

Bushfire preparation and recovery:

A manual for livestock producers



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Contents

Chapter 1:	4	Chapter 5:	27
Introduction		Immediate aftermath of fire	
1.1 About this manual	5	5.1 Safety	28
1.2 How to use this manual	5	5.2 Support, help and advice	28
1.3 Steps in farm fire preparation and recovery	5	5.3 Immediate one-page plan	28
1.4 A word of advice	5	5.4 Stock assessments	29
		5.5 Welfare of surviving stock	32
Chapter 2:	6	Case study: Infrastructure in recovery	34
Year-round preparation and recovery planning		Chapter 6:	35
2.1 Insurance	7	Short-term recovery	
2.2 Planning to respond	7	6.1 Options for surviving stock	36
2.3 Vegetation management	8	6.2 Effects of fire on surviving stock & livestock enterprise	39
2.4 Bushfire-resilient infrastructure	10	Case study 6.1: Using containment feeding in recovery	43
2.5 Preparation for fire	12	Case study 6.2: Making recovery decisions	44
2.6 Livestock management	14	Case study 6.3: Managing biosecurity risks	45
Case study: Being prepared	16	Chapter 7:	46
Chapter 3:	17	Long-term recovery	
Fire season preparation		7.1 Pause to consider	47
3.1 Read your farm fire plan	18	7.2 Long-term planning	47
3.2 Prepare your home	18	7.3 Long-term pasture recovery	47
3.3 Check equipment and fill water	18	Case study 7.1: Accepting help	50
3.4 Assess and manage fuel loads	18	Case study 7.2: Rebuilding and refining	51
3.5 Water lawns	18	Appendix A:	52
3.6 Remain informed	19	Calculating the expected cost of feeding	
3.7 Self-sufficiency and seeking assistance	20	Appendix B:	54
3.8 Risky activities on farm	20	Farm Fire Plan	
Chapter 4:	21		
Fire approaching			
4.1 Stay informed – know where there is fire	22		
4.2 Firebreaks	22		
4.3 Emergency feed	23		
4.4 Move stock to refuge area and graze down	23		
4.5 Assess personal safety risks – go out on farm or shelter at your house?	24		
4.6 Final preparations before the fire arrives	24		
4.7 Calling for help	24		
4.8 Ensure your house is ready to shelter in: action checklist	25		
4.9 Fighting the fire	25		
Case study: Enacting your fire plan	26		



Chapter 1:

Introduction

1.1 About this manual

The Black Summer bushfires of 2019–20 affected farms across six states of Australia and had a significant impact on the agricultural community, with thousands of farms affected by significant losses of livestock. Bushfire is a major threat to rural livestock production and over the coming years in Australia, fire intensity, frequency and size are all predicted to increase.

In catastrophic fire conditions, leaving the farm may be the safest option for you. A bushfire may be more severe than you expect, as was experienced by many farmers during Black Summer. Fortunately, if it is safe to stay there are concrete steps you can take that are likely to help protect your livestock and farm as well as your own safety.

Compared with producers who are unprepared, those who have a farm fire plan and appropriate equipment and training lose fewer livestock or suffer less infrastructure damage and can get back to business sooner after a fire.

This manual provides the essential information you need as a livestock producer to prepare for and recover from bushfire.

1.2 How to use this manual

The main objective of this manual is to enable you to create a fire plan for your farm. The template at the back of this manual can be used to produce your own farm fire plan. This template is based on the *Farm Fire Plan* publication produced by the NSW Rural Fire Service (RFS), with additional information specific to beef cattle and sheep farms that is based on MLA-funded research about the experiences of producers responding to and recovering from the Black Summer bushfires.

Whether or not you have experienced fire before, this manual provides the fundamental information you need to prepare your farm fire plan. It also provides links to other sources from which you can gain a deeper understanding of bushfire preparedness and recovery.

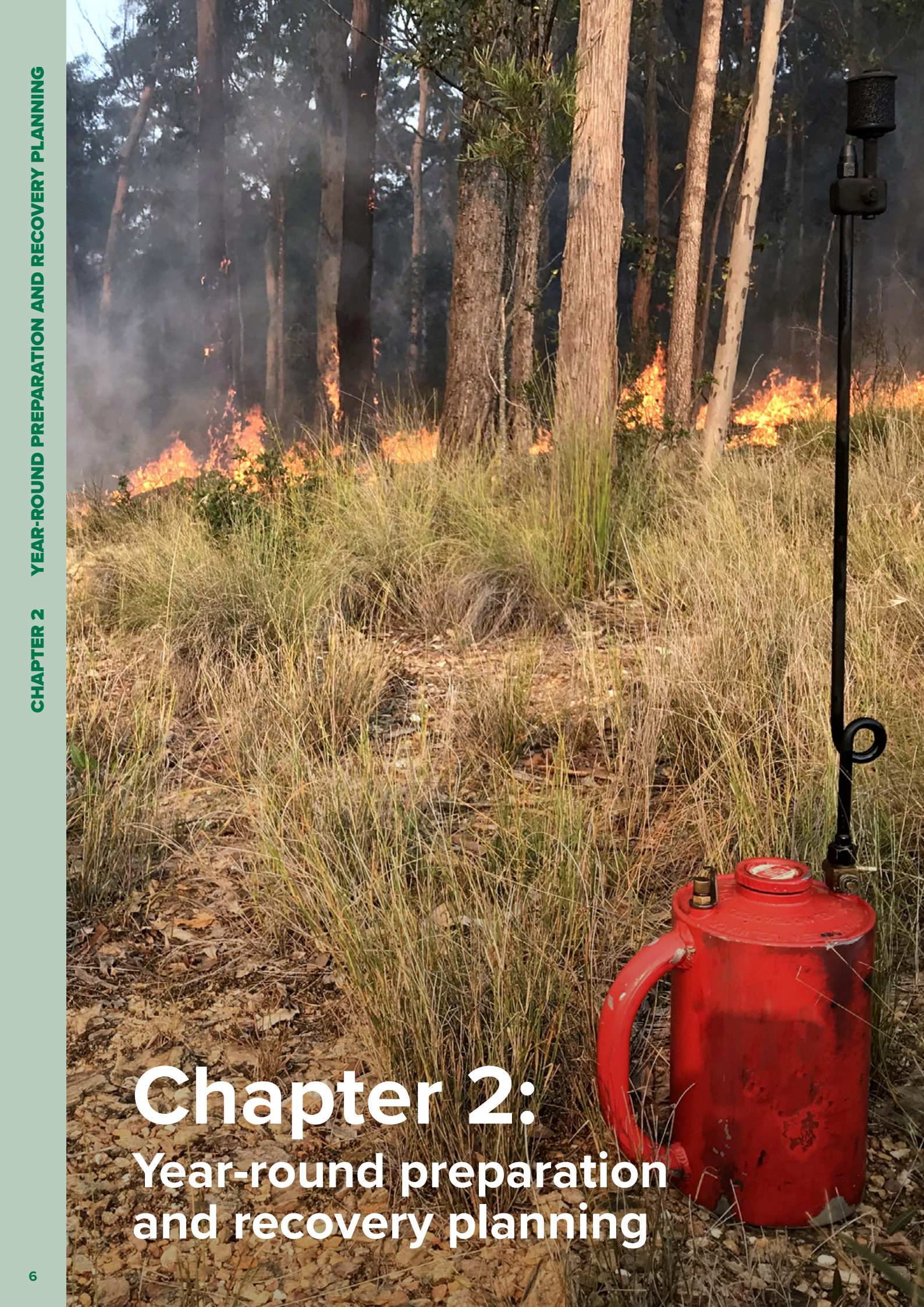
1.3 Steps in farm fire preparation and recovery

Your farm fire preparation and recovery plan should include these steps:

1. Prepare your property (e.g. reduce fuel, create an action plan).
2. Discuss (leave or stay, action checklist as fire arrives, equipment).
3. Know the conditions and bushfire alert levels.
4. Keep up to date (fire authority apps and your own observations).
5. Improve infrastructure to aid farm fire resilience.
6. Ensure you have adequate insurance.
7. Be self-sufficient (e.g. generator, food, medicines, communications, batteries).
8. Plan emergency livestock management (e.g. refuge paddock, emergency veterinary assistance).
9. Plan to recover after fire.

1.4 A word of advice

MLA and its research partners recommend this manual to you and hope that you will use it to prepare for the next bushfire in your area. Being prepared for fire is not something you do once a year or just at the start of summer. The best way to prepare for fire is to do a reasonable amount of work regularly, throughout the year, every year. This manual aims to help you to achieve that.

A photograph of a red fire hydrant in the foreground, set in a field of tall, dry grass. In the background, a fire is burning through the trees, with smoke rising into the air. The scene is captured in a natural, outdoor setting.

Chapter 2:

Year-round preparation and recovery planning

This chapter is about long-term planning for future fire. What should you do over many months or years before you are threatened by fire?

2.1 Insurance

Obtaining insurance is one of the most important things you can do to prepare for post-fire recovery. Interviewed producers who had good insurance cover felt that insurance was essential for a quick and least stressful recovery. Access to insurance increases the options you have after a fire. Few producers are fully insured: for example, in a small group of producers affected by the Black Summer bushfires, only 15–80% of losses were recouped, with the median ‘gap’ between losses and payout being approximately \$300 000.

To ensure you are insured adequately:

1. Review your policy annually when you pay your premiums to avoid accidentally underinsuring – talk to your broker.
2. Budget for insurance as a routine farm expense. Premiums are often as low as 2% of all costs, or 1.6–2.1% of gross income.
3. Understand the types of farm insurance:
 - home and contents
 - farm property: fences, livestock, buildings and contents, tanks and silos, stockyards, machinery and vehicles
 - farm business interruption: may cover the cost of feeding livestock or relocation (agistment) until the property has recovered. Check the conditions in the fine print with your broker.
4. If only partly insuring your livestock or an asset's value, discuss with your broker whether your policy has an 'average clause'. An average clause can reduce the payout if you are under-insured and you should avoid having one in your policy where possible.

Different farms may need different insurance based on fire risk and financial position. A farm with low equity and no other source of income may need greater insurance cover. In the absence of insurance, limited cash flow and therefore limited ability to reinvest and rebuild can result in severe business interruption or failure. In contrast, farms with high equity and low debt may be able to have lower insurance cover if they can borrow against other assets during recovery, although some insurances may still be required.

In general, tailor your insurance cover to your business situation, attitude to risk and the probability and potential cost of an event like a bushfire, rather than just the cost of the policy. The high cost of insurances in some areas reflects the high risk of bushfire or flood. Consider prioritising ‘business-critical’ assets: what is essential for keeping stock on your property?

No two insurance policies are the same. Seek advice about the best policy for your business. Note that insurers may refuse to update your insurances very close to bushfire season, so seek advice before planning to make late changes to your policy in high fire risk years.

2.2 Planning to respond

Develop a farm bushfire response and livestock emergency plan

Having a farm fire plan is one of the most important things you can do to be prepared for fire as a cattle or sheep producer. During the Black Summer bushfires, farms that had a plan were six times less likely to have burnt livestock than those without a plan.

A farm fire plan is more complex than a fire plan for a house in town. Farm fire plan templates are available from some state fire authorities. We have included the farm fire plan from the NSW RFS as part of an MLA/RFS combined fire plan template at the back of this manual. Compare it to your state's plan to ensure appropriateness (for example, fire danger ratings can vary across jurisdictions).

In addition to the RFS plan, the template provides information about livestock protection, insurance and other details specific to livestock producers.

Use the template to make your own plan. The plan will include the critical information, decisions and action needed if your farm is fire-affected. It will also have sections for short- and long-term recovery after fire. Farms that have clear recovery plans with good preparation before fire are usually the farms with the most successful long-term recovery.



Find your *Farm Fire Plan* Template here.

2.3 Vegetation management

Bushfire behaviour

Understanding fire behaviour helps you predict what a bushfire may do. A bushfire needs four things to start:

- fuel (particularly dry, fine fuels like grasses, twigs, bark and fallen leaves)
- oxygen (air and wind)
- heat (hot, dry weather)
- source of ignition (lightning, faulty electrical wires or an accidental ignition such as hitting a rock when slashing and creating a spark).

Once a fire starts, bushfire behaviour is affected by several factors:

- amount and dryness of fuel (doubling the dry vegetation per hectare will increase fire intensity four-fold)
- wind (fire speed and intensity increases as wind speed increases)
- geography (for example, under mild conditions, a slope of 10 degrees upwards doubles the speed of a fire)
- temperature (the warmer the temperature, the greater the likelihood of ignition and the greater the speed of fire)
- humidity (low humidity contributes to greater potential intensity and speed of fire).



Although you cannot control the weather on your farm, you can control the fuel present (amount and dryness of vegetation). Any more than 8 tonnes of fuel per hectare will result in a fire of such intensity that it cannot be extinguished or controlled.

Managing fuel loads is the major way you can reduce your fire risk. Use your time and resources effectively by prioritising key places on the farm where you will manage fuel loads, remembering some vegetation will still be required for feeding livestock during a bushfire risk period.

Safety of houses close to bush

The location of your home on the farm is important for fire risk. The CSIRO analysed Victorian fires and found that for houses at least 90 metres away from the nearest forest, 90% of people sheltering in homes survived. Ideally, you need at least 100 metres of open pasture with no forest or bush around your house and major infrastructure. For your garden, choose low flammability species that tend to stay green in summer.

Houses on farms often accumulate fuel around them. This could include vegetation (forest, scrub or pasture growth) or build-up of machinery or farm consumables close to the house. Routinely remove vegetation and flammable materials from close to the house before every fire season: slash unnecessary vegetation or clean up and take a trip to the recycling centre. If you have a choice, plant green crops like lucerne next to the house. If possible, avoid highly flammable crops like canola near homes or important infrastructure.

Vegetation management

The two main things to do around houses and infrastructure are:

1. Control vegetation around infrastructure (e.g. house, sheds) and in paddocks close to infrastructure.

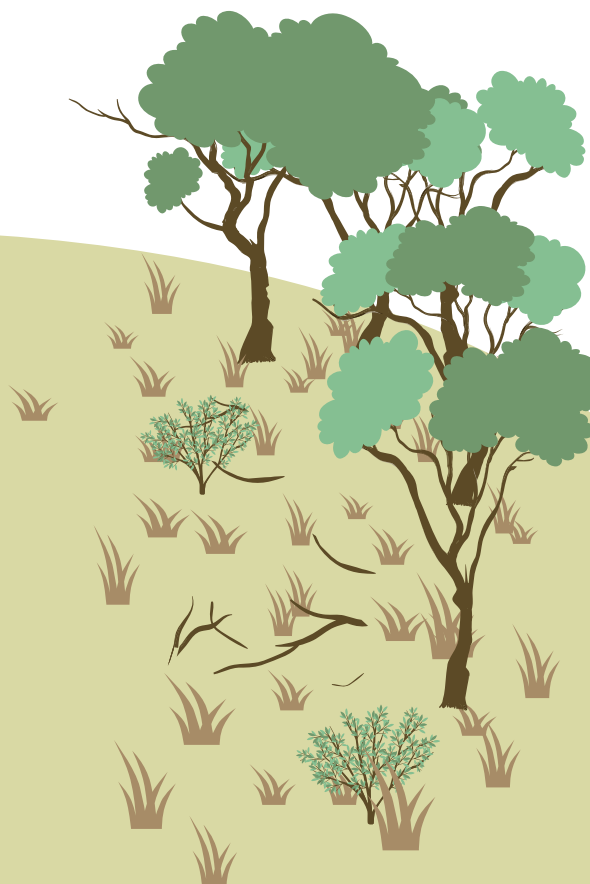
- Prevent woody weed infestation of paddocks – use herbicides and slashing.
- Graze down paddocks close to infrastructure during the fire season.
- Remove long grass and regrowth from infrastructure – slash, mow or have a paddock structure that allows you to routinely graze stock as close to infrastructure as possible to avoid fuel build-up in the most efficient way.
- Have zero fuel ('bare earth') against important infrastructure such as wooden fencing strainers and stays, tanks, troughs, plastic piping, sheds, feed silos and critical boundary fences. This could be achieved with herbicide application twice a year or by more permanent means such as concrete or gravel.

2. Conduct controlled burns (with approval) to avoid fuel build-up in any bush.

- Regularly burn forest and scrub, especially close to critical infrastructure in the cool season. This will reduce the intensity of a bushfire or sometimes even prevent a bushfire if burning was done recently.
- You will need permits and approvals – talk to your local fire service. There are rules around safely containing a fire, the environmental impacts of controlled burns (e.g. regularity of burning) and what is allowed to be burnt (e.g. not rainforest).
- Two useful sources of advice are the WA Department of Fire and Emergency Services (DFES) website for planned burning to help landholders 'burn smart', and the NSW RFS standard for hazard reduction burning:

i. www.dfes.wa.gov.au/plannedburning/

ii. www.rfs.nsw.gov.au/_data/assets/pdf_file/0011/13322/Standards-for-Low-Intensity-Bush-Fire-Hazard-Reduction-Burning.pdf



2.4 Bushfire-resilient infrastructure

Refuge on farm for people

If you choose to stay and defend your farm during a bushfire you will need somewhere to shelter as the fire passes. This is usually your house. If properly constructed, this may protect you at least for a short period of time until the fire has passed.

Features to make your house safe as a refuge are included in modern council building planning regulations, such as building to an appropriate bushfire attack level (BAL). Building to a higher BAL than the council requires can be useful despite the expense, as this gives more security when you are isolated and alone on a farm.

Over time, the required BAL level of a house in your area may increase due to climate change and emerging research on the effectiveness of BAL levels. Older houses can be improved to make them safer in a bushfire. For details, see this fire authority website for advice on retrofitting an existing house:

www.vba.vic.gov.au/_data/assets/pdf_file/0003/99471/Guide-retrofit-your-home-for-better-bushfire-protection.pdf

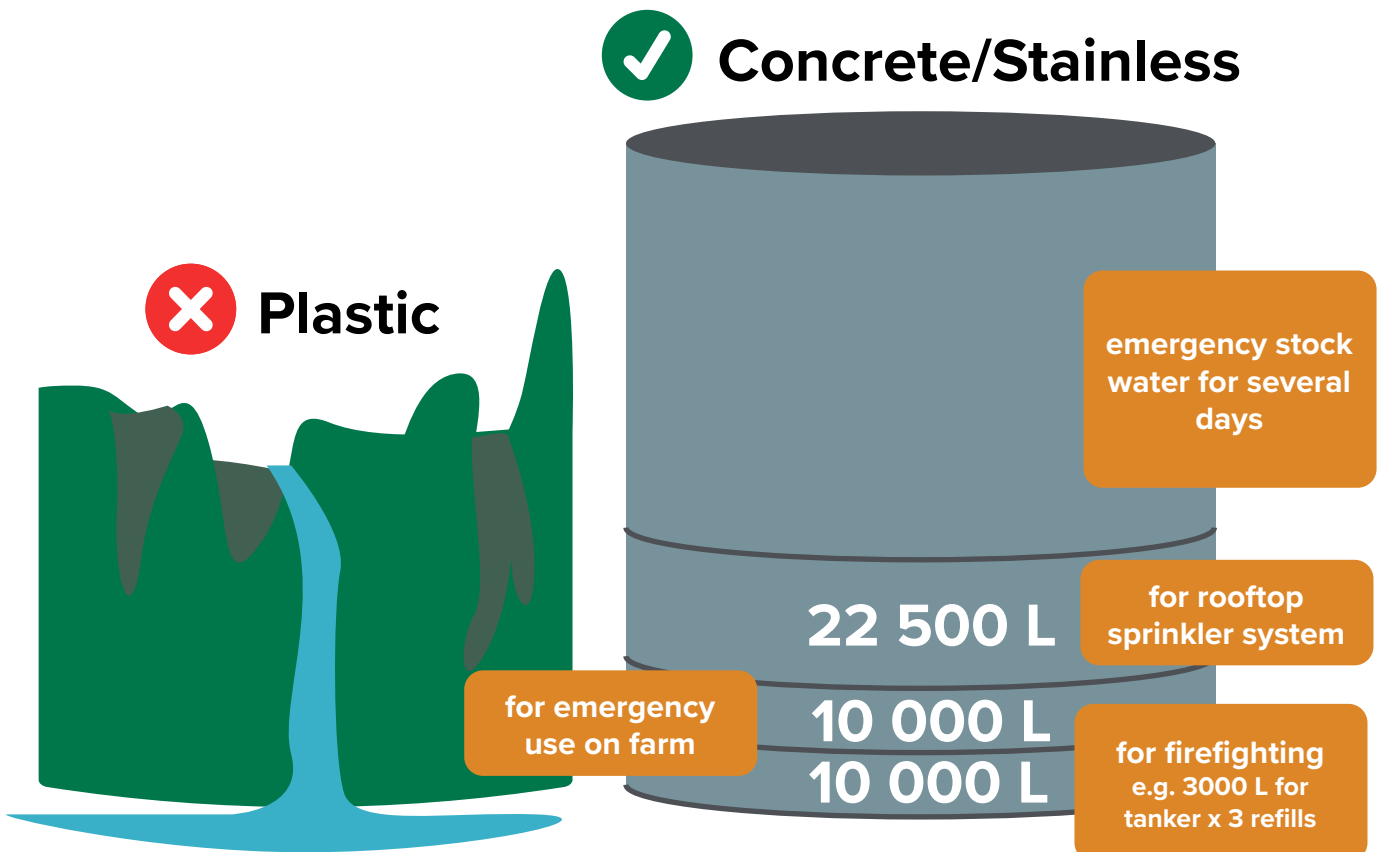
Emergency water

You need a bushfire-resistant water supply:

- large volume of renewable water (large dams, underground water etc.)
- concrete or steel tanks (not polypropylene or polypropylene-lined)
- poly pipes either buried underground or surrounded by bare earth
- back-up dams that cannot be burnt
- back-up water cartage equipment (a firefighting unit can be used).

Be aware of the water volume required during and after a fire:

- 10 000 L for emergency firefighting use at the house
- 22 500 L for a roof-top sprinkler system (if installed)
- at least 5000 – 10 000 L for emergency firefighting elsewhere on farm
- water for livestock – large volumes are required depending on livestock numbers
- water to irrigate/green house lawns to reduce fire risk – large volumes are required depending on size of lawn.



Calculate the amount of water you would need for your livestock to keep them in a refuge area for at least a week. For example, lactating cattle require an average of 80 L per day and dry ewes require 5 L per day, although these numbers double on very hot days and more can be required (see www.agric.wa.gov.au/small-landholders-western-australia/livestock-water-requirements-and-water-budgeting-south-west).

Ensure your water supplies will be sufficient. Remember that dam water quality can be affected by erosion after a fire, and above-ground connections to troughs may be fire-damaged and require replacement. Have alternative water for stock if possible.

Keep the emergency water source at your house constantly full. Consider installing a solar pump or other automatic pump on your main water source and connect it to your emergency water tank. Install a ballcock and pressure-activated switch so that whenever the level drops it is filled automatically. Automating tasks like these can significantly reduce the time spent managing water supplies and lower the risk of running out of water.

Water your lawns if you have enough water. Lawns that are short and green are harder to ignite and may even protect your house from a grass fire. If you have a good independent water supply (e.g. underground water) that is not subject to water restrictions, use this to water lawns in times of fire risk.

Use a sprinkler that works well under low pressure and casts a wide irrigation footprint (e.g. Wobble-Tee (www.wobble-tee.com.au/)). Permanently installed sprinkler systems may also be practical if your system has enough pressure.

Roof-top sprinkler system

A roof-top sprinkler system can help protect your house from direct flame attack and embers. Having a sprinkler system to protect the house may mean you and your helpers can focus on protecting other farm infrastructure, put out spot fires or shelter in place more safely.

Road access/tree maintenance

Some farm roads have trees close to the road verge. When bushfires burn this vegetation in a dry year, a proportion of trees can fall as trunks burn through at the base. These can block roads or remain suspended by other trees (become 'hung up'), at risk of falling. Clearing may require specialist skills and equipment and can delay road access to the farm.

Plan for this by clearing road verges of susceptible trees or plan for emergency clearance of trees after a fire. Factor in the cost of clearing this debris or consider relevant insurance. You should develop skills with safely operating a chainsaw so that you can safely clear some fallen trees. There are numerous private and public farm chainsaw training providers, for example:

www.tocal.nsw.edu.au/courses/short-courses/farm-skills/chainsaw-operation-and-maintenance

Learn to identify trees that are too dangerous to clear yourself or consult an arborist if unsure. Leave dangerous tree removal to professionals. If the road is council-maintained, record the council emergency number in your fire plan so you can call for help. If it is a private road, record the contact details of private tree removal specialists in your plan.

Fire-resistant farm infrastructure

When building new farm infrastructure, where possible select inflammable materials. This could include:

- using metal fence strainer posts instead of wooden ones. These will usually survive a bushfire although wires may need replacing.
- using metal cattle and sheep yards. Wooden fence posts in yards can be ignited by embers landing on top. Metal yards may also serve as a possible refuge location for livestock during a fire if they are safe.
- extending concrete slab or gravel base out from built infrastructure to keep flammable vegetation away from buildings.

2.5 Preparation for fire

Firefighting equipment and safety gear

It is often safest to leave your farm when a fire is approaching. However, if you are trained and prepared appropriately you may choose to stay. If you plan to stay on-farm during a fire, having the right equipment may enable you to put out fires around your infrastructure and protect livestock. Appropriate equipment will also be required for you to conduct controlled burns to manage vegetation during the year. Useful equipment includes:

- personal protective equipment
- firefighting unit/s
- UHF CB two-way radios
- electric generator and fuel
- machinery to install a firebreak.

Personal protective equipment

- heat-resistant goggles
- mask
- cotton or woollen clothing
- leather boots (preferably with melt-resistant soles)
- broadbrimmed hat
- leather gloves.



Image courtesy of www.rfs.nsw.gov.au

Specifically designed firefighting clothing that meets Australian standards (e.g. AS/NZ 4824: 2021) is available from a variety of sources. These specialised clothes are ideal as they are designed to keep the wearer protected yet cool. They can be purchased without logos or insignia by private individuals. For example see: www.aussiestormshop.com.au/wildland-firefighting-jacket.

Firefighting unit (fire pump, tank and hoses)

Farms with more than one firefighting unit and staff to use them had 10 times less risk of having burnt livestock in the Black Summer bushfires.

Firefighting units can be purchased as a complete unit or developed on the farm from components already present (e.g. a spray tank and a firefighting pump). They can be slip-on units for a ute or truck or can be prepared as a trailer. For example, see www.tti.com.au/product-category/fire-fighting-tanks-equipment/slip-on-units/. Service firefighting units annually before fire season.

Do not rely only on a tractor spray rig. While it may be of some use, the limited pressure and water flow of a spray rig means it is no substitute for a proper firefighting unit with sufficient pressure and flow to extinguish fire.



Image courtesy of TTI

UHF CB two-way radios

Handheld units to assist on-farm communication are useful, especially given the difficulty of using a mobile phone with leather gloves and the likelihood of telephone network outages occurring during a bushfire. One of the most common changes planned by farms affected by fire in the Black Summer season was to have two-way radios available on-farm.

The UHF radio frequency you use matters. Check rules at the Australian Communications and Media Authority for requirements (www.acma.gov.au/licences/citizen-band-radio-stations-class-licence).

On-farm, communicate on a general use channel that does not appear to be active locally. To communicate with your local fire brigade, they can advise which channel to use. If firefighters arrive on your farm and you do not know which channel to use to communicate with them, use Channel 11 to initiate contact and take advice on which channel to use.

The following channels are available. Channels outside 1–80 require a commercial license.

Channels	Available	Use
5 and 35	Yes	Emergency only
11	Yes	Initiating calls
10, 18, 29, 40	Yes	Clubs and road safety by convention
9, 12–17, 19–21, 24–28, 39, 41–60, 64–80	Yes	General use

Other equipment

Other equipment that can be very useful when preparing for fire includes:

- knapsack
- boltcutters
- rakes/McLeod tools
- chainsaws
- woollen blankets for sheltering from radiant heat
- ladder for accessing roof space or clearing gutters
- gutter plugs
- spare connections, O rings and consumables for the firefighting unit.

Equipment to install a fire break

Access to equipment such as a tractor with a 3-in-1 bucket, plough, bulldozer or grader will help you to quickly prepare a firebreak around your assets.

Note that many fire-related expenses are tax deductible – see the Australian Tax Office website for further information.

<https://www.ato.gov.au/business/primary-producers/livestock-and-other-assets/deductions-and-offsets-for-capital-expenditure/#Firepreparednessandprevention>

Firefighting training and experience

Having firefighting skills during a fire is invaluable. These skills will help you remain calm, know what to do and be aware of what is dangerous or relatively safe. It is therefore essential that you have some firefighting skills if you are going to stay on your farm during a bushfire. A fire service truck may not be available during a widespread fire, as seen during the Black Summer bushfires. If you have never experienced a fire, skills can be gained by participating in pile burning or controlled burning on your farm, or by volunteering with the local bushfire fighting brigade. These brigades provide training, equipment and experience and the opportunity to help others. Volunteering is a serious and long-term commitment but also an opportunity to gain valuable skills that you can use on your own property and those of your neighbours, friends and family.

2.6 Livestock management

Moving stock

If time allows, one of the best ways to protect your livestock from fire is to move them to the safest location on the farm (known as a 'refuge area'), or even off-farm out of the fire risk region if practically possible.

Identify which animals are the highest priority to be moved. Prioritise the animals that are most important for your business to continue post-fire, because of their genetic or monetary value. Generally, breeding stock are highest priority (rams/bulls, then young breeders, then older breeders), with dry stock lowest priority. If you cannot move all livestock, focus on your high priority animals. This is easier if you graze them in easily accessible paddocks during high-risk fire periods, so grazing management leading up to summer is needed to ensure pasture availability.

Plan to move any stock before the fire arrives. It is not safe to move stock once the fire arrives.

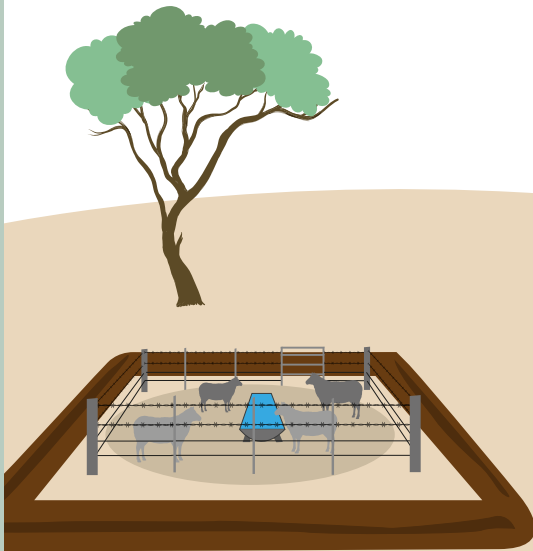
Refuge areas

A refuge area can protect your livestock from fire because it has a lower chance of burning than the rest of your farm. Ideally, you should have a permanent refuge area set up on your farm. If you don't have a specific area in an emergency, choose an area away from rising slopes with minimal dry vegetation: yards, grazed out laneways, heavily grazed paddocks, cultivated paddocks, irrigated paddocks, green fodder crops or lucerne (take care if residual dry matter present). Avoid areas that border plantation breaks or forest as radiant heat is a danger to stock. If water is not available in the emergency refuge area, it must be provided once the fire front passes.

A permanent refuge area is an area of the farm where stock can be kept during a fire or flood. A sacrifice paddock makes a useful permanent refuge. A containment area (usually used for drought feeding) also works, especially as fire often occurs in a drought year. The principles for selecting and setting up sacrifice paddocks or containment areas from drought management also apply to bushfire refuge areas.



Suitable refuge



Unsuitable refuge



At minimum, a sacrifice paddock used as a refuge area should have pasture that you don't mind being badly damaged, relatively flat land, minimal water run-on, a fireproof water supply, steel fencing and be close enough to yards and with good access for feeding and monitoring stock. Be aware of potential impacts on neighbours and public amenity. The refuge area should have large enough area to keep your stock for a period of days to weeks.

The refuge area is not just for emergencies – it is also a safe location to confine stock during fire recovery and can also be used for drought management and biosecurity quarantine. Because labour and cash flow are usually limited during early fire recovery, an existing refuge area will make recovery easier.

Pasture and feed

A fire may damage or destroy some or all of your pasture and/or stored feed. After a fire, roads may be closed and you will be busy. Calculate how much feed you would need to feed all your livestock for a week after fire if no pasture was available – an emergency feed budget. Record in your fire plan how much feed you would need, what types would be required and where you could source this feed from. If possible, have this kind of feed on hand before the fire season, but also have a back-up plan in case it is destroyed by fire.

If suitable, plan for feed that is less flammable (such as silage, pellets or grain, rather than hay) as you will be transporting it in a fire-affected district. If feeding grain or pellets, be aware of the risk of grain poisoning (see Section 6.2.1).





Phil Lamble, who farms cattle at his family farm Karina near Cobargo, NSW

CASE STUDY: Being prepared

Phil Lamble manages his family farm Karina near Cobargo, NSW. He felt prepared to enact his fire plan when fire struck on 31 December 2020. “We knew fire was a risk for this farm. I felt like I had a good understanding of fire and what could be done. I was actively managing the risk throughout the year: maintaining, clearing, managing the fuel loads.”

But the fire that arrived was not the grassfire that was expected; it was a high intensity fire that was far more difficult to defend against. “We often prepare for a grassfire, but because of the drought there was no grass. It was definitely a changing environment. Even on the day, it was just adjusting what you were doing to the conditions. I did things like having the gutters full of water, clearing anything that could burn away from the house, and was also thankful I had done that maintenance throughout the year.”

“If I’d had prior knowledge of what that fire was, I would have had about a fifteen-metre firebreak ploughed around the house. I think that would have helped. We don’t have any structural firebreaks; most of what we have is more to do with run-off. But it is cleared, besides the larger trees. They’re open paddocks.”

Another essential part of Phil’s fire plan was the insurance cover in place for the farm. “Insurance is just essential for a farm like ours. The road to recovery is long, and insurance makes a big difference to being able to move on. Looking back we probably had the right amount, though in hindsight I might have had all of our animals insured and had cover for wages. You’ve gotta be realistic of where your margins are, but I would recommend it.”

Phil has refined his fire plan since his experience during Black Summer. “There were definitely things learnt. For example, water is critical. I want to increase our sprinkler and pumping capacities: water was used to my advantage in this fire, and I would increase my ability to use the water for next time.”

When it comes to your equipment, Phil says, “quality is definitely important. Based on the fact that it’s a farm and a livelihood, it is worth investing in better quality equipment. I’d make my primary power source a diesel generator. I would also have liked a professional standard set of protective firefighting clothes to wear. The immediate effect on your body was very concerning.”

Looking forward, Phil is investing in things that benefit his business overall, as well as being useful for his fire plan. “The biggest thing is, looking where I can overlap machinery and things that would benefit the farm but also benefit firefighting.”



Chapter 3:

Fire season preparation

This chapter deals with the things you should do in the weeks leading up to and during the fire season. Your preparations will be based on the fire plan you prepared in Chapter 2.

3.1 Read your farm fire plan

Read and discuss your plan with staff and family to refresh everyone on the details. Make any final updates for the season. Assign responsibilities and set completion dates (e.g. for slashing and mowing around infrastructure).

Be ready to implement your farm fire plan if needed.

3.2 Prepare your home

Prepare your home for the fire season:

- mow lawns
- empty gutters
- remove vegetation and flammable materials from around the house
- check gutter plugs work
- make sure hoses and firefighting unit are available around the house and can connect to your emergency water supply
- if you have a rooftop sprinkler system, check it is working or service it.

3.3 Check equipment and fill water

Get out your fire units and check they are fully operational. If anything needs a service (e.g. fire pumps), schedule a date to complete this by and who will be responsible.

Locate and check all your equipment, including personal protective equipment.

Check your water supply and top up the emergency supply continually throughout the fire season.

3.4 Assess and manage fuel loads

If the fire season has started, it is likely too late to do any prescribed burning to manage fuel loads. However, you can reduce pasture length through grazing and by controlling fuel around infrastructure (you could even use a ride-on lawnmower).

Look at the fuel loads in adjoining bush to assess any risks so you are informed and mentally prepared. The Victorian Department of Sustainability and Environment has produced a good guide to assessing fuel loads:

www.ffm.vic.gov.au/_data/assets/pdf_file/0005/21110/Report-82-overall-fuel-assess-guide-4th-ed.pdf

3.5 Water lawns

If you have a very good source of water, such as an underground spring or bore, keep your lawns watered in times of bushfire risk. A short green lawn has low flammability and risk of ignition, so keeping the lawn around your house well watered will reduce the risk of spot fires starting close to the house and allow you to focus more of your attention on other areas during a fire.

Image courtesy of TTI



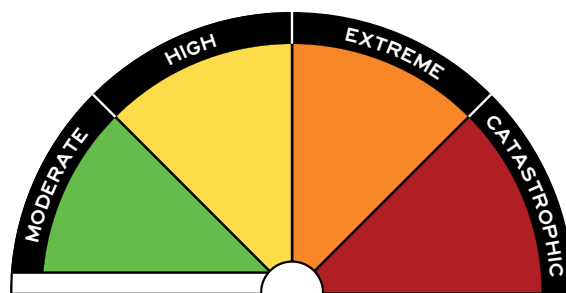
3.6 Remain informed

Check information sources regularly during the fire season. A fire app can provide key weather information and warnings with automated notifications.

Bureau of Meteorology fire weather warnings

Keep an eye on the weather through the Bureau of Meteorology (BOM) website. BOM issues fire weather warnings each afternoon for the following day when forecast weather conditions are likely to be dangerous. Check the relevant BOM webpage regularly each afternoon in the fire season:

www.bom.gov.au/weather-services/fire-weather-centre/fire-weather-services/index.shtml



MODERATE

Plan and prepare.

HIGH

Be ready to act.

EXTREME

Take action now to protect life and property.

CATASTROPHIC

For your survival, leave bushfire risk areas.

Fire danger rating

Check your region's fire danger rating each day if the weather looks hot and dry. This should be found on your state or territory fire authority's web site, where each region is listed. There are four fire danger ratings. These indicate the possible consequences of a fire if it were to start, with higher ratings linked to more dangerous conditions. A rating of extreme means that you should consider leaving unless well prepared and with an appropriate refuge. Catastrophic warnings indicate that leaving early is your only safe option if you are in a bushfire-prone area.

Fire bans

Your fire authority will issue total fire bans when it is illegal to have any fire out in the open. This includes operating some farm equipment in the open where it could start a fire (e.g. an angle grinder). Fire authorities usually recommend against carrying out activities that are dangerous when there is a total fire ban, even if some are still legal. Check your state or territory's rules.

Fire warning app

Download the fire warning app from your local fire authority onto your phone. Set the appropriate alerts, such as a warning zone close to your farm. This will issue you an alert if a fire is reported within a specified distance of your farm. Your app will also have information about total fire bans and fire danger ratings in your region.



EMERGENCY WARNING



WATCH AND ACT



ADVICE

Bushfire warning levels

All state and territory fire authorities use a bushfire warning system that is consistent for all emergencies across Australia. When a bushfire starts, one of these three warning levels is put on it, indicating the level of threat the fire poses.

The ABC Emergency website has a good description of what these warnings mean.

www.abc.net.au/emergency/your-guide-to-standardised-emergency-warnings/12935568

3.7 Self-sufficiency and seeking assistance

When going about your daily activity, do several things:

- When conducting your weekly shop, consider whether you have 1–2 weeks' food supply and other necessities at home.
- Fill a jerry can with fuel so you can run a generator or fire pump. Most farm vehicles run on diesel but remember that your petrol supply for small equipment is important, too.



- Speak to capable friends and family who may be able to help you in the event of a fire. Discuss the specifics of when, where and how they could help. You will need at least two able bodied people to safely react to a fire on your farm or even just to shelter at your house – you cannot do this alone. Their safety is also an important responsibility for you. Remember that multiple properties can come under threat from fire at the same time, and you may lose helpers who need to return home to defend their own properties.

3.8 Risky activities on farm

Some farm activities pose high fire risk, including grain harvesting, slashing and using power tools such as angle grinders and welders.

Carefully assess whether it is safe to be using risky equipment. Check fire bans and local restrictions, carry fire extinguishers and routinely take care. There is a grain harvesting code of practice to assist grain producers to assess harvesting risk:

www.cfs.sa.gov.au/prepare-for-a-fire/prepare-your-home-and-property/farm-fire-safety/

The Victorian government provides information on how to operate machinery safely (e.g. using spark arrestors) to avoid starting fires:

www.cfa.vic.gov.au/plan-prepare/how-to-prepare-your-property/farms/operating-farming-machinery-equipment-and-vehicles



Chapter 4:

Fire approaching

This chapter deals with what to do if a fire is approaching or present at your farm.

All fires are different. For some fires you may have several days' warning; other fires may arrive suddenly with only minutes to prepare. Some fires will also hit on a very dangerous day, and all you can do is leave or shelter in your house. On other days, the fire may arrive when the weather is milder.

The warning you get and the severity of the fire will affect what you have time to do and what it is safe to do.

4.1 Stay informed – know where there is fire

Monitor where local fires are, so you are not caught unawares. During the Black Summer bushfires, fires were burning and threatening for weeks or months in a local area. Knowing where fire was and was likely to spread to in the short term allowed people to plan and carry out relatively normal activities during the weeks before fires arrived at their farm.

Monitor fire location and behaviour by checking ABC local radio and fire authority apps and conducting your own local observation – don't rely on fire apps alone as they may not be up to date.

When fire is days away

4.2 Firebreaks

If you have time, install firebreaks. A firebreak is a strip of land that has been cleared of all combustible material (vegetation). It does two things:

- provides access for firefighting purposes
- helps prevent the spread of low-intensity fires.

High-intensity fire flames can blow embers or reach across firebreaks, so do not rely on a firebreak to stop all fires.

Firebreaks can be maintained in the long term or can be installed in the days or weeks before a fire arrives as a measure to contain a bushfire or protect infrastructure. If installed at the last minute, take great care not to be caught in the open as the fire arrives, or you or your machinery could be burnt. If you haven't got time (or you're not sure if you have time), don't attempt it.

To create a firebreak, remove all vegetation until bare earth is showing (so-called 'mineral earth'). This can be done in many ways: with a grader, bulldozer or tractor with a bucket or other appropriate implement. In addition, a tractor with a plough (e.g. disc plough) can achieve a similar result by turning vegetation under the soil. Longer-term firebreaks can be created by using herbicides to spray and kill all vegetation, or they can be installed permanently as roads.

Useful places to install a firebreak may include:

- on the perimeter of paddocks surrounding the house or sheds
- around your livestock refuge paddock
- along the flank of a fire to narrow and contain it.

The WA Department of Fire and Emergency Services has a good description of firebreaks and how to construct them:

www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireManualsandGuides/Constructing-Firebreaks-Brochure.pdf





4.3 Emergency feed

Your fire plan will include an emergency feed budget (see Appendix 1), so you know how much feed you will require. If your property is burnt out, you will have no pasture for your livestock. Bushfire often happens when there is already drought, so local feed supplies may be short.

If you have time, attempt to source feed before the fire arrives. For other sudden fires with less warning, order feed as quickly as you can after the fire and pick it up/get it delivered when it is safe to do so. You may have access to local donated feed, but do not rely on this.

4.4 Move stock to refuge area and graze down

Ensure your stock are in their refuge paddock before the fire arrives. Do not do this at the last minute. Livestock can be unpredictable and the fire may move quickly, putting you in danger.

If you can, move your stock to a refuge paddock a day or two before fire arrives. This will give stock a chance to graze down the vegetation before the fire comes to reduce fire risk further. However, it is likely you will already have short grass so the feed will not last long and fire could threaten for some days or weeks. Supplementary feed may be required if the pasture is too short for the stock.

Stock in the refuge paddock need access to good quality water. Stock should not be off water for more than half a day during hot times.

Final hours before fire arrives

4.5 Assess personal safety risks – go out on farm or shelter at your house?

You must decide early, while it is still safe to leave, whether you will stay or go. If you are staying, make decisions about whether you will stay near your house or go out onto the farm to protect infrastructure.

a. Decide to stay or leave

If you chose to leave but it is too late, shelter in your house; don't go out onto the farm.

b. If you stay, is it safe to leave the house and protect infrastructure?

Leaving the house or shelter can be dangerous as there may be nowhere to shelter from fire. Going out onto the farm is a judgement call based on what may affect the intensity of the fire. Assess the risk based on:

- fire danger ratings or warnings and weather
- topography – fire is faster and more intense up a slope
- the presence of bush with lots of fuel – this can lead to an intense fire.

The risks are high if there are strong winds, high temperatures and the fire is burning in forest with potential to burn up slopes. If it is a milder day with gentle winds and cooler temperatures and the fire is burning on flat pasture, the fire may be less dangerous to approach and attempt to control.

Ultimately, your house is one of the safest areas and most valuable items on your farm and should be protected if possible. It is also usually located near important infrastructure (e.g. machinery sheds), meaning you may also be able to protect infrastructure if you are nearby. Therefore, it is usually sensible to be close to your house ready to shelter if the fire is unpredictable or intense. If your house is not threatened, the fire is a distance away and fires are less intense you may be able to get out onto the farm to manage the fire.

4.6 Final preparations before the fire arrives

- Put on your personal protective equipment.
- Assemble your farm firefighting team.
- Fill your fire units and run the pump for a few minutes to check it is working well.
- Move valuable equipment to an easily defended spot (e.g. drive a tractor and implements to an open paddock or road near your house).
- Make sure the livestock are in their refuge paddock. If it is too late, do not attempt to move stock. If it is safe to do so, open internal gates or cut fences to allow stock the option to run from fire within the property. Do not open gates or fences onto roads (livestock are a danger to vehicles and may still be caught against fence lines during severe fire).
- Begin checking the priority areas of the farm close to your house for spot fires if safe to do so (but prepare to move quickly back to your house if required).

4.7 Calling for help

If you observe a new fire that was not previously known, or your life or property is under threat, call for help. Use 000 on your phone, or if there is no phone reception use Channel 5 or 35 on your UHF CB radio. However, never assume that help will come; always do what you can to protect yourself, even after calling for help.

4.8 Ensure your house is ready to shelter in: action checklist

Ensure your house is ready in case you need to shelter. Fire authorities have checklists of what you should do if you are sheltering in your house. These are two good examples:

www.dfes.wa.gov.au/site/bushfire/during.html

www.rfs.nsw.gov.au/_data/assets/pdf_file/0003/36597/GetReadyforaBushFire.pdf

Some things to do before the fire arrives include:

- Turn off gas bottles inside and outside the house.
- Move flammable items away from the outside of the house (e.g. door mats).
- Block gutters (e.g. with gutter plugs or socks full of sand).
- Wet the side of the house facing the fire and patrol the area for spots before the fire arrives.
- Seal windows, vents and doors, and ensure drafts under doors are prevented with wet towels.
- Fill baths, buckets, bins and sinks with water.
- Remove curtains and move furniture away from windows.
- Have woollen blankets ready to shelter under.
- Drink water to avoid dehydration and wear your protective clothing in case you need to leave the house.

- Protect vulnerable people (elderly, disabled and children).
- If the house becomes smoky, stay low.
- Think about where you would go if your house burned (e.g. open area nearby, dam etc.).
- Bring firefighting gear (pumps, hoses) and generators inside the house so they are available after the fire front passes.

As the fire arrives:

- Move inside if flames are on top of you and the heat is unbearable.
- Actively fight fire in your house; put out spots, including in your roof cavity. Have a ladder ready.
- Shelter in a room away from the fire that has two exits you are able to get out of (e.g. one could be a low window).

After the fire:

- Check the house for fires, including in the roof cavity and under the house.
- Patrol for several hours as embers can continue to start fires for hours after a fire.

4.9 Fighting the fire

Firefighting is a complex subject and cannot be adequately taught in this manual.

We recommend you join a local volunteer fire brigade to gain firefighting skills.

There are also private training providers who run courses, including in responding to and suppressing wildfires. For example see: fireandsafetyaustralia.com.au/about-fsa/.



CASE STUDY: Enacting your fire plan

When fire approached Belinda and Mal McKimmie’s farm in the Biggara Valley on the Victoria–New South Wales border on 4 January 2020, they enacted their fire plan. “We had the time to prepare, whereas many others in our district didn’t. That makes a big difference to what you can do. We had a couple of days to get things ready, like fixing the old fire pump. And we had good local understanding of the lie of the land.”

The McKimmie family and their neighbours who helped fight the fire had the training, equipment and protective clothing they needed, including overalls, boots, hats, goggles and gloves. “Within our farm and valley here, we had a lot of good local knowledge of fighting fires. That knowledge and know-how played a big part. Even some of our children had done a firefighting course through school. That knowledge is so important going forward.”

Communications were the main issue they encountered while fighting the fire. “Once the power and the telephones went out, we had no communication between our valley and the town in Corryong. Our satellite internet helped us connect again after the fire, long before the telephones were back working.” Since the fire, they have installed an aerial booster for the telephone and bought additional UHF radios, as well as considering how to be prepared in other parts of the farm. “We’ve also reviewed and enhanced our equipment. We put a bore in straight away after the fire, in February. We’re being careful where we’re planting trees to keep them away from the house, and we’ve got a new generator and firefighting unit.”

Belinda highlights the importance of having power and water equipment built from materials that will withstand the fire conditions. “You can have as many tanks or dams as you like, but if you have plastic tanks, plastic pipes, you’ll lose them in a fire. Some people had solar pumps, but they didn’t work because the smoke blocked out the sunlight.”

“We’ve put up fences now that should be relatively fire-proof: no plastic insulators but using ceramic instead, no wooden posts. We had some old fences that got decimated. Some other fencing that had cement posts and no plastic is still fine where it wasn’t burnt too hotly. There’s thought in how to go about the fencing so that it can withstand a fire.”



Chapter 5:

Immediate aftermath of fire



5.1 Safety

Safety is the most important thing immediately after a fire. Dangers to watch for include:

- **downed electrical wires** that could be live – do not approach
- **new fires in any remaining unburnt areas** including in infrastructure (such as a house) for hours or days after a fire
- **unstable or falling trees.** Burnt tree trunks can weaken in the hours or days after a fire and may fall at any time.
- **hidden holes.** Burnt tree roots can create a hole just beneath the surface that may be covered with soil and ash and not be visible.
- **trees that are burnt on the inside or that are hung up** (the trunk is burnt but the tree is still upright and caught on other trees) – these pose a falling risk and professional assistance may be required to clear them.

As a priority, re-establish road access to town if you were cut off during the fire. This may be urgently needed for medical reasons, transporting feed or enabling veterinary access to livestock.

5.2 Support, help and advice

You will likely be exhausted, overwhelmed and stressed in the days after the fire. Help can come from governments, friends, family or neighbours; even if you think there are others worse off, try to seek and accept the help you need.

Making decisions in the immediate period after a bushfire can be difficult, but you should try to avoid making hasty judgments. Many jobs will seem urgent but pausing briefly to prioritise can help you make the right choices for your situation. Talking through decisions with someone else can be very helpful, whether it is an independent consultant, friend, family member or neighbour.

5.3 Immediate one-page plan

Once the farm is made safe, discuss your priorities with a trusted person and create a one-page plan for what happens next. Write down:

- What needs to be done immediately?
- What needs to be done today, and what can wait until tomorrow or next week?
- Who can help? What needs to be done by you and what can be done by others? Who can you contact to get that help? Refer to the key contacts listed in your farm fire plan, including council emergency numbers and government veterinary services.

5.4 Stock assessments

Under animal welfare legislation, you are responsible for the welfare of your stock after the fire. Animals should be located and examined as soon as it is safe to do so.

Animals with severe injuries or where recovery is unlikely need to be destroyed for welfare reasons. A veterinarian will usually attend to assist with stock assessments and destruction or treatment recommendations, but in large fires and depending on access this may not happen immediately. If an animal needs to be destroyed (e.g. shot), and you can do so safely and humanely, you do not need to wait for a veterinarian to do so. To avoid voiding your insurance cover if you must do this yourself, have a witness present, take photographs to show the approximate numbers of burnt or destroyed stock and to show why stock needed to be destroyed, and contact your insurance company as soon as practicable.

If a veterinarian is able to return to the farm for follow-up assessment and the welfare of the stock is acceptable between visits, mildly injured stock may be able to be monitored and reassessed several days later. Caring for these stock is essential and includes providing feed, water, shade and veterinary treatment such as pain relief as required. If you do not have capacity to provide this care, you should not attempt to retain injured animals.

5.4.1 Assessment outcomes

Injured animals can be divided into four groups:

- **for immediate slaughter**
- **for salvage by slaughter** at an abattoir or knackery (if practical)
- **keep and nurse** with intent to retain or slaughter after fattening/finishing
- **no further action required**, where injuries are very mild.

5.4.2 Identifying stock for destruction or slaughter

Detailed state government guidelines for assessing burnt stock are available, for example:

agriculture.vic.gov.au/farm-management/emergency-management/bushfires/what-to-do-after-a-bushfire/assessing-cattle-after-a-bushfire

In general, burn injuries can be difficult to judge if you have not managed burned animals before. Animals that initially appear unharmed may have severe injuries that become obvious over coming days, especially burns to hooves and lower legs. Follow the guidelines to prevent unnecessary suffering by identifying and destroying these animals early. Monitor stock for developing injuries regularly for the first few weeks, even if they initially appear to be unaffected.

Immediate destruction is required for animals that are:

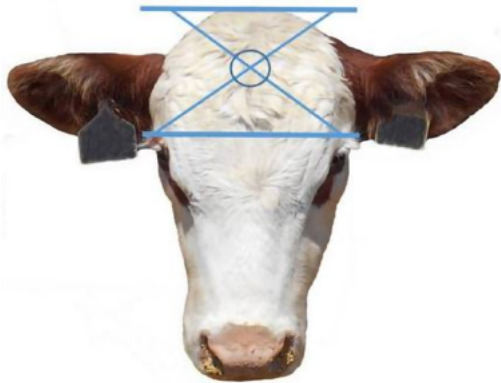
- unconscious or barely conscious
- unable to stand or walk due to injuries, burns or hoof damage
- extensively burnt (more than 10–15% of skin burnt) with deep burns or skin splitting
- showing major swelling of legs
- showing difficulty breathing due to smoke inhalation.

Salvage slaughter is appropriate for animals that do not require immediate destruction and are 'fit to load'. The condition of their hooves and ability to stand on a truck is an essential part of this assessment. Even if external damage is minimal, these animals may have decreased meat quality and may not meet quality assurance standards.

5.4.3 Destruction of livestock

Destroying and disposing of your own stock is often traumatic. Where possible, ask for help from neighbours, friends or veterinarians. Removing yourself from the job, once decisions about which stock must be destroyed have been made, can result in a less traumatic experience for you. Any person destroying stock using a firearm or similar should be licensed, trained and competent, otherwise use a professional such as a veterinarian or stock inspector/biosecurity officer.

Cattle can be euthanased with a firearm by shooting from the front just below the poll, as shown in the diagram. A rifle (0.22 magnum or larger calibre) can be used either at a distance or close to the injured animal. A shotgun (#4 shot in a 12, 16 or 20 gauge) can be used only if you are close to the animal. Alternatively, a captive bolt can be used, but as this method is not always 100% effective it should be followed by cutting the neck to allow the animal to bleed out.



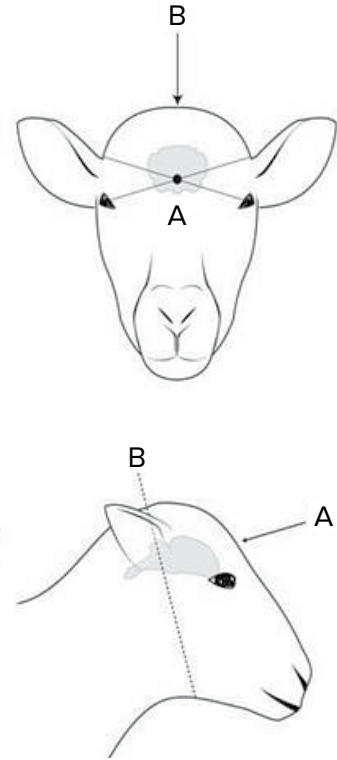
Shearer JK. Euthanasia of Cattle: Practical Considerations and Application. *Animals* (Basel). 2018; 8(4): 57. Published 2018 Apr 17. doi:10.3390/ani8040057

The proper anatomical site is on the intersection of two lines each drawn from the outside corner of the eye to the base or top of the opposite horn (2013 AVMA Euthanasia Guidelines), or half-way between two parallel lines drawn laterally: one across the poll and the other from the outside corner of each eye (Gilliam et al 2014).

For more information see:

www.mdpi.com/2076-2615/8/4/57/htm

Sheep can be euthanased with a 0.22 calibre long rifle or larger. Again, captive bolts (with bleeding out) or a shotgun can be used if you are in close proximity to the sheep. The correct way to shoot a sheep is from behind the poll (poll method, B) or from the front (frontal method, A), as shown in the diagram.



For more information see:

agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/spring-2018/euthanasia-of-livestock

Stay safe when shooting livestock:

- Do not hold the muzzle of a gun directly against an animal's head; allow some space between the head and the gun or the barrel could explode.
- If a high-calibre weapon is used, the bullet could pass through the animal's head and strike whatever is behind the animal; ensure nothing vulnerable is behind the animal and use a backstop.
- Watch for thrashing limbs when the animal falls after being shot.

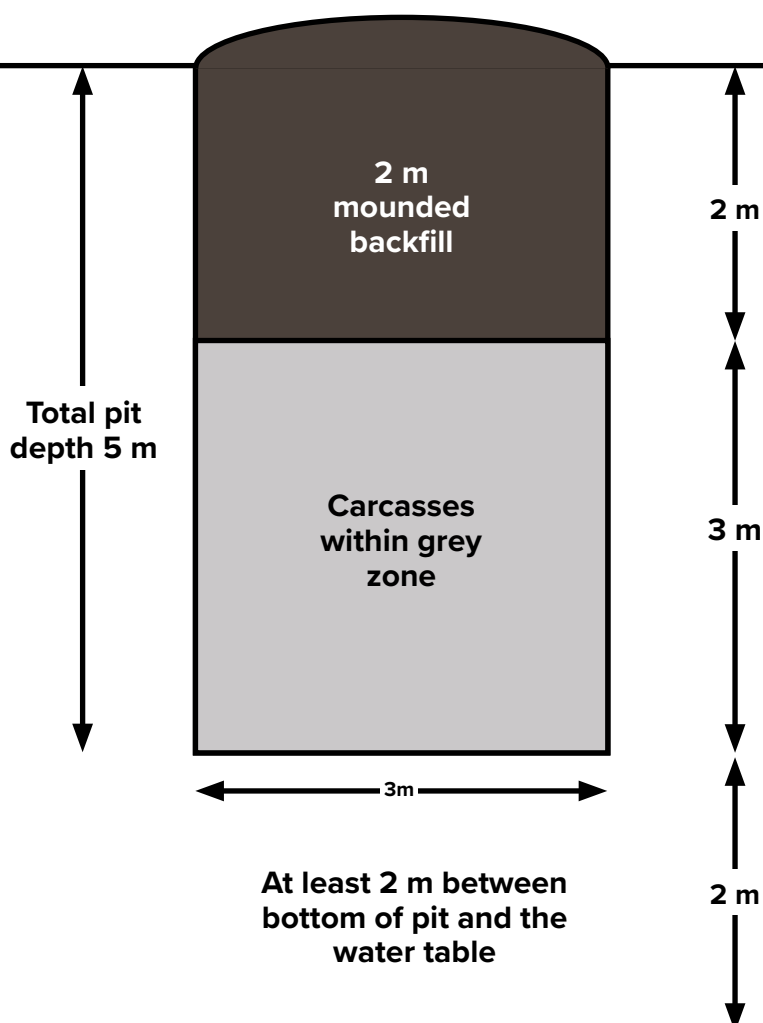
5.4.4. Disposal of livestock

Efficient disposal of stock killed in a bushfire is important for public health and amenity reasons. Carcasses decompose quickly and access for heavy machinery to handle dead stock can be difficult after fires. Your local municipality will usually take responsibility for burial of dead stock, although you will usually need to transport carcasses. Alternatively, you may arrange an earthmover yourself if road access can be achieved and on-farm burial is suitable. Before undertaking your own on-farm burial, consider effects on the environment, statutory controls, logistics and safety. Site selection is important and should take into account soil type, sufficient distance from water courses and infrastructure, and be away from houses and view of the general

public. Detailed advice is available, but in general a trench for carcass disposal should be four to five metres deep (staying at least two metres above the water table) and carcasses covered with two metres of mounded backfill.

For more information, see: agriculture.vic.gov.au/farm-management/emergency-management/bushfires/what-to-do-after-a-bushfire/disposing-of-carcasses-after-bushfire-flood-or-drought

Burial pit example



5.4.5 Nursing mildly injured stock and reassessment

Mildly injured stock that are fit to load and whose injuries will severely constrain their productive life may be suitable for salvage slaughter (rapid dispatch to a local abattoir). You will need an immediate kill slot at a nearby abattoir and prior agreement from the abattoir. The veterinarian assessing stock and your stock agent can often assist with arrangements.

Mildly injured stock likely to return to productivity and with well-managed welfare can be nursed, either on-farm or at agistment on soft, unburnt ground. The most important limitation to this is labour and resources. It will take time to medicate, feed, water and monitor these animals. Daily reassessment is required to detect animals whose injuries are worse than expected. Burn injuries are extremely painful, so pain relief is important for these animals and should be discussed with a veterinarian who can advise on appropriate products registered for other conditions in livestock. Other treatments, including antibiotics, may also be appropriate in some circumstances.

Heat stress can occur from direct fire exposure and from the high ambient temperatures in a bushfire season. Heat stress can lead to reduced appetite, reduced efficiency of nutrient absorption from food and reduced immune system function, as well as death in severe cases. Provide shade and monitor for these effects. If you do not have the labour availability and resources to successfully nurse mildly

injured stock, it is not appropriate to keep them. If their injuries mean these animals are not suitable for transport, destruction may be required. For transport guidelines, see Meat & Livestock Australia's publication *Is the animal fit to load?*

www.integritysystems.com.au/globalassets/isc/pdf-files/fit-to-load.pdf

5.5 Welfare of surviving stock

Fencing, water and feed are essential requirements for stock remaining on-farm after a fire.

5.5.1 Fencing

Securing stock is important for safety and biosecurity. In the immediate aftermath of fire, aim to keep your animals in and your neighbours' animals out. Building large amounts of fencing, such as re-establishing a full boundary fence, is expensive and time-consuming and often best left to a later stage in your recovery. Fencing a smaller area of the farm securely, using intact fences where possible as well as temporary electric fences, is faster and may be enough to secure your animals in the short term.

Assistance can be sought from BlazeAid but be aware that it can take several weeks for this help to arrive. Check if you are eligible for government grants, especially if your land adjoins crown land.



5.5.2 Water

Ensure stock have immediate access to water from a permanent source. In hot, dry conditions animals require water every day. Troughs are preferred as they are easily monitored and cleaned. Urgent plumbing repairs may be needed if reticulated water to troughs has been damaged by fire. Consider using your firefighting unit to transport water to troughs in the interim.

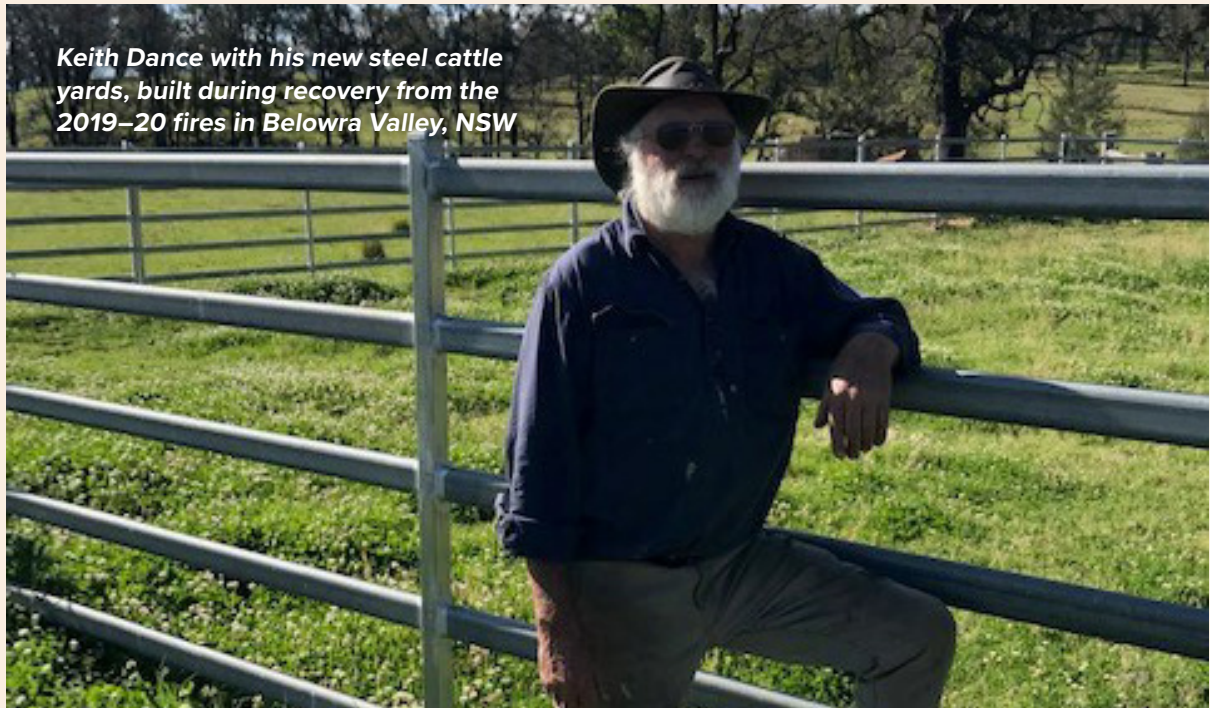
Opening up dams for stock should be considered carefully. Water quality can be poor due to ash contamination from bushfire making it unpalatable and potentially leading to health issues, especially following heavy rainfall. Monitor for dark water, a bad smell or black scum, and remove access to water that is contaminated.

5.5.3 Feed

Feed should be provided for stock as soon as practical, for animal welfare reasons and to maintain production. Note that stock may have reduced appetites for several days after the stress of a fire.

- 1. Assess how much feed is available,** including pasture and stored feed, and whether it is enough to meet the requirements of your stock for the next few weeks.
- 2. Determine if supplementary feed will be required.** Refer to the emergency feed budget in your fire plan to determine how much supplementary feed you need for the first week.
- 3. Purchase or accept donated supplementary feed.** Government departments will often provide several days of emergency feed. Alternatively, purchasing your own feed may give you more control over quality, weed status and when it is available. If feed is offered and you need it, take it, even if you are not the worst affected farm in the region.





CASE STUDY: Infrastructure in recovery

Keith and Deb Dance have faced many challenges since fires struck their farm in the Belowra Valley, NSW on New Year's Eve, 2019. Keith says that accepting help, prioritising and focussing on getting back to the parts of farming that you love have made a big difference to their recovery.

Reflecting on his experience, Keith says, “You have to set your priorities. Our first priority was to get water and feed to the stock. Construct fences to contain them. Then get yards to put them in, so you can maintain them. Get a small number of cows and calves back on the property when you can. Getting back operational is really important. You’ve gotta get back into production as soon as you’re able to and just run with it.”

“It’s always hard to ask for help because we’re all very independent. But you’ve gotta look where you’re going next. Our valley’s a bit isolated and our road is hard to get in, but I had my brother turn up, and a cousin came and fenced for weeks and weeks with us. That helped us initially, and then BlazeAid turned up and helped us secure the boundaries properly. The focus was getting the livestock under control and then building infrastructure.”

A notable change to the farm since the fires are the new steel yards, after the old wooden ones were burnt. “I used basically the same yard footprint and design. We know that design works. So we just pulled the old ones out, put the new steel posts in. I could order the steel, that was here in no time. It went up quickly and cost-wise it wasn’t too bad. Our fencing has changed too, we’re using steel posts, steel end assemblies. We had to prioritise to get some semblance of order back as quickly as possible.”

Almost two years since the fire, prioritising recovery work is an ongoing strategy. “You have to look at different options. What you’ve done in the past doesn’t stand anymore. So look at whatever’s the fastest, basic option to replace what you need. The basic necessities to get it operational, the fine tuning will come later.”

Keith says keeping his breeding cows on the farm has helped the long-term recovery process. “We kept the breeding herd so we could get the numbers back quickly. Two years later we’re basically back where we would like to be.” To Keith, a successful recovery means “getting back into what you love doing: for me that’s breeding cattle, watching calves hit the deck, getting those rewards for all your effort. Don’t give in. You will get through it.”



Chapter 6:

Short-term recovery

Once the immediate urgency of the post-fire period has passed, you will need to make short-term decisions for recovery. At this stage, avoid choices that would permanently change the future direction of your livestock enterprise. Where possible, delay major long-term decisions until recovery is established; focus on short-term issues that address the welfare needs of your stock and give you options once your initial recovery efforts are established.

Financial advice is extremely useful as you begin making decisions. The Rural Financial Counselling Service is an Australian Government initiative that provides free, independent counselling to eligible farmers, including fire-affected farmers. A counsellor can help you work out where your finances are at and what your options are. For more information and to find a counsellor, visit the Rural Financial Counselling Network website: rfcsnetwork.com.au/ or phone the national information line on **1300 771 741**.

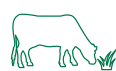
6.1 Options for surviving stock

6.1.1 Making informed decisions

With regard to surviving stock with insufficient grazing pasture, there are three main options:



- Keep and feed some or all stock.



- Temporarily agist stock off-farm.



- Sell stock and buy stock back when pastures are ready for grazing.

If many of your livestock were destroyed and suitable infrastructure and labour is available, you may choose to buy replacement stock before rain stimulates pasture growth, supplementary feeding these animals until pastures can be grazed again. Buying replacement stock early and feeding may be better value than waiting until pastures are ready to graze, when livestock may be much more expensive, but can be risky if expected rains do not eventuate. Opportunistic production feeding, such as for trade lambs, may also be considered if budgeting indicates an adequate profit margin can be generated.

Take care not to take on more than you can manage, and carefully assess labour requirements before making these decisions.

To determine the appropriate option for your situation, consider the following:

- Do you want to take on the work of retaining stock alongside your other recovery activities?
- Are the necessary human resources and infrastructure available to contain, feed and water stock? If not, can they be quickly sourced or built?
- What is the livestock value now? Is the market low or high?
- What is the livestock value likely to be when pastures are ready for grazing again? Will you be able to afford to buy back in, and is the cost appropriate for your business goals?
- If considering selling stock, what short-term opportunities exist? For example, can you expand a cropping enterprise in the meantime while stock numbers rebuild?
- What is the expected cost of feeding in the best-case and worst-case pasture recovery scenarios, and does your business have the financial reserves to allow feeding in both of these?
- Is agistment available, and if so at what cost, including freight?
- What are the additional costs of running stock (such as animal health and activities like shearing) as well as extra income under each of the three options (keep, agist or sell)?

Make an informed financial decision by undertaking a short-term budget for the period of feeding or agistment as well as a cash flow budget for 2–3 years. Seek assistance if required, as sound financial decisions now are likely to pay off over time.



6.1.2 Keep and feed

When considering if you should keep and feed stock, be aware that the cost of feed and the amount of feed required can be hard to predict and will depend on when effective rainfall occurs. Long-term rain forecasts are rarely precise enough to make big decisions like this. Instead, use long-term rainfall records to help calculate the 'expected cost' of the most likely feeding scenario. Details for this calculation are provided in Appendix A. Once the expected cost of feeding is calculated, undertake partial budgets for each stock class to determine if feeding or selling is the right strategy.

Once you have carefully decided to keep and feed, you should:

- **review** the locations available for containing stock, including water sources
- **calculate** feed budgets for different stock classes
- **identify** where you can buy feed
- **consider** how to feed out.

Feed budgets can compare different options for feed, including grain (which can be a cost-effective way to meet energy requirements) and pellets (where ease of feeding should be weighed against the cost per tonne compared to grain) as well as straw, hay and silage. Once you have chosen a feed type, calculate how much feed is needed for each stock class being kept. If you are not experienced in calculating feed budgets, seek professional assistance.

Ideally, use an existing sacrifice paddock or containment area for feeding out. Alternatively, establish a temporary area using the guidelines provided in Section 2.5. Often, availability of suitable water will drive your decision about where to keep stock. There are many resources available from state government agriculture departments and independent advisers about setting up and managing livestock in confinement for drought, and the principles are the same after fire. For example: www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/feed/confinement-feeding-cattle-drought



6.1.3 Agist off-farm

Agistment is a useful option to retain the genetic value of your herd and avoid the changeover costs of selling. Assess cash flow and cost of transport and check whether insurances will assist with agistment costs when making this decision.

Cattle agisted in distant locations may be exposed to diseases they have not encountered before. Consider whether vaccination or other risk management strategies are required before transport. Protect your farm biosecurity by quarantining returning animals. Your refuge paddock is a useful location for quarantining livestock. This will minimise the risk of introducing disease, particularly if you have susceptible stock that have remained on-farm, and limit the introduction of weed seeds.





6.1.4 Sell

Selling stock may be an attractive option to increase cash flow and reduce your stress in the short term. Retaining all stock during farm recovery is a significant, resource-intensive undertaking, especially if infrastructure is not fit for purpose. However, selling stock immediately can be detrimental to business recovery in the longer term. For example, you may find yourself understocked or having to buy stock back in at high prices that exceed what it would have cost to feed the surviving animals through that period. In interviews with producers affected in the Black Summer fire season, most who sold their stock did so because feeding stock was not a viable option.

Selling stock has several potential drawbacks, including low sale prices, non-compliance with meat quality program requirements, loss of the stock's genetic value and uncertainty about what the buying options and price will be later when purchasing replacement stock. Being understocked can have serious, long-term impacts on the cash flow and profitability of a business, as well as opportunity costs; for example, if pastures recover before you have restocked you will be unable to

utilise them. Transporting stock out can also be challenging if road access is limited or facilities to safely load are not available.

Most producers who sell stock after a fire intend to buy back in once pastures have recovered or keep more young stock in subsequent years. Therefore, demand and prices can be high if good rains following fire cause many producers to restock at the same time. Alternatively, retaining more young stock and reducing the number of older stock culled can rebuild herd numbers, but can slow your herd improvement. Consider these consequences before you sell.

6.2 Effects of fire on surviving stock & livestock enterprise

Now that you have decided whether to keep, agist or sell, you can focus your attention on your remaining livestock and your farm as a whole. Being aware of the effects that fire exposure can have on individual animals' health and behaviour, as well as on your enterprise, will help you make any necessary changes to farm management through the recovery period.



6.2.1 Livestock health and welfare during recovery



Airways and lungs

Look out for animals with breathing problems, which may be a result of smoke inhalation. In a study of sheep at abattoirs following the Black Summer bushfires, sheep with exposure to intense fire in the month before slaughter were 10 times more likely to have pneumonia detected at slaughter.



Meat quality

Meat quality at slaughter is affected by exposure to bushfire conditions. An investigation of Meat Standards Australia (MSA) index values found cattle from farms close to high-intensity bushfire had reduced MSA index results in the weeks following fire. Meat pH and meat colour are particularly affected, with unacceptably high pH most common in animals off pasture (grass-fed, compared to feedlot, grain-fed animals) and in animals receiving hormone growth promotants. As time passes, the effects of fire exposure on meat quality decrease. For animals intended for slaughter in the weeks after fire, where possible avoid hormonal growth promotants and feed a diet that meets your animals' energy requirements, including grain feeding if practical. To reduce the chance of dark cutting, retain animals for several weeks after fire on appropriate feed before sending to slaughter. Depending on your farm circumstances, meat quality may not be the highest priority and animals may need to be slaughtered sooner for practical reasons.



Immune function

Detailed investigations of immune system function from cattle on farms burnt during Black Summer showed that some animals may have reduced immune function. These effects reduce as time since the fire passes. Affected animals may have slower recovery

from mild injuries and increased risk of disease. Fire-exposed stock can be retained within your farm, but you should monitor for signs of disease that require treatment. This is another reason to carefully manage your farm biosecurity during recovery.



Animal behaviour

Stress and fear from bushfire can also affect animal behaviour, although at present this is not well understood. Some producers report that their animals are unusually calm after surviving a fire, while others report that their animals are difficult to handle, especially in the initial weeks. Take care when handling stock post-fire and ensure yards are safe and structurally sound before use.



Supplementary feeding

Grain or pellets have high energy density and can be a cost-effective way to feed stock but must be fed carefully to avoid 'grain poisoning' (also known as grain overload or lactic acidosis). Animals that have not yet adapted to grain feeding are at risk; take extra care if you do not usually feed grain or pellets to your stock. Do a gradual, controlled introduction over at least two weeks, provide hay during the introduction to avoid gorging and maintain at least 20% roughage in the ration. Ensure automatic feeders are working correctly to avoid accidentally overfeeding. Monitor closely for shy feeders and sick animals. More information and feeding guides are available here:

www.agric.wa.gov.au/feeding-nutrition/grain-overload-acidosis-or-grain-poisoning-stock

Stock being fed grain or pellets are also at increased risk of the disease pulpy kidney (enterotoxaemia). A booster vaccination with 5-in-1 or similar is recommended prior to feeding grain or pellets for both sheep and cattle.

Higher than usual stocking rates for animals being fed in small areas can increase the likelihood of diseases such as pneumonia, pinkeye and salmonellosis. Irritation from dust can also contribute to lung and eye problems. Early detection and treatment can help manage these risks. If possible, minimise dust by selecting an area with clay or clay loam soils to hold stock.



Diseases

Stressed animals or animals with inadequate nutrition are more susceptible to spreading and acquiring infectious diseases. Most diseases reported in producer interviews after the Black Summer bushfires were not directly caused by the fire but were due to the combination of the preceding drought and the changes to farm management that occurred during recovery. More than half of the interviewed farmers reported disease in the months after the fire. Early detection of problems means they can be addressed and treated and further disease prevented. Specific health issues to watch for include:

- pasture or weed toxicities (see Section 6.2.2)
- coughing, pneumonia and breathing difficulties
- eye problems, especially pinkeye
- lameness
- diseases causing abortion, including pestivirus
- salmonellosis
- misadventure or accidental injury or death
- mastitis and udder problems
- unexpected deaths.



Reproductive performance

Reproductive performance is driven by many factors including nutrition, disease and genetics. Producer interviews after the Black Summer fire season showed substantial variation in reproductive outcomes. Some farms reported reduced reproductive performance following fire. Others reported improved reproductive outcomes compared to other years, possibly due to improved nutrition from effective supplementary feeding. Long-term effects on livestock reproduction beyond the initial months after fire are unlikely except for animals with undetected scarring from burn injuries.

Before joining, assess bulls or rams for undetected damage to their testes or penis and cull affected animals. If joining in the weeks after fire, bulls or rams may have reduced fertility due to the effects of high temperatures on sperm development. These effects can last 65–70 days. Fertility beyond

two months after fire would not be expected to vary substantially from a typical year with similar weather patterns. If concerned, consider increasing the ratio of bulls to cows or rams to ewes for joining.

Infectious diseases that cause early pregnancy loss or abortion can occur due to stock straying between farms, buying in new stock or returning from agistment. Be aware of pestivirus and vibriosis in cattle and campylobacter abortion in sheep causing abortion storms and low calving/lambing rates in herds that have not previously had these diseases. While not seen on every farm after fire, losses from these diseases can be very costly. Seek specific advice about how best to manage or avoid these risks on your farm, including the potential role of vaccination.

For more information on these diseases, see:

- **Pestivirus:** www.mla.com.au/research-and-development/animal-health-welfare-and-biosecurity/diseases/reproductive/pestivirus/
- **Vibriosis:** www.mla.com.au/research-and-development/animal-health-welfare-and-biosecurity/diseases/reproductive/vibriosis/
- **Campylobacter abortion:** www.lfs.nsw.gov.au/regions/central-tablelands/articles-and-publications/abortions-in-sheep-the-silent-killer

Manage the body condition of pregnant animals carefully, aiming for appropriate body condition scores at calving or lambing. If your farm is understocked, pregnant animals grazing freely may become overfat. Some understocked farms saw an increase in calving difficulties and cows requiring caesarean section following the Black Summer bushfires. Standard body condition score (BCS) targets should be used, with an upper limit of cows no more than BCS 3.5 at calving and single-bearing ewes not exceeding BCS 4 at lambing. Consider grazing fewer paddocks at higher stocking rates, restricting access to pasture with temporary electric fencing in large paddocks, or utilising excess feed by buying additional stock to get back in business or cutting hay to replenish drought reserves.

6.2.2 Fire damage to pasture and erosion risk

After a fire, a prolonged dry period of months may occur before adequate rain triggers pasture re-growth, or heavy rainfall may occur in the weeks following fire. Heavy rainfall can cause substantial topsoil loss from burnt pastures, and can lead to dangerous mud slides causing further damage. Erosion can be particularly problematic in gullies and where it washes soil and rocks into paddocks covering new pasture growth. Strategies to manage erosion risk are outlined on pages 38 and 39 of this document from Agriculture Victoria: agriculture.vic.gov.au/_data/assets/pdf_file/0007/613519/Recovery-After-Fire-Guide.pdf

While awaiting pasture regrowth, consider managing stock in containment areas to avoid grazing bare paddocks which can lead to topsoil erosion. When regrowth occurs, challenges in utilising this pasture include being understocked, having incomplete fencing, and the presence of health risks to your animals.

Plant toxicities were one of the most common animal health issues reported in producer interviews following the Black Summer bushfires. Pastures that are regrowing vigorously after being burnt (such as kikuyu, phalaris or lush clover) can cause health issues in stock as they have little or no dry standing feed as an alternative for grazing stock, increasing the risk of toxicity. As pastures begin to recover, utilise them cautiously, with precautions such as:

- never introducing hungry stock onto a possibly toxic pasture
- reducing the area of new pasture available to stock (e.g. with temporary electric fencing)
- providing access to alternative feed such as hay or straw to reduce pasture consumption
- keeping a gate or fence line open to access standing dry feed in another paddock, if available.

Weeds post-fire are a common problem, driven by a combination of reduced pasture coverage, fire-activated growth and spread of weed seeds during fire response (e.g. by earthmoving or fire trucks). Identify the weeds that occur on your farm to determine whether

they pose a risk to your stock and control them before grazing to support pasture production and reduce animal health risks.

6.2.3 Changes to farm management after fire

After a fire, your farm and business plan for the following months will need to be adapted. Your new plan should accommodate the changes you will need to make to animal management resulting from:

- supplementary feeding, agisting or selling stock
- loss of yards, equipment or labour for usual animal management
- animals returning to the farm after agistment or straying
- new animals being brought onto the farm
- animals being sold at unusual times of year.



Agistment

- Watch for disease in animals returning from agistment. In cattle these include pestivirus, bovine anaemia (theileriosis), bovine Johne's disease (BJD), liver fluke and vibriosis. Diseases to watch for in sheep include ovine Johne's disease (OJD), footrot, lice and parasites including drench-resistant worms.
- Drench animals on return with a 'quarantine' drench to avoid introducing new drench-resistant worms to the property, using no fewer than four drench actives for sheep.
- Confine returned animals to specific paddocks for a 'quarantine' period before allowing them to mix with other animals. This will also reduce the area affected if weed seeds are present on skin, in wool or in faeces. The appropriate period varies but is at least 14 days for cattle and longer in sheep; for sheep at risk of footrot and lice, quarantine should continue until a good spring has occurred (footrot) and shearing is complete (lice).

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www.farmbiosecurity.com.au/livestock/



Buying in stock

Purchasing new stock after fire is often necessary. Take care if buying stock from other regions, as diseases such as theileriosis can be disastrous for animals that are not adapted to the local conditions. Seek animal health declarations prior to purchase to reduce the risk of introducing health problems.

Apply farm biosecurity practices: confine newly purchased animals to specific paddocks for a 'quarantine' period, drench them on arrival with a suitable 'quarantine' drench and monitor for any unusual signs of disease. Buying sheep off-shears can help reduce the risk of introducing weed seeds.

Animal management

Routine animal management activities may be disrupted due to fire damage to facilities such as yards, shearing sheds or equipment. You may need to delay these activities, use a neighbour's yards or erect temporary yards. Consider the risk of spreading or acquiring diseases if using a neighbour's facilities.

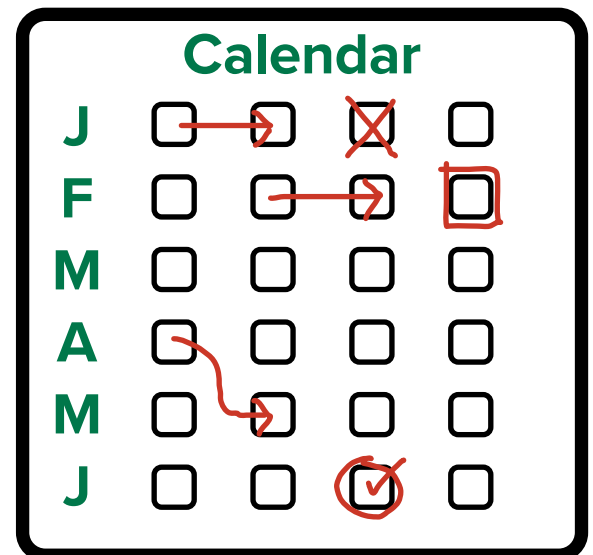
The extra work of fire recovery can restrict the availability of labour for working with your livestock. This is often a major constraint during recovery after a fire and can last for many months.

Identify which activities are critical for getting the farm business back on track and which can be delayed or skipped without compromising animal welfare, taking into account additional costs or opportunity loss if actions are delayed. Make a list of priority activities with a required date of completion for each one and another list of non-priority activities with the target time of year to reschedule each one. Be realistic, seek help and get additional labour when you can.

Consider:

- weighing and drafting
- sales and loading
- drenching
- vaccinating
- jetting for fly control (if relevant)
- joining and AI programs
- marking
- weaning
- shearing (if relevant).

If shearing after fire, a break in the wool may occur due to the general stress of the fire and changes in feed.





Rick and Annie Morris at Gradi Downs on Kangaroo Island

CASE STUDY 6.1: Using containment feeding in recovery

On Gradi Downs, at Karatta on Kangaroo Island, Rick and Annie Morris had 90% of their farmland burnt in the fire that arrived on 3 January, 2020. “It was a crucial time of year in the lead-up to mating for our ewes,” Rick says. So they decided to keep and feed their remaining ewe flock, using containment areas.

“I wanted the control, to be able to monitor their condition score and put my hands on them, in the lead-up to mating. I also considered biosecurity: I didn’t want to be sending them away to the mainland on possibly dirty trucks, considering footrot.”

Rick had never used containment areas like these before on the farm. “We had a consultant and three farmers come and consult to us on pen design. We set up three pens along a common fence line. Each one was 100 m by 100 m, so I could drive around 3 edges with my feed-out cart. Luckily we had unlimited water through a solar pump 6 km away from the pens, so we trenched in some more pipes and put troughs into the pens.”

Good pen design was complemented with efficient feed delivery approaches. “I had to use a smaller auger to feed the grain out, dropping the grain just inside the fence. Then we had double round roll hay racks; we put two rolls of straw inside them over the fence. And then Annie would go in with the hay and the feed-out cart, on the ground. It was really time-efficient to feed them in there; I could feed 4000 sheep in about an hour.”

Knowing how much to feed was also essential for success. “I’d done the Lifetime Ewe Management course before, and having those skills was really helpful to be able to do feed budgets. We had so much control over their condition score and mating was very successful.” The containment pens are also useful for the future of the farm. “Depending on the season, we will use the pens again. It gives us the ability to better manage our groundcover over the summer.”

Unfortunately, the farm did experience a disease outbreak in the months after the fire, leading to an abortion storm in the ewes caused by the infectious bacteria, *Campylobacter*. The disease appears to have spread due to the animals being in close contact. “Unfortunately, my flock was totally naïve to *Campylobacter*. I think it just came in at the most unfortunate time, and it just went through them. So what I will do from now is just vaccinate the ewe lambs each year. But that abortion storm was pretty stressful.”

Rick’s advice to others who find themselves in the same situation is: “Try and make a plan. Get in and have a good look at the farm plan, and then try and utilise the labour you do have as best as possible. Make a plan to get the materials in to set things up the way you need them.”



Craig and Tamara Corby at Belmont Park near Cobargo

CASE STUDY 6.2: Making recovery decisions

Bushfire arrived on Craig and Tamara Corby's lease farm Belmont Park near Cobargo, NSW, on New Year's Eve 2019. Tamara remembers the challenges of the early days after the fire: "Early on, I said to Craig, 'We've just been here for 12 months, there's no way we can pivot out of this.' Craig was really rational. Even before it was offered, Craig suggested agistment. He said, 'The cows are our bread and butter, this is our business model, and that's what's going to bring us our income.' We were just making the most rational decisions we could in an un-rational time."

The Corbys had saved the hay in one shed from the fire and used that to feed the cattle initially, buying them time until they could arrange agistment. "The best advice I think is, if you're uncertain about agistment, formalise it in a written agreement or contract so everyone knows their expectations. We're very lucky that the guy where we've got our cattle is really good. He's professional, he's proactive in what they need, if they need vaccinating or that sort of thing. It works both ways; they're aware of our expectations, so we work well together."

With their agistment strategy, Craig and Tamara were even able to capitalise on new opportunities during recovery, purchasing some trade cattle and selling them to help support their post-fire cash-flow. They also received professional advice from a farm consultant. "Every time he left here it was a massive weight off our shoulders. We're a couple who's really open-minded about opportunities, so we were open to any advice to help build our business. It was more than just a bushfire recovery strategy; it was about helping us move forward and use tools beyond recovery."

Accepting advice, as well as practical help, assisted their recovery. Craig says, "If people are offering you things, take them. We were a little bit hesitant to start with; you don't want to be a charity case. If you're offered something, take it and don't be so proud to not take it. People feel good about giving, and at those times, you really need it."

Tamara highlights the importance of thinking carefully before you make decisions under stress in the aftermath of a fire. "The important thing is just: Take a moment. It's really easy to get caught up in it. But take a moment to think rationally. It is so hard to do, but it's really important."

Reflecting on their experience during recovery, the Corbys say, "We just dug deep and went for it. We're optimistic about moving forward; it's forced our hand and made us think laterally. It's also made us more generous. As a result of our change in mindset, we're actually in a different place. It really has given us some solid business foundations going forward, and our ability to think laterally. Moving forward, we're in a better place."



Mark Doyle, veterinary officer with the Local Land Services in Bega

CASE STUDY 6.3: Managing biosecurity risks

Mark Doyle, a veterinary officer with the Local Land Services in Bega, NSW, was one of the veterinarians on the ground in the aftermath of Black Summer, assessing burnt livestock and helping producers make decisions about animal welfare. “In the immediate aftermath of the fire season in 2019 and 2020, I visited hundreds of properties. I have also spent a lot of time helping fire-affected producers. I am still dealing with animal cases that have been affected by fire to some degree twenty months after the event. Being an invested member of my community means that this will go on for a while yet.”

Mark has seen biosecurity issues arise for a number of producers. Some came directly from damaged fencing and straying stock. “One was a small-scale farmer, who had not realised that a bull had access to her heifers in the immediate aftermath of the fires. They all had to have interventions like caesareans at the point of calving.”

Another major issue is infectious diseases, especially disease caused by *Theileria*, a blood parasite spread by ticks. “People saw all this grass growing and wanted to get a cheap deal, so brought cattle into an endemic *Theileria* area from a naïve population [in an area that doesn’t have that disease]. This was in an effort to build up their numbers quickly, but the reverse happened and there were some tragic cases of further loss of stock. As well as being tragic for the animals involved, it was devastating for the producers.”

Making sure paddocks are safe after fire is not always as simple as re-fencing. “I had another case of one producer trying to find local agistment for his heifers. Some kindly locals offered their farm which had been destocked since the fire. Little did anyone realise, but the fire had melted a long-forgotten lead battery under a lovely big shady tree in the paddock. Some of the animals died from lead poisoning, and we have been monitoring lead levels in all of the other stock that had access.”

While biosecurity disasters don’t happen to everyone, it’s important to consider the risk and do what you can to avoid a major problem. Mark offers three pieces of advice to fire-affected farms:

“**Number one:** think of what you’re bringing onto your farm in terms of disease. Pestivirus in cattle is an example; imagine buying a PI [persistently infected] animal if you’ve got a naïve herd.

“**Number two:** think of what you’re bringing those animals to. Locally we use the example of *Theileria*. What local diseases pose a risk when moving stock?

“**Number three:** think of what you’re putting in front of them. If you have animals that have never seen bracken fern and have a taste for it, you’ll be in trouble. If you have animals that happen to be camping under a tree with a bunch of lead sinkers there to chew on, you’ll be in trouble.”



Chapter 7:

Long-term recovery

7.1 Pause to consider

At this point, you have made the necessary immediate decisions about your livestock and are about to begin making longer-term decisions about the future of your farm.



PAUSE before you take more action.

It is tempting to press on with recovery straight away and re-establish the farm exactly as it was. However, while a major fire can be very disruptive, it can also be an opportunity to take a new direction. Pause first and take some time to identify possible positive changes to your long-term plan.

Consider getting help to review the options. Discussing your ideas with others helps clarify the best choice for you. Help can come from a farm advisor or consultant, or from friends or others in your community.

7.2 Long-term planning

Once you have paused to consider your options, write down a plan for your long-term recovery. Many things will appear urgent; a plan can help you focus clearly on strategic priorities.

Consider your long-term objectives for your enterprise, as well as your goals for the next 3–5 years. Has the bushfire presented new opportunities or limitations?

Identify positive opportunities during rebuilding and where you can make capital improvements:

- rebuilding fences in better locations, better gates, steel fencing in strategic places
- location, type and design of infrastructure such as sheds, water systems and feeding infrastructure – for example, replacing wooden yards with steel, which is more durable and fireproof
- pasture type and pasture composition (see Section 7.3)
- changes to farm business such as the type of stock carried or target markets.

In most cases, both labour and cash are insufficient to complete all recovery work, so review what needs to be rebuilt or repaired and prioritise: what do you need to do first to create positive cash flow to support more work? Aim for a functional farm rather

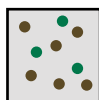
than an ideal farm. For example, re-fencing everything is time consuming and expensive, whereas re-fencing part of the farm or larger paddocks that can be subdivided later might be good enough for now.

Remember to spend time on the farm business as well as working on the farm. Fencing might seem urgent but dealing with business matters such as insurance, grants and budgets is just as important.

7.3 Long-term pasture recovery

Managing fire-damaged pastures is a key part of recovery for a livestock business. Factors that influence pasture recovery include:

- **Burn severity** (due to fire intensity on pasture)



cool to moderate burn (some residual plant material exists, including base of plant)



hot burn (all plant material is burnt, ground is bare)



very hot burn (soil is virtually sterilised, top organic matter layer of soil is burnt).

It is difficult to assess how well pastures will recover after being burnt initially. Assessment over the subsequent 12 months may be required.

- **Type of pasture**

Different grass species may respond to fire differently. Species with growing points below the ground (phalaris, kikuyu, most native pastures, lucerne) will recover from hot burns much better than perennial ryegrass or annual grasses. Subterranean clover, which buries seed, often recovers well, as was widely reported in 2020.

- **Risk of erosion**

The risk of soil erosion escalates significantly if ground cover falls below 70–90%. On hilly terrain or with light sandy soils, pasture cover should be retained over 90%. Prioritise protecting the most vulnerable paddocks. Sheep graze closer to the ground and should be removed before cattle. Remove stock from pastures with insufficient ground cover to a securely fenced sacrifice paddock, containment area or unburned area of the farm, or to agistment.

- **Time before effective rainfall to stimulate pasture growth post-fire**

In the medium term, burnt pastures that regrow may have decreased productivity and therefore carrying capacity for up to 12 months. One estimate from historical data in Victoria in a typical moderate rainfall location is shown in Table 1. Some years will be substantially better: in 2020, pasture recovery was very good in NSW and Gippsland due to the severe preceding drought (leading to low pasture cover and cool burns) being followed within weeks by effective rainfall in many areas and normal pasture production by mid-winter.

Table 1. Reduction in carrying capacity after a late summer fire with mixed annual and perennial pasture grazed by sheep

Month	Carrying capacity (% of normal)
June	20%
July	30%
August	40%
September	50%
October	60%
November	70%
December	70%
January	70%
February	70%
March	70%

Undertake a full feed budget for your retained stock, factoring in reduced carrying capacity with return to normal pasture production 12 months after fire. Adjust these budgets once seasonal rains allow you to assess any reduced pasture growth.

Pasture recovery strategies

Short term

Initial options for pasture recovery (first 6 months)

Option 1. Retain stock in containment (or other non-damaged pastures) until after seasonal rains have improved pasture cover

Option 2. Use grazing management to hasten pasture recovery of desired species and optimise pasture production

Option 3. Apply nitrogen in autumn and winter and gibberellic acid in winter to boost pasture production

Option 4. Apply strategic fertilisers if other nutrients will limit pasture growth

Option 5. Control weeds; weed incursions are likely on damaged pasture with more bare ground

Option 6. Plant fodder crop on severely damaged pastures that need preparation (weed control) before re-sowing to permanent pasture the following year

Option 7. Over-sow weakened pastures to hasten recovery

Long term

Long term, create a whole-farm pasture recovery plan, aiming for a cost-effective strategy for pasture recovery that returns pastures to full production over one or more years. Practicalities, seasonal constraints and cash flow are common constraints to the ideal program.

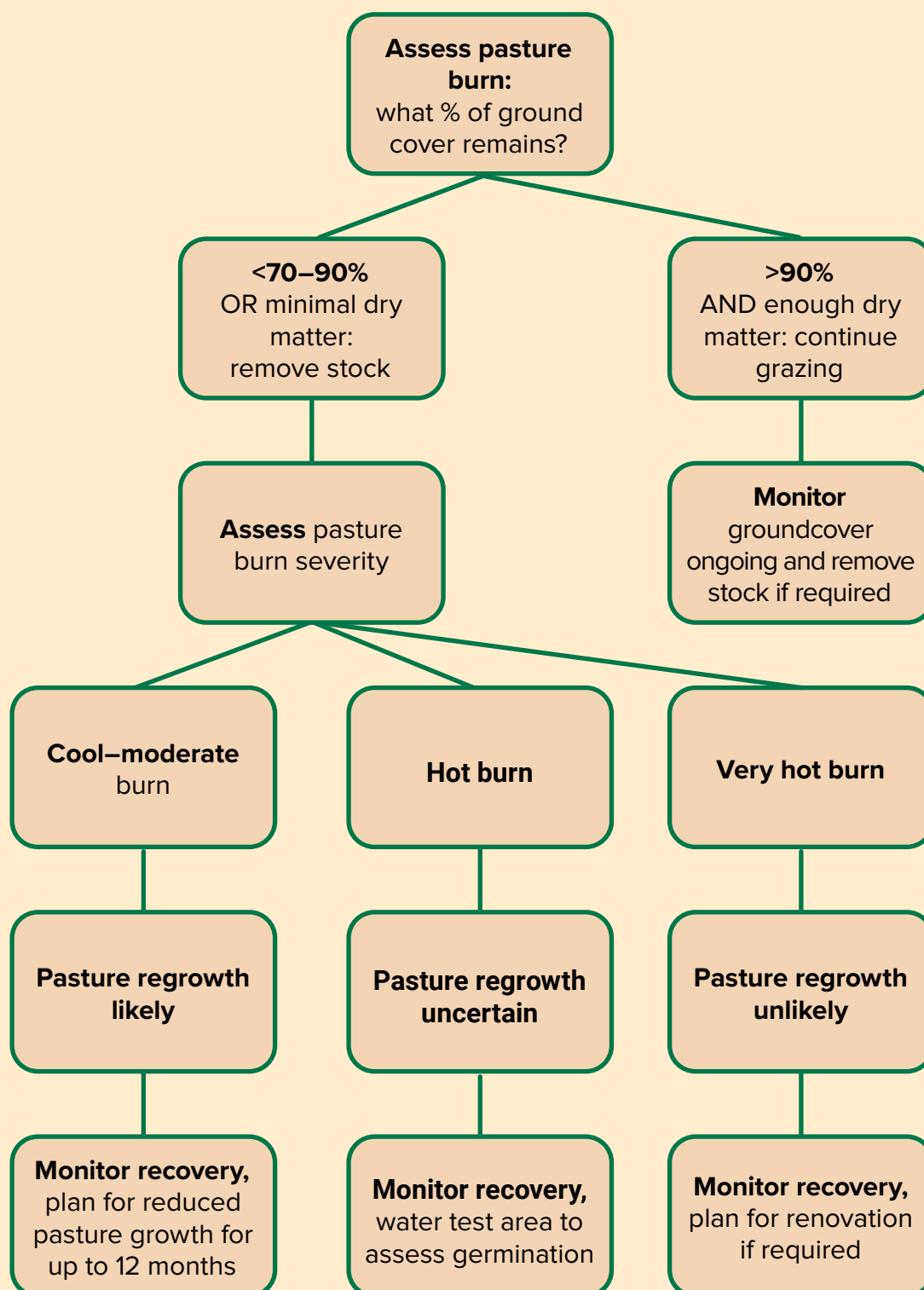
Differentiate pastures that need long-term renovation from those that can recover with effective management. Use grazing management, targeted weed control and fertiliser to recover pastures where possible, allowing time for a response before you commit to expensive work re-sowing. Pastures may recover surprisingly well. Heavily watering small 'test' areas can help assess the density of surviving

desirable pasture species and is useful even where very hot burns appear to have sterilised the soil.

Pasture renovation, while expensive, is an investment that can result in more productive pastures than previously. Consider what species might be suited to

your farm goals, including likely productivity and persistence. Don't rush into full renovation as poor preparation will result in poor pasture establishment.

Putting it together – actions to promote pasture recovery





Fire visible from
Lowanna Properties
on 31 January 2020

CASE STUDY 7.1: Accepting help

Michael Shannon is the managing partner at Lowanna Properties in Cathcart near Bombala, NSW. Following bushfire on the farm at the end of January 2020, his recovery was supported by both professionals and local community members.

Getting started in recovery meant prioritising the necessary work and establishing cash flow. “The rural financial counsellor came in; it was seriously the best thing ever. He was my saving grace. Effectively, we just came up with this plan of attack for how to get our fences up and running, how to get going again.”

Drawing on the community in the local area was also very helpful. “The best thing between my neighbours that got burnt, we sat down and had a beer and said, ‘We have a lot to do here. So what are we going to do? Let’s turn a negative into a positive.’ We built an exclusion fence that runs along the bush, about 30 km long. In times of desperation, farmers get together – what a great thing to come out of it all.”

Michael also sees great value in taking advice from professional advisors. “Trust in others who have on-ground experience and have 100% of their focus in that area as part of their job. You rely on innovation in yourself to resolve issues every day, but you don’t know everything. If you don’t have advisors all around you, you’re limiting your ability to address certain situations that come upon you. Dealing with recovery is a combination of the tacit knowledge that you have and also the information that comes in from others. You haven’t got time to go and read all that information.”

“A lot people think, ‘I can do it all’ but at the end of the day you don’t want to get yourself mentally sick because you have overdone it. A sunk cost now might have benefits on the other side. I asked myself, ‘How can I recover as quickly and successfully as I can, to re-establish by cash flow?’” The answer for Michael was agistment rather than selling his livestock.

Finding the right agistment can be daunting, especially if it’s not a normal part of your farm operations. “You really rely upon trusted agents to do the right thing and find the right agistment. For me, I had some anxieties from previous experiences in the family, but I was so pleasantly surprised. I had all the cows come back, they had the best calving, the guy treated them like his own family. That trusted relationship is so important.”

To other fire-affected farmers in future, Michael says: “Don’t be afraid to get help. Reach out to your mates, your neighbours, your livestock agent. Whoever you have trust in, they’re there to help. I had a great support network around me and I could really rely on them in recovery.”

CASE STUDY 7.2: Rebuilding and refining

At Narrawilly farm at Milton, NSW, Robert Miller has replaced and upgraded farm infrastructure since fire burned the property extensively in the first week of January 2020. “We lost seventy to eighty percent of our fencing, therefore the biggest thing was getting that addressed. We decided to pull down every fence – wire that we strained again after fire snapped, it was not good. So we started with a clean slate.”

“We lost a lot of water and poly pipes, even under the ground, and a lot of fittings going into the water troughs, so we had a lot of leaks. We’ve put bigger water lines and put them deeper into the ground now. We’ve got a lot more dirt around our troughs, trying to protect our inlets.”

“We’ve really modernised and updated the farm: the farm is more open, we’ve got new fencing, new laneways, new machinery. We’ve got water tanks everywhere that are easy to plug into a pump and use sprinklers. For convenience, we’ve used a lot more steel posts and galvanised posts – we’ve got a lot more metal fencing on the farm. It’s a lot more expense to have metal corner stays, but I want something that’s going to be there another 20–25 years without me doing anything more on it.”

Accepting the help that was offered was essential for a successful recovery. “I was fortunate that I had some farmer friends who came and helped me. I said, ‘Please take control of cleaning up’. They were taking loads of rubbish to the tip. They did a lot of the emotional stuff, so I could focus on the cows. At the end of the day we sat round and had a few drinks together and could relax a bit. It made a massive difference to my ability to cope.”

“Some farmers didn’t accept the help that was available, and there’s still a major job to be done on those farms. They could have had more help, but they didn’t take it because they were concerned about their farms being run down. Really, who else is worried about that? You don’t always have a picture-perfect farm. When trauma’s happened, you’ve gotta open up and say yes, please come and give us a hand.”

“After bushfires, you need something to lift you and give you a bit of positive energy. To people recovering from traumatic events: look at doing something different, that gives you a new experience. That’s what we took out of this – we’re thinking outside of our regular agriculture. The drought probably contributed too. But the fire was a total catalyst to say, don’t mess around anymore. If you’ve got a plan, do it.”



*Robert Miller oversees
BlazeAid volunteers
building fences on his
farm in February 2020*

APPENDIX A:

Calculating the expected cost of feeding

The cost of feed and the amount of feed required will be difficult to predict and will depend on when feeding starts and when effective rainfall occurs to stimulate pasture growth. Rather than guess when the season will break, use long-term rainfall records to help calculate the expected cost for the most likely feeding scenario. The details below will help you assess the potential costs and benefits of feeding stock.

The information you need is:

- The probability of effective rainfall to stimulate pasture growth for your farm, for each month until winter.
- The average price of feed per tonne.
- The expected feed rate as kg/DSE/week.

Note that the amount of rain that constitutes 'effective rainfall' or a 'break in the season' for locations that experience these breaks will vary depending on time of year. For example, in Central Victoria, this would be:

- 100 mm in February plus 50 mm in March.
- 50 mm in March plus 40 mm in April.
- 50 mm in April plus 25 mm in May.
- 40 mm in May plus 25 mm in June.

Rely on long-term rainfall records rather than long-term forecasts. Forecasts are of little value in late summer and autumn in predicting when effective rains will arrive. Long-term rainfall records are available from weather record stations across Australia at: www.bom.gov.au/climate/data

An example calculation:

- Fire burnt all pastures at the end of January.
- Feeding stock in containment pens with 80% grain and 20% hay or straw.
- Assume grain and hay average price \$300/t.
- Feed rate 4.0 kg/DSE/week from February onwards, until winter if required
- Probability of break in the season as above.

Table A1 shows the cumulative monthly feed cost (Column C) and the calculated expected feed cost (Column E) after considering the likelihood of a break in each month. The required feed rate is shown in Column A. Column B is calculated by multiplying the cost of feed per kg (\$0.30) by the amount of feed per DSE per day (4 kg/7 days = 0.57 kg per day on average), multiplied by the number of days in the month: for February, $0.30 \times (4/7) \times 28 = \4.80 . Using these prices, the monthly feed cost will build up to \$5.31/month for months with 31 days. Column C is calculated by adding the current month's cost (Column B) to the previous cumulative feed cost. Column D shows the probability of a break based on long-term averages. Column E, the expected cost, is calculated by multiplying the cumulative feed cost (Column C) by (1 – current month probability of a break). If feeding young stock, an adjustment for additional protein should be considered. To interpret the final result, consider both the expected feed cost for the month when the probability of effective rainfall is 95% or higher (this is the 'average-case scenario') and the cumulative feed cost by this same month (the 'worst-case scenario').

Table A1. Cumulative monthly cost of feeding and expected feed cost during drought. The expected cost is \$12.74 per DSE (dry sheep equivalent). The cumulative feed cost is \$25.71 if feeding is required until June.

Month of break	A Feed rate kg/DSE /week	B Monthly cost \$/DSE	C Cumulative feed cost \$/DSE	D Probability of break (central Vic)	E Expected feed cost \$/DSE
Dec	0.0	\$0.00	\$0.00	0%	\$0.00
Jan	0.0	\$0.00	\$0.00	0%	\$0.00
Feb	4.0	\$4.80	\$4.80	2%	\$4.70
Mar	4.0	\$5.31	\$10.11	22%	\$8.85
Apr	4.0	\$5.14	\$15.26	50%	\$11.42
May	4.0	\$5.31	\$20.57	80%	\$12.48
Jun	4.0	\$5.14	\$25.71	95%	\$12.74

In this example, the expected feed cost was \$12.74/DSE. On average, this is how much it will cost per head to feed animals through if you had the same scenario hundreds of times. But you will only have one scenario, which you cannot predict: this year. If the season doesn't break until late autumn, the actual feeding cost will be far greater, approaching \$25.71/DSE. Likewise, if the break arrives in March the feed cost will be less than \$10.21/DSE.

This method can be used to calculate the expected feed cost for all regions to help you understand the possible feeding scenarios you may face. The cost of feeding will be high in most cases. However, the consequences of reducing stock numbers will have a significant impact on future income that may outweigh the short-term cost of feeding, if feeding is a practical option on your farm.

Consider from a cash flow perspective both the expected feed cost and the worst-case scenario. There is no point in keeping all stock if you only have the funds to feed until April. If the drought does not break and you are forced to sell stock at this time, the financial outcome can potentially be worse than selling stock early.

Once the expected cost of feeding is calculated, undertake partial budgets for each stock class to determine if feeding or selling is the right strategy. You will need to know the:

- current value of stock
- expected cost and worst-case cost of feeding
- extra income received by retaining stock
- expected death rates of stock while feeding
- extra costs of running retained stock (animal health, shearing etc.)
- value of the retained stock
- likely cost of buying back stock after the drought breaks.

Production and therefore income from retained stock is usually lower than usual, because nutrition may be lower than usual for at least part of the year, leading to reduced stock growth rates (and wool quality for relevant sheep breeds). However, if you feed well, you may see improved production compared to a severely dry season where you would have persisted with pasture, although costs to achieve this improved production will be higher than usual.

Calculate budgets for feeding under the expected cost scenario and worst-case scenario and compare to budgets for selling (and agistment if considered). Consider also potential effects if you do sell and re-buy, including genetic merit of purchased stock, future income potential, their age and impact on cash flow, and the cost associated with biosecurity risks, especially if you usually run a closed herd.

APPENDIX B:

Farm fire plan



PREPARE



DISCUSS



KNOW



KEEP

GET READY FOR FIRE ON YOUR PROPERTY USEFUL TOOLS TO MAKE YOUR FARM FIRE PLAN

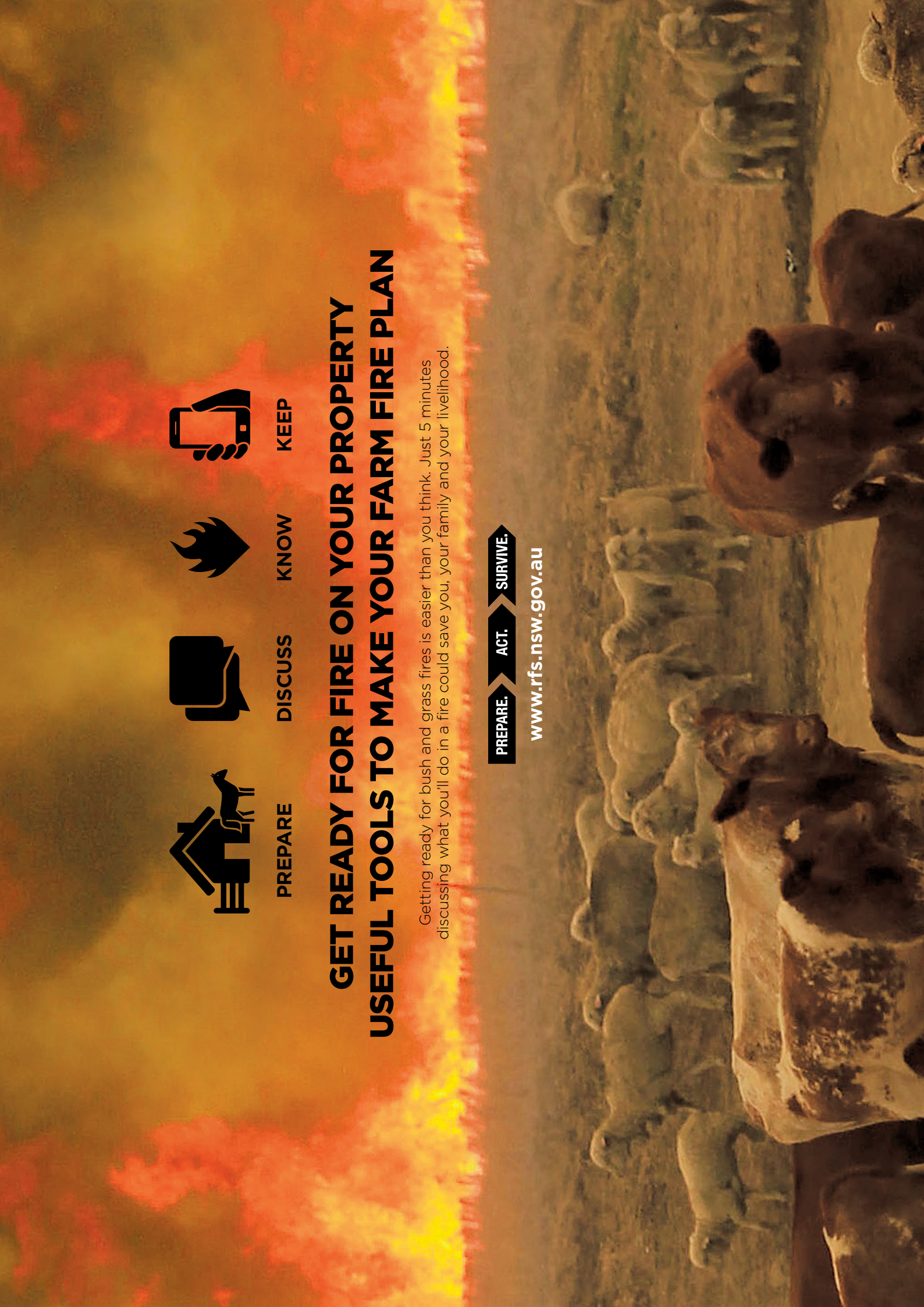
Getting ready for bush and grass fires is easier than you think. Just 5 minutes discussing what you'll do in a fire could save you, your family and your livelihood.

PREPARE.

ACT.

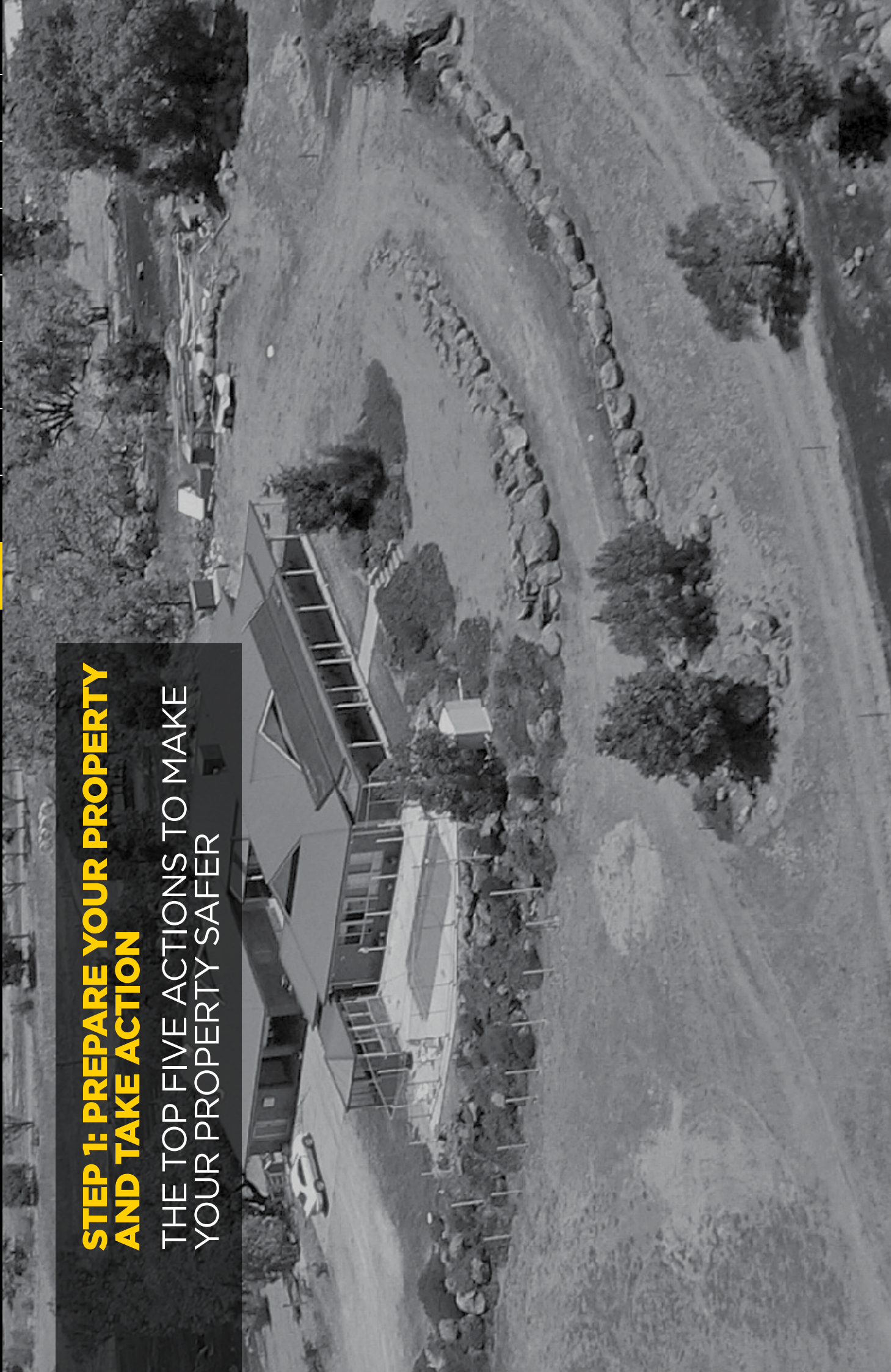
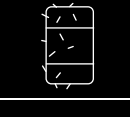
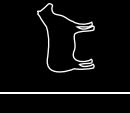
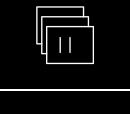
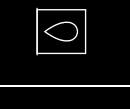
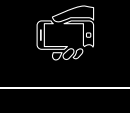
SURVIVE.

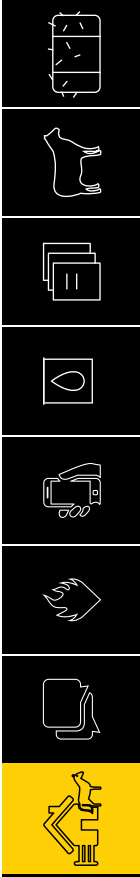
www.rfs.nsw.gov.au



STEP 1: PREPARE YOUR PROPERTY AND TAKE ACTION

THE TOP FIVE ACTIONS TO MAKE
YOUR PROPERTY SAFER





STEP 1: PREPARE YOUR PROPERTY AND TAKE ACTION

THE TOP 5 ACTIONS TO MAKE YOUR PROPERTY SAFER

There are some simple things you can do around your property to prepare it against the risk of fire. You need to prepare well beforehand as leaving it to the last minute is too late.

Here are five simple things you can do now to prevent the threat of fire.



1. CLEAR / SLASH

Clear flammable materials (e.g. gas cylinders) and slash areas of long, dry grass around structures like the home and shed.



2. BURN

If you have the required permits, approvals and skills and the conditions are suitable, conduct a controlled burn on your property to reduce fuel.



3. PLOUGH

Plough firebreaks around each paddock boundary to prevent the spread of fire.



4. ROTATE

Rotate stock across the property to ensure paddocks are well-grazed.



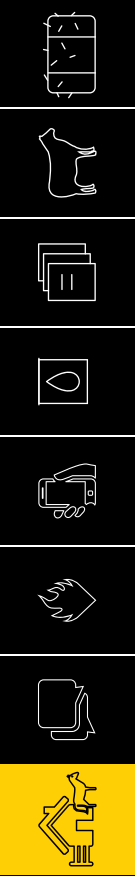
5. PREPARE

Prepare and maintain sturdy hoses and water pumps in case you need to defend your property.



If you've conducted slashing on your own property recently, you've already completed one of the top five ways to make your property safer.





STEP 1: PREPARE YOUR PROPERTY AND TAKE ACTION CREATING A PROPERTY MAP



As part of preparing your property against fire, it's important to create a map of your property with the location of important features. This will help you identify and prevent fire risks in and around your property.

MAPPING YOUR PROPERTY

Your map can be a photocopy of the property map, an aerial photograph or a map you draw yourself.

STEP 1: Using a **GREEN** pen, map and label all of the fire management areas of your property.

This may include different paddocks on the property, areas of landscaped garden or zones around important assets (e.g. sheds).

STEP 2: Use a **BLACK** pen to map assets / buildings on your property.

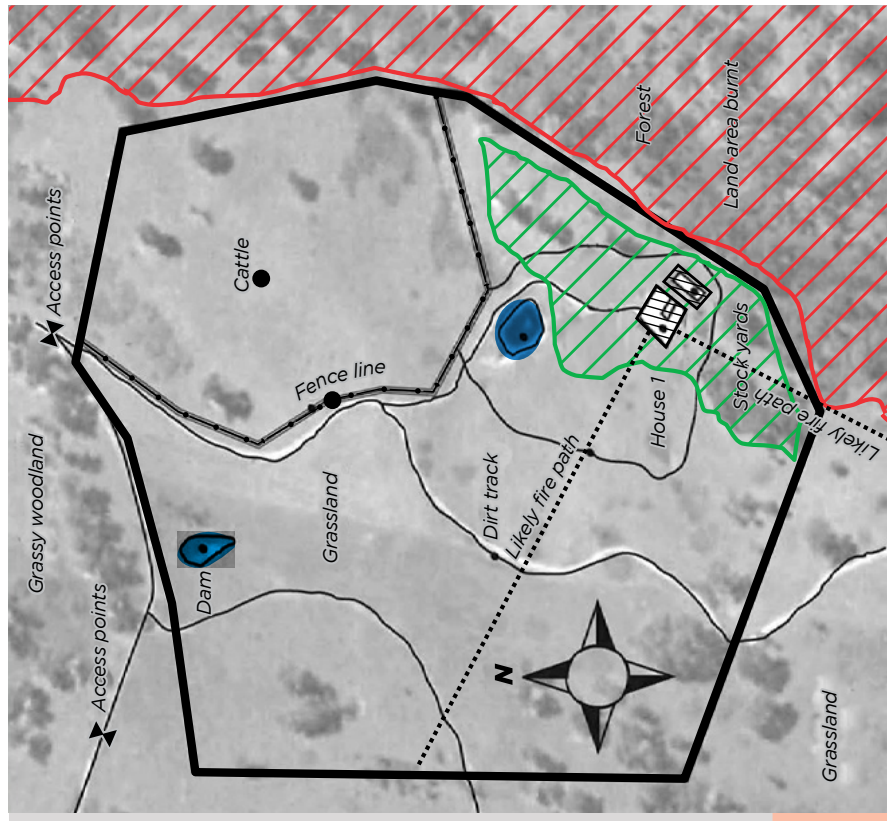
This may include houses (both occupied and unoccupied), machinery, storage or shelter sheds, fences, power lines as well as stables.

STEP 3: Locate and map any water sources using a **BLUE** pen.

These could include dams, bore water supplies, rivers / creeks, water tanks, swimming pools, pumps and hydrant points.

STEP 4: Identify and map any areas of burnt vegetation in **RED** pen.

TIP: If you have internet access, use a satellite view map (such as Google Maps) as a guide to create your property map.



HOTSPOTS FIRE PROJECT

For more information on preparing a property map, contact your local NSW RFS District Office and ask about the Hotspots Fire Project

STEP 1: PREPARE YOUR PROPERTY AND TAKE ACTION CREATE YOUR PROPERTY MAP



STEP 1: Using a **BLACK** pen, map and label all of the fire management areas of your property.

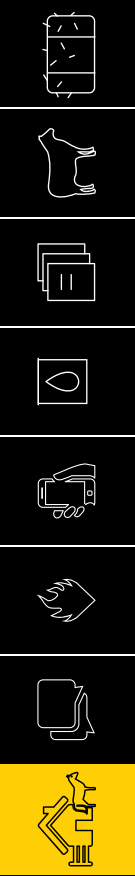
STEP 2: Use a **RED** pen to map assets / buildings on your property.

STEP 3: Locate and map any water sources using a **BLUE** pen.

STEP 4: Identify and map any areas of crops, ungrazed paddocks or unmanaged vegetation in **GREEN** pen.

DATE MAP CREATED
/ /

Large grid area for mapping property details.



STEP 1: PREPARE YOUR PROPERTY AND TAKE ACTION DEVELOPING AN ACTION PLAN



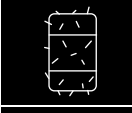
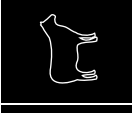
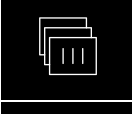
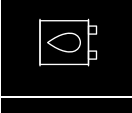
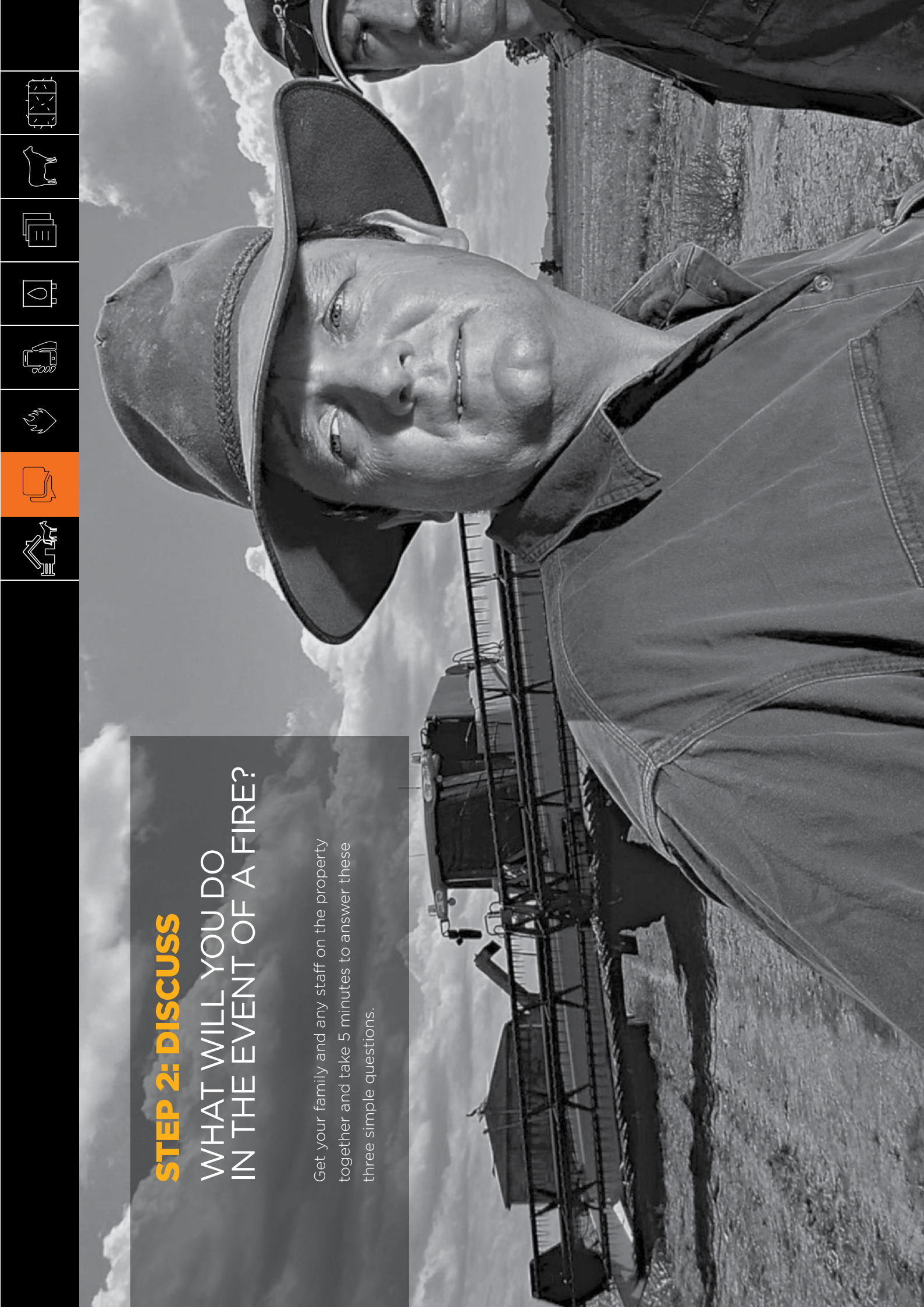
Once you have completed your property map, identify the top five risks on your property and the action needed to reduce those risks. The NSW Rural Fire Service recommends keeping the action plan in a central location where everyone on the property will have access to it. If you need any assistance completing the action plan, contact your local Rural Fire Service brigade.

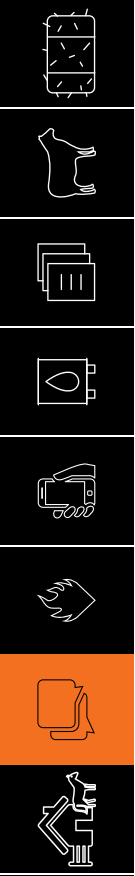
FIRE ACTION PLAN FOR PROPERTY: / / UPDATED / /

TOP 5 IDENTIFIED RISKS	AREA	ACTION REQUIRED	TO BE COMPLETED BY	PERSON RESPONSIBLE	INITIAL WHEN COMPLETED
Fire breaks not in place	Home Paddock	Plough 3m wide fire breaks around paddock	14 / 09 / 18	Dave Smith	DS
1.					
2.					
3.					
4.					
5.					

STEP 2: DISCUSS WHAT WILL YOU DO IN THE EVENT OF A FIRE?

Get your family and any staff on the property together and take 5 minutes to answer these three simple questions.





STEP 2: DISCUSS HAVE A 5 MINUTE FIRE CHAT

In the event that a fire becomes uncontrollable, you may only have minutes to react. In order to protect your family, your workers, and your livelihood it's important you know what you will do:



-  **1 WHEN WILL YOU LEAVE?**

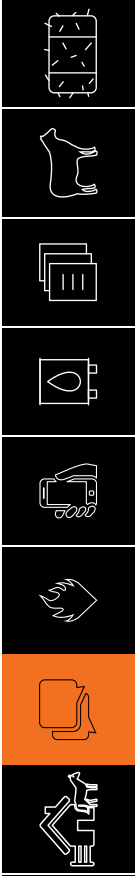
-  **2 WHERE WILL YOU GO?**

-  **3 WHAT WILL YOU TAKE?**



For a more detailed plan, use the following page which will guide you through the important questions you need to consider for your property. For more information, visit www.myfireplan.com.au





DECIDE TO STAY, BUT BE PREPARED ACTION CHECKLIST

Defending structures on your property can be physically and mentally demanding. It's important that everyone knows exactly what to do if a fire happens. You may need to make a decision early as to what structures on the property (e.g. homestead, machinery shed etc.) you want to defend.

BEFORE (well before the fire has arrived)

- Initial next to each:**
- Move flammable items away from all buildings (e.g. home, shed, stable etc.)
- Move stock to a well-grazed or ploughed area away from the house and wind
- Check all equipment is working and easily accessible (this includes testing all pumps, hoses and vehicles)
- Block downpipes and fill gutters with water
- Patrol any structures well before the fire arrives to put out embers and spot fires
- If possible, wet the side of the structure that faces the fire
- If in a house, close any doors, windows and vents
- Soak towels and rugs and lay them across external doorways
- Move your firefighting equipment to a place where it won't burn inside

DURING (as the fire is upon you)

- Don't get caught in the open as a fire approaches
- As the fire approaches take shelter to protect yourself from the heat of the fire
- If possible, shelter on the opposite side from the approaching fire, or behind a solid object to protect yourself from the heat
- Make sure that there is always more than one exit in case you need to escape
- Drink lots of water to stay hydrated

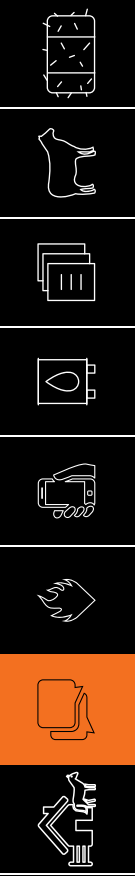
AFTER (immediately after the fire has passed)

- If possible, and safe to do so, check everyone on your property is OK
- Contact relatives or friends to tell them you are safe
- Patrol your home for several hours, looking for small fires and burning embers



Any safe place of shelter should have two or more exits.





DECIDE TO STAY, BUT BE PREPARED EQUIPMENT CHECKLIST

Defending your property from a fire can be challenging and you will need the right equipment.

[-S] Initial against all of the equipment you will need in a fire emergency.

Remember, while firefighters and emergency services will do everything they can to help you, there's no guarantee that there will be a fire truck available when you need it. Anyone who plans to stay and defend in a fire has a responsibility to know how to use firefighting equipment.

FIREFIGHTING EQUIPMENT WE WILL NEED:

- A certified road-worthy vehicle capable of carrying a fire-fighting slip-on unit
- A slip-on unit with working pump and hoses
- Multiple water sources with 10,000 litres or more (eg. dams, ets)
- Water tanks fitted with 65mm Stortz outlets and metal valves
- A first aid kit
- UHF radio transmitter

Remember, it's essential to ensure that all fire fighting equipment and vehicles are tested, and in working order every year.

PROTECTIVE CLOTHING

- Wide-brimmed hat
- Eye protection goggles
- Moistened facemask or cloth
- Loose, long sleeved cotton shirt
- Gloves
- Long cotton pants/jeans
- Sturdy leather shoes or boots



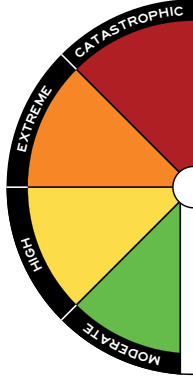
We commit to testing equipment on:

Equipment is stored in:



For every 40 properties in NSW, there is only one NSW RFS fire truck.
There is no guarantee that a fire truck will arrive at your property in the event of a fire.

STEP 3: KNOW THE CONDITIONS



FIRE DANGER RATINGS

Before a fire even starts, monitor the Fire Danger Ratings daily at www.rfs.nsw.gov.au/fdr and be aware of conditions in your area. The higher the rating, the more dangerous the conditions.



HARVEST SAFETY ALERTS

Harvest Safety Alerts provide a signal to farmers that they should be taking extra precautions during harvesting operations to prevent the ignition and spread of fire due to the prevailing weather conditions. Get your **Grain Harvester Guide** from your local Fire Control Centre.



TOTAL FIRE BANS

A **Total Fire Ban (TOBAN)** may be issued on days of increased fire danger. Check the NSW Rural Fire Service website to stay up-to-date.

DURING A TOTAL FIRE BAN:



All fire permits are suspended



No fire may be lit in the open



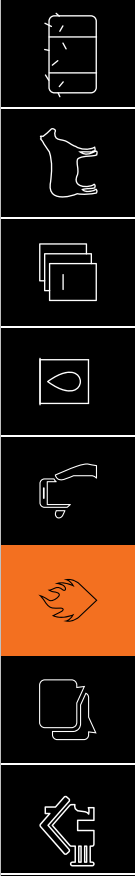
No welding, grinding etc. should be done in the open

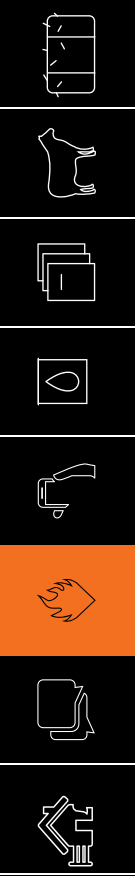


NSW RFS recommends you avoid using machinery or slashing



If you're burning, check conditions. Don't light up unless it's safe. Heavy fines apply for the unsafe use of fire if your fire escapes.





STEP 3: KNOW THE BUSH FIRE ALERT LEVELS

WHEN A FIRE OCCURS

There are some simple things you can do around your property to prepare it against the risk of fire.
You need to prepare well beforehand as leaving it to the last minute is too late.



ADVICE

A fire has started.
There is no immediate danger.
Stay up to date in case the situation changes.



WATCH AND ACT

There is a heightened level of threat.
Conditions are changing and you need to start taking action to protect you and your family.



EMERGENCY WARNING

An Emergency Warning is the highest level of Bush Fire Alert.
You may be in danger and need to take action immediately.
Any delay now puts your life at risk.

STEP 4: KEEP UP TO DATE

In the event of a fire, it's important that you stay up to date on conditions in your area. The NSW Rural Fire Service strongly advises saving these numbers, links and apps now.



IN AN EMERGENCY CALL TRIPLE ZERO (000)

For information on bush fire, call the Bush Fire Information Line
1800 NSW RFS (1800 679 737)



NSW Rural Fire Service Website: rfs.nsw.gov.au
Fire Danger Ratings: rfs.nsw.gov.au/fdr



'Fires Near Me NSW' Free smartphone app



Local radio, local ABC/emergency
broadcaster frequency, TV



facebook.com/nswrfs
twitter.com/nswrfs

The contact number of my local Fire Control Centre is:

(.....)

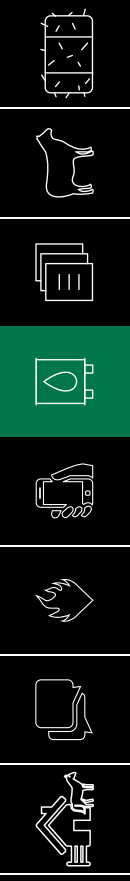
(.....)

During a fire in our area, the NSW RFS may use UHF channel:



Hang these key information contact details in a prominent location in the house
or on the property so anyone can access them.
Next to the phone is a great place to keep the contacts for easy access.





STEP 5: IMPROVE FARM INFRASTRUCTURE



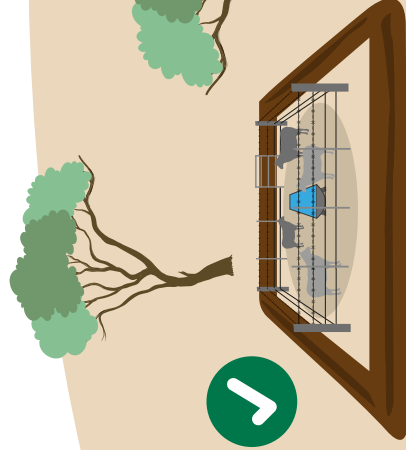
Your fire response and recovery will be improved by having infrastructure that is resilient to fire conditions.

Budget and plan for these improvements over 3–5 years or as soon as practicable.

- House improvements for your shelter
- Sprinkler systems on house and livestock yards
- Fire-resistant water tanks
- All water pipes buried underground
- Steel strainer and stays for fencing
- Metal livestock yards
- Concrete or gravel surrounding buildings like sheds to prevent vegetation

A well-designed livestock refuge area is a valuable resource during and after a fire, for other business shocks including drought and flood, and for biosecurity quarantine. The basic requirements are:

- Located away from woody vegetation and steep slopes
- Firebreaks able to be installed around it
- Steel fencing that will withstand a fire
- Reticulated water to troughs fed by gravity (or pump)
- Facilities to provide supplementary feed
- Adequate space for your livestock with subdivisions
- Pasture that can be sacrificed
- Close to supplementary feed
- Has some shade trees but not enough to pose a fire risk



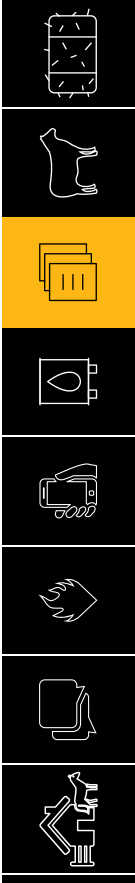
STEP 6: INSURE AGAINST LOSS FROM FIRES

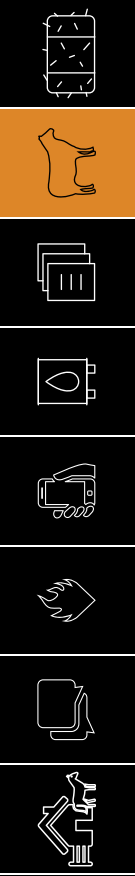
To successfully recover after fire, you need cash flow to re-establish the basics needed for your farm to run. Don't rely on grants for this.

Review your insurances annually every time you renew your policy. Many farmers who experience fire regret that their insurances were not up to date. Farm insurance will not automatically cover all parts of your farm. Most farms are selective in what they have insured. Work with your insurance advisor to make sure your cover is appropriate.

- Do new assets need to be added (infrastructure, equipment, animals)?
- Are assets covered for the amount it would take to replace them as new?
- Are the basics you need for your farm to run covered?
- Does what is covered align with your goals - if you lost everything, could you afford to keep farming?

Keep a file with photos of key assets on a cloud computer system to assist during insurance claims.





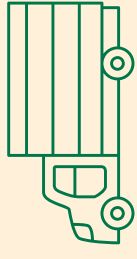
STEP 7: PROTECT LIVESTOCK



OPTIONS INCLUDE:

1

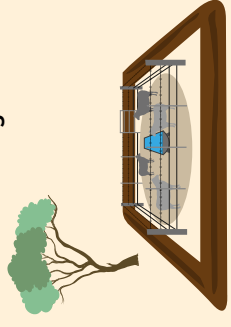
Move stock off farm (small numbers or high value).



2

Move stock to prepared refuge area.

 Suitable refuge



3

Move stock to makeshift refuge location – consider a paddock with short (ideally green) pasture and as far from trees/ bushland as possible, or stockyards – and add a firebreak if time allows.

4

Open internal gates or cut fences if your stock are not in a safe location.

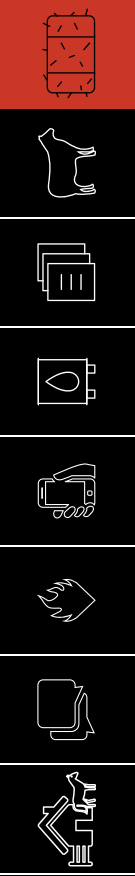
NEVER open external gates or cut fences. Livestock on roads during a fire are a danger to emergency vehicles and may still be caught against fence lines during severe fire.

5

Leave stock in paddocks – if the fire comes very quickly this may be the only option. Your safety comes first.

If stock are to be moved, this must happen ahead of time. Do not move stock in the face of the fire, as it is dangerous and unlikely to improve stock survival.

If there is not enough time to move all stock, plan your priority groups including high value animals (dollar, reproductive or genetic value), and prioritise sheep before cattle. Sheep may clump up in the face of fire and can suffocate.



STEP 8: AFTER THE FIRE **(Be self-sufficient but seek assistance)**

After a fire, urgent activities will take most of your attention. You may not be able to travel even locally after a fire. Preparing ahead can make these days easier.

CONTACT INFORMATION FOR RELIEF SUPPORT:

For fallen tree management across access road, the emergency number for council or local arborist is:

For emergency assessment of injured livestock and advice about disposal, the number to contact is:

Key government websites I can check to identify other support are:

Help is usually offered for burnt farms. You do not need to be the worst affected to receive help. There is enough help to go around and you should accept the help you are eligible for.

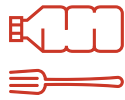
STEP 8: AFTER THE FIRE

(Be self-sufficient but seek assistance)

PLAN TO HAVE ENOUGH SUPPLIES TO SUSTAIN YOU FOR AT LEAST 1 WEEK AFTER FIRE, INCLUDING:



Generator and fuel



Food and water



Essentials such as medicines and first aid kit



Radio, ABC local frequency and batteries



UHF CB radio and batteries



Mobile phone

Mobile networks may go down but this will generally be temporary. While a generator or car can be used to power a phone, a power bank can be very useful.



Torches and batteries



STEP 8: AFTER THE FIRE

(Be self-sufficient but seek assistance)



Your livestock's welfare is important after a fire. Your pasture or stored feed may burn. Livestock may be injured.

[] MAKE AN EMERGENCY FEED BUDGET AND ORDER FEED

How much feed is needed to feed all your livestock for at least a week? Order this feed as soon as possible after the fire if you don't already have it.

- What kind of feed?
- How much feed?
- Can you have this feed on-hand in preparation for the fire?

[] PROVIDE ADEQUATE WATER

Plan ahead so that enough water for at least 1-2 weeks is available and the water system will not be damaged by fire. Dam water is a poorer alternative than reticulated water but is sometimes the only option as a dam will survive a fire. Have some emergency plumbing materials on hand (e.g. poly pipe and joins).

[] INJURED LIVESTOCK NEED TO BE ASSESSED; A GOVERNMENT VET WILL COME TO ASSIST WITH THIS

Government vets are available and should be called. However, you don't need to wait for a vet if you identify animals that need to be destroyed and are confident you can do so humanely and safely. You may plan to have a suitable firearm for this.

[] STOCK NEED TO BE CONTAINED TO YOUR PROPERTY AS QUICKLY AS POSSIBLE.

Temporary electrical fences or equipment to quickly erect fences to keep stock contained may be needed. Consider using a smaller area to contain stock initially rather than trying to re-fence the whole farm boundary.



NSW RURAL
FIRE SERVICE



It's a fact.

If you and your property are well prepared, you stand a better chance of surviving bush and grass fires. Join your community to ensure that your home, property and livelihood are protected by following the Four Simple Steps to getting ready for fire.

#MyFirePlan

NSW Rural Fire Service

www.rfs.nsw.gov.au

