

CONTRIBUTIONS ON BUSHFIRE MITIGATION BY THE LATE KEVIN TOLHURST AM

Summary of some of Kevin Tolhurst contributions to the debate on bushfire policy

(Compiled by John Cameron and David Packham OAM, 7 October 2023)



Kevin Tolhurst AM passed away on 5th October 2023, after delivering an address to a community forum on bushfire mitigation at Mallacoota.

Against a misguided political scene, Kevin continued to deliver real science and practical management options and will be greatly missed. One of his last key messages to a community forum at Mallacoota on 5th October 2023 was, that if appropriate fuel reduction had been applied prior to the 2019-20 Black Summer bushfire, Mallacoota would not have burned.

Kevin was an expert in predicting wildfire behaviour, prescribed burning techniques and guidelines, ecological management of landscapes, fire risk management and ecological impacts of fire.

Victorian bushfire policy and practise is hopelessly misguided and appallingly bad, and based on shonky science steeped in ideology. Against this misguided political scene, Kevin continued to deliver real science and practical management options, and not political ideology masquerading as science. Below are just three examples of Kevin's contribution to bushfire mitigation that should resonate for a long time:

- Commentary on factors contributing to the Black Summer Bushfires.
- Critique of the Climate Council fact sheet on fire relying on an inappropriate study.
- Abstract from joint contribution towards enhanced bushfire mitigation.

1. Factors contributing to the Black Summer Bushfires¹

The Black Summer bushfires of 2019-20 directly killed 34 people and devastated more than 8 million hectares of land along the south-eastern fringe of Australia. A further 445 people are estimated to have died from smoke-induced respiratory problems. The burned landscape may take decades to recover, if it recovers at all.

The fires were so severe because they incorporated five energy sources. The most obvious is fuel: live and dead plant material. The other sources bushfires get their energy from include the terrain, weather, atmospheric instability and a lack of moisture in the environment such as in soil and woody debris.

The Indian Ocean Dipole in positive mode, (and El Niño) brought drought. The dryer fuel meant the fire used less of its own energy to spread.

As fires grew to several thousand hectares in size, high atmospheric instability (fire storms) increased winds and dryness at ground level, rapidly escalated the damaging power and size of the fires.

¹ Derived from Kevin Tolhurst. Wednesday, 10 Jun 2020, 11:57 am | Source: The Conversation.

Fuel levels were high because of a lack of low-intensity prescribed fires over the past couple of decades. This allowed fuel levels to build up.

If we simply try to suppress bushfires, we will fail. We need a concerted effort to manage the bushfire risk. This should involve carefully planned and implemented prescribed fires, as well as planning and preparing for bushfires.

2. Climate Council Fact Sheet relying on an inappropriate 2015 study²

The Climate Council published a fact sheet titled “Setting the record straight on hazard reduction”. It concluded that, while important, in future “no amount of hazard reduction will protect human lives, animals and properties from catastrophic fires”.

They concluded hazard-reduction burning has a statistically significant effect on the extent of wildfires, but only in forested areas with distinct annual drought periods (this is ironic as drought periods are when wild fires are worse and when fuel reduction is most needed).

The 2015 study is at odds with empirical studies in Victoria and Western Australia, which found otherwise, after taking a wider view on the issues.

The researchers of the 2015 study used a metric called “leverage” (the ratio between the area burnt by wildfires and the area burnt by prescribed burning) to evaluate the effect of hazard-reduction burning on reducing the extent of wildfires. By using the leverage measure they implied that prescribed burning only increases the total area burnt, and is therefore ineffective in reducing fire extent.

Like all scientific papers, while the conclusions are valid for the researchers’ narrow focus, several assumptions don’t work in a land management context. For instance, it’s assumed only the extent of the area burnt is important, rather than the severity of the fire (it is the severe wildfires that do the damage).

The recovery of the plants, animals, nutrients and habitat after low-intensity fire is much quicker than after high-intensity wildfire, according to a long-term Victorian study.

Several other assumptions in the 2015 study lead to conflicting conclusions with other studies, and the conclusions the Climate Council draws from it are not supported.

A 2009 study looking at 52 years of fire history in southwest Western Australia identified that hazard-reduction burns lead to fewer fires starting and a greater ability to suppress fires in prescribed burnt areas (after 62 years south west WA have had no megafires).

A big reason for the different findings is because, unlike the 2009 study, the 2015 study didn’t explicitly consider how past prescribed burns lower the severity of new high-intensity fires when they move in. As these wildfires move into fuel reduced areas the fire intensity reduces which helps fire suppression efforts and helps reduce the spread of wildfires.

The 2009 study showed prescribed burning less than about 4% of the forested landscape per year wasn’t enough to show trends in reducing wildfires.

The 2015 study the Climate Council used, only included 2% of prescribed burning in the forested landscape of southeast Australia. Not enough of the landscape was prescribed burnt to have a measureable effect, so it cannot be concluded that prescribed burning is ineffective at reducing the impact of bushfires from this 2015 analysis.

² Derived from Kevin Tolhurst. Thursday, 20 Feb 2020, 06:02 am | Source: The Conversation.

The Climate Council should have taken a broader view of the available scientific studies before drawing its conclusions.

So before we decide whether hazard-reduction burning for land management is a good thing, we need to consider all of the variables. This includes increased ecosystem resilience, mitigation of wildfire number and extent, impact on human health, economic value, social impact, Traditional Owner culture, and more.

The Climate Council's conclusions are drawn only from the consideration of reduced wildfire extent (and not fire intensity). In debating the value of prescribed burning, we need to use good scientific evidence, but our decisions must be based on the whole picture, not just a selective part of it.

3. History and future direction of prescribed burning³

Fire has been part of the natural environment of south-eastern Australia for tens of millions of years. Aboriginal people used fire selectively, with skill, for many reasons. The removal of Aboriginal people from most of the region after European settlement changed fire regimes and the composition and structure of vegetation. This study draws on published and unpublished literature and data held by the Forest Fire Management Committee of the Institute of Foresters of Australia.

The study finds that the use of prescribed burning in south-eastern Australia in the past 100 years has been driven primarily by political and legal factors. Since 1939, more than 50 public inquiries, reviews and royal commissions have been held into matters concerning the management of fire in landscapes, including prescribed burning.

Prescribed burning has been used for wildfire mitigation, agricultural practices (such as stubble reduction and grazing land management), property protection, the maintenance of ecological processes and biodiversity conservation. Prescribed burning in the region has only ever been practised on a small percentage of forest and land each year.

The study finds that a substantial body of fire and ecosystem science has been generated in the past 50 years, with rapid technological developments to support prescribed burning and fire management. Research has provided tools and methods for broadscale prescribed burning, but negative public perceptions of fire have prevented the deployment of comprehensive fire management programs in the region.

Although much has been achieved, considerable changes are still required in fire management for it to be sustainable and optimal in protecting economic, social and environmental values. The risks to human lives, property, biodiversity and the environment associated with wildfire are increasing in south-eastern Australia due to climate change, and the wider use of prescribed burning is essential for managing these.

The increasing extent and occurrence of wildfire disasters in the region indicates that current fire management will not sustain the full range of ecosystem processes and biodiversity, nor reduce to an acceptable level the impact of wildfires on human lives and property.

There is compelling evidence for the greater use of prescribed burning to reduce wildfire risks and impacts, rather than committing increasing resources to wildfire suppression.

The potential negative impacts of prescribed burning can be managed effectively using existing knowledge and tools. Clear communication of the benefits of prescribed burning can influence political and public opinion in its favour. More investment in training, human capacity and supporting resources is required to safely and effectively deploy prescribed burning more widely to reduce future wildfire risks.

³ GW Morgan, KG Tolhurst, MW Poynter, N Cooper, T McGuffog, R Ryan, MA Wouters, N Stephens, P Black, D Sheehan, P Leeson, S Whight, SM Davey (2020). Prescribed burning in south-eastern Australia: history and future directions. Australian Forestry. (Abstract)