Submission No 101

INQUIRY INTO LONG TERM SUSTAINABILITY AND FUTURE OF THE TIMBER AND FOREST PRODUCTS INDUSTRY

Organisation: Brooman State Forest Conservation Group

Date Received: 28 May 2021

Logging in the state forests of the NSW South Coast.

The Fires Changed Everything

The aftermath of the Currowan fire, captured by local resident

message from the residents of Brooman State Forest.

Table of Contents

Acknowledgement of Country

We acknowledge the traditional custodians of the land in which we work, and live, and recognise their continuing connection to land, water, and community.

We acknowledge that the logging occurring in the Brooman State Forest is on Yuin country and we want to protect the sacred sites that are in this area for future Aboriginal generations.

We are living on stolen land and destroying the environment that Aboriginal people successfully managed for over 10,000 years.

We pay our respects to Elders, past, present, and emerging.

Introduction

The residents of Mogood and Brooman live surrounded by NSW State Forests. We are not "the usual suspects" when it comes to the conflict between logging and conservation. We are a diverse group, from ages 17 to 67, including farmers, tradespeople, nurses and teachers. Some of us have resided here our entire lives and all of us have lived here without conflict with the Native Forestry industry. However, **the 2019-2020 bushfires changed everything**.

According to current estimates 12 million hectares of forest were lost, 1 billion animals killed and 700 species lost. 42% of New South Wales State Forest was burnt (NSW Dept of Planning, Industry & Environment, 2020), and over 80% of forest between Ulladulla and Batemans Bay.

Fire in the Brooman State Forest, captured by local resident

The EPA, understanding the impact not only of the fires, but of habitat loss due to the loss of large, old hollow bearing trees, which are more likely to collapse during and after fire (Bluff, 2016), imposed strict post-fire logging conditions on Forestry NSW's operations. **In NSW least 46 mammals, 81 birds, 31 reptiles and 16 frogs depend on tree hollows** for foraging, shelter, roosting and nesting**.** Forty of these species are listed as threatened in Schedule 1 and Schedule 2 of the Threatened Species Conservation Act 1995, which means that they are at higher risk of extinction (NSW EPA, 2014).

Despite this, **Forestry NSW has submitted a proposal to log according to pre-fire Coastal Integrated Forestry Operations Approvals** (CIFOA) and not the Site-Specific Operating Conditions (SSOC's) that have been implemented by EPA post fires.

The standard response of Forestry NSW to community concerns is that *"Timber harvesting takes place in around 0.1 per cent of forested land in NSW each year in line with strict regulations that were developed by expert scientific panels to protect and maintain wildlife habitat, the Coastal Integrated Forestry Operations Approval"*

This fails to take into account the impact of the bushfires and the increasing body of scientific evidence that shows the dangers of post-fire salvage logging to both forest ecosystems and human life (Donato et al., 2006).

Forestry NSW wants to proceed with a 'business as usual' approach to native forest harvesting, ignoring overwhelming evidence of massive loss of wildlife and habitat, and increasing evidence that current forestry practices increase the severity of bushfires, and set back and in some cases entirely stall the recovery of ecosystems (Lindenmeyer, Burton & Franklin, 2008).

The residents of this region want to make clear to Forestry NSW and New South Wales policy makers than a 'business as usual' approach is no longer acceptable after the summer of 2019-2020.

Powerful Owl (Credit: Dave Robson),

Greater Glider (Josh Bowell),

Glossy Black Cockatoo (Greening Australia)

Above: Some of the species within the North and South Brooman State Forests and Shallow Crossing State Forest, which rely on tree hollows.

Australians pour our attention, support and resources into fire affected towns and communities, because we know that following a bushfire they are vulnerable. ***We know that even those most resilient, need time and care to return to a healthy state.***

We know that local unburnt communities become the life-line for recovery to those affected by fire, often providing ongoing essential services in the aftermath of the emergency.

This is the same for our forest*.*

Just like all the towns and communities that require special care during the recovery stages following a bushfire, so too do forests, and the animal species they provide habitat to.

Logging in any forest following these fires is akin to demolishing the only surviving local town supporting a fire affected community. Think about that. Would we do that to the people of Conjola, or Cobargo, or any one of our south coast towns? Would you close down the only available supermarket, or the hospital? Would you turn kids away from the school and knock it down, knowing that these are the only remaining places of normality that they have left in their lives?

Logging in forests following fires is counter-intuitive, and it is ***destroying crucial habitat relied on by extremely vulnerable communities, the animals****.*

Associate Lecturer
Geography & Sustainable Communities
University of Wollongong

The Effects of Post-Fire Logging

Timber harvesting has an additive or multiplicative impact in combination with wildfire but is generally more severe, longer lasting and more permanent because it is repeated in the same location at short intervals (harvest rotations) of insufficient duration for trees to reach maturity and develop hollows at 120+ years of age (Ambrose 1982)

The following summary of the effects of post-fire logging is an excerpt from Professor David Lindenmayer's submission to the Bushfire Royal Commission:

- **Bird populations are severely reduced in salvage logged areas.**
- **Soils remain highly depleted of key soil nutrients for up to 80 years.**
- **Plant communities are radically altered, with moist forest elements like tree ferns severely depleted.**
- **The recovery of natural forest vegetation is impeded.**
- **Habitat suitability for threatened cavity-dependent mammals is impaired for up to 170 years.**
- **Populations of insects and other key forest biota are detrimentally affected.**
- **Salvage logged and regenerated areas can be highly prone to further fire.**

The information below is a summary of the Krebs 2020 lecture by Prof. Lindenmayer

Post fire logging removes most large old trees and accelerates the loss of remaining old trees. It impairs the recruitment of new habitat for 100-200 years. It alters vegetation composition and damages soils for up to 80 years. It has a major impact on birds, plants and invertebrates. It elevates short term and medium term fire risk.

In short, post fire logging is the most damaging form of logging.

Forestry Response to the EPA's Site Specific Operating Conditions for Post-Fire Logging

Forestry NSW has submitted a proposal to remove some conditions of the Site-Specific Operating Conditions) to allow harvesting in partially unburnt forests as well as to reduce buffers on riparian zones and more recently to log according to pre-fire Coastal Integrated Forestry Operations Approvals (CIFOA) and not the Site-Specific Operating Conditions (SSOC's) that have been implemented by EPA post fires. Forestry claims that the SSOC's are too restrictive and that they cannot meet their obligations as contractual demands are hard to meet.

Aerial photograph of logging aftermath in South Brooman

Due to the actions of the Brooman State Forest community in constantly monitoring compliance, Forestry NSW was issued a stop-work order for site 58A as a result of numerous breaches to the SSOC's including but not limited to the destruction of numerous hollow-bearing trees. At the conclusion of the stop-work order, once harvesting resumed, hollow-bearing trees were felled once again.

Dozens of breaches were reported prior to the stop work order.

More breaches documented almost immediately after the re-commencement of operations.

Currently, correspondence has been sent to a few residents from Forestry Corporation stating that they will be logging in South Brooman compartments 52A, 53A, 54A, and will log to CIFOA and will not follow any SSOC's as **they claim the forest has recovered enough to resume logging operations under pre-logging rules**.

The EPA has not approved any harvest plans and claims that '*normal CIFOA in the context of the 2019/20 wildfires will not deliver ecologically sustainable management as required under the objectives of the Forestry Act 2012 and is likely to cause a significant impact under the NSW Biodiversity Conservation Act 2016 and the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999. It was also concluded that special conditions in SSOC's for the burnt areas are inadequate to mitigate fire and logging impacts, primarily because their time frame (12 months) of application is too short.'*

Mental Health

The mental health of the community is suffering. We lived through the fires and subsequent flood. We see the impact of the fires every day and now live with hearing and seeing the additional destruction of logging. That is made worse by the economic stress of fires, floods and COVID-19, and frustration that despite demonstrated breaches of the rules the logging is continuing.

Furthermore, **the community has no clarity about what logging will take place where.** Despite the information on the FCNSW Plan Portal, there is no clarity about what sites Forestry NSW will log next or when they will commence.

Logging will create access issues for local residents and businesses. Forestry NSW indicated in their letter to residents that the local road, The Sheep Track, would be closed to non-local traffic during the operations, which could be for a year or more. This closure would have a devastating impact on local businesses, especially the Clyde River Berry Farm who host tourists and locals to 'pick your own' berries during the summer months. This business, like others in the area, lost most of their revenue because of the fires, floods and COVID-19 and now face another peak season of lost revenue should logging expand into this area.

Logging increases bushfire threat. The residents of this area just survived a horrific bushfire season, all of us suffering damage to our properties, some losing everything, and many fighting off the fires for a week, with little or no assistance from RFS. We know that logging increases the bushfire threat and one side of our main access road is already littered with logging slash.

8 kilometres of logging slash lines the local access road 'The Sheep Track'

Not only does the destruction of logging itself cause anxiety, but so to does the knowledge that **we are being set up for more fires in the future**. This fear is compounded by the overwhelming evidence that the type of forest 'management' Forestry NSW undertakes also contributes to climate change – further increasing our risk of more fires, and threatening agricultural prospects in the area.

Above: A sign on the Princes Highway, encouraging visitors into the forest.

Below: What visitors can expect upon entering the forest at the sign posted location

Accidents have already happened on our roads with residents colliding with or being run off the road by fast-moving fully laden logging trucks. In the peak summer period, in a forest that boasts an enormous "Visit NSW Forests" sign on Boardinghouse Road, further accidents and harm to residents and visitors is inevitable.

The logging occurring is going to have an impact on our local business if road works/ closures are in place. The campers visiting the area have all mentioned the destruction they have seen on the way out to my local

business. This could stop people from visiting my business, which would cause us huge problems

After COVID, more Australians are holidaying closer to home. Tourism is expected to increase in the South Coast over the summer. Local businesses are poised to recoup some of the losses from the previous fire season and COVID-19. But **who will want to come to visit a devastated forest?** Because the jobs of a few interstate contractors were protected over countless local jobs and the safety and sanity of the local community.

The Increased Bushfire Threat

Although Forestry doesn't log within the gullies, logging around the gullies has opened up the canopy and changed the vegetation from rainforest into dry forest. The fungi, mosses, organic material and microorganisms have dried out and no longer function as part of a healthy ecosystem. The loss of this natural 'sponge' is having the effect of the creeks drying out. Rocks in the creeks and gullies, that had been exposed for tens of thousands of years, exploded with the heat from the fires – proving that the gullies had never dried out so much.

– farmer and lifelong resident of Brooman

- A detailed and thorough empirical study after the 2009 Black Saturday wildfires in Victoria showed that **logged forests that had been regenerated after harvesting were at 7 times greater risk of burning at high severity than older, unlogged forests** (Taylor, McCarthy & Lindenmayer, 2014).

- The elevated high severity fire risk in forests that have been logged and regenerated lasts for at least three decades after timber harvesting. (Lindenmayer, 2020)

- One of the suggested reasons for elevated fire severity in logged forests is the loss of mesic understory plants, such as tree ferns, in logged areas, which leads to a drying of the forest (Blair et al., 2016) Critically, the protected Threatened Ecological Communities in compartment 58A were impinged upon during operations, leading to the destruction of countless tree ferns, as documented by concerned citizens.

A collection of images taken by locals, showing destruction of mesic understory plants in Compartment 58A, as well as encroachment into protected Threatened Ecological Communities, the loss of which causes drying and increased bushfire risk and intensity.

The climate within the forest is less stable as there is no unbroken canopy, and temperature variation within forest is more extreme. When I was a boy, you could walk into the gullies in the summer and the temperature would be 10 deg. or more cooler than in the open. The gullies were dark and wet and cool - you couldn't see through the canopy. Now walking into the same gullies, it has become a dry forest.

farmer and lifelong resident of Brooman

Fire in a young forest has a very different effect relative to an old forest in terms of recovery. **Logging makes forests more prone to high severity fire for the next 30-40 years after the logging operation**. Some of the landscapes are trapped as young forests – the fire burns young forest and keeps it young with subsequent re-burning.

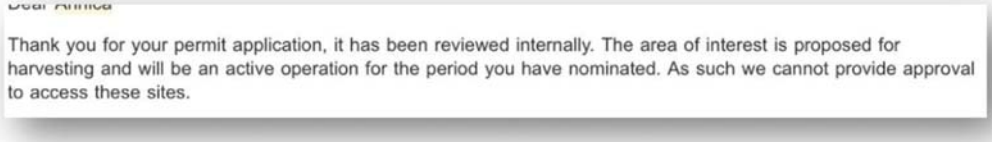
It poses a major risk to human populations in areas adjacent to logged forest.

Each fire causes 9.1% reduction in bird species.

When you log Australian Eucalypt forests about half of the biomass actually stays on the forest floor – this then dries out the forest and it alters the architecture of the forest. So, when the forest regrows you have a dense stand of young tress that has this background additional fire layer in the system.

The following species can survive in burnt and regenerating forest: the Feathertail Glider, Ringtail Possum, Eastern Pygmy Possum, Sugar Glider, Brushtail Possum, Greater Glider and Yellow Bellied Gliders (Lindenmayer, 2020).

Despite this, a request from the Australian Conservation Foundation to undertake night-time wildlife surveys within Captions 52, 53 and 54 of South Brooman State Forest was denied by Forestry NSW.



Thank you for your permit application, it has been reviewed internally. The area of interest is proposed for harvesting and will be an active operation for the period you have nominated. As such we cannot provide approval to access these sites.

Above: An email received from Forestry NSW, claiming that the area the ecologist wished to survey would be an 'active operation' in mid-November, despite the local community having not been informed when harvesting with commence.

Our bush is resilient, BUT…

Signs of life, in the form of germinating seedlings and epicormic shoots have resulted in many people believing the forest is rapidly recovering.

However, early succession forests with large old trees may only take 10-20 years to be colonised by a range of mammal species **but forests without large old trees may take 170+ years to be suitable once again for habitation by certain mammals.**

It will take decades to the replace the critical hollow bearing trees lost during the fires.

Following the 2019/2020 fires, **Ecological carrying capacity** and **ecological condition** in the fire ground was reduced by 39% since 2013 (NSW Dept Planning, Industry & Envrionment, 2020).

A koala was seen during the fires at East Lynne, adjacent to the South Brooman State Forest. A skeleton was also found post-fire. Had this dwindling population of koalas survived the fires, it could now be lost due to logging.

"The koala was once widespread through eastern Australia; however, **broad-scale land clearing and logging**…resulted in a dramatic decline following European settlement" (Lunney et al., 2013).

People said the forest was recovering. Perhaps. But it will take decades or even centuries for it to become a real forest; a real ecosystem teeming with life. Not in our lifetime, but at least there was hope for the future…

Then came the loggers.

My heart is broken. Two months after the fires, struggling native trees taken for wood chips. More habitat destroyed. The forest further opened up, letting the baking sun in to the forest floor, promoting more frequent and more severe fires. Fires already out of control due to climate change. More fires, more destruction, more death and less chance of forest recovery. An ever downward spiral.

For the sake of our grandchildren and their children, the wilful destruction of our native forests must stop.

Climate change, wild weather events, extreme bushfires, loss of habitat, loss of natural beauty.

I am frightened and lose sleep every night. My dream for our 'golden years' ruined.

But at least I had a golden childhood. One of the last of the lucky ones.

– Resident of Mogood

The Economics of Native Forestry

Fire implications of native forest timber industry – some statistics from the 2020 Krebs Lecture.

- Normal time between fires should be between 75-150 years
- The normal time to produce a saw log should be 100 years.
- There is a 20% probability of a forest reaching 80 years before there is a fire.
- There is a 14% probability of a forest reaching 100 years with a 4% chance of producing a critical hollow bearing tree.
- Native Forestry is a poor financial investment due to the recurrence of fire. Forest should burn approximately every 50-100 years but in East Gippsland fires have burnt 4 times in the last 25 years.
- In Australia, 87% of native forest was used for chips and pulp (ABARES 2018).
- 92% of forestry industry employees are in plantations (Schirmer et all 2018). In Victoria they create 3.9 million tonnes of eucalypt plantation pulp logs per year – it exports 2.9 million tonnes to China/Japan and we buy back as paper products. 88% of all our sawn timber comes from plantations and from only 5% of the land cover.

The number of hardwood mills across Australia has decreased by 64% from 2006/07 to 2016/17

Annual assessed sustainable from native forests regions as at 2018
*This is a pre-fire assessment

Forestry Region	Annual Sustainable Yield				
	High Quality Logs (m^3)	% of High Quality Logs	Non-high Quality Logs (m^3)	Total	% of total yield
North East Forests	230,000	67%	660,000	890,000	64%
South Coast	50,000	15%	160,000	210 000	15%
Tumut	35,000	10%	40,000	75,000	5%
Eden	26,000	8%	195,000	221,000	16%
Totals	341,000		1,055,000	1,396,000	

Source: NSW Department of Primary Industries: Sustainable Yield in New South Wales Regional Forest Agreement regions

ABARES – Forest sector employment dependence.

For the South Coast of NSW the FSED fell from 0.8% to 0.6% from 2011 through to 2016. (The FSED is the percentage of the total workforce directly employed in the forest sector).

Forestry Sector Workers	Tourism Workers
0.6%	6.7%

By comparison, **tourism brought $2.6 billion into the South Coast** economy in the year ending 2020, with 10.7million visitors – this, in spite of the horrific bushfire season (Destination NSW, 2020). 6.7% of the south coast workforce is employed in tourism.

Throughout my life I have worked in various sectors of the logging industry, cutting props and running a small timber milling business. Now I can see that the forest has changed and the logging industry is no longer ecologically sustainable.

farmer and lifelong resident of Brooman

NSW Forestry Commission
Financials:
From 2018/19 Annual Report

	Hardwood ($M)	Softwood ($M)	Total (1)	% H/W
Revenue	123	289	412	29.9%
Profit	1.1	73	74	1.5%

(1) excludes corporate income $6m

Note: Included in Revenue is $17.54m for Community Service Obligations and $2.19m Other State Govt Grants. (Allocation between Hardwood and Softwood of these grants is unkown.)

Community Service Obligations refers to "provision of Recreation facilities, education and advisory services, Govt liaison and regulatory services, community fire protection and research."

There is no detail on what "Other State Govt Grants" refers to.

Additional subsidies available to Forest industries

- The $34 million NSW Forest Industries Innovation Fund loan scheme will provide long-term low-interest loans to projects that contribute to supporting industry innovation and the exploration of new markets for forest products.

- Up to $20 million is available to support the haulage of burnt timber. This includes $10 million from the NSW Government and $10 million from the Commonwealth Government.

Volume and Value of Native Hardwood production

	Volume m3			% change	GVP (at mill door)			Unit rates $/m3		% change	
Product	1998-99	2008-09	2018-19	from 1998/99	1998-99	2008-09	2018-19	1998-99	2008-09	2018-19	from 1998/99
Export woodchip pulplogs	519,970	447,888	223,746	-57%	$25,769,356	$24,632,806	$23,999,711	$49.56	$55.00	$107.26	116%
Fuel logs		73,010	116,417			$3,869,530	$7,156,595		$53.00	$61.47	
Other minor log products	25,248	28,136	36,830	46%	$2,787,846	$6,074,562	$10,579,630	$110.42	$215.90	$287.26	160%
Panel logs	16,000	20,200	31,090	94%	$808,000	$1,104,940	$2,229,249	$50.50	$54.70	$71.70	42%
Ply and veneer logs	15,574	7,513	11,557	-26%	$1,454,144	$890,291	$1,952,835	$93.37	$118.50	$168.97	81%
Saw logs	1,082,561	937,147	637,275	-41%	$49,216,768	$95,050,857	$95,688,240	$45.46	$101.43	$150.15	230%
Sleepers	69,773				$1,973,088			$28.28			
TOTAL	1,729,126	1,513,894	1,056,915	-39%	$82,009,202	$131,622,986	$141,606,260	$47.43	$86.94	$133.98	182%

Overall Hardwood production has decreased by 39%
Marginal profitability has been maintained by substantial price increases across most product groups, particularly saw logs.

Volume and Value of Planation Hardwood production

	Volume m3			% change	GVP (at mill door)			Unit rates $/m3		% change	
Product	1998-99	2008-09	2018-19	from 1998/99	1998-99	2008-09	2018-19	1998-99	2008-09	2018-19	from 1998/99
Export woodchip pulplogs	81,751	94,301	278,230	240%	$2,454,165	$3,880,276	$21,620,320	$30.02	$41.15	$77.71	159%
Fuel logs			516				$16,893			$32.74	
Other minor log products	3,290	10,116	13,760	318%	$245,862	$1,513,354	$2,845,106	$74.73	$149.60	$206.77	177%
Panel logs			10,020				$707,306			$70.59	
Ply and veneer logs	4,068	9,196	5,313	31%	$304,978	$586,705	$672,876	$74.97	$63.80	$126.65	69%
Saw logs	34,445	114,382	44,676	30%	$1,378,489	$6,376,797	$4,832,992	$40.02	$55.75	$108.18	170%
TOTAL	123,554	227,995	352,515	185%	$4,383,494	$12,357,132	$30,695,493	$35.48	$54.20	$87.08	145%

Forests sequester carbon

Australian Bushfires of 2019/20 released approximately 830 million tonnes of CO_2 into the atmosphere

Australian Forests hold 21,949 million tonnes of Carbon (June 2016) of which 14,110 MT is held BELOW ground. These numbers are basically unchanged since 2001.

70% of the carbon storage potential in a tree is realised in the last half of its life (Kohl et al, 2017). In logged state forests, most trees will never reach maturity. This means that the carbon value of regrowing logged forests is far less than a mature forest.

Possibilities for Transition

State Forests are a public asset. The best and highest value for our State Forests are water, carbon storage and tourism.

We need to have carbon storage in protected areas, remove logging from forests that become fire prone, remove logging from areas close to settlements due to fire risk and don't log burnt areas as it impairs forest recovery.

- **Timber mills have been closing on the South Coast even before the fires due to lack of supply/costs.** Timber mills have steadily been closing across the South Coast since the early 2000s. In large part these closures have been due to a dwindling availability of large high-quality saw logs that are needed by mills for higher value products.

- **Forestry NSW hardwood business costs the public money and the impact of the fires on the business are yet to be seen.** In the last reporting year Forestry NSW's hardwood business reported approx $1 million profit and had been cost neutral in the three preceding years. FCNSW returned losses of almost $80m over 7 years to 2015.

- **There are relatively few jobs in the timber industry on the South Coast.** There are no more than 300 jobs in Forestry NSW, harvesting, transport, milling and processing of hardwoods on the South Coast. Some of these jobs are likely also supported by the Private Native Forestry sector and local firewood businesses.

- **There are like for like jobs available in the region to support a transition.** There is scope to transition timber industry workers to an expanding softwood

plantation sector, the development of hardwood plantations and Private Native Forestry. There will also be ongoing jobs in the management of the forests for other uses including infrastructure maintenance, fire management and recreational use.

- **The future of the industry without a plan is uncertain.** There has been no published assessment of the impact of the fires on wood supply in the forestry. This will make renewable of wood supply agreements difficult leaving contractors and mills uncertain about their future. The logging of burnt forests is expected to have a long-term but as yet unquantified impact on long-term wood supply. There is also growing public concern about the impact of the industry, eroding the social licence of the sector. This increases costs due to increasing complaints and compliance pressures and delays due to protest actions.

A better future for our forests

A plan to transition South Coast Forests

- **Our public forests should be managed for their ecological, recreational and carbon value -** creating more local jobs, allowing our forests to recover and to be part of our climate solution. Currently the primary purpose of our public native forests is their timber resources. This provides little economic value to our region and has profound ecological impacts. The primary purpose of the management of State Forests should move away from access to timber resources and towards their management as ecological, recreational and cultural reserves.

- **The South Coast could be a case study in the modern management of forests that create jobs while supporting biodiversity and recreation**. Our public native forests could be an epicentre for world class nature-based recreation including bushwalking, mountain biking, horse riding, kayaking, camping etc. The South Brooman and neighbouring State Forests have the tallest Spotted Gum in the world and 47 kilometres of Clyde River frontage as well as amazing views of the Budawangs and South Coast Coastline. Marrying up these recreational facilities with appropriate commercial development in public forests including eco-accommodation and other services could provide the economic basis to fund the ongoing management of the forests.

- **Public native forests can make a substantial contribution to reaching net zero emissions by 2050 if they are allowed to mature.** Carbon research shows it is best to source wood from plantations (Keith et al 2014). Develop new industries for this – carbon storage in native forests – with the opportunity to

earn 4 times the value of woodchips. In Tasmania, the carbon storage value of public forests has provided a significant contribution to that state reaching net zero emissions in 2015. Allowing currently logged public native forests to mature will provide some of the lowest cost carbon abatements, taking pressure off other sectors to deliver more difficult and expansive carbon emission abatement.

- **New models of management are possible including direct involvement or control by Traditional Owners.** Public forests will require ongoing management including fire management, maintenance of infrastructure and improvements to support recreational activities and commercial access. These services should be able to be funded from profits derived from user costs. There is an opportunity to more actively engage the local community in the management of local forests, including the direct management and control of Traditional Owners.

…early settlers from the UK bought land along the Clyde River to farm cattle and crops. Logging also became an important industry at that time, being one of the Southernmost areas of Red Cedar. In those days it was possible to drive a horse and cart from Brooman to Murramarang through the forest, without roads, because the old growth forest consisted of massive trees with open space in between.

farmer and lifelong resident of Brooman

Links, Citations and Further Information

Ambrose, G. J. 1982. –*An ecological and behavioural study of vertebrates using hollows in eucalypt branches.* Melbourne: La Trobe University. Ph.D thesis

Bluff, 2016. Reducing the effect of planned burns on hollow bearing trees. https://www.ffm.vic.gov.au/__data/assets/pdf_file/0006/21120/Report-95-Reducing-the-effect-of-planned-burns-on-hollow-bearing-trees-2016.pdf

Destination NSW 2020 – South Coast Visitor Profile Fact Sheet https://www.destinationnsw.com.au/tourism/facts-and-figures/regional-tourism-statistics/south-coast-region

Donato et al., 2016. Post-wildfire logging hinders regeneration and increases fire risk. Science 311, 352 (2006).

Keith, H., Lindenmayer, D., Macintosh, A., & Mackey, B. (2015). Under what circumstances do wood products from native forests benefit climate change mitigation?. *PloS one*, *10*(10), e0139640.

Köhl M, Neupane PR, Lotfiomran N (2017) The impact of tree age on biomass growth and carbon accumulation capacity: A retrospective analysis using tree ring data of three tropical tree species grown in natural forests of Suriname. PLoS ONE 12(8): e0181187.

Lindenmayer, D. B., Burton, P. J., Franklin, J. F. Salvage Logging and its Ecological Consequences. (Island Press, 2008)

Lunney Daniel, Stalenberg Eleanor, Santika Truly, Rhodes Jonathan R. (2014) Extinction in Eden: identifying the role of climate change in the decline of the koala in south-eastern NSW. *Wildlife Research* **41**, 22-34.

NSW Department of Planning, Industry & the Environment, 2020.
Fire and the Environment – 2019-2020 Summary
https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Fire/fire-and-the-environment-2019-20-summary-200108.pdf

NSW EPA, 2014. Identifying hollow-bearing and recruitment trees.
https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/epa/140444pnfhols.ashx

Schirmer, J., Mylek, M., Magnusson, A., Yabsley, B., & Morison, J. (2018). Socio-economic impacts of the forest industry. *University of Canberra and Forests and Wood Products Australia: Canberra*.

Smith A.P. 2020 Review of CIFOA standards for mitigating logging impacts in burnt NSW Forests. Setscan Pty Ltd

Taylor, C., McCarthy, M. A., Lindenmayer, D. B., Non-linear effects of stand age on fire severity. Conservation Letters 7, 355-370 (2014).

Professor Lindenmayer's submission to the bushfire royal commission:

https://naturaldisaster.royalcommission.gov.au/system/files/submission/NND.001.00076.pdf

Lindenmayer 2020, Krebs Lecture: From Landscape Transformation to Ecosystem Collapse:

https://www.canberra.edu.au/about-uc/media/media-releases/2020/february/krebs-lecture-2020-from-landscape-transformation-to-ecosystem-collapse

Appendix 1 – Full Story

I'm a farmer who grew up in Brooman, I've lived here for 50 years.

A woman who lived on my property in the mid-1800's describes how early settlers from the UK bought land along the Clyde River to farm cattle and crops. Logging also became an important industry at that time, being one of the Southernmost areas of Red Cedar. In those days it was possible to drive a horse and cart from Brooman to Murramarang through the forest, without roads, because the old growth forest consisted of massive trees with open space in between.

From the 1860's to the 1920's cutting railway sleepers was a big industry in the area. Ironbark and Red Mahogany logs were split and then adzed by hand. Cutting wattle bark for the Sydney and Ulladulla tanneries was another forest product. The people who worked in the bush lived in the bush. Logging was a dangerous business and many local loggers lost their lives.

In the late 1940's Aboriginal women were still walking from the coast up through Brooman on the Wog Wog track to Nerriga, koalas still lived in the Brooman area, and trees were felled with axes.

Things changed in the 60's when Forestry Roads were constructed and machinery was used to log the forests. Even so, they still selected specific species for different uses. It was not unusual for a log truck to be carrying only one log. One old timer (Fred Rixon) tells me logging became less profitable when he swapped his bullock team for a dozer because of the running costs of the machine compared to the bullocks.

These days, everything is done from sitting inside a machine. The workers are from outside the area, disconnected from the forest. They have no respect for the environment and the future of the forest. The focus is on quantity instead of quality of the timber.

As a result of modern practices, the climate within the forest has changed.
There are fewer days of rain, and the mist no longer hangs over the forest. The climate within the forest is less stable as there is no unbroken canopy, and temperature variation within forest is more extreme. When I was a boy, you could walk into the gullies in the Summer and the temperature would be 10 deg. or more cooler than in the open. The gullies were dark and wet and cool - you couldn't see through the canopy. Now walking into the same gullies, it has become a dry forest.

The ecology has changed and silt has filled up the creeks.

The forest is hotter, moisture isn't condensing from the air into the forest, to the detriment of the rainforest species and the water catchment. Boondobah Creek, which runs through my property, used to be a permanent creek. For 150 years all the paddocks on my property ran East-West so all cattle could access the creek. About 15

years ago, logging took place on the upper reaches, and since then the creek has been intermittently drying out.

Although Forestry doesn't log within the gullies, logging around the gullies has opened up the canopy and changed the vegetation from rainforest into dry forest. The fungi, mosses, organic material and microorganisms have dried out and no longer function as part of a healthy ecosystem. The loss of this natural 'sponge' is having the effect of the creeks drying out. Rocks in the creeks and gullies, that had been exposed for tens of thousands of years, exploded with the heat from the fires – proving that the gullies had never dried out so much.

Throughout my life I have worked in various sectors of the logging industry, cutting props and running a small timber milling business. Now I can see that the forest has changed and the logging industry is no longer ecologically sustainable.