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The Australian Academy of Science submission to the Independent Forestry Panel

New South Wales (NSW) forests provide habitat for threatened species and are key to mitigating climate change by sequestering carbon and providing vital services to people (such as clean water provision, air purification, and tourism opportunities).

Continued native forest logging in NSW is unsustainable and has significant negative impacts on biodiversity, carbon emissions, and ecosystem services. It also increases the risks of climate change and bushfire severity.

The Australian Academy of Science (AAS) makes the following recommendations:

- Native forests should be preserved to increase viable habitat for threatened species in NSW and reduce bushfire risks and impact.
- The NSW Government should commit to phasing out native forest logging and transition to a plantation-only industry.
- The NSW government should develop a long-term carbon storage plan that includes intact native forests.

NSW forests should be preserved

Australia is failing to halt biodiversity loss and species decline. Native forests in NSW are home to many threatened species. Logging significantly reduces critical habitat, such as large old hollow-bearing trees**. There is a need to both; protect native forests and embark upon reforestation to increase viable habitat for threatened species in NSW.**

From 1788 to 2021, 54% of all native forests and woodlands in NSW were cleared. This extensive deforestation has impacted 43 threatened species, with some, such as Sloane's froglet and pale yellow double tail, having less than 12% of their original range intact. [1] Further degradation of these habitats through logging threatens to accelerate species loss. Native forests which have already been cleared by logging will experience greater stress from climate change. Logging heightens the risks and impact of bushfires by increasing flammability and fire severity.[2] Logging creates debris, dries the ground layer and soil, and changes the forest architecture. This leads to more flammable young plants and alters the microclimate (making it drier, hotter, and more variable).[3,4] **Native forests should be kept intact to reduce the extinction of threatened species and the severity of bushfires.**

Demand for timber products and the future of plantations

Plantations are a more environmentally sustainable and economically viable solution compared to native forest logging.[5] NSW should increase investment in plantations to meet timber demands while phasing out the use of native forests. Currently, most sawn timber comes from plantations, whereas native forests are primarily used for lower-value products such as wood chips and paper pulp. A transition to a plantation-only industry can meet NSW's demand for timber products, as demonstrated by successful models in South

[1] Ward, M., Ashman, K., Lindenmayer, D. B., Legge, S., Kindler, G., Cadman, T., ... & Watson, J. E. (2024). Shifting baselines clarify the impact of contemporary logging on forest-dependent threatened species. *Conservation Science and Practice*, e13185.

[2] Lindenmayer, D.B., Zylstra, P., Kooyman, R. *et al.* Logging elevated the probability of high-severity fire in the 2019–20 Australian forest fires. *Nat Ecol Evol* 6, 533–535 (2022).

[3] Taylor, C., McCarthy, M. A., & Lindenmayer, D. B. (2014). Nonlinear effects of stand age on fire severity. *Conservation Letters*, *7*(4), 355-370.

[4] Bowd, E. J., Banks, S. C., Strong, C. L., & Lindenmayer, D. B. (2019). Long-term impacts of wildfire and logging on forest soils. *Nature Geoscience*, *12*(2), 113-118.

[5] Lindenmayer, D., & Taylor, C. (2022). Diversifying forest landscape management—a case study of a shift from native forest logging to plantations in Australian wet forests. *Land, 11*(3), 407.

Australia and New Zealand. **The NSW Government should commit to phasing out native forest logging and transition to a plantation-only industry.**

The importance of forests for carbon storage and reducing climate change risks

Forests and reforestation are key to mitigating climate change by sequestering carbon. However, revegetation lacks permanency as a source of greenhouse gas removal; for example, bushfires and logging can reverse this carbon storage by releasing carbon from trees. Native forests can store large amounts of carbon, but logging releases carbon into the atmosphere.[6] As temperatures rise, the permanency and efficacy of this carbon storage capacity will degrade. To achieve net zero, Australia will need to stop deforestation and land degradation and accelerate the reforestation of cleared and degraded land. To address this, **the NSW government should develop a long-term carbon storage plan that includes intact native forests. Carbon and biodiversity markets should incentivise the protection and restoration of NSW forests.**

The risk of bushfires is also increased substantially by climate change, as global warming increases the number of extreme fire days.[7] Many regions are projected to experience an increase in the probability of compound events with higher global warming, such as concurrent heatwaves and droughts, compound flooding and fire weather.[8] Bushfires are a significant risk to forests and threatened species. The 2019-20 "Black Summer" bushfires killed or displaced approximately 3 billion vertebrate animals and burnt 80% of the Blue Mountains World Heritage Area.[9]

Urgent measures are required to reduce native forest logging and adopt more sustainable practices, as intact forests play a crucial role in protecting our threatened and vulnerable species and reducing fire severity.

To mitigate and adapt to climate change risks, new technologies and modelling techniques for native forests need to be considered. Examples include using drones, ground-based sensor networks, and lightning-strike mathematical modelling to detect fires more rapidly and suppress ignitions quickly.[10] This presents opportunities to develop export markets, enabling Australia to share its science-based adaptive wildfire mitigation approaches across the entire country and with the world.

For more information, please contact the Director of Science Policy, Mr Chris Anderson on chris.anderson@science.org.au.

[6] Keith, H., Lindenmayer, D., Mackey, B., Blair, D., Carter, L., McBurney, L., ... & Konishi-Nagano, T. (2014). Managing temperate forests for carbon storage: impacts of logging versus forest protection on carbon stocks. *Ecosphere, 5*(6), 1-34.

[7] Australian Academy of Science (2021). *The risks to Australia of a 3°C warmer world*

[8] Lee, H., Calvin, K., Dasgupta, D., Krinmer, G., Mukherji, A., Thorne, P., ... & Zommers, Z. (2023*). Synthesis report of the IPCC Sixth Assessment Report (AR6), Longer report.* IPCC.

[9] Turton, S. M. (2022). *Surviving the climate crisis: Australian perspectives and solutions.* CRC Press.

[10] David Lindenmayer et al. Adaptive wildfire mitigation approaches. *Science 377,* 1163-1164 (2022). DOI:10.1126/science.ade4721