

15 July 2016

Revised Submission to the Environment and Planning Committee:

Inquiry into Fire Season Preparedness

The Victorian National Parks Association (VNPA) welcomes the opportunity to make a submission to the Environment and Planning Committee's "Inquiry into Fire Season Preparedness".

We would also appreciate an opportunity to appear at any public hearing the Committee may schedule.

Introduction

The VNPA is Victoria's leading non-government, member-based organisation advocating for the protection of Victoria's natural heritage.

We have had a long involvement in both formal and informal inquiries and discussions on fire policy and management in Victoria. Most recently:

- We were granted 'Leave to Appear' at the 2009 *Victorian Bushfires Royal Commission*.
- We are a long-standing member of DELWP's *Land and Fire Management State-wide Roundtable*.
- We organised (in association with the Royal Society of Victoria) a symposium on *Fire and Biodiversity in Victoria* in 2011.
- We have made submissions to a range of fire inquiries, including the 2015 *Review of Performance Targets for Bushfire Management on Public Land*. Our submission to that review is included as an attachment (Att. 2) to this submission. Among other things, it looks at the evolution of the 5% target for fuel reduction burning on public land in Victoria.

Victoria is already one of the places in the world most vulnerable to extreme fire weather, and under climate change we are going to face even greater problems, both to public safety and to our natural heritage. It is our firm belief that we have the capacity to improve our management of, and response to, bushfires such that we give greater protection to human life and infrastructure, and also give our native plants and animals a fighting chance for the future. These are, in brief, the key objectives of Victoria's Code of Fire Practice.

However, we are unlikely to achieve those objectives if we largely concentrate our attention and efforts on one tool – fuel reduction – and ignore other very useful means of avoiding and/or mitigating the impacts of fire in Victoria.

The terms of reference (TORs)

The first clauses in the Terms of Reference, (a)-(f), focus on the planning and practice of fuel reduction burning. Our chief contention in this submission is that fuel reduction should be seen as only one of several very useful fire management tools, and planning for fuel reduction must be part of a broader planning process, taking into account all available tools, and applied across all land tenures at a local or regional level.

However, TORs (g)-(l) allow for that broader discussion of fire preparedness, so, to facilitate a consistent argument, we will address all of the terms of reference in that broader context.

(a) The amount and nature of preventative burning undertaken to date

The amount of preventative burning is fairly well recorded, though the criteria and methods of assessing that information have varied over the years. The VNPA has tracked the levels of fuel reduction burning as far back as records allow, based on the annual reports of the Forests Commission and its successors since 1933. The resultant compilation of those figures (ATTACHMENT 1) shows no obvious correlation between the extent of fuel reduction burns and the extent of bushfires in any year. Note also that the Royal Commission's recommended annual target of 5% of public land (around 390,000ha) has only been reached once in Victoria's history, in 1980-81. But our discussions with foresters working at that time have indicated that burns at that time were largely applied mainly to the ridgetops, while the whole affected area was included in the total. In reality, the target has *never* been achieved in living memory.

In recent years the annual figures appear in DELWP's annual 'Fuel Management Report'. DELWP has consistently failed to reach the Royal Commission's 5% target largely because, as the Bushfires Royal Commission's Implementation Monitor (BRCIM) put it:

"The BRCIM's 2012 Final Report advocated that the State reconsider the planned burning rolling target of five per cent and replace it with a risk based approach focused on the protection of life and property. In 2013, the BRCIM went further stating concerns that the 390,000 ha target may not be achievable, affordable or sustainable. The BRCIM's view in relation to this target is unchanged. Area based hectare targets alone will not necessarily reduce the bushfire risk to life and property in Victoria and may have adverse environmental outcomes."

Bushfires Royal Commission Implementation Monitor Annual Report, July 2014, p. 47

Our submission to the resulting *Review of Performance Targets for Bushfire Fuel Management on Public Land* (ATTACHMENT 2) points out that the decision to establish the target was not based on very good evidence, either of its achievability or its effectiveness. A state-wide target was not, for example, recommended by the majority of the Commission's own expert panel on fuel reduction.

We support the move to a risk-based burn process, currently undertaken by DELWP, though we believe the establishment of truly effective evidence-based risk reduction planning has some way to go.

(b) The measures in place to ensure preventative burning is undertaken safely

Avoiding escaped burns

There are a number of measures undertaken to ensure planned burns are undertaken safely, and generally speaking fire managers and planners have done a good job here, given that any burn involves a number of risks. Our understanding is that in the last year, for example, around 430 planned burns took place in Victoria, and seven of those involved minor 'breaches' (in DELWP's terms). Only one, the infamous Lancefield burn, involved an 'escape' – an out-of-control burn that became a bushfire. Any such escape is unacceptable, but in the circumstances, given the difficulty of finding appropriate weather to perform the large number of burns currently planned, such an escape was probably inevitable.

But there are several other problematic safety issues with the way burns are currently planned.

Safety for fire crews

To protect ground crews performing fuel reduction burns, many burns are now contained within perimeter roads, and manually lit from this perimeter to burn towards the centre. This avoids crews having to walk throughout the area with a drip torch. For a burn to continue on its own from perimeter roads, weather and moisture levels have to be dry enough to allow the fire to carry till it extinguishes itself in the centre of the burn area. That situation increases the likelihood of burns escaping. And it almost inevitably leads to extensive scorching or removal of the tree canopy, and an increasingly severe blaze from which wildlife can't escape.



Two examples of fuel reduction burns lit from the perimeter, causing considerable impact to the canopy: Grampians National Park (left) and Murray Sunset National Park (right)

In a further complication, safety concerns for burn crews mean that all potentially dangerous trees are removed from the perimeter of the burn. The guidelines for that removal are extremely vague, and figures aren't available, but it seems that many thousands of old hollow-bearing trees have already been removed in this process across Victoria, and continue to disappear at an alarming rate. This is happening despite the listing of the 'removal of hollow-bearing trees' as a threatening process under Victoria's FFG Act. That listing is no trivial matter: a great many birds, mammals and other wildlife depend on tree hollows, and they need a great range of sizes and types of hollow.

If tree removal at anything remotely like that scale happened on private land, the purchase and protection of additional areas would be required as offsets for the lost habitat.

One good option, where remote burns are actually deemed necessary, involves dropping aerial incendiaries into large areas of bushland from helicopters. If performed at times of relatively high moisture levels, the incendiaries can start a trickle fire which burns for a time but soon dies out. By dropping a large number of incendiaries, a very patchy burn of low intensity fire can be achieved across a large area, leaving a mosaic of refuges for wildlife, and avoiding damage to the tree canopy. And areas of high fire sensitivity within a burn area (such as rainforest patches and locations of particular fire-sensitive species) can easily be excluded from the drop area. Careful planning and careful monitoring of moisture levels is critical here, but the potential for this process to lead to more manageable fuel levels and good biodiversity outcomes is considerable. It also increases safety for fire crews.

Moreover, this process avoids the need to fell the vast numbers of deemed 'hazardous' trees, the older, hollow-bearing trees of critical importance for much of our wildlife.



Above: a patch burn at Fryers Ridge, Castlemaine Diggings National Heritage Park, when moisture levels were moderate. The canopy is largely intact. Such burns appear to be rarely performed by ground crews now, because of safety concerns.

Safety for asthma sufferers

Extended periods of smoke are a problem for asthma sufferers, and this problem is largely dealt with by warnings when burns are imminent. However, changing to a process (as above), where low-severity patch burns are the norm, can potentially significantly reduce smoke levels.

(c) the effectiveness of preventative burns in achieving community safety

While fuel reduction burns can be effective in lessening the severity and/or extent of a fire, they are not necessarily the *most effective* means of protecting life and property.

First, while the effectiveness of planned burns varies greatly across landscape and ecosystem types, in many woodland and forest areas planned burns only significantly reduce fuel in the undergrowth for about three years, and sometimes even less. Burning most public land in the state every few years would be impossible, as suitable weather conditions are rare, and under climate change likely to be rarer still.

The effectiveness of local burns

Research tells us that the most effective fuel reduction burns for protection of life and property are those close to the assets we are trying to protect.

“All fuel treatments were more effective if undertaken closer to houses... Our results imply that a shift in emphasis away from broad-scale fuel-reduction to intensive fuel treatments close to property will more effectively mitigate impacts from wildfires on peri-urban communities.”

Gibbons P, et al. (2012) *Land Management Practices Associated with House Loss in Wildfires*.
PLoS ONE 7(1): e29212. doi:10.1371/journal.pone.0029212

“The results suggest that recently burnt areas (up to 5-10 years) may reduce the intensity of the fire but not sufficiently to increase the chance of suppression under severe weather conditions... Fuel treatments need to be located close to houses in order to effectively mitigate risk of loss.”

Price, O. F. and Bradstock, R. A. 2012. *The efficacy of fuel treatment in mitigating property loss during wildfires: insights from analysis of the severity of the catastrophic fires in 2009 in Victoria, Australia*.
Journal of Environmental Management, 113: 146-157.

The 390,000-hectare target discouraged those smaller, more difficult and expensive burns in favour of remote area burns (even in the Mallee!). And we have largely ignored planned burns on private land, seriously compromising strategic plans for fuel reduction across the landscape. Burns (or other means of fuel reduction) on private land are in many cases the most important strategic options available to fuel reduction planning. These burns are expensive and difficult, but more useful, as they can reduce the severity of a fire where that reduction is most crucial.

As an aside ... the issue of the effectiveness of local burns and relative ineffectiveness of remote burns mirrors the evidence of the capacity of cattle grazing in Victoria's high country to effectively reduce fire. Two recent thorough studies have added to a number research papers that show grazing had little impact on actual bushfires at a landscape level, either on the high plains or in the grassy woodlands of the alpine region.

Williamson G.J., Murphy B.P., Bowman D.M.J.S. (2013) *Cattle grazing does not reduce fire severity in eucalypt forests and woodlands of the Australian Alps*. Austral Ecology.

Also:

Williams R.J., Wahren C-H., Bradstock R.A., Muller W.J. (2006)

Does alpine grazing reduce blazing?

***A landscape test of a widely held hypothesis*. Austral Ecology 31, 925-936.**

Other research, below, has also found limits in the effectiveness of fuel reduction programs.

Weather impacts

Other studies support the finding that the prime driver of fire in the landscape is weather, not fuel. In extreme weather conditions even a grass fire can be extremely perilous, and most forest or woodland fires will roar through the canopy:

"Weather and ignition management were consistently more important for explaining variation in area burned than fuel management approach and effort, which were found to be statistically unimportant."

"The findings demonstrate that year-to-year variation in weather and the success of ignition management consistently prevail over the effects of fuel management on area burned in a range of modelled ecosystems."

Cary, G. J., et al (2009). *Relative importance of fuel management, ignition management and weather for area burned: evidence from five landscape-fire succession models*. International Journal of Wildland Fire, 18 (2), 147-156.

Management of ignition points

Successful management of ignition points can include:

- The deployment of a strong rapid attack capability, aerially or on ground. That can be an expensive process, but not as expensive as dealing with the aftermath of a large fire. On Black Saturday, a fire started at Quarry Road on the edge of the Dandenongs, but was extinguished by a fortuitously located helicopter. The impact on people and infrastructure in the Dandenongs would have been considerable had that fire got away.

Victoria is good at rapid aerial attack on fires, and has been upgrading its aircraft availability and skills. But to be really effective, we need to be able to get to the start of a fire very quickly, almost anywhere in the state. In places like the Mornington Peninsula, for example, where tea-tree and polygala surrounding houses defy any planned burn program, immediate aerial attack may be the only way to control a fire in bad conditions. Building that capacity across Victoria would be expensive, but with climate predictions of increased severe fire weather already proving true we

could save many lives, and many billions of dollars, with a significant increase in rapid attack capability.

- A strong police presence and/or fixed cameras where firebugs are known to operate on extreme fire weather days.
- Encouraging (or mandating) local generation of power, such as household solar, avoiding the need for powerlines in many areas.

Bushfire shelters

If we focus on the overriding priority for bushfire management – the protection of human life – there is one important management option that seems to have been forgotten almost entirely. The Victorian Bushfires Royal Commission found the lack of an effective design standard for private bushfire shelters was such a crucial issue that it put out an urgent ‘interim report’ on the subject, well before its final report.

Research has shown that, while most people include ‘leaving early’ in their personal fire plan, very few actually do leave early.

“Our analysis of a dozen post-Black Saturday surveys showed that while people knew what to do on a Code Red day, and most intended to do it, only 2% changed their behaviour.”

**Prof John Handmer, Centre for Risk & Community Safety, RMIT University.
Presentation to ‘Managing Biodiversity under Climate Change Symposium’ 2015**

It’s a serious problem, but we seem to have forgotten that the Royal Commission did provide a solution. It saw a clear role for private bushfire shelters. And it saw the lack of an approved Building Code of Australia design standard for private bushfire shelters as such a critical gap in fire preparedness that it put out the interim report mentioned above.

2009 Victorian Bushfires Royal Commission Interim Report 2: Priorities for Building in Bushfire Prone Areas. November 2009

Though a design guide now exists and approved shelters are available, there has been no initiative (such as interest-free loans to install shelters in existing homes, or even an education program) to encourage private shelters. This is a particularly concerning situation, given that ‘protection of life’, *not* the protection of infrastructure, is the over-riding priority in fire management. Approved shelters should be mandated for any new developments in fire-prone areas.

Performance Standard for Private Bushfire Shelters. Australian Building Codes Board, 2010

Evacuation

In Canada’s recent Fort McMurray fire, officials declared a total evacuation of that city of some 80,000 people in the face of a 370km fire front. It was a huge effort, but despite the destruction of around 2,400 homes and other buildings, **not a single life was lost**. In Victoria, we have no such capacity to compulsorily evacuate people. Instead, we are wedded to a voluntary ‘stay or go’ strategy, even though we know that few people who stay are

equipped to deal with a bushfire, and certainly not equipped, let alone experienced, to deal with a catastrophic fire.

If protection of life is the overriding priority (and it should be), then the appropriate powers and planning to facilitate any necessary evacuation should be in place well before the next Black Saturday event comes to Victoria.

**(d) the impact of preventative burns on threatened species, and
(e) the impact of preventative burns on ecological vegetation classes**

It is probably best to respond to these two terms of reference together, as the issues are the same or similar.

In the last three annual *Fuel Management Reports* by DEPI/DELWP, its self-assessment of the impact of its fuel reduction program on Victoria's biodiversity has been: *"We did not achieve our planned activities and outcomes, but the risks arising from this non-achievement are manageable"*.

*Reducing Victoria's Bushfire Risk on Public Land Fuel Management Report
2011-12, 2012-13 & 2013-14. DEPI/DELWP*

When questioned, DELWP has told us the reason the situation is 'manageable' is that a large part of the current impact on our natural heritage has been the result of recent bushfires. However, as climate change modelling predicts even more frequent fires for Victoria, this seems an unjustifiably optimistic assessment of future management.

In the most recent of these reports, two measures were used to assess the impacts of DELWP's burn program on our natural areas.

The first, an assessment of 'time since fire' for each ecosystem type, shows that most of Victoria's native bushland lies below each ecosystem's 'tolerable fire interval'. This means that, in most of the state, ecosystems will struggle to recover from any additional fire in the near future. DELWP's burn program is only partly to blame; vast areas of the state have been subject to bushfires in the last 15 years or so. It's a real problem.

The second, more sophisticated, assessment looks at whether an appropriate range of 'fire age classes' currently exists for each ecosystem. It assesses whether we have a suitable range of long-unburnt bush, and medium age classes, through to more recently burnt bits of bush for each habitat type. Protecting appropriate growth stage structures is a well-advised strategy – a precautionary measure in the absence of more detailed studies of how the thousands of different species of plants and animals, etc. cope with and respond to fire.

In its own assessment, DELWP's management failed on both counts.

In ecological terms, that is potentially disastrous. Our many different native plants and animals need many different habitat 'age classes', some needing access to several different age classes at a given time. Important habitat features like fruit, seed and nectar production, fungi growth, pollination relationships, hollow formation and a range of other shelter requirements vary considerably with any particular ecological vegetation class's fire history.

Cheal, D. (2010) *Growth stages and tolerable fire intervals for Victoria's native vegetation data sets. Fire and Adaptive Management Report No. 84.*
Department of Sustainability and Environment, East Melbourne, Victoria, Australia.

Further, in the most recent (2013-14) report, DELWP cites its collaborative "Foothills Fire and Biota Project", designed to assess the impact of fire on Victoria's foothill forests.

According to DELWP, the results of this research program show that:

"Foothills forest is relatively resilient, most of the species the project could analyse are likely to persist on a landscape scale if subjected to fire regimes within the range of historical variation".

However, in our understanding, the results of that study came with several caveats, none of which were mentioned in the DELWP report:

- Climate change was not taken into consideration (meaning that 'historical' levels of fire will almost certainly be exceeded).
- The study did not take into account fragmented and/or isolated areas, where recruitment of lost species after fire is difficult.
- The study did not look at fire impacts on already threatened species.

The issues relating to the ecological impact of current and future fire regimes are many and varied, and we don't have the time to deal with all of them here. However, as an indication:

- A recent DELWP study showed that *"planned burns unambiguously and substantially increased the collapse probability of hollow bearing trees."* Given the importance of hollow-bearing trees to a great range of Victoria's wildlife (the loss of these hollows is listed as a threatening process in Victoria's Flora and Fauna Conservation Act), serious consideration should be given to the ecological impact of any currently planned burns which have questionable usefulness for public safety.
Lucas Bluff. Reducing the Effect of Planned Burns on Hollow-bearing Trees. Fire and Adaptive Management report no 95. DELWP 2016
- The felling of a great many 'dangerous' trees along roadsides throughout the Victoria is further reducing the range of hollows for wildlife.
- DELWP-funded research by La Trobe and other universities showed no evidence of ecological benefit from fuel reduction burns, and established an urgent need to protect long-unburnt woodland areas to protect wildlife dependent on long-unburnt habitat.
- The DELWP-funded Strategic Bushfire Risk Assessment & Strategy Selection Project, an educational program and survey of local community attitudes in the Otways, showed people favoured ecological priorities for burning in the broad landscape.
- DELWP-funded surveys in the Murray Sunset National Park found a proposed planned burn would compromise the largest known population of the threatened Mallee Emu-wren.
- Canopy tree scorch from fuel reduction burns in south-western Victoria has undermined years of work by hundreds of volunteers to save the endangered South-eastern Red-tailed Black Cockatoo.

In summary, the serious lack of long-unburnt areas in Victoria, the absence of an appropriate range of 'age classes' for each of Victoria's many habitat types, and the continuing decrease in the number and range of hollow-bearing trees all seriously exacerbate existing threats to Victoria's native flora and fauna.

The strong consensus amongst Australia's best fire ecologists (who are also amongst the world's best), is that frequent fuel reduction burns will not maintain biodiversity in the Australian bush.

(f) the impact of preventative burns on the climate

We will leave comment on this topic to others.

(g) the targeting of preventative measures statewide

It is important to set clear targets for any management program. While others are better qualified to develop effective targets for many existing and potential management programs than we are, we recommend one set of targets that should be very useful for wildfire management.

We know that an appropriate range of age classes is important, indeed critical, for many species. And while there will be ongoing discussions about what that range should be aimed at for each habitat type, we already know enough to make a useful assessment. Fire planners and ecologists should set an aspirational range of age classes for each habitat type across the state, allowing for 'spare' patches in the old and near-old age classes to cover for loss in future unplanned fires. Planning for management burns would then have clear and consistent goals to guide decisions.

While our knowledge of 'tolerable fire intervals' of different habitat types, and the individual fire responses of many species, is increasing greatly, the ecological needs of Victoria have too often been short-changed in recent years.

(h) the resources available to ensure that adequate preparation is undertaken, *and*

(i) the coordination of such planning and preparation with other departments and agencies across government

It is most useful to respond to these two points together.

We find it hard to evaluate the adequacy of the available resources as information on all aspects of the various fire management budgets is not readily available. Moreover, it is not really appropriate to look at the adequacy of fire preparation until the appropriate distribution of the budget is critically assessed.

We believe that if some of the measures we have indicated here were assessed against the efficacy of widespread fuel reduction programs, there might well need to be a greater emphasis on things like:

- controlling ignition points by:
 - planning and resourcing for increased local rapid attack capability
 - increased police presence (and installation of remote sensing cameras) where firebugs are likely to operate on acute fire weather days
 - removal of power lines by burying, or by encouraging on-site, off-grid power generation (and mandating that for new developments).
- encouraging or mandating private bunkers (and/or community shelters where appropriate).
- ecological burns where clearly advantageous on good scientific advice (and subject to age class objectives for any given EVC or habitat type).
- fuel reduction burns (including on private land!) where they are deemed to be realistically effective, with clearly defined and stated objectives for protection of communities and assets.
- education programs (leave early, bunkers, building design and garden plantings) etc.

Most importantly, we believe that such a re-assessment would result in increased protection for life and property, and better protection for Victoria's natural heritage.

(j) the nature and level of emergency response

As noted above, we believe an increased emphasis on Victoria's rapid attack capability will increase public safety, and also help protect biodiversity. That may well prove expensive, but increased rapid attack capability has the capacity to be very cost-effective, given the high cost in lives and infrastructure from otherwise unmanageable catastrophic fires. The quick intervention of a helicopter at the Quarry Road fire in the Dandenongs on Black Saturday may well have saved hundreds of lives and billions of dollars. But as far as we are aware, the cost effectiveness of successful rapid attack interventions has never been assessed in Victoria.

(k) the relevant administrative and organisational structures in place within the department and with other relevant government departments and agencies, *and*

(l) the impact of land tenure on the ability to provide fire prevention activities and the differences between types of land tenure such as national park, state forest, regional park and others.

Addressing both points together, we believe there is an urgent need to take fire management and planning squarely into a cross-agency and cross land tenure situation. Currently, most fire management is in the hands of DELWP, where legislative arrangements allow cross-tenure planning and management across all public land, including the conservation reserve system. However, there is little capacity to bring private bushland into that equation. And given that fuel reduction is known to be most effective close to where protection is critical, that situation should change.

And even though 'planning' exists within DELWP's administrative realm, there is currently, as far as we can see, no co-ordination there. We note that most of the Bushfire Royal Commission's recommendations in relation to planning (and there are many!) have mostly either been inadequately applied or scarcely implemented at all. Importantly, people continue to build in highly fire-prone areas, putting their own lives, and the lives of volunteer and/or professional fire-fighters, at risk.

DELWP currently has the burden of trying to solve the fire problem by using the single tool primarily at its disposal: fuel reduction on public land. That is, we believe, a fundamentally impossible task.

We need to look at *all* of the tools available, and use the appropriate mix of those tools most appropriate to each local situation. That will only happen when we can bring fire planning, and budget allocations, into a cross-agency planning process.

Again, we believe that such a re-assessment would result in increased protection for life and property, and better protection for Victoria's natural heritage.

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We would appreciate any opportunity to discuss these issues further.



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