

## Black Saturday bushfire

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Scorched Earth

The long-term forecast is hot and dry, with frequent megafires: all we can do is learn to live with them reports Åsa Wahlquist.

The forecast for Saturday was unequivocal: Victorians were facing the worst fire weather day on record. The question is why, with computer technology providing detailed information about fire location and weather condition that was unimaginable even a decade ago, analysis based on the best fire research in the world, and an army of agencies fighting the fire and providing services, the death toll from Saturday's holocaust exceeded not only all records, but exceeded our worst fears.

The severity of bushfires is determined by a number of key factors: weather, including drought; fuel load; topography; the location of the population; their houses; and householders' preparedness to manage fire.

But, in the same way that the past is no longer a guide to future water management in Australia, Saturday showed bushfire risk in Australia has entered a new era.

The bottom line is Australia is a continent like no other, when it comes to fire. Stephen Pyne, the author of *Burning Bush: A Fire History of Australia*, points out Australia's cycles of wet and dry set the scene for massive fires. The vegetation flourishes in the wet, then parches and even burns in the dry. Our dominant tree, the eucalypt, has evolved to live with fire. They drop massive amounts of highly flammable leaf litter.

Some, like the stringy-barks have long tongues of bark that carry fire to the leaves with their high level of volatile compounds. Ignited bark can fly ahead, creating spot fires. After fire eucalypts send out new green shoots and their seeds, released by the heat, germinate in the bed of ash.

Pyne argues it was only after the 1939 Black Friday fires that Australians understood they could not control bushfire and they were going to have to live with it.

Most of Australia's significant bushfires have resulted in changes about planning, about where and how we live in this fire-prone land. Australians might love their tree change, their homes among the gum trees, but the question has to be asked: how safe will that home be in south-eastern Australia in a hotter, drier future?

Athol Hodgson was the Chief Fire Officer for the fore-runner to Victoria's Department of Sustainability and Environment. The first fire he fought was as a nine year old, defending his father's farm at Corryong on Black Friday, 1939. "We saved our house and paddocks and cows. I still remember it vividly. But when you add up all the things that drive bushfires, Saturday was certainly the worst we have ever had."

Hodgson, a life-long forester, says the driver of the fire was very dry fuel. "You can't live cheek by jowl with the sort of vegetation that we grow and expect to survive on a day which every 20 years or so happens."

He is full of praise for the fire-fighters, the volunteers and the police. "They are going a magnificent job, but it is a job they shouldn't have to do."

After the 1939 bushfires, in which 71 people died and 1.4 million hectares were burnt, the Stretton Royal Commission recommended the sawmills, and their workers, be moved out of the forests. "Then we went through many years, when we didn't kill many people in fires because people didn't live in the bush," Hodgson says.

In the 1960s, after fires in the Dandenongs, on the outskirts of Melbourne, Hodgson says "as the Forest Commission, we were given the money to buy back properties and compulsorily acquired a lot of standing houses".

The 1994 fires around Sydney produced startling evidence of the importance of planning rules. On the Illawong-Menai side of the Woronora River, there was about 20 km of housing/bushland interface. In that whole area there were about half a dozen houses destroyed and a similar number were damaged. On the other side, the Como-Jannali side of the river there was one and a half to two kilometres bushland interface. But about 85 houses were totally destroyed and quite a large number damaged.

It was the same fire: the difference was Illawong-Menai had been developed under town planning and house building rules that were formulated with an understanding of bushfire behaviour.

Hodgson was frustrated by the Victorian Government's response after the Ash Wednesday fires in the Otways. "We proposed the same thing apply again and the government stop rebuilding. But it was a different government and they said 'no way, you can't do that to people'.

"The planning process could have a greater effect on the destruction of houses and deaths than the number of red fire trucks you have," he asserts.

Gary Morgan is the CEO of the Bushfire Co-operative Research Centre. He says three things are needed to survive a bush fire: "knowledge, that is where the research comes from; you need experience; and then there is communications, it is about knowing where fires are."

Morgan says Australia has excellent research on building in bushfire-prone areas, on what he calls "creating defensible space", and on fire behaviour. He says the next stage of research, pending funding, will be in the area of the social sciences, "about what people do, and how do we make better decisions".

"Fire fighting today is not about a tanker being at a door," Morgan says. "It is about the whole community knowing what to do and the shared risk and responsibility. That is what our research is telling us and that is what the agencies are focussing on."

The Victorian agencies have been asking fire-prone households to put together a fire plan, to either leave early or stay and defend a well-prepared house. The large number of people who lost their lives on Saturday on the road, fleeing in

cars at the last minute, will no doubt be the subject of future enquiry.

Morgan says the research shows people are safer in a house, "even if you can't do the defending". He says cars these days are mainly made from PVC "and the fumes are really toxic and they are going to knock people down before the car burns, so you are not much better than being on foot".

Phil Cheney, the former head of CSIRO Bushfire Research Unit, says fires come down to fuel loads. "If you put your home in the forest, as a lot of those places were, it is very, very difficult to survive. The sort of recommendations about staying with your home were really predicated on the home being practically fuel-free for something like 50 metres around it. It becomes exponentially more difficult as you get these big heaps of forest fuel. Marysville is tall stringybark forest country, it generates a lot of fuel."

Cheney says there has not been enough fuel reduction in Victoria, in the form of controlled winter fires or prescribed burning.

He compares it to the West Australian experience. "One of the reasons why the losses in WA are low compared with anywhere else in Australia is because of the prescribed burning. People in that peri-urban forest area are being constantly reminded by the smoke in the air that the stuff around them burns."

Cheney says Western Australia has an annual target for prescribed burning. "The telling statistic to me is their [WA] land managers in the forested areas spend somewhere between 21 and 25 per cent of their time on fire management. I would be surprised if the figure in Victoria was over five per cent. The West Australians have a huge commitment and it works," Cheney says.

In January 2003 a mega-fire roared into Canberra, re-writing the fire rules. The term mega-fire was coined in California to describe a series of fires of unprecedented ferocity that had burned in the US since the year 2000.

Mega-fires are typically formed from several fires, often covering a huge area. They exhibit complex behaviour, releasing atomic bomb-like amounts of energy. They create their own weather, and are beyond any attempt to control them.

Hodgson says: "The simple fact is when a fire gets beyond a certain intensity then forget about trying to put it out. You are going to have to wait until it runs out of fuel or the weather changes. Having three air cranes flying around is not going to help you one bit."

The mega-fire is one new phenomenon Australian fire fighters have to face. Another is climate change, and the increased possibility of more frequent severe fire weather days.

In 2006, as mega-fires burnt through rural Victoria, Victorian Emergency Services commissioner Bruce Esplin warned that the change in climate should be changing the way fire seasons are managed. "There really is a need for a rethink. The emergency services, the public land managers and the community need to recognise that this dryness and this extreme fire danger is something that we need to prepare for all year, every year," he said in 2006. "It is not just something we do for the bad years."

Saturday was the hottest day on record for most of Victoria. Melbourne set a new record of 46.4°C, eclipsing the previous record was 45.6°C, set on Black Friday, 13 January 1939. Throughout the state, temperatures exceeded those of the 1939 heatwave. January was another dry month in Victoria, the last in a long series of dry times going back over a decade. Blair Trewin from the National Climate Centre, says the area north of Melbourne that burnt on Saturday was been markedly dry for the last ten years. "Most of that area has been about 20 per cent below the historic average [rainfall] over the last 12 years. That is way outside any previous period of comparable length," he says.

Trewin says that long term drying is consistent with climate change. And he argues climate change has nudged the temperature up a degree. "It turned your 45s in 46s, and your 46s into 47s."

Graham Mills, a scientist with the Centre for Australian Weather and Climate Research, says scientist have "a good understanding at a quite advanced level" of fire weather, adding "but there are always more things to find out".

Mills says the conditions that lead to extreme fire weather are heat, low humidity, wind and pre-existing drought, "the more of that you have at the same time the worse the fires are, as we saw the other day".

But he says that relationship is not a simple, linear equation: a small change in one can lead to a hugely increased fire risk.

On Saturday the temperature set new records. And this lead to another problem. "When you get those conditions, nobody has really had experience of them ever before," Mills observes. He says most studies on future climate conditions, like that undertaken by the CSIRO and the Bureau of Meteorology, "suggest that the fire weather will get worse. The temperatures are projected to increase and the rainfall is projected to decrease so you have two of your factors that are going to get worse."

Mills says they have "a little bit of a study" on extreme fire weather fronts. "There is some evidence, although there is a great deal of uncertainty, that the frequency of these fronts will increase during the 21st century, if the climate projection models are correct."

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