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Damned if We Do, Damned If We Don't: Fuel Reduction Burning is a Hot Topic

The Victorian State Government's prescribed fuel reduction burning in forests is under scrutiny from scientists, environmental groups, health professionals, traditional owners, and regional residents. Is it part of the solution, or part of the problem?

Fuel reduction burning, while intended to mitigate the risk of uncontrolled wildfires, has become a contentious practice that poses significant threats to biodiversity, human health, and climate stability. In the era of climate-driven megafires, it is imperative to rethink and reform our approach to fire management.

A Tree Change

In 1986, I moved to Gippsland to begin a teaching career and embrace a tree change from city to country life. Five years later, I purchased a bush block and built a mudbrick house from recycled materials. My 40-acre property, nestled about 20km south of the Avon Wilderness Reserve in Maffra West Upper, has brought me close to nature — and, more than once, dangerously close to fire.

Since 1991, I've experienced the impact of major bushfires repeatedly (2019–2020, 2018, 2014, 2009, and 2006–07). On three of those occasions, fire fronts were held just 10km from my home thanks to the incredible efforts of CFA (Country Fire Authority) and DEECA (Department of Energy, Environment and Climate Action) firefighters. They've saved my property three times, and for that, I'm profoundly grateful. My admiration for their courage runs deep, and I'm mindful not to let my concerns about fire policy be misinterpreted as criticism of their heroic work.

Even with my property spared, the toll of living through these fires has been real. During the 2006–07 Great Divide fires, which burned for 69 consecutive days, thick smoke blanketed my community. Some days, the air felt chewable. Burnt leaves covered my roof, and I evacuated for 10 days to stay safe. The constant summer threat has left me anxious and on edge each fire season.

Still, I wouldn't trade my life in the bush. Living here has deepened my connection to the land. As an environmental educator focused on biodiversity for over two decades, I've become increasingly concerned about climate change and its accelerating impact on our

ecosystems. Our planet is heating up — fires are fiercer, seasons are shifting, and extreme weather is more frequent. Alongside the human cost, biodiversity is under growing pressure.

Biodiversity Under Threat

A World Wildlife Fund Australia report from July 2020 estimated that three billion animals were killed in the 2019-2020 bushfires in Australia (Department of Environment, Land, Water and Planning, 2020). That number does not include invertebrate animals, which are said to make up 95–99% of all biodiversity. La Trobe University's Professor Heloise Gibb told Yahoo News Australia that the number would be in the trillions. Across the whole fire-affected landscape, Gibb estimates that six trillion invertebrates were killed as a result of the Black Summer Fires (Gibb, 2023).

Could the full truth have resulted in more people wanting faster action on climate change? Governments and media of the day used a smokescreen to play down an existential biodiversity crisis.

Health Impacts of Smoke

To make matters worse for me as a regional resident, during the in-between major bushfire years, fuel reduction burning ramped up and once again we who live in the bush are enveloped by smoke for an extra three months of each year. Over the 30 years I've lived in the bush, I have developed sinus, asthma, and heart problems. I believe some of these conditions have been exacerbated by smoke from fires, including fuel reduction burns.

Forest Fire Management believes that fuel reduction burns should be conducted during autumn, leading into winter, rather than spring leading into summer. As a resident, the cool, still, foggy autumnal nights mix with smoke from fuel-reduction burning to form a thick layer of smog that blankets valleys, gullies, and low-lying places until the wind blows again.

There is growing concern from within the health industry and local environment groups such as the Field Naturalist Club of Victoria and the Environment East Gippsland Group, who believe fuel reduction burn smoke is causing a rise in serious health conditions like those I have experienced. They are also concerned that already vulnerable habitats are being burned to reduce fuel loads, which has negative impacts on biodiversity.

Impacts on Vulnerable Species

An article in The Guardian, May 2025, glossy black cockatoos could be pushed towards extinction in Victoria if burns go ahead, experts warn. This concern follows the massive bushfires of 2019-2020 where it is estimated that 65% of glossy black cockatoo habitat was burnt (Menkhorst et al., 2024). These vulnerable birds feed on black she-oak seeds. Remaining black she-oak stands have become critical for the conservation of the remaining population, estimated to be as few as 250 glossy black cockatoos. Therefore, fuel reduction burns should not be conducted in these areas.

I hope to one day see a glossy black cockatoo in the wild but it's the invertebrates I've studied most as a nature educator. I wonder how fuel reduction burns are impacting invertebrates and other small animals. The forest floor is home to trillions of creatures, insects, fungi, plants, and other living organisms.

The Little Things That Run the World

It was the late Harvard biologist, naturalist, and entomologist, Professor E. O. Wilson, who popularised the saying "The little things that run the world," emphasizing the indispensable role of insects in maintaining ecological balance (Wilson, 1987). Wilson further warned, "If we were to wipe out insects alone on this planet, the rest of life and humanity with it would mostly disappear from the land. Within a few months" (Wilson, 1992). These insights underscore the critical importance of invertebrates in sustaining biodiversity and highlight the devastating consequences of their loss. By drawing attention to the intricate connections between insect populations and broader ecological health, Wilson's work serves as a powerful reminder of the need to protect these often-overlooked species.

In 2003, the Department of Sustainability and Environment (DSE) of Victoria published Report No. 57, Ecological impacts of fuel reduction burning in a mixed eucalypt foothill forest – summary report (1984–1999). Report no 57 details research from a series of studies completed between 1998–2000 by DSE scientists, Nick Collet and Dr. Fred Neumann, investigating invertebrate taxa richness and taxa activity findings from leaf litter and humus at Treatment sites where fuel reduction burns were undertaken, compared with Control sites where no burns were undertaken. The researchers found that Collembolans (springtails), Diptera (flies), and Annelids (earthworms) declined in the short-term at Treatment sites, interrupting the decomposition process for up to three years.

The 2003 report concluded that various studies investigating the impact of fuel reduction burning on invertebrate life in leaf litter and the forest floor show taxa richness and taxa activity are not adversely affected by successive fuel reduction burns over three years. 'Fire stable' is a term used to describe invertebrate life in leaf litter. It is time to repeat this research. What an important body of research it would be 26 years later.

The scientists involved do recommend more research into the impacts of fuel reduction burns on invertebrate populations, as not all taxa have been investigated in existing studies. With wildfire impacts like those of the scale of the 2019-2020 bushfires, added to large areas of fuel reduction burns, can any species be rightfully described as 'Fire stable'?

Drought, Bushfire, and Fuel Reduction Burning

Drought, bushfire, and fuel reduction burning are inextricably linked together.

Report no. 57 states, fuel reduction burning was also found to warm and dry out the forest floor. When coupled with seasonal conditions like drought, this presents a threat to Coleoptera (beetles), Diptera (flies), Collembolans (springtails), and Annelida (earthworms). At both control and treatment sites in Collet and Neumann's research, dry or drought conditions and fuel reduction burns resulted in a sudden decline in springtails, which they observed began to flow through the food chain causing declines in earthworms and larval Diptera (fly) populations.

Professor David Lindenmayer, from the Australian National University, is an expert in forest ecology, resource management, and biodiversity conservation. He believes the evidence shows that fuel reduction burns result in thick and dense layers of forest regrowth in the understory, which makes them more flammable and susceptible to future fires. It is estimated

by researchers that disturbed forest areas remain more flammable than undisturbed forest areas for between 40 to 70 years after disturbance.

Lindenmayer's research also highlights that:

- Fuel reduction burns have limited effectiveness, primarily when conducted close to homes and infrastructure, rather than in remote forest areas.
- Prescribed burns can increase flammability due to dense understorey regrowth, which raises fuel loads and fire intensity for decades after disturbance.
- Old-growth forests are more fire-resilient, being up to three times less flammable than recently burned or logged areas.
- Thinning and logging to reduce fire risk can backfire, making forests more prone to high-severity fires.

Dr. Sarah Perkins-Kirkpatrick, a climate scientist at the University of New South Wales, has also weighed in on the issue. She emphasizes that climate change is amplifying the frequency and intensity of extreme weather events, including bushfires. According to her research, the rising temperatures and prolonged drought conditions are creating a feedback loop that exacerbates fire risks. Dr. Perkins-Kirkpatrick advocates for integrating climate adaptation strategies into fire management policies to address the root causes of these escalating threats.

Dr. Victor Steffensen, an Indigenous fire practitioner and advocate for cultural burning practices, has shared his insights on the importance of traditional fire management techniques. Steffensen emphasizes that cultural burning, practiced by Aboriginal communities for thousands of years, is not just about reducing fuel loads but also about nurturing the land and promoting biodiversity. He argues that these methods, which involve cooler and more controlled burns, can help restore ecosystems, protect vulnerable species, and reduce the intensity of wildfires. Steffensen's work highlights the need for collaboration between Indigenous communities and fire management authorities to integrate these practices into modern fire management strategies.

Rethinking Fuel Reduction Burning

Is the price of fuel reduction burning worth it? We've been using fuel reduction burns since the 1970s, yet wildfires have still burnt through vast areas of Victoria since then. I feel for Forest Fire Management, who are compelled by governments of the day to carry out large-scale fuel reduction burning programs. Damned if they do and damned if they don't. Can we burn our way out of uncontrollable bushfires?

The scale of the Black Summer fires of 2019-2020, estimated to have burned 19 million hectares, with trillions of animals killed, shows us we can't. Forest Fire Management reduces the impacts of uncontrolled fires, and they save many properties. However, they're up against a changing climate, a warming planet with more extreme fire conditions. It's a big ask, they have to save our lives, buildings, assets and Mother Nature – biodiversity as well. We're expecting them to save it all.

From the perspective of Forest Fire Management, uncontrolled fire is the greatest threat to biodiversity. Without fuel reduction burns, wildfires could burn uncontrolled, hotter, and longer which will result in greater losses of property and biodiversity in the long term.

Some people believe traditional cooler burns undertaken by some Aboriginal tribes may be a way to lessen the impacts of fuel reduction burning on biodiversity. Aboriginal people and Fire Management Authorities are negotiating new methods in partnership. Cooler burning methods could reduce impacts on biodiversity and lessen air pollution caused by fires and fuel reduction burns.

Climate Change and CO2 Emissions

We also have a CO2 problem in our atmosphere, which burning adds to. Recent and large wildfire events around the world are adding large volumes of CO2 to our atmosphere. The Black Summer Fires were said to contribute as much CO2 as Australia produces in a year, around 380 million tonnes per annum. In comparison, fuel reduction burns are small, however we don't need to add more pollution with fuel reduction burns. Every little bit of carbon reduction we can manage will help us to achieve global climate targets by 2050.

Supporting Firefighters

As I stated earlier, I think our DEECA and CFA firefighters are the best in the world. We will need to increase their capacity to rapidly attack and prevent fires from becoming uncontrollable, if this is possible. If we stop fuel reduction burning as a method for reducing bushfire impacts, we will need to give our firefighters a chance. They will need the resources, technology, equipment and the personnel required to prevent and attack uncontrolled bushfires. Firefighting aircraft are desperately needed, not submarines! We are entering a war with climate change.

Fuel reduction burning is not good for human health or biodiversity conservation in this new era of change, in my view. It seems clear from my investigations; it both reduces fuel and creates fuel at the same time. Fuel reduction burning adds to CO2 omissions, increases air pollution and it impacts on biodiversity as life tries to recover in the times between large bushfire events. Through my eyes, these reasons negate the value of fuel reduction burning.

It is time to rethink our methods.

We must act now to protect biodiversity, human health, and our planet's future. Policymakers, researchers, and communities must come together to explore alternative fire management strategies that prioritize conservation, reduce emissions, and safeguard vulnerable species. By investing in innovative approaches and empowering our firefighters with the resources they need, we can build a more resilient future for all.

It is now late June and winter is in full swing. As I drive out of the foothills, I can see over the Gippsland Plains, which looks beautiful in the hazy light. I see a thin cloud of smog carpeting the plains. As I return home later in the day, I can see the haze of smog over the mountains. The view looks beautiful, but something doesn't smell right. Living in a high-risk bushfire zone, close to fuel reduction burns, sometimes I find myself thinking... I need to get back to the city for some fresher air.

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In-Text Citations

- (Department of Environment, Land, Water and Planning, 2020)
- (Gibb, 2023)
- (Menkhorst et al., 2024)
- (Dahlstrom, 2025)
- (Department of Sustainability and Environment, 2003)
- (Lindenmayer & Zylstra, 2022)
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