

USING FIRE AND MACHINES TO BETTER FIRE-PROOF OUR COUNTRY TOWNS



Balmoral laments lack of action

“It came through as a wild fire, it crowned through that and had a four kilometre run into the village. There’s been nothing done in that area since 2001, we’d had 18 years of fuel growing on the ground. It was a time bomb waiting to go off.”

[Balmoral Village Rural Fire Service (RFS) captain Brendon O’Connor]

- Sydney Morning Herald, 11 January 2020¹

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THIS PROPOSAL

MECHANICAL FUEL REDUCTION SHOULD BE USED TO COMPLEMENT HAZARD REDUCTION BURNS TO BETTER PROTECT COMMUNITIES AND KEY ASSETS

Bushfire risk in Australia can be significantly reduced through a far more aggressive approach of targeted reduction of understorey and dense forest regrowth around strategically important assets such as power sub-stations, telecommunications towers, water catchments and timber plantations.

Federal, state and local governments should work more closely with rural communities to create buffers within a 5km radius of at-risk towns and strategic assets. This will reduce fuel loads and improve access for firefighters, which in turn will reduce the risk of bushfires developing and engulfing towns and important rural assets.

Mechanical fuel reduction is a widely accepted bushfire mitigation tool in other fire-prone nations, however, it is underutilised in Australia despite its proven efficacy. A Deloitte Access Economics analysis found the economic benefits of removing fuel from the bush, in combination with fuel reduction burning, could dramatically reduce the damage caused by bushfires and massively outweigh the costs.²

Research has found that in the eucalypt forests of south-eastern Australia, an annual fuel reduction program of 5% of the landscape could reduce the extent of bushfires by as much as 50%.³

Biomass removal and fuel reduction burning needs to be ongoing to prevent the undergrowth regenerating within a short number of seasons and should be combined with more aggressive fire break construction. The more traditional fuel reduction burning would continue to be employed as fire is vital to remove the finer fuels on the forest floor, reducing the risk of ignition and fire spread.

The strategic use of hazard reduction burns and mechanical fuel reduction is consistent with how Indigenous Australians managed the land for tens of thousands of years, using 'fire-stick farming' to burn off excess fuel loads during cooler weather to prevent intense forest fires and to promote forest regeneration.⁴

USING MACHINERY CAN BE A BETTER OPTION FOR CREATING BUFFER ZONES AROUND COMMUNITIES

The combination of mechanical and fire based fuel load reduction can be applied around our country towns and villages to create a far more manageable 'buffer zone', making it easier for communities to create fire breaks and defend their towns.

However, experts argue that prescribed burns become more expensive and challenging closer to homes due to smoke and the risk of fires getting out of control. This means deploying machinery to reduce fuel loads around communities can be a better and more cost-effective option.

"In remote areas the cost per treatment (controlled burn) might be as little as \$100 a hectare. But closer to urban areas it can be \$1000 to \$10,000 a hectare... and that isn't factoring in the impacts to human health."

(Professor Ross Bradstock, Bushfire expert, Sydney Morning Herald, 30 January 2020)⁵



Mulcher undertaking reduction of understorey and forest regrowth - Source: CJD



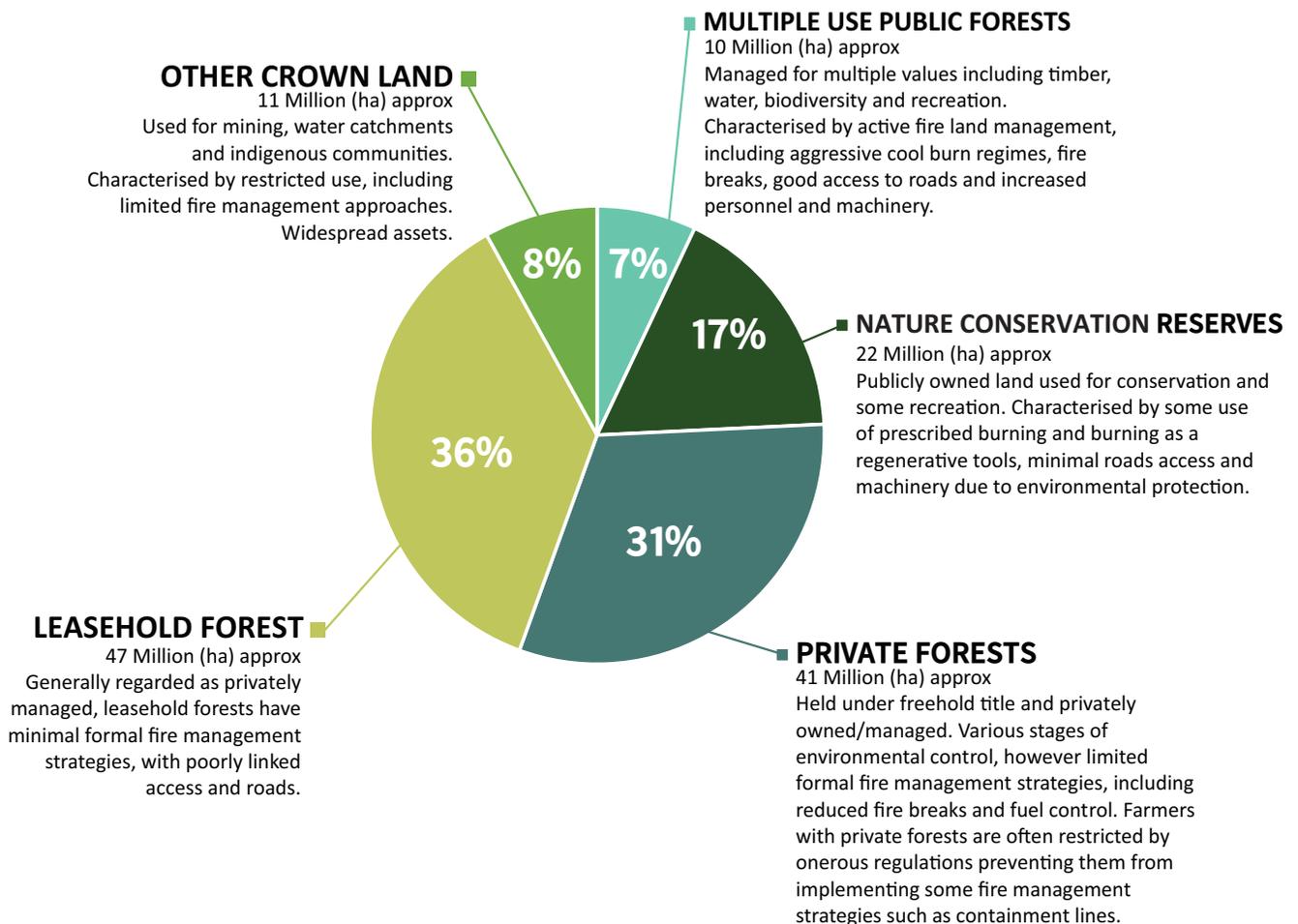
MULTIPLE NATIVE FOREST TENURES

MULTIPLE FIRE MANAGEMENT APPROACHES

MULTIPLE FUEL LOAD REDUCTION STRATEGIES

MULTIPLE AGENCIES AND OPERATORS

Australia has 132 million hectares of native forest. Forest ownership and management is divided across multiple tenures.⁶ Such an approach has led to multiple approaches to forest management and bushfire mitigation. Agencies and land managers operate with great good will and cooperation, however few deny their jobs would be made easier if the boundaries of land use were not so different. Farmers too often decry the imposition of rules and codes which greatly inhibit their ability to deal quickly and effectively with bushfires, such as being able to clear a fire-break before a fire becomes an emergency.



MECHANICAL FUEL REDUCTION IN ACTION

After a bushfire, forestry contractors are deployed for the vital job of removing burnt and dangerous trees, particularly around roads. This is a very specialised task that requires equipment unique to the forestry industry, and years of training.

It is important to remove some of the burnt wood and biomass generated from these operations from the forest floor so as to not create dangerous fuel loads.

Forestry contractors removing dangerous trees in Mallacoota, in Eastern Victoria, after the January 2020 fires. Without a timber industry, this vital firefighting resource will be lost forever.



REDUCING FUEL LOADS REDUCES FIRE RISK

" Thinning to reduce fire risk is intended to slow the rate fire spreads, lower flame heights and improve recovery after wildfire hits. This was shown in a 2016 extensive review of US research, which found thinning and prescribed burning helped reduce fire severity, tree mortality and crown scorch. "

(Professor Rod Keenan, University of Melbourne, The Conversation, 20 January 2020)⁷

"There's obviously been a change in the logging industry. The bush is not being logged to the same extent it was ... There's been a change in the amount of fuel ... more fuel levels and a changing climate and changing weather on top of that. These are things our values have demanded, but it has created the situation we are in now. "

(Former Victorian Emergency Management Commissioner Craig Lapsley, The Age, 6 January 2020)⁸

"Sensible logging [is needed] to enable access to forests in fire. The carbon removed (timber) can be stored in dwelling construction. And, along with fuel reduction, we then have a better chance to control the fires and protect species and assets. "

(Robert Gottliebsen, Economist, The Australian, 13 January 2020)⁹

"Fires are a landscape problem. They are not a problem resulting from insufficient or inadequate means of suppression but from fuel continuity, [and] accumulation of fuels from vegetation... The solution is resilient landscapes that balance the hazards, reduce risk and can be established and sustained."

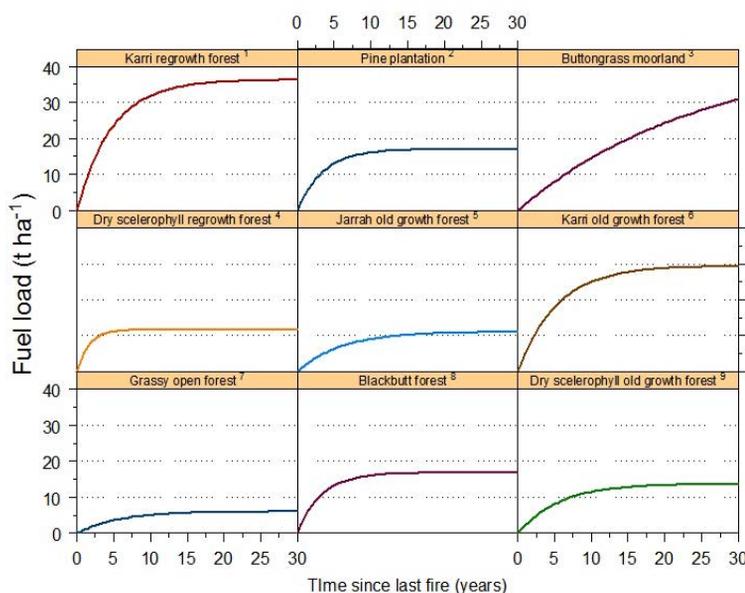
(Peter Moore, Fire Management Specialist, FAO, Financial Review, 5 January 2020)¹⁰

FUEL LOAD BUILD-UP EXPONENTIALLY INCREASES BUSHFIRE INTENSITY

As fuel load is doubled, the rate of fire spread is doubled and intensity is quadrupled.¹¹

"In terms of rate of spread, the important fuel factors are those that affect the flame length and the rate of ignition. These include fuel fineness, the bulk density of the fuel bed which is a combination of the total fuel load and the height of the fuel bed the continuity or spacing of fuels, particularly if they are clumped as are many natural fuels, and the fraction of dead and green material within the fuel bed."

(Dr Phil Cheney, Former CSIRO bushfire scientist, Joint Select Committee on Bushfire, 10 December 2002)¹²



CSIRO study showing how quickly fuel load builds up over time. in some forest types, one hectare can accumulate up to 20 tonnes of fuel after just 5 years.¹³

WHY DO WE NEED MECHANICAL TREATMENT AS WELL AS BURNING OFF?

The impact of climate change – which is contributing to longer, more severe droughts, and higher temperatures – makes it even more pertinent that we better manage our forests, deploy more resources and increase fuel load reduction as we deal with shorter windows for hazard reduction burns and longer bushfire seasons.

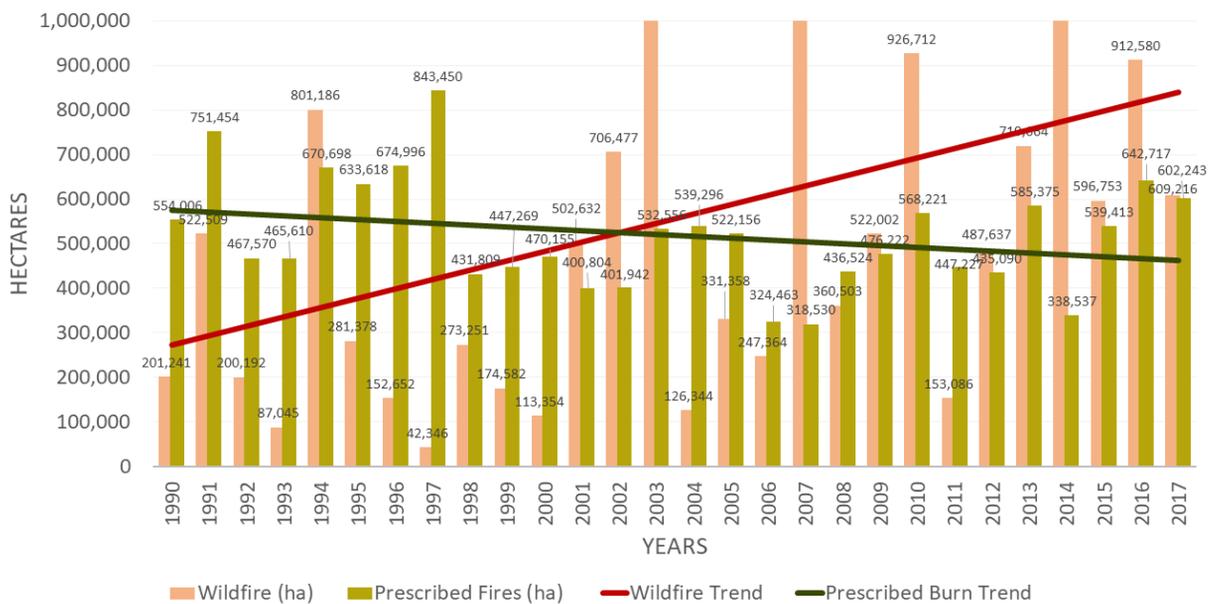
We need to also use mechanical biomass removal to reduce understory and dense forest regrowth, in conjunction with fuel reduction burns, in strategic areas to reduce the intensity of forest fires close to communities and assets.

The Forest Industry Advisory Council – a statutory advisory body to the Federal Government – recommended in its 2016 report, *Transforming Australia’s Forest Products Industry*, that the Australian Government commits to a \$300 million, 10 year programme of mechanical fuel reduction as a bushfire mitigation measure.¹⁴

There have been dozens of inquiries after major bushfires in Australia. Each one has identified fuel load as a significant contributing factor and recommended that more be done to address this fuel build-up in our forests. Our national response has been to do less burning off and barely any mechanical fuel removal even though it can be done year-round and avoids exposure to smoke.

AFPA believes a national Royal Commission into the recent bushfires should have a focus on how Australia can move to a whole-of-landscape approach to land management and bushfire mitigation. This should include national benchmarks for fuel reduction in key sites such as along roads, and a close examination of how mechanical fuel reduction can complement hazard reduction burns in a national bushfire strategy.

A STORY OF LESS BURNING OFF AND MORE FIRES



The area of native forest in Australia burnt through bushfires has increased significantly over the past 30 years as the rate of prescribed burns has declined.¹⁵ State governments are failing to meet their own annual hazard reduction burn targets, pointing to the need for additional means of removing fuel loads from our forests.

CASE STUDIES

BALMORAL, NSW, DECEMBER 2019

The village in the NSW Southern Highlands was hit hard by multiple fire fronts just before Christmas, with 18 homes destroyed and 90 per cent of the surrounding bush burnt. The local fire captain, Brendon O'Connor, who has decades of firefighting experience, has been hailed as a hero for saving much of the town from the catastrophic fires. He attributed the intensity of the Balmoral fire to the lack of fuel removal in the forest surrounding the village, and says that there needs to be a much more aggressive program of fuel reduction – including through mechanical removal – to avoid a repeat.¹⁶



Source: ABC News

YARLOOP, WA, JANUARY 2016

On 6 January 2016, the communities of Yarloop and surrounding areas in the Shires of Harvey and Waroona (south-west WA) were hit by a devastating bushfire that killed two people and destroyed 181 homes. An independent report found that fuel management was the cornerstone of every issue relating to the fire. The inquiry noted that localised areas of long unburnt fuel within and adjoining Yarloop played a significant contribution to the damage by generating very high fire intensities and mass ember attack that resulted in extensive damage to buildings. The inquiry recommended that more regular, effective fuel management practices be employed, with a focus on biomass removal and hazard reduction burning.¹⁷



Source: ABC News

DUNALLEY, TAS, JANUARY 2013

In January 2013, major fires ravaged areas around Forcett, Lake Repulse and Bicheno in south-eastern Tasmania. More than 200 homes were lost. An independent inquiry identified fuel reduction practices as a high priority and recommended a strategic fuel management plan be developed and implemented with measurable targets, and that the planning should happen across all land tenures. The Inquiry noted that the rapid spread of the fire was attributable, in part, to high fuel loads, combined with wooded and inaccessible terrain.¹⁸



Source: Stuff News NZ

MECHANICAL FUEL REDUCTION IN THE UNITED STATES

The United States Government is nearing completion of a 10-year, \$400 million Collaborative Forest Landscape Restoration Program (CFLRP) with a focus on bushfire mitigation.

A key component of the program is the thinning of forest regrowth using machinery. This has multiple benefits in terms of improving forest structure, increasing water yields and reducing bushfire risk. Similarly, water yield has been shown to improve by up to 16%.

The US Government's biomass removal project has been praised by one of the world's largest non-government environment organisations;

“Given the many other non-water benefits of such restoration efforts – including fire risk reduction and fish and wildlife benefits – our assessment suggests that investing in Sierra Nevada forest restoration deserves consideration as a cost-effective water supply strategy for California.”¹⁹
(The Nature Conservancy, 2015)

“Re-establishing desired vegetation conditions through mechanical thinning or prescribed burning makes landscapes more resilient to fire and reduces the risk of catastrophic wildfire... These treatments help preserve and restore critical wildlife habitat, protect the water supply, enable firefighters to manage fires more safely, reduce the risk to communities, and may also result in providing wood byproducts to benefit local economies.”²⁰
(US Department of Agriculture, mid-term review, 2015)



A natural stand of pine ponderosa forest in Arizona. The forest on the left is 'overstocked' and at high risk of fire danger.

The forest on the right has been managed with mechanical removal and cool burns, greatly reducing the risk of catastrophic fire.²¹



REFERENCES

1. Sally Rawsthorne and Wolter Peeters, 'The RFS abandoned our village': Balmoral laments lack of action, The Sydney Morning Herald, 11 January 2020 <https://www.smh.com.au/national/the-rfs-abandoned-our-village-balmoral-laments-lack-of-action-20200110-p53qix.html>
2. Deloitte Access Economics, Scoping Study on a Cost Benefit Analysis of Bushfire Mitigation, 2014 <https://ausfpa.com.au/other-publications/deloitte-access-economics-scoping-study-on-a-cost-benefit-analysis-of-bushfire-mitigation/>
3. Lachlan Mccaw (2013), Managing forest fuels using prescribed fire – A perspective from southern Australia, Forest Ecology and Management, vol 294 <https://www.sciencedirect.com/science/article/abs/pii/S0378112712005452>
4. Landcare Australia, Traditional Aboriginal Burning in modern day land management <https://landcareaustralia.org.au/project/traditional-aboriginal-burning-modern-day-land-management/>
5. Mike Foley, "PM's bushfire response must include climate change: experts", Sydney Morning Herald, 30 January 2020 <https://www.smh.com.au/politics/federal/pm-s-bushfire-response-must-include-climate-change-experts-20200129-p53vtl.html>
6. ABARES (2019), Australia's State of the Forests Report 2018 https://www.agriculture.gov.au/sites/default/files/abare_forestsaustralia/documents/sofr_2018/web%20accessible%20pdfs/SOFR_2018_web.pdf
7. Professor Rod Keenan, University of Melbourne, 'There's only one way to make bushfires less powerful: take out the stuff that burns' The Conversation, January 2020 <https://theconversation-com.cdn.ampproject.org/c/s/theconversation.com/amp/theres-only-one-way-to-make-bushfires-less-powerful-take-out-the-stuff-that-burns-129323>
8. David Crowe and Rob Harris, States to feel federal heat over hazard reduction burning, The Age, 6 January 2020: <https://www.theage.com.au/politics/federal/states-to-feel-federal-heat-over-hazard-reduction-burns-20200105-p53ozo.html>
9. Robert Gottlieb, Bushfires an opportunity to better manage our carbon-storing forests, The Australian, 13 January 2020 <https://www.theaustralian.com.au/business/economics/bushfires-an-opportunity-to-better-manage-our-carbon-storing-forests/news-story/079f5fcd4346f7f57a554f65434ceac0>
10. Peter Moore, Forestry Officer, Forest Fire Management & Disaster Risk Reduction, FAO-Food and Agriculture Organisation of the UN, Better land management is the key to restricting bushfires, Australian Financial Review, 5 January 2020 <https://www.afr.com/policy/energy-and-climate/better-land-management-is-the-key-to-restricting-bushfires-20200103-p53ohx>
11. Bill McCormick (2002), Science, Technology, Environment and Resources Group, briefing note: Bushfires: Is Fuel Reduction the Answer?, APH Library https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/CIB/cib0203/03Cib08
12. Dr Phil Cheney, former CSIRO bushfire scientist, evidence to the Australian Parliament's Joint Select Committee on Bushfires, 3 June 2012 <https://www.parliament.nsw.gov.au/ladocs/transcripts/1192/Transcript%2003%20June%202002%20-%20Inquiry%20into%20the%202001-2002%20Bushfires.pdf>
13. Jim Gould and Miguel Cruz (2012), Australian Fuel Classification: Stage II, Ecosystem Sciences and Climate Adaptation Flagship, CSIRO <https://publications.csiro.au/rpr/download?pid=csiro:EP126505&dsid=DS4>
14. Forest Industry Advisory Council (2016), Transforming Australia's Forest Products Industry <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/forestry/australias-forest-policies/fiac/transforming-australias-forest-products-industry.pdf>
15. Australian Greenhouse Emissions Information System data, Land Use, Land Use Change and Forestry 1990-2017, Commonwealth Department of Environment and Energy, June 2019 <https://ageis.climatechange.gov.au/QueryAppendixTable.aspx>
16. June 2019 Sydney Morning Herald, 11 January 2020
17. Euan Ferguson AFSM, Special Inquirer, Reframing Rural Fire Management: Report of the Special Inquiry into the January 2016 Waroona Fire, pp36-38, tabled in the WA Parliament on 23 June 2016 <https://publicsector.wa.gov.au/waroona-bushfire-special-inquiry>
18. Malcolm Hyde (2013), Special Investigator, 2013 Tasmanian Bushfires Inquiry http://www.dpac.tas.gov.au/__data/assets/pdf_file/0015/208131/1.Tasmanian_Bushfires_Inquiry_Report.pdf
19. The Nature Conservancy and Ecosystem Economics (2015), Estimating the Water Supply Benefits from Forest Restoration in the Northern Sierra Nevada, <https://www.lgc.org/wordpress/wp-content/uploads/2018/11/WATERSUPPLYBENEFITSfromForestRestorationMarch2015-2.pdf>
20. United States Department of Agriculture (2015), Collaborative Forest Landscape Restoration Program 5-Year Report, FY 2010–2014, https://www.fs.fed.us/restoration/documents/cflrp/CFLRP_5-YearReport.pdf
21. Mick Stephens (2013), Active forest fire management for multiple landscape benefits in the United States and Canada, Gottstein Fellowship Report <https://gottsteintrust.org/wp-content/blogs.dir/651/files/2015/10/2013-Gottstein-report-Stephens-Active-forest-fire-management1.pdf>