

# The burning issue of igniting the Wombat

Words and images by Alison Pouliot

The Wombat Forest is extraordinarily complex. It is both resilient and fragile. Our efforts to understand it increase its potential to flourish. I am fortunate to interact with a great range of people in the course of my work, who know the forest from different perspectives and experiences. Each interaction provides an opportunity and a new lens with which to understand the forest and environmental issues.

One issue that repeatedly arises is that of prescribed burning. As I've travelled through the forests of four states this autumn, I've been struck by the deep and widespread concern about what are known as prescribed burns, or 'fuel reduction burns'. These burns are used as a 'fire management or hazard management tool', for reducing the amount of 'fuel' in a given area, based on the assumption that they lessen the risk and impact of wildfire. I repeatedly hear stories from people including farmers and fire fighters, fire ecologists and other scientists, Aboriginal elders, conservationists, landholders and others who are concerned about the effectiveness of and environmental damage caused by inappropriate prescribed burning. Many consider that the cumulative effect of regular, repeated and inappropriate burning poses as serious a threat to biodiversity as the high intensity wildfires it supposedly ameliorates. Others say that in most ecosystem types, prescribed burning is unlikely to have any effect at all on the extent of wildfire. I hear numerous accounts of the lack of regeneration due to inappropriate burns. Meanwhile Melbournians grow ever more irritated by excessive levels of smoke. And most agree that there is nothing even remotely 'ecological' about prescribed burns, with some suggesting that individuals should be held accountable for the destruction caused by prescribed burns and criminally charged.

## Failure of the Royal Commission?

The Victorian Bushfires Royal Commission following the 2009 Black Saturday bushfires recommended an annual 'burn target' of 5% of public land (approximately 390,000 hectares). This has since been replaced with a target of reducing bushfire risk to 70% or less. The 2017-2018 Victorian budget to 'reduce bushfire risk, refurbish forest-based assets and protect our forests and



The long term impacts of fire on the Wombat's biodiversity are largely unknown. Photography © Alison Pouliot

wildlife through better compliance and enforcement' is a staggering \$309.4 million. Yet DELWP's fire simulation software tool – that might be effective for aiding wildfire control – is considered by many to be a very blunt tool for risk reduction.

Many experts consider that the Commission has failed in its aims of protecting life and property, as well as having perpetuated biodiversity loss. Their first hand experiences of the impacts of prescribed burns echo the concerns of the Royal Commission's independent monitor, Neil Comrie, who has consistently argued that targets are not achievable or sustainable and have potentially adverse environmental outcomes.

The first priority of bushfire management on public land is the protection of human life and property. The protection of biodiversity receives only scant and token attention. However, many people question whether prescribed burning really increases human safety at all, or is focused on meeting targets. It is well accepted that during bushfires most homes (c.a. 90%) are lost due to ember attack. Fire scientists and ecologists have repeatedly told us that in order to protect humans prescribed burns should be focused directly around houses, not forests uninhabited by humans. Moreover, broad scale approaches to burning do not apply to the great complexities and variation within Australia's ecosystem and climate types. Fire intensity is influenced by air temperature, weather, moisture levels and the nature and amount of organic matter. Rate of spread of a fire is influenced by

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topography, wind speed, vegetation type and moisture levels along with other factors. Grasslands, sclerophyll forests, temperate rainforests and other ecosystems all function in very different ways, including in their adaptations to fire. Enormous variation also occurs within the one ecosystem type. I am not a fire scientist and recognise the detailed assessments, preparation and planning necessary to determine burning regimes, yet too often it appears that burns are not tailored specifically to local ecologies, climates and situations.



The destruction of stags (standing dead trees) through prescribed burns means the loss of vital habitat for gliders, birds and numerous other animals that rely on hollows as habitat. Photography © Alison Pouliot

### Are burns effective?

Opinions inevitably vary regarding the effectiveness of burns but the bottom line is that peer-reviewed scientific research shows that prescribed burns have a short term effect, reducing so-called 'fuel loads' for only about three years. Repeated burning at this interval is not only impossible, especially given the ever narrowing burning window due to human-induced climate change, but more significantly, the frequency of such burns on biota is largely unknown but likely to be severe. Moreover, while such burns could have some effect on controlling moderate level fires, their effectiveness with more severe fires is negligible. In some

situations they actually *increase* wildfire risk by favouring the regeneration of species that are more volatile and increasing regenerating biomass.

Burning has significant effects on the species composition of forest ecosystems. Frequent low intensity burns alter species composition especially in understorey plants and leaf litter inhabiting species. Changes to these habitats affect bird species that prefer shrubby undergrowth and dense leaf litter layers. This knowledge is only the tiniest piece in the jigsaw and whether species are being locally eliminated due to frequent burning in the Wombat is largely unknown. Approximately 1,500 hectares of the forest were burned this autumn. Over time, the gradual continued pressures on biota from frequent fires have a cumulative effect. Although sometimes difficult to detect and quantify, the loss of habitat and age structure reduces biodiversity, which in turn reduces forest resilience. What does this mean in real terms? It means that the forest has less capacity to respond to and recover from other stresses such as drought. It is a gradual weakening of its ability to 'cope'; to support its diversity of species and be self-sustaining. Simple and politically motivated solutions such as inappropriate fuel reduction burning should NEVER be applied to complex systems and issues.

### So what is 'fuel'?

Just for a moment, let's take a look at the misnomer of 'fuel'. Fuel is organic matter. Leaves, sticks, branches and other parts of plants – but also animals and fungi – that naturally accumulate. It is habitat for an incredibly diverse range of organisms that underpin the functioning of terrestrial ecosystems. It is also those organisms themselves – both dead and living. Several ecologists I've spoken with consider the notion of 'fuel load' to be 'conceptually questionable' especially in forest ecosystems. I suggest we move beyond the reductionist notion of habitat as fuel that reduces the complexity of these ecosystems and their organisms to something akin to diesel, to legitimately recognise their ecological significance.

Within these habitats fungi form mutually beneficial relationships with the great majority of plants. In these relationships the trees provide sugars produced through photosynthesis to the fungi. In return, fungi increase the absorptive area of plant root systems, enabling them to explore more of the subterrain in search of food and water. Fungi also solubilise (make absorbable) a great range of nutrients otherwise not available to plants. Moreover, fungi provide a connective network of interactions within and across plant species. These interactions are especially important when trees are stressed as in the case of exposure to fire, drought or other environmental or human-induced stresses.

The majority of fungi that inhabit leaf litter are recyclers (also known as saprobes or saprophytes). They break down

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complex organic molecules into their constituent parts through the secretion of enzymes, and in the process known as pedogenesis, create soils. Mycelium in soils provides a supportive architecture that allows water to gently percolate, as well as aerating soils making them inhabitable for other organisms. It is these intricate and abundant interactions that are fundamental to the resilience and health of terrestrial environments.

What's more, water is retained by fungi in leaf litter. Slide your hand under some leaf litter and then compare an area where leaf litter has been burned or removed. Which is wetter? Yet in all of the justifications for burning, how often do you hear these arguments about the importance of leaf litter in both retaining moisture and retaining fungi and their interactions with plants?

Like animals and plants, fungi can tolerate particular conditions, beyond which they die. Australia's biota is adapted to the extremes and vagaries of our highly variable climate, but increased, repeated and more extensive exposure to fire potentially has detrimental accumulative effects that are not well understood. Consider what happens to the invertebrate food source of State-listed (*FFG Act*) species such as the Brush-tailed Phascogale when leaf litter is destroyed. Therefore, it would be wise to take a precautionary approach in our attempts to 'manage' Australian ecosystems, including the use of fire.

### Realigning values

Conservationists and environmental groups are often subjected to ridicule, even bullying, for their concern about the impacts of prescribed burns. Commonly portrayed as sentimental and uninformed, my experience is exactly the opposite. The people I've encountered are often not outright opposed to fire as a management tool. More often they question the reasoning, insight and preparation behind the prescribing of burns and the lack of inclusion of biological and ecosystem values. They often live in close association with these ecosystems over an extended time. They have personally witnessed and observed first hand the changes wrought by inappropriate burning regimes. All advocate the need for solid science and local understanding as opposed to reactive politics in managing local environments. Moreover, there is suggestion that prescribed burning where there are nationally-listed species, such as the Greater Glider, could be breaching the *Environment Protection and Biodiversity Conservation Act 1999*.

One underlying problem between fire agencies and those opposed to inappropriate burns is a misalignment of values. The extent of prescribed burning is determined by



*Pyronema omphalodes* can appear within days of a fire and like other pyrophilous fungi, is an early coloniser of burnt habitats. Photography © Alison Pouliot

an assessment of the risk to the things that we value in the landscape. There is a gross oversight that biodiversity underpins a functioning planet, and that 'biodiversity' and 'ecology' comprise more than one species (*Homo sapiens*). Human lives and property take precedent. Of course nobody wants human lives and property to be destroyed by wildfire. So we need to begin by considering why we expose ourselves to fire-prone situations and locations with the expectation that all other biota will acquiesce when humans and their property are threatened. We need to accept the risks involved in where we choose to live and take responsibility accordingly.

There is no simple answer to the issue of fuel reduction burning. As I mentioned at the beginning of this piece, the Wombat Forest is extraordinarily complex. And fire is a complex issue that requires comprehensive, evidence-based understanding. The Wombat and other forests are also under stress from climate change and other human-induced changes. Burning stressed ecosystems seems not just counterintuitive, but reckless and foolhardy. Managing fire requires extensive knowledge of all the ecological factors and variables as well as the risks. Current asset-focused approaches fall woefully short of what is required to sustain our forests. Even the best intentions and most informed planning can still go awry. We live in one of the most variable and unpredictable climates in the world and conditions frequently exceed predictions. Efforts to maintain a state of continuous safety could in fact reduce people's capacity to deal with unexpected hazards. Only when we accept rather than attempt to control the vagaries of our climate and landscape will we fully appreciate our precious continent.

Let's not play with fire. ■

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