



Inspector-General for Emergency Management
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Report into Victoria's preparedness for and response to the 2019-20 fire season

Friends of the Earth (Melbourne) Inc is a membership based environmental advocacy organisation which has been active in Victoria for more than 40 years. We welcome the opportunity to provide a submission to the IGEM Inquiry.

We will address the 'matters of consideration' most relevant to our work.

Our key recommendations

- We urge the state government to increase funding for FFMV firefighters, including remote area firefighters (rappel crews) and air capacity for fighting fires
- The government should provide annual funding to purchase firefighting aircraft to increase our fire fighting capacity and reduce the need to contract aircraft from interstate or overseas
- In addition to funding additional FFMV remote area teams we propose a new volunteer remote area fire force be established, similar to the Remote Area Fire Teams (RAFT) model in NSW, which could be structured to offer opportunities for younger and urban based people to join fire fighting efforts
- We urge this investigation to listen to the science relating to the relative values of fuel reduction burning and resist simplistic 'more burning will solve the fire problem' analysis which is being promoted in many mainstream and social media outlets
- We oppose a return to a hectare target for fuel reduction burning and support the retention of the "targeted risk reduction" approach. Hectare targets will only cover public land. A considerable portion of fire risk in Victoria comes from the remaining two thirds of the land mass, which is held privately. Focusing on hectare targets on public land ignores the real fire risk that is associated with private land
- Where fuel reduction treatments are used, we would recommend that smaller areas are burnt. We also suggest that the IGEM consider the proposal to establish local volunteer GreenFire groups to work with land managers on fuel reduction and fuel load management, which might also involve the use of non fire techniques

- We encourage continued state government support for Cultural Burning programs
- In considering future fire threat, the IGEM must consider the contribution of native forest logging to forest flammability
- It should specifically rule out salvage logging of burnt areas because of the ecological impacts of such activity
- There are specific ecological values in snow gum and alpine ash forests that need to be considered before any fuel reduction burning is introduced into these forest communities. Some vegetation communities, such as rainforest should not be burnt, and buffer and ecotone areas should also be protected from burning
- The Office of the Conservation Regulator has been undertaking an investigation into claims about excessive road clearing in East Gippsland after last summer's fires. We urge the IGEM to consider any recommendations that come from the OCR report when it is completed
- The state government should take a leadership role to educate the Victorian community about the fact that climate change will make fire seasons longer and more destructive
- Climate change will continue to make fire seasons longer and more intense. The Victorian government must continue to reduce carbon emissions in line with the recommendations of mainstream climate science, so we do our part in global efforts to try and avoid catastrophic climate change.

Matters for consideration:

- **Preparedness ahead of the 2019-20 fire season; including the effectiveness of regional emergency management work undertaken to inform and educate the community about the coming season, community engagement, impact of lengthening fire seasons, and any relevant legislation, policy and practice.**

Key Victorian ministers have, on a number of occasions, identified the fact that climate change will make fire seasons longer. This is welcomed in the face of continued denial by the federal government. Longer and more intense seasons will, over time, change the way Victorians relate to forests and the landscape, because worsened fires will become an aspect of life for more people. This has implications for land management, water availability, public health, and how and where we allow housing and other developments.

However, polling shows that many in the community have not yet heard this message, with many people believing that 'lack of fuel reduction' is a key reason why this fire season was so bad.

It is essential that the state government continue to take a leadership role in educating the community about the ramifications of climate change on bushfires (obviously they also need to take meaningful action to reduce Victoria's contribution to climate change and build resilience in the face of climate change).

There are many previous examples of the Victorian Premier and Responsible Ministers taking a strong public role in advocating for government action and to build public awareness (for instance the current response to COVID-19, the strong public campaigns about gendered violence and harassment, mental health, etc). Similar leadership should be displayed around the climate - fire link.

- **Consider all challenges and implications for bushfire preparedness arising from increasingly longer and more severe bushfire seasons as a result of climate change.**

Climate change will place greater pressure on all our land and air fire fighting capacity. Australia drew on 1,000 overseas firefighters last summer, higher than in previous seasons. However, with fire seasons also becoming longer in the northern hemisphere, we cannot rely on such large numbers in future. We share resources with other states and territories and longer seasons will add pressure to existing volunteer and career firefighters. Any sensible response to climate change requires additional resourcing.

We wish to make a number of recommendations about fire fighting capacity.

1/ Additional FFMV fire fighting capacity

Forest Fire Management Victoria (FFMV) crews do an outstanding job of protecting our public lands.

It is clear, especially after this summer, that we need additional seasonal firefighters, including more remote area firefighters (including rappel crews). DELWP runs 4 x 8 person helicopter rappel crews from Heyfield and Ovens as remote area firefighters for inaccessible fires. These rappel crews conduct initial attack operations or cut helipads to enable additional DELWP firefighters to access the fire by helicopter.

Landscape scale fires are also more likely to produce 'plume' clouds (pyrocumulonimbus clouds) which make fire fighting difficult, if not impossible. The CFA noted that during the fires of 2018/19, there was an 'unprecedented' number of these plume dominated fires. CFA Fire Behaviour Analyst Musa Kilinc says 'with climate change, the potential for more frequent plume-dominant fire behaviour is very real' ([source](#)). Additionally, longer fire seasons - and overlapping seasons between different state and territories - will put more demand on existing fire fighting capacity. These are all reasons why additional fire fighting capacity is needed.

We urge the Andrews government to increase funding for seasonal project firefighters within Parks Victoria and DELWP, including remote area fire crews.

2/ additional air capacity

Air capacity is central to fighting fires. It is also incredibly expensive.

Australia's National Aerial Firefighting Centre contracts a fleet of 150 firefighting aircraft across all states and territories, which goes up to 500 when including "on call" vehicles.

Yet, as was shown this summer, we still do not have enough air capacity to fight all fires, both when they are starting (eg just after a lightning storm) and once they have got going.

Fire seasons across Australia and in the northern hemisphere used to be staggered – allowing exchange of vital equipment such as aerial water bombers and firefighters. The increasing overlap of fire seasons between states and territories and with the USA and Canada will limit our ability to help each other during major emergencies.

A key dilemma is that we share resources with other jurisdictions, within Australia and overseas. As fire seasons become longer, there will be shorter periods of time where we can contract in resources from interstate and overseas. This will mean that the costs of contracting will go up, placing greater pressure on state budgets.

Given the Australian government does not support the creation of a shared, national fixed-wing air-tanker capability, the logical option for the Victorian government is to seek to purchase additional firefighting aircraft, with an allocation specifically for this in all future state budgets.

3/ The state government should establish a remote area firefighting capacity of volunteer fire fighters.

Dry lightning storms will become ever more common under climate change scenarios. This is already the case in western Tasmania. More lightning means more fires in remote areas. In addition, and as noted above, increased incidence of pyrocumulonimbus plume clouds during bushfires can generate dry lightning which can trigger fires.

This summer it was clear that there wasn't enough capacity to attack fires after major lightning strike events. In particular, the New Years Eve fires demonstrate that we currently have insufficient resources to fight fires in the 'new normal' reality.

While FFMV crews did an incredible job (as did the air support who extinguished many fires after the December 31st lightning storm), there were simply too many to contain with the resources available. If there had been additional remote area teams able to hike into fire ignition points, we may have stopped some of the fires that subsequently turned into major blazes. One example is the Tabletop fire near Mt Hotham that joined fires in the Upper Victoria River, then others, eventually burnt more than 44,000 ha, and almost destroyed the township of Dinner Plain. If a small crew had been available to hike in and put the fire out on January 1 or 2, we may have avoided the significant costs of having to fight this enormous fire (eg, CFA strike teams to defend Dinner Plain and Mt Hotham village and houses in the Cobungra area, and the air support that was allocated to stopping the fire, etc). Small, agile teams of volunteer firefighters would be a cost effective way of stopping many fires before they become established.

There are a number of precedents we could follow:

The first is from Tasmania. From the early 1980s until the mid 1990s, a volunteer force called the Smoke Walkers operated during fire season, which was tasked with supporting remote area firefighting in Tasmania. Sometimes the Smoke Walkers would work alongside Parks Service, Forestry Tasmania and Tasmania Fire Service (TFS) firefighters and sometimes they would be deployed separately. Many of the members were bushwalkers who knew the remote wilderness and wanted to help protect it.

The investigation into the Tasmanian fires of 2016, recommended that the Tasmanian Fire Service should [pursue the creation of a cadre of volunteer remote area firefighters](#).

NSW has an active volunteer program that could act as a model for Victoria. The NSW Rural Fire Service (RFS) has Remote Area Fire Teams ([RAFT](#)) that are composed of volunteer firefighters. They help compliment the work done by NSW National Parks and Wildlife Service (NPWS) remote area crews. Many are members of local RFS brigades and turn out to 'regular' fires with their brigade but may also be called up for remote area firefighting.

There are also Rapid Aerial Response Teams (RART), which is a program within the RFS where specially trained firefighting teams (trained RAFT Firefighters) are 'placed on standby at appropriate times and in appropriate places, transported by helicopter to the scene of an incident when needed and, if necessary, transferred to the ground by winching or similar insertion' ([source](#)).

The RART programme was introduced within the NSW RFS in 2011 as a response to the Victorian Royal Commission findings into the 2009 fires. The idea is that when certain weather conditions are forecast a standby RAFT team and a winch capable medium helicopter are mobilised, ready to deploy, for a period of time to instantly respond upon a report of a new fire.

The NSW RFS has 27 RAFT Units across the state, with a total of about 500 personnel. The value of the NSW model is shown by the effectiveness of their teams in stopping fires becoming blazes: for instance, in the 2018/19 fire season the Rapid Aerial Response Teams responded to 77 incidents, and were able to keep 90 percent of the fires they attended contained to less than 10 hectares in size ([source](#), p 32).

In addition to funding additional FFMV remote area teams we propose a new volunteer remote area fire force be established.

There are various ways this new remote area force could be established in Victoria:

It could be a stand alone fire fighting force which is trained by the relevant government authority. For instance, in Victoria, they would be trained to the standard of the seasonal firefighters employed by FFMV. They may require additional medical and fitness tests, and additional training in 'dry' firefighting techniques, Helicopter

Insertion Techniques (as per the RFS model), and the Operate in Remote Environments (ORE) training undertaken within the RFS ([source](#), p 74). In NSW there is a specialised training capacity for RAFT and RART volunteers, run through Ops Support (previously called the Remote Area Firefighting and Specialised Operations, or RAFSO). A similar training capacity should be established in Victoria.

The RFS also has an Arduous Firefighter Program, which was introduced in 2016 as a stepping stone between normal 'tanker based' firefighters and RAFT firefighters. This was partly to help train people to be ready for interstate and international deployments. An Arduous Firefighter in the NSW RFS has at least a couple of years' firefighting experience. They may then decide to do ORE training to qualify as a RAFT volunteer.

- As a volunteer unit it would make sense for it to be hosted by the CFA
- It would receive support from the state government (training, uniforms, meals when on deployment, equipment, and potentially vehicles, etc)
- They could be mobilised at the start of each fire season. Members who have their appropriate training and other state requirements (eg burn over and hazardous trees training) could nominate to be available for that season and then opt into possible strike team deployment on a weekly basis. These would be deployed via the state authority as volunteer strike teams are allocated at present, with priority given to deployment on remote area fires. Unlike a standard strike team deployment where members often leave from their home station in an appliance, volunteers may need to get themselves to a staging point near the fire, or the state government may organise transport from major cities or regional centres. Additionally, these firefighters could simply be regular members of their local CFA brigade, and nominate to join remote deployments when a call out is made. This could be easily managed at an operational level as brigades regularly nominate members to join Strike Teams during fire season
- The organisation would be administered and supported by staff seconded from Fire Rescue Victoria, as per the arrangement with the CFA
- Teams would be deployed from the staging point to the fire ground via vehicles or air travel operated by the relevant state agency (PV, DELWP, Melbourne Water). In NSW, RAFT teams are managed / deployed at the District level
- They would be specifically allocated where remote access is required on public lands – eg walk in firefighting, blackout and mopping up using dry firefighting techniques, etc. A key priority would be for them to be deployed to attack new fires triggered by lightning in mountainous and remote areas when air support is not available
- They may also be deployed alongside regular volunteer units who are allocated to campaign fires on public land

The Joint Operational Protocols for Remote Area Firefighting in NSW are available [here](#).

The Operational Protocols for NSW RART which is used in NSW are available [here](#) and include details on how RART teams are dispatched and managed.

4/ Creating opportunities for younger and urban based volunteer firefighters

We believe there is an additional benefit that would come with the establishment of a volunteer force which is focused on 'campaign' fires rather than being based in a local brigade. Many volunteer fire brigades in rural areas are aging. As fire seasons worsen and become longer, there will be greater pressure on these local brigades to help provide the 'surge capacity' needed to fight big campaign fires (through providing Strike Teams). While the peri-urban brigades do tend to provide much of the surge capacity at present, membership of these brigades is limited to people who live near a fire station.

A volunteer remote area firefighting force would, by its virtue of its activity – which will include remote area work requiring robust fitness - attract younger and potentially urban based members, which would create a pathway for many new people to sign up for volunteer fire fighting who do not live in the catchment of an existing brigade. This would, over time, provide substantial benefits to existing volunteer forces like the CFA, because it would increase its base of trained and active firefighters who can be available during the summer months. Not having to fight local fires means they will be available for strike team deployment on big fires.

Creating a volunteer firefighting role which is not linked to existing brigades would be most useful for attracting new urban members. It may be possible to create urban based brigades specifically for the volunteer remote area firefighters, and these could potentially be co-located in SES Units in suburban Melbourne, where there is room available.

Recruit training could be done as a block, potentially in a residential situation, and potentially timed during university holidays to make it more likely that urban based young people would be able to join.

We understand that Victoria has very different arrangements to legislation around crown land firefighting and management compared with NSW. FFMV currently take a significant lead in remote areas such as state forest and parks firefighting. However, with political will, it would be possible to make the necessary changes to management structures for FFMV to be able to include volunteer teams in fire fighting deployment logistics.

While we understand there are serious budget constraints in Victoria, this proposal could provide a considerable boost to our state's firefighting capacity at relatively low cost to the government.

- **Review of all opportunities and approaches to bushfire preparedness, including different methods of fuel and land management (for example 'cool burning', mechanical slashing, integrated forest management, traditional fire**

approaches) to protect life and property as well as ecological and cultural values.

1/ Fuel reduction

We accept that fuel reduction (FR) burns are a useful tool in managing fuel load and hence limit the intensity of wild fires. However, we fear that much of the public debate treats FR burning as a panacea and not a component of managing fire risk and intensity.

Often fuel reduction is presented as a simple tool that will reduce risk, because it reduces one part of the fire triangle (fuel/ ignition/ oxygen). On one level, 'less fuel = less fires' is correct. However, in the real world there are many complexities we need to deal with if we wish to introduce fire into the landscape. Fuel reduction is a tool, not a panacea. There is currently very little public debate about:

- how fuel reduction burns might impact on vegetation and native animals, and whether fire is ecologically beneficial in specific areas that are subject to fuel reduction treatment
- how increased fire activity and logging is leading more forests to be in a rapid regrowth (highly flammable) stage, and whether FR is the best way to deal with this increased flammability
- whether in some areas introducing or increasing fuel reduction regimes may actually increase fire risk
- there is additionally very limited attention given to the public health impacts of broad acre FR burning

Our current fire management regime on public land in Victoria is heavily influenced by the Royal Commission that was held after the Black Saturday fires of 2009. It recommended that 5% of public land be burnt every year to reduce fuel loads. This led to government agencies often burning areas a long way from human habitation, such as the Mallee parks, and having to push control burns into weather conditions that were risky in order to meet the 5% target. The Government abandoned the hectare target in favour of a "targeted risk reduction" program several years ago. This had a focus on human asset protection and resulted in less broad scale burning, including in remoter places like the mountain forests.

Moving back to a hectare target will drive burning into dangerous weather windows and ecosystems that do not benefit from such burns. As we know, the available window to safely carry out FR burning is being reduced by climate change.

Hectare targets will only cover public land in Victoria (which roughly covers eight million hectares, approximately one third of the state). A considerable portion of fire risk in Victoria comes from the remaining two thirds of the land mass, which is held privately. Focusing too strongly on hectare targets on public land potentially ignores the real fire risk that is associated with private land, and doesn't address the hazards that are on private land, farms and around settlements and towns.

The argument being put forward by proponents of FR is that the shift from hectare targets to targeted risk approaches led to much greater fuel load, which then allowed wildfires to become uncontrollable, as happened in East Gippsland and the north east this summer. [Evidence from a range of studies](#) demonstrates that fuel loads can significantly modify fire behaviour under benign weather conditions. But this argument misses the fact that climate change is changing the nature of wildfire, making fire seasons longer, with a combination of drought and heat causing more intense fires. In these scenarios, FR is growing increasingly ineffective as fires become more severe, more often.

This is illustrated through anecdotal evidence from fire grounds. [One example comes from the community of Wyaliba](#) near Glen Innes in northern NSW. Fires threatened the area in September 2019. High winds caused embers to spot more than 10 kilometres and despite a large operation of more than 20 RFS trucks, more than 100 fire fighters, bulldozers and waterbombers, much of the area was burnt. Barely two months later, a crown fire burnt in from the west on 'a hot afternoon with an 80km per hour wind. It wasn't on the ground, it was a firestorm in the air, raining fire' according to local resident Badja Sparks, who said that in spite of the recent burn, 'There was no fuel on the ground, it was already burned. The heat ahead of the fire front ignited nearly everything in its path'.

This is also supported by experts: 'The effectiveness reduces with the severity of the fire,' Australian National University professor of environmental science Phil Gibbons said in a recent news item [published by the ABC](#). A more severe fire, where larger dry branches and logs have dried out and are available to burn increases the "available fuel quantities" in the forest even if there has been fuel reduction burning.

Droughts and higher temperatures mean that forests and grasslands are drier, ignite more easily and burn more readily, meaning fires are harder to control.

Unfortunately, these droughts are becoming the 'new normal'.

Professor Gibbons says that targeted burns are the most effective type of reduction fires and has backed the Victorian Government's 'targeted risk reduction' approach.

In promoting more fuel reduction, proponents need to be aware of the dangers that come with this proposal.

1/ The fact that climate change fueled fire seasons are making this technique less effective.

2/ One obvious downside of fuel reduction burning is that fires can get out of control and then burn large areas, damage plantations or production forests, kill livestock, or destroy human assets like houses, fences and farm buildings. Despite extensive planning, over the past decade prescribed burns have [escaped containment lines](#) several times, and destroyed houses, such as at Margaret River in Western Australia in 2013 and Lancefield, Victoria in 2015. To prevent a repeat of this, policies require burns only to proceed when the weather is suitable not just on the day, but for three to five days afterwards. This has meant many burns do not go ahead or are delayed for years.

3/ Smoke from fires can increase mortality and hospitalisation rates, and so concerns about the effect on human health is playing an increasing role in whether to burn or not. There are a growing number of studies into the health effects of fine particulate matter in the atmosphere caused by fires, and that exposure to the material is associated with increased hospital admissions during fire season. Encouraging broadacre burning in autumn or spring will extend the amount of the year that particulate pollution will impact on public health, with obvious personal, public and economic impacts. It is estimated that smoke pollution from the Black Summer may have killed more than 400 people, and sent 4,000 people to hospital. Some regional areas with older populations face particular health risks from fuel reduction and, where possible, alternative methods of treatment should be considered in these areas.

The Victorian government clearly understands the link between climate change and fire. It has consistently said that hazard reduction burns can play a role in fire management but the window to carry them out is getting smaller due to the changing climate and longer fire seasons. We urge them to continue to apply sensible, science policy when it comes to fire risk.

The fuel reduction promoters have muddied the waters on this issue because the demand for more fuel reduction often neglects to acknowledge the fact that fuel reduction burns are already carried out widely by fire authorities. Strategic fire breaks are also used to reduce landscape scale movement of fire.

We oppose a return to a hectare target for fuel reduction burning.

The existing approach of aiming for asset protection through targeted burns or mechanical clearing is the most cost effective. The most effective approach is to assess risks around assets to protect them and ensure they are maintained, to be effective over the long term.

As Gibbons et al found in their research, *Land Management Practices Associated with House Loss in Wildfires* ([Source](#)), overall land use patterns are irrelevant to predicting house loss in a fire. It is fuel loads within 40 metres of the asset that are the most significant factor to protect houses.

If a decision is taken to greatly increase landscape wide burning there are a number of significant logistical and resourcing considerations:

- More FFMV firefighter capacity would be required. One option would be to turn some of the existing seasonal firefighter positions into permanent positions, or extending them through summer into the autumn burning period
- We would need additional budget for equipment. Putting more vehicles into the field (often with rough road conditions) will lead to a considerable increase in maintenance costs
- If we are to burn more areas of land, this is likely to bring more burns closer to regional towns. This in turn will require extra pre treatment work (eg removing forest litter away from the bases of trees at containment lines) which in turn will increase the cost per hectare of treatment

- At this point, if there is a wildfire, we attempt to put it out as soon as possible, where firefighting resources allow it. Government could make a decision to let some fires burn out in the cooler months. But these would need resourcing to allow them to be monitored and fought should they 'take off'

There are also ecological implications. FR regimes will impact on different vegetation communities in different ways. While eucalypts are fire adapted, not all are fire tolerant. There are some significant ecological issues to consider if we want to greatly increase the amount of burning we do:

- the science suggests that the best option for protecting remaining old growth snow gums is to [exclude fire wherever possible from this vegetation community](#)
- Rainforest is not fire adapted and is badly impacted by fire. So fire must be excluded from remaining pockets of cool temperate rainforests, including their surrounding buffer zones of eucalypt forest
- There are areas, like the Errinundra Plateau and Toorongu Plateau, that have traditionally acted as bushfire "refugia" sites. Both these areas (one in far East Gippsland, one north of Noojee) have been heavily impacted by logging. Logging can increase the flammability of forests, by turning older forests with cool humid microclimates into thick forests of regrowth. Ecological refugia sites will become even more important as the climate warms and must be protected from any fire, planned or otherwise, which will reduce their ability to act as a refuge for plant and animal species. This is also true of older forests in general, which are generally less flammable than younger post fire or post logging vegetation
- Alpine ash communities don't like a 'hot' burn. They can cope with a cool burn, and often older forests will have a mixed range of trees from saplings to old trees. [We have lost so much of our older ash in recent years](#) and any introduction of fuel management fires into this forest community needs to be considered, and managed, very carefully. Perhaps the best option is to treat surrounding foothills forests with controlled burns in order to slow down any fires that do burn up into alpine ash communities
- We need to reconsider how we use or manage fire in declared wilderness zones. One aim could be to implement partial protection of areas threatened by wildfire (eg using air support to drop flame retardant over some areas before a wildfire entered the wilderness boundary). This would create a mosaic effect of burnt areas over time, with a range of ages of vegetation within the wilderness area.

The scale of fires

There is also the simple ecological fact that 'fuel' is also 'habitat' for many species. Ecological implications of burning large areas of forests needs to be carefully assessed for the likely impacts on local ecology.

The re-adoption of a hectare target policy would push fuel reduction burns to be larger, because they will be cheaper and quicker to deliver per hectare. This is one of the reasons we oppose the reintroduction of this policy.

One option with fuel reduction burns is to reduce the size of them, where appropriate. Small burns are more likely to be cool burns. The window of opportunity for fuel reduction is narrow, and getting narrower as a result of climate change. Scheduling larger burns increases the likelihood of them escaping and turning into bushfires and will increasingly mean they can't be carried out because of conditions. In contrast, many small cool burns in a particular landscape will be more like traditional Cultural burning patterns, have a wider weather window to burn, and more likely to remain controllable. And, significantly, a mosaic of small cool burns will potentially help maintain biodiversity. Being small scale means there is more ability to burn around or lightly through areas of high conservation significance.

Opting for smaller burn areas would obviously increase the cost per hectare being treated. One option that would have a number of benefits, including financial ones, would be to support the proposal from David Bowman and Jason Alexandra to establish local 'GreenFire' groups.

They suggest that these could be 'the equivalent of district Landcare groups, but focused on hazard reduction and fuel management. These groups could be encouraged to learn patch-burning techniques, and other landscape scale management practices, such as creating green firebreaks of non-flammable species. If well coordinated, these techniques would reduce fire hazards across private and public lands. These groups could be an extension of existing Landcare groups combined with volunteer firefighting services. They would aim to increase capacity for fuel management at the landscape scale and provide opportunities for more people to learn skills and share knowledge, with and from professionals working in government forest and national parks agencies.

These kinds of activities, mostly in the cooler, green seasons would enhance the capacity of communities to prepare for future fires, and increase the capacity of traditional fire fighting to suppress dangerous fires' (source).

These groups would need to be appropriately trained, and could work under the mentorship and authorisation of fuel management/reduction officers.

These could be district fire officers or senior staff of public land management agencies who currently manage fuel reduction on public lands.

Having volunteer groups can be expected to:

- Increase public understanding of, and support for, fuel reduction burning, as community members will be involved in the burns
- Reduce costs of fuel reduction compared with relying on career firefighters to carry out all the work
- Allow for appropriate scale fires
- Increase ecological outcomes from burning.

We would like to add some additional points regarding the use of fuel reduction treatment in specific vegetation communities.

Snow gum forests

A report from researchers at Melbourne University highlights the fact that ‘over 90% of the Victorian distribution of snow gums has been burned at least once since 2003. What is of greater concern though, is that each of the large fires of the last 15 years has overlapped to some extent, leaving thousands of hectares of snow gums burned by wildfire twice, and sometimes three times’.

Research by Tom Fairman, Associate Professor Lauren Bennett, Shaunna Tupper and Dr Craig Nitschke, at the University of Melbourne showed that frequent bushfires in the Victorian high country have devastated the snow gum population, endangering the flora and fauna that depend on them for survival.

They say, [in an article](#) titled ‘*Recurring fires are threatening the iconic Snow Gum*’: “Our [recent study](#) found these higher incidences of bushfires, which are likely due to climate change, are devastating for the usually fire-tolerant snow gums of southern Australia.

The snow gum has “a close relationship with fire. This is a necessity given that the mountainous regions of Australia are subject to periodic bushfires. While the bark on the stems of snow gums is particularly thin, meaning their trunks and branches are frequently killed outright by fire, snow gums have a built-in insurance mechanism that ensures persistence – a large swelling at their base, known as a ‘lignotuber’.

Partially buried, the lignotuber is where reserves of energy are stored, as well as protected buds that lie dormant until the tree’s canopy is lost. This feature allows it to vigorously re-sprout after fire, rapidly producing new leaves.

The research found that the lignotuber continued to re-sprout very well after one fire, but after two and three fires, the number of new sprouts significantly declined. The level of whole-tree death (that is, the stems *and* lignotuber dying) was fairly low following one and even two, fires; however, after three successive fires, on average half of all trees in our plots were dead. In some plots, this figure was as high as 80 per cent of all trees.

However, the death of established trees is not too much of a problem if there are a lot of new seedlings, as these will one day replace the dead trees. After one fire, we found there was a ‘pulse’ of snow gum seed regeneration – but unfortunately, after two and three fires, these seedlings were killed and significantly reduced in abundance. This means for double and triple burned forests, the next generation of trees to replace the older cohort has been eliminated.

This is supported by more recent research. A research paper titled ‘*Alpine treeline ecotone stasis in the face of recent climate change and disturbance by fire*’ (2020) ([available here](#)) and authored by Aviya Naccarella, John W. Morgan, Seraphina C. Cutler, and Susanna E. Venn considers the interaction between fire, climate change and the treeline.

They say ‘Twice-burned areas (within a decade), however, lose small-sized trees and saplings both above the treeline and within the subalpine woodland. The occurrence of two fires within a decade is an unprecedented event in the Australian Alps. Although mature tree mortality was low, and as such there was no evidence of treeline recession, woodland structure had shifted substantially. The substantial reduction in saplings above- and below-treeline suggests younger and smaller individuals are more susceptible to fire’.

Another significant piece of research into fires and snow gums that should inform our understanding about fire on snow gum forests looked at the impacts of fires on Lake Mountain and the Buffalo Plateau. The report [How snow gum forests and sub-alpine peatlands recover after fire](#) was written by Fiona Coates, Philip Cullen, Heidi Zimmer, James Shannon. They used the long unburnt Baw Baw Plateau as an example of what these systems could be like in the absence of fire events.

They found that:

- Even areas that have been subjected to hot and very destructive wildfire, such as on the Lake Mountain plateau during the 2009 Black Saturday fires, can be expected to recover – provided we can keep fires out of these systems. However, this will take time. For instance they suggest it will take the forests at Lake Mountain at least 70 years to return to pre-fire structure. No specific management needs to be undertaken to aid this process beyond excluding fires
- The researchers repeatedly note that there are serious doubts about the value of fuel reduction burning in these forests. They note that low intensity fires negatively impact on tree resprouting ability
- Repeated fires change the character of snow gum forests, creating a multi stemmed forest of shorter trees. That is, forests get denser, with more of a ‘Mallee’ aspect to how the trees grow. They call this ‘potentially irreversible degradation of stand structure’, which has already happened to the extent that old growth snow gum forests are increasingly rare. They note that the traditional open forest structure of snow gum forests will not be able to develop if there are repeated fires, as the result over time will be that forests will become dominated by lots of small stemmed trees rather than a ‘traditional’, open snow gum forest
- Repeated fires can also inhibit the ability of trees to store carbon above the ground
- They say that ‘fire exclusion is imperative to preserve landscape quality and representation of long unburnt snow gums’
- They recommend that current ‘fire and cattle exclusion policies’ at places like Mt Buffalo and Lake Mountain be continued. They note that cattle grazing can drive the creation of multi stemmed trees, in the same way that fire tends to, again driving the forest towards a multi stemmed and immature form. Exclusion of cattle is also very important for recovery of burnt areas of peat land
- Older, more open snow gum forests are better at collecting water and ensuring regular run off, retaining soil moisture and snow accumulation.

What are the implications for fire fighting in the alpine country? The key message is that we need to keep fire out of snow gum forests wherever possible. Locking in more intense fuel reduction regimes are unlikely to make snow gum forests less fire prone, for the reasons outlined above.

Alpine Ash

While the focus of public debate about managing fire risk is on fuel reduction burning, other land use practises on public land appear to be increasing fire risk. The native forest industry is creating forests that are younger, and hence more flammable (see separate section). As landscapes become more fire prone - and logging operations have a strong focus on Mountain Ash and Alpine Ash forests - this impacts on adjacent vegetation communities that have not been logged.

A recent study called 'Temporal fragmentation of a critically endangered forest ecosystem' ([available here](#)) showed that Mountain Ash (*Eucalyptus regnans*) and Alpine Ash (*Eucalyptus delegatensis*) forests in the Central Highlands of Victoria 'have experienced major disturbance over the past 20 years through a major fire (in 2009) and extensive industrial logging'. The research found that around 65% of the Alpine Ash forest areas were either disturbed or within 200 metres of a disturbed area. Inclusion of planned logging increased these disturbance categories to 70%.

Alpine ash forests are unlikely to survive after two high severity fires under 15 - 20 years, which is the age when regenerating stems begin to produce seed. If burnt too often, Alpine ash forest may transition into acacia shrubland. Forest Solutions, who are involved in reseedling of Alpine Ash after fire, estimate that about 10,000 ha of Ash is at imminent risk of population collapse in Victoria, which would see them transition to other types of vegetation.

When alpine ash forests become mature, they move, in the words of alpine ecology and fire dynamics expert Phil Zylstra from the University of Wollongong, to a very "low flammability stage".

Zylstra's work shows that the less frequently alpine ash forests burn, the less likely they will burn badly in the future. That's because the understorey naturally thins out over time, making the inevitable small and medium-sized fires much less likely to become megafires which crown, moving into the treetops and killing the parent tree.

So if we wish to make alpine ash forests less flammable, a better strategy than FR treatment is to exclude fire from these communities.

Non fire options

We also need to actively support research into ways of reducing flammability of forested areas that do not rely on burning. For instance, researchers from La Trobe University have found that Lyrebirds can reduce the risk of bushfire. Their foraging sifts the forest floor, burying leaf and other forest litter, speeding up leaf decomposition, and reducing the amount of fuel for bushfires. It was also found to inhibit the growth of ferns, grasses and other plants which would otherwise contribute more potential bushfire fuels ([source](#)).

Any push to move back to a hectare target approach would be likely to force broad acre burns into areas which would then impact on local opportunities to reduce fuel load without burning. The government should actively seek to adopt non fire options which will reduce fuel load.

2/ Native forest logging and fire risk

It is well documented that industrial scale logging of native forests can increase the flammability of logged areas. David Lindenmayer, Professor of Ecology and Conservation Biology at the Australian National University has led research on the effects of post-fire logging for more than 16 years.

His research shows that "Post-fire logging is by far the most damaging form of logging. The impact it will have on Australia's fire-ravaged ecosystems will be catastrophic".

Yet some groups advocate for increased logging regimes, partly in order to reduce future bushfires. This simply does not line up with the research, or with simple observation of logging operations: where clearfelling occurs, a burn is undertaken to prepare the site for natural regeneration. Where regeneration is a success, it creates a dense vegetation pattern where early colonisers, such as Acacias, and Eucalypts compete for water and sunlight. These dense young regrowth forests are clearly highly flammable, and will remain so until they move towards maturity, when the understory starts to thin out.

The research also backs this up. For instance, the Australian National University (ANU) and Melbourne University research after the 2009 Black Saturday bushfires found that the increased fire risk began about seven years after an area had been logged and lasted for another 50 years.

Many towns in areas areas that have experienced recent logging, such as Healesville, Toolangi, Warburton, Noojee and Marysville, must now exist with heightened fire risk as a result of logging. Professor Lindenmayer said there should be no logging within five to 10 kilometres of towns to ensure "that we don't add extra risk through extra logging".

He also states that there is a need to 'comprehensively revise' forest policy in this state to reduce fire risk. "We need to let those forests recover and we need to develop the wet forests... which do have a fire suppressive effect." Yet it is these wet forests (dominated by species like Mountain Ash) that are most at risk from logging.

3/ Cultural Burning

Cultural Burning has significant benefits for traditional owner groups involved in such programs.

We do caution about the promotion of 'Indigenous burning' practises which are not driven by traditional owners. There is considerable misunderstanding of Aboriginal

firestick farming techniques, which is grossly simplified, partly because of recent works by authors like Bill Gammage, who wrote *The Biggest Estate on Earth* (2011).

Gammage says Indigenous land management formed one coherent "estate", continent-wide (including Tasmania), and that fire was a key tool everywhere, used to create beneficial combinations of vegetation in the landscape. He suggests that "most of Australia was burnt about every 1 - 5 years depending on local conditions and purposes, and on most days people probably burnt somewhere", while also noting that "very few sources (used in developing his theories) come directly from Aboriginal people."

In suggesting that, pre invasion, traditional owners burnt large tracts of the continent each year sits at odds with ongoing cultural practises, where targeted areas are burnt for particular outcomes. In the south, where Cultural Burning is being reintroduced, we should be mindful of previous practises. In Victoria's high country, for instance, research indicates that burning in pre-invasion times was predominantly on established travel routes in valleys and above tree line, rather than right across the landscape.

We also need to be cautious about trying to place Cultural Burning practises into the fuel reduction 'box' without understanding the complexity of these practises. Shaun Hooper, a Wiradjuri man, Fire Behaviour Analyst, volunteer fire fighter, and Cultural Burning practitioner, says that '*Aboriginal Cultural Burn(ing); does not generally look like a hazard reduction. This is because it is not. An Aboriginal Cultural Burn is not guided by a prescription, it is guided by the close relationship that the Aboriginal Cultural Fire Practitioner has with Country and everything in it.*

This relationship based approach allows for the involvement of other than human beings such as bettongs, bandicoots, lyrebirds, wombats and brush turkeys who all assist with Cultural burning by turning over and reducing the leaf litter.

Cultural Burning is a landscape wide approach unlike the more strategic hazard reduction approach. It provides for emergent outcomes for a range of species who contribute in various ways to the implementation, Cultural Burning in its true sense is not just people driven, this is important as it respects the relational requirements of Aboriginal Cultural Practice". ([source](#)).

The Victorian Traditional Owners Cultural Fire Strategy outlines [six core principles](#) that underpin cultural burning practises in the state.

We would encourage the state government to continue to develop cultural burning programs with traditional owner groups. Groups that are already engaged in Cultural Burning programs, such as Dja Dja Wurrung, could be resourced to share knowledge with other traditional owner groups.

- In considering effectiveness of Victoria's operational response to the 2019-20 fire season, IGEM should particularly consider:

- **impact of increasingly longer fire seasons on the ability to prepare, deploy and sustain efforts directed towards emergency events in Victoria**

The ever increasing length of fire season and intensity of fires will obviously impact on the state's ability to fight wildfire effectively. It also has implications for resource sharing between states and territories and other nations. As was highlighted by the 2019/20 fires, shared resourcing (equipment, staff and volunteers) is essential for effective fire fighting. But with interstate requests for support occurring so early (Queensland putting in requests in September) over time, existing local career and volunteer forces struggled with exhaustion.

We clearly need additional air support capacity, organisational and logistics capacity, and volunteer and career fire fighters. This is addressed elsewhere in this submission. However we believe the IGEM should consider encouraging the federal government to establish a national remote area firefighting force which can be deployed as needed across Tasmania and mainland states when World Heritage, National Parks and other remote areas are at risk. [This was recommended by a Senate inquiry](#) after the devastating fires in Tasmania of 2016.

This force would provide additional capacity to local fire fighters and could also be deployed to allow local brigades to rotate out for longer rest periods during campaign fires.

- **impact of providing Victorian responder officers to other Australian jurisdictions to assist with emergency events (as early as September 2019 this summer season)**

Please see point above. It is essential that Victoria continue to play it's part in supporting firefighting efforts in other states, territories and countries.

- **planning and response mechanisms to protect biodiversity threatened by bushfire**

During fire fighting operations

Because of the scale of this fire season, and we have to assume future ones, the value of unburnt forest has grown. In the operational phase of fire fighting it is essential that ground crews act to protect these areas where it is practical. Areas of unburnt vegetation within burn areas must be protected from 'burning out' by fire crews, whenever possible. The burning of these natural refuge areas increases the ecological impacts of wildfire and inhibits the recovery of plants and wildlife.

After fire

1/ salvage logging

'Salvage logging' compounds the impacts of both fire and logging, and subjects fire-affected forests to mechanical disturbance during the critical recovery stage of the vegetation and should not be allowed in fire impacted regions.

2/ vegetation clearing after fire

We are deeply concerned about direct impacts on vegetation communities and animals after the fires. Following the East Gippsland fires, we understand roads had to be re-opened and made safe. However we were extremely disturbed at the amount of questionable clear felling of large habitat trees that occurred along thousands of kilometres of East Gippsland's roads.

Unprecedented clearing occurred around Buchan, Black Mountain, Combienbar, Orbost, the Bonang Road, Cann River, Mallacoota, Cape Conran, state forests inland from Bairnsdale, along the Great Alpine Way, and many other fire affected roads in East Gippsland.

We received reports that:

- despite a statement from the Deputy Incident controller Orbost ICC that the roadside tree removal is definitely Hazardous Tree Removal, only a small proportion of trees cut were actually hazardous
- the vast majority of clearing was done by contractors, who may have limited training in identifying hazardous trees, with few arborists involved and apparently very little oversight
- forest has been cleared well away from roads (ie, not posing a conceivable public risk to people using roadways). This is likely to cause impacts on gliders and other species which will not be able to cross roadways because the canopy gap will be too large
- valuable habitat trees have been felled, often with very little quantifiable risk documented first
- there has been loss of ecologically significant vegetation. For instance, near Cann River many bloodwoods (*Corymbia gummifera*) were cut. The Martins Creek rainforest reserve on the Bonang Highway had a lot of its tree cover in the rainforest ecotone felled, with no regard to impacts on recovering rainforest
- it appears that in many instances, unwanted trees and heads were pushed back into the edge of the bush, increasing fire danger along the roadsides.

According to reports received by our organisation, this clearing was done without adequate ecological assessment of the additional risk the works posed to threatened species already severely impacted by the bushfires.

Excessive roadside clearing will fragment forest ecosystems and cause biodiversity impacts.

The Office of the Conservation Regulator has been undertaking an investigation into these claims however it has not yet completed the report. We urge the IGEM to consider any recommendations that come from the OCR report when it is completed.

Our organisation and others, such as Gippsland Environment Group have documented the scale of the road clearing and can provide additional information to the IGEM if required.