

Executive Summary

Key findings

Impacts of the 2019/20 wildfires

The 2019/20 wildfires were unprecedented in their scale, extent of high and extreme fire severity, and duration. They burnt 4.8 million hectares of land in NSW, including just over 64 percent (around 0.7 million hectares) of the native state forest estate. The wildfires significantly impacted forest ecosystems, including native flora and fauna, soil, and water.

The wildfires extensively impacted communities, with 26 fatalities, 2,476 homes destroyed, loss of other infrastructure and business assets, ongoing physical and mental health impacts, and financial hardship.

Forestry operations in coastal NSW usually occur under the Coastal Integrated Forestry Operations Approval (Coastal IFOA). While the Coastal IFOA reflects best practice forest management for regular conditions, it was not designed to mitigate the risks of harvesting in severely fire-affected landscapes like those from the 2019/20 wildfires. As a result, forestry operations have ceased in many of these areas. In other areas, forestry has continued in a limited fashion under site-specific operating conditions (SSOCs) and voluntary measures, which are intended to be temporary.

The valuable native forest timber industry has also been severely impacted, with wood supply falling sharply in all regions in 2020 as a direct result of the wildfires. The Forestry Corporation of NSW (FCNSW) advised the Commission that, while there have not yet been any mill closures as a direct result of reduced timber supply caused by the wildfires, some are at risk of closure unless supply can be increased and there is certainty of ongoing supply. In regions where wood supply was substantially reduced, there have been reductions in work shifts and some redundancies. Further, FCNSW advised that mitigations employed to date – such as supplementation from private property on the south coast and plantations on the north coast – are no longer available to the extent required to meet wood supply levels.

What the Commission was asked to do

The Natural Resources Commission (the Commission) has been asked through a terms of reference to provide independent, evidence-based advice on pathways back to FCNSW operating under standard Coastal IFOA prescriptions, and recommend ways to give effect to that advice.

The Commission has developed a data-driven risk assessment framework to inform a series of pathways (**Figure 1**). This was developed in consultation with agencies and an independent expert panel, using the best-available scientific evidence. Guided by the expert panel and in line with the principles of ecologically sustainable forest management set out in Part 5B of the *Forestry Act 2012*, the Commission has adopted a conservative approach to assessing risk, setting thresholds, and applying additional measures.

Adopting the recommended risk assessment framework and pathways will give FCNSW and the timber industry more certainty to understand if and when relevant wood supply agreements are likely to be fully met and the short- to long-term impacts on regional businesses and job security. It will also provide transparency to communities about how potential

cumulative impacts of forestry operations in fire-affected landscapes are being managed to allow forests to recover and protect environmental values. Adopting the risk assessment framework will also provide the NSW Government with a repeatable approach based on the latest science to manage risks from future large-scale fires.

The risk assessment framework

The risk assessment framework assigns areas of the Coastal IFOA one of four risk ratings (low, medium, high, and extreme) based on the extent to which standard Coastal IFOA prescriptions can mitigate impacts from the 2019/20 wildfires. These ratings determine what actions can occur in that area.

The framework consists of three gateways, at which different assessments are undertaken. Gateway 1 is a management zone-scale assessment that considers risk across a larger management area. Gateways 2 and 3 are additional local landscape area desktop and field assessments required for medium and high risk management zones before limited harvesting can occur.

In low risk management zones, harvesting can resume under the standard Coastal IFOA prescriptions.¹ In these areas there is sufficient confidence that native forests can withstand the short-term impacts of harvesting and that adequate safeguards were in place through the standard Coastal IFOA prescriptions to protect environmental values over the long-term. Noting that, on average, harvesting is already excluded from approximately 50 percent of local landscape areas to protect important environmental values across the Coastal IFOA region.

In management zones rated as being extreme risk, there is a risk of serious and irreversible harm to environmental values from the cumulative impacts of fire and harvesting. In line with the precautionary principle, harvesting must be temporarily suspended for three years from the time of fire (taken to be February 2020).

Management zones that receive medium or high risk ratings can have limited harvesting once there are sufficient additional temporary refuges (preferably unburnt and lightly burnt forest) retained at the local landscape area to mitigate the impacts of additional disturbance. In high risk management zones, the retention requirement is fixed at 75 percent. In medium risk management zones, a variable additional retention requirement is applied based on localised impacts, expected to be approximately 65 percent on average of a local landscape area.

The risk assessment framework is designed to consider both high and extreme severity fire impacts from the 2019/20 wildfires (using version 3 of DPIE-EES' Fire Extent and Severity Mapping (FESM)) and the recovery of those high and extreme impacts since fire (using the post-fire spectral recovery index developed by the Department of Planning, Industry and Environment's Environment, Energy and Science group (DPIE-EES) and the Department of Primary Industries Forest Science team (DPI Forest Science)). This approach draws on the best available data and science for decision making.

¹ Standard Coastal IFOA prescriptions reflect an outcomes-based approach to regulation, with a multi-scale landscape approach to establishing habitat and native fauna protections. The Coastal IFOA incorporates several aspects of best-practice forestry management, including: permanent exclusion zones, retention of important feed and habitat resources within the harvesting footprint; harvesting limits and regimes that distribute short-term impacts in space and time; and settings to minimise impacts on soil and water quality from roading, harvesting and other activities.

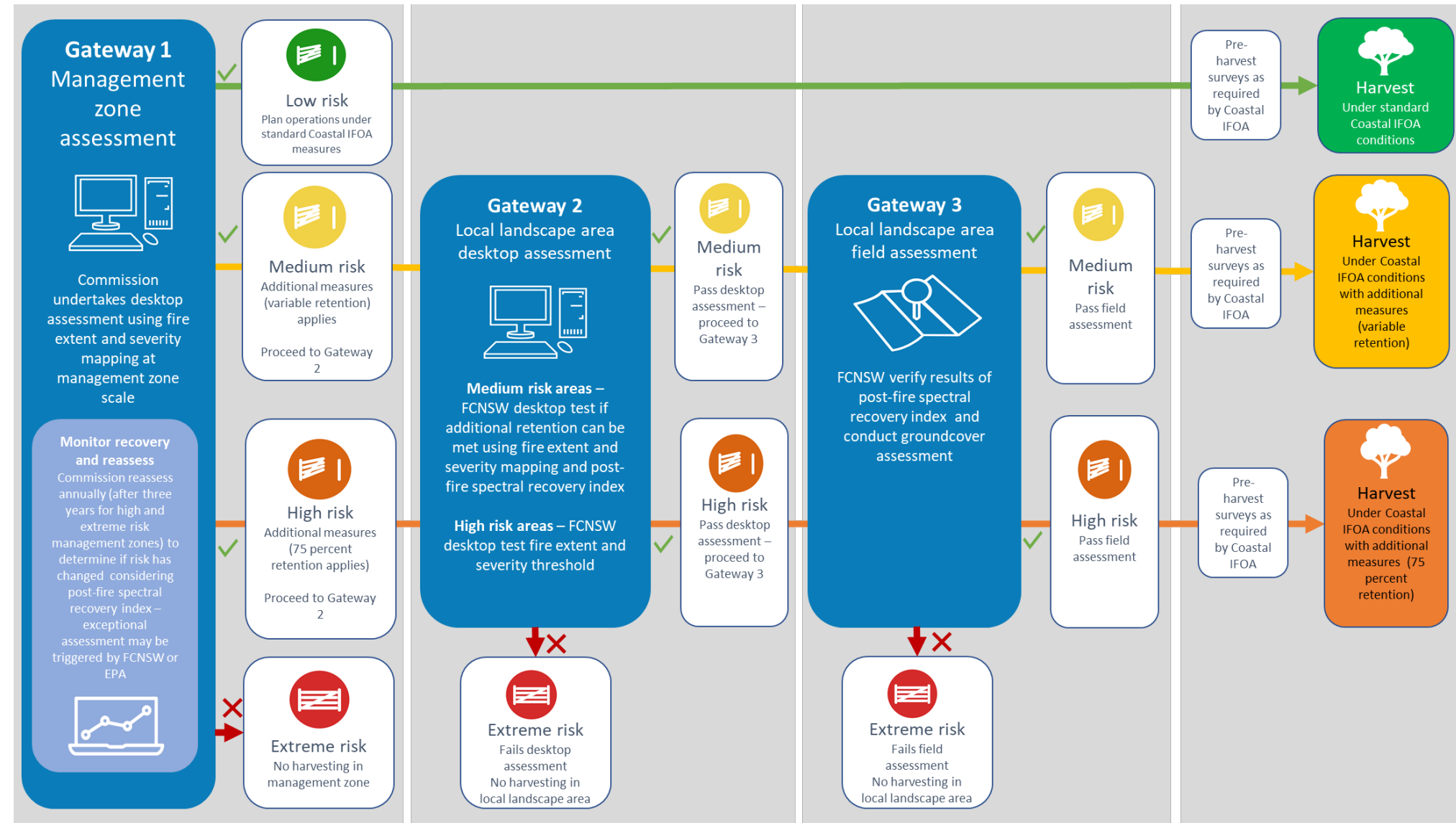


Figure 1: Risk and evidence-based framework used to determine pathways

Results of Gateway 1 assessment and recommended pathways

The Commission has undertaken the management zone-scale assessment (Gateway 1) using the best available data. **Table 1** shows the risk rating and recommended Gateway 1 pathway for each management zone and **Figure 2** shows the location of management zones and risk ratings.

Table 1: Summary of assessment results for the Commission’s Gateway 1 assessment

Assessment result	Management zones
<p>Low risk – Harvesting should be allowed under standard Coastal IFOA prescriptions</p>	<p>Seven management zones:</p> <ul style="list-style-type: none"> ▪ Bulahdelah ▪ Chichester ▪ Tenterfield ▪ Urbenville ▪ Urunga ▪ Walcha-Nundle ▪ Wingham
<p>Medium risk – Pending gateway 2 and 3 assessments, harvesting should be allowed under standard Coastal IFOA prescriptions with additional measures, including temporary refuge based on a variable retention requirement in local landscape areas</p>	<p>Eleven management zones:</p> <ul style="list-style-type: none"> ▪ Casino ▪ Coffs Harbour ▪ Coopernook ▪ Grafton ▪ Kempsey ▪ Kendall ▪ Morisset ▪ Queanbeyan ▪ Styx River ▪ Tumut ▪ Wauchope
<p>High risk – Pending gateway 2 and 3 assessments, harvesting should be allowed under standard Coastal IFOA prescriptions with additional measures, including temporary refuge based on a fixed retention requirement of 75 percent in local landscape areas</p>	<p>Six management zones:</p> <ul style="list-style-type: none"> ▪ Badja ▪ Bago-Maragle ▪ Batemans Bay ▪ Dorrigo ▪ Eden ▪ Glen Innes
<p>Extreme risk – Harvesting should be suspended for three years from February 2020</p>	<p>Three management zones:</p> <ul style="list-style-type: none"> ▪ Narooma ▪ Nowra ▪ Taree

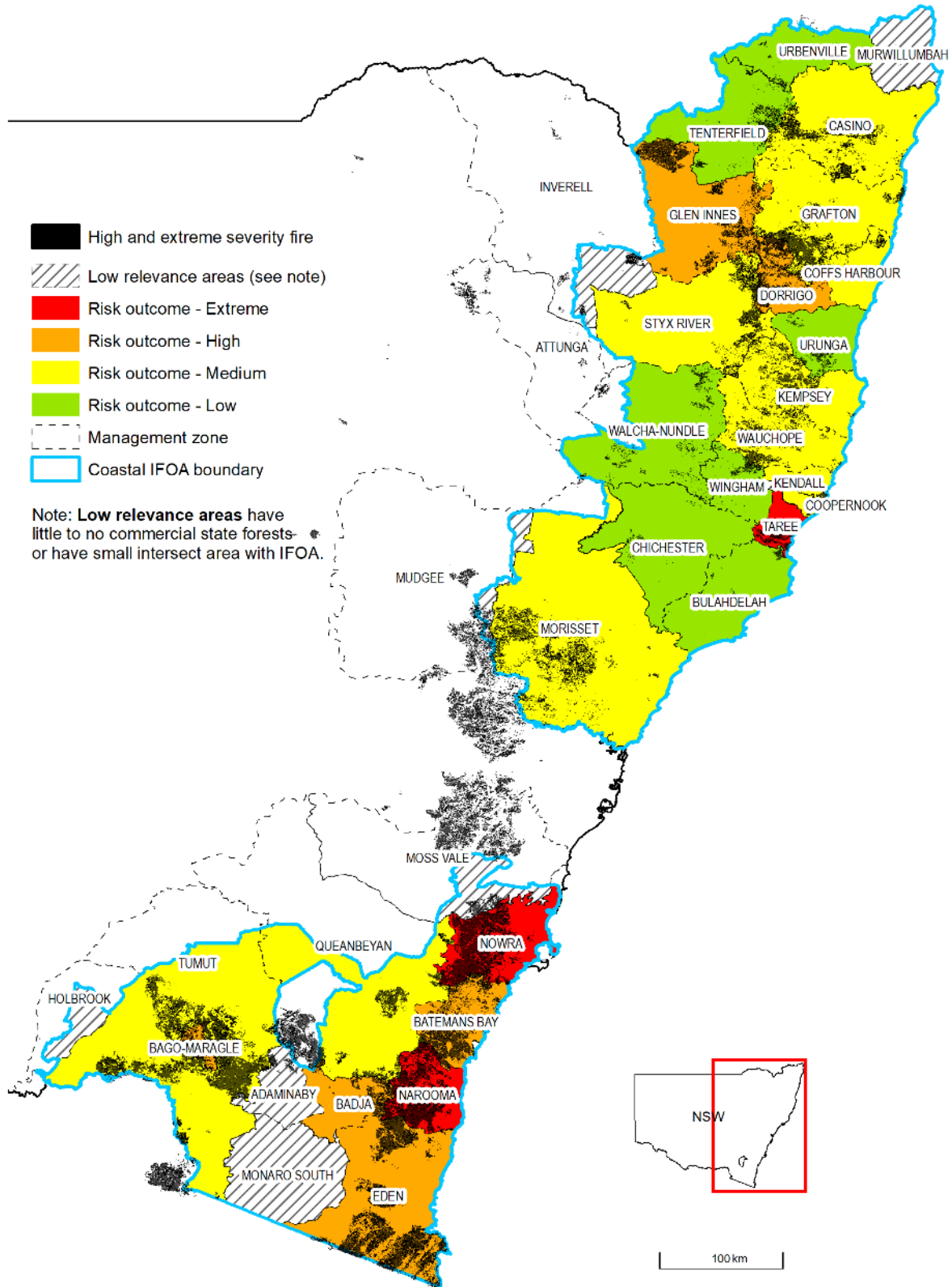


Figure 2: Risk assessment results by management zone

Significant short-term reduction in wood supply is likely on the south coast under the pathways, with smaller impacts on the north coast

The 2019/20 wildfires resulted in reduced wood supply, particularly on the south coast. For this review, FCNSW with oversight by the Commission analysed the potential wood availability and wood supply under the recommended pathways and risk mitigations, based on a scenario of progressive recovery.

FCNSW advised that the potential impact of the recommendations on timber supply cannot currently be estimated with a high level of confidence. A more detailed understanding on how gateways 2 and 3 are practically applied on-ground is needed to provide a more accurate estimate of short- to medium-term impacts on wood supply. Noting these limitations, the analysis indicates that significant short-term impacts are likely on the south coast, with smaller impacts on the north coast.²

Impacts were most severe in the South Coast subregion, where there may be up to an 80-90 percent reduction in planned wood supply volume based on the Commission's recommended pathways and risk mitigations. In the Eden subregion, risk mitigations are expected to reduce available wood supply volume by 40 percent. These impacts, while not as large as in the South Coast subregion, are still significant. In the Tumut subregion there is an estimated reduction in supply of approximately 35 percent of wood supply agreement volume. Across the north coast subregions, wood supply may be reduced by 10-20 percent under the recommended pathways and risk mitigations.

In the north coast and Eden subregions, FCNSW considers that impacts on the current operational plans could be mitigated over time by additional planning of alternative areas where harvesting can occur. However, this will require significant planning resources.

There are likely to be significant short-term jobs at risk in south coast subregions, with mill viability at risk. Jobs at risk are expected to be lower on the north coast.

Based on advice from FCNSW, reductions in wood supply from the 2019/20 wildfires has already had flow-on impacts to the forest industry in the form of reductions in work shifts and some redundancies in regions where wood supply was substantially reduced. 74 jobs were reported to have been stood down at March 2021.

The Commission analysed potential short-term impacts on the forest industry based on the potential reductions in wood supply from applying the outcomes of the risk assessment and mitigations recommended in this report. However, there were limited data on the forest industry, and no NSW-specific data on the correlation between wood volumes and employment. Estimates based on direct ratios of wood supply to employment also do not consider operating needs of mills, which require enough throughput to remain competitive. Further, under the terms of reference the Commission was not able to consult with the forestry sector or forest industry, which also impacts the accuracy of estimates.

The Commission notes that there would have been continued significant risks to jobs from the impacts of the wildfires themselves, as well as from the continued application of SSOCs and FCNSW voluntary measures.

² For the purposes of this review, the term 'south coast' refers to the general Coastal IFOA area on the south coast of NSW. This area has three subregions: South Coast, Eden and Tumut. The term 'north coast' refers to the general Coastal IFOA area on the north coast of NSW. This area has two subregions: Upper North East and Lower North East.

Noting the limitations, analysis using comparable interstate data indicates there is likely to be a significant risk to jobs in south coast subregions at least in the short term and potentially longer if mills are no longer viable at reduced supply levels. It is possible that some parts of the industry will not be viable to operate at the forecast supply levels. Estimated reduced wood supply volumes place the Nowra and Narooma sawmills at risk. Reductions in wood supply would also likely lead to lower operating levels for the existing mill and the mill currently under construction in Eden. The significantly reduced operating levels may make the mills non-viable. It is estimated that over half the forestry jobs in the south coast and Eden subregions would be affected in the short term (next 18 months) and potentially in the medium term. This warrants immediate further analysis and engagement with industry.

North coast subregions could see a relatively smaller amount of jobs at risk. The location of impact is difficult to determine and could be driven by several factors, including the potential to supplement supply from private native forestry, the capacity to redirect supply-demand imbalances and capacity of industry to use less preferred timber species.

The terms of reference did not ask the Commission to advise on recommended actions to address or mitigate potential impacts on industry. It is also not practical to do this given the uncertainties in the current analysis described above. Industry should be consulted to enable NSW Government to quantify the impacts of the measures proposed in the recommendations in this report.

The risk assessment framework allows for long-term management of risks to forests

The risk assessment framework is not a one-off process. Forests are dynamic ecosystems. There will continue to be variable recovery and future fires of varying severity and extent. The NSW Government and industry need to adapt to changing risks, including climate change. The risk assessment framework and pathways provide a mechanism to reassess risk and should be applied after the designated reassessment periods outlined in the framework.

There is already evidence of vegetation recovery in some areas due to above average rainfall in late 2020 and early 2021. If these regions continue to recover, reassessment would allow them to be given a lower risk rating once nominated thresholds for recovery are reached and timing for reassessment is met. Similarly, the reassessment also allows for risk ratings to be increased in the event of further large-scale forest impacts, such as future fires. This is important given predicted changes to climate will continue to challenge the health and condition of NSW forest ecosystems.

A new condition and protocol should be included in the Coastal IFOA to give effect to the pathways

The recommended pathways and risk assessment framework have been developed in response to a *force majeure* event: the 2019/20 wildfires were an unforeseen circumstance that would prevent FCNSW from fulfilling its obligations under the Coastal IFOA to meet the Coastal IFOA objectives and outcomes. There is currently no condition in the Coastal IFOA that enables broad scale changes to conditions to be efficiently implemented in the event of a large-scale fire, such as the 2019/20 wildfires.

To give effect to the pathways, a new condition and protocol should be developed and included in the Coastal IFOA. The Commission considers that this is the most effective way to ensure the NSW Government can provide effective regulatory responses to *force majeure* events in the future.

Alternative approaches to implementing the framework and pathways include continuing to apply SSOCs under Condition 23.4 of the Coastal IFOA or through a voluntary arrangement with FCNSW, noting the Environment Protection Authority (EPA) has no authority to regulate voluntary arrangements. However, the Commission considers these approaches would be less efficient, transparent, and potentially less effective (in the case of SSOCs). They would also be harder to apply consistently, enforce and regulate.

Interim arrangements should be implemented ahead of a new condition and protocol being finalised

Agencies advised that a new condition and protocol will likely take approximately 12 months to develop, conduct public consultation and submit to Ministers to consider and approve. However, there is an urgent need to provide greater certainty to the timber industry and the regional communities dependent on this industry and to provide greater environmental protections over what the Coastal IFOA currently provides for. Further, in the absence of agreed SSOCs, there is a need for clarity on how the NSW Government is overseeing FCNSW fulfilling its responsibilities in ecologically sustainable forest management (ESFM) in response to the wildfires. In addition, it is essential to test and understand the practical implications associated with implementing gateways 2 and 3 in the risk assessment.

To address these concerns, the Commission recommends the following interim arrangements be adopted while the NSW Government fast-tracks the recommended condition and protocol. These include that:

- FCNSW can commence new forestry operations under standard Coastal IFOA prescriptions in management zones classified by the Commission as low risk (and continue any existing forestry operations in low risk areas)
- jointly under Section 69R of the *Forestry Act 2012*, the two Ministers suspend existing, planned or new forestry operations in management zones classified by the Commission as extreme risk until a new condition and protocol is adopted³ (existing operations should cease as soon as operationally practical but no longer than three months)
- the NSW Government request in writing that FCNSW:
 - continues with existing forestry operations under SSOCs or the Coastal IFOA with FCNSW's additional supplementary measures in management zones classified by the Commission as medium or high risk, but harvesting in these operations must cease within six months, after which interim arrangements must be voluntarily adopted (described in the following point)
 - for all other forestry operations, adopt on a voluntary basis the risk assessment process, including fieldwork, and additional measures for planned or new forestry operations in management zones classified as medium and high risk, and apply until a new condition and protocol is adopted
- the Commission oversees the interim arrangements in close collaboration with FCNSW and EPA and provides any further advice to the NSW Government on the recommended condition and protocol before finalising.

³ The Commission notes that under obligations intended to be legally enforceable in the NSW Regional Forest Agreements, NSW is required to advise the Commonwealth within 14 days of a termination, suspension or revocation of an integrated forestry operations approval that applies in a Regional Forest Agreement area.

The framework should be adaptively managed, and a stronger evidence base established for long-term forest management

The Commission is confident that the proposed framework is fit-for-purpose and has built in several safeguards – including multi-scale risk assessments and field tests – to reduce the risk of errors or perverse assessment outcomes.

However, like most management processes, uncertainties will always remain, such as in the setting of risk thresholds. As such, it is critical that an adaptive management approach is adopted, with mechanisms allowing for regular review and improvement of the framework as lessons are learned through its implementation. This could be efficiently facilitated through the existing Coastal IFOA annual health check process overseen by the NSW Forest Monitoring Steering Committee.

The NSW Government's existing Forest Monitoring and Improvement Program will lead and coordinate monitoring, evaluation and research for improved forest management on public and private land. However, there are additional monitoring and research needs required to support the implementation of the framework and inform policies and responses to future large-scale fire events.

While decision making in this area will always rely on judgement and expert advice to some extent, the NSW Government should invest in building the evidence and tools to support future data-driven decision making. This will help reduce uncertainty and increase confidence in 'what to do next' when future fires impact forests and the forestry sector.

The results of climate and wildfire modelling indicate that these drought and fire conditions will happen again in the future. Ensuring the NSW Government has the best empirical evidence regarding the impacts of the full range of management prescriptions will allow faster, more targeted, and more effective responses to future wildfires. This will save money, protect jobs, and better protect forest values, including biodiversity.

Agencies require additional resources to implement the pathways

Implementing the pathways will require additional resources, including to accelerate the development of datasets and undertake desktop and field assessments for the gateways. The development of a new condition and protocol will also require legal and policy resources. While the current Forest Monitoring and Improvement Program will support implementation of the pathways if adopted, the scope and scale of some of this work will need to be expanded, including targeted, experimental research to understand if and how forestry can occur in future post-fire landscapes.

Recommendations

- 1 The NSW Government should adopt the Gateway 1 pathways presented in **Table 1** and **Figure 2** in this report, to:
 - 1.1 allow for harvesting under standard Coastal IFOA prescriptions in the following **seven low risk management zones**: Bulahdelah, Chichester, Tenterfield, Urbenville, Urunga, Walcha-Nundle and Wingham
 - 1.2 allow for harvesting under standard Coastal IFOA prescriptions with additional measures (as described **Table 16**), including temporary refuges based on a variable retention requirement in local landscape areas in the **following eleven medium risk management zones**: Casino, Coffs Harbour, Coopersnook, Grafton, Kempsey, Kendall, Morisset, Queanbeyan, Styx River, Tumut and Wauchope
 - 1.3 allow for harvesting under standard Coastal IFOA prescriptions with additional measures (as described **Table 16**), including temporary refuges based on a fixed retention requirement of 75 percent in local landscape areas in the following **six high risk management zones**: Badja, Bago-Maragle, Batemans Bay, Dorrigo, Eden and Glen Innes
 - 1.4 temporarily suspend harvesting for a minimum of three years (from February 2020) in the following **three extreme risk management zones**: Narooma, Nowra and Taree.
- 2 The NSW Government should adopt the Commission's risk assessment framework used to determine the pathways in Recommendation 1 (as presented in **Chapter 5**) and apply it at the reassessment intervals outlined in the framework until all management zones have returned to standard Coastal IFOA prescriptions (low risk). The NSW Government should request the Commission to undertake the annual reviews, including Gateway 1 assessments.
- 3 To give effect to the pathways and risk assessment:
 - 3.1 the NSW Government should amend the Coastal IFOA to include a new *force majeure* condition and associated protocol that includes the risk assessment process (**Chapter 5**) and additional measures set out in **Table 16**
 - 3.2 as required by the *Forestry Act 2012*, the NSW Government should include in the development of the new condition public consultation and joint approval by the Deputy Premier/Minister for Regional NSW and Minister for Energy and Environment⁴
 - 3.3 the Chief Executive Officer of the EPA and the Director General of DPI should jointly approve the new protocol
 - 3.4 the EPA must collaborate with the FCNSW in developing the new protocol, and on any subsequent amendments
 - 3.5 the NSW Government should accelerate improvement of DPIE-EES' recovery index in consultation with FCNSW, including a large-scale, funded, scientific field sampling strategy across the Coastal IFOA region and request the Commission to oversee this work through the Forest Monitoring and Improvement Program. The

⁴ The *Forestry Act 2012* requires joint approval from the Minister for the Environment and Minister for Lands and Forestry. The Commission has adopted the Ministers' current portfolio titles throughout this report.

- post-fire spectral recovery index should be updated in January each year based on new satellite imagery.
- 4 The NSW Government should adopt the interim implementation arrangements outlined in **Section 4.2** while the recommended condition and protocol is developed to provide additional time to test and understand the practical implications associated with implementing gateways 2 and 3 in the risk assessment.
 - 5 The NSW Government should provide FCNSW, EPA, DPIE-EES and the Commission with additional resources for planning and field-testing to implement the recommended framework and pathways.
 - 6 The NSW Government should initiate a rapid assessment of forestry industry size, viability, and resilience to changes in wood supply for south coast subregions in full consultation with industry.
 - 7 To ensure the risk framework is responsive to new data and events, the NSW Government requests the NSW Forest Monitoring Steering Committee to:
 - 7.1 regularly review and improve the risk assessment framework under its oversight role and annual health checks for the Coastal IFOA monitoring program including public reporting
 - 7.2 recommend priority research and monitoring (**Section 4.5**) for further funding.
 - 8 To ensure that future forestry in a changing climate is sustainable and reflects best practice, the NSW Government should:
 - 8.1 ensure the risks of achieving Coastal IFOA outcomes and objectives under predicted change in fire regimes and drought are effectively considered during the scheduled five-yearly Coastal IFOA review, in consultation with the community
 - 8.2 fund FCNSW to accelerate its sustainable yield modelling improvement program to incorporate projected climatic and fire regimes and post-fire mortality and growth assumptions. This work to include a reference group, including relevant independent experts, the EPA, DPIE-EES, DPI Forestry and the Commission
 - 8.3 consider how it can best support regional employment and multi-use forests under different predicted climatic and fire scenarios
 - 8.4 invest in landscape-scale research on forestry and forest management, including ecological recovery and regeneration in the south coast. This could span two management zones assessed as high and extreme risk with similar forest types to ensure a full suite of fire severity impacts are included.
 - 9 The NSW Government should increase investment in large-scale, regionally coordinated pest and weed control on state forests to address risks from incursion and predation.