

THE IMPACT OF LOGGING ON FOREST FIRE

Conflicting objectives...from burning everything to burning nothing and everything in between, and always at the wrong time.

SUMMARY

This section discusses the impact of post-logging fire on the quality of forests in southeast NSW and the interrelated problems affecting human and natural environments. Empirical and scientific evidence is here offered that, historically, forests are capable of self-managing, and that human interference over the past two and a quarter centuries has caused dramatic problems in the forests of the southeast region of NSW. Further, it is proposed that the ideals and management practices of the Great Southern Forest will help remediate these problems for the forests and adjacent townships and communities. Of course, it is not claimed here that logging is the sole cause of more damaging fires as climate change is accepted as exacerbating these problems.

Logging Affects the Susceptibility of Forests to Fire

Traditional people all over Australia base their burning on the same principles. If we can get these principles to work in our Country, we can start to get back to our traditional ways. If we all come together to learn from each other, we can start doing our burning in better ways.¹

The foremost question is whether the quality of forests is improved or disadvantaged because of industrial fire—post-logging and hazard reduction burning. It is established that forests sequester carbon, fire releases carbon dioxide into the atmosphere, opens forests' canopies, creates dryer forest understories and floors, and that fire destroys wildlife habitat.

It has been argued that 'industrial logging was a source of almost unprecedented holocausts...'.² Despite claims by Australian forestry to the contrary, global studies show that post-logging changes to the forest landscape make it more susceptible to wildfire.

To the best of their knowledge David Lindenmayer and his colleagues³ agree that to date, there has been no detailed published review of how industrial logging policies and practices can alter fire regimes. In their paper *Effects of logging on fire regimes in moist forests*, they outline interrelated ways whereby logging in native forests (not plantations) can change forest wildfire frequency, extent and/or severity. Their study found that selective logging reduces the number of dry days needed to make a forest more combustible than uncut native forests. This supports empirical knowledge that the natural microclimates in the temperate forests of southeast NSW have been greatly affected by logging, rendering them dryer and therefore more fire prone.

Studies in southeast Australia show that logging alters the structure and species composition of forests and the nature of inter crowning, and creates a less complex vegetation composition which is dryer and hence, more fire prone. Logging alters fire regimes by changing the amount, type and moisture content of fuels. Clear-felling of moist forests in southern Australia has led to the development of dense stands of regrowth saplings creating more available fuel.

Building of logging truck routes increases the number of ignition points for fires. Lightning strikes are attracted to post-logging fine fuel loads which take from 10-30 years to become less inflammatory following logging. Logging operations change the patterns of how forests are naturally interrelated. Creation of unnatural forest edges facilitates entry points for fires burning in adjacent forests. Forest logging truck roads create the same effect.

Relationships between logging and fire regimes are contingent on forest practices, the kind of forest under consideration, and the natural fire regime characteristic of that forest. Such relationships will influence both the threat of fire to human life and infrastructure, and biodiversity conservation.⁴

Logging therefore has a great influence on the character and fabric of forests. One of these influences is the development of their incendiary propensity. Fire regimes and forest practices are interrelated and mismanagement may affect a forest's finely balanced biodiversity.

Melbourne scientist Chris Taylor said: 'Logged forests are highly fire-prone for 5-25 years after logging. Mature forests repel fire and recover quickly'.⁵ Following the Black Saturday fires of 2009, Dr Taylor presents evidence from his research, that the most intense fires occurred in grassland, plantations and logged forests, and that unlogged forests were the most resistant to fire and were where the fires finally halted.

Dr Taylor visited logged southeast forests around the Nippon Paper chip mill at Eden where up to 90% of trees are chipped for export to Japan. He said that the logging was some of the worst he had seen, with mono species Silver Top Ash taking over the forests, and it was on par with current logging in Victoria where montane Ash forests comprise less than 1% of the original forests.

Fire has an Impact on Species' Survival

The cumulative effect of 45 years of industrial logging and associated burning in southeast NSW has contributed to a drastic reduction in animal and plant species and numbers, and some are now close to regional extinction.

A worldwide objective of biodiversity conservation is to avoid population extinctions due to inappropriate fire regimes. Wildfires, post-logging and hazard reduction burning affect floral and faunal species and thus the rate of extinction in forests in southeast NSW. Individual statistical evidence of the impact of these three occurrences upon species in southeast NSW is lacking. Yet, many species have been lost. Thirty-year Murrah State Forest resident, Suzanne Foulkes, witnessed:

The koala colony in the gully behind us vanished after their habitat was demolished by Forests NSW. Of course the follow up burning would have made certain...

Floral and faunal species play a vital part in making forests more resistant to bushfire. Biological processes which provide resilience against bushfire should be taken much more seriously. The roles of bandicoots, lyrebirds, oecophorid moths, bugs, beetles and other organisms are essential for reducing and recycling litter on the forest floor. This natural cycle is broken when they are wiped out in control burns. The NSW State Government's Scientists agree that:

Clearing of leaf litter and fallen logs, often associated with clearing and/or burning of the understorey for clearing, removes habitat for a wide variety of vertebrates and invertebrates which live in the leaf litter and in the fallen logs—including reptiles, small mammals, invertebrates, for example, spiders, molluscs, millipedes, ants, etc. These

impacts may affect ecological functioning. Loss of the leaf litter also exposes bare soil which will be susceptible to soil erosion and drying, and hence affects the soil biota, and may make sites more vulnerable to weed invasion. ⁶

The research paper *Choice of biodiversity index drives optimal fire management decisions*, by Giljohann and colleagues, describes how dynamic programming based on random probability occurrence was used to model changes in vegetation in the presence of both planned and unplanned fires. This research used an extensive data set based on the occurrence of birds, reptiles, and small mammals in different states in semiarid Australia. The researchers concluded that:

... using the extinction risk objective, we show that a policy to annually burn 5% of the landscape could increase the average probability of extinction for the modelled species by 7% over the next 100 years compared to the optimal management scenario. ⁷

Results of this research highlight the need for careful consideration when specifying an objective to represent overarching conservation goals. Five percent is the amount of fire reduction carried out on public lands each year in NSW. Just as the 5% target is an inefficient method for minimising the impact of major bushfires on human life and communities, it also has negative consequences for the resilience of natural ecosystems. It's time to drop the simple 5% target. It is a blunt tool, and a risk-based approach more effectively focuses fire protection where it's most needed to safeguard people and wildlife.

Impact of Post-logging Burning on Trees Left Standing

Research into the impact of slash burning and the mortality and collapse of trees retained on logged sites in south-eastern Australia ⁸ compared rates of mortality and collapse among trees retained on logged sites that were routinely treated with a high-intensity slash-burn, with those on logged sites treated with a low-intensity slash-burn. All observations were made 2–5 years after logging.

The study found that 37% of trees retained on logged sites were more likely to die and collapse if the site was treated with a high-intensity slash-burn; however, 14% of trees were also more likely to die if the basal area of trees retained on the site was relatively low and the site had a northerly aspect. Mortality rate was similar among all diameter classes on sites treated with a high-intensity slash-burn.

The conclusion was that some of the objectives of retaining trees on logged sites, such as perpetuating hollow-bearing trees for wildlife, were compromised after high-intensity post-logging slash-burns.

Forestry must keep a certain amount of habitat trees or recruitment trees in case the habitat tree dies. In every compartment surveyed by local conservationists, they found that debris has been pushed up against retained trees. This wouldn't necessarily be a problem, but when forestry log then burn, obviously debris pushed up against a retained tree, it will also catch fire. So quite often these habitat trees that forestry have marked to be retained end up dying with consequent loss of wildlife habitat.

Logging Near Towns Increases Fire Risk to Communities

Science has well established the risk to townships of logging close by. The effect of this was especially evident in the Black Saturday fires in Victoria in 2009. Researchers Lindenmayer and Taylor established that logging practices can 'greatly increase the severity of fires' in extreme weather conditions such as Black Saturday. They examined hundreds of thousands of trees

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burnt in the bushfires in Victoria on a day of extreme temperatures and high winds. They found that the increased fire risk began about seven years after an area had been logged and lasted for another 50 years. Lindenmayer's advice was 'We need to let those forests recover and we need to develop the wet forests...which do have a fire suppressive effect'.⁹

During the Canberra bushfires in January 2003, fire raced up from the Murrumbidgee River Valley eastwards to Canberra over grasslands at breakneck speed with the wind behind it. The land had been cleared for pine plantations and livestock grazing. Fire destroyed property in the suburb of Duffy and over 20 lives were lost. If the native, more moist, native forests had been standing, they may have slowed the progress of the fire which would have resulted in time for warnings and evacuation.

The ongoing practice of logging close to southeast NSW townships threatens life and homes and creates an insurance risk. Retaining our native forest to allow them to become moist ones is the best insurance policy against fire. Local communities are very concerned that, with the southern regions' forests running out of supplies of contracted timber, logging is now coming close to towns and villages such as Bermagui, Tanja and Tathra. This logging puts residents at increased risk from wildfires. For example, in 2010, logging took place within 300m of Bermagui residents' properties and the dense 'Cathedral' of trees abutting residents was only saved after community protest.

...To damage our Mountains is to physically damage us. The person is the Land and the Land is the person. Our connection with the Mountains, with this Earth, is alive and strong.¹⁰

Bronte Somerset

CONCLUSION

As demonstrated, logging has a devastating and unexpected effect on the fires that follow it, as well as fires that naturally happen in unlogged forest. To avoid even greater disasters to nature and townships, including loss of human life, the continuation of this process cannot be contemplated.

From the information provided, it is obvious that all elements of the southeast are impacted by more intense and frequent forest fire incidents: from the community residents and property, entire forest inhabitants, to all species of flora that sustain life: clean water, healthy soil, bird life, bees and other pollinators and CO₂ absorption. Indeed, the forestry industry itself is threatened as its resources are more frequently destroyed before being harvested, even if future logging was to be allowed in native forests.

A new vision for our future is needed and a change of approach to land and forest care in general be adopted. The Great Southern Forest is the indisputable response required to ameliorate the current state of the southeast and ensure a viable and responsible environment in the region.

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Image 1: Post-logging fire out of control on Gulaga (Mt Dromadery). 2010. BJS



Image 2: Post-logging burnt landscape, Bermagui State Forest. 2010. BJS

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- ¹ Plan of Management, Yuin Mountain Parks. (2014) Office of Environment and Heritage NSW. p.96
 - ² Pyne, S.J. (1982) *Fire in America: a cultural history of wildland and rural fire*. Princeton University Press, Princeton, New Jersey.
 - ³ Lindenmayer, D. B., Hunter, M. L., Burton, P. J. & Gibbons, P. Effects of logging on fire regimes in moist forests. *Conservation Letters*. 2009.
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 - ⁵ Taylor, C. (2010). *Tracking the Black Saturday bushfires — at the source of ignition*. Melbourne University.
<http://www.serca.org.au/nature/fire.html>
<http://wilderness.org.au/articles/summary-and-implications-report-victorian-2009-february-fires>
 - ⁶ Department of Environment and Heritage, NSW State Government.
<http://www.environment.nsw.gov.au/determinations/ClearingNativeVegKTPListing.htm>
 - ⁷ Giljohann, K. M., McCarthy, M. A., Kelly, L. T. & Regan, T. J. (2015) *Choice of biodiversity index drives optimal fire management decisions*. Centre of Excellence for Environmental Decisions, The School of Botany, University of Melbourne, Parkville, Victoria 3010 Australia.
<http://www.esajournals.org/doi/abs/10.1890/14-0257.1>
 - ⁸ Gibbons, P., Lindenmayer, D.B., Barry, S.C. & Tanton, M.T. (2000) The effects of slash burning on the mortality and collapse of trees retained on logged sites in south-eastern Australia. *Forest Ecology and Management*. Volume 139, Issues 1–3, 20 December 2000, Pages 51–61.
doi:10.1016/S0378-1127(99)00333-3
 - ⁹ Logging can 'greatly increase' fire severity for 50 years, researchers say. 774 ABC Melbourne. Posted 4 Aug 2014.
<http://www.abc.net.au/news/2014-08-04/logging-greatly-increases-fire-risk-black-saturday-study/5646220>
 - ¹⁰ Plan of Management, Yuin Mountain Parks. (2014) Office of Environment and Heritage NSW. p. 31