Australia's National
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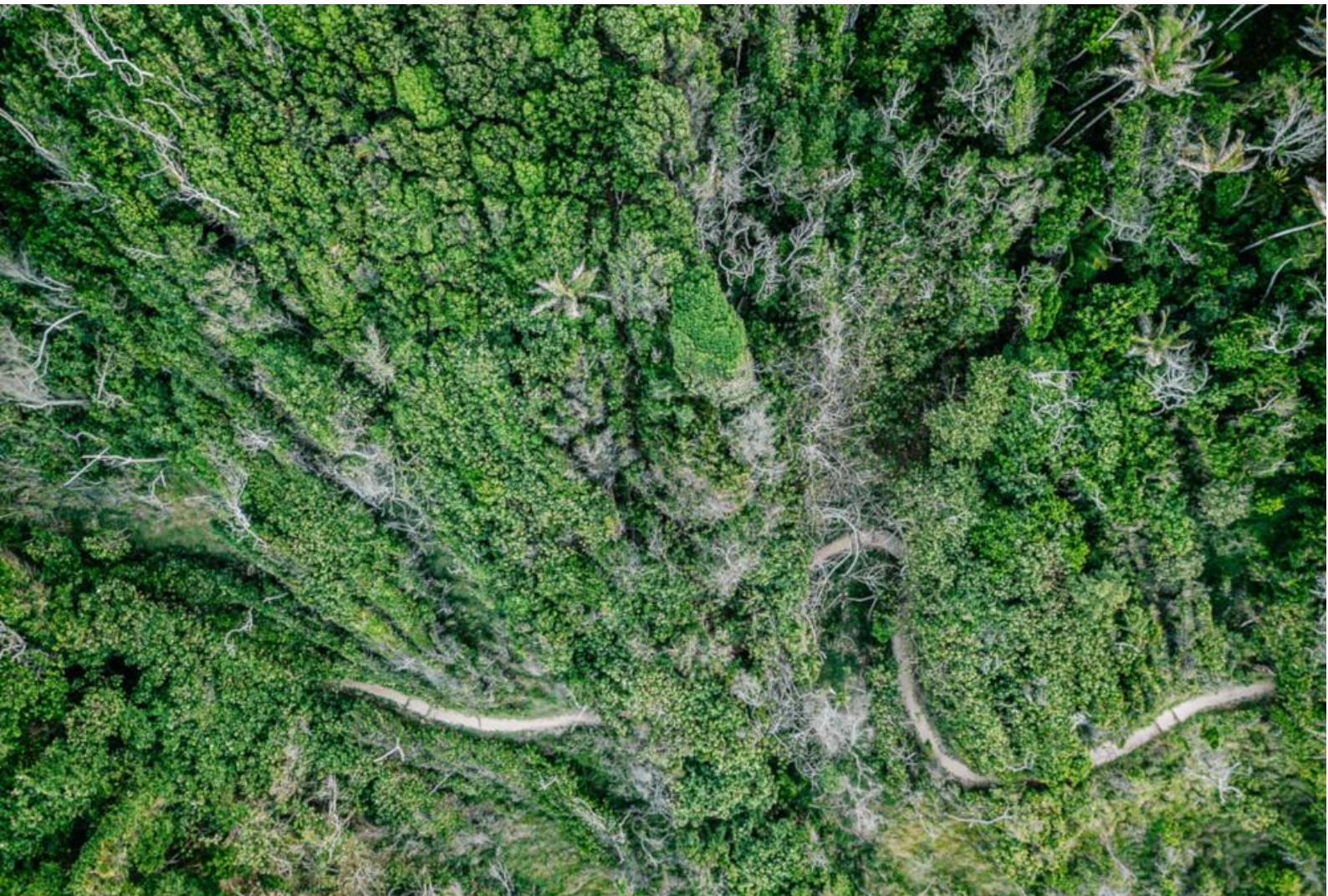
# Assessing natural capital risks for Australia's forest industry

CSIRO, together with forestry and financial sector partners, has developed a methodology for carrying out rigorous, comparable assessments of natural capital risks for Australian forest growers, consistent with emerging international standards. The project is now identifying indicators and data sources to facilitate these assessments. The intent is that the framework will be piloted by both small- and large-scale forest managers in Tasmania (including Private Forests Tasmania, Sustainable Timbers Tasmania, Forico and Reliance Forest Fibre, which together represent the majority of Tasmanian production forestry). These pilots will explore the framework's utility in terms of improving business performance, supporting transparent disclosure of natural capital risks and risk management to lenders, investors and other stakeholders, unlocking ecosystem services markets and improving social licence to operate.



## What is natural capital?

The term natural capital refers to nature as a stock of natural assets generating flows of ecosystem services that contribute to human economic activity and wellbeing. Natural capital assets are the clean air, water, land, soil and living things that together provide humans with the means for healthy lives and enable economic activity. Globally, natural capital assets are under pressure. Changes in natural capital are being driven directly via impacts associated with its use such as pollution and land clearing, as well as indirectly via processes such as climate change. Demand for the services derived from natural capital is increasing with population size and economic growth. Combined, these pressures affect the capacity of natural capital to continue to provide the environmental goods and services that businesses and society depend on.

Degradation of natural capital can translate into economic and business risks. These risks can be understood in terms of:

- **Dependencies**: Businesses depend on natural capital, and this can create a risk of financial loss if the ecosystem services the business depends on become less available in future. For example, forestry enterprises depend on adequate rainfall for growing trees, and precipitation patterns may be affected by climate change. Lower rainfall could reduce productivity or entail increased costs. Currently, risks associated with dependencies on natural capital are not commonly explicitly recognised by businesses.
- **Impacts**: Business activities also can impact on natural capital, either positively or negatively, and this can create a risk of incurring additional costs (e.g. clean-up costs or fines), loss of social licence or reputation, or loss of natural capital that the business itself depends on. For example, pollution can affect soil and water quality, which may lead to regulatory penalties as well as lowering the business's own productivity.

Sustainably managed forestry can maintain or increase natural capital and produce financial benefits. Conversely, less well managed forestry has the potential to degrade natural capital, thus directly or indirectly undermining its own long-term financial, environmental and social sustainability.

## The first study of natural capital risk in the Australian forestry sector

In December 2020, CSIRO released a report: '**Natural Capital Risk Assessment – Australian Forestry'**. This report:

- **Builds on emerging international standards for natural capital risk assessment** (the Natural Capital Protocol and the Natural Capital Finance Alliance guide to natural capital risk assessment in agriculture).
- Presents the **first systematic, evidence-based materiality assessment of the risks associated with natural capital dependencies and impacts for Australian forestry**. A risk is considered material if it has reasonable potential to significantly alter decisions being taken, such as a decision to invest in or lend to a forestry enterprise.

## What are the key natural capital risks in Australian forestry?

The CSIRO report looked into:

- Water availability
- Water use
- Water quality
- Temperature
- Extreme events – bushfires, and other events
- Soil quality
- Fertiliser use
- Contamination and waste
- Biodiversity
- Weeds
- Pests and diseases
- Energy
- Greenhouse gas emissions
- Other air emissions

## What did we find?

The most material risks for Australian forestry were associated with water availability, temperature, bushfire, extreme storm events, soil quality and pests and diseases (for all sub-sectors), and biodiversity (for native forests). All of these highly material risks arise from natural capital dependencies, apart from biodiversity which was an impact risk for native forests only, and bushfire and soil quality which were both a highly material dependency risk and impact risk.

**Table 0-1 Summary of materiality assessment of Australian forestry natural capital impact and dependency risks, by sub-sector**

| Thematic area | Risk area | Definition | Materiality | | |
|---|---|---|---|---|---|
| | | | Softwood plantations | Hardwood plantations | Native forests |
| Water | Water availability (dependency) | The risk that rainfall, or groundwater resources, will be insufficient to produce the target volume and quality of harvestable biomass. | High | High | High |
| | Water use (impact) | The risk that water extracted beyond its renewal rate, or diverted away from other ecosystem uses. | Moderate | Moderate | Low |
| | Water quality (impact) | The risk that forestry activities negatively affect the quality of surface or sub-surface water. | Low | Low | Low |
| Weather and climate | Temperature (dependency) | The risk of lower productivity and/or increased costs due to exposure to changes in average temperatures, or temperature extremes. | High | High | High |
| | Bushfires (dependency) | The risk of lower productivity and/or increased costs due to exposure to bushfires. | High | High | High |
| | Bushfires (impact) | The risk that forest activities, such as prescribed burning, may increase the incidence of fire in the surrounding areas. | Moderate | Moderate | High |
| | Extreme storm events (dependency) | The risk of lower productivity and/or increased costs due to exposure to extreme storm events, for example floods, storms, hail, snow, cyclones. | High | High | High |
| Land and soil | Soil quality (dependency) | The risk of lower productivity and/or increased costs due to poor soil quality. | High | High | High |
| | Soil quality (impact) | The risk that forestry activities negatively affect soil quality. | High | High | High |
| | Fertiliser use (dependency) | The risk that non-renewable inputs to fertiliser may be priced at higher levels in future. | Low | Moderate | N/A |
| | Contamination and waste (impact) | The risk that land is contaminated with various forms of waste. | Low | Low | Low |
| Biodiversity and ecosystems | Biodiversity (dependency) | The risk of lower productivity and/or increased costs due to loss of ecosystem services provided by biodiversity. | Moderate | Moderate | Moderate |
| | Biodiversity (impact) | The risk that forestry activities may negatively affect biodiversity or habitats. | Moderate | Moderate | High |
| | Weeds (dependency) | The risk of lower productivity and/or increased costs due to weeds. | Moderate | Moderate | Moderate |
| | Weeds (impact) | The risk that forestry activities increase the incidence or impact of weeds. | Moderate | Moderate | Low |
| | Pests and diseases (dependency) | The risk of lower productivity and/or increased costs due to pests and diseases. | High | High | High |
| | Pests and diseases (Impact) | The risk that forestry activities increase the incidence or impact of pests and diseases. | Low | Low | Low |

| Thematic area | Risk area | Definition | Materiality | | |
|---|---|---|---|---|---|
| | | | Softwood plantations | Hardwood plantations | Native forests |
| **Energy** | **Energy (dependency)** | The risk of lower productivity and/or increased costs due to inefficient use of energy and/or higher prices of energy inputs. | **Low** | **Low** | **Low** |
| **Air emissions** | **Greenhouse gas emissions (impact)** | The risk that emissions of greenhouse gases may be priced at higher levels in future, reflecting true costs of climate change, or that regulations will limit future GHG emissions. | **Low** | **Moderate** | **Moderate** |
| | **Other air emissions (impact)** | The risk that other air emissions (such as particulates and volatile organic compounds) may be priced at higher levels in future, or regulations will limit future emissions. | **Low** | **Low** | **Moderate** |

## Lessons for the forest industry

- **Climate change is an underlying driver of environmental change affecting all 'highly material' dependencies**, for example through altering rainfall, temperature, fire regimes, and the distribution of pests and diseases. Climate change could also exacerbate impacts from forestry operations, such as impacts on biodiversity.
- The long-term time horizons of climate change, the uncertain outcomes, and the long timeframes for growing trees, all increase the financial risk to forestry enterprises.
- Overall, **impacts were generally scored as lower materiality than dependencies**. This reflects a lower financial risk to the business from impacts and a higher financial risk from dependencies. That is not to say that unsustainable forest management would not cause significant impacts on, and degradation of, natural capital, but that the materiality to the business of those natural capital risks is generally lower. This is partly due to the fact that management of these impacts is already highly regulated and largely integrated into forest management plans, with mitigation strategies in place.

The conclusions of this assessment are generic and only applicable at whole-of-industry level in Australia, at the present time. Assessments at individual estate level, and/or sector level in specific regions, may differ.

This research does, however, provide a framework to guide future assessments for individual forest estates on a case-by-case basis. Frameworks and guidelines like this (a) increase the comparability and credibility of assessments, (b) provide a systematic way for companies to identify what it is important to report against, and to manage in their operations and (c) put the industry in a better position to disclose natural capital risks and dependencies to markets and potential investors.

## Next steps.

CSIRO continues to work with the forestry industry, financial sector and government to further progress natural capital risk management. We are currently identifying suitable indicators and data to assess natural capital risk. This will help forest managers to monitor and manage their natural capital impacts and dependencies, and help the financial sector to evaluate natural capital risks associated with investments in forestry. A consistent and comparable framework for assessing and disclosing natural capital risk is in line with recent recommendations for improved disclosure of climate risk from the Task Force on Climate-related Financial Disclosures (TCFD), which in turn has led to calls for a Task Force on Nature-related Financial Disclosures (TNFD - https://tnfd.info/) to be established.

'**Natural Capital Risk Assessment – Australian Forestry'** was written by Greg S. Smith, Francisco Ascui, Anthony O'Grady and Libby Pinkard. The report was funded by the National Institute for Forest Products Innovation (Launceston) with the support of the Australian and Tasmanian State Governments. It is the second report of the '*Unlocking financial innovation in forest products with natural capital*' project and is available at http://hdl.handle.net/102.100.100/389889?index=1

The first report in the '*Unlocking financial innovation in forest products with natural capital*' project '*Opportunities for natural capital financing in the forestry sector*' is available at: https://doi.org/10.25919/5e4ad4ab53e43



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