

SUBMISSION TO THE
VICTORIAN GOVERNMENT'S
INDEPENDENT INQUIRY
INTO THE

2019-20 VICTORIAN FIRE SEASON

**PHASE 1: Community and sector preparedness for
and response to the 2019-20 summer season**

by

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Glossary

A feature of the public discussion over bushfires is the interchangeable use of terms which essentially have similar meanings. Understandably, this inconsistency can be confusing for those not already steeped in knowledge about the topic. The notes and definitions below are an attempt to clarify any confusion that may otherwise arise in the reading of this submission.

Bushfire or wildfire?

The Inquiry's Terms of Reference uses the term '**bushfire**', and our responses refer to bushfires for consistency, but also at times we use our preferred term '**wildfire**' when talking more generally about principles, practices, and operational experiences.

Bushfire is an Australian term for any unplanned landscape fire in grassland, woodland, heathland or forest. However, it is sometimes only used to mean "forest" fire and so has an element of ambiguity about it. **Wildfire** is the international term used for any unplanned fire in grassland, woodland, heathland or forest. However, it is sometimes taken to imply fires are of high intensity, when wildfire can be low and/or high intensity, but are all "unplanned". Wildfire is a less ambiguous term and is internationally understood and is therefore the preferred term for a professional association of forest scientists.

Bushfire preparedness or wildfire mitigation?

The Inquiry's Terms of Reference uses the term '**bushfire preparedness**', and our responses also uses this term for consistency, but also at times we use the term '**wildfire mitigation**' when talking more generally about actions that directly improve the protection and resilience of the community and the environment.

The term **wildfire mitigation** refers to pre-season actions, primarily fuel reduction burning, that can mitigate the extent and severity of wildfires. But it can also include road and track maintenance that enables rapid first attack on wildfires therefore also limiting their extent. This is really only a subset of **bushfire preparedness** which also includes community education, warnings, and emergency messages.

Cool burning /prescribed burning/ fuel reduction burning

The Terms of Inquiry refers to '**cool burning**' but the terms '**prescribed burning**' and '**fuel reduction burning**' are more preferred to describe low intensity fires planned and lit to reduce fuel levels during the cooler and more stable weather in autumn or in spring.

The preferred term is "**Prescribed Burn**" for fires which have been carefully planned and documented before implementation with a clearly stated set of management objectives and carried out under clearly prescribed conditions based on fire science.

In the context of this submission, **prescribed burning** is used interchangeably with **fuel reduction burning**, but **prescribed burning** can also describe other deliberately planned and controlled burning undertaken for other reasons, such as to remove logging debris and create an ash seed-bed for tree regeneration, or for ecological reasons to maintain or renew specific vegetation communities.

Forest fire management

All activities associated with the management of fire-prone forested land, including the use of fire to meet land management goals and objectives. There are seven distinct components: Research (and application); Prevention (regulation, warnings, education); Preparedness (fuel reduction, training, infrastructure maintenance); Detection (fire spotting); Emergency Response (operational wildfire suppression); Recovery (post-fire rehabilitation); and Landscape Maintenance (use of fire to maintain biophysical and ecological processes).

Executive Summary

Our submission

The Institute of Foresters of Australia and Australian Forest Growers (hereafter referred to as the 'Institute') is Australia's independent national body representing forest scientists, technicians, growers and managers with professional and practical expertise in private and public forest and plantation management.

Members are engaged in many aspects of forestry, nature conservation, resource and land management, research, administration and education. Fires are a day-to-day preoccupation of many of the Institute's members either through their practical work in native forests or plantations; through involvement in research; or in the administration of forest/plantation management agencies or companies.

The Institute's 1,000 plus members have led the field of fire management and research in Australian forests over many decades. We advocate balanced land use that meets society's needs for sustainable forest management, including timber supply and biodiversity conservation, while addressing the fire and conservation issues arising from a changing climate.

Most foresters have had personal responsibility for bushfire mitigation and suppression at some stage during their careers. They have generally also gained far more experience and understanding of fire in the natural environment than any other firefighters, largely through the operational use of fire prescribed for silvicultural or conservation purposes, and for fuel reduction.

The Institute would welcome the opportunity to present in person to the Inquiry or to provide more detailed written information. We would be pleased to respond to any questions this submission may raise.

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Overall concerns about forest fire management in Victoria (and SE Australia)

The Institute is deeply concerned that the current primary focus of Victorian forest fire management on wildfire suppression (also referred to as emergency wildfire response), in lieu of bushfire preparedness (chiefly prescribed burning to mitigate wildfire intensity), has unintentionally increased human and wildlife deaths, caused greater damage to human and community assets, increased environmental degradation, and led to spiralling total fire costs.

In the short term, a fire suppression focus drives down the area burnt by wildfire. However, over time, it allows forest fuel levels to increase over the majority of the forest, thereby increasing

the intensity of wildfires when they occur. These wildfires then burn hotter and faster, are harder to control and invariably cover greater areas. Human, environmental and economic costs spiral with increased area burnt at high intensities. Over time, a primary focus on fire suppression is a flawed management strategy.

Contrary to much of the public narrative surrounding the 2019-20 bushfires which blamed them solely on climate change, the Institute firmly believes that the fires were primarily a consequence of decades of poor fire management and a more recent shift to a risk-averse firefighting approach exacerbated by an over-reliance on aircraft.

Concern over lack of fuel management

Victoria's bushfire Royal Commissions of 1939¹ and 2009² both recommended a greater focus on bushfire preparedness, particularly through prescribed burning to reduce forest fuel levels. After the 2009 Victorian Bushfires Royal Commission, this direction was initially heeded, but over time expenditures on fire season wildfire suppression, especially on using aircraft, has substantially increased relative to expenditure on off-season bushfire preparedness (mainly prescribed fuel reduction burning).

Furthermore, the diminished levels of prescribed burning still being undertaken to reduce forest fuel levels has shifted from across the broad forested landscape to a focus on strategic 'fence-line burning' adjacent to privately-owned built assets in order to reduce community fire risk³. This shift has been driven by political and social factors, including more people living close to flammable forests, and the evolution of a more risk-averse and litigious society, as well as ill-conceived concerns about the supposed damage of periodic low intensity fire on environmental values across the broader landscape.

While protecting human life and property is paramount, as a dominant focus it becomes problematic if it allows fuel levels to build across the bulk of the forested landscape to an extent that enables resultant wildfires to burn at intensities beyond firefighters' capability to control them. As should be evident from the 2019-20 fires, these circumstances can lead to exponentially greater damage to life and property than prescribed cool season fuel reduction burns could ever do.

The Institute believes that forest fire management in Victoria (and SE Australia) is now too focussed on asset protection at the expense of extensive wildfire mitigation (i.e. through broadacre prescribed burning), especially on public lands where fire-adapted vegetation requires more frequent low intensity fire to maintain biodiversity and to prevent catastrophic high intensity wildfires. Into the future, as expected warmer and drier conditions have greater impact on native forests, the Victorian government needs to give a higher priority to managing forest fuel levels across the entire forested landscape if the number and costs of wildfires are to be reduced⁴.

Despite this imperative, public debate over the benefit of fuel reduction burning persists. Almost all public commentary questioning the value of prescribed fuel reduction burning

¹ Stretton LEB. 1939. Report of the Royal Commission to Inquire into the Causes of and Measures Taken to Prevent the Bush Fires of January, 1939, and to Protect Life and Property Melbourne, Victoria: Victorian Government.

² Teague B, McLeod R, Pascoe S. 2010. The 2009 Victorian Bushfires Royal Commission Final Report (Summary). Melbourne, Australia: Parliament of Victoria.

³ G.W. Morgan, K.G. Tolhurst, M.W. Poynter, T. Blanks, N. Cooper, T. McGuffog, R. Ryan, M. Wouters, N. Stephens, P. Black, D. Sheehan, P. Leeson, S. Whight and S.M.Davey (2020), *A History of Prescribed Burning in South-eastern Australia*. Australian Forestry, Vol. 83:1, 4-28, April 2020, DOI: [10.1080/00049158.2020.1739883](https://doi.org/10.1080/00049158.2020.1739883)

⁴ Williams J.T. (2013), *Exploring the onset of high-impact mega-fires through a forest land management prism*, Forest Ecology and Management, Volume 294: 4 – 10, April 2013, <http://dx.doi.org/10.1016/j.foreco.2012.06.030>

emanates from environmental activists and academic ecologists with no personal experience of planning and conducting prescribed burns and no experience of fighting forest fires to gain an appreciation of the benefit of such burns in mitigating wildfire intensity and reducing environmental impacts. This includes the most outspoken members of the 'former fire chiefs' climate change activist group, who mostly have urban or rural fire backgrounds, as distinct from forest fire management experience. Nevertheless, the media opportunities that these critics are given creates real concern that public policy will be shaped by impractical ignorance rather than informed expertise.

During the 2019-20 bushfires, there have been many examples showing the benefit of fuel reduction burning, and it is expected that these will be highlighted in submissions to the inquiry from persons living closer to the affected forests in East Gippsland and NE Victoria. However, it must be acknowledged that these benefits are limited because there are far too few forests being fuel reduced each year, and this in-part underpins the criticism being levelled against prescribed burning.

Concern over firefighting strategies, tactics and practices (including an over-reliance on aircraft)

Despite some media emphasis, Victoria's fire management problems are not wholly due to high fuel levels. An equally important area of concern is the risk-averse strategies, tactics and practices now being used to fight major fires. In particular, an over-reliance on aerial water/retardant-bombing in lieu of aggressive ground-based attack on fires which is ultimately the only way to ensure that they can be safely controlled.

For some years, our members have been concerned at the declining use of formerly standard practices such as night-time construction of fire containment lines either by hand or machine; hand-trailing of remote area fires where machinery access is problematic, and thorough ground-based blacking-out especially on remote area fires. These shortcomings are exemplified in recently documented instances of very small and easily accessible lightning strikes near Wye River (2015) and Harrietteville (2013) being allowed to develop into large, damaging conflagrations which collectively did enormous damage to the environment and human assets.

The Institute is concerned that these shortcomings are being misrepresented in the public arena as unavoidable consequences of climate change. For example, former Victorian Emergency Management Commissioner, Craig Lapsley, remarked on Channel 9's *Sixty Minutes* program of 9 February 2020, that: "*We are getting to the point where the traditional tactics being deployed are no longer effective.*"⁵ However the observations and anecdotes of our members suggest that the former 'traditional tactics' have long since been replaced by a diluted, indecisive and hopeful version that is far more likely to fail. Of particular concern is the partial shift away from direct attack on the fire edge at every opportunity to a far more commonly used indirect attack strategy of falling back to distant control lines with or without backburning and relying on aerial water/retardant bombing (in the mistaken belief that it will extinguish fires).

Our members have made the Institute aware of a range of alleged concerns arising from the 2019-20 wildfires in East Gippsland. These include:

⁵ It is acknowledged that Craig Lapsley no longer has a formal role in the Victorian Government's emergency management agencies, although he may do occasional consulting or contract work. However, he was interviewed on *Sixty Minutes* because his former role earmarked him as an expert on Victorian forest firefighting even though his background expertise is in rural and urban fire.

- That Forest Fire Management Victoria (FFMV) had not completed the training of its casual summer fire crews in time for the start of the fire season;
- That one/some timber industry contractor/s with decades of firefighting experience were told by FFMV prior to the fire season that their machinery would no longer be required for firefighting;
- That on several East Gippsland fires, contracted machinery operators were directed by FFMV to work only normal 'business hours' thereby indicating a lack of urgency to contain the fires.
- That FFMV elected not to use backburning to contain a slow-moving wildfire burning for several weeks in the Snowy River National Park because they didn't want to disturb park values, thereby enabling the wildfire to eventually break-out and severely burn huge areas of forest;
- That the fire which eventually burnt along the East Gippsland coast and into Mallacoota went undetected for several days and no serious attempt was made to contain it before dangerous fire weather conditions arose;
- That FFMV refused to risk putting fire-fighters on the ground to traverse 'dead' fire edges after initial rain events had halted fire spread despite this being the only way to guarantee that the edges were safe; and
- That the priority afforded to felling so-called 'killer trees' along roads and tracks diverted effort away from and may have even delayed first attack on some fires.

We stress that these concerns have been heard second or third-hand and so have not been verified by the Institute. However, we believe that they should be investigated by this Independent Inquiry as they collectively suggest that firefighting effectiveness may be being seriously compromised by a lack of perspective in relation to firefighting risk, environmental risk, and/or operational capability.

Recommendations to the Inquiry in response to selected Terms of Reference:

Bushfire preparedness recommendations

Recommendation 6.1: (See TOR 6, p. 16)

That the Victorian Government increases expenditure and commitment to off-fire season forest management to mitigate wildfires, especially through increasing the annual level of fuel management and by reinstating and upgrading road and track networks, especially in remote area forests.

Recommendation 6.2: (see TOR 6, p. 16)

That in the interests of long-term bushfire preparedness, the Victorian Government:

- supports the coordination and collaboration for independent applied wildfire research and development to ensure continuity of effort and expertise beyond the life of the current Bushfire and Natural Hazards CRC;
- works with the Commonwealth Government to provide financial support and incentives to appropriate tertiary institutions to revive specialist field-based applied education courses for forest and fire management; and

- works with the University of Melbourne to revitalise the Victorian School of Forestry at Creswick as a Centre for Excellence in Learning and Research for Forest and Fire Management.

Recommendation 7.1 (See TOR's 7 (p. 19), 11c (p. 27))

That the Victorian Government increases expenditure and commitment to off-fire season fuel management to mitigate the adverse impacts of wildfires and to reinstate a more equitable resourcing balance with in-season emergency response to wildfires.

Recommendation 9.1: (See TOR 9, p. 22)

That the Victorian Government revisit the 'Residual Risk' concept's underlying thinking and assumptions with a view to revising fuel management programs so that, in addition to prioritising lives and residential properties, they also aim to minimise the impact of wildfires on a broader range of values, such as critical infrastructure, economic assets, rural and remote communities, and ecological biodiversity.

Recommendation 9.2: (See TOR 9, p. 22)

That the Victorian Government expand the use of mechanical fuel reduction as a safer tool for strategic areas adjacent to private and community assets where prescribed burning would be inherently risky, difficult and costly.

Recommendation 9.3: (See TOR 9, p. 22)

Traditional Owners' forest fire management practices should be fostered and re-introduced where possible, complementing existing prescribed burning programs but not replacing them.

Emergency wildfire response recommendations

Recommendation 1.1: (See TOR 1, p. 12)

That in order to evaluate the effectiveness of emergency management command, control and accountability arrangements in Victoria, this Independent Inquiry into the 2019-20 Victorian Fire Season, investigates whether:

- specific, measurable, achievable, relevant and time-bound objectives were framed and documented for those occupying responsible positions during the 2019/20 forest fires, and if
- people appointed to those responsible positions possessed the skills and ability to fulfil their responsibilities.

Recommendation 1.2: (see TOR 1, p. 12)

That the Victorian Government:

- reinstates permanently decentralised professional land management staffing levels in smaller townships distant from large regional centres to maintain a cohort of locally based agency personnel with detailed geographic and fire knowledge of our parks, forests and Crown lands; improve engagement with local communities; and help safeguard rural and remote economies;
- rearranges command and control functions for emergency wildfire response based on the principal of subsidiarity whereby decision-making is best undertaken from as close as possible to the emergency location.

Recommendation 2.1: (See TOR 2, p. 14)

That this Independent Inquiry seriously investigates the strategies, tactics, and practices employed in fighting the recent 2019-20 East Gippsland wildfires with a view to learning lessons to improve future forest fire suppression. Such an investigation should be conducted by

experienced forest fire incident controllers who are independent of Forest Fire Management Victoria.

Recommendation 7.2: (See TOR 7, p. 19)

That the Victorian Government conduct an independent evaluation of the cost-effectiveness and efficiency of the aerial fire suppression resources used on the 2019-20 bushfires, including the potential for savings to be generated for use in improving bushfire preparedness.

Recommendation 11.2: (See TOR 11a, p. 26)

That the Victorian Government redirects expenditure and commitment towards improving emergency response to remote area wildfires. This may necessitate a re-evaluation of what constitutes acceptable risk, given that striving to eliminate firefighting risks can often lead to fires growing larger with exponentially increased risks to greater numbers of firefighters and the broader community.

Recommendation 11.4: (See TOR 11e, p. 29)

That the Victorian recognises the importance of retaining viable timber industries to maintaining an efficient and cost-effective ground-based firefighting capability.

Recommendation 11.5: (See TOR 11e, p. 29)

That the Victorian Government rebuilds its in-house fleet of heavy machinery and invests in training experienced operators to restore its forest firefighting capability.

Recommendation 14.1: (See TOR 14c, p. 32)

That DELWP (Forest Fire Management Victoria) annually train and/or conduct joint exercises in forest firefighting with Defence Force personnel.

Other recommendations

Recommendation 4.1: (See TOR 4, p. 16)

That Victoria invests in further research to improve the content of community messaging through the Bushfire and Natural Hazards Cooperative Research Centre (or its successor).

Recommendation 7.3 (See TOR 7, p. 19)

That the Victorian Government undertake an audit of the state's implementation of the 14 goals set out in the National Bushfire Management Policy Statement.

Recommendation 8.1: (See TOR 8, p. 21)

That the Victorian Government work Local Governments to set state-wide guidelines for urban planning in wildfire-prone areas to help reduce the community impacts of future wildfires.

Recommendation 11.1: (See TOR 11a, p. 26)

As the best way to reduce wildfire risks to human life and property is to contain and extinguish fires as soon as possible, the Victorian Government should add and promote the importance of this in its emergency response priorities and nominate an objective of controlling fires within 24 hours of detection.

Recommendation: 11.3: (See TOR 11c, p. 27)

That Victoria's Auditor General's Office investigates the ability of land management agencies to meet their management plan objectives through the funded activities of Forest Fire Management Victoria, in the face of longer and more frequent periods of severe fire weather.

Recommendation 11.6: (See TOR 11g, p. 31)

That a new workforce model be developed for Victoria that will meet the needs for operational fire response, relief, and the recovery of communities, firefighters and the environment.

Introduction

The Institute of Foresters of Australia and Australian Forest Growers

The Institute of Foresters of Australia and Australian Forest Growers (hereafter referred to as 'the Institute') is the independent national body representing Australia's forest scientists, technicians, growers and managers with professional and practical expertise in forest and plantation management.

The Institute is governed by an elected voluntary Board and has active members and in all Australian States and Territories. A requirement of professional level membership is tertiary qualifications in forest science or a closely related scientific discipline, or alternatively, extensive practical experience in forest or plantation management or forest science. The age and experience profile of the Institute's 1,000-plus members ranges from new graduates to retired men and women with over 50 years of experience in land and park management in Australia.

The Institute's members are employed in a wide variety of positions including in native forest, plantation and national park management, research, bushfire management, land care, education, public service administration, private land forestry, and associated wood-based industries. Fires are a day-to-day preoccupation of many of the Institute's members either through their practical work in forests or plantations; through involvement in research; or in the administration of forest/plantation management agencies or companies.

Foresters and forestry practitioners have led the field of fire management and research in Australian forests over many decades and there are linkages and collaboration with professionals engaged in these activities elsewhere in the world. Most Victorian foresters have had personal responsibility for bushfire mitigation and suppression at some stage during their career. They have generally also gained far more experience and understanding of fire in the natural environment than other firefighters, largely through the operational use of fire during prescribed burning operations for silvicultural or conservation purposes, and for fuel reduction.

The Institute is fortunate to have amongst its members some of Australia's more knowledgeable and experienced State forest and national park fire managers, and fire researchers.

Our support for the Independent Inquiry

The Institute welcomes this Independent Inquiry as an opportunity for long overdue improvements to Victorian forest fire management.

We believe that state government policies on forest fire management, over at least the past 20-years, have been overly influenced by urban-based political imperatives rather than the need for responsible land management that minimises the threat of fire.

We would also point out that we have made similar submissions to a number of previous inquiries and Royal Commissions and have subsequently watched with concern as recommended changes have not been fully implemented. We sincerely hope that this Inquiry leads to effective improvements to state government and agency forest and fire policies.

This submission

This submission provides specific recommendations in response to the Inquiry's Terms of Reference from the perspective of professional forest managers and scientists. If required, it can be supported by a verbal presentation to the Inquiry. If this was to occur, the Institute would be pleased to respond to any questions that this submission may have raised.

Background

The Institute and fire

The Institute is one of the few organisations to have developed formal national policies on bushfire/wildfire management and the ecological role of fire in Australian forests and woodlands. These policies have evolved since they were first developed 40 years ago. The current Policy Statement 3.1, "The Role of Fire and Its Management in Australian Forests and Woodlands" represents our thinking and approach to forest fire and underpin this submission (see attached Appendix 1).

The Institute also publishes a quarterly peer-reviewed scientific journal – *Australian Forestry* – which includes many fire-related research articles, thereby adding to the store of fire science knowledge.

Basis for this submission

Our contribution to this Inquiry is founded on the following factors:

Training, experience and responsibility

Since the early 1900s fire management in Australian forests (including woodlands) has predominantly been the responsibility of forestry agencies managed almost exclusively by professional foresters. Most Institute members have received university-level training in the science underlying bushfire behaviour, fire suppression and prevention, as well as in fire ecology, and land use planning which incorporates forest fire management.

Many Institute members spend their entire careers in field-based forest, park and plantation management roles where wildfire prevention and suppression are day-to-day preoccupations. This includes practical experience with prescribed burning for ecological, silvicultural, or fuel reduction purposes.

Pioneers in bushfire research and operational application

Professional foresters have pioneered and become leaders in nearly every aspect of forest fire research and applied management under Australian conditions. This includes research into fire behaviour and fire prevention, and its application via prescribed fuel reduction burning, fire suppression, bushfire safety, fire training, fire ecology and fire weather forecasting. Foresters were also instrumental in introducing aviation into Australian fire management.⁶

Historical lessons learned

Australian foresters know the history of wildfire disasters in this country – from Black Friday in 1939, Ash Wednesday in 1983, the 2003 Alpine fires; the Black Saturday fires of 2009, the Eyre Peninsular and south-east forest fires in South Australia in 2006, the Dwellingup and Karridale Fires in Western Australia in 1961, and the Hobart (1967) and Sydney (1994) fires. Many Institute members fought these fires, and took part in subsequent inquiries that have aimed to improve forest fire management to minimise their re-occurrence.

Professional concern for environmental and community values

Foresters have a professional concern for Australia's forested lands and parks and the values that are threatened by high intensity wildfires. At the same time, we are also members of the community, and wish to see land management practices which effectively strive to protect human life and property from the ravages of fire.

⁶ Rolland, D. (1996) *Aerial agriculture in Australia : a history of the use of aircraft in agriculture and forestry*. ISBN 0 646 24840 5

Response to selected Inquiry Terms of Reference

Note: The Institute has made no response to the following Terms of Reference:

TOR 3: Effectiveness of declaring a State of Disaster

TOR 5: The timeliness and effectiveness of the activation of Commonwealth assistance

TOR 10: Effectiveness of Victoria's Code Red Day arrangements

TOR 12: Review support available to staff and volunteers

TOR 13: Consideration of the effectiveness of existing administrative and funding mechanisms

TOR 1: Effectiveness of emergency management command and control and accountability arrangements in Victoria.

Emergency management arrangements in Victoria, as documented in the Emergency Management Manual Victoria (EMMV)⁷, provide for coordination amongst the responsible organisations and those people in responsible roles. However, the effective implementation of these arrangements relies upon people with the skills and capability to follow the documented arrangements.

The EMMV (Part 3, Section 2.4) lists six 'State emergency management priorities' which:

... focus on the primacy of life and the issuing of community warnings and information, in order to assist people to make informed decisions about their safety.

It is assumed that all of these priorities are of equal importance to the Government and that, depending upon the nature of an emergency, the appropriate ones will receive due attention.

It is noted that four of these EMMV's State emergency management priorities are:

- *Protection of critical infrastructure and community assets that support community resilience*
- *Protection of residential property as a place of primary residence*
- *Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability*
- *Protection of environmental and conservation assets that considers the cultural, biodiversity, and social values of the environment.*

The effectiveness of the emergency management arrangements that deal with command, control and accountability depends upon:

1. the objectives laid out to those carrying responsibility for the emergency, and
2. whether, or not, those appointees have the skills and ability to fulfil their responsibilities.

The Institute is not in a position to comment, at this stage, on whether specific, measurable, achievable, relevant and time-bound objectives were documented for those carrying responsibility for Victoria's 2019-20 forest fires. It expects that this Independent Inquiry shall, through its investigative powers, be able to make a reasonable determination on that.

Likewise, the Institute relies upon this Inquiry to identify whether those appointed had the relevant forest fire management skills and experience to fulfil their role of responsibility.

⁷ Emergency Management Manual Victoria: <https://www.emv.vic.gov.au/policies/emmv>

Unfortunately, there appears to be a trend of full-time fire professionals from urban and rural agencies acting beyond their sphere of expertise to influence or dictate forest fire management policies and wildfire suppression strategies in forests. This is exacerbated when those occupying senior roles in managing Victoria's national parks, Crown lands and State forests are not sufficiently skilled nor experienced in forest fires. Under these circumstances, it is highly questionable as to whether such managers can provide direction when wildfires burn across Victoria's fire-prone forests.

In his 1939 Victorian Bushfires Royal Commission report, Judge Leonard Stretton raised the desirability of the Forests Commission Victoria being independent of politics for the expenditure of public funds, rather than it being directed by ministerial authority:

... Forestry being a science and its practice an art, understandable only by technicians, it is undesirable that control of moneys to be expended upon the maintenance and protection of forests should be given to a person who, in forestry matters, is a layman.

The same observation could be made for forest fires being controlled by other than a qualified and experienced forester.

In regard to medical health, we demand a specialist physician for an operation in preference to a general practitioner. We all expect medical professionals to work collaboratively to provide the best level of care for us, each acknowledging that others have more knowledge and experience in separate fields of medicine. Why should we think differently about fires? There are many types of fires (e.g. structural, marine, grass, scrub, coal, peat, and forest and plantation) which can be grouped into three main categories – urban, rural and forest. Each type of fire requires different levels of knowledge and experience for prevention and suppression.

Given that poor policies and suppression strategies in relation to wildfire can have tragic consequences, it is essential that fire agencies or organisations collaborate based on their respective expertise, rather than trying to dominate in areas that are outside their expertise.

Recommendation 1.1:

That in order to evaluate the effectiveness of emergency management command, control and accountability arrangements in Victoria, this Independent Inquiry into the 2019-20 Victorian Fire Season, investigates whether:

1. specific, measurable, achievable, relevant and time-bound objectives were framed and documented for those occupying responsible positions during the 2019/20 forest fires, and if
2. people appointed to those responsible positions possessed the skills and ability to fulfil their responsibilities.

In the decades prior to the 2019-20 fires, successive Victorian Governments have centralised their land management functions into large regional centres, effectively reducing the numbers of field-based personnel managing the public forest estate from nearby small towns. This has contributed to the general population decline in rural areas creating economic difficulties for many businesses, resulting in fewer local jobs for younger people thereby forcing many to move away in search of employment.

In many rural areas this decline has significantly reduced the capacity of the volunteer-based Country Fire Authority to retain existing members and recruit new members; and has also reduced the capability to access local machinery required to fight wildfires.

History has shown that decentralised forest and park management supported by locally-based equipment, greatly improves the capability of rural and remote communities to:

- manage forest fuel levels for wildfire mitigation;
- undertake prescribed burning to maintain and enhance biodiversity;

- maintain and improve the forest access network for rapid first attack on wildfires; and
- optimise the efficiency and effectiveness of firefighting (including non-local resources, such as Defence Force personnel) during large-scale bushfires through leadership informed by local knowledge.

We are aware that the emergency response to the 2019-20 fires in East Gippsland was primarily managed from Bairnsdale, which is up to several hundred kilometres away from the extremities of these fires. The Institute does not believe that such a centralised emergency management approach is as effective as command and control arrangements that adhere to the principle of subsidiarity, whereby important operational decisions are made by appropriate appointees located close to the action with a better appreciation of the situation.

Recommendation 1.2:

That the Victorian Government:

- reinstates permanently decentralised professional land management staffing levels in smaller townships distant from large regional centres to maintain a cohort of locally based agency personnel with detailed geographic and fire knowledge of our parks, forests and Crown lands; improve engagement with local communities; and help safeguard rural and remote economies;
- rearranges command and control functions for emergency wildfire response based on the principle of subsidiarity whereby decision-making is best undertaken from as close as possible to the emergency location.

TOR 2: Effectiveness of Victoria’s operational response to the 2019-20 fire season

There are various ways in which the effectiveness of response to bushfires can be assessed, including:

- The state of the post-fire landscape; including the impact on ecosystems and wildlife;
- The impact of the bushfires on human life and property, including the personal impacts on CFA volunteers;
- The state-wide economic impacts, including the impact on tourism and other rural industries.

An assessment based on any or all of these measures would not paint a flattering picture of the operational response to the 2019-20 bushfires.

To be fair, there can be circumstances where underlying drought and unnaturally frequent incidences of dangerous fire weather can overwhelm the very highest standards of operational response by firefighting agencies. Therefore, the key to objectively assessing the effectiveness of operational response is to determine where the 2019-20 fire season sits in terms of underlying and day-day conditions that determine the degree of difficulty in responding to bushfires.

The far eastern regions of Victoria which experienced massive bushfires in 2019-20 – while certainly in the grip of severe drought and subject to periods of dangerous fire weather – also experienced some lengthy periods favourable for firefighting. In East Gippsland, a lightning storm ignited 48 fires on November 21st 2019. While it was a commendable effort to quickly contain and control 44 of these fires, the remaining four fires burning north and north-east of Bairnsdale, defied control efforts for 5 weeks before dangerous fire weather on 30 December transformed them into uncontrollable conflagrations that were ultimately responsible for most of the huge area of the region’s forests that were burnt.

The inability of the FFMV to control these four fires – at W Tree, Ensay, Bruthen and Barmouth – despite at least a month of favourable fire weather conditions, is incomprehensible to the Institute’s oldest and most experienced members, especially given the far more technologically advanced firefighting tools that are now available compared to the past.

In trying to understand what went wrong, our members have been made aware of a range of alleged concerns arising from the response to the 2019-20 wildfires in East Gippsland, including:

- That despite it being a drought year in which the fire season was likely to start earlier than usual, FFMV had not completed the training of its casual summer fire crews when the major lightning event ignited over 40 fires in East Gippsland on 21st November;
- That at least one logging contractor with decades of firefighting experience was told by FFMV prior to the fire season, that his machinery would no longer be required for firefighting because of Victorian Government plans for a phased closure of the timber industry – noting that two of the four small lightning strikes that eventually burnt through East Gippsland would reportedly have been contained in the first 24-hours if more machinery had been available;
- That FFMV elected to take no direct action on one of these fires as it burnt slowly for several weeks under benign weather conditions in the Snowy River National Park, reportedly because they didn't want to disturb park values by conducting backburning that could have contained the fire to a much smaller size. By the time backburning finally began, the fire was much larger and within a few days dangerous weather conditions arose making the fire uncontrollable. It was this fire which eventually burnt through Goongerah, threatened Cann River and other small settlements, and burnt most of the forest north of the Princes Highway;
- That the fire which eventually burnt along the coast and into Mallacoota went undetected for several days after it started just south of the Princes Highway near the Wingan River, and grossly inadequate resources were assigned to it thereby making it impossible to contain while it was small;
- That FFMV did not task ground-based firefighters to black-out 'dead' fire edges after initial rain events had halted fire spread, preferring instead to just keep water-bombing every smoke that emerged. If true, such action is no substitute for ground-based mopping-up of still burning material, particularly at the beginning of summer, and it is only by good luck that usually regular rain events prevented the fires in the alpine areas from reigniting;
- That the priority afforded to felling so-called 'killer trees' along roads and tracks to be used by fire-fighters diverted effort away from and may have even delayed first attack on some fires; and
- That on several East Gippsland fires, contracted machinery operators were directed by FFMV to work only normal 'business hours' thereby indicating a lack of urgency to contain fires by not taking advantage of the evening, after-dark, and early morning hours when dampened fire behaviour offers the best opportunity to gain control.

We stress that these concerns have been heard second-hand in most instances, and so remain unverified. However, we believe that they should be investigated by this Independent Inquiry as otherwise they collectively suggest that the effectiveness of the operational response to Victoria's 2019-20 bushfires may have been seriously compromised by a lack of perspective in relation to firefighting risk, environmental risk, and/or operational capability.

From the perspective of an informed but mostly arms-length observer, the Institute believes that while some of the operational response to the 2019-20 fire season was adequate, there are deep concerns about aspects of the firefighting strategies and practices, especially on the East Gippsland fires, which may reflect a lack of perspective around firefighting priorities and what constitutes acceptable risk. Note: The section in response to TOR 11 (p. 26) contains further discussion about firefighting concerns.

Recommendation 2.1:

That this Independent Inquiry seriously investigates the strategies, tactics, and practices employed in fighting the recent 2019-20 East Gippsland wildfires with a view to learning lessons to improve future forest fire suppression. Such an investigation should be conducted by experienced forest fire incident controllers who are independent of Forest Fire Management Victoria.

TOR 4: State evacuation planning and preparedness processes/practices and their effectiveness with an emphasis on remote/isolated communities and Victorian peak holiday season locations.

The 2009 Victorian Bushfires Royal Commission's recommendation no.5 stated:

The State introduce a comprehensive approach to evacuation, so that this option is planned, considered and implemented when it is likely to offer a higher level of protection than other contingency options. The approach should:

- *encourage individuals—especially vulnerable people—to relocate early,*
- *include consideration of plans for assisted evacuation of vulnerable people*
- *recommend 'emergency evacuation'.*

This precipitated a changed approach to community warnings within Victoria. During the 2019-20 fire season there was an emphasis by authorities in the media that leaving is the safest option. Unfortunately, communicating a simple message in response to a complex issue does not appear to be bringing about the desired approach to the personal safety of all categories of people in all circumstances.

The Bushfire CRC research post-'Black Saturday' fires which examined more than 600 survivors, their decisions and actions was combined with the Victoria Police investigation into the 173 deceased persons by police investigator Sergeant Doug Hart.⁸ Using this valuable resource, the Australasian Fire and Emergency Services Authorities (AFAC) developed a guideline⁹ to assist emergency service agencies to communicate the report's findings to communities with the aim of improving fire safety. The success of this cooperative approach to community safety was documented in a case study report.¹⁰

More recently, Bushfire and Natural Hazards Cooperative Research Centre's (BNHCRC) research conducted by Dr Josh Whittaker¹¹ revealed that many people only leave home when they feel threatened upon actually seeing the fire. This indicates the complexity of providing messages that bring about the right response by different people facing a variety of fire circumstances.

Clearly more research is needed on the content of community messaging to ensure that an appropriate community response is heeded for different levels of fire behaviour.

Recommendation 4.1:

That Victoria invests in further research to improve the content of community messaging through the Bushfire and Natural Hazards Cooperative Research Centre (or its successor).

⁸ Victoria Police (2014) *Lessons Learnt from the Black Saturday Bushfires: Information for fire agency managers of community safety.*

⁹ Community Safety Messaging for Catastrophic Bushfires: Lessons Learnt from Black Saturday Bushfires, Victoria 2009 <http://www.afac.com.au/insight/doctrine/article/detail/community-safety-messaging-forcatastrophic-bushfires-lessons-learnt-from-black-saturday-bushfires-victoria-2009>

¹⁰ AFAC. (2017). Learning lessons from research insights. AFAC Case Study. AFAC, Melbourne, Victoria,

¹¹ Whittaker J. (2019) *Ten years after the Black Saturday fires, what have we learnt from post-fire research?* Australian Journal of Emergency Management Volume 34, No. 2, April 2019 33

TOR 6: 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.

The Institute considers that there are two aspects to fire season preparedness:

- immediate actions undertaken prior to the 2019-20 fire season; and
- longer-term actions over the years and even decades preceding a particular fire season.

Immediate fire preparedness

Short term fire preparedness can include community information, education, and engagement. We have no comments to make on these matters in relation to the 2019-20 fire season, except to question whether these actions are being given a greater priority than arguably more important immediate actions that can reduce the potential for wildfires to physically impact on communities.

Pre-season training of casual summer fire crews is another component of immediate fire preparedness. In TOR 2 (p. 14), we have already registered our concern about an (unverified) allegation that the casual summer fire crew was not fully trained when the fire season effectively began in late November 2019 with over 40 fires ignited by lightning in East Gippsland.

Longer-term fire preparedness

Longer term fire preparedness includes:

- annual levels of fuel management, chiefly through prescribed burning, but also through other means;
- maintenance of forest road and track access networks; and
- acquired levels of fire management expertise and learning.

It has been well documented in the 2009 Victorian Bushfires Royal Commission, as well as other bushfire inquiries since 2003, that annual levels of fuel management in Victoria are inadequate, and that this has been a major contributing factor to the increased incidence of huge mega-fires experienced since 2003.¹²

Arguably, the nation's most successful land management regime has been that applied in the forests of south-western WA since the 1960s, whereby 6 – 8% of the forest has been annually fuel reduced. This means that at any point in time, between 30 – 40% of the forest contains fuels of less than 5 years of accumulation.¹³ Under these circumstances, any wildfire generally runs into fuel reduced areas where it can be more easily controlled. This fuel management regime has kept WA's south western forests relatively free of the mega-fires that have afflicted SE Australia's forests, especially over the past 20-years.¹⁴

In Victoria since the mid-1990s, the rolling 10-year average of annual fuel reduction burning has varied from 80,000 – 150,000 hectares of its 7.7 million hectares of public forest. This equates to 1 – 2% of the public forests being annually fuel reduced over the past 25-years (or ~1.5 – 2.7% of the public forest types that are suitable for burning). This is clearly insufficient to achieve the wildfire mitigation benefit being enjoyed by WA, notwithstanding that it is harder to achieve the same

¹² G.W. Morgan, K.G. Tolhurst, M.W. Poynter, T. Blanks, N. Cooper, T. McGuffog, R. Ryan, M. Wouters, N. Stephens, P. Black, D. Sheehan, P. Leeson, S. Whight and S.M.Davey (2020), *A History of Prescribed Burning in South-eastern Australia*. Australian Forestry, Vol 83:1, 4-28, April 2020, DOI: [10.1080/00049158.2020.1739883](https://doi.org/10.1080/00049158.2020.1739883)

¹³ Burrows N. and McCaw L. (2013), *Prescribed burning in southwestern Australian forests*, The Ecological Society of America: *Frontiers in Ecology and the Environment*, Volume 11 Issue s-1, e25-e34 (August 2013)

¹⁴ *Burning Issues*, by M. Adams and P. Attiwill, CSIRO Publishing (2011)

proportional rate of annual fuel reduction in Victoria's far more ecologically and topographically variable forest estate.¹⁵

Further to this, the expansion of national parks at the expense of former State forests has – especially in remote locales – been generally accompanied by a contraction in the size and quality of the road and track network due to a mix of park management philosophy and a lack of budgetary resourcing.¹⁶ This has made it harder to safely confine prescribed fuel reduction burns to planned boundaries, and at times has seriously impeded the capability to quickly access and attack wildfires when they are small and most controllable.¹⁷

Recommendation 6.1:

That the Victorian Government increases expenditure and commitment to off-fire season forest management to mitigate wildfires, especially through increasing the annual level of fuel management and by reinstating and upgrading road and track networks, especially in remote area forests.

Fire preparedness is also being hampered by an acknowledged lack of forest fire management expertise amongst the responsible government agencies. Up until around 1990, most Victorian public forests were managed by trained and experienced foresters whose careers had been heavily integrated with fire. Nowadays, with around 60% of Victoria's public forests in park and conservation reserve tenures, this is no longer the case and there have been reported instances where personnel placed in-charge of major forest fires have lacked the training and necessary experience to hold such positions. Indeed, it is now not uncommon for personnel from non-forest/land management agencies, with little or no wildfire experience, to be placed in-charge of wildfire response.¹⁸ Unnecessarily large or damaging wildfires have resulted from such poor decisions.

The reduced reliance on the forestry profession for forest fire management is also rooted in changes to the tertiary education of forested land managers, such as professional foresters and park rangers, which has largely been reduced to generic 'environmental science' over the past 20-years. The politicisation of public land management has led to forestry being demonised as a vocation solely concerned with timber production. Accordingly, the profession's critical role in managing the wildfire threat is now largely downplayed or ignored.

Despite this, Victoria's forest managers still collectively have the knowledge and practical expertise to conduct prescribed burns for wildfire mitigation and other land management functions. What is lacking is sufficient numbers of trained professionals and competent field staff to deal with the complexities of fire and land management issues in a comprehensive way. In a land where bushfires are ubiquitous, it is incomprehensible that senior park and forest managers are often no longer required to have forest fire management knowledge and skills.

Exacerbating the problem is that bushfire research in Australia has undergone major changes in scale and scope over the past two decades. National research collaboration increased substantially with the establishment of the Bushfire Cooperative Research Centre (Bushfire CRC) in 2003, reflecting an expanding research agenda with greater emphasis on social and health

¹⁵ G.W. Morgan, K.G. Tolhurst, M.W. Poynter, T. Blanks, N. Cooper, T. McGuffog, R. Ryan, M. Wouters, N. Stephens, P. Black, D. Sheehan, P. Leeson, S. Whight and S.M.Davey (2020), *A History of Prescribed Burning in South-eastern Australia*. Australian Forestry, Vol. 83:1, 4-28, April 2020, DOI: [10.1080/00049158.2020.1739883](https://doi.org/10.1080/00049158.2020.1739883).

¹⁶ Ryan M. and Runnalls R. (2015), *Does timber harvesting in natural forests have any influence on fire management at the landscape level?* Unpublished paper presented to the Institute of Foresters of Australia Biannual Conference, Coffs Harbour, 2015.

¹⁷ *Goongerah-Deddick Trail Fire January – March 2014: Community Report*, Emergency Management Victoria, July 2014

¹⁸ Teague B, McLeod R, Pascoe S. 2010. *The 2009 Victorian Bushfires Royal Commission Final Report (Summary)*. Melbourne, Australia: Parliament of Victoria.

sciences and a more active role for the Bureau of Meteorology in climate and weather research. The Bushfire CRC also created linkages between the university sector and the emergency management sector through engagement with the Australasian Fire and Emergency Service Authorities Council (AFAC) which represents urban fire services and other emergency response agencies. Major wildfires in south-eastern Australia in 2003, 2006/07 and 2009 sharpened the focus for delivery of research outputs from the Bushfire CRC.

In 2014, the Bushfire CRC was succeeded by the Bushfire and Natural Hazards CRC (BNHCRC). The BNHCRC's broader all-hazards approach has translated into a stronger research focus on emergency response at the expense of fire behaviour and ecosystem management. However, this all-hazards approach has strengths in research and its translation into practice, including collaboration on shared issues around climate and weather modelling, public warnings, remote sensing, and the impact of multiple hazard events. With the BNHCRC's current funding due to expire in mid-2021, there is considerable urgency to determine appropriate new arrangements that ensure on-going co-ordination and collaboration of independent applied wildfire research and technology development.

Recommendation 6.2:

That in the interests of long-term fire preparedness, the Victorian Government:

- supports the coordination and collaboration for independent applied wildfire research and development to ensure continuity of effort and expertise beyond the life of the current Bushfire and Natural Hazards Cooperative Research Centre;
- works with the Commonwealth Government to provide financial support and incentives to appropriate tertiary institutions to revive specialist field-based applied education courses for forest and fire management; and
- works with the University of Melbourne to revitalise the Victorian School of Forestry at Creswick as a Centre for Excellence in Learning and Research for Forest and Fire Management.

TOR 7: Consider all challenges and implications for bushfire preparedness arising from increasingly longer and more severe bushfire seasons as a result of climate change.

Public commentary around climate-induced changes to the length and severity of bushfire seasons has partly centred around the challenges that this creates for conducting fuel reduction burning by narrowing the window of opportunity. This has often been framed in the context of blanket opposition to, or a lack of enthusiasm for, fuel reduction burning as a fire management tool.

The Institute believes that the trend towards longer and more severe fire season heightens (rather than diminishes) the importance of managing fuels. While it is not a given that longer fire seasons make it impossible to do more fuel management, it does create challenges about doing it safely.

The Institute believes that meeting this challenge will necessitate:

- a reversion back to doing more broadscale prescribed burning for fuel reduction and environmental objectives in remote areas in lieu of the current 'residual risk' approach which concentrates a reduced amount of burning in strategic areas adjacent to private and community assets (see also TOR 9, p. 22);
- an innovative approach to prescribed fuel reduction burning outside the traditional seasons, such as extending into either side of winter given an expectation that it may also become drier; and burning later into the evening when conditions allow during the traditional burning seasons; and

- a partial shift to other non-burning methods of fuel management, especially the use of mechanical methods that mulch or remove the fuels, especially in close proximity to private or community assets where burning risks are problematic.

Reportedly Forest Fire Management Victoria (FFMV) is already extending the burning season into winter months and burning into the evening to a limited extent in parts of East Gippsland; while mechanical fuel reduction has also been trialled in the same region.

A major challenge will be in dealing with the increased costs of widely implementing these approaches. However, given the current over-reliance on aircraft use in firefighting, considerable amounts of money could potentially be saved and redirected towards fuel management and employing more field staff if aircraft-use was reduced in accordance with a proper cost-benefit assessment.

The Victorian Government has shown a lack of enthusiasm for fuel reduction burning and has at times justified its stance by citing an escaped burn that destroyed three houses near Lancefield in September 2015.¹⁹ Reportedly, this attitude is being reflected in FFMV's reduced operational budgets for off-season fire management which reportedly in some places is forcing fuel reduction burning to be largely restricted only to office hours (ie. 8 am – 5 pm) on week days.²⁰ Clearly there is plenty of scope to do more fuel management more safely if there was sufficient Government support and funding to allow statewide 7-day-a-week, all-hours prescribed burning to enable full advantage to be taken of suitable fuel and weather conditions. This would also require the Victorian Government to dispense with its current attitude towards the level of acceptable risk it allows for prescribed burning.

A more general concern about bushfire preparedness in Victoria (and throughout SE Australia) is the gradual 20-year shift to a forest fire management approach strongly weighted towards emergency wildfire response in lieu of the traditional approach that was based on a reasonable balance between off-season wildfire mitigation (such as fuel reduction) and in-season wildfire suppression. This shift is strongly correlated with the sharply increasing expense of using aerial firefighting technology.

In this we have followed the USA where the domination of aircraft-based emergency wildfire response arose because of a need to protect burgeoning suburbs, towns and other assets that were increasingly being built adjacent to or amongst flammable forests. But while this justified the approach, it is generally accepted to be failing to reduce the incidence, extent and severity of large wildfires because:

- it is focussed on treating the symptoms rather than addressing factors that underpin fire risk;
- massive expenditure on aircraft reduces the budgetary resources for off-season activities such as fuel reduction and maintaining forest access that is integral to quickly containing wildfires while they are small;
- aerial water-bombing under suitable operating decisions, can be useful at saving houses and other community assets, but is relatively ineffective in controlling most forest fires (once they are larger than one hectare); and

¹⁹ Both the Victorian Premier, Daniel Andrews, and his Minister for Police and Emergency Services mentioned the escaped Lancefield burn in media appearances during the 2019-20 bushfires. A former Victorian IFA member who planned and managed that burn has previously noted that the Government should bear some responsibility for its escape by failing to provide sufficient over-time funding to employ the requisite workforce for thorough black-out and patrol on a public holiday weekend.

²⁰ Personal comments from IFA members.

- an over-reliance on aerial water/retardant-bombing is partly displacing ground-based firefighting which, although carrying higher fire-fighter risks, is integral to containing wildfires.^{21,22}

These consequences are now evident in Australia, and according to some researchers and commentators they foster a self-sustaining cycle of massive wildfires which is regularly reinforced because each big fire increases community and political demands to further expand the fleet of firefighting aircraft. Recent research in Mediterranean countries, refers to this phenomenon as the 'firefighting trap' because nowhere in the world has increasing the numbers of firefighting aircraft ever reduced the incidence, extent, and severity of large forest fires.²³

Large Air Tankers as used during the 2019/20 fire season are enormously expensive and have limitations in their use. While fires were threatening townships in January, the media successfully encouraged the Commonwealth Government to provide more funds (\$11m) to the fire agencies, so they could contract four more large aircraft at short notice. However, to date no independent evaluation of their cost-effectiveness on the season's fire suppression outcomes has been made publicly available.

The Institute believes that Victoria could generate savings from reducing the expenditure on operational fire-fighting by increasing its annual program of prescribed burning. The additional expenditure on conducting an enlarged prescribed burning program should be more than offset by the savings generated through reducing expenditure on large air tankers, which currently dominates the cost of dealing with the fire threat.

Dexter and Macleod (2017)²⁴ have previously raised concerns that forest fire management on Victoria's public land are neither being effectively nor efficiently applied nor fully and transparently documented, and have called for an investigation by the Victorian Auditor General's office. Similar concerns have been voiced in other jurisdictions.

It is hoped that an outcome of this Independent Inquiry shall be a direction to the Victorian Auditor General's office to undertake such an analysis. To assist this Inquiry in fulfilling its Terms of Reference, a wider audit of Victoria's implementation of the 14 National Goals contained within the National Bushfire Management Policy Statement for Forests and Rangelands²⁵ would be very revealing.

Recommendation 7.1:

That the Victorian Government increases expenditure and commitment to off-fire season fuel management to mitigate the adverse impacts of wildfires and to reinstate a more equitable resourcing balance with in-season emergency response to wildfires.

Recommendation 7.2:

That the Victorian Government conduct an independent evaluation of the cost-effectiveness and efficiency of the aerial fire suppression resources used on the 2019-20 bushfires, including the potential for savings to be generated for use in improving bushfire preparedness.

²¹ Pyne, S., *The Still Burning Bush*, Scribe Publications (2006)

²² Williams, J.T. (2013), *Exploring the onset of high-impact mega-fires through a forest land management prism*, *Forest Ecology and Management*, Volume 294: 4 – 10, April 2013

²³ Moreira et al (2020), *Wildfire management in Mediterranean-type regions: paradigm shift needed*, *Environmental Research Letters* 15 011001

²⁴ Dexter B. and Macleod D. (2017): *What is the True Cost of Forest Fire Management on Public Land in Victoria? What actions are required to increase transparency and accountability in reporting these costs in the public interest?* ISBN 978-0-9942531-4-9 Printed paperback (spiral bound) with CD-ROM. Accessible at:

https://members.professionalsaustralia.org.au/Forestry/About_the_IFA/forest_fire/Fire_TrueCostandBriefing_2019.pdf

²⁵ Forest Fire Management Group (2014), *National Bushfire Management Policy Statement for Forests and Rangelands*. ISBN: 978-0-646-58481-2. Accessible at:

https://knowledge.aidr.org.au/media/4935/nationalbushfiremanagementpolicy_2014.pdf

Recommendation 7.3:

That the Victorian Government undertake an audit of the state's implementation of the 14 National Goals set out in the National Bushfire Management Policy Statement.

TOR 8: In the context of bushfire preparedness, assess the readiness and responsibilities of statutory agencies, Local Government and State Government bodies.

Bushfire preparedness has been defined by the Australasian Fire and Emergency Services Authorities (AFAC) as: *All activities undertaken in advance of bushfire occurrence to decrease its extent and severity and to ensure more effective fire suppression.*²⁶ This includes prescribed burning for wildfire mitigation, firefighter training, operational and logistics planning, equipment procurement, and infrastructure development and maintenance (e.g. road/track network, water storages; helipads). [Note: We acknowledge that TOR 6 refers to 'bushfire preparedness' as also including community education and other forms of engagement].

TOR 6 already recommends increasing prescribed burning for wildfire mitigation on public lands. The same priority should be afforded to prescribed burning by Local Government, statutory agencies, and other State Government bodies.

Given the State Government's greater emphasis on the evacuation of residents when wildfires threaten, safe egress must be assured. Hence, roadside fuels should be increasingly reduced as part of the State's preparedness for approaching fire seasons. Over time such focus has had peaks and troughs. The peaks in removal of roadside fuels have typically occurred immediately following major wildfires. However, as subsequent years have passed without a major wildfire in Victoria, this priority has always tended to wane.

CFA brigades historically did much pre-fire season roadside burning, although, this has reduced in recent years as slashing has been increasingly used. Both are effective in reducing fuels but burning has additional benefits in removal of weed species, encouraging native flora and providing fire experience for CFA members. This active training refreshes the old hands and initiates new recruits in preparation for the upcoming fire season.

The Institute is not in a position to pass judgement on how prepared the statutory agencies, Local Government and State Government bodies were prior to the 2019/20 fire season. However, Victoria's extremely fire-prone environment necessitates Local Government bushfire preparedness beginning at the urban planning stage. Trying to retrofit fire prevention and preparedness after developing urban environments adjacent to native forest (on either public and private land), and other rural lands, is fraught with danger.

When prescribed burning for wildfire mitigation is conducted adjoining urban development the risks are magnified. But who should shoulder the risk and the costs? Is this a transfer of risk? Naturally, conflicts arise.

Some of the conflict over the use of prescribed burning to reduce wildfire risk, would have been avoided through improved urban development planning. As a community living in a highly fire-prone and fire-adapted landscape, there is an imperative to address where and how homes are built and to accept that we must live with fire. This requires sharing of responsibilities between all levels of government and the most at-risk communities.

Recommendation 8.1:

That the Victorian Government work with Local Governments to set state-wide guidelines for urban planning in wildfire-prone areas to help reduce the community impacts of future wildfires.

²⁶ AFAC (2012) Bushfire glossary. Available at: www.fireandbiodiversity.org.au/_literature_196883

TOR 9: 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.

To achieve sufficient ‘bushfire preparedness’ all of the above methods are needed in far larger measures (than are currently reported) to offer significant protection for life, property and assets, and to minimise wildfire impacts on ecological and cultural values.

Prescribed fuel reduction (or cool) burning – Residual risk versus Area-based annual targets

The most cost-effective method of achieving broadacre ‘bushfire preparedness’ over proportionally large areas is fuel reduction burning undertaken mostly in autumn in Victoria, but also in the spring (ie. the cool seasons). It is well established that prescribed fuel reduction burning is effective in reducing wildfire intensity and aiding fire suppression.^{27,28,29,30,31} Further to this, there would be thousands of undocumented incidences across Australia where previous prescribed burns have reduced the extent and severity of wildfires.

Despite this, some researchers (as well as environmental activist groups), continue to advocate the cessation of widespread prescribed burning of SE Australian forests in lieu of a focus on ‘fence-line’ burning adjacent to built assets as the best means of reducing community fire risk.^{32,33,34} Contrary to this, other scientists strongly advocate the need to continue broad-scale burning across the wider forested landscape³⁵ as do professional associations representing practising forest and fire managers – i.e. the Forest Fire Management Group (FFMG)³⁶, the Institute of Foresters of Australia (IFA)³⁷ and the Australasian Fire and Emergency Service Authorities Council (AFAC)³⁸

In Victoria, planned and organised programs of fuel reduction burning began in the State’s public forests in around the early-1950s. Over time, the annually treated area steadily grew and peaked in the early 1980s at 470,000 hectares in 1982. By the mid-1980s the annually treated area began to decline, reaching a low point of around 50,000 hectares per annum in the early to mid-2000s.³⁹ This near 20-year decline coincided with a lengthy period of successive bureaucratic restructures and prolonged organisational instability with the responsible land management agencies.

²⁷Billings P. (1981), *Effectiveness of fuel-reduction burning: five case histories*, Forests Commission Victoria, Fire Management Research Report No. 10.

²⁸ Grant S. and Wouters M. (1993) *The effect of fuel reduction burning on the suppression of four wildfires in Western Victoria*. Department of Conservation and Natural Resources. Fire Research Report No. 41.

²⁹ McCarthy G.J. and Tolhurst K.G. (1998) *Effectiveness of firefighting first attack operations by the Department of Natural Resources and Environment from 1991/92–1994/95*. Department of Natural Resources and Environment. Fire Management Research Report No. 45.

³⁰ McCarthy G.J. and Tolhurst K.G. (2001) *Effectiveness of broadscale fuel reduction burning in assisting with wildfire control in parks and forests in Victoria*. Department of Natural Resources and Environment. Fire Management Research Report No. 51.

³¹ Tolhurst K.G and McCarthy G.J. (2016) *Effect of prescribed burning on wildfire severity: a landscape-scale case study from the 2003 fires in Victoria*. Australian Forestry. 79:1–14.

³² Bradstock R.A and Price O.F. (2010) *The effect of fuel age on the spread of fire in sclerophyll forest in the Sydney region of Australia*. International Journal of Wildland Fire. 19:35–45.

³³ Gibbons P. et al (2012) *Land management practices associated with house loss in wildfires*. PLoS One. 7 (1): e29212.

³⁴ Price O.F. et al (2015) *An empirical wildfire risk analysis: the probability of a fire spreading to the urban interface in Sydney, Australia*. International Journal of Wildland Fire. 24:597–606.

³⁵ Adams M. and Attwill P. (2011), *Burning Issues*, CSIRO Publishing, Melbourne, Victoria.

³⁶ Forest Fire Management Group (2014) *National bushfire management policy statement for forests and rangelands*. [accessed 2018 Oct 11]. Canberra (Australia)

³⁷ Institute of Foresters of Australia (2018) *The role of fire and its management in Australian forests and woodlands*. Canberra (Australia). IFA Forestry Policy Statement 3.1

³⁸ AFAC (2015) *Overview of prescribed burning in Australasia*. Report for the National Burning Project – Sub-project 1. Australasian Fire and Emergency Service Authorities Council Limited, Melbourne (Australia)

³⁹G.W. Morgan, K.G. Tolhurst, M.W. Poynter, T. Blanks, N. Cooper, T. McGuffog, R. Ryan, M. Wouters, N. Stephens, P. Black, D. Sheehan, P. Leeson, S. Whight and S.M. Davey (2020), *A History of Prescribed Burning in South-eastern Australia*. Australian Forestry, Vol. 83:1, 4-28, April 2020, DOI: [10.1080/00049158.2020.1739883](https://doi.org/10.1080/00049158.2020.1739883)

After 'Black Saturday', the 2009 Victorian Bushfires Royal Commission recommended a tripling of the then annual rate of fuel reduction burning from 130,000 hectares to at least 390,000 hectares, which equates to 5% of the State's forested public land.⁴⁰ From 2011, an increased rate of burning began to build towards meeting this 5% target despite opposition mounted by environmental groups and some academic ecologists. From the Institute's perspective, most of this opposition was (and continues to be) misguided and almost totally emanates from sources who have never been involved in fuel reduction burning to understand its planning, conduct, nature and extent; and have never fought forest fires to gain a first-hand appreciation of its value in mitigating wildfire extent and impact.

By 2013, the ongoing public debate over fuel reduction burning and the inability of the responsible land management agencies to meet the annual minimum burning target (390,000 ha) recommended by the Royal Commission, led the Victorian Bushfires Royal Commission Implementation Monitor (VBRCIM) to question whether an area-based performance measure would achieve appropriate risk reduction; and whether it was affordable or sustainable.⁴¹ Despite Victoria having prescribed burnt over 250,000 ha during 2012-13 (its highest annual burnt area since 1983), the VBRCIM recommended that the annual burning target be discarded in favour of a strategic risk-based burning approach.

In 2015, Victoria's Inspector-General for Emergency Management (IGEM) also recommended a risk reduction target to better protect life and property and guide wildfire mitigation burning as an alternative to a hectares-based burn target.⁴²

In July 2016, a so-called 'residual risk' approach was introduced into Victoria by FFMV. It prioritised the most at-risk areas for fuel reduction operations with the aim of maintaining the bushfire risk at, or below, 70 per cent of Victoria's maximum bushfire risk. The objective of reducing the level of bushfire risk by at least 30% is the subject of ongoing debate as to whether or not it is an acceptable level of risk reduction. In practical terms, had a 30% level of risk reduction been achieved in Victoria before 2009, about 1,400 houses would have been lost rather than the 2,000 that were actually lost in the 'Black Saturday' fires.

The 'residual risk' concept is also controversial because it has never been fully explained in a published research paper outlining the assumptions and thinking that underpins it. In the absence of this, it is clear that it places far greater weighting on strategic burning along the public-private land interface as giving a greater reduction to community risk; but it prioritises larger population centres to the detriment of small rural communities and remote areas due to the extra weighting given to 'saving' more lives. The 'residual risk' rating also does not consider risks to other values such as economic assets in forestry and agriculture, social and critical infrastructure, or cultural and biodiversity values. Gazzard et al has documented a number of limitations to the modelling, including that it is based on single run one-day fires and so does not account for the multi-day campaign fires have occurred during the 2019-20 fire season.⁴³

The respective weightings assigned to these burning strategies is important given that the 2019-20 fire season reinforced the reality that the largest and most environmentally damaging fires often start in remote country before growing large and sufficiently uncontrollable to eventually threaten human life and property. Under such circumstances, narrow strategic burns conducted along the

⁴⁰ 2009 Victorian Bushfires Royal Commission – Recommendation 26: The State fund and commit to implementing a long-term program of prescribed burning based on an annual rolling target of 5 per cent minimum of public land.

⁴¹ Comrie N. (2013), Bushfires Royal Commission Implementation Monitor, 2013 Annual Report. Melbourne (Australia): Inspector General for Emergency Management, Department of Justice and Regulation.

⁴² IGEM (2015), *Review of performance targets for bushfire fuel management on public land*. Melbourne (Australia): Inspector General for Emergency Management, Department of Justice and Regulation.

⁴³ Gazzard T, Walshe T, Galvin P, Salkin O, Baker M, Cross B and Ashton P, 2020, *What is the 'appropriate' fuel management regime for the Otway Ranges, Victoria, Australia? Developing a long-term fuel management strategy using the structured decision-making framework*, International Journal of Wildland Fire, <https://doi.org/10.1071/WF18131>

private-public land interface may provide little barrier to large intense wildfires throwing spots and embers for long distances (over 20 km) ahead of the fire-front. Experience has shown that a focus on burning adjacent to private land boundaries – while beneficial to the nearby private assets – ultimately increases risks to the broader community by allowing dangerous fuel build-up over the majority of the landscape thereby increasing the likelihood of very large, damaging, severe fires.⁴⁴

When FFMV introduced the ‘residual risk’ concept there were fears that it would lead to a substantial reduction in the annual area of fuel reduction burning given that strategic burning near private land assets is riskier, and therefore more difficult and costly. Concentrating efforts on such burning thereby precipitates a substantial drop in the state-wide annual fuel reduced area being achieved with the available budgetary resources. This has largely come to fruition with Victoria’s annual area of prescribed fuel reduction burning declining sharply since 2016,⁴⁵ from 190,000 ha to 110,000 ha (or from 2.5% to 1.4% of Victoria’s forested land).

In the absence of any detailed explanations of the thinking and assumptions which underpin the ‘Residual Risk’ concept, it appears to favour community protection over and above land and environmental protection – which does not fit well with the objectives of land management agencies expected to adhere to it.

Recommendation 9.1:

That the Victorian Government revisit the ‘Residual Risk’ concept’s underlying thinking and assumptions with a view to revising fuel management programs so that, in addition to prioritising lives and residential properties, they also aim to minimise the impact of wildfires on a broader range of values, such as critical infrastructure, economic assets, rural and remote communities, and ecological biodiversity.

Forest management – non-commercial mechanical fuel reduction

Non-commercial mechanical fuel reduction is the physical removal of fuels using machinery to push or pick-up fuels for subsequent mulching or removal from the targeted site. It is more expensive than fuel reduction burning, but has the advantage of being safer to use in situations, such as in wide strips adjacent to private property or built assets, where burning would carry substantially greater risks. It has the additional advantage of not being subject to weather conditions, therefore enabling it to continue for much of the year.

There has been limited use around at least one East Gippsland township, and an expansion of its use in similar circumstances around the State would be expensive, but would free-up FFMV resources for burning in less difficult and risky situations which should assist in enabling more burning to be achieved throughout the wider landscape.

The extra expense of adopting widespread mechanical fuel reduction could be off-set from savings made by reducing reliance on large aircraft for wildfire response – see TOR 7 (p. 19) – and reducing the need for post-wildfire recovery.

Recommendation 9.2:

That the Victorian Government expand the use of mechanical fuel reduction as a safer tool for strategic areas adjacent to private and community assets where prescribed burning would be inherently risky, difficult and costly.

Forest management – commercial thinning

⁴⁴ Tolhurst K.G. et al. (2013) “Wildland-Urban Interface” to “Wildfire Interface Zone” using dynamic fire modelling. In: 20th International Congress on Modelling and Simulation, MODSIM2013; Adelaide: Modelling and Simulation Society of Australia and New Zealand. p. 290–296.

⁴⁵ G.W. Morgan, K.G. Tolhurst, M.W. Poynter, T. Blanks, N. Cooper, T. McGuffog, R. Ryan, M. Wouters, N. Stephens, P. Black, D. Sheehan, P. Leeson, S. Whight and S.M Davey (2020), *A History of Prescribed Burning in South-eastern Australia*. Australian Forestry, Vol 83:1, 4-28, April 2020, DOI: [10.1080/00049158.2020.1739883](https://doi.org/10.1080/00049158.2020.1739883)

Commercial thinning has been widely used as a fuel reduction measure in densely over-stocked North American conifer forests choked with flammable dead stems and dried needles. However, the eucalypt forests of Victoria differ substantially in their composition, structure, and availability for use from the northern hemisphere's natural conifer forests.

Nevertheless, commercial thinning of densely-stocked advanced regrowth forests in East Gippsland and alpine forests in Victoria has been found to deliver a reduced fuel hazard side-benefit achieved by the physical knock-down of elevated understorey fuels and the off-site removal of bark fuels and woody biomass. Research suggests that the resultant lower fire hazard can last for 15 years.^{46,47}

The limited areas of Victorian forest that are still available for timber production (ie. just 6% of the public forests), and the even smaller sub-set of these that are advanced regrowth growing on topography where commercial thinning is operationally possible; means that it is impractical to consider commercial thinning as a widespread fire management tool, notwithstanding that its incidental benefit could be useful on a small strategic scale in some locales.

Traditional burning practices

The past use of fire by Traditional Owners is acknowledged. Traditional knowledge and burning practices have great potential to contribute to positive social and environmental outcomes. Forest fire management can also be used to reintroduce traditional knowledge to communities where it may have been lost.

Prescribed burning for wildfire mitigation undertaken by State forestry authorities since at least the 1950s, has been based on a similar concept of preventative cool season burning.

While Traditional burning practices have been very successfully re-introduced into the vast and sparsely populated landscapes of northern Australia, Victoria has far more densely populated mixed farming and forested landscapes, with more variable topography. Furthermore, some Indigenous fire practitioners have noted that the heavy fuel loads which are evident across much of the public lands of Victoria, could be a constraint to re-introducing Traditional burning practices.

These factors create difficulties for using Traditional burning practices to the extent needed to make a significant impact on reducing forest fuels at a landscape scale, especially given the limited window of opportunity for safe burning. However, the principles of traditional burning are applicable providing that burning conforms with land management prescriptions.

Recommendation 9.3

Traditional Owners' forest fire management practices should be fostered and re-introduced where possible, complementing existing prescribed burning programs but not replacing them.

TOR 11: In considering effectiveness of Victoria's operational response to the 2019-20 fire season, IGEM should particularly consider:

a) effectiveness of the State's response priorities, including primacy of life;

In the opinion of the Institute, confusion over what constitutes acceptable risk to the primacy of fire-fighter's lives is hampering effective forest firefighting. Safety hazards which were once effectively managed in concert with highly efficient firefighting outcomes, have for some time now become central to a risk-averse operational health and safety culture which has diluted the formerly aggressive approach to forest firefighting. Today's relatively timid, risk-averse response to

⁴⁶ Proctor E. and McCarthy G.J. (2015), *Changes in fuel hazard following thinning operations in mixed species forests in East Gippsland, Victoria*, Australian Forestry Vol.78:4, 195-206 (November 2015).

⁴⁷ Volkova L., Bi H., Hilton J. and Weston C. (2017), *Impact of mechanical thinning on forest carbon, fuel hazard and simulated fire behaviour in Eucalyptus delegatensis forest of south-eastern Australia*, Forest Ecology and Management, 405,92.

wildfires is counter-productive because it increases the likelihood of wildfires burning out-of-control for longer periods, thereby ultimately increasing the threat to human life amongst a greater number of firefighters and the broader community.

The most recent Victorian Emergency Operations Handbook (Edition 5.2, December 2019) produced by Emergency Management Victoria, lists six State emergency management priorities. The first of these priorities is that "*The protection and preservation of life is paramount*" and refers to both the safety of emergency services personnel and community members.

The Handbook also lists 'the Principles of Emergency Management [which] underpin the actions of agencies to address a range of hazards, including fire'. Although it stresses that these principles are not in priority order, the first one listed is "*Primacy of life - The protection and preservation of human life, including the lives of both agency personnel and those of the community, takes priority over all other considerations*".

On the other hand, under its Part 2, Bushfire Readiness and Response section, states that:

"First response (also known as initial response or first attack) to fires and other emergencies will be fast, determined and thorough and will take precedence over normal agency activities."

The Institute contends that the prevailing risk-averse operational health and safety culture has made it difficult to mount a (inherently risky) 'fast, determined and thorough' initial response to fires, especially in remote areas. This is central to reportedly declining use of formerly standard practices such as night-time construction of fire containment lines either by hand or machine; hand-trailing of remote area wildfires where machinery access is problematic, and thorough ground-based blacking-out especially on remote area wildfires. Ultimately the incidence of direct attack on the fire edge has reduced in favour of falling back to roads/tracks and backburning (known as indirect attack), which guarantees larger burnt areas and typically increases the risk of fires becoming uncontrollable by prolonging their duration.

It is also apparent that a lack of experienced machinery operators and on-ground firefighters is a further impediment to fast, determined and thorough initial response to wildfires, given that a lack of confidence translates into a reduced capability to manage operational risks.

Clearly the best way to the reduce bushfire risks to human life and property is to contain, control and extinguish fires as quickly as possible after they are detected or reported, and it is imperative that this basic edict be included amongst the state's emergency response priorities.

Recommendation 11.1:

As the best way to reduce wildfire risks to human life and property is to contain and extinguish fires as soon as possible, the Victorian Government should add and promote the importance of this in its emergency response priorities and nominate an objective to control wildfires within 24 hours of detection.

Recommendation 11.2:

That the Victorian Government redirects expenditure and commitment towards improving emergency response to remote area wildfires. This may necessitate a re-evaluation of what constitutes acceptable risk, given that striving to eliminate firefighting risks can often lead to fires growing larger with exponentially increased risks to greater numbers of firefighters and the broader community.

b) effectiveness of public information and warning systems, including cross-border coordination and communication;

The Institute makes no comment about this topic.

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

Studies predict that climate change in Victoria will lead to longer and more frequent periods of severe fire weather within each year and year-on-year. With a surplus of natural and human-caused ignition sources, this is expected to lead to more fires and greater incidences of severe fire.

The potential for more, high intensity fires in Victoria could lead to more woody fuels due to woody regrowth at the expense of herbaceous regrowth, thereby further exacerbating the potential for more hot fires. More woody-regrowth will mean poorer habitat for many tree-dependent species such as birds, bats, invertebrates, mammals, and reptiles which are typically more abundant in older-growth vegetation.

Old growth vegetation and domestic water supply catchments will be more susceptible to high intensity wildfire if the surrounding vegetation becomes highly flammable due to either being long-unburnt or being burnt by fires that are too intense to maintain their structure.

Fire is critical in assisting many plant species to move across the landscape and potentially find better habitats as the climate changes, by providing them with opportunities to regenerate and use more climate tolerant parts of their gene-pool.

For there to be a significant increase in the extent of low-intensity fire across the landscape, prescribed burning needs to be significantly increased so that fires occur at times of year when they will be less intense. This is currently being achieved in northern Australia by Traditional Owners who are being paid to do so on the basis of the reduction in greenhouse gas emissions from cooler early-season fires compared with the more intense lightning-caused late-season fires.

Australia's first Code of practice for fire management on public lands was introduced in Victoria in 1995, providing a comprehensive framework for fire management procedures and practices. This code conveyed a balance of community views, fire-behaviour science, and fire ecology, integrated with practical wildfire-mitigation measures. It was updated in 2006 and revised again in 2012 to reflect the recommendations of the 2009 Victorian Bushfires Royal Commission.

The 2012 version of the Code provides greater recognition of the role of fuel management in reducing wildfire risk over broad areas and risk-based planning with the primacy of human life.

The scale and level of energy released from wildfires will never be a match for human resources such as fire tankers and fire bombers, so extensive, low-intensity prescribed burning is the only viable option to mitigate its power.

With the need for more extensive prescribed burning, there is a need for better ways of protecting people suffering respiratory illness from the effects of smoke. However, the risks of prescribed burning must be weighed up against the risks associated with uncontrolled wildfires.

Fire is often seen by people, including some scientists, as a damaging process, but the Institute believes that community perceptions need to change to be more aligned with the Traditional Owners who saw fire as an important cultural element and an important way of sustaining the landscape in a productive state.

A long-unburnt landscape should not be used as a point of reference because it is unachievable and has not existed in Australia for tens of thousands of years. More, lower intensity fires in the environment will mean that Victoria will suffer less high intensity, damaging wildfires.

Continuing to have a focus on input activities in managing our natural environment, on private and public lands, (e.g. prescribed burning or wildfire suppression resources) misses the opportunity to analyse whether Victoria is progressing towards its desired environmental state.

Recommendation: 11.3

That Victoria's Auditor General's Office investigates the ability of land management agencies to meet their management plan objectives through the funded activities of Forest Fire Management Victoria, in the face of longer and more frequent periods of severe fire weather.

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

In Australia, no jurisdiction has sufficient skilled forest fire resources to meet the demands of the most serious forest fire situations. Victoria, being the State with the highest forest fire risk, is more likely to need support from interstate resources than any of the other States. Hence, it makes sense to provide support to other Australian jurisdictions in their time of need.

In the past, Victoria provided a strong and determined initial attack on all going wildfires during the fire season. When fire behaviour was such that it was beyond the first attack resources' capability to quickly suppress the fire, other resources would be sourced from across the State, to provide the additional support needed to control the fire.

This allocation of fire suppression resources was conducted with the overall State's fire risk in mind. Hence, while as many resources as requested travelled to provide support, often only a first attack capability remained in the locations providing the support.

The Institute fully supports the ongoing tradition of providing mutual support to other Australian jurisdictions. However, it does so with a cautionary note that the people who are sent to other jurisdictions should possess the skills and experiences necessary to perform the roles requested by the receiving jurisdiction. Such requests for resources should not be met the provision of people as a training experience. To do so, undermines the trust that has developed between jurisdictions, over many years, and may place other firefighters and the communities they are sent to protect in jeopardy.

e) availability and utilisation of private assets and resources (including plant equipment) to support emergency preparedness and response;

The Institute has no reason to question the availability of private assets and resources to support emergency response. However, there is a direct correlation between the usefulness of these assets and where they have come from, and, in the case of earth-moving plant, the bush experience of their operators.

In the past, the State government's forest management agency (currently DELWP) would maintain and operate its own plant for use in firefighting and other functions, and would complement this with machinery contracted mostly from the timber industry. However, economic rationalism over the past 30 years has seen the fleet of government-owned and operated plant substantially reduced in favour of an out-sourcing model that places far greater reliance on hiring machines on short-term contracts on an as-needs basis. Coupled with this has been the declining availability of timber industry machinery, forcing DELWP and its predecessors to place far greater reliance on hiring plant from outside the forests sector.

The progressive closure of the Victorian native forest timber industry over several decades has had a significant impact on the state's forest firefighting capacity by substantially reducing the availability of fit-for-purpose timber industry machinery driven by very experienced operators skilled at working in rough forested terrain. In 1984, there were 133 Victorian timber industry contractors. By 2002, their numbers had declined to 105, and thereafter declined more sharply to

just 35 by 2014.⁴⁸ Given the ongoing forced decline of the Victorian native forest industry since 2014, largely driven by the more stringent imposition of questionable wildlife preservation regulations (e.g. for Leadbeater's Possum and Greater Glider), it is likely that only 25 to 30 timber industry contractors are still operating in 2020⁴⁹. Given that many contractors possessed several machines, the reduced number of contractors translates to a greater loss in terms of machines and experienced operators.

The declining availability of timber industry machinery has been countered by increased contracting of equivalent heavy machinery largely drawn from the farming and road-making sectors. But while the overall number of available firefighting machines may be similar to what it always was, there is a substantial difference in the utility and effectiveness of machines operated by skilled forest workers, compared to machines that are normally engaged in road-making or farm dam-building on relatively flat and tree-less work sites.

The effectiveness of heavy machinery in forest firefighting has been assessed in terms of the rate of construction of fire control lines. Given similar terrain and vegetation, it has been found that machinery operators with limited experience (i.e. generally less than 10 years total experience, less than five years in forested situations, or less than 10 forest fires attended) generally work at substantially reduced rates of control line construction compared to more experienced operators. Up to 50% slower when using a D4-sized bulldozer, and 10 – 30% for a D6-sized bulldozer.⁵⁰

Clearly, reduced rates of control line construction are in impediment to the aim of controlling fires when they are small. Furthermore, at a large fire incident (> 100 ha), once DELWP's dozers and the reducing regular pool of known and reliable contractors with skilled dozer operators are all committed, extra dozer resources must be sought. While extra machines can be readily sourced, often these contractors do not have operators skilled in forest conditions, and as a machine is only as good as its operator, they cause numerous problems to planning and on the fire ground when they cannot perform to the expected level.

The Institute considers that the decline in numbers of skilled machinery operators is a significant contributor to the increase in large fires as there are not enough available in any part of Victoria to successfully control a fire once it grows to beyond 100 hectares.

Recommendation 11.4:

That the Victorian recognises the importance of retaining viable timber industries to maintaining an efficient and cost-effective ground-based firefighting capability.

Recommendation 11.5:

That the Victorian Government rebuilds its in-house fleet of heavy machinery and invests in training experienced operators to restore its forest firefighting capability.

f) planning and response mechanisms to protect biodiversity threatened by bushfire;

Planning to mitigate the adverse effects of wildfires on Victoria's public lands estate is complicated by government administration. While it is clear that DELWP (through FFMV) in the Ministry for Energy, Environment and Climate Change, is responsible for wildfire suppression on all public lands; two other Ministries also have responsibilities that can affect the capability to suppress wildfires.

⁴⁸ Ryan M. and Runnalls R. (2015), *Does timber harvesting in natural forests have any influence on fire management at the landscape level?* Unpublished paper presented to the Institute of Foresters of Australia Biannual Conference, Coffs Harbour, 2015.

⁴⁹ Sourced from VicForests Annual Reports based on the proportional reduction in native forest wood production since 2014.

⁵⁰ *Park and forest firefighting resources guide*, Department of Sustainability and Environment (2003).

Management actions taken by the Ministry for Water and the Ministry for Agriculture can have an impact on wildfire behaviour and resource availability, e.g. reluctance to reduce fuels in domestic water supply catchments. Accountabilities would be much clearer if one Ministry was responsible for all public lands.

Over the past 20 years, response mechanisms to protect biodiversity threatened by bushfires have varied according to public land tenure; the personal philosophies of Incident Controllers; and (allegedly) of the responsible Government Minister. One of the 2019-20 bushfires in East Gippsland allegedly featured an intervention to what would formerly have been standard firefighting practices in order to (supposedly) preserve environmental values in the Snowy River National Park – the result of not controlling the fire while it was relatively small, was a much larger and far more ecologically damaging fire which eventually threatened several small townships (See TOR 2, p.14).

Various government agencies and their primary stakeholders seem to have varying philosophies about the desired state of public lands which can be at odds with the reality that fire-adapted Victorian landscapes need regular fire. For example, the environmental movement, which champions national parks, is primarily opposed to the regularity of burning needed to sustain the biodiversity of most forest types, and many environmentalists would prefer fire to be totally excluded from national parks. This puts pressure on Parks Victoria and DELWP that may be reflected in their enthusiasm for prescribed fuel reduction burning.

Arguably, a distaste for regular broadacre burning of the landscape was what underpinned DELWP's decision to dispense with the area-based annual burning target recommended by the 2009 Victorian Bushfires Royal Commission, in favour of a risk-based approach designed to concentrate a significantly smaller area of strategic annual burning along the public-private land interface (see TOR 9, p. 22).

Until the responsible government agencies develop an enthusiasm for regular prescribed burning throughout the forested landscape, the protection of biodiversity from the threat of wildfire will be tragically inadequate.

g) effectiveness of the existing workforce model to support response, relief and recovery.

The current Victorian model for the provision of operational response to forest fires is of serious concern because it is placing too great a reliance on the State's Country Fire Authority (CFA) volunteer fire-fighters to assist for lengthy periods in forest fire-fights far removed from their home base. Most volunteers willingly turn out to forest fires but most do not wish to venture into remote forested areas too far from private farming lands.

Unfortunately, fires such as those experienced during the 2019-20 fire season, often become so large through inadequate resourcing and poor land management that they eventually impact on private assets while degrading the natural environment during their ferocious run through the forested landscape of State forests and national parks.

CFA volunteers should rightfully be praised for their efforts. However, the Institute is concerned that Victoria's continued heavy reliance on them is ultimately not sustainable, particularly as the number of skilled and experienced firefighters within Forest Fire Management Victoria who can lead the volunteers, is also limited.

The progressive loss of the native forest timber industry over the past 30-years has also been a significant blow (as described in TOR 11 e, above). Accordingly, the current workforce model does not adequately account for the forest operator skills and machinery requirements for operational wildfire response and the subsequent recovery of the post-fire landscape in accord with the State forest and national parks management plans.

Victoria is too frequently experiencing high intensity wildfires. The Institute believes that this is a performance measure for Victoria that reflects a need to modify the current workforce model (see Recommendation 1.2, p. 14).

The existing workforce model also does not sufficiently provide for adequate natural recovery processes. Unlike in the past, there is insufficient seed collected and stored in a seed bank to provide regeneration of large areas of eucalyptus ecosystems. This has been demonstrated in north eastern Victoria's alpine ash forests within national parks which should have been regenerated by seed of similar provenance and protected from another wildfire until after the trees reached reproductive maturity to enable self-regeneration.

That this has not happened over some significant areas that have been repeatedly burnt in quick succession is another indicator that the current Victorian workforce model to support operational fire response, relief and recovery is inadequate.

Recommendation 11.6:

That a new workforce model be developed for Victoria that will meet the needs for operational wildfire response, relief, and the recovery of communities, firefighters and the environment.

TOR 14: In considering the timeliness and effectiveness of activation of Commonwealth assistance, and Commonwealth resource availability, IGEM should particularly consider:

a) effectiveness of current national resource sharing arrangements when multiple and simultaneous fire events are occurring;

The Australian Institute for Disaster Resilience states:

Arrangement for Interstate Assistance (AIA) is the primary arrangement for mutual assistance in emergency management activities being conducted by Australian and New Zealand agencies. It does not replace existing bi-lateral agreements that provide for everyday response operations by agencies across borders in support of their immediate neighbours. It caters for occasions when significant resource deployments are requested for response to large scale events.

The AIA is maintained by the AFAC National Resource Sharing Centre, which coordinates and facilitates international and interstate deployments through its established partnerships and national arrangements as authorised by the Commissioners and Chief Officers Strategic Committee (CCOSC).

The Commonwealth, through Emergency Management Australia (EMA), co-chairs CCOSC and is integral to this arrangement.

The National Resource Sharing Centre (NRSC) is a business unit of the Australasian Fire and Emergency Service Authorities Council (AFAC).

In a similar manner to the NRSC, the National Aerial Firefighting Centre (NAFC) is a business unit of AFAC for the procurement and supply of firefighting aircraft.

Whether the NRSC and NAFC serve Victoria well is dependent on the strength of argument presented by the Victorian representative. It is noted that NSW has a greater representation on CCOSC than Victoria, and that the land management expertise in the CCOSC is limited to one person.

While we are not in a position to judge the effectiveness of these arrangements, we wonder whether they are equitable given that Victoria is the Australian State that has been most tragically impacted by wildfires since European settlement.

b) effectiveness of existing governance arrangements supporting access to Commonwealth and State air fleets;

The arrangement for firefighting aircraft is covered under TOR 14a. The effectiveness of these arrangements should be the subject of a well-structured independent investigation examining the requests made by the Victorian agencies in terms of:

- the delivery of the right aircraft;
- the timeliness of delivery given the task at hand; and
- an analysis of the delivery result in aiding fire suppression.

The Institute has been made aware that some people in regional Victoria would prefer to see more use made of small, medium and large aircraft in preference to very large aircraft. It is noted that the Prime Minister, after media pressure, provided funding for additional aircraft during the fire season. Was this what Victoria asked for to meet its needs?

The National Aerial Firefighting Centre (NAFC) has reportedly had a good record of meeting the needs of the jurisdictions in a fair and equitable manner. However, the Institute is not in a position to assess whether it was effective in meeting Victoria's needs over 2019/20 fire season.

c) use and integration of Australian Defence Force assets into Victoria's emergency response and relief operations;

In the past, Victoria has welcomed the support of Defence Force personnel during wildfires.

Large numbers of Navy personnel from HMAS Cerberus were used with considerable success in January 1984 when wildfires burnt 51,400 ha near Bright; while Army personnel from Puckapunyal and Bandiana have been used in more recent fires. Under the instruction of experienced forest firefighters, these personnel have worked well to construct hand trails in remote and rugged terrain to successfully bring wildfires under control.

Over many years, training of Defence Force personnel has been conducted by land management staff (currently Forest Fire Management Victoria) in readiness for the fire season.

The HMAS Cerberus Naval Training Base near Crib Point on Westernport Bay has about 6000 personnel. They average 800 trainees at any one time and Puckapunyal has up to 4,000 personnel at any given time. There is no reason why they shouldn't still be considered as a back-up resource for use during major forest fires in Victoria.

The Bandiana Base in NE Victoria houses the Army Logistic Training Centre which should be able to be utilised by Forest Fire Management Victoria during campaign fires providing that pre-fire season joint training is undertaken.

Recommendation 14.1:

That DELWP (Forest Fire Management Victoria) annually train and/or conduct joint exercises in forest firefighting with Defence Force personnel.

APPENDIX 1

IFA Position Paper 3.1:

The role of fire in Australian forests and woodlands



The Institute of Foresters of Australia (IFA) advocates a better appreciation of the important and complex role that fire plays in the evolution and maintenance of Australian ecosystems and its potential to significantly impact on social, economic and cultural values. The IFA also advocates for better management of bushfires and prescribed fires, including the need for further scientific research and the systematic monitoring and review of fire management with the results being made available to policy makers, land managers, fire services and the community.

Fire is one of the most important factors in the ecology of Australian forests and woodlands. Hence, the managers of both public and private forests must understand the role of fire both in meeting land management objectives and in minimising the potential for adverse impacts on human life and property.

The Issues

Fire is an essential element of the Australian natural environment that cannot be removed. It is integral to maintaining environmental processes such as nutrient cycling, adaptation and evolution via gene expression and redistribution, faunal and floral composition and structure, hydrological processes and habitat formation and maintenance.

However, uncontrolled fire can also be destructive, potentially leading to human death, loss of houses, infrastructure and services, loss of amenity, impact on water flows and water quality, loss of habitat, loss of soil and soil nutrients and loss or degradation of other forest values such as timber. The impact of fire can also extend beyond the burnt area with smoke from bushfires or planned burns having potential to cause visibility problems, adversely affect human health, and damage crops such as wine grapes.

To manage for the protection of human life and biodiversity, fire must be viewed and managed at a landscape scale and over long timeframes even though its impact, at any one time, may be local and immediate. To this end, fire in the natural environment must be managed by professionally trained, experienced and accredited forest managers, not just emergency service agencies.

There has been an increasing reliance on the use of tools and technology, such as aircraft, firefighting vehicles, fire suppression chemicals, computer models and voluntary evacuation ("leave early") to control fires and reduce the loss of human life. This has been at the expense of rapid and aggressive early fire control using experienced and well trained ground crews in direct attack strategies early in the fire's development which, in most cases, is more likely to be effective than indirect attack strategies.

Position Statement

The IFA recognises that:

- Fire is an essential ecological factor, which has an important and ongoing role in maintaining biodiversity and ecological processes in Australian forests and woodlands.

- The ecological effects of fire vary according to the season, frequency, intensity, patchiness and scale of burning within a landscape.
- Bushfires can have effects that are significant at local, regional and global spatial scales and operate on timescales from the immediate to impacting over decades or centuries.
- Bushfires can be a very real threat to human life, property, economic and cultural values, social function and environmental values.

The IFA considers that:

- Every fire management program should be objectives-based and outcome-focused. The objectives should be set out in management plans based on legislative requirements, government policy and public consultation. Objectives must cover the protection of human life, property, economic and cultural values, social function and environmental values.
- Short-term fire management objectives should be consistent with long-term, landscape-scale fire and land management objectives.
- A decision to deliberately exclude fire from naturally fire-prone forests and woodlands will have adverse consequences for ecosystem productivity and function in the long-term.
- Because of the complex interaction of factors affecting fire and land management, there can be some uncertainty about the outcomes of different strategies and operations, therefore a risk-based assessment is a good way to approach fire management. Given the uncertainty in all the contributing factors and their interactions, the application of sound risk management principles gives the best likelihood of achieving specific management objectives. Having an outcomes focus, with well-defined performance measures, will lead to a system whereby the results of fire management strategies can be identified and measured over a long timeframe.
- The Australian, State and Territory governments have a responsibility to provide adequate resources for coordinated research and systematic monitoring of the behaviour, environmental effects and social impacts of bushfires and to provide inter-generational continuity of skills, capability and resources.
- The focus in all fire management programs should be around Prevention, Preparedness, and Fire Regime management and there needs to be a move away from relying primarily on Response and Recovery.
- The use of fire in the landscape by many Traditional Owners is acknowledged. Traditional knowledge and burning practices have great potential to contribute to positive social and environmental outcomes. Fire management can be used to reintroduce traditional knowledge to communities where it has been lost.
- All fire management operations should put a high priority on firefighter safety. However, the level of risks taken should be commensurate with the potential benefits to be gained, cognisant of the fact that firefighting is inherently risky and that trying to avoid all risk may inhibit the capacity to control fire in a timely manner and result in greater impacts and losses.
- Firefighting aircraft, tools and technology are not a substitute for effective on-ground firefighting. The primary focus of fire control should always be around on-ground efforts with aircraft, tools and technology being used to make on-ground efforts safer and more effective.
- Planned burning must be undertaken to enable forests and woodlands to be managed sustainably in the long-term, including the ability to evolve and adapt to climate change, physical disturbances, pests and diseases.

- Communication and consultation between forest managers, emergency response agencies and other stakeholders is vital to establish management objectives, including levels of “acceptable bushfire risk” for successful planning and fire management activities.
- Adaptive fire management (“learning by doing”, monitoring and recording with scientific analysis) should always be used.
- Many aspects of forest fire management are common globally. It is important to exchange knowledge and expertise nationally and internationally to extend the range and depth of knowledge and experience in bushfire policy, research and management.

Supporting Documents

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- South Australia (2012). *Code of Practice for Fire Management on Public Land in South Australia*. South Australia, Government. 12pp. <http://www.environment.sa.gov.au/managing-natural-resources/fire-management/bushfire-risk-and-recovery>