



Wildfire Prevention in Australia



Australian Wildfires (Bushfires)

Wildfires, or bushfires as they are commonly known in Australia, are a naturally occurring phenomenon in the Australian environment. Before the arrival of humans on the Australian continent, bushfires were often started as a result of lightning strikes or volcanic eruption. While lightning still continues to provide the spark for bushfires, the actions of people (either deliberate or accidental) also contribute to the many bushfires that occur in Australia each year.

Every year, especially in summer, Australia experiences a large number of bushfires that occur as either 'grass fires' or 'forest fires'. Grass fires occur mainly on grazing, farming or remote scrub land country. Although these fires often destroy fences, livestock and some buildings, the nature of the country and its usage, generally mean that heavy losses (particularly human life) are rarely experienced.

Forest fires on the other hand often destroy a greater number of homes that border bushland areas, resulting in larger losses of human life and property. Australia's most devastating bushfires have happened where they have raged through the dense eucalypt forests in the southeast of the continent.

Bushfire Disasters

Most bushfires are not disasters, however, if not quickly detected and contained, even small fires can get out of control and result in a disaster. Thankfully, few bushfires earn the title of 'disaster', but repeated disastrous bushfires near the capital city in the states of Tasmania, South Australia, Victoria, New South Wales and Western Australia have occurred, in which many people have lost their lives, or their homes and property.

The worst of these were:

Victoria (1939)	71 dead
Southern Tasmania (1967)	62 dead
New South Wales (1968)	14 dead
Southern Victoria (1969)	23 dead
South Australia/Victoria (1983)	76 dead

Australian Bushfires – Case Studies

South Australia and Victoria – 'Ash Wednesday', 1983.

Conditions for Disaster - On 16 February 1983, Melbourne was experiencing a very hot, dry day. The temperature peaked at 43°C with relative humidity of only 6%. Drought conditions had persisted in south-eastern Australia for several years with 1982/83 summer being extremely hot and dry. Many small to moderate bushfires occurred in South Australia and Victoria over this period. Fires burned over 100,000 hectares near the New South Wales/Victoria border on 1 February. On 6 February, 95 fires were reported as they flared in hot, strong, north-westerly winds. By 16 February-'Ash Wednesday', South Australia and Victoria were tinder dry and fuel loads in forests were very high.

The Toll – In the twenty-four hours following that morning, a holocaust of bushfires erupted, and in just a few days, burnt over 520,000 hectares across the two States. More than 3,700 buildings were destroyed, including

84 commercial, and about 1,000 farms. A total of over 2,400 families or individuals lost their homes while 76 people died! Many of the total 1,100 injured people required hospital treatment. Livestock losses were very high, with over 340,000 sheep and 18,000 cattle, either dead or having to be destroyed, while 20,000 km of fencing and 1.5 million hay bales were burnt. During that summer of 1982/83, at least 1 million hectares were burnt out across South Australia and Victoria. Insurance losses exceeded \$320 million and total estimated costs were \$950 million in 1997 values.

New South Wales – Eastern Seaboard, 1994

Relentless Westerlies - In early January 1994, hot, dry, westerly winds began to blow from the inland affecting most of the east coast of the State. Several large bushfires broke out in the north. These were soon followed by serious outbreaks all along the coast extending to the south of Batemans Bay. Dangerous winds persisted for about three weeks resulting in over 800 bushfires. The most serious fires were in the Hunter, Blue Mountains

and Sydney regions. About 20,000 volunteer fire-fighters (including reinforcements from all states and territories) battled the flames and helped evacuate over 25,000 people from areas under serious threat.



Losses and Costs - About 800,000 hectares burnt, including sections of Sydney suburbs and 40 National Parks. Four deaths (including 3 fire-fighters) resulted, 120 people were injured and 800 people were left homeless after 205 homes and about 20 other buildings were destroyed. Only 200 livestock died but 600 km of fencing and thousands of native animals perished. Insurance losses were \$56 million with total costs estimated at \$165 million (1997 values).

Mornington Peninsula and Dandenong Ranges-Victoria, 1997

Heatwave Conditions - Temperatures soared above 40°C as northerly winds gusted to 70 km per hour contributing to two damaging bushfires near Melbourne between 19 and 21 January 1997. At Mt Eliza two homes burnt and evacuations were required at Mt Martha and Arthur's Seat, also on the Mornington Peninsula. 250 bushfires burnt areas of Victoria on 21 January, a 41.2°C day! Worst-affected were Ferny Creek, Upwey and Kalorama settlements in the Dandenong Ranges where it took 1,500 fire-fighters and 6 water-bombing aircraft to control the 3,700 ha forest blaze.

The Toll - Apart from Mt Eliza, another 41 houses were destroyed and 45 damaged in the Dandenongs. Tragically, three people died (at Ferny Creek) and about 40 were injured throughout the State. Insurance losses were about \$10 million with total estimated costs of \$40 million (1997 values).



Bushfire Prevention Strategies

The raw materials for any potential bushfire are the presence of fuel such as grass, leaves and twigs, oxygen from the surrounding air, and heat or direct flame.

Once a fire is started with these raw materials, the spread of the bushfire depends on a number of environmental factors including:

- the type and size of the fuel,
- the fuel's moisture content and its degree of compaction,
- the weather, and
- topography.¹

Australia's approach to bushfire prevention centres on lessening the possibility of a fire occurring and minimising the spread of bushfires. Fire prevention strategies fall into the following four main categories.

Land Management

Land management strategies are effective in:

- lessening the presence of fuels in forests or grassland area;
- slowing down and sometimes ceasing the spread of bushfires; and
- providing easier access routes for firefighters to reach and extinguish fires.

Fuel reduction is paramount to bushfire minimisation. By taking away the fuel, fires cannot start, nor can they continue to spread². One of Australia's strategies to reduce the build-up of fuels in forest and grassland areas involves the deliberate burning off of these fuels by various fire and land management agencies.

Not only do these 'fuel reduction burns'³ lessen the potential for future fires in these areas (especially during the dry hot summer months), if a fire does start or enter into such an area, the flame height and intensity will be reduced and the spread of the fire retarded.

The deliberate creation of fire lanes or firebreaks is another land management strategy. These firebreaks are generally areas of land that have been cleared of vegetation (and maintained) in order to provide 'strategic corridors'³ that act as fire suppression barriers and assist firefighting operations.

Land management strategies for fire prevention also require a community-based approach. People living in rural areas or those who live in urban areas which are next to bushland have a responsibility both to themselves, their neighbours and the wider community in the prevention of bushfires. Fire agencies across Australia have developed programs, such as 'Community FireGuard', which emphasise individual and shared responsibilities for the prevention of fires.

Residents in these areas too are required to undertake similar land management strategies, which includes removing as much fuel as possible from around their house or property and the creation of suitable firebreaks particularly for properties that are situated next to bushland.

Building Management

The findings following the 'Ash Wednesday' fires showed that the sparks and embers emitted from the fires were what caused houses to catch fire. As such, building guidelines and standards are now being developed that are specifically aimed at making buildings more resistant to these fire emissions.

In some communities, local government authorities have regulations controlling home siting, design and the use of building materials in bushfire prone areas. These controls serve not only to minimise the damage to homesites and reduce losses from fires, they also assist in the prevention and spread of bushfires.

Community Education

People and their actions (whether deliberate or not) are responsible for the majority of bushfires that occur in Australia. Some of the more common causes of bushfires in Australia have resulted from deliberate burning-off that gets out of control and fires escaping from burning rubbish heaps¹.

However it can also take only a single spark from machinery such as welding equipment, a campfire or outdoor cooking facility not properly extinguished or children playing with matches for a fire to begin.

With such a high bushfire incident rate resulting from the actions of people, community education in Australia is particularly important. Education takes on a number of forms and is generally designed to provide people with a better understanding of the risks they face from bushfires and the measures the community can take to minimise these risks.

A range of information brochures are made available to the general public which cover such issues as what measures people (particularly those living in bushfire prevalent areas) can take to minimise the spread of a bushfire and the protection of their property and lives before and during a bushfire. The type of advice provided includes:

Preparation before the Bushfire Season

- Where possible, prepare a firebreak around the home.
- Trim branches so that they are well clear of the house.
- Clear roof gutters of leaves and twigs.
- Store wood, fuel and paints etc well clear of the house.
- Remove rubbish, leaf litter and plants that are close to the house
- Keep grassed areas (especially those around the house) short/ green.
- Fit wire screens to doors, windows and vents (to prevent burning embers from entering the house).
- Enclose any gaps, roof eaves and the under area of the house.
- Keep a ladder nearby for roof access (both inside and out).
- Have water hoses available and ensure they will reach all parts of the house and garden. Where water is not connected, obtain a high pressure pump.
- Decide on a household plan to either leave early or stay to protect the **properly prepared** home during the bushfire.

If a Bushfire Approaches

- Phone the bushfire brigade – do not assume they know about the fire.
- Fill baths, sinks, buckets etc with reserve water and turn off any gas and power.
- Remove curtains and move furniture away from windows.
- Wear protective clothing that covers the body area, solid boots or shoes, a hat or woollen balaclava and gloves.

- Plug downpipes with rags and fill all roof gutters with water. Hose down walls, garden etc on the sides of the house facing the 'fire-front' and watch for spot fires.
- Inside, close all windows, doors and block crevices and gaps. When the fire front arrives, **stay inside**, away from windows, while it passes (usually 5-15 minutes).
- Quickly **extinguish** any fires, which may have started in, on, or under the house and check **inside** the roof cavity as well.
- If the house is alight and can't be extinguished, move away to safe **burnt** ground. **Don't** leave the area, wait for help. Listen to the battery radio for official information.

There are even information brochures available on how to select the least vulnerable home site (and suggested layout) for people who are intending to move into bushland areas. For example, the New South Wales Department of Bushfire Services brochure 'Everyone's Guide to Rural Homesite Selection and Layout' provides advice such as:

When Choosing a Homesite

- Flat ground is safer than sloping ground
- Gentle slopes are safer than steep slopes
- The bottom of the slope is safer than the top.
- Slopes facing east are safer than slopes facing north, northwest, west or south.
- Establish fire breaks (preferably ploughed) between any unmanaged grass or bushland/forest if a natural firebreak (such as a road or river) does not exist.
- The firebreak should encircle the homesite and the wider it is the better.
- Minimise grass fuel and fuel in timbered areas within 60 meters of the homesite by controlled burning and slashing.
- Position the homesite so that any forested areas are to the south and east of the site.
- Position high-moisture content trees on the hazard prone side of the site (between the hazard and the homesite) to act as a shield against radiated heat and flying sparks and embers.
- Put sheds to the south and east of the homesite and ensure the entrances face east.
- Isolate inflammable fuel from the homesite and hay shed ⁴.

Fire Danger Warnings

For the general public, television and radio broadcasts are an especially effective means of educating people regarding their responsibilities in relation to fire prevention. These fire prevention and safety campaigns are generally broadcast right throughout the year, however they increase in intensity particularly in the lead up and right through the summer months.

These campaigns provide simple advice in relation to such issues as campfire safety, the conduct of fuel burn-offs, burning of rubbish in outdoor fires and even educating people regarding the disposal of cigarette butts.

Australia also has a fire danger rating system which forecasts the potential for a forest or grassland fire and

is based on seasonal drought, recent rainfall, temperature, relative humidity, wind speed and the amount of fuel on the ground. The categories of the rating system are as follows:

- Extreme Fire Danger
- Very High Fire Danger
- High Fire Danger
- Moderate Fire Danger
- Low Fire Danger

This rating system is used Australia wide and is designed to control the general public's use of fire during the bush fire season in order to lessen the potential for fire outbreaks.

Sources:

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2. Bush Fire Council of N.S.W., *Bush Fire Protection: Safety and Survival*, Government Printer, New South Wales.
3. Department of Natural Resources and Environment & Country Fire Authority, (1999), *Fire in the Australian Landscape*, East Melbourne, Victoria.
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Article Prepared by:

Emergency Management Australia in conjunction with the Australasian Fire Authorities Council and Country Fire Authority - Victoria

For further information contact:

*Emergency Management Australia
Department of Defence
PO Box 1020
Dickson ACT 2602
Australia*

Phone: +61 (0) 6288 5402

Fax: +61 (0) 6257 7665

Email: ema@ema.gov.au