Blueprint Institute

# Branching out

## Exploring Alternate Land Use Options for the Native Forests of New South Wales

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# About Blueprint Institute

Every great achievement starts with a blueprint.

Blueprint Institute is an independent public policy think tank established in the era of COVID-19, in which Australians have witnessed how tired ideologies have been eclipsed by a sense of urgency, pragmatism, and bipartisanship. The challenges our nation faces go beyond partisan politics. We have a once-in-a-generation opportunity to rethink and recast Australia to be more balanced, prosperous, resilient, and sustainable. We design blueprints for practical action to move Australia in the right direction.

For more information on the institute please visit our website: blueprintinstitute.org.au

# Acknowledgements

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Images are courtesy of Unsplash.

# Attribution

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# About the authors

## David Cross

David is a public policy expert and leader with extensive experience managing large teams and providing advice across multiple portfolio areas to senior government ministers, heads of departments, c-suite business leaders, and university Vice-Chancellors. As CEO of Blueprint Institute, David leads one of Australia's newest and most dynamic public policy think tanks—crafting policy roadmaps for our political leaders in climate and energy policy, education, tax and fiscal policy, and productivity reform. His commentary has been featured in the Sydney Morning Herald, The Australian Financial Review, The Daily Telegraph, the ABC, and Sky News—as well as on numerous other outlets. Prior to joining Blueprint, David was Chief of Staff to the NSW Minister for Education and Early learning and led the crafting of significant pieces of education reform. He has also worked as a public policy adviser to the University of Sydney and as a business analyst in the private sector. David holds a Masters degree (MPhil) from the University of Cambridge in politics and international studies, and a first class honours degree from ANU. He is presently completing a PhD in public policy decision making processes at the University of Sydney.

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Mark holds a Master of International Relations from the University of Melbourne and a Bachelor of Arts in Economics and Political Science from McGill University. Prior to joining Blueprint Institute, his passion for pragmatic and evidence-based policy reform led to stints at the Institute of Health and Social Policy at McGill University—a multidisciplinary institute for research in support of effective social policy—and Reset Australia—an initiative working to counter digital threats to democracy across the world.

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Lauren holds a Bachelor of Science (Hons) in Psychology and went on to complete a Masters in International Development and Public Health (Distinction) from the University of Sheffield. Her research involved collaborating with organisations based in Nepal, South Sudan and London, working on a wide range of social policy and development issues. Following her Masters, she worked for CARE International UK, to campaign for sustainable development projects.

## Claire Poulton

Claire holds a Master of International Relations from the University of Sydney with a specialisation in social research. Her thesis examined evolving conceptions of sovereignty and the nature of global environmental agreements. She has also completed a Bachelor of Communication and Media studies. Prior to joining Blueprint she worked in several digital marketing agencies, crafting strategic communication campaigns for clients in the non for profit, financial services and business space.

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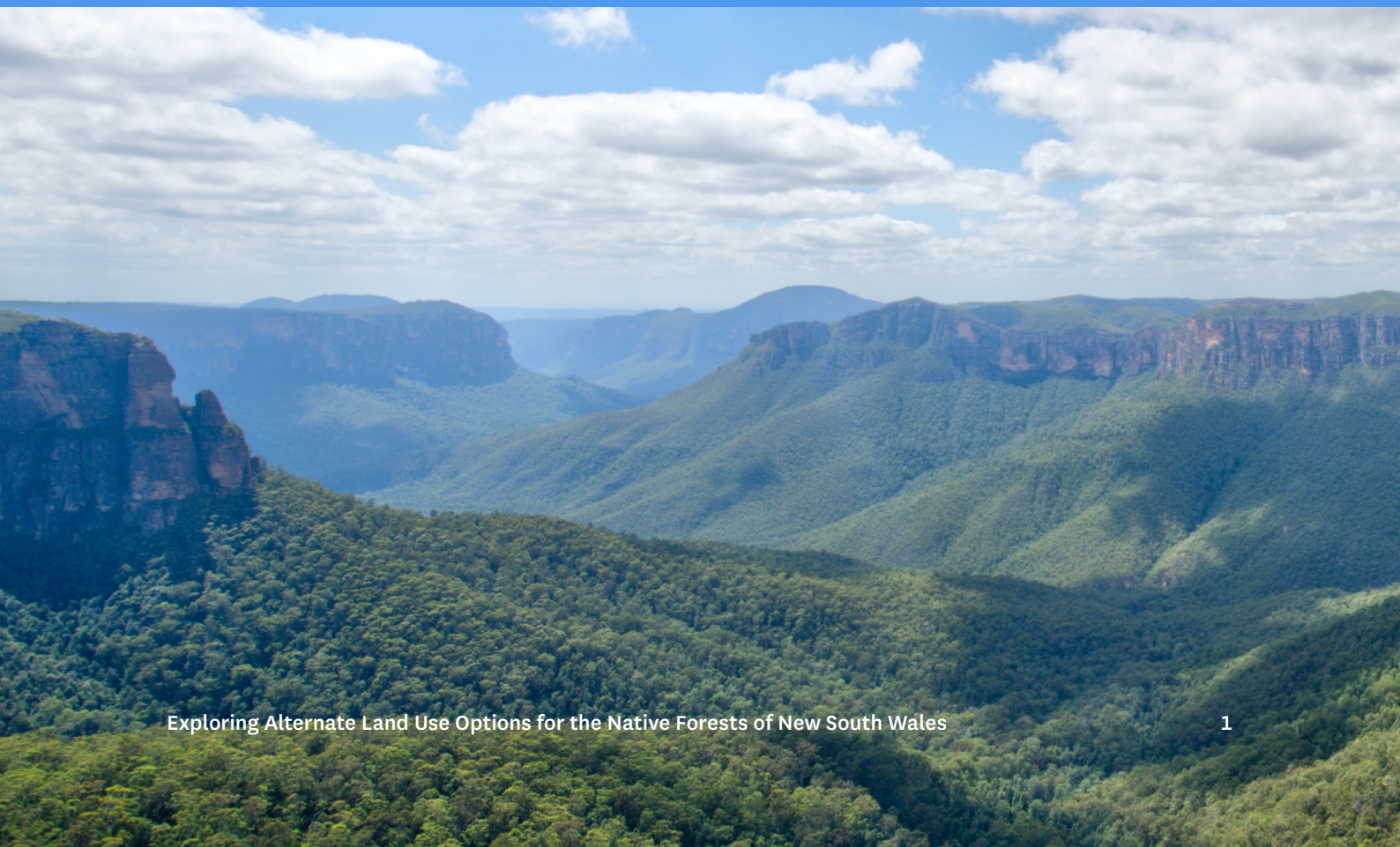
# Executive summary

Australia is home to some of the world's most ancient forests. The benefits of native forests are extensive—they are efficient carbon sinks, they are amongst the most biodiverse environments on the planet, and they provide vast quantities of water (and preserve the quality of the water table).

This paper offers policymakers a blueprint for assessing the true value of our native forests. Recognising the inherent preferencing of the quantitative (particularly when it comes to Expenditure Review Committee processes), we conduct a comprehensive cost-benefit analysis of conserving the native forests of the Upper and Lower North East Regional Forest Agreement areas of New South Wales, also known as the North Coast. This piece of work builds upon Blueprint's previously published cost-benefit analysis of alternate land uses versus logging in Victoria's Central Highlands.

We assess the economic potential of native forest conservation by modelling the value of carbon sequestration and tourism against continued logging. Our findings demonstrate conclusively that there is no economic case for continued logging of native forests on the North Coast of New South Wales. As in the Central Highlands of Victoria, logging of native hardwood forest on the North Coast is a loss making enterprise, subsidised by Forestry Corporation of New South Wales' (FCNSW) profitable softwood plantation division, along with the taxpayer via periodic equity injections from the state government. Based on its own merits, we find that FCNSW's native hardwood division is not commercially viable.

Using cost-benefit analysis modelling we find that ending native forest logging in 2023–24 instead of 2039-40 (the date that the North East Regional Forestry Agreement is currently scheduled to expire), and instead utilising the land for carbon sequestration and tourism will deliver a net benefit valued at $45 million in present-day dollars. This includes the estimated cost of providing transitional packages to the industry as it shuts down, as well as the cost of breaking wood supply agreements that extend to 2028.



Were we to remove the cost of transitional packages and contract payouts from our cost-benefit analysis and assess the native logging industry on its own free market merits against alternate land uses for native forest, we find a net benefit of $260.1 million in ceasing logging immediately. By including a transitional package in our model, along with a range of other favourable assumptions, we, methodologically speaking, have given the logging industry 'the benefit of the doubt'—demonstrating that even when every conceivable dollar is counted in favour of FCNSW's native hardwood timber division, it nevertheless runs at a loss.

The native forests on the North Coast have significant capacity to immediately generate major alternate revenue streams that can replace revenue generated from logging. In particular, we find that managing the North Coast region in a manner consistent with conservation would abate an average of 0.45 million tonnes of carbon annually. This equates to a net present value of $174 million. Our analysis also indicates that increased tourism to the region could, over 17 years, provide a net present value of $120 million. In totality, from present to FY2040, using the forests of the North Coast for purposes other than logging will generate at least $294 million in revenue.

The next government-led five yearly review of the logging industry will commence in 2024, making now an ideal time for impactful analysis. We encourage the New South Wales Government and Opposition to enact the following recommendations

1. Immediately cease all government subsidies to FCNSW.
2. Create a 'natural capital' weighting that increases the Benefit Cost Ratio of native forests when Expenditure Review Committee decisions affecting them are made.
3. Legislate the end of native forest logging in New South Wales.
4. Expand land valuation methodologies to include carbon storage, tourism and water.
5. Expand hardwood timber plantations to meet hardwood demand.
6. Incentivise private investment in timber plantations.
7. Expand formal policy mechanisms aimed at conserving native forests.

# Australian forestry

Native forestry in Australia is on the decline. This is a result of a combination of factors, including unsustainable harvesting practices, conservation concerns, market pressures, bushfires, and a decline in public support. Between 2008 and 2019 harvest levels from Australian native forests fell by over 50%. The native forestry industry has also been affected by the shift toward plantation-based forestry, which is significantly more productive—commercial plantations comprise only 1.5% of Australian forests, yet they generate 88% of Australia's wood supply.

State governments have tried to sustain the native forestry industry despite its deteriorating economic outlook, often incurring significant financial losses. Blueprint Institute's analysis has shown that immediately halting native forestry logging in the Central Highlands of Victoria—as opposed to the status quo of a delayed exit by 2030—will deliver a net benefit of $59 million in present-day dollars. Similarly, the Victorian Parliamentary Budget Office concluded that immediately ending native logging in the state would save taxpayers $192 million.

Sustainable Timber Tasmania (formerly Forestry Tasmania), ran at an alarming loss of $454 million over 20 years from 1997 to 2017. The Tasmanian forestry industry has been the beneficiary of almost one billion dollars worth of rescue packages in the form of state and federal grants. The hardwood native sector of Forestry Corporation of New South Wales has also generated consistent losses, recently calculated at $441 per hectare in 2021.

Due to these rapidly deteriorating financial results, some state governments have acted to phase out native logging. The Victorian government has committed to, but is yet to legislate, phasing out native logging by 2030. In Queensland, native logging is being phased out in the western, south-east, and eastern regions. In Western Australia, the government has recently announced plans to end native logging from 2024 and invest $350 million in softwood timber plantations to support sustainable jobs. Their September 2021 announcement argued:

**The ever-increasing impacts of climate change, the importance of maintaining biodiversity and forest health, the need for carbon capture and storage, and declining timber yields mean that it is essential that we act now to protect Western Australia's forests.**

In New South Wales, there are no concrete plans, legislative or otherwise, to phase out native logging in a timely manner—despite extensive evidence that the native forestry division of the state owned Forestry Corporation delivers poor financial returns. In fact, in 2018 the Federal and New South Wales Government extended the Regional Forest Agreements in the state by 20 years.

# New South Wales forestry

Over 50% of native forests in New South Wales, an area of approximately 29 million hectares, have been lost as a result of deforestation since 1750. This equates to an area roughly the same size as New Zealand. Of the remaining 25 million hectares, nearly a third is considered degraded. This mass deforestation is one of the major causes of species decline. Australia now has 1869 flora and fauna species listed as threatened with extinction. A recent study approximated that 244 threatened species in New South Wales were potentially impacted by logging between 2000 and 2022.

In addition to depriving native species of critical resources, such as food, shelter, and breeding areas, logging also necessitates the construction of road networks to transport timber from forests to processing facilities. These roads can provide easy access for invasive predators like cats, dogs, and foxes, as well as enable the spread of pathogens.

Since the late 1990s, New South Wales has undergone a transformation in its approach to forest management, claiming greater emphasis on the importance of ecologically sound practices. At the heart of this shift are the three Regional Forest Agreements established between the Commonwealth and New South Wales Government. These consist of The Eden Regional Forest Agreement, The North East Regional Forest Agreement, and The Southern New South Wales Regional Forest Agreement. The agreements attempt to provide a framework for the sustainable management of forests in New South Wales and regulate logging operations. In 2018 the Federal and New South Wales Government extended the agreements until FY2040. The agreements nominally run for 20 years, but can be extended indefinitely on a rolling basis for a further five years, provided native timber harvesters pass a five-yearly review. The next scheduled review is due to be conducted in 2024.

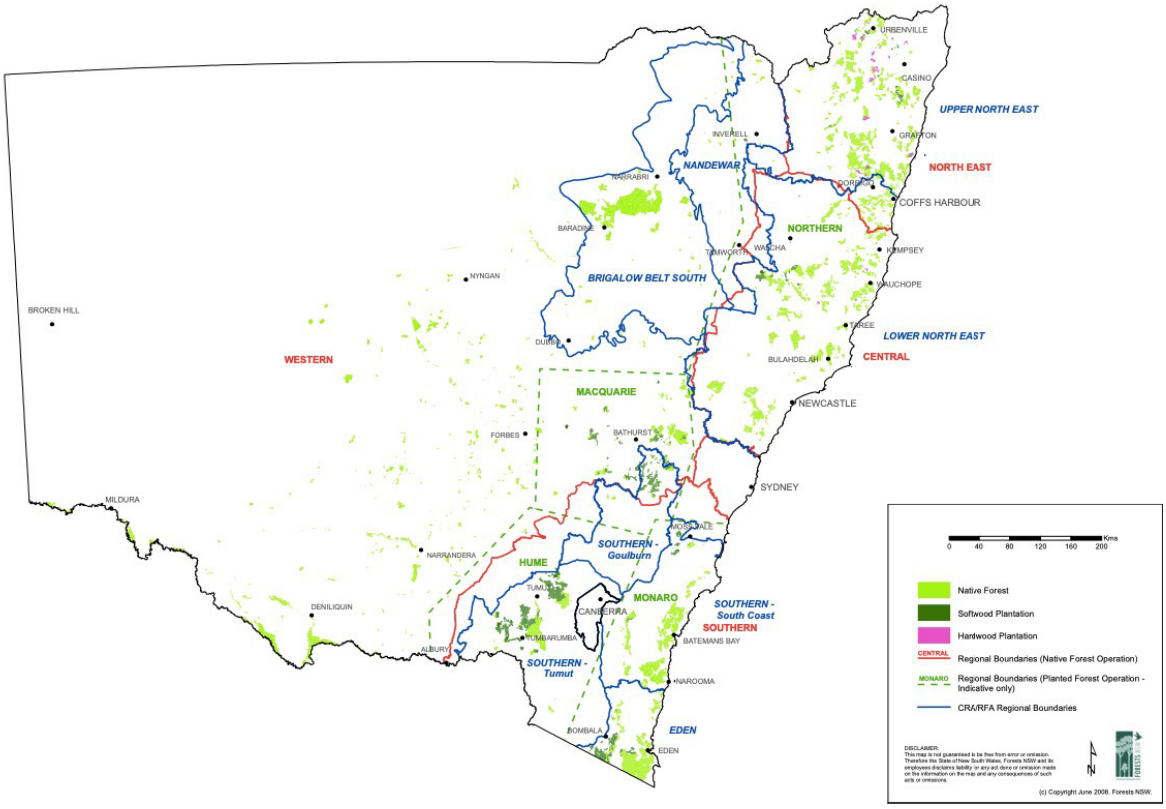



**Figure 1** State forest regional boundaries and CRA/RFA regional boundaries
**Source** Forestry Corporation

Forestry Corporation of New South Wales (FCNSW) is the government body responsible for managing nearly two million hectares of state forest. Half of these forests are preserved for tourism, recreation, conservation, and agricultural uses. The remaining one million hectares are available for logging, of which approximately 30,000 hectares of native forests are harvested annually.

FCNSW segment their operations into a softwood and hardwood division. The softwood division is made up of exotic or non-native trees (predominantly radiata pine) harvested entirely from plantations. By contrast, although FCNSW currently manage a small area of hardwood plantation estate, the vast majority of hardwood timber is derived from native forests.

The past 20 years has seen a growing recognition of the importance of preserving native forests as biodiversity hotspots and carbon sinks. In particular, concerns have arisen over the detrimental effect of logging on native ecosystems. This has led to increased public scrutiny and calls for greater protection of native forests.

Correspondingly, since 1994, the size of the state forests under the management of FCNSW has shrunk by nearly 2 million hectares, primarily due to transfers of land to the National Parks and Wildlife Service. As a result, the volume of hardwood timber harvested by FCNSW has decreased significantly, falling from 1.3 million cubic metres in 2010 to around 939,000 cubic metres in 2017. Timber production further plummeted following the Black Summer bushfires to a low of 0.6 million cubic metres in 2020–21. This has placed significant strain on sawmills dependent on hardwood timber.

A significant amount of native forest is also held under private ownership. Prior to harvesting timber, landowners must acquire approval from Local Land Services in the form of a Private Native Forest Plan (PNFP) as well as a forest management plan. In 2021, there were approximately 580,000 hectares of private land that were covered by the PNFP. In 2022, the state government reformed Private Native Forestry Codes to support the growth of privately owned forests for timber production.

While there is a large area available for timber production on private land, mostly situated on the North Coast, the productivity of this land has been relatively poor to date. The New South Wales government attributes this to young regrowth in private forests being in a poor growing state. Other research has pointed to private landowners' lack of professional expertise and the inaccessibility of information on effective native forest management.

## Losses in the hardwood sector

The hardwood and softwood division of FCNSW produce vastly different financial results. An inspection of historic data shows that the hardwood division—the vast majority of which consists of native trees with a small proportion of plantation estate—is being propped up by the far more economically viable softwood sector.

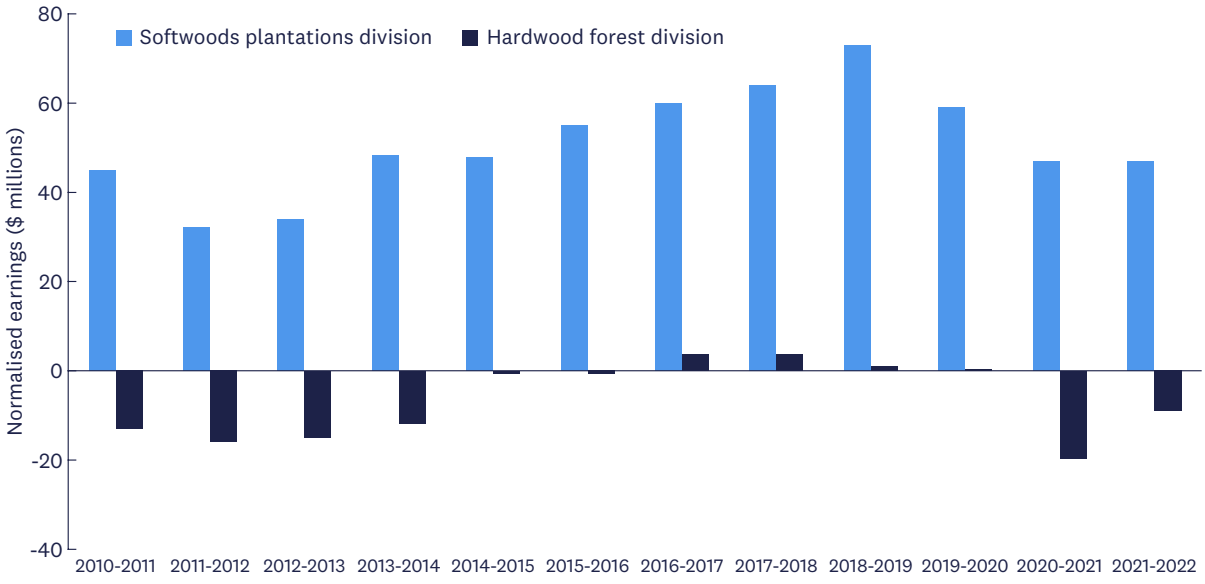



**Figure 2** Normalised earnings of softwood plantations and hardwood forests (2010–2022)
**Source** Forestry Corporation

As shown in Figure 2, the softwood division of FCNSW reported total normalised earnings of $290 million from 2018 to 2022, with average annual earnings of $58 million. This is vastly superior to the hardwood sector, which even for the five years prior to the Black Summer bushfires was on average only able to achieve annual normalised earnings of a mere $1.4 million.

One may be tempted to attribute the hardwood division's troubles to extenuating circumstances. According to FCNSW's latest annual reports, the hardwood division incurred an operational loss of $28.6 million over the past two years, primarily as a result of bushfire and extreme wet weather events. A closer analysis reveals, however, that the hardwood division has endured long periods of financial loss predating the effects of the Black Summer bushfires. Between 2010 and 2014, the hardwood division lost $55.8 million.

The organisation underwent a major restructure in 2014, cutting costs by $5 million per annum. This allowed the hardwood division to achieve a very slight operating profit of $3.8 million for the first time in 2017.

While cost-cutting allowed the hardwood division to achieve a moderate fiscal turnaround, it is crucial to note that the fundamental nature of FCNSW's native forestry business in the North East RFA remains unaltered, with neither product, value, nor volume seeing any appreciable improvement. Any organisation can, to an extent, cut overheads to achieve a marginally better financial result, but without more substantial reforms it is unlikely such improvements will be sustainable nor repeatable.

## Forestry employment

As it stands, the state-run native logging industry in New South Wales is not a substantial contributor to regional employment. According to their latest annual report, FCNSW has 562 full-time equivalent employees. Approximately 235 people are believed to be employed in the hardwood division, according to evidence given at the 2015 budget estimates.

If native logging were to stop, the positions that would be at greatest risk would be those that manage the timber sales, harvesting and hauling operations, and primary wood processors such as sawmills. The Northern region has the highest concentration of employees in these sectors, with the total number estimated to be around 590.

The hardwood sector has been in structural decline for some time, largely due to the introduction of more stringent forestry regulations. The reduction in wood supply has caused contraction in the processing industry. As less hardwood has become available, the number of people employed in hardwood sawmills has reduced. The majority of sawmill jobs are concentrated in several local government areas. To keep haulage costs down, sawmills tend to be located close to native logging operations. Australian census data shows declining employment figures in nearly every local government area of concern. For instance, within Clarence Valley, employment in wood product manufacturing fell by 23% from 2016 to 2021.

Despite the commonly reiterated political narrative, the forestry industry makes up a small, and in the case of wood manufacturing, declining share of regional employment. According to the latest census data, the percentage of people employed in the forestry and logging sector (which includes activities related to forest management, growing and harvesting) within the relevant Local Government Areas is between just 0.1% and 1.4%. The corresponding figure for people directly employed in wood product manufacturing (which includes those working in sawmills) is between 0.5% and 2.5%. Australian Bureau of Statistics data provides aggregate figures for those employed in both plantations and native forestry. Thus, the proportion of people directly involved in the native forestry sector of FCNSW would logically be less than these figures.

We are cognisant of the historical importance of the forestry industry—particularly the intergenerational employment opportunities it has offered to regional communities. It is vital that appropriate measures be taken to fairly compensate workers in the forestry and wood manufacturing sector in light of industry contraction. This is similarly the case in other states where employee support packages have been put in place to ease the transition following the ending of native forestry. We propose a similar transition package in New South Wales if native logging were to cease.

# Fire

Several studies have shown that logging activities in forests can increase the severity of bushfires, particularly during extreme weather events such as those experienced during the Black Summer bushfires.

Logging has been shown to cause changes in the structure and composition of the forest, making it more vulnerable to fire. For example, logging can remove older, larger trees that are more resistant to fire and create a denser understory of small trees and shrubs, which can serve as kindling for fires. Logging can also lead to the accumulation of debris and dry vegetation on the forest floor, which can increase the intensity and spread of fires.

In New South Wales, the impact of the 2019-20 Black Summer bushfires ranged from an estimated 20% reduction in wood supply in the North Coast subregions to up to 90% in the South Coast subregion. Although the impacts on the North Coast were less severe, over 200,000 hectares of harvestable area were affected by the fires.

The relationship between logging and bushfire severity is complex, and can depend on a variety of factors such as the type and intensity of logging, the characteristics of the forest, and the weather conditions. However, it is clear that logging can increase the risk and severity of bushfires, and that managing forests in a way that reduces logging and promotes ecological resilience is an important step towards reducing the impact of bushfires.

# Koala wars

Native forest logging has long been a contentious political issue in New South Wales. This controversy derives from conflating state subsidised native forest logging with private land clearing laws. Indeed, recalcitrant (in relation to logging) MPs on Macquarie Street frequently refer to the rights of rural landowners to manage their own farmland as reasons to oppose strengthening formal policy mechanisms to protect our native forests. Often forgotten is the fact that land clearing laws and government subsidy of native forest logging are two separate issues (even though both have a marked impact on ensuring the rehabilitation of koala populations).

The infamous 'koala wars' that almost split the Coalition and destroyed the Berejiklian government in 2019 had very little to do with native forest conservation practices, and more to do with National Party opposition to the State Environmental Planning Policy (Koala Habitat Protection) 2019 (SEPP44) which sought to protect koala habitat, and strengthen land clearing laws to protect other endangered species. The bill would have seen the protected tree species list increasing from 10 to 65—thus restricting the types of land that could be cleared privately.

Deputy Premier and Nationals Leader at the time John Barilaro claimed that the proposed bill undermined the ability of farmers to manage their own land. Barilaro then threatened to have the Nationals withdraw from the Coalition agreement with the New South Wales Liberals if the SEPP proceeded. Whilst Barilaro eventually backed down in the face of Premier Berejilklian standing her ground, the SEPP was watered down, and the issue remains contemporaneous.

Just prior to the 2023 election, the Nationals attempted to introduce a new private native forestry bill to make it easier for farmers to log native koala habitat. The bill proposed to remove the powers of local councils to limit native forest logging or implement environmental controls to protect threatened species within their region—handing over powers to private landowners. The bill was once again quickly withdrawn following threats of a revolt from Coalition members, including Nationals member for Tweed Geoff Provest—whose electorate was decimated by the recent floods in Northern New South Wales.

# Study area—North East New South Wales

The economic analysis used in this study focused on the native forests of the North East region of New South Wales. This region comprises the Upper and Lower North East Regional Forest Agreement areas (Figure 3).

Within the North East Regional Forest Agreement area, there are around 836,000 hectares of native forests. The species used for timber in the region are: Blackbutt (E. pilularis), Spotted gum (C. maculata), Blue gum (E. saligna), tallowwood (E. microcorys), brush box (Lophostemon confertus), and New England species.

However, only 355,000 hectares are available for native timber production. The rest of the forests are reserved for conservation purposes. There are also 60,000 hectares of plantations in North East New South Wales—34,000 hectares are managed for hardwood and 26,000 hectares for softwood.

FCNSW sells native timber to wood processors under long term contracts or Wood Supply Agreements. In June of last year, nearly all Wood Supply Agreements on the North Coast were awarded five-year extensions until 2028 by the agricultural minister—much to the dismay of environmental groups.

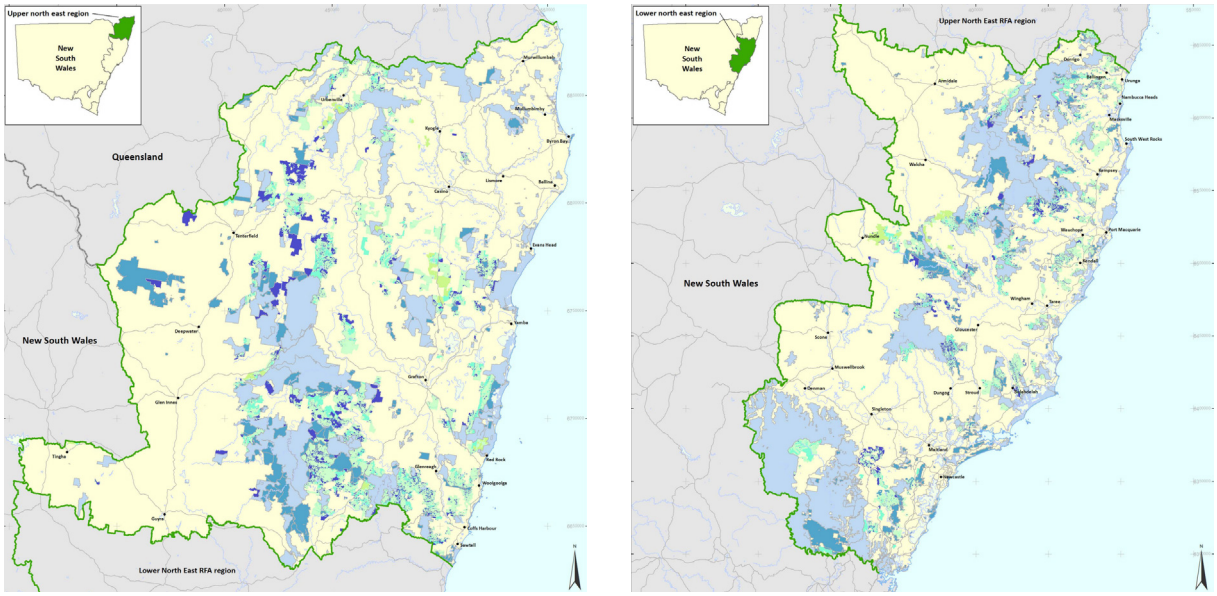



**Figure 3** Upper and Lower North East Regional Forestry Agreements
**Source** ABARES

# Plantations in New South Wales

Plantation logs are an economically superior alternative to native logging. They account for 88% of Australia's log production, despite occupying a fraction of the land area available for native forest harvesting.

Furthermore, as plantations are intensively managed, they are considerably more efficient and productive than native logging operations. Plantations provide various environmental benefits, such as carbon sequestration and biodiversity conservation. Notably, softwood timber generated by plantations emits 60% less greenhouse gas emissions compared to hardwood native timber.

Contrary to popular belief, native logging is not essential to supply the domestic construction industry. According to FCNSW's most recent sustainability report, as seen in Figure 4, at least half of the timber harvested from native forests is pulpwood and low quality logs. Pulpwood is a term used to describe trees that are used in the production of paper.

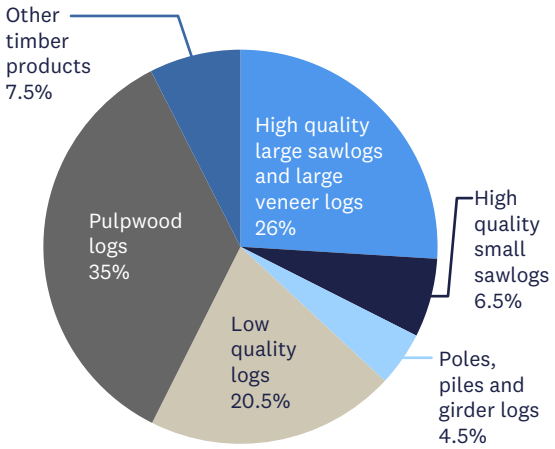



**Figure 4** Distribution of sawlog production by type (2021–2022)

**Source** Forestry Corporation

Most of the timber that is used in housing is softwood sawlog sourced from plantations. As Figure 5 indicates, sawlog production makes up 97.5% of the softwood plantation estate. In contrast, hardwood plantations predominantly yield pulplog, with this making up 86% of supply.

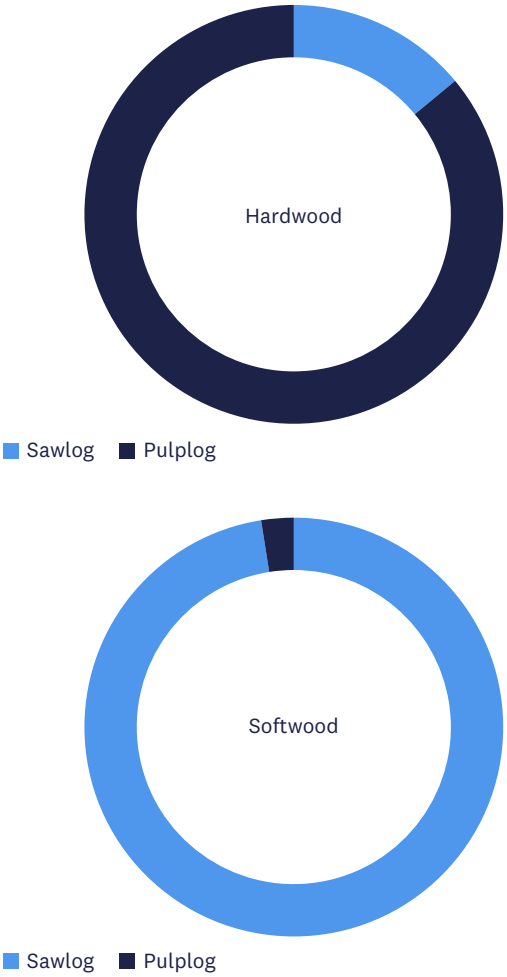



**Figure 5** Sawlog and pulplog proportions for softwood and hardwood plantations in Australia (2021)

**Source** ABARES

Lack of investment in new plantations over the past several decades, as well as more stringent native forest regulations, have placed significant strain on the supply of both hardwood and softwood timber.

Between 1975 and 1990, softwood timber plantations in Australia grew by an average 33,000 hectares annually. However, this level of growth has since stagnated, with the total area remaining consistent at approximately one million hectares since the late 1990s. Evidence given to the 2022 industry inquiry into the long term sustainability and future of the timber and forest products industry indicated that the growth in softwood plantations has failed to keep up with both population growth and timber demand in the last 15 years. The former

government's Home Builder stimulus package further compounded the timber shortage, as demand for construction materials increased far more rapidly than expected.

Hardwood plantations declined by 10% from 2014–2015 to 2019–2020. This decline has primarily been driven by the collapse of Managed Investment Schemes (MIS). During the late 1990s, the Nationals were seeking to bolster plantations in response to the decline of the Tasmanian timber industry. Their solution was to introduce an arrangement whereby investors were offered generous tax incentives to participate in agribusiness schemes.

In response, companies prioritised investment and expansion in short rotation hardwood pulplogs, which led to a boom in the industry. However, most of these forestry MIS companies collapsed around 2009 due to the global financial crisis. Many of the hardwood plantations previously managed under MIS have since been converted to other land uses, such as agriculture. This trend was particularly pronounced within the North Coast, where hardwood plantations have declined by over a third since 2009–10.

The decline in hardwood plantations can also be attributed, in part, to the fact that trees used in softwood plantations, like pine, are fast-growing and can tolerate a wide range of conditions, making them more suitable for plantation forestry. Indeed, softwoods tend to have a shorter time to maturity compared to hardwoods, which means they can be harvested and replanted more frequently.

The constraints affecting the supply of both hardwood and softwood were, of course, exacerbated by the Black Summer bushfires, which affected approximately 830,000 hectares of native state forests, as well as 62,000 hectares of state timber plantations in New South Wales alone. The availability of softwood sawlog timber has been forecasted to remain short until at least 2035.

During 2022, the federal government announced an $86 million dollar investment to expand the plantation sector. According to the latest budget papers, Labor is set to continue this policy. Whilst increased investment in plantations is necessary to meet the growing demand for sustainably sourced timber, the capital cost of acquiring additional land is considerable.

Previous studies indicate that a substantial expansion of the hardwood plantation sector, to the tune of 33,000 hectares, would require an initial investment of $165 million for land and establishment costs. The whole-of-life expenditure for such an expansion, estimated over 25 years and assuming a 7% discount rate, would cost $233 million in present-day dollars. The same study also argued that an additional 33,000 hectares of softwood plantation would come with a price tag of $204 million over 30 years, assuming a 7% discount rate.

# How farm forestry can meet growing demand

One of the ways to alleviate timber supply issues, as well as avoid the high capital costs of purchasing additional land, is to encourage the uptake of farm forestry.

Over half of the native forests on the North Coast of New South Wales (3.4 million hectares) are in private ownership. Much of these are currently used for livestock grazing. Graziers generally clear land, meaning they remove most or all of the trees.

Farm forestry, or silvopastoral systems (SPSs), refer to the practice of deliberately managing both livestock and trees and aims to optimise land productivity within a given area. Silvopastoral systems present a promising opportunity to improve the financial outcomes of farms by diversifying their income streams.

Silvopastoral systems have been shown to increase fertility of the soil, boost growth rates and improve the quality of life of the animals by providing shade. If graziers sustainably harvest native timber or convert part of their land into plantations, these trees would not only sequester methane emissions from cattle, but also alleviate some of the strain on timber supply.

A 2020 study affirmed that approximately 525,600 hectares of privately owned land within the North East Regional Forestry Agreement met the necessary preconditions to be of high harvestable quality.

The greatest barrier preventing the uptake of farm forestry amongst landowners may be a byzantine tangle of red tape that has led to confusion. An investigation by an independent journalist last year found that graziers believe they are currently stymied by restrictive codes that prohibit timber harvesting in conjunction with livestock production. The article asserts that the Private Native Forestry code forces graziers to choose one or the other.

Blueprint's own investigations with an official at New South Wales Local Land Services, however, contradict this claim. Instead, the office stated that timber harvesting in conjunction with livestock grazing has always been allowed, subject to certain regulations.

The government has introduced an $86 million grant program over five years to encourage new forestry plantations. We propose that this be made available to landowners to establish silvopastoral systems. At the same time, the government must work closely with landowners to better communicate exactly what is and is not allowed under the Private Native Forestry code in order to enable farm forestry to reach its full potential.

# A cost-benefit analysis of native logging in the North East RFA region

The focus of Australian policymakers in land-use assessment has been overly myopic, limiting our ability to fully leverage the potential of our distinctive ecosystems for sustainable economic prosperity.

In addition to their commercial value, forests offer a range of intangible benefits that should be taken into account. These include improvements to social, psychological, and physical well-being, safeguarding habitats for endangered species, and enhancing biodiversity. Whilst these benefits should arguably be priced into any economic analysis, due to their intangible nature, it is difficult to project an accurate price for a subjective value that may ultimately compromise the accuracy of the tangible cost analysis.

We have thus omitted intangible benefits and costs in our overall cost-benefit analysis. Yet even when considering land-use scenarios from a purely economic perspective, our cost-benefit analysis concludes that ending logging in the region would deliver a social benefit of $45 million in present day dollars compared to the business as usual case of continuing to log until FY2040.

| **Benefits** | |
|---|---|
| Avoided costs from logging | $725 million |
| Carbon sequestration value | $174 million |
| Tourism revenue | $120 million |
| **Total** | **$1,020 million** |
| **Costs** | |
| Forgone logging revenue | $744 million |
| Costs for developing tourism | $15.7 million |
| Industry adjustment package | $215 million |
| **Total** | **$975 million** |
| **Net present value (Benefits less Costs)** | **$45 million** |
| **Benefit-cost ratio** | **1.05** |

**Table 1** Cost-benefit analysis comparing business as usual to ceasing native forestry in 2023

**Source** See Appendix

**Notes** Net present value factors in a seven percent discount rate. For technical details on our cost-benefit analysis, refer to the Appendix at the end of this paper.

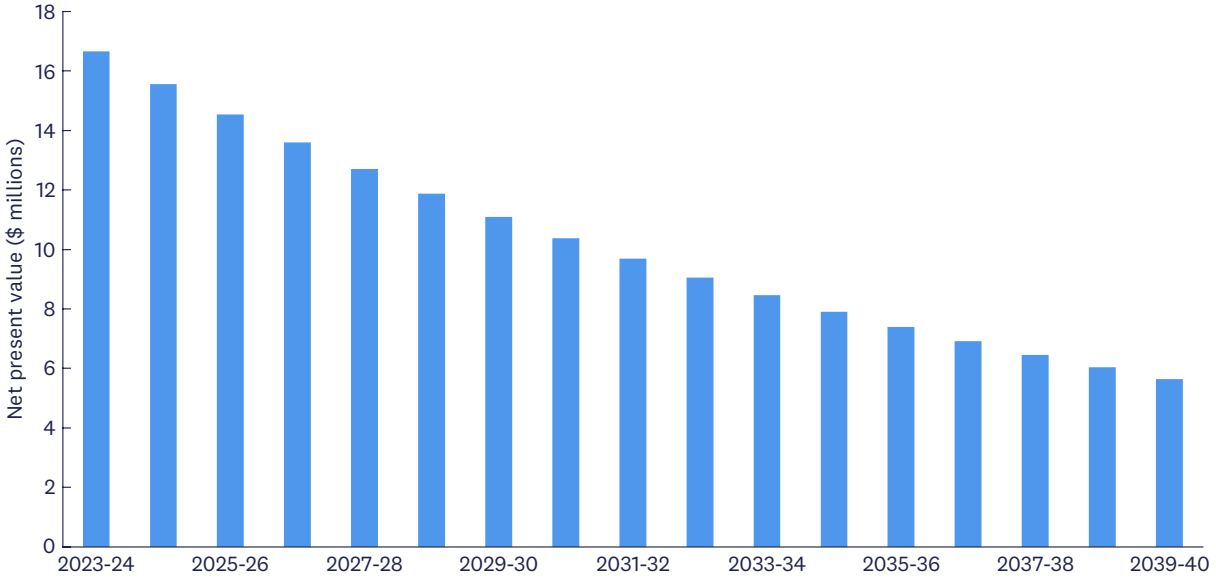



**Figure 6** Net present value of the cost-benefit flow in cessation of logging scenario (2023–2040)
**Source** Blueprint Institute analysis
**Note** A seven percent discount rate is applied.

# Carbon

| | |
|---|---|
| Carbon abatement from stopping logging across 2023–40 (tCO2e) | 7.65 |
| Australian carbon credit unit spot price (per tonne of CO2, March 2023) | $36.65 |
| Net present value | $174 million |

**Table 2** Net present value of carbon abatement due to cessation of logging (2023–40)

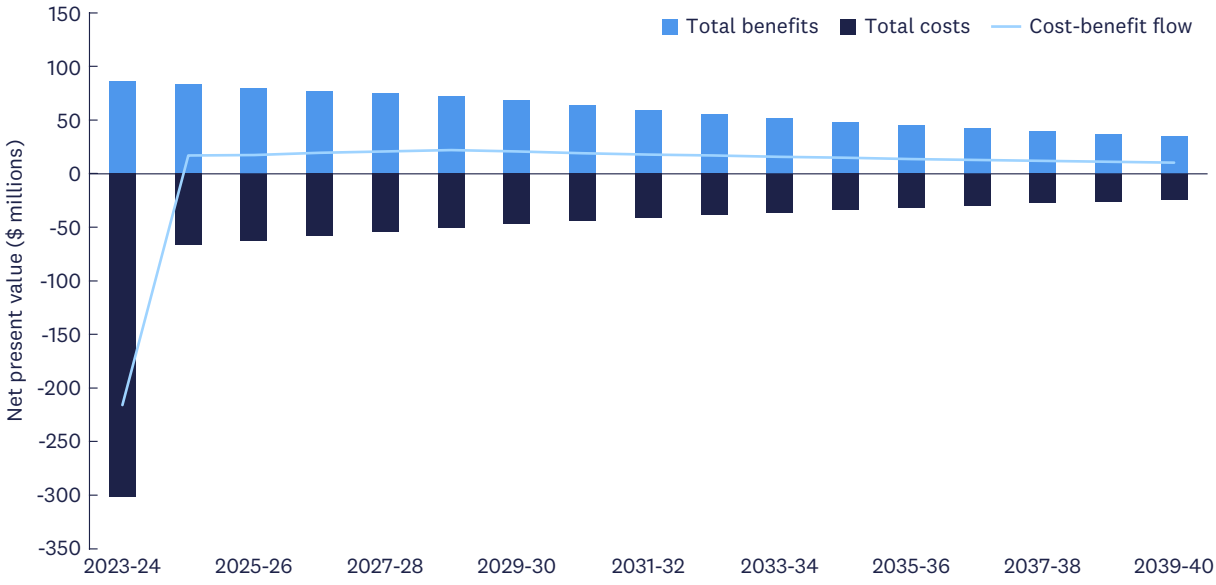



**Figure 7** Net present value of carbon abatement due to cessation of logging (2023–2040)
**Source** Blueprint Institute analysis
**Note** A seven percent discount rate is applied.

Managing the North East RFA region in a manner consistent with conservation would abate an average of 0.45 million tonnes of carbon annually. This equates to a net present value of $174 million if logging were to stop now relative to business as usual up to FY2040. This figure is based on the March 2023 Australian carbon credit unit spot price of $36.65 per tonne, and a seven percent discount rate.

Forests play a crucial role in mitigating climate change by sequestering carbon dioxide from the atmosphere and storing it in the form of organic matter. Across Australian forests there are over 21,949 million tonnes of carbon stored, and, in New South Wales, over four million tonnes of carbon are stored across the native forests and plantations that FCNSW manage. By logging native forests, this carbon is released back into the atmosphere, contributing to greenhouse gas emissions and exacerbating climate change. Assessments of carbon stocks across New South Wales forests reveal a net loss of 164 million tonnes of carbon between 1990 and 2020.

Similar research has been done in the Southern and Eden RFA regions in New South Wales, showing that 0.95 million tonnes of carbon dioxide equivalents would be saved each year if logging stopped in these regions. This is 3.4 times more carbon abatement projected per year compared to the largest Emission Reduction Fund project.

In addition to the environmental benefits of preserving native forests, there are also economic benefits associated with carbon. Carbon credits can be generated by projects that preserve and enhance carbon stocks in forests, and these credits can be sold in international carbon markets as a way to finance conservation efforts. Although in Australia, this only applies to reforestation—the process of replanting trees in areas that have previously been cleared—the social value of carbon abatement nonetheless remains.

A common criticism of attempting to value carbon abatement is that it does not consider second-order effects. A sudden cessation in native timber logging could result in considerable carbon leakage as the industry could potentially be compelled to import timber to compensate for the lack of hardwood supply. Thus, deforestation could merely shift offshore to a country with far less scrupulous environmental regulations.

The change in carbon stock used in our study, therefore, was based on a paper that took carbon leakage into account. Notably, when using the life cycle assessment—the best carbon accounting framework to assess actual atmospheric impacts—findings showed that conserving native forests in New South Wales was not the most optimal outcome.

The paper notes that while managing native forests exclusively for conservation would result in additional carbon abatement, it was not the optimal result. Rather, continuing to log while also processing an additional 50% of the residue currently dumped at harvesting sites into pulp resulted in the most carbon abatement. This scenario would arguably maximise carbon abatement by avoiding the importation of pulp from other countries with less stringent environmental regulations.

It is not clear that processing more residue along the North Coast is economically feasible, however. Research has shown that utilising an increased proportion of native residue as part of forestry management is potentially uneconomic because of costly extraction and transportation—particularly in our study region, where the remaining native forest harvesting sites are relatively far away from processing facilities. The facts on the ground also speak for themselves—after all, if there was money to be made from hauling and processing a greater volume of residue into pulp, it is curious that profit-seeking firms have thus far chosen not to do so.

The problem of carbon leakage could also be addressed from another angle. Specifically, if commercial plantations were increased in the region to account for the loss of timber from native forests, the amount of carbon leakage would be reduced.

Plantation expansion would also increase the average carbon storage in woody biomass and contribute to Australia's emission reduction targets. Furthermore, plantations have the economic advantage of gaining tradable carbon credits, which only 10% of FCNSW plantations currently qualify for.

## Tourism

Our analysis indicates that increased tourism to the region through FY2040 could provide a net present value of $120 million at a seven percent discount rate.

While we are proposing conserving the entire 355,000 hectares currently available for native timber logging in our study area, our scenario calls for an initial allocation of 100,000 of those hectares to develop recreation facilities to encourage tourism. We estimate that an initial upfront investment of $15.7 million would be required to develop the proposed facilities. This would include the creation of the 50km walking trail, a 900km boundary as well as the construction of park infrastructure such as campsites, pathways, signs, and car parks. Cost estimates for each of these items are detailed in the appendix. Construction would take place over five years.

Ongoing costs related to park maintenance and staffing would be approximately $2.2 million annually. We also note that the New South Wales government already allocates significant annual grants ($25 million in FY2022) to FCNSW for forest management services such as "provision of recreation facilities, education and advisory services...,flood stabilisation, tourism precincts..., light fleet fire spray protection, and strategic fire trails." We assume these expenditures would continue, albeit adjusted to focus primarily on conservation.

Tourism plays a crucial role in the New South Wales economy, contributing $37.1 billion in 2019-2020 and employing over 256,000 people. Unsurprisingly, COVID-19 and the Black Summer bushfires caused significant disruption to the sector, leading to a decline in tourism consumption of 20.5% compared to the previous year. There was also a significant contraction in tourism employment of 13.5% compared to 2018-19.

Visitation to national parks in New South Wales has been growing annually, increasing by 58% in the decade 2008-2018 (Figure 9).

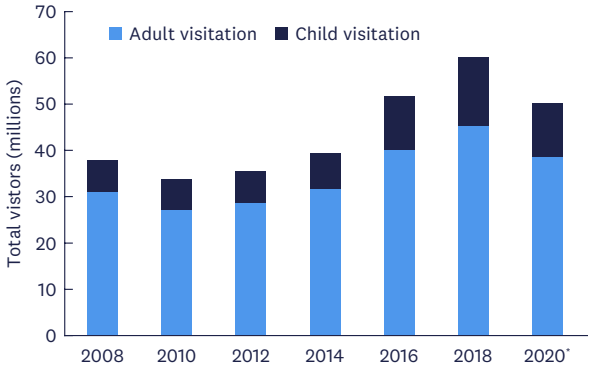



**Figure 9** Visitation in New South Wales national parks

**Source** New South Wales Department of Planning and Environment

*Visitation in 2020 was impacted by major wide-spread disruptions, including natural disasters and the COVID-19 pandemic.

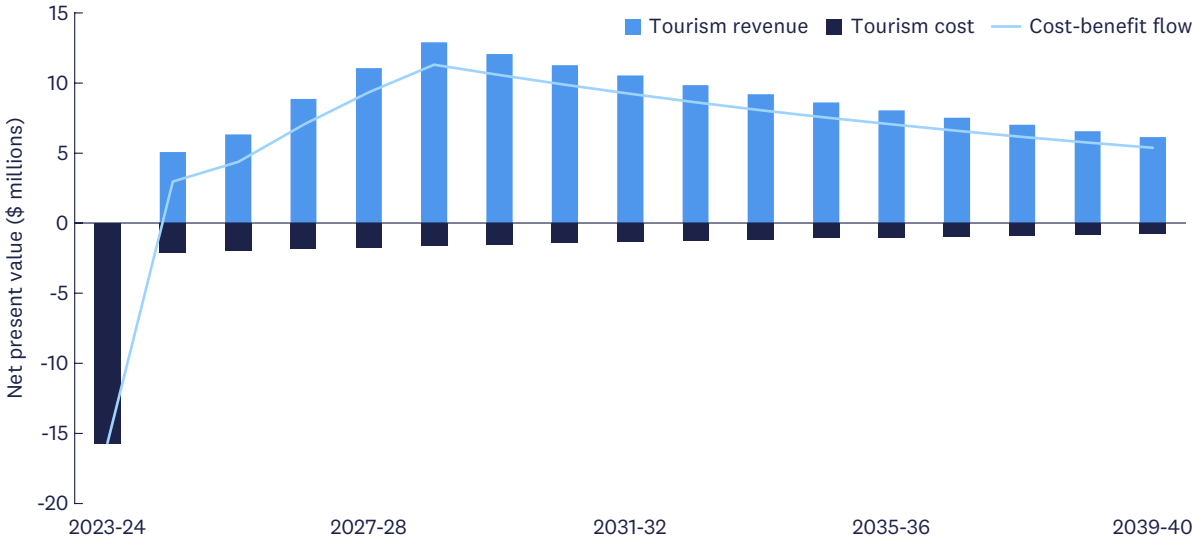



**Figure 8** Tourism cost-benefit flow (2023–2040)

**Source** Blueprint Institute analysis

**Note** A seven percent discount rate is applied.

Although the pandemic predictably caused a decrease in visitation, the value that people place on the natural environment has risen since the lockdowns began. The results of a government survey show that on average, 45% of New South Wales residents reported an increase in their use of public spaces and parks following the pandemic, with parks and walking tracks being the two most appreciated public spaces.

Furthermore, nature based outdoor activities contributed $6.7 billion to the state's economy in 2016. In addition to these substantial economic contributions, nature based activities also offer social, psychological, and physical well-being benefits—resulting in $480 million in avoided healthcare system costs annually in New South Wales.

Access to outdoor space is key to taking advantage of these benefits. The North Coast of New South Wales attracted over 10 million visitors in 2022. Preserving the area currently being used for native timber harvesting provides the region with a great opportunity to capitalise on outdoor recreation.

The North Coast is also one of the last strongholds for koalas, with numbers estimated to be between 15,000 to 28,000. This is a huge asset for the region in generating tourism, with koalas being seen as the quintessential icon of Australia. Preserving the forests gives the dual benefit of providing more accessible outdoor space, whilst also expanding the potential available habitat for koalas. Unfortunately, the koala population in the region has declined by 30% following the Black Summer bushfires and is now an endangered species. To reverse this trend, it is imperative to protect and restore the koala habitat. Studies have indicated that, without additional conservation efforts, the koala population is likely to continue declining over the next 20 years, and current management plans may be insufficient to prevent their extinction. Conserving the native forests would secure an additional 355,000 hectares of land for the koala population in the region.

# Limitations

## Status quo

Our effort to value FCNSW's native forestry activities along New South Wales' North Coast involved significant methodological challenges. FCNSW's annual reports only provide detailed financial data for their activities in aggregate. This presents an obstacle as FCNSW is effectively comprised of two separate firms operating under two very different financial realities: the profitable softwood division, and the loss-making hardwood division.

When possible, instead of relying directly on FCNSW's annual reports, we derived our projections from other sources such as FCNSW's sustainability reports, in addition to reviews of FCNSW's operations—required periodically by law—conducted by independent organisations with access to proprietary FCNSW data.

For example, our projection of future high quality native timber harvest levels in the North East RFA was based on an average of predicted future sustainable volume found in FCNSW's sustainability reports, and similar data found in an analysis by the Sustainable Yield Review conducted after the Black Summer bushfires. In this case, our long-term annual harvest projections of 225,000$m^3$ of high quality sawlog, 143,000$m^3$ of high quality sawlog, and 41,000$m^3$ of pulplog are extremely likely to be significant overestimates.

Even before the Black Summer bushfires, FCNSW had not been able to consistently achieve our allocated harvest levels. Post-bushfires, in FY2022, harvest levels for high quality sawlog were just 105,000$m^3$, and long-term sustainable yield for high quality sawlogs was predicted to be below 200,000$m^3$ through FY2040. Our overestimates were intentional, as we wanted to show that even overly optimistic projections leave native timber harvesting in the North Coast at an operational loss.

Lastly, as the mills in the region are privately held entities, financial data on their operations were publicly unavailable. Thus, we were unable to include projections of the foregone revenue and avoided costs due to any mill closures in the region in the event native timber logging ceases.

Nevertheless, we have included the cost of an industry transition package similar in scale to those implemented in Victoria and Western Australia. The transition package includes redundancy and retraining cost for all employees who work in harvest/haulage and the mills, compensation payments for mill plant and equipment redundancy, the cost of wood supply agreement buyouts, and a sizeable allocation for regional economic diversification. The total cost of this transition package for the region is approximately $215 million. Detailed information on the derivation of this cost is available in the appendix.

## Carbon

The net present value of additional carbon sequestration, in the event native timber logging on the North Coast ceases immediately, varies substantially depending on the carbon price used (Table 3).

| Carbon price | Net present value of additional carbon sequestration |
|---|---|
| ACCU spot price | $174 million |
| Emissions Reduction Fund average price | $93 million |

**Table 3** Net present value of carbon abatement should North Coast native forests be managed exclusively for conservation, by carbon price (March 2023)

**Source** Australian Carbon Credit Unit, Emissions Reduction Fund, Blueprint Institute Analysis

We have elected to use the higher Australian Carbon Credit Unit spot price in our cost-benefit analysis as it is a marginal price, as opposed to the Emissions Reduction Fund average price.

Our estimate of annual carbon abatement was inferred from a 2016 study that projected an average of 0.45 million tonnes of carbon abatement annually over a 65-year period. We made the key assumption that the annual 0.45 million tonnes of carbon abatement would be consistent across the 17-year time frame as well.

## Sensitivity analysis

We conducted a sensitivity analysis to ensure our results were robust to variance in discount rates, timber prices, and harvest volumes. Since our baseline harvest volume projection was already above the long-term projected sustainable yield of around 200,000m$^3$ of high quality sawlog per year, we have only conducted a sensitivity analysis with respect to low future logging volumes (Table 4a, 4b, 4c).

| Low discount rate | Base discount rate | High Discount rate |
|---|---|---|
| 5% | 7% | 9% |

**Table 4a** Sensitivity analysis—Discount rates
**Source** Blueprint Institute Analysis

| Timber types | Low future logging volume (m$^3$) | Low timber price (-15%) | High timber price (+15%) |
|---|---|---|---|
| High quality sawlog | 175,000 | $177/m$^3$ | $240/m$^3$ |
| Low quality sawlog | 111,000 | $94/m$^3$ | $127/m$^3$ |
| Pulplog | 32,000 | $72/m$^3$ | $97/m$^3$ |

**Table 4b** Sensitivity analysis—Timber outputs
**Source** Blueprint Institute Analysis

| | Baseline (7% discount rate) | Five percent discount rate | Nine percent discount rate | Low future logging volume | Low timber price (-15%) | High timber price (+15%) |
|---|---|---|---|---|---|---|
| Benefits (millions) | $1,020 | $1,160 | $905 | $858 | $1,020 | $1,020 |
| Costs (millions) | $975 | $1,074 | $894 | $809 | $863 | $1,086 |
| Net present value (millions) | $45 | $87 | $11 | $49 | $157 | -$66 |
| Benefit-cost ratio | 1.05 | 1.08 | 1.01 | 1.06 | 1.18 | 0.94 |

**Table 4c** Sensitivity analysis—Results
**Source** Blueprint Institute Analysis

In all cases, except for the high timber price scenario, the net present value of immediately ceasing native timber logging remains positive, indicating our results are robust. Relative to the baseline, there is minor variance in results in response to differing discount rates and logging volumes.

Our results are considerably more sensitive with respect to variance in timber prices. A substantial increase in timber prices in the range of 15+% does tip the net present value of ceasing native timber logging into the negative. However, the significance of this finding should not be overstated.

The baseline timber price we used coincided with the peak of the inflationary cycle and may have already moderated substantially due to lower fuel prices. It is extremely unlikely that timber prices jump another 15+% from our already inflated baseline and remain permanently elevated across the 17-year timeframe of our analysis. In addition, we have also made a range of assumptions favourable to FCNSW's bottom line throughout the cost-benefit analysis—an adjustment of those assumptions to more realistic levels could easily return the net present value calculation under high timber prices to a positive number.

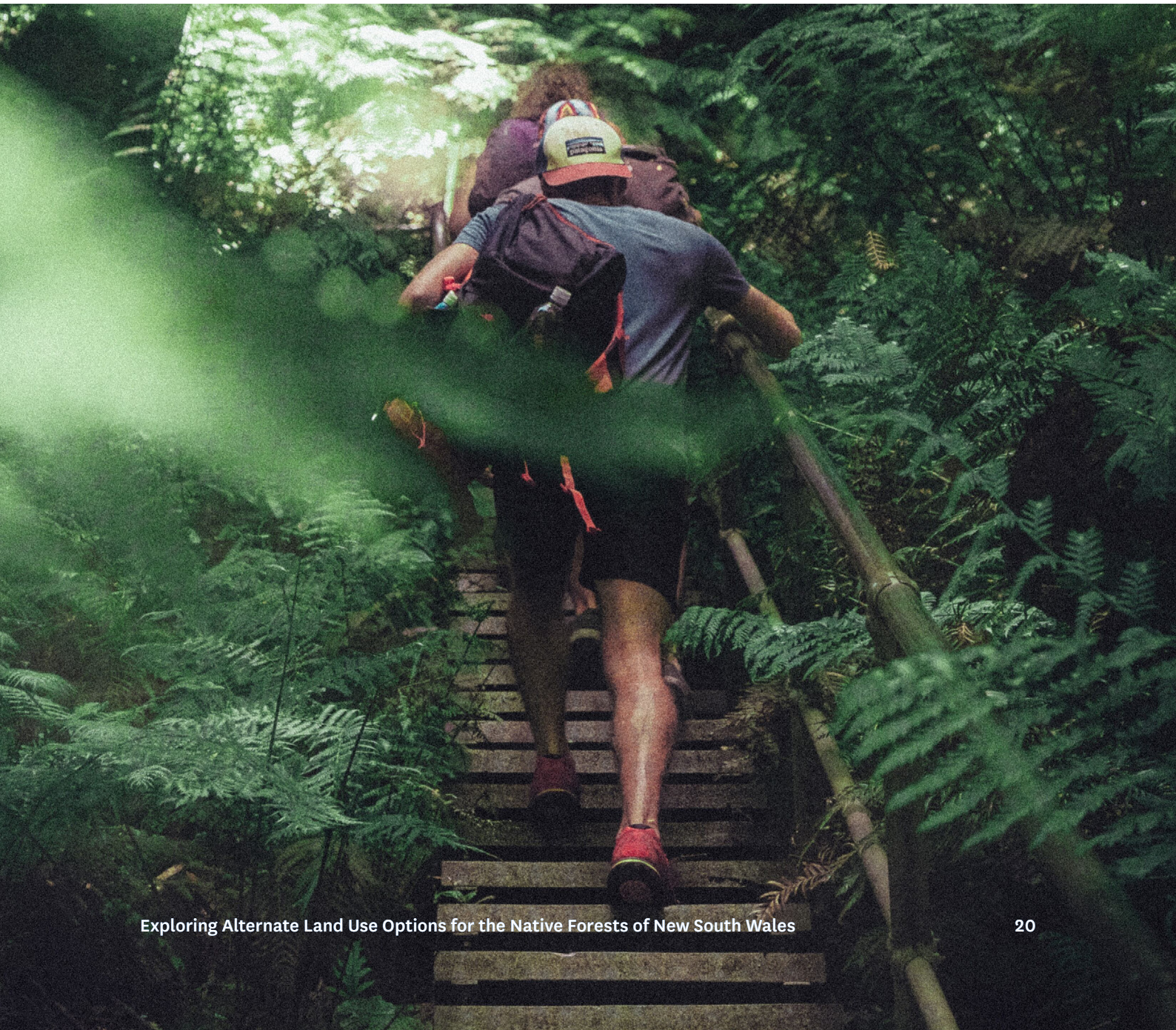
## Tourism

The cost of building park infrastructure was derived from relevant case studies, with prices adjusted for inflation. We acknowledge that the case studies used are not directly comparable, and that, as a result, these costs should be interpreted as estimates.

Data was taken from Tourism Research Australia's National Visitor Survey to ascertain the average expenditure per trip per night in Northern New South Wales—resulting in an estimate of $210 per night.

Again, we acknowledge that this estimate may have a wide error margin. There are idiosyncratic spending choices at play—for example, national park campers are likely to spend differently to those staying in other accommodation. Also, as the Northern New South Wales region is home to many other popular tourist destinations, such as Byron Bay, it is plausible that travellers may visit the national park without staying overnight.

Thankfully, since our projections for tourism revenue were relatively small in scale in the context of the entire cost-benefit analysis, even a substantial cut in tourism revenue in the order of 25% does not change the ultimate conclusion of the analysis—that FCNSW's native forestry activities should cease.



# Appendix

## Modelling for status quo of logging through to FY2040

Our status quo scenario assumes continued native timber logging in the area defined by the North East Regional Forestry Agreement through the present day to FY2040, at which point the RFA expires.

Our projection of future high quality native timber sawlog harvest levels in the North East RFA was based on the predicted long-term average of future sustainable harvest volume, found in FCNSW's sustainability reports, and similar data sourced from a separate Sustainable Yield Review analysis, both produced after the 2019–20 bushfires (see Table 5).

It is our assessment that it is highly dubious that the projection of 225,000m$^3$ of high quality sawlog yield is met, especially in the short term, due to the lingering effects of the Black Summer bushfires. Nevertheless, in order to maintain consistency with our overall philosophy of affording FCNSW the most favourable assumptions possible, we have elected to assume an improbable immediate rebound in harvest yield. This assumption errs on the side of a greater volume of native timber harvesting, thus inflating FCNSW's revenue and profit, particularly in the short term.

Projections for the volume of low quality sawlog and pulplog (see Table 5) were derived from the historical relationship between high quality sawlog, low quality sawlog, and pulplog yield. Specifically, our analysis found that high quality sawlog on average accounted for approximately 55% of total yield, while low quality sawlog accounted for 35%, and pulplog 10% of total yield.

Price estimates for hardwood native timber were calculated using data from the New South Wales Department of Primary Industries and Indufor, inflated to 2023 price levels using the producer price index for wood product and pulp, paper, and converted paper product inputs (see Table 6).

| | High quality sawlog (m$^3$) | Low quality sawlog (m$^3$) | Pulplog (m$^3$) |
|---|---|---|---|
| North East RFA | 225,000 | 143,000 | 41,000 |

**Table 5** Annual sustainable yield projections in North East RFA (2023–40)
**Source** FCNSW Sustainable Yield Review, FCNSW 2021-22 Sustainability Report, Blueprint Institute analysis

| High quality sawlog (m$^3$) | Low quality sawlog (m$^3$) | Pulplog (m$^3$) |
|---|---|---|
| $208 | $110 | $84 |

**Table 6** Average price of hardwood native high quality sawlog, low quality sawlog, and pulplog (2023)
**Source** New South Wales Department of Primary Industries, Indufor, Blueprint Institute analysis

Cost projections for harvesting operations were based on the limited disaggregated data publicly available for FCNSW's hardwood division, published in their annual financial reports. Given that the only disaggregated information available was revenue and normalised profit, we based our future cost projections on the hardwood division's average profit margin over the pre-bushfire years of FY2016-19—2.48% (see Table 7).

We note that these financial years were particularly lucrative relative to the hardwood division's historical mediocre performance. Again, choosing these especially profitable years was consistent with our overall philosophy of allocating FCNSW with the most favourable assumptions possible.

| Input | Value |
|---|---|
| Discount rate | 7% |
| Forgone revenue if logging halts in the North East RFA | $69,470,000/year |
| Average operational margin between FY2016-19 | 2.48% |
| Avoided costs from logging | $67,750,000/year |

**Table 7** Status quo inputs for native logging in the North East RFA

**Source** Blueprint Institute Analysis

# Carbon

Our valuation of carbon abatement as a result of ceased native timber logging in the North East RFA region was based on a 2016 FWPA study. The study looked at the North Coast and used life cycle assessments to predict carbon abatement, including the influence of carbon leakage.

Based on the average change in carbon abatement relative to business as usual over the long-term (65 years), derived from the aforementioned study, ending logging, and preserving the native forests in the region for conservation purposes would abate 0.45 million tonnes of carbon annually. Over a 17-year timeframe, this equates to a valuation of $174 million (based on the March 2023 Australian carbon credit unit spot price of $36.65 per tonne, and a seven percent discount rate).

Valuation of this amount of carbon sequestration is unavoidably imprecise. There is no one uniform carbon price in Australia, and the trajectory of prices is subject to market fluctuations and unpredictability. During the Emissions Reduction Fund most recent auction in April 2022, the average price per tonne of contracted carbon abatement was $17.35. By contrast, Australian Carbon Credit Units were auctioned at a spot, or marginal, price of $36.65 in March 2023.

| Carbon prices | Values |
|---|---|
| Australian Carbon Credit Unit marginal price | $36.65 |
| Emissions Reduction Fund average price | $17.35 |

**Table 8** Difference in domestic carbon price (March 2023)

**Source** Australian Carbon Credit Unit, Emissions Reduction Fund, Blueprint Institute Analysis

# Tourism

Construction projects include the building of park boundaries, multi-day walks, and core infrastructure. Estimates for each of these line items are detailed below.

| Variables | Value | Units |
|---|---|---|
| Area | 100,000 | hectares |
| Park infrastructure | 12 | $/hectare |
| Trail | 50 | kilometres |
| Trail cost | 200 | $/metre |
| Maintenance | 5 | $/metre |
| Boundary | 900 | kilometres |
| Boundary fencing | 5,000 | $/kilometres |
| Construction timeline | 5 | years |
| Park worker average wage | 80,000 | $/year |
| Park workers required | 25 | workers |
| Visitors in Year 1 | 30 | % of total visitors |
| Visitors in Year 2 | 40 | % of total visitors |
| Visitors in Year 3 | 60 | % of total visitors |
| Visitors in Year 4 | 80 | % of total visitors |
| Visitors in Year 5+ | 100 | % of total visitors |
| Visitors | 86,269 | visitor nights |
| Visitor spend | 210 | $/visitor night |
| Discount rate | 7% | |
| Years | 17 | |

**Table 9** Tourism modelling inputs
**Source** Blueprint Institute analysis

The establishment of a 50-kilometre trail would cost $10 million assuming an estimated cost of $200 per metre—based on the construction of the Grampians peak trail which cost an average of $192 per metre.

Core park infrastructure such as tracks, signage, interpretation signs, picnic sites, and campsites are vital to attract increased tourism. We have inferred a cost of $12 per hectare based on a relevant case study. Therefore, assuming an area of 100,000 hectares, (just under a third of the harvestable area of native forests in the North East region) a $1.2 million initial investment would be needed in the construction of core park infrastructure.

A cost of $5,000 per kilometre was used to estimate the expenditure involved in the construction of a boundary fence. This figure was derived from examples of previous park establishments. Assuming a boundary of 900 kilometres, the cost would be $4.5 million. The estimated cumulative initial cost for setup is $15.7 million.

We assume a five-year timeframe for construction—consistent with previous, comparable modelling.

We have estimated that a park of this size would require approximately 25 full-time workers based on previous case studies. We have also included

a cost of $5 per metre to maintain the 50km walking trail. Thus, total ongoing costs relating to both park maintenance and staffing will be $2.25 million annually.

Average visitor numbers to National Parks and Wildlife services within northern New South Wales were extrapolated from a recent Roy Morgan report. The same report indicated that on average, 4-6% of park visitors stay overnight. Thus, taking the visitor numbers from 2018, we estimated that a national park in the North East of New South Wales could attract 86,269 visitor nights. Data obtained from Destination New South Wales was used to ascertain the average spend per night by visitors to the North Coast.

# Industry adjustment package

| | Inputs | Payment per unit | Total |
|---|---|---|---|
| Redundancy and retraining — North Coast | 500[1] workers | $120,000 per worker | $60,000,000 |
| Harvester and hauler redundancy and business transition voucher | 39 firms | $275,000 per firm | $10,725,000 |
| Mill plant and equipment redundancy | 151 aggregated in both north and south coast | $275,000 per firm | $37,750,000 |
| Wood Supply Agreement buyout | 2,045,000m$^3$ | $19 per cubic metre | $38,855,000 |
| Regional economic diversification | | | $64,000,000 |
| **Grand Total** | | | **$215,105,000** |

**Table 10** Industry adjustment inputs

**Source** Blueprint Institute analysis

Our industry adjustment package was designed to be broadly similar to those already implemented in Victoria and Western Australia. However, we made a series of deliberate choices in order to produce an overestimate of total costs to compensate for the limited number of inputs we modelled. This was to account for additional costs, like those for mental health and wellbeing support, that will be incurred but are difficult to estimate in advance.

Specifically, we allocated the maximum amount of $120,000—available only to the most senior of employees in Victoria—to all 500 long-term direct jobs available in harvesting, haulage, and sawmills in the North Coast region. Similarly, as we could not find geographically disaggregated data, we allocated $275,000—as in Victoria, $250,000 in plant and equipment redundancy payments and $25,000 in business transition support—to all 151 mill plants along both the North and South Coast. We also allocated $275,000 per firm to all 39 harvest and haulage firms on the North Coast.

Wood Supply Agreements with sawmills and other timber processors along the North Coast were all recently extended until 2028. These are legal contracts between FCNSW and the sawmills and will have to be bought out.

We based our estimate of the cost of the buyouts on precedent—specifically, FCNSW reached a deal with Boral (a sawmill operator) to buy back a total of 450,000m3 of high-quality sawlog allocation in exchange for $8.55 million, or $19 per cubic metre. Given our projection of an annual yield of 409,091m3, we calculate that, through 2028, a total of 2,045,000m3 of allocation will have to be bought out. This results in a total cost of about $39 million.

Finally, as in Victoria, we allocated $64 million for a broad community support fund, including $36 million "to grow businesses and create jobs in affected communities," $22 million for local development plans, and $5.5 million for economic diversification planning to "support affected local economies' transition to new and sustainable industries."

We assumed all these funds would be paid out immediately, and thus, with respect to our net-present value calculations, no discounting took place.

[1] Based on the Natural Resource Commission's long-term post-bushfire job availability projection