



Victorian  
Forest  
Products  
Association

## VICTORIAN FOREST PRODUCTS ASSOCIATION

Submission to the Victorian Regional  
Forest Agreements Major Event

Review of the 2019-20 Bushfires

Discussion Paper

**August 2021**



## Contents

Table of Figures .....	3
Table of Recommendations.....	5
About VFPA.....	7
Victoria's Forest Products Industry.....	7
Executive Summary .....	9
1 Introduction .....	10
1.1 RFAs, Major Event Review and Victoria's Forest Products Industry.....	10
1.2 RFA Major Event Review Parameters.....	11
1.3 A principled approach to the Review.....	12
2 History of Victoria's Wildfires .....	14
2.1 Economic Impact .....	21
3 Bushfire inquiries and their influence on policy and management.....	24
4 Victoria's Forest Estate.....	27
4.1 Bushfires and Native Timber Harvesting.....	28
4.1.1 Native timber salvage harvesting .....	31
4.2 Bushfires in Plantations.....	32
4.3 Climate Change, Carbon Emissions and Bushfires .....	36
5 Bushfire Preparedness and Management.....	41
5.1 Plantation Bushfire Preparedness.....	41
5.2 Public Land Bushfire Preparedness.....	42
5.2.1 Joint Fuel Management Program .....	44
6 Resources.....	48
References.....	49

## Table of Figures

Figure 1 Wildfire extent (ha), all states 1851 to 2020 .....	15
Figure 2 Wildfire extent (ha), Victoria only 1851 to 2020 .....	15
Figure 3 Extent of 1851 bushfires.....	16
Figure 4 Wildfire extent (ha), Victoria only 2002 to 2020 .....	17
Figure 5 Annual extent of wildfires in Victoria since 1920 (Morgan, et al., 2020) .....	17
Figure 6 Black Thursday 6 February 1851 by William Strutt.....	18
Figure 7 Fire Storm Upper Murray 2019-20.....	19
Figure 8 Extent of 1939 Victorian Bushfires .....	19
Figure 9 Wildfires affecting Victoria between 1995-2020 (Lindenmayer & Taylor, 2020).....	20
Figure 10 2019-20 Victorian Bushfire Extent.....	20
Figure 11 Economic Cost of the 2009 Black Saturday Fires (\$million) (Deloitte Access Economics, 2017).....	22
Figure 12 Proportion of public native forests available for timber harvesting 2020 .....	27
Figure 13 Extent of ash forests and immature ash forests in East Gippsland .....	28
Figure 14 National Plantation Inventory Regions.....	28
Figure 15 VicForests Silviculture Regimes (VicForests, 2019) .....	30
Figure 16 Radiata pine rotation.....	32
Figure 17 Australia's plantation fire losses over 100 ha; five-year intervals (Geddes, 2020) .....	33
Figure 18 Number of Australia's plantation fires over 100 ha – all years (Geddes, 2020) .....	33
Figure 19 Number of Australia's plantation fires over 100 ha – 2005-2020 (Geddes, 2020).....	34
Figure 20 Numbers of fires where 1000 hectares or more of Australian plantations were burnt (Geddes, 2020) .....	35
Figure 21 Area burnt where 1000 hectares or more of Australian plantations were burnt (Geddes, 2020) .....	35
Figure 22 Carbon density of Australia's Forests 2016 .....	36
Figure 23 Long-term average emissions for Victorian ash forest and forest products for each alternative forest management and forest product scenarios (Australia's State of Forests, 2018).....	37
Figure 24 Carbon storage in Victoria's forests (Department of Environment, Land, Water and Planning, 2019) .....	38
Figure 25 Emissions from fire (wildfire and prescribed burnings) and other sources – Victoria 1990 to 2017 (Department of Environment, Land, Water and Planning, 2019).....	38
Figure 26 Forest burnt, planned, unplanned or both 2011-12 to 2015-16 (Australia's State of Forests, 2018) .....	43

Figure 27 Victoria's Total Forest Area Burnt - Planned and Unplanned (Australia's State of Forests, 2013) .....	43
Figure 28 Total area of 2019-20 bushfire extent in RFA regions.....	44
Figure 29 Proportion of South West WA forest regions burnt by prescribed burning to that burnt by wildfires (Sneeuwjagt, 2008).....	45
Figure 30 Joint Fuel Management Program – Prescribed Burns 2020-21 to 2022-23.....	46
Figure 31 Joint Fuel Management Program – Mechanical Works 2020-21 to 2022-23 .....	46

## Table of Recommendations

<b>Recommendation 1:</b> That the Panel confines the Review to the East Gippsland, Gippsland and North East RFAs.....	10
<b>Recommendation 2:</b> That the Panel reaffirms the importance of Victoria's plantation and native timber harvesting industries, which underpin the social and economic fabric of many rural Victorian communities.....	11
<b>Recommendation 3:</b> That the Panel notes Victorian Government's decision to phase out native timber harvesting does not support the National Forest Policy Statement or the intent of Victoria's Regional Forest Agreements. ....	11
<b>Recommendation 4:</b> That the Panel <b>reaffirms</b> that the Review will not consider early implementation of the Victorian Government's plan to phase out native timber harvesting.....	12
<b>Recommendation 5:</b> That the Panel takes a principles approach in delivering their Review report and recommendations to the Federal and Victorian Governments. ....	12
<b>Recommendation 6:</b> The Panel considers whether the CAR estate will be negatively impacted over the longer term from the 2019-20 bushfires, and what remedial actions are required to negate these impacts within the CAR.....	12
<b>Recommendation 7:</b> Should the Panel consider that the CAR cannot be addressed other than through adding working forests to the CAR, the Panel must recommend that this is a swap. To simply add more forests to the CAR will lead to detrimental outcomes for the RFAs social and economic values.....	13
<b>Recommendation 8:</b> The Panel should seek information from Forest Fire Management Victoria, the Country Fire Authority and the Department of Environment, Water, Land and Planning on the build up of forest fuel loads ahead of the 2019-20 bushfires, the time since last burnt, and the extent of prescribed burning or mechanical control that occurred in the public land estate .....	25
<b>Recommendation 9:</b> The Panel should consider current fuel build up in the public land estate across Victoria, along with the time since the last reduction occurred (bushfire, prescribed burn or mechanical control). This should provide a view of risk for the rest of Victoria into the future. ....	25
<b>Recommendation 10:</b> That the Panel seeks information on the trends in matters of national environmental significant in harvest coupes (from VicForests) versus the conservation estate (from the Department of Environment, Water, Land and Planning).....	26
<b>Recommendation 11:</b> That the Panel recommends active forest management including timber harvesting, should continue and be expanded on Victoria's public land estate, due to the positive impact on protected matters and bushfire control.....	26
<b>Recommendation 12:</b> The Panel recommends that the Victorian Government undertakes a socio-economic assessment of past and current decisions to transfer working forests (i.e. state and regional parks) into the conservation estate to determine the socio economic impacts to affected communities and businesses. ....	26
<b>Recommendation 13:</b> The Panel notes that native forestry, forest management and native timber production delivers superior carbon emissions outcomes for Victoria's mountain ash forests compared to conservation only uses. ....	37
<b>Recommendation 14:</b> The Panel recommend the Federal and Victorian Government investigate biomass markets for biomass residues.....	38

**Recommendation 15:** The Panel recommends controlled burning in forests to attenuate carbon emissions from wildfires.....39

**Recommendation 16:** The Panel should consider climate change induced forest growth and therefore fuel loads will impact bushfire frequency and severity.....39

**Recommendation 17:** That the Panel considers recommending that Victoria's forests are compartmentalised to assist managing the spread of bushfires.....41

## About VFPA

VFPA is the peak industry body representing the forestry products value chain in Victoria from those growing, managing and harvesting our sustainable plantations and multiple use natural forests to the primary and secondary processing of timber, the manufacture of pulp and paper, and the value-added timber and pulp and paper products supply chains.

## Victoria's Forest Products Industry

The Victorian forest products industry utilises a mix of hardwood (eucalypt) and softwood (pine) resources supplied from multiple use public forests and private plantations. Victorian forest products are manufactured into a wide range of timber products including sawn timber products, engineered wood products, pulp and paper manufacture, and high-quality wood chips.

Wood is beautiful and functional, renewable, biodegradable, and recyclable. Wood is used for new homes, buildings, furniture, paper, toiletry and sanitary products, and fuel for green energy. With over 5000 known uses for wood, wood is simply an essential part of life and the ultimate renewable. All parts of the harvested tree are used to its highest value use – there is simply no waste.

The Victorian forest products industry is highly regulated and implements sustainable forest management practices across private and public land tenures and participates in ecological restoration for the benefit of Victorians. 0.04 per cent and 0.03 per cent of native and plantation trees respectively are harvested annually, with plantation trees replanted, and every native harvest area regenerated.

Victoria's forest products industry has a significant role to play in the move to a net-zero carbon future. New research demonstrates that plantation trees for harvest capture three times more carbon abatement than environmental plantings over 100 years as the carbon is sequestered in trees and the subsequent harvested timber products for the life of that product.

The Victorian forest products industry is a significant contributor to the Victorian and Australian economies:

- Victoria's plantation estate at 418,000 hectare covers just 1.9% of Victoria, or 3.4% of the land classified as farmland. It is mostly located in the Green Triangle, North East, and Gippsland.
- Victoria's plantation estate is 53% softwood and 47% hardwood. The softwood estate reached a peak of 226,400 hectare in 2009-10 and has been relatively stable since then. The hardwood estate was stable until 2013-14; however has declined by 12,400 hectare or 6% since then.
- Victoria has nearly 8 million hectare in its public land estate. Around half or 3.1 million hectare is multiple use forests, of which around 450,000 hectare is considered available and suitable for harvest. Of this, VicForests harvests up to 3,000 hectare annually, or 0.04% of the total public land estate.
- Victoria has approximately 30 sawmills across native hardwood, softwood, post and pole processors, wood-based panel processors, and paper and paperboard processors.

- 🌲 Victoria produces 8.9 million m<sup>3</sup> or 27% of the nation's log supplies<sup>1</sup> - with native hardwood contributing 28% of Australia's native hardwood logs, hardwood plantations supply 34% of Australia's hardwood log, and softwood plantations supply 23% of Australia's softwood logs.
- 🌲 The gross value of Victoria's log production is \$734 million, with the value per log volume comparable across native and plantation sectors.
- 🌲 Victoria contributes \$7.95 billion in direct sales, or 32% of the nation's forest product primary and secondary manufacturing by value<sup>2</sup>.
- 🌲 Direct employment of more than 21,000 people across the supply chain with the full supply chain supporting up to 50,000 jobs.

---

<sup>1</sup> ABARES 2020 Forest & Wood Products Dataset, 2018-19 data

<sup>2</sup> Ibid, excludes forestry and logging and value-added supply chain products



## Executive Summary

The Victorian Regional Forest Agreements Major Event Review of the 2019–20 Bushfires (the “Review”) was incorporated into the most recent Victorian Regional Forest Agreements (the “RFAs”) with the 2019–20 bushfires now triggering this provision. The RFAs have stood the test of time and support mature policy decisions that equally balance the RFAs environmental, social, economic, Indigenous, and cultural values. The Panel must continue to maintain this balance through a principled approach and mature policy recommendations to the Federal and Victorian Governments.

Australia’s landscape has been actively and sophisticatedly managed by Indigenous peoples for over 60,000 years. Bushfires are critical to some plants, in fact, it is critical for the continuation of some species. Wilderness and a “lock up and leave” ethos is a white man’s construct that completely disrespects cultural and traditional knowledge. Numerous research reports and bushfire inquiries point to the need to actively manage our landscape and indeed incorporating Indigenous knowledge will be critical to manage future fires.

Since 2000 there have been more regular significant bushfire events, albeit the 1851 and 1939 fires have surpassed recent events in terms of the area burnt. Some now call recent events mega fires due to the significant capacity of these fires to generate their own weather and the damage inflicted to human and animal life, our environment, agriculture, plantation forests and communities and our built infrastructure. Moreover, the social, mental and health costs and impacts to the youngest in our society are now well noted.

The Victorian forest products industry has likewise been affected. The costs of preparing for and responding to bushfires is a significant investment for the plantation sector. So too, our native timber industry is impacted through fire devastating harvesting coupes and the expertise, skills, knowledge, and specialised equipment of those working in our native timber harvesting industry to respond to bushfires and assist with post fire recovery.

Moreover, in terms of bushfires and the public land estate, the scientific consensus is that ongoing native timber harvesting, active management of the forest estate through thinning and other operations, along with controlled burning and mechanical fuel reductions of a sufficient level is required. The link between serious fires and ongoing benefit for up to 20 years through fuel reduction provides insights to better target public land planned bushfire preparedness measures.

The closure of Victoria’s native forestry industry as proposed by the Victorian Government ignores this. The Victorian Forest Products Association urges this Review to recommend that the Victorian Government overturns its policy decision to phase out native timber harvesting by 2030. For the Review to otherwise support an earlier closure of native timber harvesting would be folly and judged for generations to come.

Several recommendations are provided for consideration by the Panel.

# 1 Introduction

The Victorian Forest Products Association (VFPA) welcomes the opportunity to make a submission to the Review. This submission will focus on matters relevant to Victoria's forestry industry.

## 1.1 RFAs, Major Event Review and Victoria's Forest Products Industry

VFPA notes that this Review will consider impacts to all five Victorian RFAs. However, the major event, i.e. the 2019-20 bushfires primarily affected the East Gippsland, Gippsland and North East RFAs. VFPA acknowledges that some fires occurred in the Western RFA, albeit not of the scale of the eastern Victoria fires.

In addition, the Review's Summary Report confines its comments to these fire impacted RFA regions. It is therefore perplexing as to why all five RFAs will be considered. Even the title "major event" would indicate that the Review must consider the major event, i.e. the 2019-20 bushfires.

**Recommendation 1:** That the Panel confines the Review to the East Gippsland, Gippsland and North East RFAs.

Moreover, the Review should only consider those sub-regions of the RFAs affected by the major bushfire event. This would mean that a considerable part of the Gippsland and North East RFAs are excluded.

VFPA notes that the current RFA are the first to include a provision for a major event review, and this is only relevant to Victoria's RFAs – and importantly this is the latest of nearly 60 reviews and inquiries since 1939. And yet bushfires are continuing and will continue to occur.

More importantly, the major event review mechanism was included in the Victorian RFAs following the 2019-20 fires. This begs the question of whether the provision was included as a "trojan horse" for political expediency to seek an earlier end to native timber harvesting than 2030. VFPA would hope that this is not the case.

All Victoria's RFAs updated and that came into effect in 30 March 2020 contain the following clauses in the Preamble:

- provides for the ecologically sustainable management and use of forests in the RFA region
- is for the purpose of providing long-term stability of forests and forest industries
- has regard to studies and projects carried out in relation to all the following matters relevant to the RFA region –
  - a) ...
  - b) ...
  - c) economic values of forested areas and forest industries
  - d) social values (including community needs), and
  - e) ....
- defines forest to include "*Australia's diverse Native Forests and Plantations*"
- defines forest estate to mean all forests growing on public land or private land
- defined forest industries as industries that generate jobs and economic benefits that depend on forests including (but not limited to) timber and forestry products industries,  
.....

- defines forest management as the management and administration of all forests on public land and private land, including native forest and plantations
- defines forestry operations to include planting of trees, managing trees before harvest and harvesting of forest products
- defines harvest levels, plantations, processed and unprocessed wood, RFA forestry operations and so on.

Moreover, the RFA's strongly support the National Forest Policy Statement:

*"Parties confirm their commitment to the goals, objectives and implementation of the National Forest Policy Statement (NFPS) by:*

- a) implementing Ecologically Sustainable Forest Management (ESFM)*
- b) establishing and maintaining a Comprehensive, Adequate and Representative Reserve System*
- c) supporting internationally competitive Timber and Forestry Products Industries, and*
- d) promoting the conservation and management of Native Forests."*

RFAs are not simply about the conservation estate but about the importance of Victoria's private and public land estate across social, economic, environment and cultural outcomes. This is reiterated in the RFA proper<sup>3</sup>, however, VFPA is disappointed that the subsequent clause<sup>4</sup> reiterates the Victorian Government's decision to phase out native timber harvesting from 2030. This is not in keeping with the rest of the document that supports native timber harvesting and the National Forest Policy Statement.

**Recommendation 2:** That the Panel reaffirms the importance of Victoria's plantation and native timber harvesting industries, which underpin the social and economic fabric of many rural Victorian communities.

**Recommendation 3:** That the Panel notes Victorian Government's decision to phase out native timber harvesting does not support the National Forest Policy Statement or the intent of Victoria's Regional Forest Agreements.

## 1.2 RFA Major Event Review Parameters

There is a long-established divide in the Victorian community over timber harvesting in native forests, driven by ideology and history. This tension is between the productive use of the forests versus conservation and protection to preserve habitat and biodiversity. This has played out in the political, policy, and economic environments, and the community for decades (Department of Environment, Land, Water and Planning, 2021).

While a small number in the community (i.e. environmental activists primarily) wish to see this Review facilitate an end to native timber harvesting sooner than 2030 and use the devastating bushfires as the reason, this is not supported by the RFAs nor the major Review's terms of reference.

Clause 38F of the RFA states that a major event review will consider the impacts on the operation of the RFA, ecologically sustainable forest management, the CAR system matters of national environmental significance, timber harvest levels and the long-term stability of forests and forest industries.

---

<sup>3</sup> Actual clauses may vary, but as an example, the Central Highlands RFA, clause 69.

<sup>4</sup> Ibid, clause 69C

The major event scoping agreement signed in September 2020 and states at Clause 6 “*will not open the RFAs up to renegotiation*” and at Clause 7, the scope of the Review must consider those points outlined above, as well as impacts on the environment and heritage values, listed species and communities, ecosystem services and economic and social values. In addition, at Clause 9, the Panel is to consider the impacts of bushfires in areas (native forest and plantation) available for harvest, and assessment of impact on forest industries and the social and economic impacts of the bushfires.

These clauses support the overarching premise that this Review explicitly excludes an early implementation of the Victorian Government’s policy to phase out native timber harvesting. VFPA thanks the Victorian and Commonwealth Governments for confirming the Review will not reconsider early implementation of the phase out of native timber harvesting.

**Recommendation 4:** That the Panel **reaffirms** that the Review will not consider early implementation of the Victorian Government’s plan to phase out native timber harvesting.

### 1.3 A principled approach to the Review

The VFPA strongly encourages the Independent Panel to take a principled approach to this Review and their report and any supporting recommendations to the Federal and Victorian Governments.

**Recommendation 5:** That the Panel takes a principles approach in delivering their Review report and recommendations to the Federal and Victorian Governments.

As stated above, the purpose of the RFAs is to balance the economic, social, environment and the Indigenous and cultural values of Victoria’s forests. The primary role of the Panel should seek to ascertain whether these values, on reflection, remain in balance, as all values have been impacted by the 2019-20 fires.

Victoria’s conservation reserves are the means to protect our forests and biota for future generations, and must be comprehensive, adequate, and representative (CAR), with the RFAs delivering a level of protection that is very high by world standards<sup>5</sup>.

The Panel should first consider whether the CAR estate is impacted by the 2019-20 fires, can the estate recover with time, will the bushfires deliver improved biodiversity outcomes (as it is well documented that many species need fire to regenerate), and what remedial actions are required to assist restoration and regeneration. The key requirement is to seek first and foremost what can be done to address the net impacts on the CAR. Furthermore, will these actions lead to improved outcomes for the CAR.

**Recommendation 6:** The Panel considers whether the CAR estate will be negatively impacted over the longer term from the 2019-20 bushfires, and what remedial actions are required to negate these impacts within the CAR.

If the answer is no, and only after consideration of all remedial measures, the Panel considers that the CAR is no longer representative, the second consideration is whether areas of the CAR should be “**swapped out**” for forest areas not currently within the CAR reserves. VFPA emphasises swapped out here. The reason being that simply adding more to the conservation estate will not deliver the principled stance that the RFAs must deliver balance across all its values.

---

<sup>5</sup> Source: [Protecting our Forest Environment - Department of Agriculture](#)

If the answer is that swapping out will **not** deliver the comprehensiveness, adequateness, and representativeness of the conservation estate pre the 2019-18 fires, then swapping out should **not** be considered and the Panel **must** concentrate on the remedial actions in delivering the Review.

If the answer is yes, the Panel may consider recommending that some areas of the CAR are moved into multiple use forests, including made available for timber harvesting, and some of our working forests moved into the conservation estate but only to a level that delivers the level of CAR in place before the 2019-20 fires. This means delivers an equivalent but not higher level of CAR.

**Recommendation 7:** Should the Panel consider that the CAR cannot be addressed other than through adding working forests to the CAR, the Panel must recommend that this is a swap. To simply add more forests to the CAR will lead to detrimental outcomes for the RFAs social and economic values.

As stated above the role of the Panel is to take a principled approach that will maintain a balance between the environment, social, economic, Indigenous, and cultural values of the RFAs. To do otherwise is inconsistent with the RFAs.

## 2 History of Victoria's Wildfires

Australia's forest landscapes developed over millions of years, and for thousands of years until 1788, Aboriginal people used fire tools to manage the landscape<sup>6</sup>, transforming it into today's fire and drought adapted landscape (Bowman & Yeates, 2006). The primary reason for this 'cultural burning' was to maintain biodiversity and to assist with recruitment of animals for food:

*Aboriginal burning was important in creating habitat mosaics that favoured the abundance of some mammal species and in the maintenance of infrequently burnt habitats upon which the survival of specialized fauna depends.* (Bowman D. M., 1998)

Cool burning created a landscape mosaic of small patches of differently aged vegetation. To some extent, the burning was also to maintain low fuel levels in the landscape<sup>7</sup>. European settlement had a major impact on the management of Australia's landscape. Notably:

*Recent environment history and ecological research suggests the decline in cultural burning after colonisation worsened ecosystem health in Victoria and increased bushfire risk.*<sup>8</sup>

*The rapid expansion of rain forests into treeless grasslands, and the change from low to high densities of trees in Eucalyptus forests, has been attributed to a decrease in fire frequency following the cessation of Aboriginal landscape burning.... and the extinction or threat of extinction of about 10 per cent of the Australian terrestrial avifauna... by destruction of suitable habitats.* (Bowman D. M., 1998)

*Following European colonisation....the frequency of injurious fires increased to a mean of less than 20 years presumably because of increased fuel loads* (Bowman D. M., 1998)

Large wildfires and megafires in Victoria's landscape became more prevalent and widespread from the 1851 event. The trend line for the extent of significant wildfires across Australia is downward (Figure 1), with the 2019-20 Victorian fires ranking eleventh over the same period or third largest when considering only wildfires in Victoria.

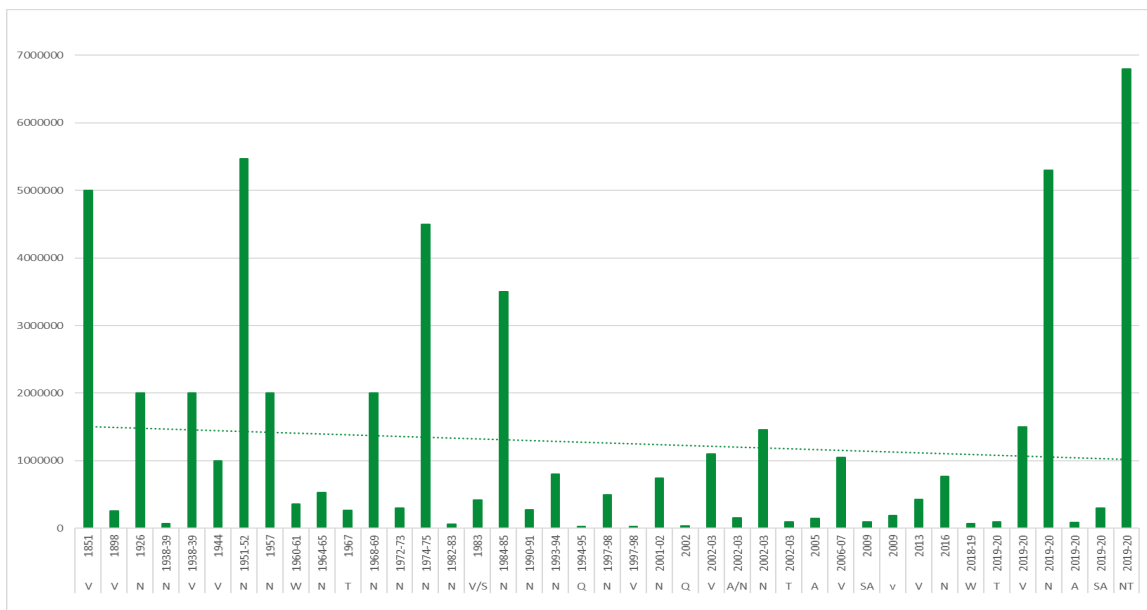
---

<sup>6</sup> Cultural burning strategy ([ffm.vic.gov.au](http://ffm.vic.gov.au))

<sup>7</sup> [Australia's Black Thursday Fires 1851 – how big and why? – MikePole](#)

<sup>8</sup> Ibid

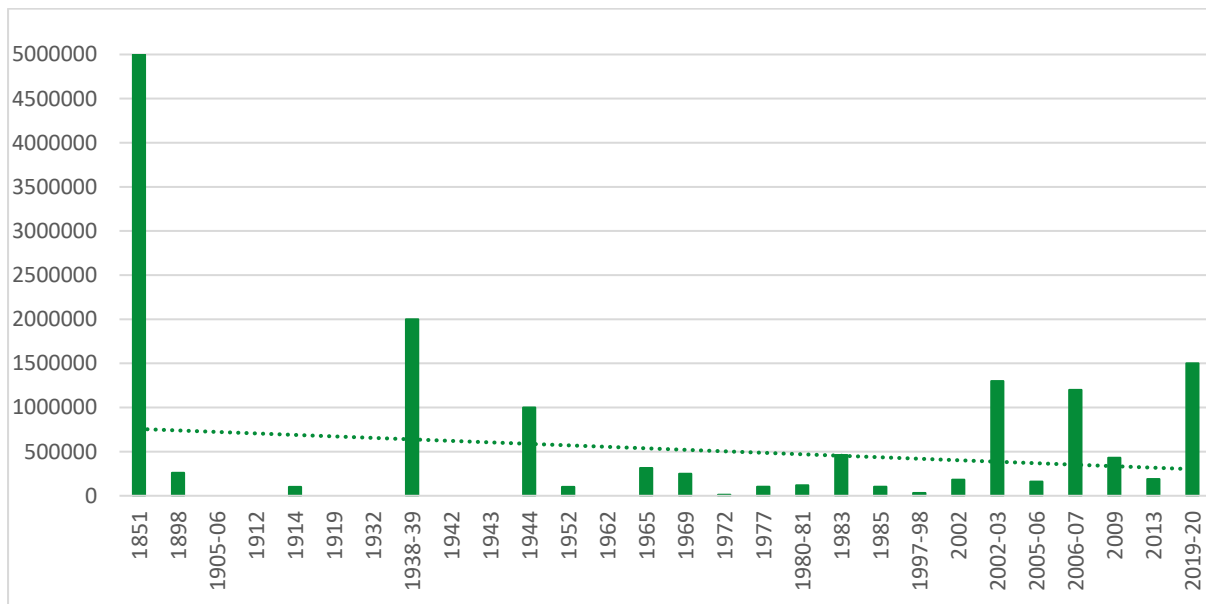
Figure 1 Wildfire extent (ha), all states 1851 to 2020<sup>9</sup>



Furthermore, when considering the major wildfires for Victoria only, the trend remains a downward trend (Figure 2 a). Note that while the graph only includes the major event years, including every year does not change the downward trend. Furthermore, until the 1930s bushfires were either rare occurrences, or records and/or reporting was inaccurate. However, what is clear is that from 2000, there has been an increase in bushfire events of significant size (Figure 2 b).

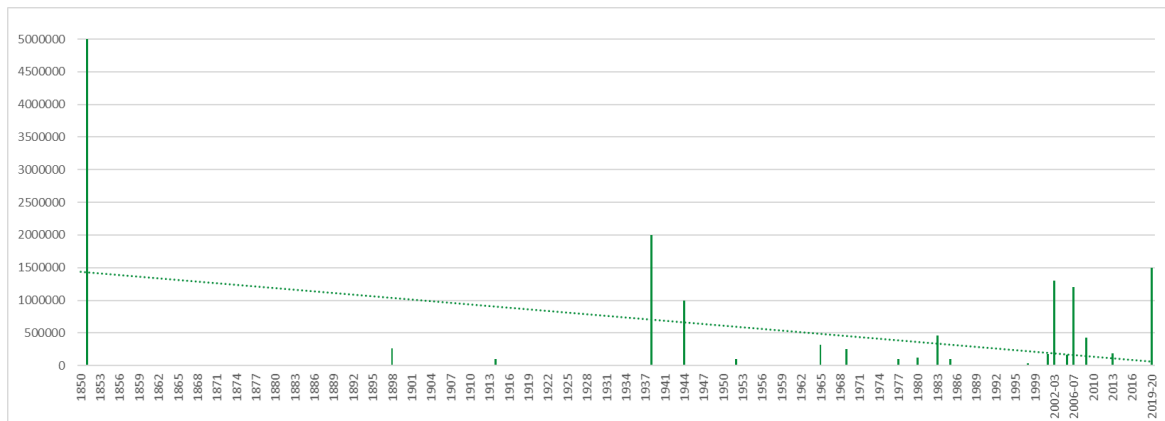
Figure 2 Wildfire extent (ha), Victoria only 1851 to 2020

a) Wildfire event years



<sup>9</sup> Note that the state is denoted on the horizontal axis by the beginning letter e.g. V = Victoria, N = NSW.

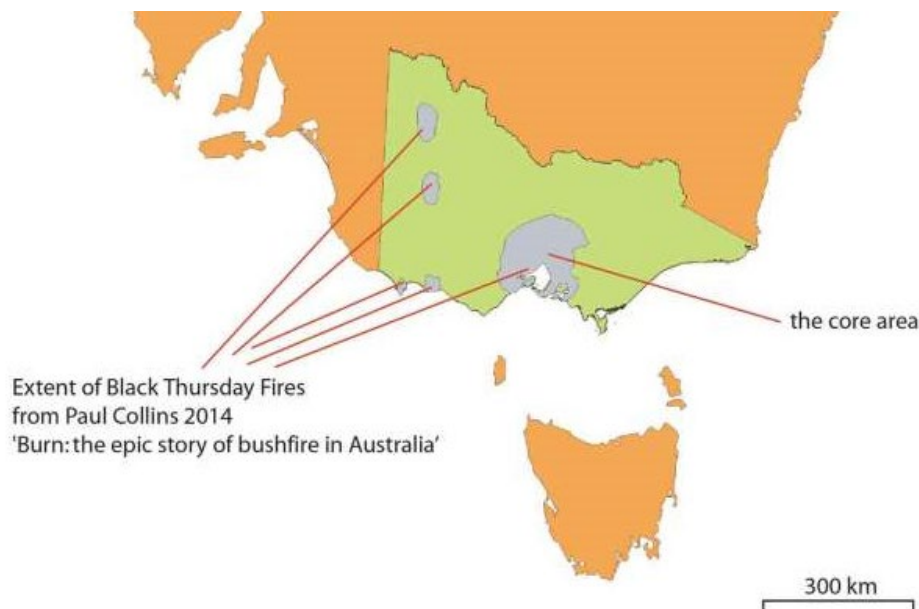
*b) all years*



This graph makes it very clear that no single wildfire event since 1851 have surpassed the devastation of this event. The 1851 event would have had a major impact on the environment, which reportedly burnt around 1.5 million hectares of forests.

The only attempt at mapping the 1851 fires – suggests that the 1851 bushfire was around 2.7 million hectares of which around 2.07 million hectares included the area of Melbourne and surrounds (Collins, 2006) (Figure 3). This places the 1851 fire close to the extent of the 1939 fires. Collins reportedly stated that the fire extent could have been larger. Even at the extent outlined by Collins suggests that the 1851 fire remains the largest Victorian fire. This is not unexpected given the resources available to fight fires in 1851 compared to today.

*Figure 3 Extent of 1851 bushfires<sup>10</sup>*



The further settlement and development of Victoria has increased the nexus between wildfires and our society – people, built environment, agriculture, forestry, and the natural environment. This was also noted by a review of Collins, 2006:

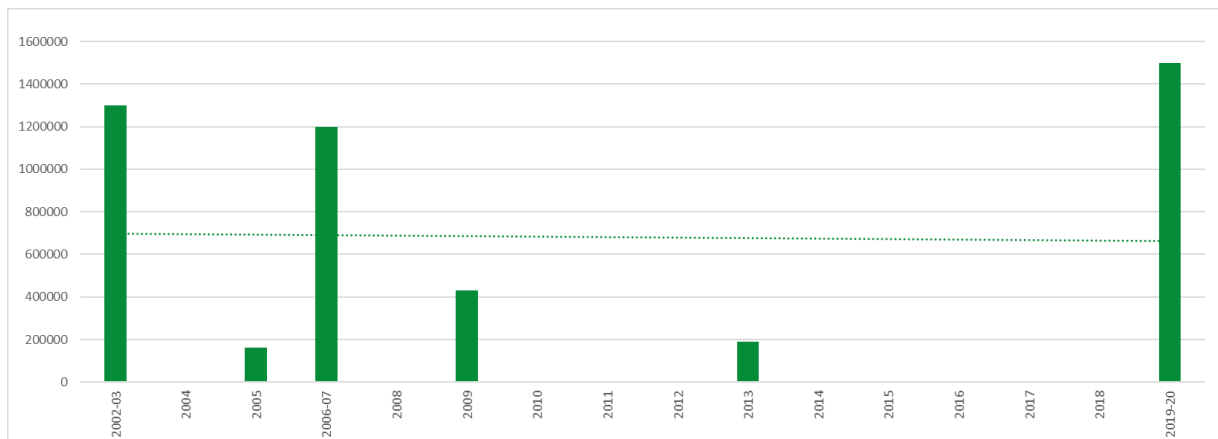
<sup>10</sup> [Australia's Black Thursday Fires 1851 – how big and why? – MikePole](#). Accessed 10 August 2021



*The hard fact he presents is that fires have increased because of the expansion of people into the bush either through settlement or recreational interests. Where people are, fires occur.* (Bantick, 2006)

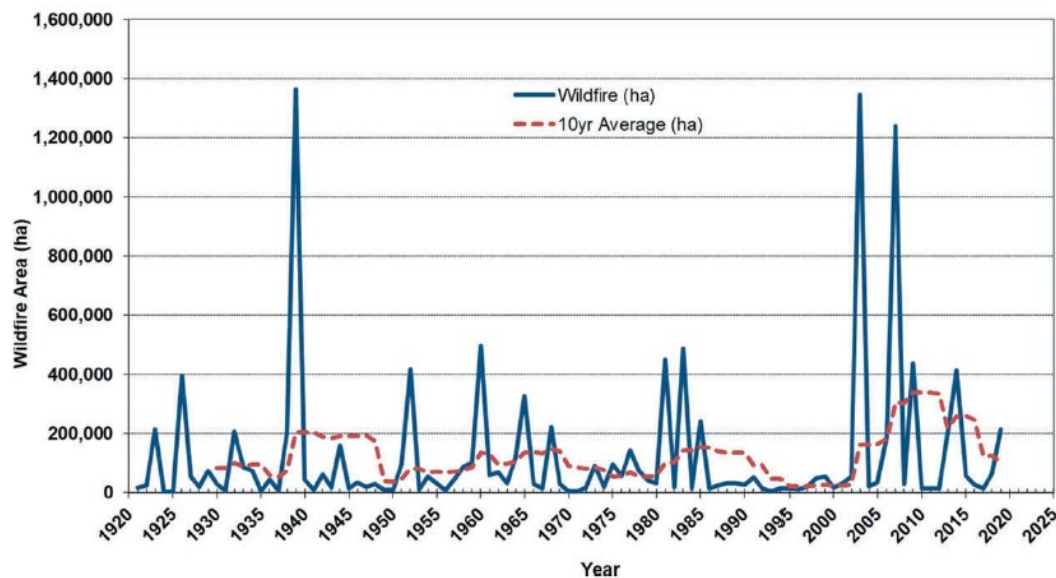
While the extent of the 1851 and 1939 megafires are a driver for the downward trend, even if these data points are removed, the area burnt trend remains on a slight downward trend, even over the period since 2000 (Figure 4)<sup>11</sup>.

**Figure 4 Wildfire extent (ha), Victoria only 2002 to 2020**



An alternative view of wildfire extent is provided in Morgan, et al., 2020<sup>12</sup> (Figure 5), which includes a 10-year moving average.

**Figure 5 Annual extent of wildfires in Victoria since 1920 (Morgan, et al., 2020)**



The 2019-20 fires stand in stark contrast to the 1851 and 1939 fires in terms of area; however descriptions appear like the experiences of 2019-20. The National Museum of Australia provides further explanation about the conditions leading up to the 1851 bushfires. The weather period from 1848 to 1851 was erratic from heavy rainfall to drought, high temperatures, snow,

<sup>11</sup> The data was sourced from Morgan, et al., 2020 and Forest Fire Management Victoria [Past bushfires \(ffm.vic.gov.au\)](http://ffm.vic.gov.au)

<sup>12</sup> Figure 4 on page 8

and floods, with a build-up of vegetation. The 1851 summer was long and hot with uncontrolled bushfires in the Plenty Ranges, Mount Macedon, and the Pyrenees. Black Thursday was 43.4 degrees Celsius<sup>13</sup> with strong northerly winds driving the fires:

*flames leap[ing] from treetop to treetop, and windblown fragments of burning bark drove the fires onward". The impact on homes, livestock and wildlife was immense "birds were dropping down off the trees before the fire in all directions – opossums, kangaroos, and all sorts of beast can be had today ready roasted all over the bush"<sup>14</sup>.*

This account appears to be supported by other commentary from the time such as this account from the Melbourne Herald<sup>15</sup>:

*The fire kept enlarging its orbit, rolling about like some huge monster, destroying everything it touched, its track marked by charred timber, embers and ashes, cries and lamentations. Not content with dashing along the ground, it ran up the highest trees and the flames leaped in monkey fashion from tree to tree.<sup>16</sup>*

The 1851 fires experience is depicted in the painting by William Strutt (Figure 6) which appears to be reminiscent of the 2019-20 bushfires as depicted in media reporting at the time (Figure 7).

**Figure 6 Black Thursday 6 February 1851 by William Strutt<sup>17</sup>**



---

<sup>13</sup> Other accounts suggest temperatures of around 47 degrees Celsius

<sup>14</sup> Accessed 5 August 2021. Online [Black Thursday bushfires | National Museum of Australia \(nma.gov.au\)](https://www.nma.gov.au/black-thursday-bushfires)

<sup>15</sup> A further account by William Howitt can be viewed at [Black Thursday - John Blay's South East Forests](https://www.fox.com.au/black-thursday-john-blays-south-east-forests). Accessed 10 August 2021

<sup>16</sup> Accessed 6 August 2021. Online [Romsey Australia: Bushfires in Victoria 1851 Black Thursday](https://www.fox.com.au/black-thursday-john-blays-south-east-forests)

<sup>17</sup> *ibid*

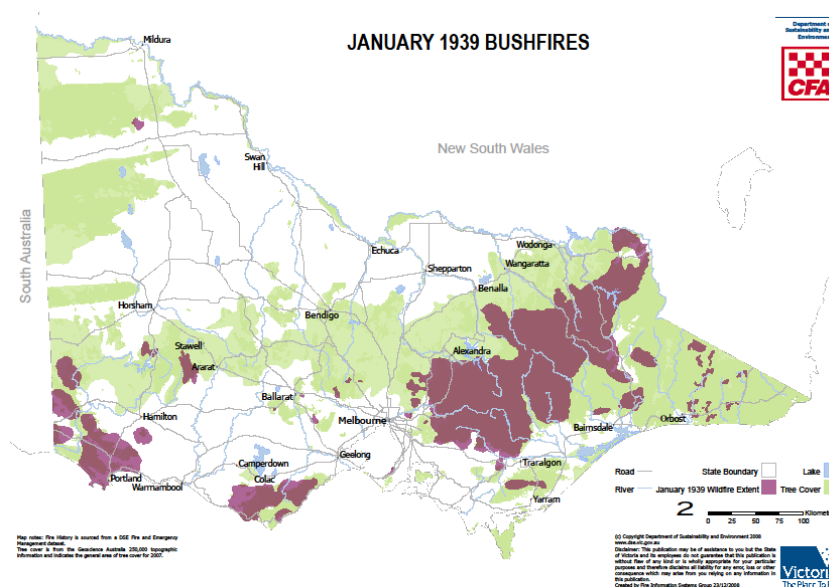
**Figure 7 Fire Storm Upper Murray 2019-20<sup>8</sup>**



However, the 1851 fires remain the largest single bushfire event since European settlement and is likely to have surpassed the impact on Victoria’s biota from the 2019-20 fires. What is stark is the sheer number of larger bushfires since 2000, with now close to 5 million hectares burnt across Victoria in seven major events – all in less than 20-years – an area that equates to nearly one third of the total area burnt by major fires since 1851.

The extent of the 1939, forest fires between 2002-03 and 2009, and 2019-20 fires are shown in Figure 8, Figure 9 and Figure 10 respectively.

**Figure 8 Extent of 1939 Victorian Bushfires<sup>19</sup>**



<sup>18</sup> <https://www.abc.net.au/news/2020-09-05/heroic-volunteer-firefighters-to-be-immortalised/12630212>. Accessed 10 August 2021

<sup>19</sup> [Past bushfires \(ffm.vic.gov.au\)](http://Past bushfires (ffm.vic.gov.au))

Figure 9 Wildfires affecting Victoria between 1995–2020 (Lindenmayer & Taylor, 2020)

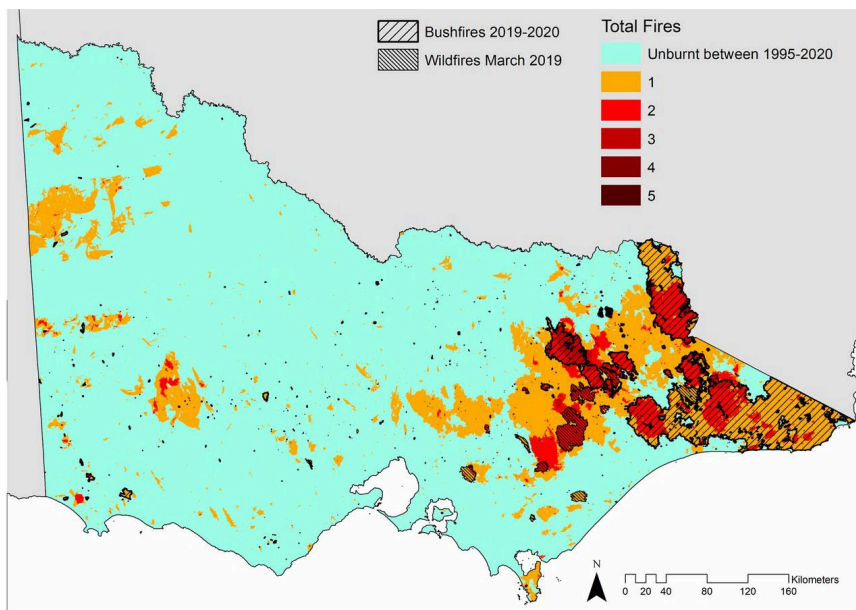
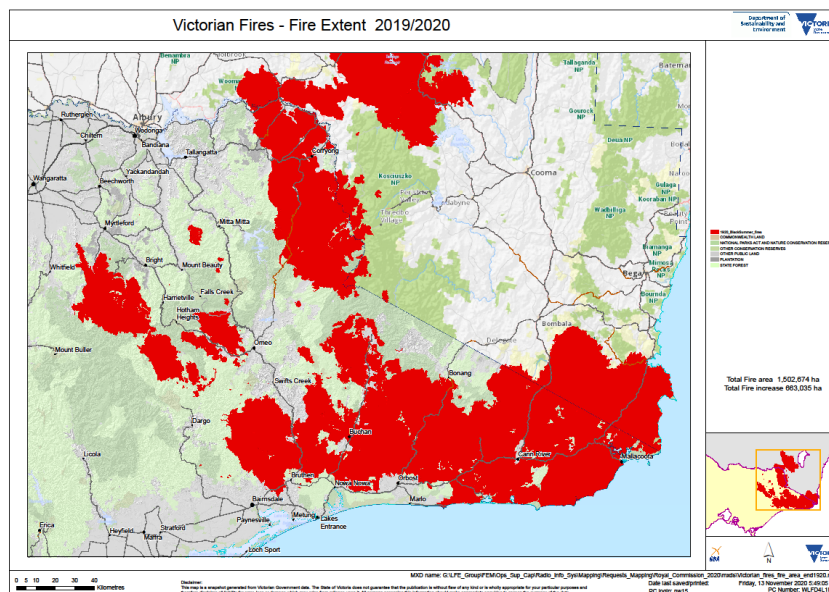


Figure 10 2019–20 Victorian Bushfire Extent<sup>20</sup>



What the above discussion shows is that Victoria's eastern forests have been mostly ravaged by fires, and some significant events, since 1850. Much of the RFAs environmental values have recovered or are in the process of recovering. The 2019–20 fire landscape while devastating to the forests and wildlife, will also recover with time.

The Australian State of the Forests Report, 2013 states that Australia's:

*“flora and fauna species have a range of adaptations for surviving fire, and the absence of fire or changed fire regimes are threats to many ecosystems and specifically to forest health. However, wildfire can be very dangerous to life and property, especially in*

<sup>20</sup> Ibid

*south-west and eastern Australia, where the combination of climate and vegetation is particularly conducive to producing catastrophic fire conditions".*

*Fire is also an important forest management tool in Australia. Planned fire of the appropriate intensity is used in fire-adapted forest types to reduce fuel loads and increase the ability to manage subsequent unplanned wildfire, to promote forest regeneration after wood harvesting, to promote the health of forest stands, and for biodiversity management. Forest fires, both planned and unplanned, burn annually across large areas of the woodland forests of northern Australia*

Recently published research by the Country Fire Authority (CFA) and Monash University suggests that the number of extreme fire days in Victoria will increase by 10-20 per cent (2085-2100 compared to 1973-2016), with temperature the main driver resulting in the fire season becoming longer and more dangerous (Jenkins, 2021) (Country Fire Authority, 2021).

The 2009 Victorian Bushfires Royal Commission, noted that there is a significant trend showing increasing severity with time since the area was last burnt, and that the benefits of a burn through reduced fuel load continue for around 20 years. The 2003 and 2006-07 fires correlate to the 1939 fires. Fires affecting Gippsland were seen in 1983 and 2009, with the 2009 fire only partially correlating to the area burnt in 2019-20. This suggests that East Gippsland was at risk.

Moreover, with a significant increase in wildfires right now occurring in the USA, it is interesting to note the commentary around the devastation broadly being a factor of human activity. While climate change is a factor, so too, land management is a factor laying the foundations for extreme fire risk. This was noted as a lack of investment in thinning and suppression regime that led to a buildup of fuel for large fires (Whittington, Clark-Ginsberg, & Balagna, 2021). This commentary is highly relevant to Australia.

The cause of fires can be natural, deliberate, or accidental. Lightning strikes are responsible for 26 per cent of fires followed by arson at 25 per cent, agriculture (16 per cent), campfires (10 per cent) and cigarettes (7 per cent)<sup>21</sup>. In terms of cause by area burnt, again lightning strikes comes out in front (46 per cent), public utilities and arson (14 per cent respectively)<sup>22</sup>.

However, fire severity is not just measured in terms of fire extent, but in terms of anthropological impact such as loss of life, impact to agriculture (crops and livestock) and plantations, and loss of the built environment (homes, businesses, roads etc), with the impact on the natural environment rising in concern over the last decades.

The deadliest fire remains the 2009 Black Saturday fire with 173 deaths followed by the 1939 fire (71 deaths), 1926 fire (60 deaths), 1944 (51 deaths), 1983 (47 deaths), and 1962 (33 deaths)<sup>23</sup>, which collectively represent 78 per cent of deaths. While the 2019-20 fires are notable for the impact on wildlife.

## **2.1 Economic Impact**

The three recent intense broadscale wildfires in Victoria (2002-03, 2006-07 and 2009) had significant impacts across the alpine and other national parks and on multiple-use forests used for wood production. The total area of multiple-use forests burnt in these fires was 1.2 million

---

<sup>21</sup> [Bushfires in Victoria - Wikipedia](#). Accessed 10 August 2021

<sup>22</sup> Ibid.

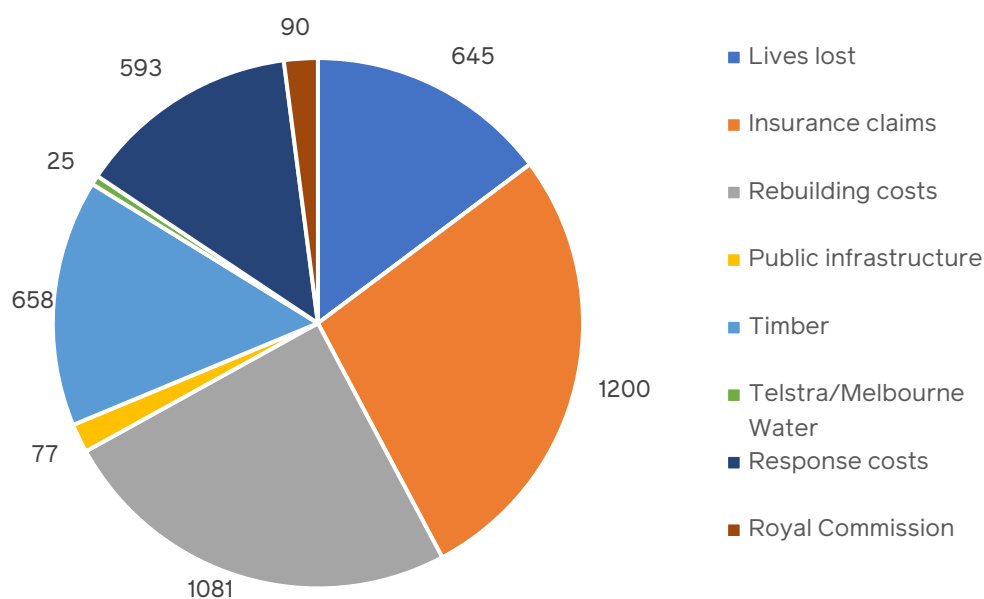
<sup>23</sup> Ibid

hectares, and the total area of nature conservation reserves burnt was 0.94 million hectares (Australia's State of Forests, 2013).

The social and economic impact of fires is substantial. A conservative assessment of the 2009 bushfires was estimated to cost over \$4 billion (Deloitte Access Economics, 2017). Figure 11 shows the breakdown of these costs. Of note is that the impact on forest industry and timber of \$658 million (16 per cent of the total cost), which includes lost timber and replanting costs but omits costs impacting the supply chain in future years.

An alternate view by the Bushfire CRC suggests a net cost of \$942 million (cost of \$2,939 million less government aid programs, donations, and insurance claims of \$1,998 million), of which timber losses were estimated at \$80 million (Stephenson, Handmer, & Haywood, 2012).

**Figure 11 Economic Cost of the 2009 Black Saturday Fires (\$million)** (Deloitte Access Economics, 2017)



Some attempts have been made to cost the 2019-20 bushfires, using the Deloitte Report as a base, and suggested that for all the 2019-20 fires (i.e. not just Victoria), including both tangible and intangible, the cost will be \$230 billion (Read & Denniss, 2020). Another report suggested that the Australian economy took a \$20 billion impact, resulted in \$1.7 billion in insurance losses, and smoke caused between \$12-50 million disruption to Sydney alone (Filkov, Ngo, Matthews, Telfer, & Penman, 2020).

The Victorian Department of Treasury and Finance<sup>24</sup> modelled the impact of the 2019-20 fires, estimating that the overall welfare impact to Victoria's economy to be \$2.1 billion (net present value over ten years; excludes recovery costs, estimated at \$250 million) and that it would take more than five years to recover. The major costs were \$663 million destroyed capital offset by \$167 million in insurance payouts and \$183 million labour productivity losses. In addition, is the cost to the natural environment and with 60 per cent of over 50 national parks and nature reserves affected, and concerns for regeneration of Alpine Ash (Huf & Mclean , 2020).

<sup>24</sup> [The economic impacts of the 2019-20 bushfires on Victoria | Department of Treasury and Finance Victoria \(dtf.vic.gov.au\)](https://www.dtf.vic.gov.au/economic-impacts-of-the-2019-20-bushfires-on-victoria)

The Bushfire and Natural Hazards CRC suggests three types of impacts – direct costs (homes, infrastructure, crops), tangible indirect losses (relief and recovery expenditure) and intangible indirect costs (mental health, social effects and the value of forests burnt) and suggests the 2019-20 fires incurred over \$100 billion in costs<sup>25</sup>. Moreover, intangible costs can peak years after a disaster, sometimes decades if not generations<sup>26</sup>. The social cost (health, mental, impacts to children etc) of the 2019-20 fires has been a significant focus than perhaps for any other fire.

---

<sup>25</sup> [Calculating the losses this fire season | Bushfire & Natural Hazards CRC \(bnhrc.com.au\)](https://www.bnhcrc.com.au/news/calculation-the-losses-this-fire-season)

<sup>26</sup> [With costs approaching \\$100 billion, the fires are Australia's costliest natural disaster \(theconversation.com\)](https://www.theconversation.com/with-costs-approaching-100-billion-the-fires-are-australias-costliest-natural-disaster)

### 3 Bushfire inquiries and their influence on policy and management

Bushfires are emotive, as are the pros and cons of bushfire preparedness through controlled or prescribed burns. Between 1939 and 2018 there were 56 reviews and inquiries in relation to bushfires – with around 29 per cent of these related to Victorian fires. Since 2018, there have been numerous more including in Victoria and with some inquiries yet to be finalised<sup>27</sup>. The Natural Disaster Royal Commission, however, identified more than 240 formal analyses completed since 1927 resulting in thousands of findings and recommendations<sup>28</sup>. The Royal Commission noted the following common themes:

- agency organisation
- responsibility
- hazard management and risk reduction, and
- response coordination (Royal Commission into National Natural Disaster Arrangements, 2020).

The Bushfire and Natural Hazards CRC has also catalogued these inquiries and reviews and sought to map the recommendations into 32 key themes, with the most common being:

- doctrine, plans, standards, and legislative reform (200 recommendations)
- land use planning / development / building codes / regulation of building and refuges (81 recommendations)
- community warnings and communication (76 recommendations)
- emergency management agency organisation, management, and authority (75 recommendations), and
- Incident Management Teams (73 recommendations) (Royal Commission into National Natural Disaster Arrangements, 2020).

This Review is one in a long history of reviews and inquiries. This is in addition to any litigation. The cost is huge, consumed massive amounts of time and resources and “*created a fire management approach that is now highly risk-averse and focussed exclusively on the potential negative effects of wildfires and prescribed burning*” (Morgan, et al., 2020).

Morgan, et al., 2020 also discuss these inquiries and their impacts on policy and management. The key points are outlined below.

The 1939 Stretton Royal Commission criticised the “*ridiculously inadequate*” extent of prescribed burning in state forests, with the resultant shift in government policy to a gradual increase in controlled burns and silviculture on public land.

Likewise the 2003 fire inquiries facilitated a national fire research program, with substantial investment in prescribed burning, which assisted in the management of fire risks and environmental values. The 2009 fires also noted that land and fuel management was an important issue. The Streeton Commission clearly viewed prescribed burning as a tool to decrease fuel loads and thus reduce bushfire spread and intensity, which ultimately helps protect biota.

---

<sup>27</sup> For example, the Australian Senate Finance and Public Administration References Committee, Inquiry into the [Lessons to be learned in relation to the Australian bushfire season 2019-20 – Parliament of Australia \(aph.gov.au\)](#) with the final report due 2 December 2021

<sup>28</sup> [Background paper | Royal Commission into National Natural Disaster Arrangements](#)



This is supported by a significant body of supporting research in Australia (Volkova, Bi, Hilton, & Weston, 2017) (Volkova, et al., 2014) (Keenan, et al., 2021) (Keenan R. , There's only one way to make bushfires less powerful: take out the stuff that burns, 2020) (Keenan, Weston, & Volkova, Forest thinning is controversial, but it shouldn't be ruled out for managing bushfires, 2020) (Poynter M. , 2018) (Tolhurst & Vanclay, 2020) (Tolhurst & Vanclay, 2021) and overseas (USDA Forest Service, 2020).

Research following the 2003 bushfires determined that the most significant factors determining fire severity were weather, followed by time since the last prescribed burn – and the subsequent build up of fuel levels. Importantly there was a significant trend showing increasing severity with time since the area was last burnt, and that the benefits of a burn continue for around 20 years (2009 Victorian Bushfires Royal Commission, 2010).

**Recommendation 8:** The Panel should seek information from Forest Fire Management Victoria, the Country Fire Authority and the Department of Environment, Water, Land and Planning on the build up of forest fuel loads ahead of the 2019–20 bushfires, the time since last burnt, and the extent of prescribed burning or mechanical control that occurred in the public land estate.

**Recommendation 9:** The Panel should consider current fuel build up in the public land estate across Victoria, along with the time since the last reduction occurred (bushfire, prescribed burn or mechanical control). This should provide a view of risk for the rest of Victoria into the future.

Notably the 2009 Commission stated “*maintaining pristine forests untouched by fuel reduction can predispose those forests to greater destruction in the event of a bushfire*” (Morgan, et al., 2020). With over 8 million hectares of land in the public land estate and much of it forests, it would appear that the Commission's findings in 2009 came to fruition in 2019–20 yet again where significant impacts to Victoria's conservation estate, state parks and cultural and heritage values occurred.

And this is the crux of the problem – the views of some that forests need to be locked up and left pristine versus active management that includes timber harvesting and active forest management such as thinning, regeneration and so on.

It is clear that active forest management and timber harvesting has led to improved environmental outcomes for Victoria's forests and its dependent biota. For example, over 1000 colonies (nominally up to 12,000 individual animals) of Leadbetter's Possum have been located in harvest coupes as ash forests around 20 years after harvest with acacia understorey are the possums preferred feeding habitat. Timber harvesting has supported this iconic species and its survival.

The question then should be what will the impact be of the Victorian Government's decision to phase out native timber harvesting on protected matters such as the Leadbetter's Possum if there is no further active forest management. One could dare suggest that this decision will lead to a decline in the species.

The lessons of locking up Victoria's world important river red gum forests in northern Victoria should be noted. In 2010, 80 per cent of the forest was converted to national parks. Locals expressed concern about the increase risk of fire as grazing and firewood collection ceased. Five years later, locals described these iconic forests as:

- an extreme fire risk, with volunteer CFA fire fighters refusing to enter the forest
- neglected and deteriorated
- having an increased woody weed burden and thus fuel load

- having reduced fire access roads and tracks many of which were impassable, and
- subjected to a decline in national park funding (Poynter M. , 2018).

Victoria's conservation culture has infiltrated the political spheres and the bureaucracy, it perverts good land management decision making as it is driven from an ethos that environmental protection can only be achieved by reducing the intersection between people and the environment (Poynter M. , 2018). However, there is neither the capacity or sufficient funding to manage and monitor all of Victoria's 8 million hectares of public land.

**Recommendation 10:** That the Panel seeks information on the trends in matters of national environmental significant in harvest coupes (from VicForests) versus the conservation estate (from the Department of Environment, Water, Land and Planning).

**Recommendation 11:** That the Panel recommends active forest management including timber harvesting, should continue and be expanded on Victoria's public land estate, due to the positive impact on protected matters and bushfire control.

Arguments to phase out productive working forests (e.g the Otways, and the Barmah-Millewa forests) and transfer these into the conservation reserve suggest that a new era of eco-tourism will replace the industries affected (e.g. fire wood collection, grazing and timber harvesting). Some assistance via Government programs is provided to assist affected businesses through the structural adjustment period (e.g. Victoria's Forestry Plan). As yet, no socio-economic assessment has occurred on whether eco-tourism or indeed the government structural adjustment programs has significantly replaced the previous socio-economic fabric of the community.

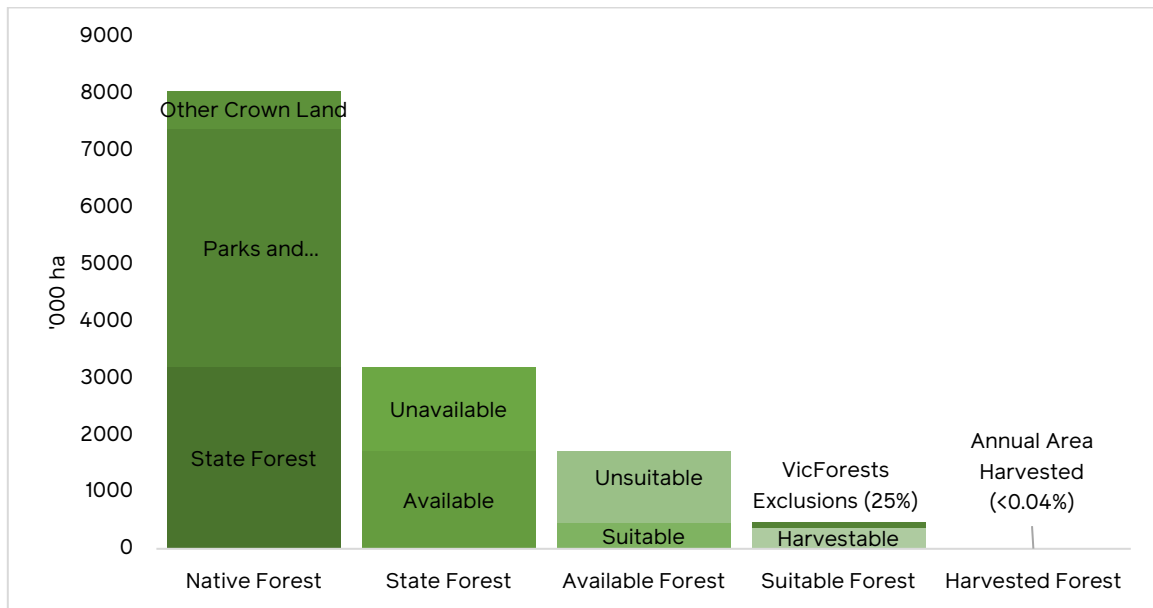
**Recommendation 12:** The Panel recommends that the Victorian Government undertakes a socio-economic assessment of past and current decisions to transfer working forests (i.e. state and regional parks) into the conservation estate to determine the socio economic impacts to affected communities and businesses.

## 4 Victoria's Forest Estate

Victoria has over 8 million hectares in the public land estate, of which approximately 3.2 million hectares is multiple use forests, including for native timber harvesting. There is an additional 1.5 million hectares of private land forests.

Not all Victoria's public land estate is available or suitable for native timber harvesting. Less than 5 per cent is able to be harvested, with harvesting of up to 3,000 hectares or 0.04 per cent of the public land estate each year (Figure 12).

*Figure 12 Proportion of public native forests available for timber harvesting 2020<sup>29</sup>*



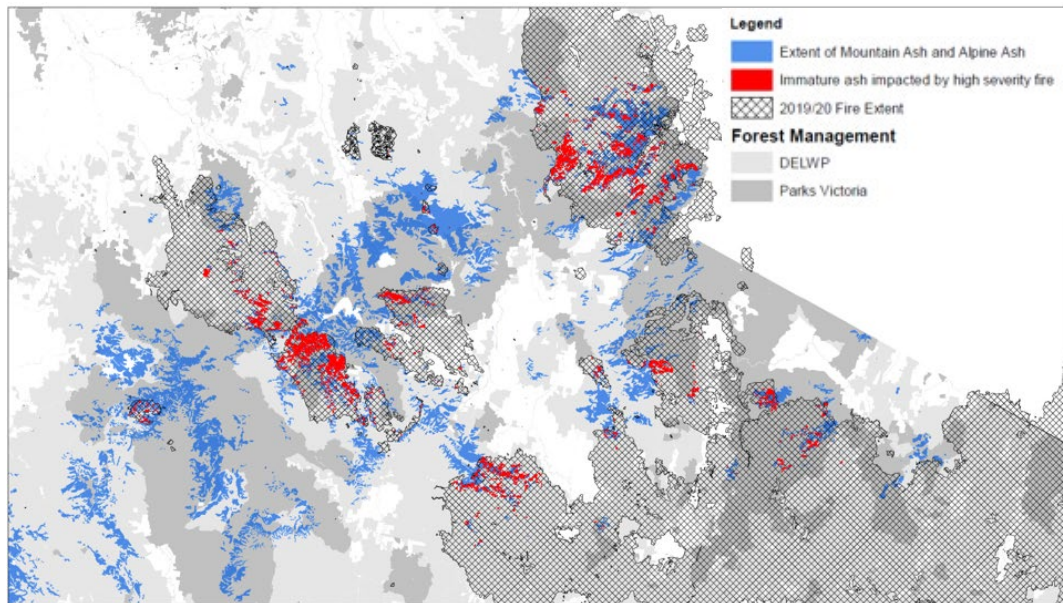
Of the 83,000 hectares of ash forests 22,000 hectares were reproductively immature ash forests (less than 15-20 years) that burned at high severity, had been subjected to fires since 2000 (Figure 13) and thus were vulnerable ahead of the 2019-20 fire season.

VicForests is not just responsible for harvesting native timber. VicForests also collects seeds that are used to regenerate of harvest coupes. This seedbank was critically important in assist to regenerate the fire ravaged landscape after the 2019-20 fires. This was the largest single re-seeding program where over 11,000 hectares was reseeded with 4,000 kg of mountain ash and 2,000 kg of alpine ash seed (sourced from VicForests and other agencies). An explanation of the program can be explored further at the Community Bushfire Connection website ([Regrowing our ash forests • Community Bushfire Connection](#)).

Regeneration will be more important as the risk of fire increases due to climate change and with increasing fuel loads. It is a way in which we can ensure our forests can be here not just today but for the future.

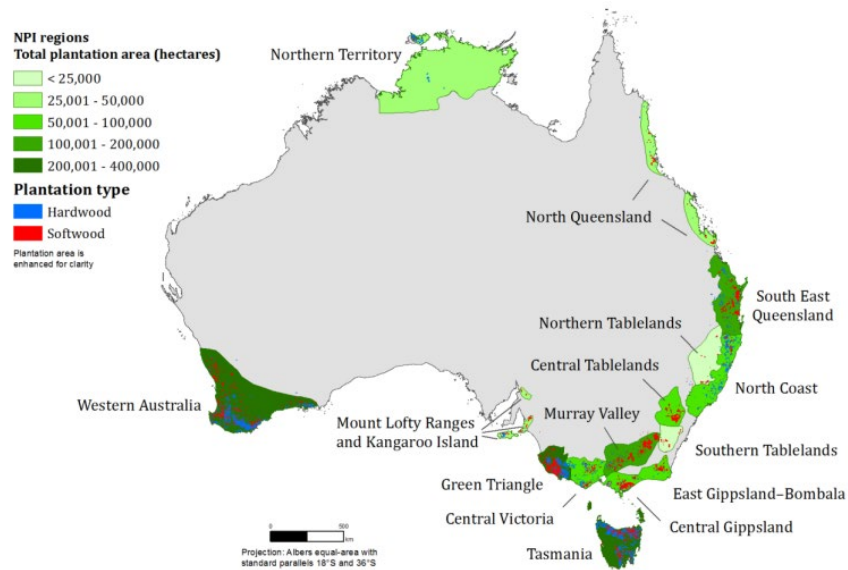
<sup>29</sup> Source: VicForests

Figure 13 Extent of ash forests and immature ash forests in East Gippsland<sup>30</sup>



In 2018-19, Victoria's plantation estate was approximately 418,000 hectares, with the estate remaining fairly static over the past decade. The plantation estate is concentrated in three main regions: the Green Triangle, Gippsland and North East Victoria (Figure 14).

Figure 14 National Plantation Inventory Regions<sup>31</sup>



#### 4.1 Bushfires and Native Timber Harvesting

Without doubt, there is a significant impact from wildfires on the ability to harvest native timber. The 2019-20 fires reportedly impacted 40 per cent of the state forests allocated to VicForests and further exacerbated timber supplies to sawmills (Towell, 2020). Timber supplies had already been constrained due to green lawfare and injunctions against VicForests.

<sup>30</sup> Source: [Regrowing our ash forests - Community Bushfire Connection](#)

<sup>31</sup> Source: [AustPlantationStats\\_2019\\_v.1.0.0.pdf \(agriculture.gov.au\)](#)

The area available for native timber harvesting has decreased over time driven by activists who continue to grossly misrepresent timber harvesting as an existential threat to a range of wildlife species and other forest values. These views have clearly driven today's public policy and the Victorian Government's decision to phase out native forestry.

This is just poor public policy that will only exacerbate the severity of fires because:

- The loss of experienced fire-fighters, and their equipment, who previously worked as foresters and industry contractors in the industry
- Increasingly locked up conservation estates has led to the neglect or has closed roads and tracks that have significantly hampered rapid fire control, and
- Active forest management and native timber harvesting have been long recognised as contributing to the reduction in forest fuel and thus fire severity.

The Inspector General Emergency Management (IGEM) Inquiry into the 2019-20 fires, as summarised in Department of Environment, Land, Water and Planning 2021, supported these views:

- the loss of experienced people able to operate machinery in steep, rough country is critical to fire suppression tactics
- a loss of specialised heavy equipment as the demand will be reduced and many smaller operators will not be able to afford to maintain their equipment to the high standard required for firefighting and fuel management operations
- a loss of local knowledge as many small communities are sustained by the timber industry but people will potentially need to move to larger towns to find work, and
- much of Forest Fire Management Victoria's (FFMV) road and track maintenance funds comes from VicForests haulage fees, which will be lost when native timber harvesting ceases (Department of Environment, Land, Water and Planning, 2021).

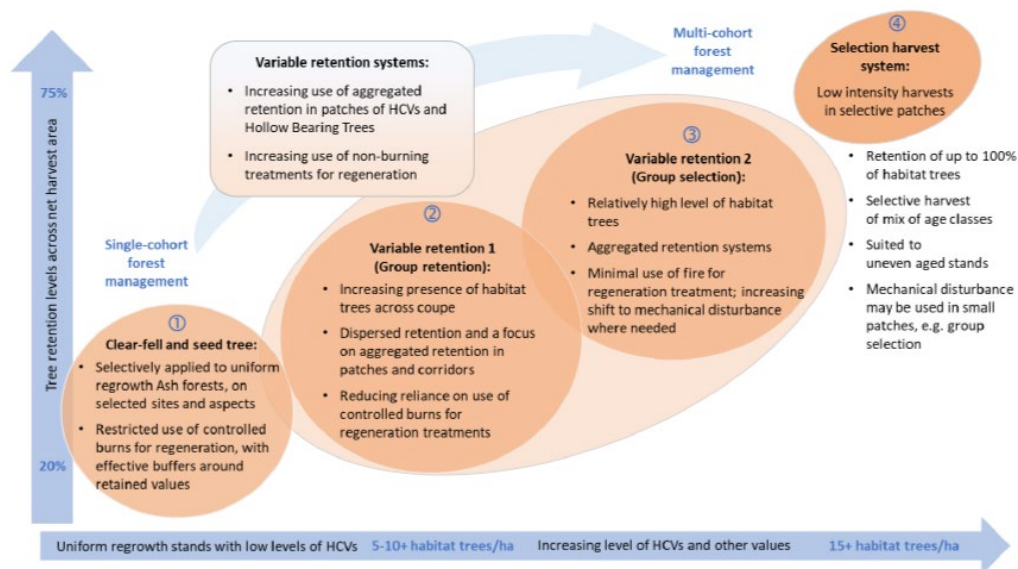
Given the history outlined in previous sections, it is of note that native timber harvesting continues to be blamed for the impact to Victoria's native flora and fauna. It is notable that historic mega bushfires have occurred across nearly, if not all, of eastern Victoria's forests.

Historic native timber harvesting over the period from the mid-1800s to the mid-1900s was significant and suggests that this may have supported reduced forest fuel loads that led to very infrequent fire events compared to post 1980. Considering the extent of timber harvesting now (less than 3,000 hectares), the impacts of bushfires on Victoria's forests are significantly in favour of bushfires to native timber harvesting.

Moreover, VicForests is required by law to regenerate each forest coupe. This creates a sustainable industry and promotes a healthy forest ecosystem. Australia is a world leader in integrating sensitive, renewable forest use and active management underpinned with high standards of environmental protection.

Despite this, in 2019 VicForests announced it would cease logging of old growth forests and implemented a variable harvesting regime (Figure 15), which protects hollow trees, recruits future hollow trees, connects habitat patches, and regenerates forest ecology through mechanical disturbance and low intensity fires. VicForests has committed to reduce the reliance on clear-felling and regeneration burning (VicForests, 2019), with this already in place in East Gippsland.

Figure 15 VicForests Silviculture Regimes (VicForests, 2019)



The VicForests harvest and regeneration plan states that to move to mechanical disturbance instead of controlled burns for regeneration needs further testing and refinement. Of note is that the former is generally more expensive and time consuming than regeneration burning.

Importantly as variable retention harvesting systems were to account for more than 75 per cent of its harvest area by 2020, additional insights into how this has influenced forest fuel loads may be available in the future.

Some scientists, ecologists, and conservationists (Zylstra, Wardell-Johnson, Watson, & Ward, 2021) are opposed to timber harvesting in native forests and use bushfires as a reason to stop these activities (Keenan, et al., 2021). In some cases, scientists continue to publish work such as suggesting that forests managed for timber production near settlements may be at increased risk of high-severity fire (Lindenmayer, Taylor, & Blanchard, 2021); however, those in bushfire ravaged towns may have a different perspective. There are also contrary studies showing timber harvest does not exacerbate bushfires (Keenan, et al., 2021). A recent opinion (Tolhurst & Vanclay, 2021) argue that research blaming timber harvesting is poor science (and may incorporate inadvertent bias) as the factors leading to fire severity are well established (Keenan, et al., 2021).

Keenan, et al., 2021 analysed timber harvesting along with fire extent and severity. They found that the 2019–20 bushfire extent and severity was largely driven by three years of well below average rainfall resulting in a significant volume of dry fuel across all vegetation types, extreme fire weather conditions and local topography – past timber harvesting had negligible or no impact on fire severity. This is supported by all three government inquiries, none of which found that timber harvesting contributed to fire severity and extent and there were no recommendations to support the calls from some that timber harvesting ceases (Keenan, et al., 2021).

Tolhurst & Vanclay, 2021 argue that a 2014 study on the two million hectares burnt in Victoria in 2003 and 2007 show no significant difference between fire severity in National Parks compared with State Forests, particularly when considered at the landscape scale. They argue that long term fire management in forested landscapes across all land tenures along with increasing the skills and knowledge to actively manage these landscapes will be important to reducing the

bushfire risks. They conclude that ceasing native timber harvesting will have a much greater impact on increasing bushfire severity and extent across the landscape. This view was supported by the recently released research by Keenan, et al., 2021.

It is notable that the extent of the 2019-20 bushfires is equivalent to 600 years of timber harvesting in Victoria<sup>32</sup>, showing how insignificant annual native timber harvesting is compared to such events.

#### **4.1.1 Native timber salvage harvesting**

Native timber salvage harvesting has been occurring for 80 years (The Institute of Foresters of Australia/Australian Forest Growers, 2020). Post bushfire harvesting is time constrained and must be undertaken before the timber deteriorates. The timber can be critical to maintaining timber supplies, supporting regional communities and industries while avoiding industry closures, reduce future fire risk and potential fire spotting. While it can be contentious in the broader community, these views are mostly based on misunderstanding and misinformation (The Institute of Foresters of Australia/Australian Forest Growers, 2020).

One response to the 2019-20 fires was to harvest fire-killed ash and other severely burnt species. Salvage harvesting was subjected to additional environmental regulations than would normally apply. Salvaging timber avoids placing more pressure on other unburnt forests designated for production (The Institute of Foresters of Australia/Australian Forest Growers, 2020).

Following the 2019-20 fires, VicForests harvested 350,000 tonnes of burnt trees, which equated to around one quarter of the annual native timber harvest volume. The salvaged timber was primarily in the Corryong and Tambo regions. As these trees were dead, this effectively allowed VicForests to substitute salvaged timber for coupes scheduled for harvest in the fire zones.

Timber was also salvaged as part of the post fire major roadside clearing works undertaken on the Princess Highway. This timber was supplied to VicForests' East Gippsland customers and assisted supply during the post fire period. As an interim measure, the balance of these customers' requirements was supplied from the West Gippsland and North East Regions until the revised prescriptions were put in place (see below)<sup>33</sup>.

VicForests worked with the Office of Conservation Regulator to determine additional adaptive prescriptions for the protection of threatened species within the fire footprint, and subsequently commenced harvesting operations with the revised prescriptions in place, and which remain in place until now. This was supported by a moratorium that precluded harvesting outside the fire footprint between June 2020 and February 2021<sup>34</sup>.

The approved Timber Release Plan (TRP) includes several coupes identified as so damaged by the fires that they cannot be harvested. VicForests will replace these coupes on future TRP's, for which the planning work is ongoing<sup>35</sup>.

---

<sup>32</sup> 1.5 million hectares of 2019-20 fire extent divided by 2500 hectares of native timber harvested annually.

<sup>33</sup> Source: VicForests

<sup>34</sup> Ibid

<sup>35</sup> Ibid

All VicForests' East Gippsland contractors are working to revised harvest schedules and most of the supply into East Gippsland mills is now planned from the region's harvest and haul contract operations<sup>36</sup>.

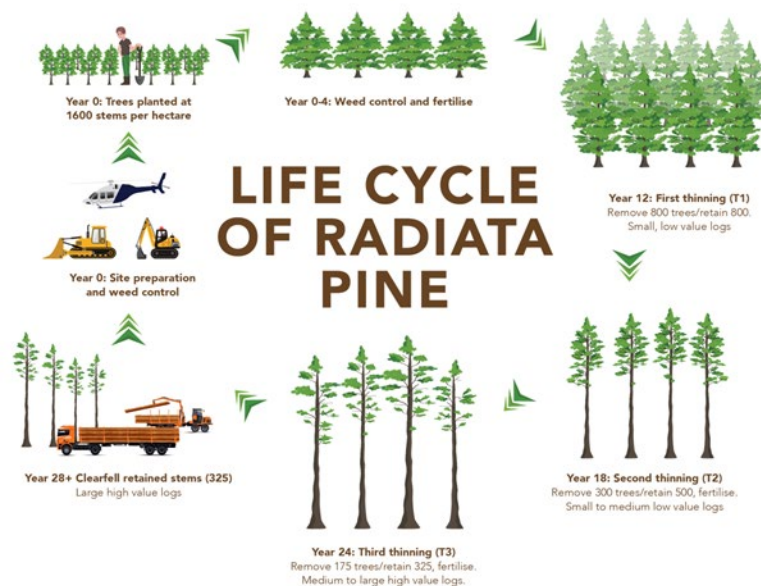
It should be noted that several harvest contractors earned income by combatting the fires and the post recovery works. Unfortunately, attempts to ascertain the quantum of these costs, and indeed the full costs of responding to and recovery from the 2019-20 fires to the Victorian Government has been unsuccessful.

## 4.2 Bushfires in Plantations

High temperatures, heatwaves, drought, low humidity, strong winds and the accumulation of fuel will exacerbate the risk of bushfires. Future climate models suggest these risks will increase in terms of severity and the number of high bushfire risk days.

Plantation forests undergo more regular changes through thinning and harvest operations over the course of rotation. An example of a pine rotation is included at Figure 16, with the actual rotation varying depending on factors such as species, regional conditions, and whether the plantation's end use is for pulp or saw logs. Fuel loads on virgin plantings are likely to be low, however, these build up over the course of the plantation's rotation (Pinkard, et al., 2014) and for subsequent rotations where harvest residue is used to assist tree seedling establishment.

*Figure 16 Radiata pine rotation*



With projected climate change, the plantation fuel loads will increase in response to increased photosynthesis. Inland areas have the highest fire risk exposure, with Victoria identified as experiencing one of the largest changes in fire risk. Management of fuel loads, on both private and public land, to reduce fire intensity is critical to reduce risk of damage.

Without a doubt, Victoria has faced, and will continue to face, significant risks from bushfires. Plantations lost from fire in Australia have increased in line with the growth of the plantation estate (Figure 17), albeit due to data paucity, not all losses above 100 hectares may have been

<sup>36</sup> Ibid



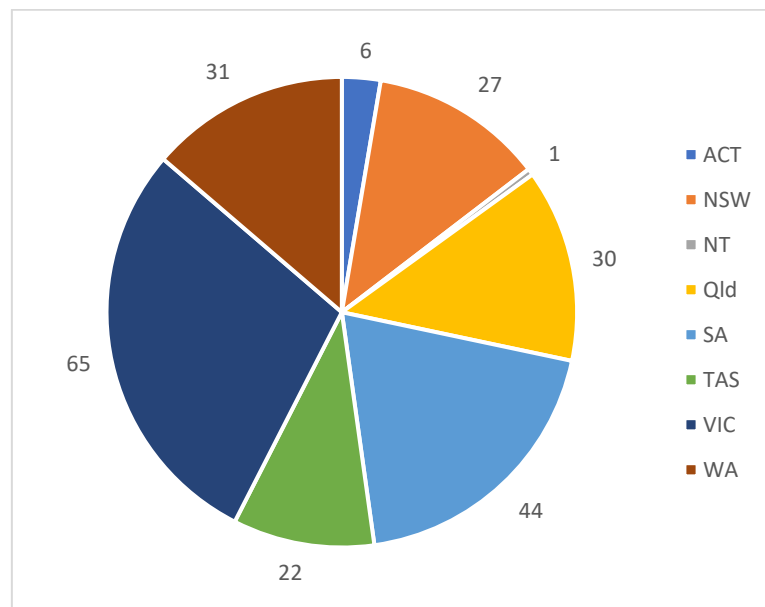
identified (Geddes, 2020). 100 hectares was chosen as the cut off, as areas above this have market implications in terms of loss of future log (or chip) for regional supply (Geddes, 2020).

*Figure 17 Australia's plantation fire losses over 100 ha; five-year intervals (Geddes, 2020)<sup>37</sup>*



When just Victoria's plantation losses are considered, between 1939 and 2020<sup>38</sup> there have been 65 fires (or 29 percent of all fires) greater than 100 hectare that have burnt a total of 65,000 hectares<sup>39</sup> (Figure 18), and 37 fires (or 32 per cent) between 2005-2020 (Figure 19).

*Figure 18 Number of Australia's plantation fires over 100 ha – all years (Geddes, 2020)*

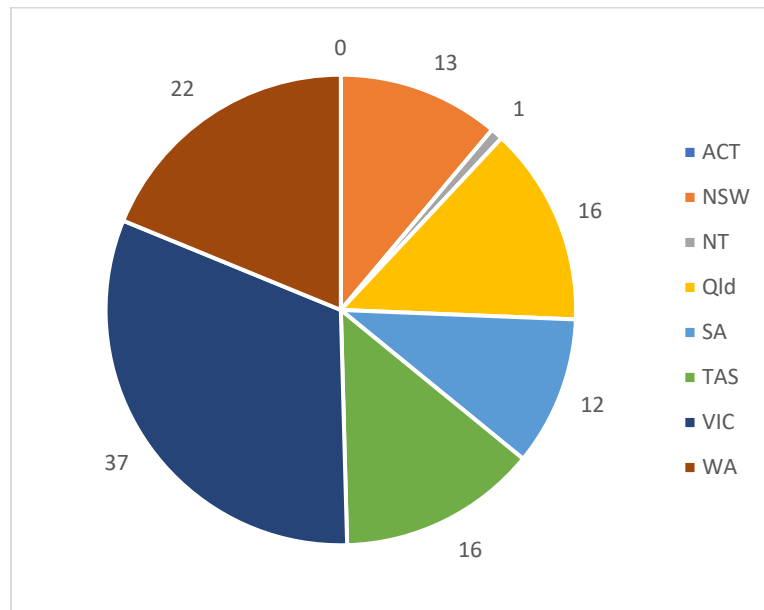


<sup>37</sup> LH Axis: more than 100 ha was burnt (red) compared with the total Australian plantation area (green; RH axis).

<sup>38</sup> As each state's plantation sector developed differently, the affected years vary widely, however, all data is included.

<sup>39</sup> Source: Forest & Wood Products Australia

*Figure 19 Number of Australia's plantation fires over 100 ha – 2005-2020 (Geddes, 2020)*

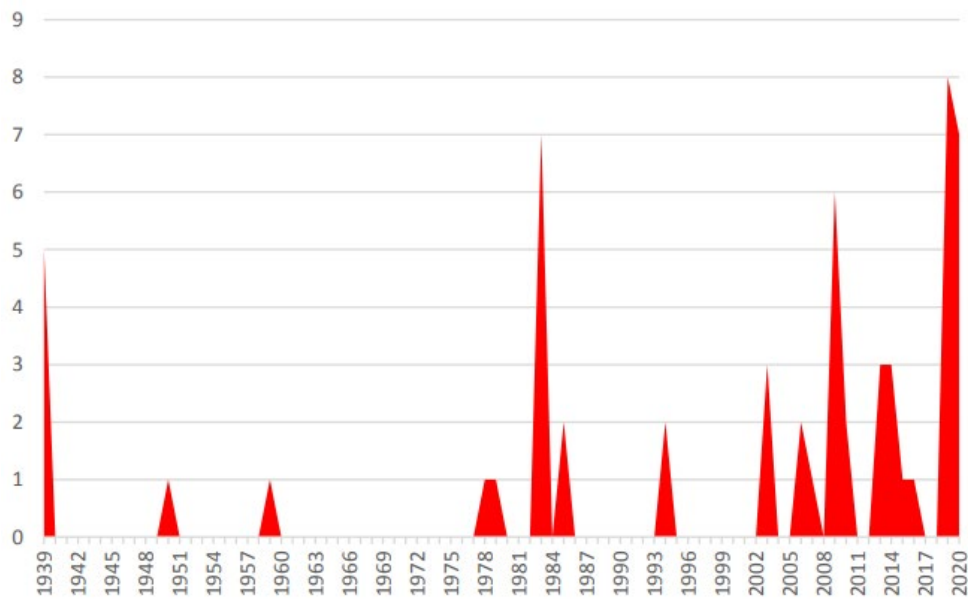


Around 85 per cent of the area of Victoria's plantations burnt has occurred since 2000 – and overwhelmingly, radiata pine was the species burnt. The amount of plantations burnt during each bushfire event is highly variable. For the 2019–20 bushfires, there were five bushfires that burnt plantations in Victoria with the amount of plantations burnt to the entire bushfire area varying between 1.5% and 87%.

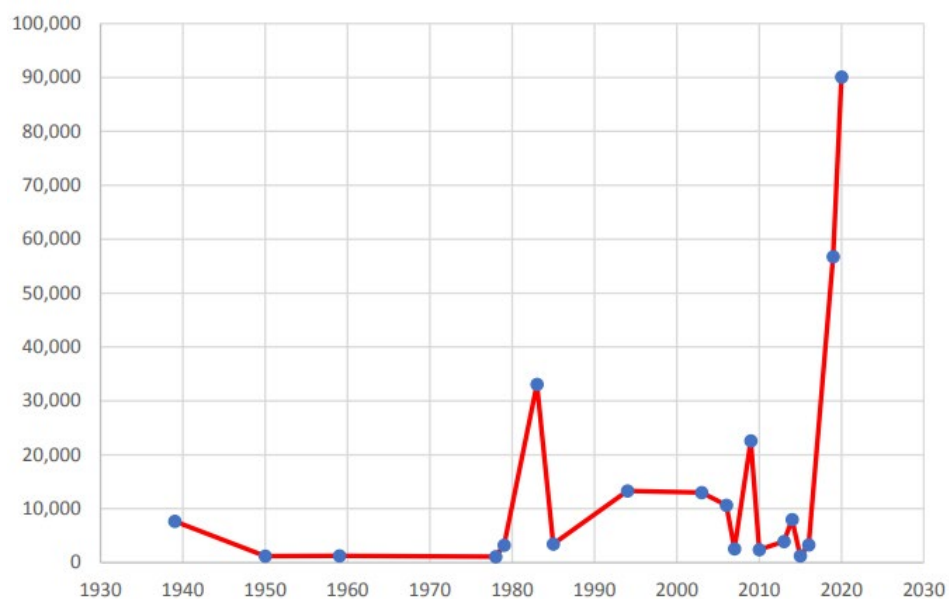
Victoria's plantation industry has and continues to be disproportionately affected by fires when compared to other states and this is driven by the higher incidence of bushfires in Victoria.

Geddes, 2020 notes that fires above 1000 hectares can have severe regional supply implications. These landscape scale losses across Australia in terms of numbers of fires and area included at Figure 20 and Figure 21. For the Victorian plantation sector, there have been 16 fires over 1,000 hectares between 1939 and 2019–20, with 13 accounting for 90 per cent of the area burnt since 2000. The 2019–20 fires resulted in 20,574 hectares burnt or 40 per cent of the area burnt since 2000. Using the figures (2009 values) provided in (Deloitte Access Economics, 2017) would suggest nominal cost of \$1500 per hectare or \$30.8 million cost to the industry.

*Figure 20 Numbers of fires where 1000 hectares or more of Australian plantations were burnt (Geddes, 2020)*



*Figure 21 Area burnt where 1000 hectares or more of Australian plantations were burnt (Geddes, 2020)*



The cause of Victoria's plantation fires varies but fall in line with bushfire causes mentioned previously:

- Lightning – 25%
- Arson – 18%
- Powerlines, vehicle/plantation operations, escape burns – 11% respectively
- Cigarettes, camp fires, spot fires – 6%
- Unknown – 18%

For the 2019-20 fires affecting plantations, three were the result of lightning (which burnt 95 per cent of the total plantation burnt area in 2019-20), one from a campfire and one from machinery.

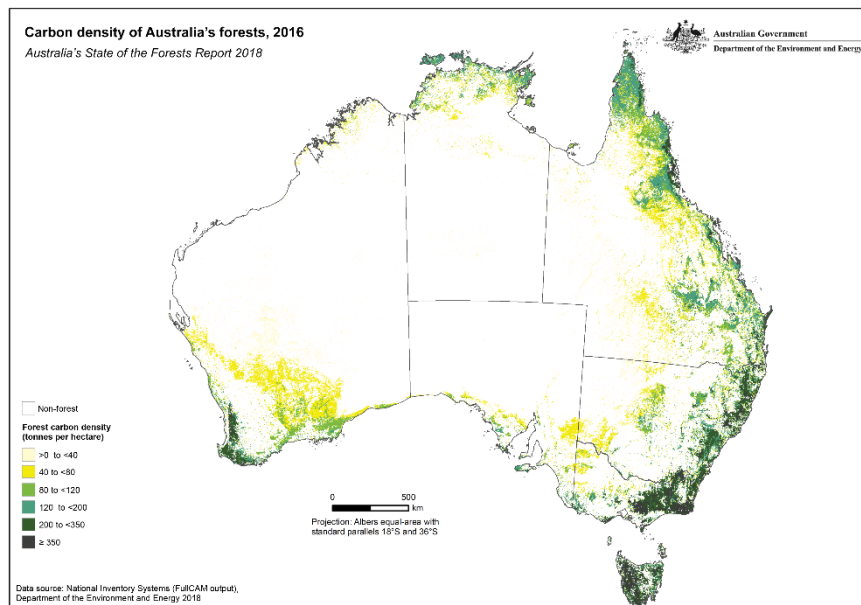
Inappropriate (or the lack of) fire control measures that predispose the landscape to catastrophic fires exacerbate the risk of major economic impacts to plantations. Plantations are long rotation tree crops and thus require long term investments. Plantation investments are also supported by multi-million-dollar investments in processing facilities. As stated above, bushfire events of at least 1000 hectares can have a severe impact right along the timber supply chain. These impacts may be delayed as experienced in the following circumstances:

- The Carter Holt Harvey Morwell mill closed in 2017 with the loss of 160 jobs, largely as the result of the damage to the Gippsland plantation resources from the 2009 Black Saturday fires
- The loss of ~20,000 hectares of plantation in the Green Triangle region in the 1983 Ash Wednesday Fires had major flow on impacts until the early 2000s at least, reducing industry expansion potential in the region
- The loss of nearly 28% (~52,000 hectares) of the plantation estate in the Murray Valley national plantation inventory region in 2020 will have significant short-, medium- and long-term effects on the timber processing industry in north-east Victoria and the Riverina Murray Region of NSW (Hancock Victoria Plantations Pty Ltd, 2020).

### 4.3 Climate Change, Carbon Emissions and Bushfires

Australia's State of Forests, 2018 states that Australia's carbon stocks in 2016 was 22,093 Mt C, of which 2,042 Mt C was Victoria's stored carbon in forests and wood products. The density of carbon in Australia's forests is shown in Figure 22. Since 1990, the area of cleared forests has declined significantly, with reclearing and regrowth or replanting dominating the net carbon accounts (Australia's State of Forests, 2018).

**Figure 22 Carbon density of Australia's Forests 2016<sup>40</sup>**



Australia's State of Forests, 2018 also discussed the roles of forestry and forest management in mitigating climate change – from maintaining or increasing carbon stores in the forest biomass, soil and harvested wood products and reducing emissions through the use of wood instead of other more energy intensive products. This was backed by collaborative research of a life cycle

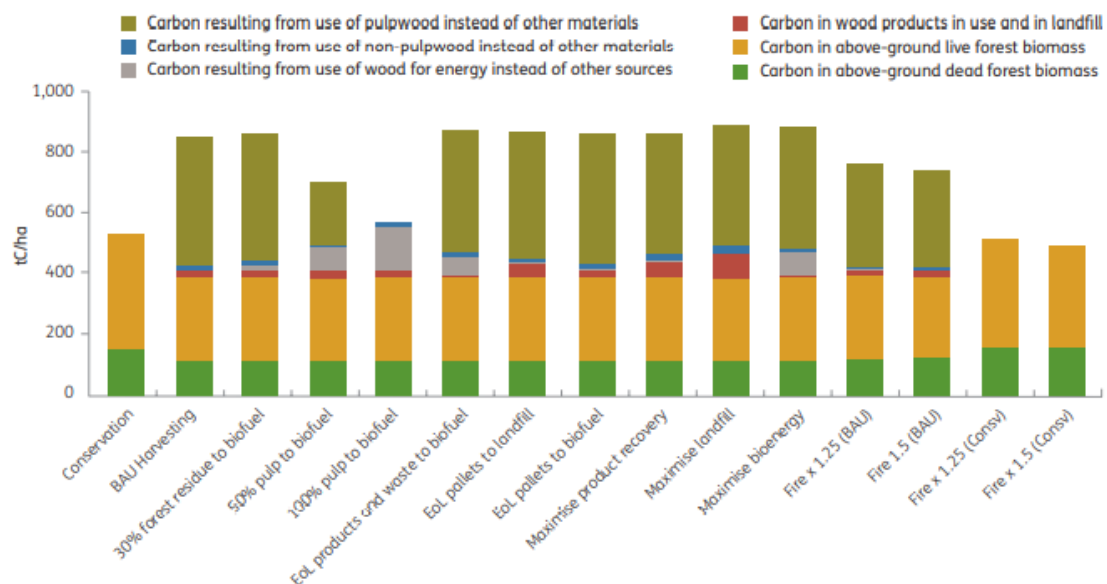
<sup>40</sup> Source: State of Australia's Forests Report 2018

[SOFR\\_2018\\_Fig\\_5\\_1\\_Forest\\_carbon\\_density\\_Australia.png \(3411x2374\) \(agriculture.gov.au\)](#)

assessment. The work produced results for the long term average for Victorian ash forests from a range of forestry and forest management regimes and is shown in Figure 23 with conservation use of forests resulting in the least beneficial emissions outcome. The key findings of the study were:

- above ground carbon was not as high as previously reported
- production scenarios resulted in greater greenhouse gas benefits compared to conservation scenarios
- harvest and mill residues could be better utilised, for example, as bioenergy
- using harvested wood products mitigates emissions from higher emissions substitutes
- using Australian native forest pulpwood for paper production also reduces emissions compared to pulpwood sourced from native forests in SE Asia
- the emissions benefits of wood use are maintained regardless of the fate of the wood at disposal stage, i.e. recycled, used for energy or disposed to landfill.

**Figure 23 Long-term average emissions for Victorian ash forest and forest products for each alternative forest management and forest product scenarios** (Australia's State of Forests, 2018)



The report concludes that halting native forest management for wood production would not reduce overall greenhouse gas emissions, and that there is considerable room for improvement in emissions outcomes from production forestry. These improvements come from using a combination of reduced wastage, increased recovery, increased physical carbon storage in hardwood forest products and increased use of wood biomass instead of fossil fuels to produce energy (Australia's State of Forests, 2018).

**Recommendation 13:** The Panel notes that native forestry, forest management and native timber production delivers superior carbon emissions outcomes for Victoria's mountain ash forests compared to conservation only uses.

One of the issues with bushfires along with significant storm events faced earlier this year in the Dandenongs and Gippsland, is what should be done with the biomass residues where the only option is to landfill. In some cases timber may be suitable for processing as sawn timber but generally the market dynamics are not there (e.g. volume, accessibility and distance to a

mill). In other cases, the timber is not suitable for sawn timber processing. This situation is relevant to both native timber and plantation timber.

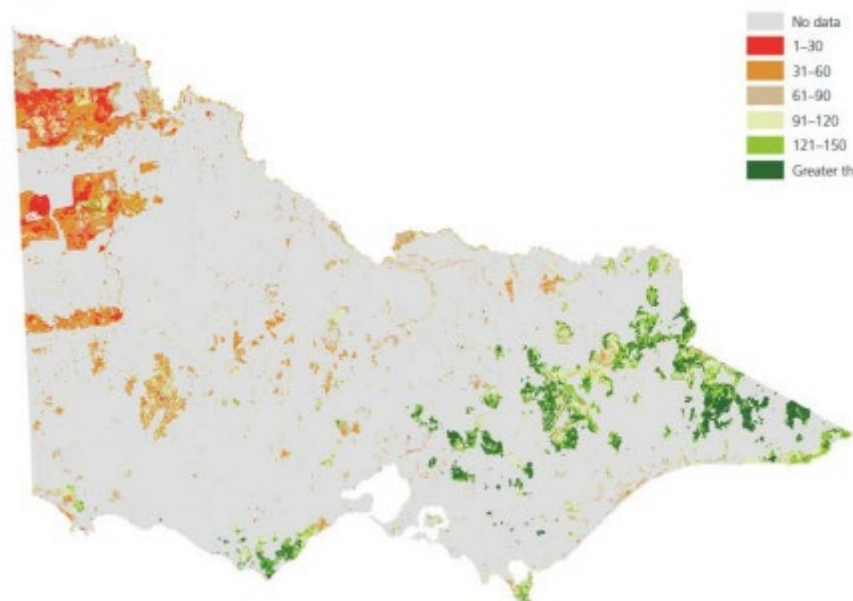
There are much better options that could be delivered, such as a market for biomass residues. This would require urgent work to assess how this might be structured and delivered.

**Recommendation 14:** The Panel recommend the Federal and Victorian Government investigate biomass markets for biomass residues.

Victoria's forests store more than 270 million tonnes CO<sub>2</sub> (Department of Environment, Land, Water and Planning, 2019), and that good management of forests (including preventing large scale severe fires) along with restoration programs will protect these stocks and increase sequestration. However, it is notable that the carbon in State Forests (i.e. multiple use working forests) is 40 per cent higher than in the conservation estate.

Victoria's ash forests in the Central Highlands have the highest density of carbon in the world (although note the findings of Australia's State of Forests, 2018 above), storing 1,867 tonnes of carbon per hectare (Department of Environment, Land, Water and Planning, 2019). Forest carbon stores in Victoria's forests are shown in Figure 24.

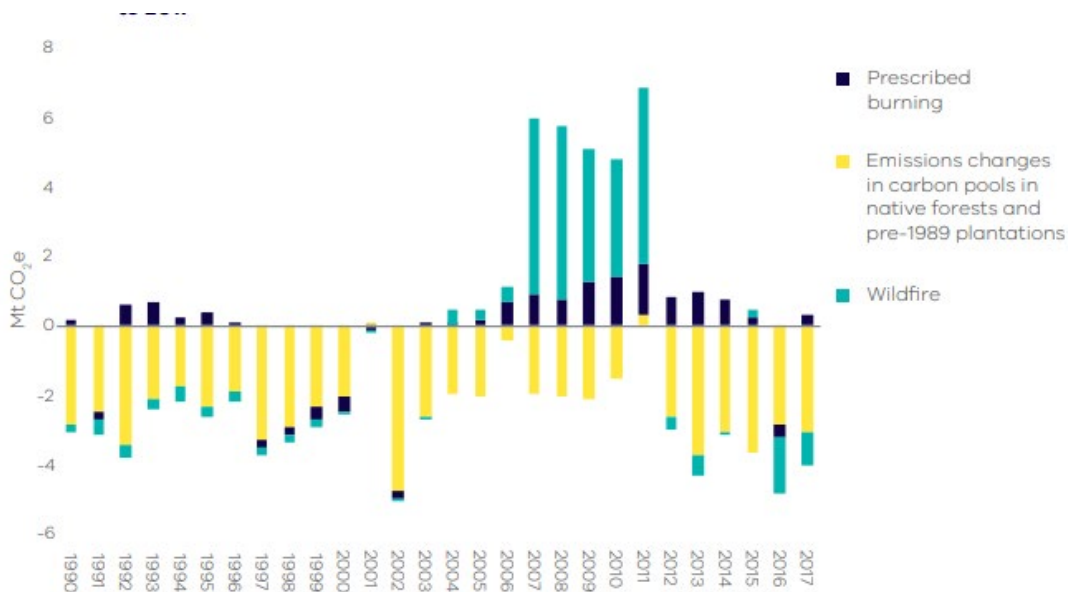
**Figure 24 Carbon storage in Victoria's forests** (Department of Environment, Land, Water and Planning, 2019)



A key driver for emissions from forests is wildfire and fire management practices. It is interesting to note that the Australia's State of Forests, 2018 states that bushfires have a "transient impact on Australia's forests, but the loss of carbon stocks... can be very high in years in which substantial bushfires occur in temperate forests".

The effect on carbon stores from Victorian bushfires can be seen in Figure 25, with the wildfires of 2006-07 and 2009 shown as emissions from 2007 to 2011, with little break in emissions between events. It would be expected that the next set of carbon accounts will highlight the carbon emissions from the 2019-20 bushfires, with the emissions likely to continue over the following years.

**Figure 25 Emissions from fire (wildfire and prescribed burnings) and other sources – Victoria 1990 to 2017** (Department of Environment, Land, Water and Planning, 2019)



Research on the impact on carbon emissions from Victorian wildfires in regions with and without controlled burning shows a higher emissions in areas without controlled burns (Volkova, et al., 2014). Moreover, compared to the fuel reduced forest, the release of non-CO<sub>2</sub> greenhouse gases nearly doubled following a wildfire, particularly for long-unburnt forests (Volkova, et al., 2014). It was observed that the long unburnt forest fire was a severe crown fire and consumed all litter, ground cover and overstorey foliage as combustion was far more complete (Volkova, et al., 2014).

**Recommendation 15:** The Panel recommends controlled burning in forests to attenuate carbon emissions from wildfires.

The effect of climate change on forest growth through increased photosynthesis needs to be considered going forward. This is likely, at least in some areas, to increase fuel loads.

**Recommendation 16:** The Panel should consider climate change induced forest growth and therefore fuel loads will impact bushfire frequency and severity.

Australia's State of the Forests Report, 2013 discussed climate change and the potential impacts on fires – with Box 3.2 included on the following page for completeness.

*Box 3.2: Potential effects of projected climate change on fires*

*Climate change will affect fire regimes in Australia through changes to temperature, rainfall, humidity, and wind—the fire weather components—and through the effects of increases in levels of atmospheric carbon dioxide (CO<sub>2</sub>) and changes in atmospheric moisture on vegetation and therefore fuels. Climate change projections are for warming and drying over much of Australia, and hence an increased risk of severe fire weather, especially in south-eastern Australia.*

*Modelling suggests an increase of 5–65% in the incidence of extreme fire danger days by 2020 in southeastern Australia, compared with 2009. Modelling of fire regimes in the Australian Capital Territory predicts that a 2°C increase in mean annual temperature would increase landscape fire intensity by 25%, increase the area burnt and reduce intervals between fires.*

*Fire danger at many sites in south-eastern Australia, as measured by the average annual sum of the Forest Fire Danger Index, rose by 10–40% between 1980–2000 and 2001–07. Increases in fire danger have also been detected in some other parts of Australia.*

*Climate change will have complex effects on fuels. Elevated atmospheric CO<sub>2</sub> and temperatures may enhance vegetation production and thereby increase fuel loads. Drought may decrease long-term vegetation production and thereby decrease fuel loads; however, it might also reduce fuel moisture, thereby increasing potential rates of fire spread, especially in forested landscapes.*

*Fire regimes within Australia differ because of variation in key drivers such as fuel accumulation and drying, fire weather and ignitions. Climate change may have a greater effect on fire regimes in regions where constraining factor(s) are related to fire weather and fuel dryness (e.g. temperate forests of the south-east) than in places where fuel load and ignition are more important (e.g. tropical woodland forests of the north).*

*Climate change and changed fire regimes will have complex (positive and negative) feedback interactions with forest biodiversity, with different outcomes in different Australian biomes. There may be increased risks to species that are sensitive to either fire intensity or the interval between fires. Eucalypts and other species that are killed by fire and regenerate from seed may be at risk if fire frequency exceeds the time required for the plants to reach reproductive maturity.*

*Managing fire regimes to reduce risk to property, people, biodiversity and ecosystem services will be increasingly challenging under climate change. In Australia, management of fire regimes for biodiversity conservation has variously emphasised fuel management, fire detection and fire suppression. Continued research on the complex interactions between fire, biodiversity, people, fuel management and land-use change is needed. Source: Adapted from Williams et al. (2009) (Australia's State of Forests, 2013)*



## 5 Bushfire Preparedness and Management

Victoria's native and plantation forests are similarly affected by bushfires. For the public land estate, the Victorian Government's bushfire preparedness is critical to deal with the adverse consequences to plantation forestry, agriculture, the environment, the built environment, communities, and people. A critical part of this is adequate fuel load management across both public and private tenures at sufficient landscape scale that avoids the catastrophic bushfires of the recent and not so recent past.

Victoria's public land estate needs active management to reduce the fire risks, improve forest resilience and to facilitate more active fire suppression under less severe conditions – through, for example, forest thinning/management, along with burning and mechanical fuel reduction (Keenan, et al., 2021) (Australian Forest Products Association, 2020).

In addition to active forest management, there is an opportunity to consider other measures to assist protect the CAR during bushfire events. Bushfires that generate their own weather and are in difficult to access areas, create untenable situations in trying to respond to the event. Clearly there is a need to stop the spread of these very large significant fires. VFPA suggests that compartmentalising the CAR may be an opportunity that will assist in stopping the spread of a bushfire and protect our forests.

**Recommendation 17:** That the Panel considers recommending that Victoria's forests are compartmentalised to assist managing the spread of bushfires.

### 5.1 Plantation Bushfire Preparedness

For plantation forests, "adaptation" to bushfires largely revolves around fuel management and preparedness. Preparedness includes fire management plans, training, fire break preparation, fuel load management and suppression resources, such as firefighting equipment and communications devices. In some cases, the employment of additional staff over the fire danger period results in increased wages.

In their submission to the Royal Commission, Hancock Victoria Plantations outlined their preparedness activities across Victoria, which span several hundred trained firefighters, numerous tankers, "slip on" units and command vehicles (Hancock Victoria Plantations Pty Ltd, 2020). In addition, other resources that may be deployed include helicopters, planes, fire towers, graders, bull dozers and other plant for fire prevention and suppression activities. There is a significant investment in fire resources and preparedness activities across the plantation estate that can be deployed for fires started outside or within the plantation.

In event response activities include the deployment of personnel and assets to respond to and assist with firefighting. Post event activities include rehabilitation, replanting and salvage, soil and water impacts, and damage to built infrastructure (roads, vehicles, buildings, fences, and bridges).

In addition to plantation owners/managers, the harvest contracting businesses are important to fire preparedness, response, and post fire clean-up activities. Examples of activities undertaken by the industry include fire breaks, back burning, access construction, tree falling/removal, clearing road lines and asset protection. The forestry sector provides significant local, regional, and state resources that are both efficient and cost effective.

In addition to the above point, the knowledge and expertise of foresters and others in the industry regarding bushfire behaviour, preparedness, knowledge of the local environment and landscape as well as acting as fire spotters cannot be emphasised enough.

As an example, the 2019–20 Gippsland fires saw the forestry industry response and clean-up activities span five months, involved 15 harvest/haulage businesses, 45 pieces of specialised forestry equipment used and saw 80 employees directly involved with firefighting efforts (Australian Forest Contractors Association, 2020).

For the Victorian forestry industry and the forest contractors, preparedness and bushfire suppression are not insignificant costs. Across the Victorian industry, preparedness is likely to be in the tens of millions of dollars per annum. One estimate of preparedness cost is \$20/hectare/annum, which extrapolated over the plantation estate is circa \$8.5 million per annum; however, given the quantum of resources as described above, this figure seriously underestimating the cost of preparedness and resourcing for fire responses across the plantation estate.

In event fire suppression, loss of resource, and post event restoration, however, will be significantly more and likely to be in the order of \$25,000/hectare in a mature plantation.

In addition, is the impact to the plantation sector from fires on public land. The 2019-20 bushfires saw over 140,000 hectares of plantations burnt, of which 80 per cent were pines, and representing some 10 million cubic metres of standing trees (Jenkin, Technical & Best Practice Recommendations. Guidelines for salvage harvest, storage and processing of plantation-grown logs affected by fire, 2020).

Fortunately, most of these plantations were not in Victoria, where nearly 20,000 hectares of mostly pine plantations were burnt<sup>41</sup>.

Fire damaged trees have a limited time to be harvested before the logs deteriorate. With \$2.5 million in Australian and Victorian Government assistance, the industry worked hard to recover 125,000 tonnes of salvage plantation timber. Without a doubt, this activity assisted in meeting the construction timber gap over 2020-21. However, this will lead to a future supply gap for when these trees would have been harvested.

Forest & Wood Products Australia developed guidelines to assist with a report published to help inform salvage efforts (Jenkin, Guidelines for salvage harvest, storage and processing of plantation-grown logs affected by fire, 2020). This was supported by technical and best practice recommendations (Jenkin, Technical & Best Practice Recommendations. Guidelines for salvage harvest, storage and processing of plantation-grown logs affected by fire, 2020). This technical document in particular is very relevant to the Review, and considers a wide range of pre-fire, fire responses and post fire salvage considerations.

Past Victorian research has shown that 90 per cent of the damage to plantations occurs from 25 per cent of fires that enter from adjacent native forests or grasslands (Poynter M. , 2021). The impact of uncontrolled forest fires impacts plantations along with the loss of life, loss of built infrastructure and impacts on the environment.

## **5.2 Public Land Bushfire Preparedness**

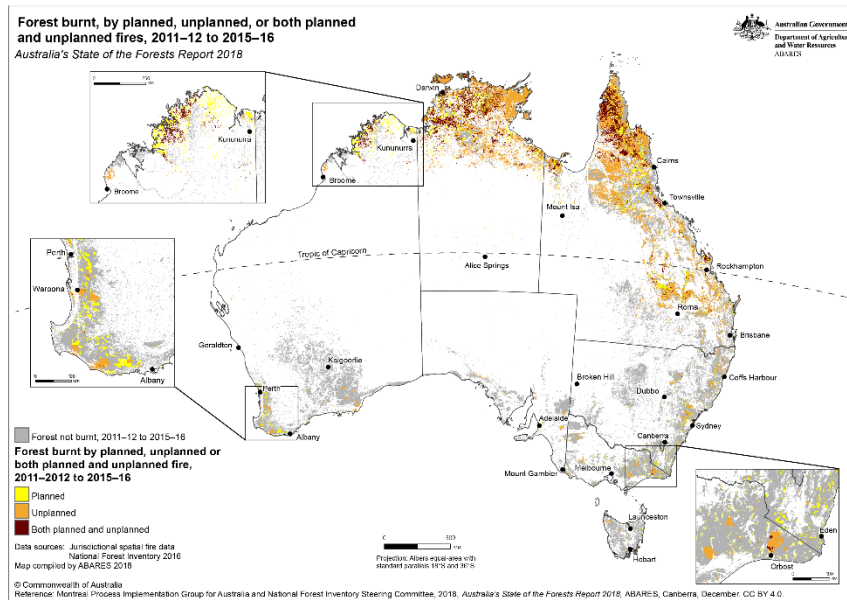
In addition to responding to bushfires, each year jurisdictions undertake fire control activities to reduce the risk of adverse fire events. The area of planned (fire control) and unplanned (bushfires) is shown in Figure 26 with Victoria's from 2006-07 to 2010-11 shown in Figure 27. The area burnt in 2019-20 for each RFA region is shown in Figure 28, as provided in the Review

---

<sup>41</sup> Source: Forest & Wood Products Australia

Summary Report. On average Victoria's planned burn of 157,000 hectares represents less than 2 per cent of the public land estate.

**Figure 26 Forest burnt, planned, unplanned or both 2011-12 to 2015-16** (Australia's State of Forests, 2018)



**Figure 27 Victoria's Total Forest Area Burnt - Planned and Unplanned** (Australia's State of Forests, 2013)

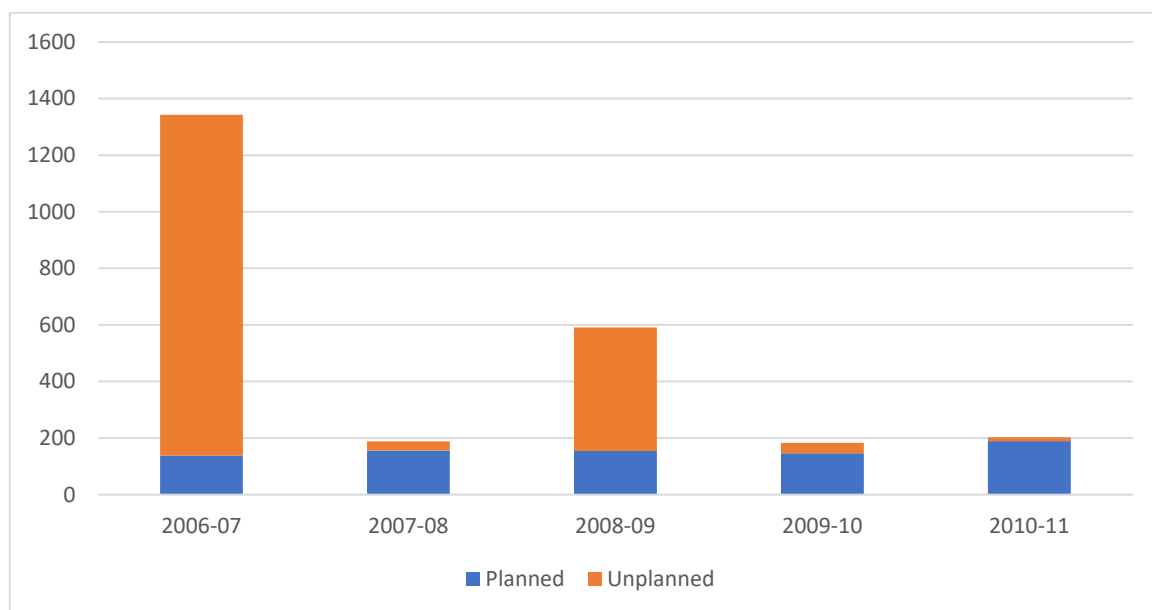
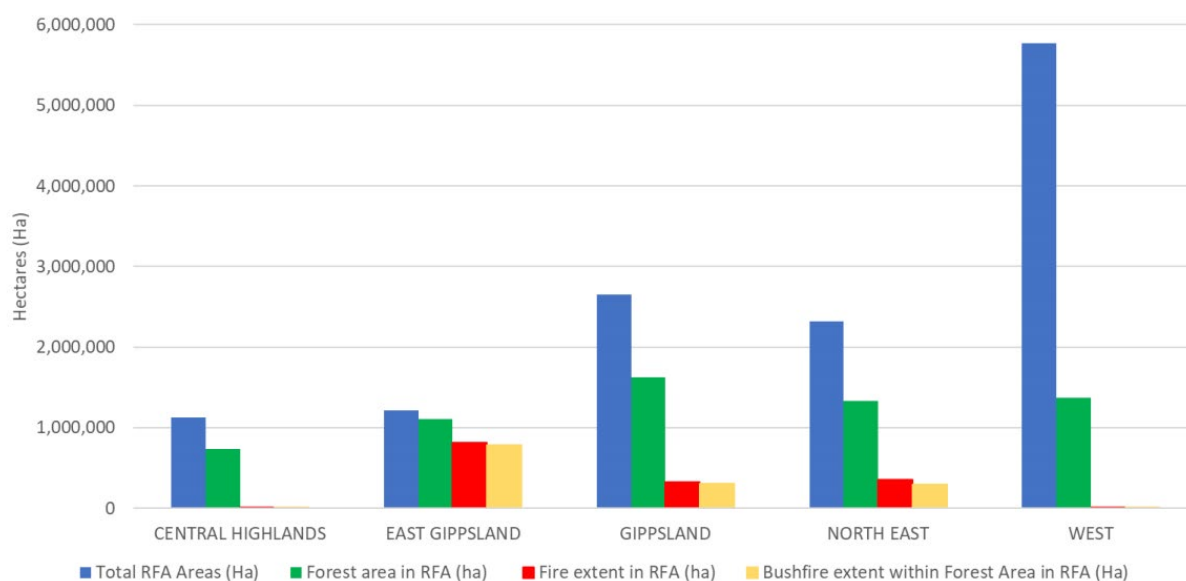


Figure 28 Total area of 2019-20 bushfire extent in RFA regions<sup>42</sup>



### 5.2.1 Joint Fuel Management Program

In 2009, less than two per cent of the public estate was controlled burnt – and the Royal Commission deemed this grossly inadequate. “*Victoria has maintained a minimalist approach.... Despite....reports and inquires, all of which have recommended increasing the prescribed-burning program. The State has allowed the forests to continue accumulating excessive fuel loads, adding to the likelihood of more intense bushfires and thereby placing firefighters and communities at greater risk*”.

The Commission recommended that the area of prescribed burning is increased to 5 per cent – this represents some 400,000 hectares of public land.

More recently, data published in Western Australia (WA) supports the Royal Commission’s findings. Data gathered from 60 years of historical forest fires in WA unequivocally show that when the area of prescribed burning trends down, the area of uncontrolled wildfires trends up (Bushfire Front, 2021). Controlled burning does not stop wildfires but wildfires are harder to put out in long-unburnt, heavy fuel load areas, and the area burnt annually escalates exponentially when the area of prescribed burning in a region falls below 8 per cent per annum Figure 29) (Bushfire Front, 2021). Burning 8 per cent pre annum results in 40 per cent of bushland carrying fuels less than five years old (Bushfire Front, 2021). Prescribed burning is effective in reducing the significant impacts from large damaging wildfires. In the 2019-20 fires, Victoria’s forest fuel reduction was less than optimal, and this is discussed further below.

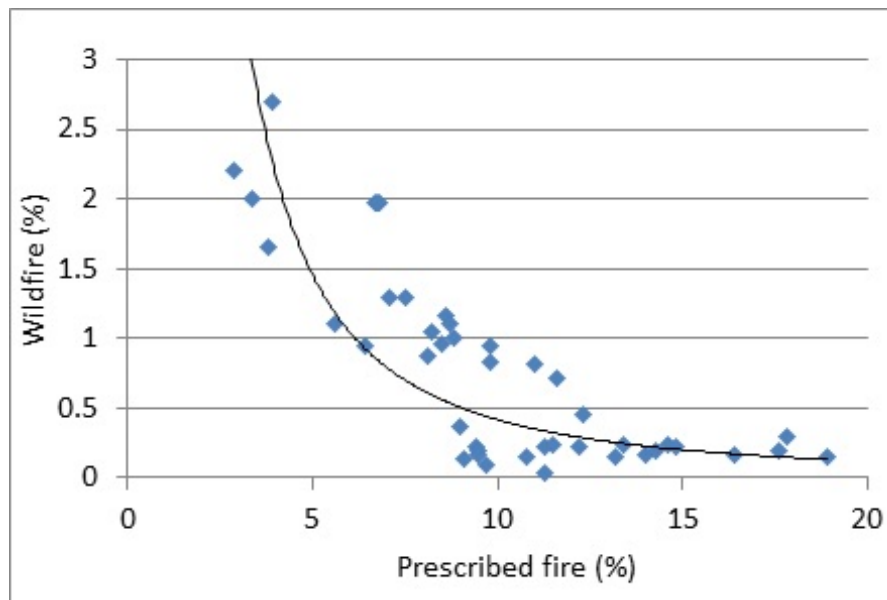
Bushfire Front, 2021 further suggests that to be effective, prescribed burning:

- needs to be done across the landscape and across all land tenures to actively manage the landscape
- be strategically planned
- individual burns undertaken at sufficient scale to be effective to retard and control
- covers at least 8 per cent to ensure that at least 40 per cent of the landscape has less fuels less than 5 years old

<sup>42</sup> Source: [Summary\\_Report\\_May\\_2021\\_-\\_Accessible\\_Version\\_002.pdf \(amazonaws.com\)](#)

- done to appropriate standards of fuel removal and fire intensity to ensure 60 per cent of the area is burnt, and
- Is not confined to as a fringe around developed areas as this will not remove fuel from large areas of forest.

*Figure 29 Proportion of South West WA forest regions burnt by prescribed burning to that burnt by wildfires (Sneeuwjagt, 2008)<sup>43</sup>*



Risk evaluation drives the Joint Fuel Management Program – and it is clear that few understand what this means (Department of Environment, Land, Water and Planning, 2021). There is a perception (especially amongst urban dwellers) that burning close to assets is best, however this does nothing to counter the fires that start in remote locations and have the potential to develop into major fires. It also biases the protection towards areas with higher populations.

The residual risk data is developed through modelling the fuel levels at maximum level to create the 100 per cent risk level and then comparing what impact the fire history and planned burning will have to manage the risk. Most of what is the residual risk is the fuel risk that is on private property, hence very rarely will the state be able to reduce the risk below 50 per cent in any one area and ~60 per cent state wide **if** fire agencies achieve their full planned burning target.

According to the 2018-19 Achievements Report<sup>44</sup>, 142,078 hectares of land treated equates to less than 2 per cent of the public land estate. While most regions were held at below the 70 per cent risk threshold, it is notable that Port Phillip (which includes the Central Highlands) was well above that target at 80 per cent and Gippsland was slightly above at 72 per cent in the year before the devastating 2019-20 bushfires that decimated these regions.

The Forest Fire Management Victoria Statewide Joint Fuel Management Program Summary<sup>45</sup> states that 220,000 hectares will be burnt in 2020-21 “to address bushfire risk close to towns

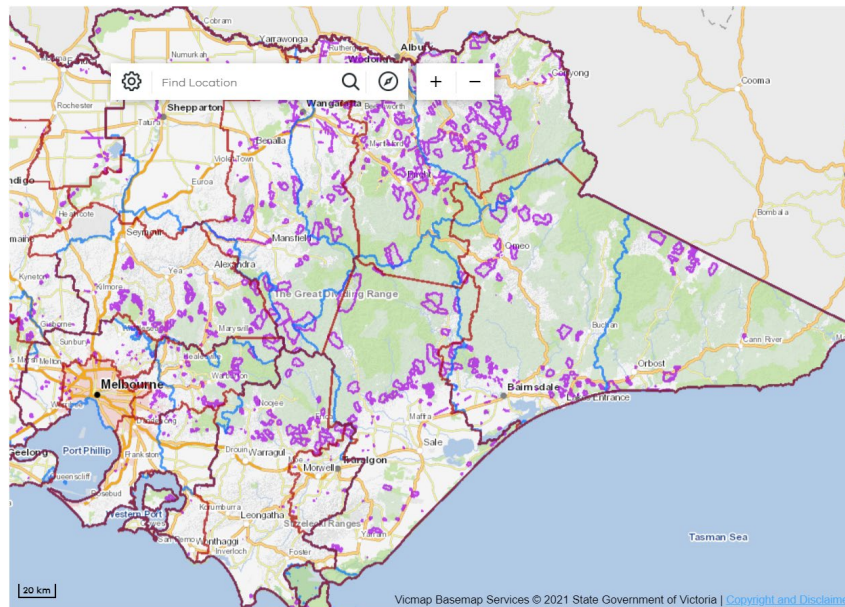
<sup>43</sup> Updated and as reported in (Bushfire Front, 2021)

<sup>44</sup> <https://www.ffm.vic.gov.au/fuel-management-report-2018-19/homepage>

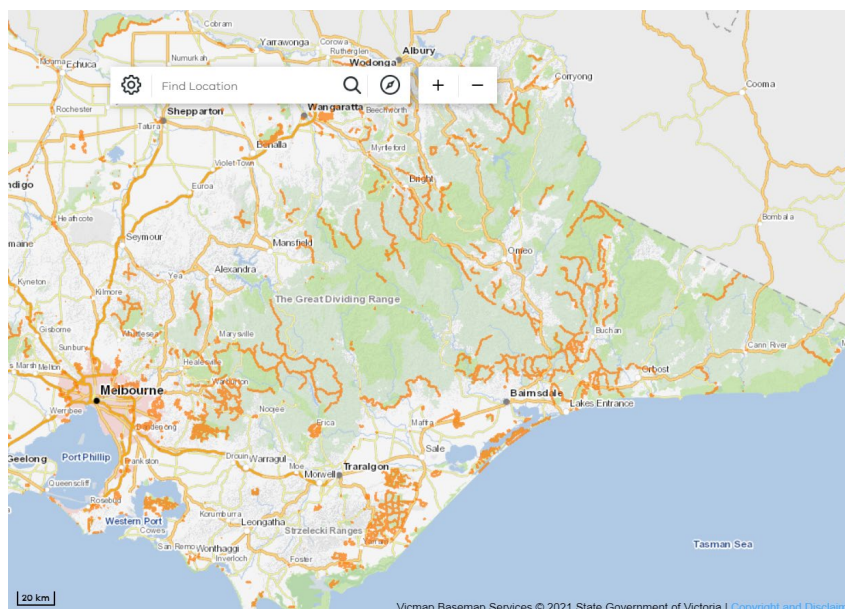
<sup>45</sup> [Statewide Joint Fuel Management Program Summary-v2.pdf \(ffm.vic.gov.au\)](#) Accessed 6 August 2021.

and along strategic roads and rail corridors”. This strategy does not clarify how much of the public land estate will be targeted. However, the language supports the focus on people and infrastructure, which clearly disregards the target recommended by the 2009 Royal Commission. This is backed up by maps for burns (Figure 30) and mechanical works (Figure 31) under the Joint Fuel Management Program (2020-21 to 2022-23) that show that very little of the eastern Victoria public land estate will either undergo burns or mechanical reduction.

**Figure 30 Joint Fuel Management Program – Prescribed Burns 2020-21 to 2022-23<sup>46</sup>**



**Figure 31 Joint Fuel Management Program – Mechanical Works 2020-21 to 2022-23<sup>47</sup>**



<sup>46</sup> [Joint Fuel Management Program \(JFMP\) \(ffm.vic.gov.au\)](http://ffm.vic.gov.au) Accessed 6 August 2021.

<sup>47</sup> Ibid

It is not possible to compare the proposed target of 220,000 to the Commissions target of at least 5 per cent given the different focus of the burn program. However, it would appear that today, the 2009 Commission's recommendations have been ignored.

The annual FFMVic Fuel Management Reports provide some general insights into the weather conditions in the past years that have hindered efforts to complete the hazard reduction<sup>48</sup> burning program across the entire state, noting that the 70 per cent residual risk was achieved in three of the four years. The CFA notes that the very dry conditions in Gippsland throughout 2019 made the implementation of the fuel management program very challenging. Likewise, Regional Roads Victoria and East Gippsland Shire Council described the challenges associated with the dry conditions in Gippsland in 2019 in completing the roadside slashing program. Evidence provided highlighted how the early onset of bushfires meant that public land managers were unable to complete the program.

The VFPA is strongly supportive of fuel modification using burning and mechanical treatments to reduce the risk of very large catastrophic fires. Such activities need to be undertaken both close to communities and assets as a protection measure and in forests to assist the control of fires. Fuel modification is most effective with helping control lower intensity fires. Undertaking works in forests assists in controlling in difficult to reach places and can assist in preventing fires becoming large and uncontrollable.

The VFPA has serious concerns regarding the impact that the proposed cessation of native forest harvesting in Victoria will have on fire management. The industry provides specialised equipment and highly skilled and experienced operators required to control fires in forested areas. It has been suggested by consultants undertaking work for the Victorian Government that plantation harvesting equipment could be substituted. Different equipment is used in plantation harvesting to native forest harvesting and is not suitable for extensive fire line construction.

---

<sup>48</sup> A complete literature review on land management and hazard reduction was published as a background paper for the Natural Disaster Royal Commission and can be accessed [Background Paper - Land management - hazard reduction a literature revi....pdf \(royalcommission.gov.au\)](#)

## 6 Resources

VFPA commends the following for consideration:

- 🌳 National Bushfire Management Policy Statement for Forests and Rangelands, endorsed by all members of the COAG in 2012  
<https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire/national-bushfire-management-policy-statement-forests-rangelands.pdf>
- 🌳 AFAC (2016) National Position on Prescribed Burning (AFAC Publication No. 2036)  
<https://knowledge.aidr.org.au/media/4869/national-position-on-prescribed-burning.pdf>
- 🌳 Prescribed burning saves lives, property, and biodiversity  
[https://www.forestry.org.au/Forestry/About/Prescribed\\_burning/Forestry/About\\_the\\_Forestry/Prescribed\\_burning.aspx?hkey=64c04659-09b0-4c4e-92ac-7034e2442927](https://www.forestry.org.au/Forestry/About/Prescribed_burning/Forestry/About_the_Forestry/Prescribed_burning.aspx?hkey=64c04659-09b0-4c4e-92ac-7034e2442927)
- 🌳 Forest Fire Management  
[https://www.forestry.org.au/Forestry/About\\_IFA/Forest\\_fire/Forestry/About\\_the\\_IFA/Fire.aspx?hkey=312d6496-f730-4da5-ace0-88fb92c749cd](https://www.forestry.org.au/Forestry/About_IFA/Forest_fire/Forestry/About_the_IFA/Fire.aspx?hkey=312d6496-f730-4da5-ace0-88fb92c749cd)
- 🌳 Centre of Excellence – Prescribed Burning  
<https://knowledge.aidr.org.au/collections/centre-of-excellence-for-prescribed-burning/>
- 🌳 AFPA Using Fire and Machine to Better Fire-Proof our Country Towns  
<https://ausfpa.com.au/publications/using-fire-and-machines-to-better-fire/>
- 🌳 Victorian Association of Forest Industries submission to the Royal Commission into National Natural Disaster Arrangements
- 🌳 <https://naturaldisaster.royalcommission.gov.au/system/files/submission/NND.001.01044.pdf>



## References

- 2009 Victorian Bushfires Royal Commission. (2010). *Final Report*. Melbourne: State of Victoria. Retrieved August 6, 2021, from <https://www.parliament.vic.gov.au/papers/govpub/VPARL2006-10No332Vol2Chap7-9.pdf>
- Australian Forest Contractors Association. (2020). *Submission to the Royal Commission into National Natural Disaster Arrangements*.
- Australian Forest Products Association. (2020). *Using Fire and Machines to Better Fire-Proof our Country Towns*. Canberra: Australian Forest Products Association.
- Australian Forest Products Association. (2020). *Using Fires & Machines to Better Fire-Proof Our Country Towns*. Deakin: Australian Forest Products Association.
- Australia's State of Forests. (2013). *Australia's State of the Forests Report*. ABARES. Canberra: Department of Agriculture. Retrieved August 13, 2021, from <https://www.agriculture.gov.au/sites/default/files/abares/forestsaustralia/documents/criterion3-web.pdf>
- Australia's State of Forests. (2018). *Australia's State of Forests Report 2018*. Canberra: Department of Agriculture and Water Resources. Retrieved August 17, 2021, from [https://www.agriculture.gov.au/sites/default/files/abares/forestsaustralia/documents/sofr\\_2018/web%20accessible%20pdfs/SOFR\\_2018\\_web.pdf](https://www.agriculture.gov.au/sites/default/files/abares/forestsaustralia/documents/sofr_2018/web%20accessible%20pdfs/SOFR_2018_web.pdf)
- Bantick, C. (2006, December 2). Burn: The Epic Story of Bushfire in Australia. *The Age*. Retrieved 8 10, 2021, from <https://www.theage.com.au/entertainment/books/burn-the-epic-story-of-bushfire-in-australia-20061202-ge3p9t.html><https://www.theage.com.au/entertainment/books/burn-the-epic-story-of-bushfire-in-australia-20061202-ge3p9t.html>
- Bowman, D. M. (1998, July 18). Tansley Review No. 101: The impact of Aboriginal landscape burning on the Australian biota. *New Phytologist*, 140(3), 385-410. doi:<https://doi.org/10.1111/j.1469-8137.1998.00289.x>
- Bowman, D., & Yeates, D. (2006, March 27). A remarkable moment in Australian biogeography. *New Phytologist*, 170(2), 208-212. doi:<https://doi.org/10.1111/j.1469-8137.2006.01699.x>
- Bushfire Front. (2021). *The Truth About Fuel Reduction Burning*. Retrieved from Bushfire Front: <https://www.bushfirefront.org.au/the-truth-about-fuel-reduction-burning/>
- Collins, P. (2006). *Burn: The Epic Story of Bushfire in Australia*. Allen & Unwin.
- Country Fire Authority. (2021, August 16). The number of high-risk bushfire days could triple in some parts of Victoria by the end of the century, according to new climate research by CFA and international research bodies. Melbourne, Victoria, Australia. Retrieved from <https://news.cfa.vic.gov.au/high-risk-bushfire-days-set-to-soar-this-century>
- Deloitte Access Economics. (2017). *The economic impact of selected communities receiving bushfire compensation payments*. Melbourne: Maurice Blackburn.
- Department of Environment, Land, Water and Planning. (2019). Assessing the current and future value of forests in storing carbon. Melbourne, Vic, Australia. Retrieved August 12, 2021, from [https://www.delwp.vic.gov.au/\\_\\_data/assets/pdf\\_file/0023/416408/8-Carbon-factsheet-FINAL.pdf](https://www.delwp.vic.gov.au/__data/assets/pdf_file/0023/416408/8-Carbon-factsheet-FINAL.pdf)
- Department of Environment, Land, Water and Planning. (2021). *Building a better understanding of bushfire risk consultation*. Extracts from bushfire inquiries reports. Retrieved from [https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/8016/2432/9071/Summary\\_Report.pdf](https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/8016/2432/9071/Summary_Report.pdf)

- Filkov, A., Ngo, T., Matthews, S., Telfer, S., & Penman, T. D. (2020, September). Impact of Australia's catastrophic 2019/20 bushfire season on communities and environment. Retrospective analysis and current trends. *Journal of Safety Science and Resilience*, 1(1), 44-56. doi:<https://doi.org/10.1016/j.jnlssr.2020.06.009>
- Forest Fire Management Group. (2007). *Softwood Plantation Fire Synopsis*. Retrieved August 12, 2021, from [https://victoriasforestryheritage.org.au/pinefire/FFMG\\_2007\\_SoftwoodPlantationFireSynopsis.pdf](https://victoriasforestryheritage.org.au/pinefire/FFMG_2007_SoftwoodPlantationFireSynopsis.pdf)
- Geddes, D. (2020). *Database capture of individual significant scale Australian forestry plantation fire losses*. Melbourne: Forest & Wood Products Australia. Retrieved August 9, 2021, from [https://www.fwpa.com.au/images/marketaccess/2020/Historical\\_larger-scale\\_plantation\\_fire\\_loss\\_data\\_Final\\_Report\\_v3.pdf](https://www.fwpa.com.au/images/marketaccess/2020/Historical_larger-scale_plantation_fire_loss_data_Final_Report_v3.pdf)
- Hancock Victoria Plantations Pty Ltd. (2020, April 28). National Natural Disaster Arrangements Royal Commission Submission. Victoria: Natural Disaster Royal Commission. Retrieved August 13, 2021, from <https://naturaldisaster.royalcommission.gov.au/system/files/submission/NND.001.00982.pdf>
- Hancock Victorian Plantations Pty Ltd. (2016, June 17). Submission to the Fire Season Preparedness Inquiry. Legislative Council Environment and Planning Standing Committee. Retrieved August 13, 2021, from [https://www.parliament.vic.gov.au/images/stories/committees/SCEP/Fire\\_Season\\_Preparedness/Submissions/Submission\\_25\\_-\\_Hancock\\_Victorian\\_Plantations\\_Pty\\_Limited\\_HVP\\_Plantations.pdf](https://www.parliament.vic.gov.au/images/stories/committees/SCEP/Fire_Season_Preparedness/Submissions/Submission_25_-_Hancock_Victorian_Plantations_Pty_Limited_HVP_Plantations.pdf)
- Huf, B., & Mclean, H. (2020). *2019-20 Bushfires*. Parliamentary Library and Information Service. Parliament of Victoria. Retrieved August 10, 2021, from <https://www.parliament.vic.gov.au/publications/research-papers/send/36-research-papers/13904-bushfires-2019-20>
- Jenkin, B. (2020). *Guidelines for salvage harvest, storage and processing of plantation-grown logs affected by fire*. Melbourne: Forest & Wood Products Australia. Retrieved August 9, 2021, from [https://www.fwpa.com.au/images/processing/2021/Guidelines\\_for\\_fire\\_log\\_salvage\\_Exec\\_Summary.pdf](https://www.fwpa.com.au/images/processing/2021/Guidelines_for_fire_log_salvage_Exec_Summary.pdf)
- Jenkin, B. (2020). *Technical & Best Practice Recommendations. Guidelines for salvage harvest, storage and processing of plantation-grown logs affected by fire*. Melbourne: Forest & Wood Products Australia. Retrieved August 9, 2021, from [https://www.fwpa.com.au/images/processing/2021/Guidelines\\_for\\_fire\\_log\\_salvage\\_Tech\\_Recommendations.pdf](https://www.fwpa.com.au/images/processing/2021/Guidelines_for_fire_log_salvage_Tech_Recommendations.pdf)
- Jenkins, O. (2021, August 17). Fireys to battle savage bushfires more often as fire danger days set to spike. *Herald Sun*. Melbourne, Victoria, Australia. Retrieved August 17, 2021, from [https://www.heraldsun.com.au/subscribe/news/1/?sourceCode=HSWEB\\_WRE170\\_a\\_GGL&dest=https%3A%2F%2Fwww.heraldsun.com.au%2Fnews%2Fvictoria%2Ffireys-to-battle-savage-bushfires-more-often-as-fire-danger-days-set-to-spike%2Fnews-story%2F65515d6747f17c1ea73b6d932](https://www.heraldsun.com.au/subscribe/news/1/?sourceCode=HSWEB_WRE170_a_GGL&dest=https%3A%2F%2Fwww.heraldsun.com.au%2Fnews%2Fvictoria%2Ffireys-to-battle-savage-bushfires-more-often-as-fire-danger-days-set-to-spike%2Fnews-story%2F65515d6747f17c1ea73b6d932)
- Keenan, R. (2020, January 6). There's only one way to make bushfires less powerful: take out the stuff that burns. *The Conversation*. Retrieved August 13, 2021, from <https://theconversation.com/theres-only-one-way-to-make-bushfires-less-powerful-take-out-the-stuff-that-burns-129323>

- Keenan, R. J., Kanowski, P., Baker, P. J., Brack, C., Bartlett, T., & Tolhurst, K. (2021). *No evidence that timber harvesting increased the scale or severity of the 2019/20 bushfires in south-eastern Australia*. Melbourne: Australian Forestry. doi:10.1080/00049158.2021.1953741
- Keenan, R., Weston, C., & Volkova, L. (2020, January 20). Forest thinning is controversial, but it shouldn't be ruled out for managing bushfires. *The Conversation*. Retrieved August 13, 2021, from <https://theconversation.com/forest-thinning-is-controversial-but-it-shouldnt-be-ruled-out-for-managing-bushfires-130124>
- Lindenmayer, D. B., & Taylor, C. (2020, June 2). New spatial analyses of Australian wildfires highlight the need for new fire, resource, and conservation policies. (U. o. Erild Underdal, Ed.) *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, *117*(12481-12485), 22. doi:<https://doi.org/10.1073/pnas.2002269117>
- Lindenmayer, D., Taylor, C., & Blanchard, W. (2021, August). Empirical analyses of the factors influencing fire severity in southeastern Australia. *Ecosphere*, *12*(8), 18. doi:<https://doi.org/10.1002/ecs2.3721>
- Matysek, A. L., & Fisher, B. S. (2016). *The Economic Potential for Plantation Expansion in Australia*. Canberra: BAEconomics. Retrieved from <https://ausfpa.com.au/wp-content/uploads/2016/02/BAEconomics-plantations-report.pdf>
- Morgan, G. W., Tolhurst, K. G., Poynter, M. W., Cooper, N., McGuffog, T., Ryan, R., . . . Davey, S. M. (2020, April 21). Prescribed burning in south-eastern Australia: history and future directions. *Australian Forestry*, *83*(1), 4-28. doi:<https://doi.org/10.1080/00049158.2020.1739883>
- O'Donnell, J. (2021). *Potential opportunities and strategies for improved bushfire pine and hardwood plantation protection and management across Australia*.
- O'Donnell, J. (2021). *Potential Opportunities for Improved Town and City Bushfire Protection Across Australia*.
- Pinkard, L., Bruce, J., Mattaglia, M., Matthews, S., Drew, D., Downes, G., . . . Ottenschlaeger, M. (2014). *Adaptation strategies to manage risk in*. Melbourne: Forest & Wood Products Australia. Retrieved July 21, 2021, from [https://www.fwpa.com.au/images/resources/FWPA\\_FINAL\\_REPORT\\_030914/FWPA\\_FINAL\\_REPORT\\_030914.pdf](https://www.fwpa.com.au/images/resources/FWPA_FINAL_REPORT_030914/FWPA_FINAL_REPORT_030914.pdf)
- Poynter, M. (2018). *Going 'Green': Forests, fire and a flawed conservation culture*. Connor Court Publishing.
- Poynter, M. (2021, August 6). Australia's short-sighted approach has caused this wood shortage. Australia. Retrieved August 6, 2021, from <https://www.timberbiz.com.au/opinion-mark-poynter-australias-short-sighted-approach-has-caused-this-wood-shortage/>
- Read, P., & Denniss, R. (2020, January 17). With costs approaching \$100 billion, the fires are Australia's costliest natural disaster. *The Conversation*. Retrieved August 18, 2021, from <https://theconversation.com/with-costs-approaching-100-billion-the-fires-are-australias-costliest-natural-disaster-129433>
- Royal Commission into National Natural Disaster Arrangements. (2020). *Australian inquiries and reports concerning natural disasters*. Canberra: Commonwealth of Australia. Retrieved August 17, 2021, from <https://naturaldisaster.royalcommission.gov.au/system/files/2020-05/Background%20paper%20-%20Australian%20inquiries%20and%20reports%20concerning%20natural%20disasters.pdf>

- Sneeuwjagt, R. J. (2008). Prescribed Burning: How effective is it in the control of large forest fires? *2008 AFAC Bushfire CRC Conference*. Melbourne: Australasian Fire Authorities .
- Stephenson, C., Handmer, J., & Haywood, A. (2012). *Estimating the net cost of the 2009 Black Saturday Fires to the affected regions*.
- The Institute of Foresters of Australia/Australian Forest Growers. (2020). *Bushfire Recovery Harvesting Operations*. Melbourne: The Institute of Foresters of Australia/Australian Forest Growers. Retrieved August 19, 2021, from [https://www.forestry.org.au/Forestry/documents/IFA\\_AFG\\_PositionPaper\\_Bushfire.pdf](https://www.forestry.org.au/Forestry/documents/IFA_AFG_PositionPaper_Bushfire.pdf)
- Tolhurst, K., & Vanclay, J. (2020, March 25). Talking Point: Stopping native forest logging to fight fire doesn't stack up. *The Mercury*. Hobart, Tasmania. Retrieved from <https://www.vicforests.com.au/static/uploads/files/talking-point-stopping-native-forest-logging-to-fight-fire-doesnt-stack-up-the-merc-wfjahvfvwmoh.pdf>
- Tolhurst, K., & Vanclay, J. (2021, July 23). *Selective science in bushfire mitigation*. Retrieved from Timberbiz: <https://www.timberbiz.com.au/opinion-prof-tolhurst-am-prof-jerry-vanclay-selective-science-in-bushfire-mitigation/>
- Towell, N. (2020, January 7). 'Train crash' for timber industry as forests, plantations burn. *The Age*. Melbourne, Victoria, Australia. Retrieved August 13, 2021, from <https://www.theage.com.au/national/victoria/train-crash-for-timber-industry-as-forests-plantations-burn-20200107-p53pln.html>
- USDA Forest Service. (2020). *A comprehensive review of results and lessons learned from ten years of the CFLRP implementation*. 16, October, Washington. Retrieved August 13, 2021, from [https://www.fs.fed.us/restoration/documents/cflrp/CFLRP\\_LessonsLearnedCompiled20201016.pdf](https://www.fs.fed.us/restoration/documents/cflrp/CFLRP_LessonsLearnedCompiled20201016.pdf)
- VicForests. (2019). *Harvesting and Regeneration Systems*. Melbourne: VicForests. Retrieved August 9, 2021, from <https://www.vicforests.com.au/static/uploads/files/vf-ms-harvesting-and-regeneration-v1-2-16-aug-2019final-wfxdbqcvvero.pdf>
- Volkova, L., Bi, H., Hilton, J., & Weston, C. J. (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), 92-100.
- Volkova, L., Meyer, C. P., Murphy, S., Fairman, T., Reisen, F., & Weston, C. (2014, June 27). Fuel reduction burning mitigates wildfire effects on forest carbon and greenhouse gas emissions. *International Journal Of Wildland Fire*, 771-780. Retrieved from <http://dx.doi.org/10.1071/WF14009>
- Whittington, J., Clark-Ginsberg, A., & Balagna, J. (2021, August 14). *Climate change is only one driver of explosive wildfire seasons – don't forget land management*. Retrieved August 18, 2021, from The Hill: <https://thehill.com/opinion/energy-environment/567846-climate-change-is-only-one-driver-of-explosive-wildfire-seasons?rl=1>
- Zylstra, P., Wardell-Johnson, G., Watson, J., & Ward, M. (2021, May 20). Native forest logging makes bushfires worse - and to say otherwise ignores the facts. *The Conversation*. Retrieved August 13, 2021, from <https://theconversation.com/native-forest-logging-makes-bushfires-worse-and-to-say-otherwise-ignores-the-facts-161177>



**Victorian  
Forest  
Products  
Association**

VFPA is the peak industry body representing the forestry products value chain in Victoria from those growing, managing and harvesting our sustainable plantations and multiple use natural forests to the primary and secondary processing of timber, the manufacture of pulp and paper, and the value-added timber and pulp and paper products supply chains.