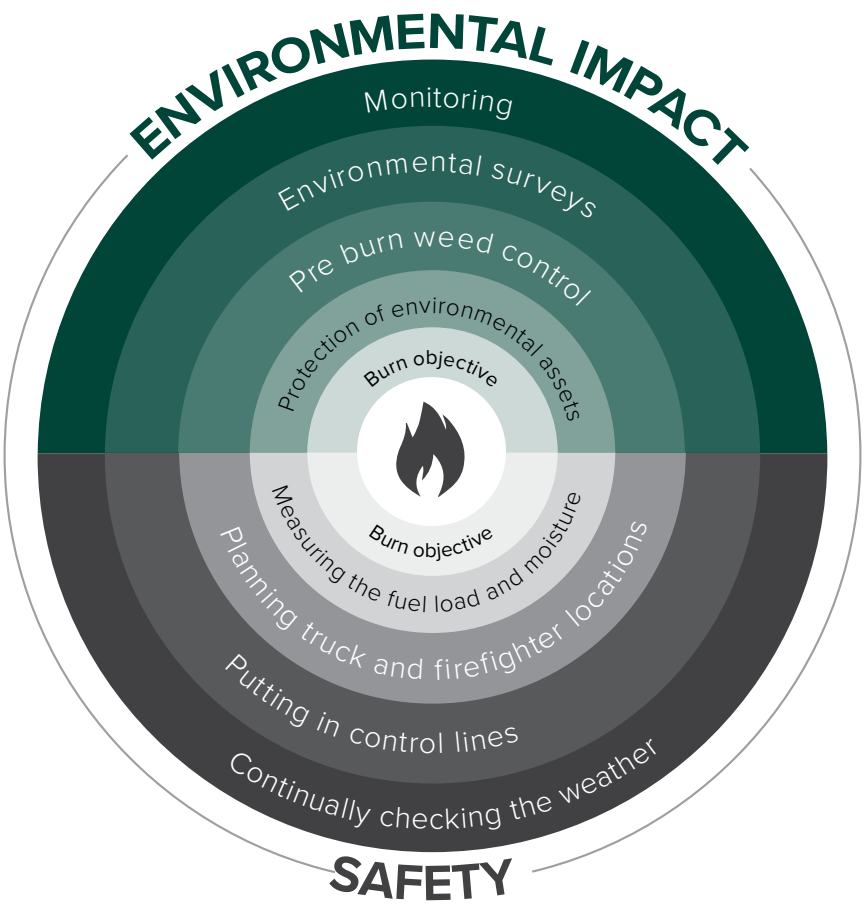


staff measuring fuel moisture prior to igniting a prescribed burn

Prescribed burn preparation

Preparing for a prescribed burn involves a lot of planning and on ground work.

Burn planning begins years in advance and burns are added to a dynamic rolling program.





Fire crews controlling non native pine trees to reduce fuels and prepare for a burn

There are a variety of operational tasks that crews do on-site before a burn to make it safer and more effective.

Actions aimed at reducing environmental impacts and providing ecological benefits include:

- Environmental surveys
- Pre burn weed control
- Protection of environmental assets

Actions undertaken to make a burn safer to conduct include:

- Creating control lines (brushcutting, verging tracks, etc)
- Planning the number, location, and positioning trucks and firefighters
- Measuring the fuel load and moisture
- Ensuring there are adequate water supplies nearby

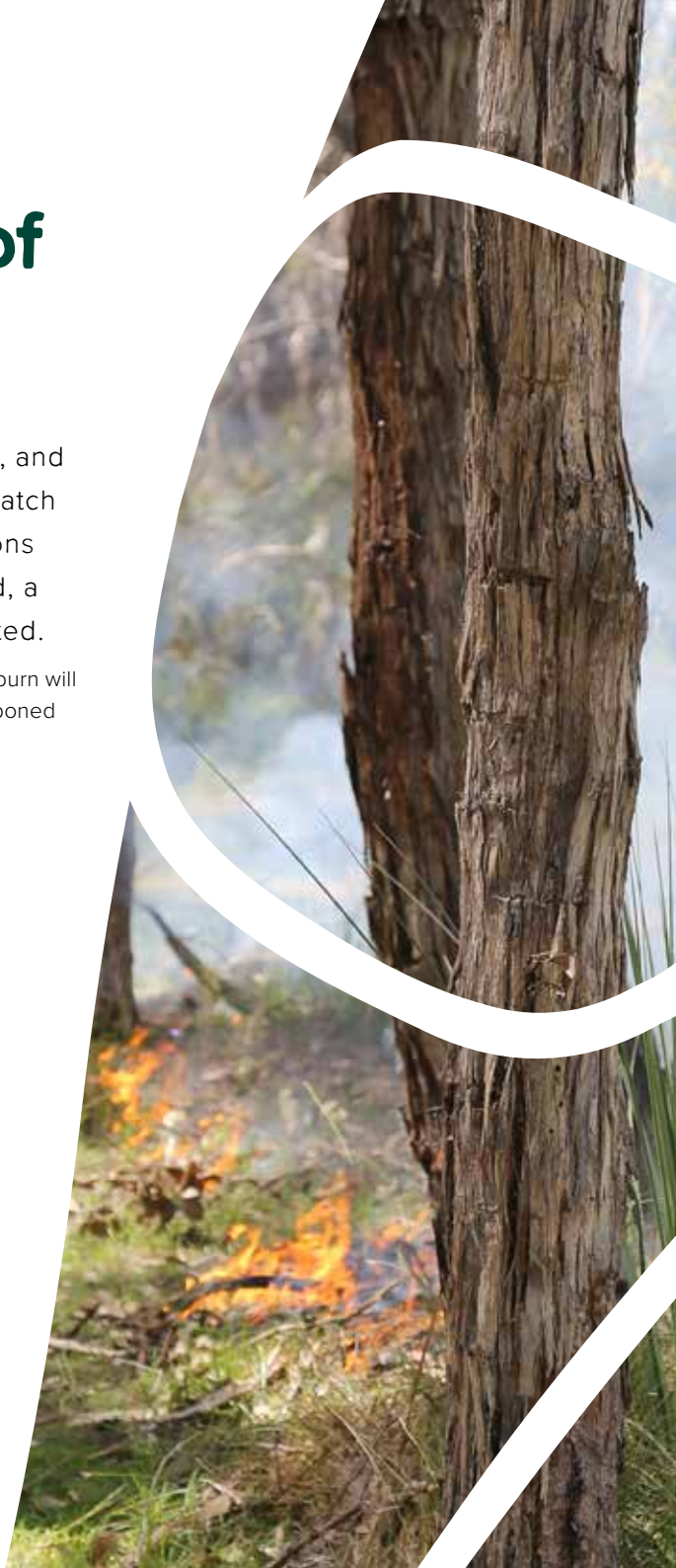
Photo: Clearing around hollow bearing trees to protect them



The day of the burn

Once the planning and preparation are complete, and the weather conditions match with the required conditions that have been calculated, a small test burn is conducted.

If the fire behaves as planned the burn will continue, otherwise it will be postponed until conditions are more suitable.



Operations Officer timing a test burn to check fire behaviour



Checking the weather on
ground before ignition

Day of the burn



Ignition begins: lighting up the edge of a burn with a drip torch


Prescribed burning is conducted by highly trained firefighters from National Parks and Wildlife Service with support from CFS, ForestrySA, and SA Water.

These agencies also have the necessary equipment, protective clothing and protocols to ensure burns are conducted safely and successfully.

Photo: Aerial ignition is sometimes used for burns in inaccessible terrain



Day of the burn



**Lighting methods
and patterns are
tailored to each
burn to manage fire
intensity and make
sure we can achieve
our planned objective.**

Once light up is complete,
crews mop up and patrol
the area day and night
to ensure it is safe and
doesn't rekindle.

Photo: Aerial view of ignition pattern
and control line at Cleland
Conservation Park

Animals and fire

Before every prescribed burn, staff assess the potential impact on native animals and plants, and ensure there is enough unburnt habitat in the landscape for populations to use while the burnt habitat regenerates.

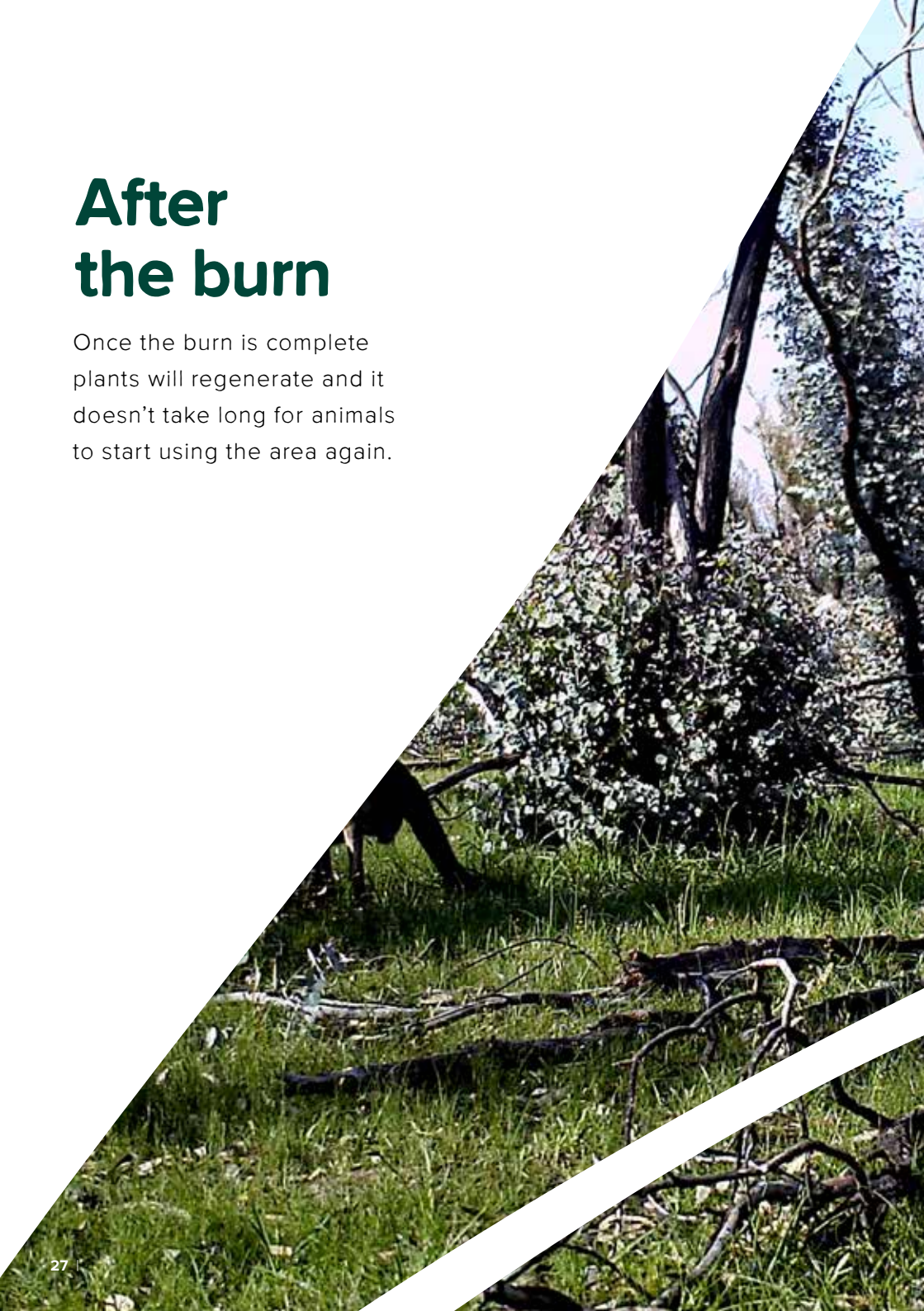
Animals have various strategies to survive in prescribed burn areas. Some will move ahead of the burn, while others will seek shelter in the tops of trees or in burrows or under rocks and logs.





After the burn

Once the burn is complete plants will regenerate and it doesn't take long for animals to start using the area again.





Vegetation recovery

The Australian landscape has been evolving with fire for millions of years.

Plants in fire-prone landscapes respond in two main ways, by re-sprouting or by germinating from seed. Some plants need the smoke and/or heat from fire for their seeds to germinate.



Endangered *Hibbertia tenuis* seeds appear to require fire to germinate



Epicormic growth on a stringybark tree



Banksia seedling germination in response to fire





Some plants use the opportunity after a fire, when there is less competition from other plants, to grow prolifically and set seed

Weed control

Fire will stimulate the germination of many plant species, including weeds. That's why controlling weeds that emerge after a burn is important.

Weed control that is planned carefully in conjunction with burns can reduce the time taken to manage the infestation and improve the recovery of native vegetation in the weedy area.



Buddleja sprayed with herbicide to ensure it burns



Buddleja site post-burn with good access for follow up weed control

Temporary control line recovery

Temporary control lines are sometimes required to help conduct a burn safely.

After the prescribed burn, the slashed vegetation will regrow along these control lines and new plants will germinate in the cleared space.



Temporary control line on the day of the burn



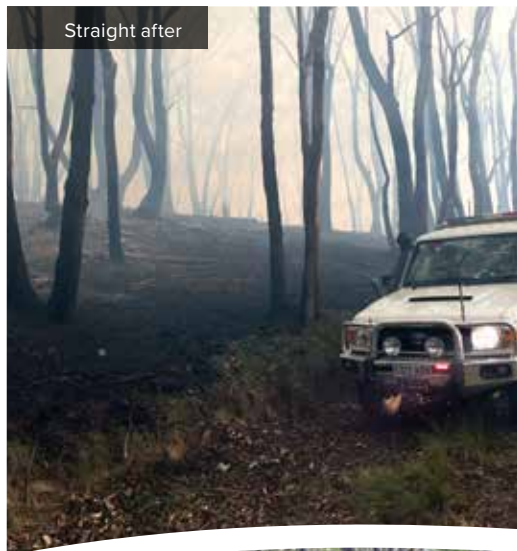
One year later

Fuels over time

Bushfire fuels are not constant over time. Immediately following a fire there will be very little fuel available, but bark and leaf litter accumulate as time passes.

Plants regrow and re-establish surface and elevated fuel layers over time. Depending on the type of vegetation it can take as little as 5 years or as long as 30 years for the fuel level to return to how it was before the fire.

Some vegetation will regrow quickly and might seem as dense as it was prior to the fire, but the reduction of dead plant material and loose bark will continue to have an effect. The 'fuel hazard' (amount of available fuel for a bushfire) will typically be lower than it was pre-fire for at least 10 years.



1 month after



4 months after

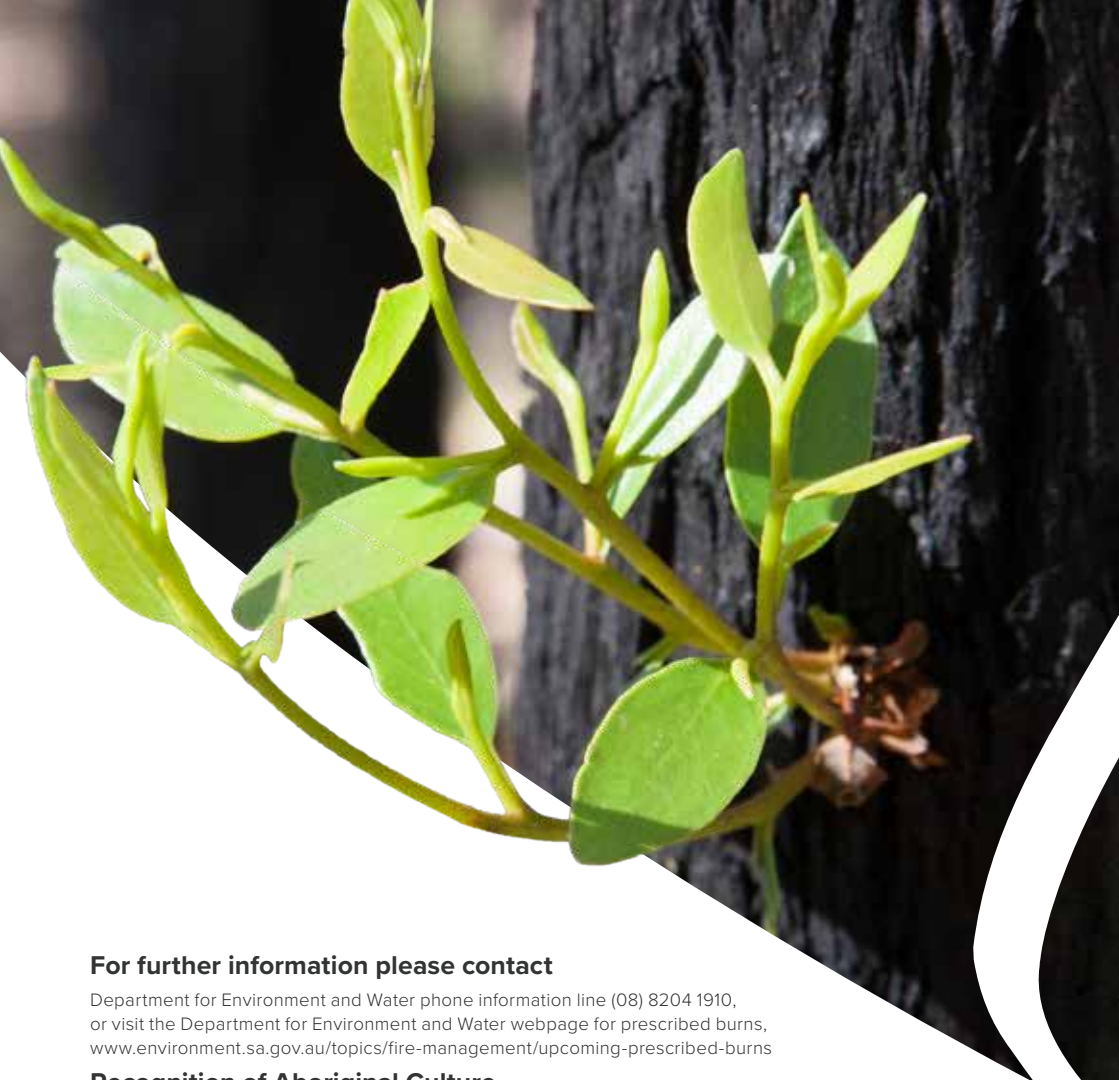


2 years after



10 years after





For further information please contact

Department for Environment and Water phone information line (08) 8204 1910, or visit the Department for Environment and Water webpage for prescribed burns, www.environment.sa.gov.au/topics/fire-management/upcoming-prescribed-burns

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environment.sa.gov.au/topics/fire-management



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