Independent Forestry Panel

Public submission

JESSICA PERINI Submission ID: 204713

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Jessica Perini
[redacted]

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To the Independent Forestry Panel,

Re: Response to the Independent Forestry Panel's call for stakeholder feedback on the Forestry Industry Action Plan by the NSW Government.

As a permaculture designer, sustainability facilitator, and former board and team member of several non-profit humanitarian and environmental organisations in Australia, I am writing in response to your call for submissions for sustainability of forestry operations in New South Wales.

Permaculture is a systems thinking approach which can be applied to farming, forestry, gardening, and to much broader contexts of workplaces, work-life balance and beyond. Its principles provide guidelines to create not only sustainable systems, but resilient, holistic approaches to community management of resources. Hence it can easily and readily be adapted to a holistic approach to forestry.

First we need to acknowledge the value of trees, particularly old growth forests.

Old-growth forests hold immense value for both ecology and human subsistence, particularly in the context of climate change. It should be noted from the outset, that the wholesale clearing of old growth forests for the following reasons must be banned, not only in this state, but throughout Australia.

In regards to their ecological value, old growth forests provide or contribute to:

- critical habitats for a wide range of species, including many that are endangered. The complex structure of these forests—characterised by multiple canopy layers, large trees, and decaying wood—supports diverse flora and fauna.[1]
- carbon sequestration. These forests are significant carbon sinks, capable of sequestering large amounts of atmospheric CO_2. They continue to absorb carbon throughout their lifespan, contributing to climate change mitigation efforts.[2] Disturbing old-growth forests can release stored carbon back into the atmosphere, exacerbating climate issues.[3]
- soil formation and health by retaining more carbon and nitrogen than younger forests. This retention is crucial for maintaining nutrient cycles and supporting plant growth.[4]
- unique microclimates that help moderate temperatures and humidity levels, benefiting both the forest ecosystem and surrounding areas.[5]
- maintaining clean water supplies by regulating water cycles and filtering pollutants through their complex root systems.[6]

How much old growth forest is left in New South Wales?

Troublingly, fewer than 10% of old-growth forests in the state are left due to extensive clearing and disturbances from logging, grazing, and other human activities.[7]

According to the DEC website: 'Old Growth Forests are considered rare across the landscape. Their protection is very important to the maintenance of biodiversity.'[8]

The value of forests in any context, are closely tied to human subsistence. Forestry NSW is no doubt aware of their uses and significance in terms of:

- timber, medicinal plants, and food sources like mushrooms and berries. We would like to emphasise here that the **sustainable** harvesting of these resources can support local economies. 'Sustainable' means that they must be done **in a way that preserves ecological integrity**.[9]
- cultural value for many communities, including First Nations peoples who have historically relied on these ecosystems for sustenance and spiritual practices. Their preservation is crucial for maintaining cultural heritage.[10]
- recreation and tourism, which can generate economic benefits while fostering a connection between people and nature. The aesthetic beauty of old-growth forests also contributes to mental well-being and community identity.[11]

Climate change mitigation is the greatest argument for the preservation of old growth forests in that it speaks to the future of generations to come, and indeed, life on this planet. Every government (whether local, state or federal), organisation, and individual must approach mitigation with utmost seriousness.

Protecting old-growth forests is essential for climate adaptation strategies as they enhance ecosystem resilience. Their complex structures can buffer against extreme weather events, helping both flora and fauna survive and adapt to changing conditions.[12]

An important note about carbon credits. The **protection** of old-growth forests can play a role in carbon trading markets, providing financial incentives while contributing to global carbon reduction goals. **Logging and thinning practices at an industrial scale (as opposed to a community or individual level) for carbon credits risks releasing more carbon than it saves, especially in relation to old growth forests, undermining climate benefits**.[13]

Carbon Storage in Old Trees vs. New Trees

Old Growth Forests[14]	**Young Forests**[15]
highly effective at storing carbon due to their large biomass	absorb carbon at a faster rate due to rapid growth
can sequester approximately 950 million to 1.11 billion metric tons of carbon per year globally	can store between 1.17 and 1.66 billion metric tons of carbon per year
accumulate carbon over their long lifespans, sequestering more carbon than they emit, making them important carbon sinks	**the total volume of carbon they can store is generally lower than that of mature forests** because they have less biomass overall
a mature tree can store much more carbon over its lifetime compared to a young tree, which may take decades to reach a similar storage capacity[16]	

contribute to soil carbon storage, holding significant amounts of carbon[17]	

The key distinction lies in the volume of carbon stored versus the rate of sequestration. Young forests may sequester carbon more rapidly, but old-growth forests hold much larger quantities due to their greater biomass and long-term accumulation capabilities.

In conclusion, while young trees contribute significantly to annual carbon uptake, old trees and forests are crucial for long-term carbon storage and ecological stability. Their protection is essential for effective climate change mitigation strategies.

Permaculture strategies for forestry

Let's now look at permaculture principles and how they can be applied to sustainable forestry.

When permaculturists design systems we look to long-term resilience. If parties wish to continue to profit from forestry it's imperative that they advocate for forestry practices that enhance ecosystem resilience, ensuring forests can withstand climate change and other environmental stressors. If that is not prioritised, there will be no remaining forests from which to profit.

Strategy 1: Value trees

The first strategy is to minimise tree removal wherever possible. Part of the issue is the over-reliance on trees for products that simply do not need to be made from trees. For example toilet paper, packaging and fabric are often made from tree pulp. As an alternative, bamboo, flax, hemp and wheat straw have fibres that could be produced, with less deleterious effects on the environment.

In order to make this shift possible, forestry needs to have a plan to transition its workforce away from trees to more sustainable industries. I acknowledge this must first happen at a government level, removing subsidies.

Strategy 2: Plan for diversity

If trees must be cut down, when we plan forestry operations, biodiversity must be a key factor. Promoting mixed-species plantations will enhance ecological stability and resilience against pests and diseases.

Monoculture plantations have faced significant challenges and failures due to their lack of biodiversity, which makes them vulnerable to pests, diseases, and environmental changes. Here are some notable examples:

Examples of Failures of Monoculture Plantings

- Irish Potato Famine (1840s): The reliance on a single potato variety led to catastrophic crop failure when a water mould (*Phytophthora infestans*) devastated the

crop. (Note this was not the only factor leading to the famine, but it was a significant one.)

- Banana Industry Collapse (1950s–present day): The Gros Michel banana variety which dominated the global banana market until the 1950s was hit by Panama disease, caused by a soil-borne fungus (*Fusarium oxysporum*), thus wiping out plantations. The Cavendish variety, which now dominates, is now also facing similar threats from new strains of the same disease.
- Eucalyptus Plantations in Australia and beyond: Monoculture eucalyptus plantations have led to reduced biodiversity and soil degradation. Significant ecological imbalances affect local wildlife and water resources, not to mention contributing to significant fire risks. The 2017 wildfires in Portugal, which resulted in 66 fatalities, were exacerbated by extensive eucalyptus monocultures.
- Rubber Plantations in Southeast Asia: The expansion of rubber monocultures has led to deforestation and loss of biodiversity. Studies show that these plantations often fail to support the diverse ecosystems that existed prior, resulting in a decline in species richness and habitat loss.

The impacts of monoculture plantations include:[18]

- greater susceptibility to pest outbreaks because they lack natural predators that would be present in a biodiverse ecosystem. This often leads to increased pesticide use, which can harm non-target species and lead to further ecological imbalances.
- the depletion of specific nutrients from the soil, leading to reduced fertility over time. This necessitates higher inputs of fertilisers and can ultimately result in soil exhaustion.
- altered local hydrological cycles, leading to decreased water availability for surrounding ecosystems and communities.

Strategy 3: Plan for Soil Health

We need to highlight the role of healthy soils in sustainable forestry. To do this we must look to original habitats for best practice examples. Healthy landscapes in Australia prior to colonisation had multiple layers of canopy, groundcovers, and abundant mycorrhizal networks. The systems were kept in balance for millennia by wildlife and First Nations people who cohabitated within the landscape, providing targeted harvesting ensuring future use and mosaic (or cool) burns for weed and plant management.

When planning for soil health we must engage communities that have a strong connection to the land, and its workings. We cannot supplant millennia of sensitive management with an industrial process. (The results of that are clear to see: since European settlement, human activities have led to significant soil degradation in Australia, including erosion, acidification, and salinisation.)

A connection to and expansion of Local Land Services Aboriginal Ranger Programs is key to re-connecting the land to soil health. Monoculture plantings, huge climate fuelled bushfires, and clear-felling of New South Wales forestry has led to the abundance of eucalyptus in the landscape, which has fed into the negative cycle of poor soil and wider ecological health and climate crisis. We must return to first principles: diversity is key.

Engaging farmers within the wider community on issues or soil health and management is crucial to the success of the forestry industry, as no ecology, including NSW forests, exists in a vacuum. Connecting farmers to already existing programs on soil health, including those run by Australian Organic Limited (formerly known as Biological Farmers of Australia) is crucial to wider systems health. Overfertilising, and spraying of pesticides common in NSW farming systems impacts the wider systems that relate to forestry, notably soils, air and water quality. Examples are abundant.

Regular monitoring programs and access to education (run by independent parties) for all industry participants and those in wider industries such as farming are crucial to the success of any soil management program.

Strategy 4: Plan for Sustainable Water Management

When it comes to plantations water conservation techniques, such as swales and rainwater harvesting can help maintain water quality and availability for wider forest ecosystems.

Keeping water in soils is the most efficient way to keep water on a site (as well as preserving the trees, which act as water pumps). To do so we must ensure our ancient soils have access to the diversity of life so abundant in complex healthy and traditionally-maintained ecologies.

Soils that have access to plentiful organic materials act like sponges. Clear-felling often removes not only trees but the organic materials on the forest floor essential to the protection of the soil and regeneration of the forest, and beyond that the continuation of the water cycle which is crucial to the healthy and balanced continuation of the ecology.

Strategy 4: Plan for Community Involvement

Engage local communities in forestry management decisions, thereby fostering a sense of stewardship and ensuring that local knowledge and needs are incorporated.

During the most recent and catastrophic bushfire season of 2019–2020 permaculture communities were instrumental in disaster planning, but also mitigation within their own communities.

If these and wider communities are consulted prior to such disastrous situations, their approaches to management will aid in the dissemination of local expert knowledge, and can thus bring a flexible and thoughtful response to forestry management.

Community approaches to farm land management

Tony Rinaudo, known as The Forest Maker, has been teaching communities to sustainably manage forests for over two decades. He pioneered a system called Farmer Managed Natural Regeneration, which is a “low-cost land restoration technique used to combat poverty and hunger amongst poor subsistence farmers by increasing food and timber production and resilience to climate extremes”. This approach can work equally in New South Wales, as it can in Africa. In this approach locals become caretakers of forests around them, selectively

pollarding and caring for trees, as per the needs of the community, prioritising the ecology to the benefit of all.

A Forest Investment Fund[19] has been trialed in various countries including Brazil and Mexico helping communities become invested in regenerating deforested and degraded land. This empowers communities to become stewards of the land, and provides them with yields, which leads to better more sustainable outcomes. If they exhaust that yield, the opportunities for the community end.

Strategy 5: Integrate with Agriculture

Agroforestry systems where trees are integrated with crops or livestock, can provide multiple benefits such as improved biodiversity, soil health, and economic returns (if managed closely and sustainably). Again, education is key.

Strategy 6: Respect traditional land management

We must recognise and incorporate First Nations values in forest management practices, ensuring respect for traditional land management techniques. (See also Strategy 3: Prioritise soils.)

Key recommendations

1. Old growth forests must be left intact, at least at the forestry industrial level.

2. Bequeath old growth forests to communities to manage. These must *not* be managed by industrial processes for profit (or non-profit as the case may be when government subsidises these industries). Soil, air and water health must be top priorities. Monitor progress, health, and keep strict guidelines for harvesting and diversity.

3. Engage traditional land managers to oversee operations.

4. Run educational programs for stakeholders about sustainable forestry practices, permaculture principles, and organic farming. These will promote broader understanding and adoption of more sustainable practices. Ensure soil, air and water health are key among teachings.

5. Provide ongoing monitoring of forestry practices to assess their ecological impact, allowing for adaptive management strategies that respond to changing environmental conditions. This must be done by independent third parties on a regular basis.

6. Remove current forestry standards; they have overseen wholesale clearance of native forests to an extent never seen before in history. Replace current standards with an independent standard, established on sustainable baselines based on science. Governments must legislate that all industries linked to deforestation, go deforestation-free.

[1] https://oldgrowthforestecology.org/ecological-values-of-old-growth-forests/; https://www.environment nsw.gov.au/resources/nature/landholderNotes10OldGrowthForests.pdf.

[2] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/; https://www.oldgrowthforest net/why-oldgrowth-forests.

[3] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/.

[4] https://www.oldgrowthforest.net/why-oldgrowth-forests; https://oldgrowthforestecology.org/ecological-values-of-old-growth-forests/structure-composition/.

[5] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/; https://www.oldgrowthforest net/why-oldgrowth-forests.

[6] https://oldgrowthforestecology.org/ecological-values-of-old-growth-forests/; https://www.environment nsw.gov.au/resources/nature/landholderNotes10OldGrowthForests.pdf.

[7] https://www.environment nsw.gov.au/resources/nature/landholderNotes10OldGrowthForests.pdf.

[8] www.environment.nsw.gov.au.

[9] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/; https://www.oldgrowthforest net/why-oldgrowth-forests.

[10] https://oldgrowthforestecology.org/ecological-values-of-old-growth-forests/; https://www.environment nsw.gov.au/resources/nature/landholderNotes10OldGrowthForests.pdf.

[11] https://www.oldgrowthforest.net/why-oldgrowth-forests; https://oldgrowthforestecology.org/ecological-values-of-old-growth-forests/structure-composition.

[12] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/; https://www.environment nsw.gov.au/resources/nature/landholderNotes10OldGrowthForests.pdf.

[13] https://oldgrowthforestecology.org/ecological-values-of-old-growth-forests/; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8728480/; https://iceds.anu.edu.au/news-events/news/industry-push-earn-carbon-credits-australia%E2%80%99s-native-forests-would-be-blow-nature.

[14] https://psmag.com/environment/young-trees-suck-up-more-carbon-than-old-ones/; https://ijw.org/wild-carbon-storage-in-old-forests/.

[15] https://psmag.com/environment/young-trees-suck-up-more-carbon-than-old-ones/; https://news.mongabay.com/2019/05/tall-and-old-or-dense-and-young-which-kind-of-forest-is-better-for-the-climate/.

[16] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/; https://ijw.org/wild-carbon-storage-in-old-forests.

[17] https://www.ncbi nlm nih.gov/pmc/articles/PMC8728480/

[18] https://foodrevolution.org/blog/monocropping-monoculture/; https://eos.com/blog/monoculture-farming/; https://projects.research-and-innovation.ec.europa.eu/en/horizon-magazine/rise-and-fall-monoculture-farming; https://news.mongabay.com/2008/09/monoculture-tree-plantations-are-green-deserts-not-forests-say-activists/; https://www.savingbees.org/en/2023/03/21/why-monocultures-are-not-good-for-the-environnement/; https://www.gallantintl.com/blogs/environmental-impacts-of-monoculture; https://news.mongabay.com/2019/05/tall-and-old-or-dense-and-young-which-kind-of-forest-is-better-for-the-climate/; https://www.edo.org.au/2020/10/22/is-logging-in-nsw-after-the-fires-ecologically-sustainable-expert-reports-cast-further-doubt/.

[19] https://www.cif.org/sites/cif_enc/files/knowledge-documents/kn-fip-engaging_and_empowering_local_communities_in_sustainable_forest_management_0.pdf.