

# Conserving Native Forests

Volume | 452



Edited by Justin Healey

**ISSUES**  
**IN SOCIETY**

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# INTRODUCTION

**Conserving Native Forests** is Volume 452 in the 'Issues in Society' series of educational resource books. The aim of this series is to offer current, diverse information about important issues in our world, from an Australian perspective.

## KEY ISSUES IN THIS TOPIC

Time is running out for the world's forests, whose total land area is shrinking daily. Humans depend on forests for shelter, the food we eat, the air we breathe and the wood products we use. Besides providing habitats for animals and livelihoods for people, forests also protect biodiversity, prevent soil erosion, produce oxygen and help to mitigate climate change. Global deforestation and forest degradation is a great problem requiring greater action.

This book looks at the current state of the world's forests and progress towards more sustainable forest conservation globally. It also focuses on how Australia is managing and conserving its own native forests, with topics including forestry protection policies; tree clearing and logging regulation; addressing habitat destruction and species loss; and forestry certification, practices and plantations. What are the sustainable solutions to deforestation and forest management – how do we see the forests for the trees?

## SOURCES OF INFORMATION

Titles in the 'Issues in Society' series are individual resource books which provide an overview on a specific subject comprised of facts and opinions.

The information in this resource book is not from any single author, publication or organisation. The unique value of the 'Issues in Society' series lies in its diversity of content and perspectives.

**The content comes from a wide variety of sources and includes:**

- Newspaper reports and opinion pieces
- Website fact sheets
- Magazine and journal articles
- Statistics and surveys
- Government reports
- Literature from special interest groups

## CRITICAL EVALUATION

As the information reproduced in this book is from a number of different sources, readers should always be aware of the origin of the text and whether or not the source is likely to be expressing a particular bias or agenda.

It is hoped that, as you read about the many aspects of the issues explored in this book, you will critically evaluate the information presented. In some cases, it is important that you decide whether you are being presented with facts or opinions. Does the writer give a biased or an unbiased report? If an opinion is being expressed, do you agree with the writer?

## EXPLORING ISSUES

The 'Exploring issues' section at the back of this book features a range of ready-to-use worksheets relating to the articles and issues raised in this book. The activities and exercises in these worksheets are suitable for use by students at middle secondary school level and beyond.

## FURTHER RESEARCH

This title offers a useful starting point for those who need convenient access to information about the issues involved. However, it is only a starting point. The 'Web links' section at the back of this book contains a list of useful websites which you can access for more reading on the topic.

## THE STATE OF THE WORLD'S FORESTS

THIS FACT SHEET IS COURTESY OF THE **FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**

### FOREST PATHWAYS TO SUSTAINABLE DEVELOPMENT

**T**he 2018 edition of *The State of the World's Forests* shines a light on the profound interlinkages that exist between forests and trees and multiple goals and targets of the 2030 Agenda for Sustainable Development.

Bringing together evidence from a wide range of scientific sources, the analysis indicates how forests are critical to the livelihoods of the world's poorest people and confirms the vital importance of healthy and productive forests to sustainable agriculture. It provides proof of the significance of forests and trees for water quality, climate and biodiversity, for future energy needs and for designing sustainable, healthy cities. SOFO 2018 draws on eight case studies in countries across continents, describing how actions and landscape approaches that simultaneously address forests, agriculture, food, land use, and rural and national development have led to progress.

Delivering the 2030 Agenda requires fortifying an enabling environment and creating the conditions necessary for transformational change. Forest pathways to sustainable development will be fundamentally

### Progress towards sustainable forest management for each of the sub-indicators of SDG indicator 15.2.1

SDG regional grouping	Forest area net change rate	Above-ground biomass stock in forest	Proportion of forest area located in legally established protected areas	Proportion of forest area under long-term forest management plans	Forest area under independently verified forest management certification schemes
World	●	●	●	●	●
North America	●	●	●	●	●
Europe	●	●	●	●	●
Latin America and the Caribbean	●	●	●	●	●
Central Asia	●	●	●	●	●
South Asia	●	●	●	●	●
Eastern Asia	●	●	●	●	●
Southeast Asia	●	●	●	●	●
Western Asia	●	●	●	●	●
North Africa	●	●	●	●	●
Sub-Saharan Africa	●	●	●	●	●
Oceania, excluding Australia and New Zealand	●	●	●	●	●
Australia and New Zealand	●	●	●	●	●
Landlocked developing countries (LLDCs)	●	●	●	●	●
Least-developed countries (LDCs)	●	●	●	●	●
Small island developing states (SIDS)	●	●	●	●	●

NOTE: The indicator is presented as a dashboard of traffic lights that show progress in each of the five sub-indicators, with green, yellow and red indicating the direction and rate of change.  
SOURCE: FAO, FRA 2015a.

● Positive change  
● No/small change  
● Negative change  
● No certified areas



## KEY MESSAGES

- To achieve our global goals, urgent action is needed to sustain the planet's forests. Time is running out for the world's forests, whose total area is shrinking by the day.
- The branches of forests and trees reach out across the SDGs. From tackling poverty and hunger to mitigating climate change and conserving biodiversity, the impacts of forests and trees go well beyond SDG15 to contribute to achieving multiple goals and targets across the 2030 Agenda.
- It is time to recognise that food security, agriculture and forestry can no longer be treated in isolation. Sustainable agriculture needs healthy and productive forests. Forests and trees supply hundreds of millions of people with food, energy and income, acting as a safety net during hard times.
- To reach those furthest behind first, we must go down the forest path and empower agents of change. Policies that secure tenure rights for the poor and vulnerable, including indigenous people, landless farmers, rural women and youth, will go a long way to ending poverty and food insecurity.
- Landscape approaches balance sustainability. Landscape approaches that protect and sustainably use vital ecosystem services, sustain livelihoods and tackle food security challenges while adapting to the impacts of climate change must be integrated into national strategies and development priorities.
- Coherent policy frameworks encourage partnerships and stakeholder engagement in forests. Effective partnerships and private sector engagement, clear legal frameworks, community engagement and coherent policy measures that balance stakeholder interests are part of the enabling environment needed to successfully integrate forests into sustainable development strategies.
- Healthy cities need trees. Trees, parks and forests are a must for planners designing the sustainable cities and peri-urban landscapes of the future.
- Evidence is key in achieving recognition of the true value of forests in the 2030 Agenda. By investing in monitoring at national and subnational levels, governments will gain a clearer picture of the social, economic and environmental impact of forests and trees across the SDGs.



## FACTS

- Studies suggest that forests and trees may provide around 20 per cent of income for rural households in developing countries, both through cash income and by meeting subsistence needs.
- In 2015, 25 per cent of forests were managed with soil and/or water conservation as an objective, a global increase over the past 25 years.
- Forests supply about 40 per cent of global renewable energy in the form of wood fuel – as much as solar, hydroelectric and wind power combined.
- An estimated 38 per cent of global industrial roundwood was certified as being sustainably produced in 2016.
- By the end of 2017, some 120 countries had made commitments to climate change mitigation and adaptation that include action on forests.

strengthened by legal frameworks that recognise and secure the rights of local communities and smallholders to access forests, by transforming the informal sector and helping to incentivise private sector engagement in pro-sustainability activities.

Investing in effective monitoring will help plug data gaps so that countries can fashion integrated policies based on evidence. Ultimately, ending hunger and poverty and transforming to a sustainable world can only be realised if sectoral ministries – forestry, agriculture, rural development and national development – coordinate policies across government.

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Food and Agriculture Organization of the United Nations (July 2018). *The State of the World's Forests*. Retrieved from [www.fao.org](http://www.fao.org) on 26 March 2019.



# FORESTS AND TREES ARE KEY FOR A SUSTAINABLE FUTURE

Time is running out for the world's forests, whose total area is shrinking by the day, warns a [FAO](#) report which urges governments to foster an all-inclusive approach to benefit both trees and those who rely on them

**H**alting deforestation, managing forests sustainably, restoring degraded forests and adding to worldwide tree cover all require actions to avoid potentially damaging consequences for the planet and its people, according to *The State of the World's Forests 2018*.

Forests and trees contribute far more to human livelihoods than is commonly known, playing crucial roles in food security, drinking water, renewable energy and rural economies. They provide around 20 per cent of income for rural households in developing countries – notably more in many areas – and fuel for cooking and heating for one in every three people around the world.

“Forests are critical to livelihoods,” said FAO Director-General José Graziano da Silva.

“Healthy and productive forests are essential to sustainable agriculture and we have proof of the significance of forests and trees for the quality of water, for contributing to the energy needs of the future, and for designing sustainable, healthy cities.”

This year's report documents just how essential forests are for 2030 Agenda objectives ranging from tackling climate change to conserving biodiversity, reducing inequalities and improving urban habitats. It offers concrete proof of the multiple contributions forests make and maps pathways for them to do more.

“Trees and forests contribute to achieving multiple targets across the 2030 Agenda and need to be incorporated into strategies to achieve the Sustainable Development Goals,” said FAO Forestry Director Eva Mueller.

The report emphasizes the importance of clear legal frameworks regarding forest tenure rights, applauds the growing trend in local governance, and calls for effective partnerships and private sector engagement to pursue sustainable goals. Given that deforestation is the second leading cause of climate change after burning fossil fuels, it notes that “corporate responsibility for zero deforestation is key.”

## PROGRESS REPORT

While there is much work to be done, the publication points to numerous examples that indicate growing awareness and a gradual increase in sustainable practices regarding the world's forests and trees.

For example, more than 56 per cent of paper is recycled today, up from less than a quarter in 1970.



Forests and trees contribute far more to human livelihoods than is commonly known, playing crucial roles in food security, drinking water, renewable energy and rural economies.

Meanwhile, using discarded materials to make wood panels for construction has allowed production to grow four times faster than fresh timber requirements over the past two decades.

Healthy forests and trees do far more than provide lumber. One in five people around the world count on non-wood forest products (NWFP) for food, income and nutritional diversity, the mainstays of human life. That is especially important for the estimated 250 million people – mostly in Africa and Asia and comprising around 40 per cent of the extreme rural poor – who live in forests and savannah areas that are “hotspots for poverty” across the tropics.

Studies show that a large number of households in tropical areas collect forest foods for their own consumption, frequently bringing in more than they produce from agriculture or raising livestock. Even in prosperous Europe, one in four people gather food directly from forests – and, including fruit and berries, 90 per cent of people purchase them.

Around one-third of smallholder farmers in Africa cultivate trees on their land, and derive around one-sixth of their gross income from them in various ways, on top of added benefits ranging from soil fertility to shade from the sun.

Globally, income generated from NWFPs amounts to \$88 billion, but the real figure is likely much higher. Research in Uganda found that the non-cash value of forest products – in this case including charcoal and building materials – was two to four times higher for the local population than the cash raised by their sale.

Forests also help people buy food by boosting their income. The sector is estimated to account for more than 45 million jobs and \$580 billion in labour income each year, without considering what is understood to be a very large informal sector. Policy-makers should aim to shift more forestry jobs into the formal sector.

“To reach those furthest behind first, we must go down the forest path and empower agents of change,” Mueller said, hailing a global trend in devolving forestry rights from national governments to local and community-based tenure.

### A NATURAL ALLY FOR WATER AND ENERGY NEEDS

Sustainable forest management is an imperative for the world’s water and energy needs, the report emphasizes.

Large cities such as Vienna, Tokyo, Johannesburg and Bogota all obtain significant amounts of their drinking water from protected forests. 180 million people in the United States of America rely on forests for their drinking water, according to that country’s Forestry Service.

While many of the world’s major watersheds have lost tree cover, the report notes a worldwide increase

over the past 25 years in the forest areas now managed for soil and water conservation.

Wood fuel accounts for as much of the world’s renewable energy supply as solar, hydroelectric and wind power combined – and more than half of the national primary energy supply requirements for 29 countries, most of them in sub-Saharan Africa. That forests contain the equivalent of 142 billion tonnes of oil, roughly 10 times the annual global primary energy consumption, underscores their value and the need for their sustainable use.

*The State of the World’s Forests 2018* report has been crafted with an eye to the High-Level Political Forum on Sustainable Development meeting in New York from 9 July onwards. In this context it will be presented at a special event of the United Nations Forum on Forests.

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Food and Agriculture Organization of the United Nations  
(6 July 2018). *Forests and trees are key for a sustainable future*.  
Retrieved from [www.fao.org](http://www.fao.org) on 26 March 2019.

## IMPORTANCE OF FORESTS

**These green giants are essential for people, climate and wildlife. We need to safeguard our forests, cautions WWF in this fact sheet**

### *The importance of forests cannot be underestimated*

**W**e depend on forests for our survival, from the air we breathe to the wood we use. Besides providing habitats for animals and livelihoods for humans, forests also offer watershed protection, prevent soil erosion and mitigate climate change. Yet, despite our dependence on forests, we are still allowing them to disappear.

### *How have forests affected your life today?*

Have you had your breakfast? Travelled to work in a bus or car? Sat on a chair? Made a shopping list? Got a parking ticket? Blown your nose into a tissue? Forest products are a vital part of our daily lives in more ways than we can imagine.

### *Over 2 billion people rely on forests*

Forests provide us with shelter, livelihoods, water, food and fuel security. All these activities directly or indirectly involve forests. Some are easy to figure out – fruits, paper and wood from trees, and so on. Others are less obvious, such as by-products that go into everyday items like medicines, cosmetics and detergents.

### *Habitats for biodiversity and livelihood for humans*

Looking at it beyond our narrow, human – not to mention urban – perspective, forests provide habitats to diverse animal species. They are home to 80% of the world’s terrestrial biodiversity, and they also form the source of livelihood for many different human settlements, including 60 million indigenous people.

### *Forests provide jobs for more than 13 million people across the world*

In addition, 300 million people live in forests, including 60 million indigenous people. Yet, we are losing them. Between 1990 and 2015, the world lost some 129 million ha of forest, an area the size of South Africa. When we take away the forest, it is not just the trees that go. The entire ecosystem begins to fall apart, with dire consequences for all of us.

### *After oceans, forests are the world’s largest storehouses of carbon*

They provide ecosystem services that are critical to human welfare. These include:

- Absorbing harmful greenhouse gasses that produce climate change. In tropical forests alone, a quarter of a trillion tonnes of carbon is stored in above and below ground biomass
- Providing clean water for drinking, bathing, and other household needs
- Protecting watersheds and reducing or slowing the amount of erosion and chemicals that reach waterways
- Providing food and medicine
- Serving as a buffer in natural disasters like flood and rainfalls
- Providing habitat to more than half of the world’s land-based species.

© WWF – World Wide Fund for Nature. *Importance of Forests*.  
Retrieved from [wwf.panda.org](http://wwf.panda.org) on 25 March 2019.



# GLOBAL FOREST FACTS

## FOREST FACTS COMPILED BY THE SPINNEY PRESS



- The number of trees in the world was estimated at 3 trillion in 2015, of which 1.4 trillion are in the tropics or sub-tropics, 0.6 trillion in the temperate zones, and 0.7 trillion in the coniferous boreal forests.
- Forests cover one third of global land surface and are home to 80% of the world's terrestrial biodiversity (species of animals, plants and insects).
- Over half of the world's forests are found in just 5 nations: Canada, United States, Brazil, Russia and China.
- Tropical rainforests are the most biologically diverse and complex of forests, producing 40% of Earth's oxygen and storing more carbon than any other land-based ecosystem.
- As much as 20% of the planet's oxygen is produced by the Amazon rainforest alone.
- After oceans, forests are the world's largest storehouses of carbon, and act as carbon sinks, absorbing the greenhouse gasses that produce climate change.
- The amount of carbon absorbed by forests is dependent upon the species of trees and their age.
- Forests impact our lives daily through: the air we breathe, the food we eat, the buildings we inhabit, to everyday items made from forest products such as furniture buildings, paper, medicines and cosmetics.
- Over 1 billion people live in and around forests, depending on them for fuel, food, medicines and building materials.
- The amount of wood humans harvest from forests and plantations each year may need to triple by 2050 to meet growing global demand, putting more pressure on forests.
- Around 1.6 billion people depend on forests for their livelihood, including 70 million indigenous people.
- Between 2010 and 2015, the world lost 3.3 million hectares of forest areas.
- As forests are lost or degraded, they can become sources of harmful greenhouse gases instead of carbon sinks. Deforestation and forest degradation are the largest sources of CO<sub>2</sub> emissions after the combined emissions from all cars, trucks, trains, planes and ships in the world.
- Changing agricultural practices, due to an increased population and shifts in diet, is responsible for most of the world's deforestation.
- Illegal and unsustainable logging is responsible for most of the degradation of the world's forests.
- In the last 25 years alone, the world lost a forested area the size of South Africa. The biggest forest area loss in the last two decades has been in the tropics, particularly Africa and South America.
- More than 80% of deforestation between 2010 and 2030 is likely to happen in just 11 places. If business as usual continues, more than a quarter of the Amazon could be treeless by 2030, and we could see a global loss of forests equivalent to the size of Germany, France, Spain, and Portugal combined.
- Human impacts have already led to the loss of around 40% of the world's forests. An area the size of 40 football fields is destroyed every minute.
- Every year, 8.8 million hectares of forest is destroyed, making way for activities like cattle pasture, palm oil plantations, soy fields or roads. Most of this is in tropical regions, where there is a particularly rich variety of life.
- Even larger areas are suffering from degradation – where the forest remains, but its richness and health is in decline. Threats include illegal and unsustainable logging, overharvesting of wood for fuel and charcoal, small-scale farming, hunting, forest fires, and pests and diseases.
- Rainforests are a powerful natural climate solution. Forests not only regulate global temperatures, they also cool and regulate local microclimates and limit the Earth's reflectivity, which in turn stabilises ocean currents, wind and rainfall patterns.
- Tropical forests have become net carbon emitters. A 2017 study published in the journal *Science* reveals that tropical forests that once served as the Earth's carbon sinks now emit more carbon than they absorb, because of deforestation and forest loss caused by humans.
- Tropical rainforests cover less than 3% of Earth's area, yet they are home to more than half our planet's terrestrial animal species. Bengal tigers, mountain gorillas, orangutans, jaguars and blue poison dart frogs are among many of these species now facing extinction; their continued existence is crucial to maintaining the balance of delicate rainforest ecosystems.
- Rainforests play an essential role in maintaining the Earth's limited supply of fresh water. Rainforests add water to the atmosphere through the process of transpiration, by which plants release water from their leaves during photosynthesis.
- Rainforest plants are used in some of the world's most important, life-saving medicines. More than 60% of anti-cancer drugs originate from natural sources, including rainforest plants. Compounds in rainforest plants are already used to treat malaria, heart disease, bronchitis, hypertension, rheumatism, diabetes, muscle tension, arthritis, glaucoma, dysentery and tuberculosis, among other health problems. Many commercially available anaesthetics, enzymes, hormones, laxatives, cough mixtures, antibiotics and antiseptics are also derived from rainforest plants and herbs.
- The Earth's forest areas continue to shrink, down from 4.1 billion hectares in 2000 (31.2% of total land area) to about 4 billion hectares (30.7% of total land area) in 2015. However, the rate of forest loss has been cut by 25% since 2000-2005.

### SOURCES

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Compiled by The Spinney Press.

# SAVING FORESTS AT RISK

More than 80% of deforestation between 2010 and 2030 is likely to happen in just 11 places. These are the “deforestation fronts”, according to this fact sheet summary reproduced courtesy of WWF

WWF wants to see an end to the destruction of our planet’s vital forests. Our target, as explained in previous chapters of the *Living Forests Report*, is Zero Net Deforestation and Forest Degradation (ZNDD) by 2020.<sup>1</sup>

To achieve this, we need to focus on the forests most at risk. Drawing on a wealth of research, WWF has identified 11 deforestation fronts (*see map*) – places where the largest concentrations of forest loss or severe degradation are expected in the near future.

Without action to change current trends, up to 170 million hectares of forest could be destroyed in these places by 2030 – more than 80 per cent of total projected forest losses globally. Imagine a forest stretching across Germany, France, Spain and Portugal – wiped out in just 20 years.

The 11 deforestation fronts contain some of the richest biodiversity in the world, including large numbers of unique species. Urgent action is needed to save them.

## WHAT ARE THE THREATS?

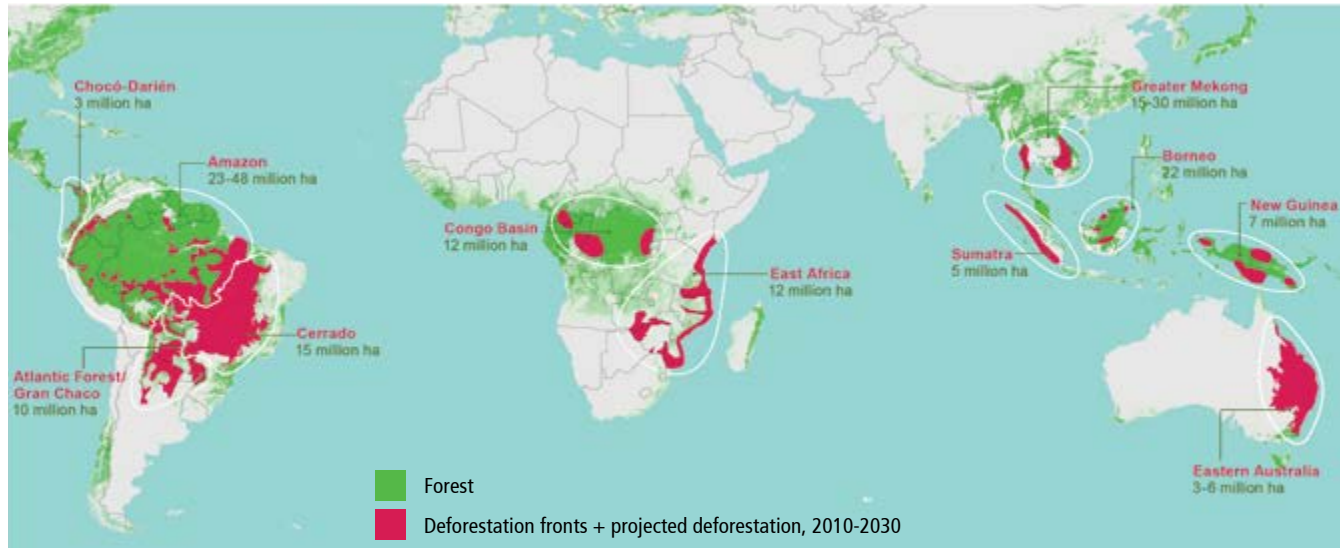
Different deforestation fronts face different pressures. Globally, the biggest cause of deforestation is expanding agriculture – including commercial livestock, palm oil and soy production, but also encroachment by small farmers. Unsustainable logging and fuelwood collection can lead to a spiral of degradation that eventually leads to deforestation or “death by a thousand cuts.”

Mining, hydroelectricity and other infrastructure projects are another major threat – new roads can have a large indirect impact through opening up forests to settlers and agriculture. Forest fires are also increasing in frequency and intensity.

## WHAT ARE THE SOLUTIONS?

As previous chapters of the *Living Forests Report* have shown, it’s possible to meet human demands for food, energy and raw materials in the coming decades without sacrificing precious forests. With better planning, management and collaboration at a landscape scale, we can sustainably increase production and meet local development needs while conserving critical ecosystems.

## WHERE ARE THE DEFORESTATION FRONTS?

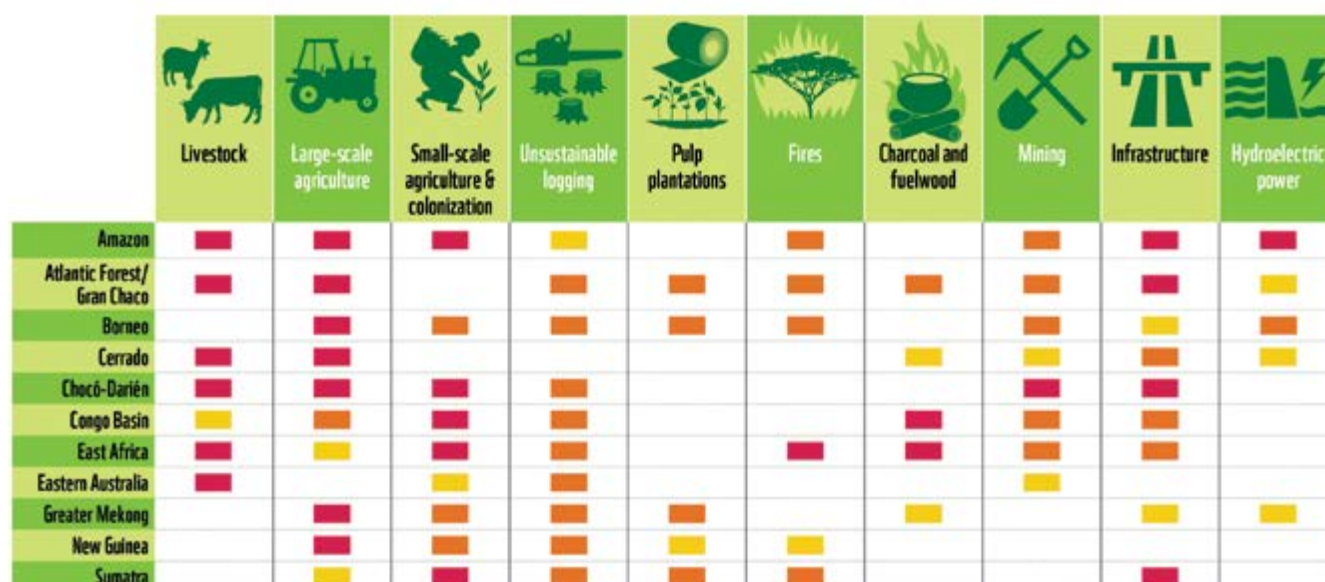


### The 11 deforestation fronts, with projected losses, 2010-2030

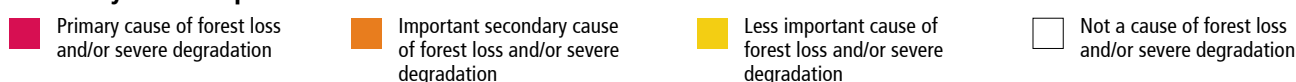
**HIGHLIGHTS FROM THE FRONTS.** **Amazon:** The world’s largest forest is also where the biggest losses are expected. If recent deforestation trends continue, more than a quarter of the Amazon will be treeless by 2030. **Atlantic Forests/Gran Chaco:** Tighter legal controls to protect remaining fragments of Atlantic Forests are putting pressure on the Gran Chaco; 85 per cent of the forest there has been cleared in the past 30 years and the deforestation rate is accelerating. **Borneo:** The island of Borneo has lost almost half its forests over the last few decades – and half of what’s left could be destroyed by 2030. Palm oil plantations are a main cause. **Cerrado:** Brazil’s Cerrado contains almost 5 per cent of all species on Earth, but less than 3 per cent of it is strictly protected. Conversion of natural vegetation to agriculture continues at an alarming rate. **Chocó-Darién:** The tropical rainforests of the Chocó-Darién are among the most biologically diverse regions in the world, but they’re increasingly threatened by coca production and cattle ranching. **Congo Basin:** The Congo Basin contains a fifth of the world’s tropical forests, home to gorillas, chimps and forest elephants. But forests could become fragmented to meet a fast-growing population’s needs for fuel and farmland. **East Africa:** Farming and fuelwood collection, driven by a high population density, threaten the Miombo woodlands and coastal forests of East Africa. Forest fires are also an increasing problem. **Eastern Australia:** A weakening of laws to control deforestation in Queensland and New South Wales could bring a resurgence of large-scale forest clearing, mainly for livestock farming. **Greater Mekong:** The economies of the Greater Mekong are booming, but much development has come at the expense of the region’s forests – threatening unique biodiversity and essential ecosystem services. **New Guinea:** The region retains significant forest cover. However, it faces a growing deforestation threat. The rate of forest loss could surge if current proposals for agricultural development are realized. **Sumatra:** Sumatra holds some of the richest and most diverse forests in the world – but more than half have been destroyed, and what remains is at risk from land clearing by new settlers or for commercial plantations of oil palm, rubber or pulpwood.

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# DEFORESTATION PRESSURES



Summary of main pressures on forests in different deforestation fronts



Large-scale interventions are needed in deforestation fronts to stop the march of deforestation and manage land use more smartly and sustainably. Parts of the solution include:

- Expanded and strengthened networks of protected areas. Well-managed protected areas, including indigenous reserves, are a proven strategy for combating forest loss. At a minimum, they can provide sanctuaries for biodiversity in deforestation fronts and serve as a reservoir for future restoration. Ideally they should be well connected and large enough to ensure wildlife can move freely and ecological processes continue to function.
- Valuing ecosystem services. Forests provide many benefits – from securing clean water supplies, to harbouring important species and sites of cultural significance. Recognising the value (including the economic value) of these benefits can help governments and businesses around deforestation fronts make wiser land-use decisions.

*Without action to change current trends, up to 170 million hectares of forest could be destroyed in these places by 2030 – more than 80 per cent of total projected forest losses globally.*

- REDD+ rolled out on a far larger scale. The REDD+ scheme, which provides incentives to developing countries to reduce greenhouse gas emissions from deforestation and forest degradation, could help counter threats in deforestation fronts, while supporting poverty alleviation, land rights and equitable resource governance.

- “Deforestation-free” supply chains. A growing number of major retailers, manufacturers and investors have pledged to eliminate deforestation from their supply chains and portfolios. Expanding and fulfilling these commitments could make a major difference in deforestation fronts affected by international commodity markets.

*Globally, the biggest cause of deforestation is expanding agriculture – including commercial livestock, palm oil and soy production, but also encroachment by small farmers. Unsustainable logging and fuelwood collection can lead to a spiral of degradation that eventually leads to deforestation or “death by a thousand cuts.”*

- Forest-friendly infrastructure. Those financing, building and regulating infrastructure like roads, dams and mines in deforestation fronts can take measures to mitigate their social and environmental impacts, without undermining local development opportunities. Forest safeguards should be built into all infrastructure projects.
1. Essentially, this means no overall loss in forest quantity or quality, while allowing for some flexibility: for example, allowing some degraded forest to be cleared to meet local needs while restoring an equivalent area in an important biodiversity corridor could be a worthwhile trade-off.

© WWF – World Wide Fund for Nature. *Living Forests Report: Chapter 5 Executive Summary* (2015). Retrieved from <http://awsassets.panda.org> on 26 March 2019.



# DEFORESTATION AND FOREST DEGRADATION

Deforestation and forest degradation are the biggest global threats to forests in this issues brief by the [International Union for Conservation of Nature \(IUCN\)](#)

- Deforestation and forest degradation are the biggest threats to forests worldwide.
- Over half of the tropical forests worldwide have been destroyed since the 1960s, and every second, more than one hectare of tropical forests is destroyed or drastically degraded.
- The degradation and loss of forests threatens the survival of many species, and reduces the ability of forests to provide essential services.
- Deforestation and forest degradation impact the lives of 1.6 billion people whose livelihoods depend on forests. One billion of them are among the world's poorest.
- Nature-based solutions such as forest landscape restoration (FLR) can reverse the effects of deforestation and degradation and regain the ecological, social, climatic and economic benefits of forests.

## WHAT IS THE ISSUE?

**D**eforestation and forest degradation are the biggest threats to forests worldwide. Deforestation occurs when forests are converted to non-forest uses, such as agriculture and road construction. Forest degradation occurs when forest ecosystems lose their capacity to provide important goods and services to people and nature.

Over half of the tropical forests worldwide have been destroyed since the 1960s, and every second, more than one hectare of tropical forests is destroyed or drastically degraded. This intense and devastating pressure on forests is not limited to the tropics – an

estimated 3.7 million hectares of Europe's forests are damaged by livestock, insects, diseases, forest fires, and other human-linked activities.

## WHY IS IT IMPORTANT?

### *Biodiversity*

Over 80% of the world's terrestrial biodiversity can be found in forests – from pine trees in the boreal North to the rainforests in the tropics. The degradation and loss of forests threaten the survival of many species, and reduce the ability of forests to provide essential services such as clean air and water, healthy soils for agriculture, and climate regulation.

### *Sustainable livelihoods*

Healthy forests support the livelihoods of 1.6 billion people globally, one billion of whom are among the world's poorest. Deforestation and forest degradation have real and tangible impacts on the lives of these vulnerable communities. For example, 52 per cent of all land used for food production is moderately or severely impacted by the erosion of healthy soil. This occurs when trees are removed from a landscape, leading to increased food insecurity.

### *Climate mitigation and adaptation*

The world's forests absorb 2.4 billion tonnes of carbon dioxide (CO<sub>2</sub>) per year, one-third of the annual CO<sub>2</sub> released from burning fossil fuels. Forest destruction emits further carbon into the atmosphere, with 4.3–5.5





GtCO<sub>2</sub> eq/yr generated annually, largely from deforestation and forest degradation. Protecting and restoring this vast carbon sink is essential for mitigating climate change.

Forests also play a crucial role in climate change adaptation efforts. They act as a food safety net during climate shocks, reduce risks from disasters like coastal flooding, and help regulate water flows and micro-climates. Improving the health of these forest ecosystems and introducing sustainable management practices increase the resilience of human and natural systems to the impacts of climate change.

## WHAT CAN BE DONE?

### *Forest landscape restoration (FLR)*

Nature-based solutions such as forest landscape restoration (FLR) can help countries reverse the effects of deforestation and degradation and regain the ecological, social, climatic and economic benefits of forests.

FLR brings people together to identify and implement the most appropriate restoration interventions in a landscape. It seeks to accommodate the needs of all land users and multiple land uses.

FLR is not just about planting trees – it can include multiple activities like agroforestry, erosion control and natural forest regeneration. FLR also addresses the underlying drivers of forest loss. For example, it provides farming communities living in and around forests with knowledge on sustainable agricultural methods that do not rely on destroying forests.

Countries and other land owners are committing to FLR through the Bonn Challenge – a global effort to restore 150 million hectares of degraded and deforested land by 2020 and 350 million hectares by 2030, launched

by IUCN and Germany in 2011. The Bonn Challenge has so far generated pledges from governments and organisations to restore over 156 million hectares.

### *Assessing restoration opportunities*

With IUCN's support, 26 countries are applying the Restoration Opportunities Assessment Methodology (ROAM) – a framework that assesses the extent of degraded and deforested landscapes in a country or area, and identifies the best strategies for restoring them. ROAM helps governments and decision makers use FLR interventions to meet multiple national priorities and international goals on climate, biodiversity and land degradation.

For example, a ROAM assessment in Malawi helped the government introduce sustainable agricultural systems to address food insecurity. In Colombia, FLR interventions have supported the rehabilitation of landscapes after decades of conflict.

### **MORE INFORMATION**

- IUCN's Forest Programme, [www.iucn.org/theme/forests](http://www.iucn.org/theme/forests)
- The Bonn Challenge, [www.bonnchallenge.org](http://www.bonnchallenge.org)
- Forest Landscape Restoration (IUCN), [infoflr.org](http://infoflr.org)

For more IUCN issues briefs focused on nature conservation and sustainable development, visit: [iucn.org/issues-briefs](http://iucn.org/issues-briefs)

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# FOREST DESTRUCTION

## FACT SHEET COURTESY OF GREENPEACE AUSTRALIA PACIFIC

**A**s much as 80% of the world's forests have been destroyed or irreparably degraded. Our ancient forests are looted every day to supply cheap timber and wood products to the world. The price for this destruction is escalating climate change, biodiversity loss and community displacement. And it's happening in our region. Indonesia has lost 72% of its ancient forest, Papua New Guinea 60% and the Solomon Islands was predicted to lose all of them by 2014. Back in Australia, we are part of the problem.

*Ancient forests are destroyed every day to supply cheap timber, pulp and paper, and palm oil to the world.*

The illegal and destructive logging operations are pushing species such as the orangutan towards the brink of extinction and devastating local communities. What's more, forest destruction accounts for around 20% of global carbon emissions. That's more than the world's entire transport sector.

We need to act fast to save the last remaining ancient forests.

### Destructive logging

A handful of international logging companies are cutting down the rainforests at record rates. Every year around the world, seven million hectares of ancient forest are logged, cleared or severely degraded.

The last remaining rainforests in our region – which

span across Indonesia, Papua New Guinea and the Solomon Islands – are disappearing at an alarming rate. In fact, Indonesia has been awarded a Guinness World Record for being the country with the fastest rate of forest destruction on the planet.

### Illegal logging

Illegal logging runs rife in our region. While corruption, bribery and greed is often at the root of illegal practices in logging countries, importing countries are also to blame. Illegal timber operations involve many countries, with China being the largest importer of illegal timber from the rainforests in our region.

### Palm oil and agriculture

Agribusiness is responsible for massive rainforest destruction as forests are cleared or burned to make way for cattle ranches, palm oil or soya plantations. Irreplaceable rainforests are converted into products that are used to make toothpaste, chocolate and animal feed. Indonesia's peatlands only cover 0.1% of the land on Earth, but thanks in part to the activities of the palm oil industry they contribute to 4% of global emissions. If expansion of the palm oil industry continues unabated, that figure can only rise.

### Climate change

Today, forests face another threat – climate change. When we destroy forests, we add to climate change because forests trap carbon and help stabilise the world's climate. When forests are trashed, the carbon trapped in trees, their roots and the soil is released into the atmosphere. Deforestation accounts for up to 20% of all carbon emissions. This is why Indonesia is the world's third largest greenhouse gas emitter after the US and China. At the same time, climate change itself threatens forests on a terrifying scale.

### Community devastation

As their forest is cut down, millions of indigenous people suffer human rights abuse, and increased poverty and disease. Their food and medicine sources are destroyed. Their drinking water is polluted by soil erosion. With less than 5% of the logs' value given back to the communities, the business of logging is moving landholders from subsistence affluence to a desperate type of poverty.

### Biodiversity loss

Some of the world's most rare animals and plants call the last remaining rainforests in our region home. As their habitats are destroyed, many face extinction.



Greenpeace Australia Pacific. *Forest destruction.*  
Retrieved from [www.greenpeace.org.au](http://www.greenpeace.org.au) on 25 March 2019.

# FORESTS AND CLIMATE CHANGE

## FORESTS ARE A STABILISING FORCE FOR THE CLIMATE, ACCORDING TO THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN)

- Forests help stabilise the climate. They regulate ecosystems, protect biodiversity, play an integral part in the carbon cycle, support livelihoods, and can help drive sustainable growth.
- To maximise the climate benefits of forests, we must keep more forest landscapes intact, manage them more sustainably, and restore more of those landscapes which we have lost.
- Halting the loss and degradation of natural systems and promoting their restoration have the potential to contribute over one-third of the total climate change mitigation scientists say is required by 2030.
- Restoring 350 million hectares of degraded land in line with the Bonn Challenge could sequester up to 1.7 gigatonnes of carbon dioxide equivalent annually.

### WHAT IS THE ISSUE?

**F**orests are a stabilising force for the climate. They regulate ecosystems, protect biodiversity, play an integral part in the carbon cycle, support livelihoods, and supply goods and services that can drive sustainable growth.

Forests' role in climate change is two-fold. They act as both a cause and a solution for greenhouse gas emissions. Around 25% of global emissions come from the land sector, the second largest source of greenhouse gas emissions after the energy sector. About half of these (5-10 GtCO<sub>2</sub>e annually) comes from deforestation and forest degradation.

Forests are also one of the most important solutions to addressing the effects of climate change. Approximately 2.6 billion tonnes of carbon dioxide, one-third of the CO<sub>2</sub> released from burning fossil fuels, is absorbed by forests every year. Estimates show that nearly two billion hectares of degraded land across the world – an area the size of South America – offer opportunities for restoration. Increasing and maintaining forests is therefore an essential solution to climate change.

### WHY IS IT IMPORTANT?

Halting the loss and degradation of forest ecosystems and promoting their restoration have the potential to contribute over one-third of the total climate change mitigation that scientists say is required by 2030 to meet the objectives of the Paris Agreement.

Other benefits in support of both people and nature are considerable:

- Globally, 1.6 billion people (nearly 25% of the world's population) rely on forests for their livelihoods, many of whom are the world's poorest.
- Forests provide US\$ 75-100 billion per year in goods and services such as clean water and healthy soils
- Forests are home to 80% of the world's terrestrial biodiversity.

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### WHAT CAN BE DONE?

IUCN's forest work tackles the role of trees and forests in building resilience to climate change in several ways:

- **Combatting deforestation and forest degradation** in areas of high biodiversity and cultural significance, such as primary forests and World Heritage sites. This helps conserve the benefits that people and societies get from forests, including forest carbon stocks and livelihoods.
- **Restoring forest landscapes** helps enhance climate change mitigation and adaptation. As the co-founder and Secretariat of the Bonn Challenge – a global effort to bring 150 million hectares of deforested and degraded land under restoration by 2020 and 350 million hectares by 2030 – IUCN supports national and sub-national decision makers in reaching this important goal. Reaching the 350 million hectare target could sequester up to 1.7 gigatonnes of carbon dioxide equivalent annually.
- **Enabling rights-based land use** ensures community involvement in land-use outcomes. IUCN produces results on the ground through partners and projects worldwide to help strengthen community control over forests, alleviate poverty, empower women and men, enhance biodiversity, and sustainably manage forests.
- **Unlocking forest benefits** is critical to a sustainable and equitable supply of forest goods and services.



IUCN builds capacity for implementing restoration, engaging the private sector and striving to make sure benefits – such as those from Reducing Emissions from Deforestation and Forest Degradation (REDD+) – are equitably shared with local landowners and forest communities.

Today, more and more consumers are demanding forest products from sustainable sources, and an increasing number of major palm oil, timber, paper and other forest product corporations are beginning the conversion to deforestation-free supply chains.

In addition to creating and maintaining protected areas and launching initiatives towards more sustainable management, many countries, subnational governments and private landowners are restoring degraded and deforested land. This helps to take pressure off healthy, intact forests and reduce emissions from deforestation and forest degradation.

As the world debates how to operationalise the Paris Agreement, it is imperative that national leaders accelerate these actions. This can be done by subscribing to and implementing the New York Declaration on Forests, sustain forest climate financing, and include forest and land use in countries' Nationally Determined Contributions (NDCs) under the Paris Agreement.

Nature – and in particular, trees and forests – can and must be part of the solution to keeping the climate within the globally accepted two-degree temperature increase limit.

*IUCN supports and assists climate change mitigation and adaptation through its global network of thousands of members and partners in Latin America, Africa, the Middle East, Asia and Oceania.*

### ***IUCN's support for climate change action at UNFCCC COP23 and beyond:***

- **Initiating and supporting international efforts to combat forest loss and degradation**, including those under the New York Declaration on Forests to halve global natural forest loss by 2020, and end it by 2030.
- **Driving the restoration of 150 million hectares of degraded landscapes and forest lands** by 2020 and 350 million hectares by 2030 through the Bonn Challenge and related regional initiatives.
- **Expanding protected areas**, including indigenous, privately-owned and community conservation areas, in ways that enhance the landscape's resilience and stabilise and store carbon.

*As a Union of state and non-state members, IUCN is able to support climate change action from setting goals and generating new knowledge, through to implementation on the ground.*

### **MORE INFORMATION**

- IUCN's Forest Programme, [www.iucn.org/theme/forests](http://www.iucn.org/theme/forests)
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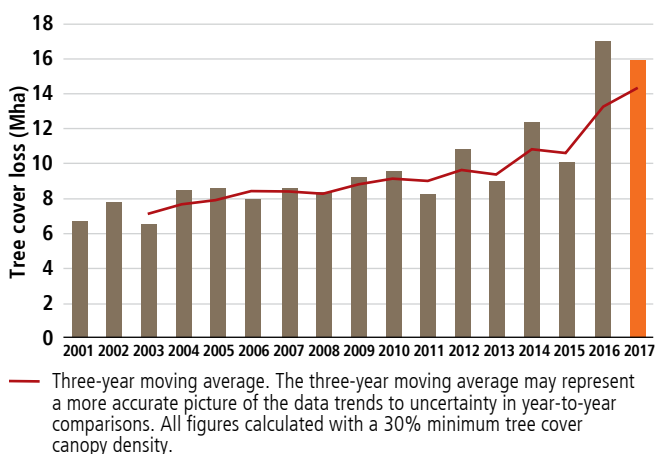
# DEFORESTATION IS ACCELERATING, DESPITE MOUNTING EFFORTS TO PROTECT TROPICAL FORESTS. WHAT ARE WE DOING WRONG?

A BRIEF BY FRANCES SEYMOUR FOR THE **WORLD RESOURCES INSTITUTE**

**T**he 2017 tree cover loss numbers are in, and they're not looking good. Despite a decade of intensifying efforts to slow tropical deforestation, last year was the second highest on record for tree cover loss, down just slightly from 2016. The tropics lost an area of forest the size of Vietnam in just the last two years.

In addition to harming biodiversity and infringing on the rights and livelihoods of local communities, forest destruction at this scale is a catastrophe for the global climate. New science shows that forests are even more important than we thought in curbing climate change. In addition to capturing and storing carbon, forests affect wind speed, rainfall patterns and atmospheric chemistry. In short, deforestation is making the world a hotter, drier place.

## TROPICAL TREE COVER LOSS



In light of these high stakes, those of us in “forestry world” who dedicate our professional lives and personal passions to saving the rainforest need to pause and reflect: *If the indicators are going in the wrong direction, are we doing something wrong?*

## BRICK ON THE ACCELERATOR, FEATHER ON THE BRAKE

There's no mystery on the main reason why tropical forests are disappearing. Despite the commitments of hundreds of companies to get deforestation out of their supply chains by 2020, vast areas continue to be cleared for soy, beef, palm oil and other commodities.

In the cases of soy and palm oil, global demand is artificially inflated by policies that incentivize using food as a feedstock for biofuels. And irresponsible logging continues to set forests on a path that leads to conversion to other land uses by opening up road access and increasing vulnerability to fires.

A large portion of that logging and forest conversion is illegal, according to the laws and regulations

of producer countries, yet illegality and corruption remain endemic in many forest-rich countries. And indigenous peoples – whose presence is associated with maintaining forest cover, yet whose land rights are often unrecognised – continue to be murdered when they attempt to protect their forests.

The situation reminds me of the many movies that feature a runaway train: The throttle of global demand for commodities has been engaged, and the brakes of law enforcement and indigenous stewardship have been disabled. The only way to prevent a disastrous train wreck is for the hero (or heroine) to get into the conductor's seat, remove the brick on the accelerator, and hit the emergency brakes.

We actually know how to do this. We have a large body of evidence that shows what works. Brazil, for example, reduced large-scale deforestation in the Amazon by 80 per cent from 2004-2012 by increasing law enforcement, expanding protected areas, recognising indigenous territories, and applying a suite of carrots and sticks to reign in uncontrolled conversion to agriculture, even while increasing production of cattle and soy. The problem is that our current efforts to apply these tools amount to a feather on the brake compared to the brick on the accelerator.

## FORESTS ARE COLLATERAL DAMAGE IN MAJOR ECONOMIC AND POLITICAL EVENTS

To a certain extent, the bad news in the 2017 tree cover loss numbers reflects collateral damage from unrelated political and economic developments in forested countries. Colombia's 46 per cent increase in tree cover loss is likely linked to its recent conflict resolution, which opened up to development large areas of forest previously controlled by armed rebel forces. While the doubling of Brazil's tree cover loss from 2015 to 2017 was in part due to unprecedented forest fires in the Amazon, the uptick is likely also attributable to a relaxation of law enforcement efforts in the midst of the country's ongoing political turmoil and fiscal crisis.

Indeed, it is striking how many of the world's tropical forested countries have either experienced a recent change in government (Liberia, Peru), are currently in political crises (Brazil, Democratic Republic of Congo), are in the midst of elections (Colombia), or will face elections in the near future (Indonesia).

## WE KNOW THE SOLUTIONS FOR STOPPING DEFORESTATION

This context hammers home what we already knew: No amount of international concern about tropical forests





will make a difference unless it meaningfully connects to domestic constituencies in forested countries, and changes the incentives that drive deforestation.

One of the key strategies for aligning national priorities with anti-deforestation actions started a decade ago. Reducing Emissions from Deforestation and forest Degradation and enhancing forest carbon stocks, or REDD+, is a framework endorsed by the Paris Agreement on climate change that encourages rich countries to pay developing countries for limiting deforestation and forest degradation.

Unfortunately, the volume of REDD+ funding on offer (about a billion dollars per year) remains trivial compared to the \$777 billion provided since 2010 for financing agriculture and other land sector investments that put forests at risk. This is surely one reason why domestic coalitions for change in countries participating in REDD+ have been unable to overcome competing coalitions for deforestation-as-usual.

While the prospects for immediate increases in REDD+ finance remain bleak, other strategies to strengthen domestic constituencies for reform show promise.

Brazil pioneered a system of monitoring deforestation by satellite. The public disclosure of that data was key to generating political will and the information necessary for fighting illegal clearing. Now, remote-sensing tools are helping communities and law enforcement officials around the world to detect and respond to illegal deforestation in near-real time. For example, Peru's Ministry of Environment distributes weekly deforestation alerts to more than 800 government agencies, companies and civil society groups, which led to several prosecutions in 2017.

International cooperation on law enforcement can also create domestic incentives for forestry sector reform. In late 2016, Indonesia became the first country to receive a license to export to the European Union timber

verified as legally harvested. By ensuring that its timber was harvested legally, Indonesia secured access for its forest products in a lucrative international market.

Indonesia has also witnessed the application of a new generation of transparency tools to fight deforestation. For example, in 2017, civil society groups used publicly available databases on corporate finance and governance to uncover monopolistic practices and non-compliance with plantation regulations among 15 companies in the palm oil sector. They then shared their findings with Indonesia's Corruption Eradication Commission and other government authorities in a position to respond with policy or legal action.

Finally, there's increased action at the sub-national level. Dozens of governors and district heads in forest-rich jurisdictions around the world have committed to low-emissions development.

For example, the Brazilian State of Mato Grosso launched a "Produce, Conserve, and Include" strategy to end illegal deforestation while promoting sustainable agriculture. Some of the companies that have made anti-deforestation commitments are considering preferential sourcing of commodities from such jurisdictions as a way of both reducing risk and encouraging continued progress toward better land-use management.

## THOSE OF US IN "FORESTRY WORLD" CAN'T DO IT ALONE

There are clearly solutions out there, but they need to be scaled up and expanded to forests throughout the world. This week, more than 500 citizens of "forestry world" are gathering at the Oslo Tropical Forests Forum to reflect on the last 10 years of efforts to protect forests, and chart a way forward. But we can't do it alone.

Preliminary analysis suggests that a significant chunk of forest loss in 2017 was due to "natural" disasters of the sort expected to become more frequent and severe with climate change. Hurricane Maria flattened forests in the Caribbean, and fires burned large areas of Brazil and Indonesia over the last few years. While degradation of forests through logging and fragmentation by roads renders them less resilient to extreme weather events, there is a limit to which forest-specific interventions can be effective in the face of a changing climate. While stabilising the global climate is contingent on saving the world's forests, saving the forests is also contingent on stabilising the global climate.

In addition to doubling down on the proven strategies for reducing deforestation (and allocating a fair share of climate finance toward those efforts), all countries need to up their game on climate action.

Nature is telling us this is urgent. We know what to do. Now we just have to do it.

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Seymour, F (26 June 2018). *Deforestation is accelerating, despite mounting efforts to protect tropical forests. What are we doing wrong?* Retrieved from [www.wri.org](http://www.wri.org) on 25 March 2019.



# CAN WE HALT RUNAWAY CLIMATE CHANGE? FORESTS HOLD THE KEY

Deforestation and forest degradation continue at alarming rates, warns **WWF**

**C**limate change continues to dominate the headlines as we start the new year. As world leaders gather in Davos for the annual World Economic Forum (WEF) meeting, we need to remember that the next few years are going to be critical to put the world on the path to a more sustainable future that safeguards people and the natural resources we rely upon.

For the sixth year in a row, “Failure of climate change mitigation and adaptation” holds a spot in the top five global risks in terms of impact, in the World Economic Forum’s *Global Risks Report 2019*.

The new report comes on the heels of the Intergovernmental Panel on Climate Change report, which underscored the small window of opportunity we have to avoid the worst impacts of climate change and boost climate action efforts.

Natural ecosystems are still the best carbon-capture technology available and forests are an important part of the solution. Ending forest conversion, preserving the forest carbon sink, and restoring forests has the potential to avoid more than one-third of global emissions. Yet deforestation and forest degradation continue at alarming rates – the world lost more than one football pitch of forest every second in 2017, adding up to an area equivalent to the whole of Italy over the year.

The WEF *Global Risks Report* is another stark reminder that we must change the ways we use land and the resources it provides. We need governments, businesses, financial institutions, civil society and everyone to coalesce around a New Deal for Nature and People that addresses the underlying drivers of loss. Protecting nature is not only the right thing to do, but it is also an economic risk reduction and management imperative, and it’s essential to our security and wellbeing.

## THE CASE FOR FORESTS

Halting deforestation, protecting natural forests, sustainably managing production forests and promoting landscape restoration are proven, cost-effective, and readily available methods to reduce carbon emissions and conserve biodiversity.

Yet forests aren’t being invested in at a rate that represents either their actual contribution to climate change mitigation and adaptation or their non-carbon benefits, like clean air, medicinal plants or habitats for wildlife. Just 2 per cent of international climate finance goes to forests, while subsidies and investments in sectors driving deforestation amount to 40 times more than investments in protecting forests. This needs to change if we are to realise the full potential of forests.

Ambitious forest action should be included in every country’s Nationally Determined Contribution (NDCs),

with targets both to conserve and enhance forests as a carbon sink, and to reduce emissions from deforestation and forest degradation. This is essential for countries to not just meet their climate targets but also to take action on the Sustainable Development Goals.

The human impact on forests goes beyond biodiversity and climate targets. It has a profound impact on the human side of global risks. Disease outbreaks are on the rise, and research shows that increasing deforestation and tree-cover loss is linked to 31 per cent of outbreaks like Ebola, Zika and Nipah virus. The potential of climate change to accelerate the transmission patterns of infectious diseases such as Zika, malaria and dengue fever is also rising.

For businesses, keeping forests resilient is key to mitigating long-term supply risk. This risk not only affects businesses that source products from forests, such as timber, but any industry that sources products coming from the land – whether it’s pharmaceutical companies that source products from forests, beer manufacturers that source water originating from forests, or food companies that rely on commodities that only grow in specific, predictable climates.

Public relations risk is also a key driver. With awareness about sustainability and monitoring capabilities increasing, companies need to address their supply chain and their impact on forests, even if they are not directly connected to forests.

We are already seeing positive steps by companies to go beyond their supply chains to invest in sustainable solutions for conserving and restoring the forest landscapes they source from, for e.g. companies supporting deforestation-free meat and soy in the Cerrado.

## FORESTS AS CLIMATE CHAMPIONS

Given today’s technological advancements and scientific knowledge about the trajectory and impacts of climate change, there is no excuse for inaction. If we don’t halt deforestation and forest degradation, we run the risk of forests turning into carbon emitters and losing all the valuable ecosystem services they provide, such as clean water and flood prevention.

As world leaders gather in Davos for the WEF meeting, we need to remember that forests can be our greatest allies in addressing the most pressing environmental and social threats of our time. Let’s join together to protect them before it’s too late.

**Alistair Monument** is Practice Leader of Forests, WWF International.

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*Can we halt runaway climate change? Forests hold the key.*  
Retrieved from [wwf.panda.org](http://wwf.panda.org) on 25 March 2019.

# Deforestation and climate change

Protecting natural ecosystems and sustainably managing and re-establishing forests are important ways to slow down climate change, according to the [Climate Council](#)

**F**orests store large amounts of carbon. Trees and other plants absorb carbon dioxide from the atmosphere as they grow. This is converted into carbon and stored in the plant's branches, leaves, trunks, roots and in the soil. When forests are cleared or burnt, stored carbon is released into the atmosphere, mainly as carbon dioxide. Averaged over 2015-2017, global loss of tropical forests contributed about 4.8 billion tonnes of carbon dioxide per year (or about 8-10% of annual human emissions of carbon dioxide) (*WRI 2018*).

Whilst forests are important carbon sinks, meaning they draw down carbon dioxide from the atmosphere, the carbon stored in these sinks is part of an active, relatively quick carbon cycle. As living things (including trees) die and decay, the carbon that they once stored is released back into the atmosphere.

By contrast, carbon stored underground in the form of fossil fuels such as coal, oil and gas, is much more stable, and is part of a much slower carbon cycle. Without the influence of humans burning these fossil fuels for energy, this carbon would be unlikely to reach the atmosphere. When fossil fuels are burned, carbon from dead and decayed plants, animals and phytoplankton that lived hundreds of millions of years ago (before dinosaurs existed), is released into the atmosphere in the form of carbon dioxide. Burning fossil fuels, in combination with destruction of carbon sinks due to deforestation and other activities, has contributed to more and more carbon dioxide building up in the atmosphere – more than can be absorbed from existing carbon sinks such as forests. The build-up of carbon dioxide in the atmosphere is driving global warming, as it traps heat in the lower atmosphere. Carbon dioxide levels are now at their highest levels in human history.

It is not effective to "offset" greenhouse gas pollution from burning fossil fuels by storing carbon in forests. This is because fossil fuels are pumping much more carbon dioxide into the atmosphere than existing forests can absorb. At the same time, carbon stores in forests and other natural carbon sinks will become increasingly unstable as climate change progresses. Droughts, tropical storms, heatwaves and fire weather are increasing in severity and frequency because of climate change. This will continue to result in increases in forest losses, contributing to more and more carbon dioxide being released into the atmosphere. Risks are significantly reduced but not avoided by keeping the rise in global temperature well below 2°C.

Protecting natural ecosystems and sustainably managing and re-establishing forests are important ways to reduce greenhouse gas emissions and slow down temperature rise in the short term by drawing down carbon dioxide from the atmosphere. At the same time, we must deeply and rapidly reduce global greenhouse gas emissions levels from fossil fuels – coal, oil and gas. If we do only the former and not the latter, we risk transforming more and more of our carbon sinks into carbon sources as climate change progresses.

**To learn more about this topic, read our report:**

*Land Carbon: No Substitute for Action on Fossil Fuels*, [www.climatecouncil.org.au/resources/land-carbon-report/](http://www.climatecouncil.org.au/resources/land-carbon-report/)

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Climate Council of Australia (21 August 2019). *Deforestation and climate change*. Retrieved from [www.climatecouncil.org.au](http://www.climatecouncil.org.au) on 22 August 2019.



# Five reasons to be optimistic about reducing – and reversing – deforestation

There are reasons to be positive, writes Justin Adams from the [World Economic Forum](#)

**L**et's be frank. For those of us who care about deforestation, the last few years have not been good. The latest data tells us we're losing more tropical tree cover than ever before. The biggest culprit is still commodity agriculture. This is exactly what we, in the Tropical Forest Alliance, are working to deter.

Way back in 2012, the Alliance was founded to help the companies behind the Consumer Goods Forum (CGF) achieve their 2020 zero net deforestation target. And we were so committed to this collective goal, we even named ourselves TFA 2020.

For me, as the incoming TFA director, it could be seen as something of a poison chalice. What was I thinking? Taking the helm at a time when we seem destined to fall short of our founding principle? Tying myself to a target that is so short-term it surely will scare off new partners? Needless to say, I take a very different view.

Yes, the lagging indicators (which tell us what has happened) give real cause for concern. But the leading indicators (which point to what could happen) paint a brighter picture. And we know what more needs to be done to catalyze action and accelerate progress.

So, let me give you an alternative perspective.

If we only tell negative stories, we inhibit progress. Instead, let's focus on the progress we did make in 2018, and look with optimism at priorities for 2019. And, for me, there are five big reasons to be positive:

## **1. The market signals are getting stronger**

Never underestimate the power of market forces or

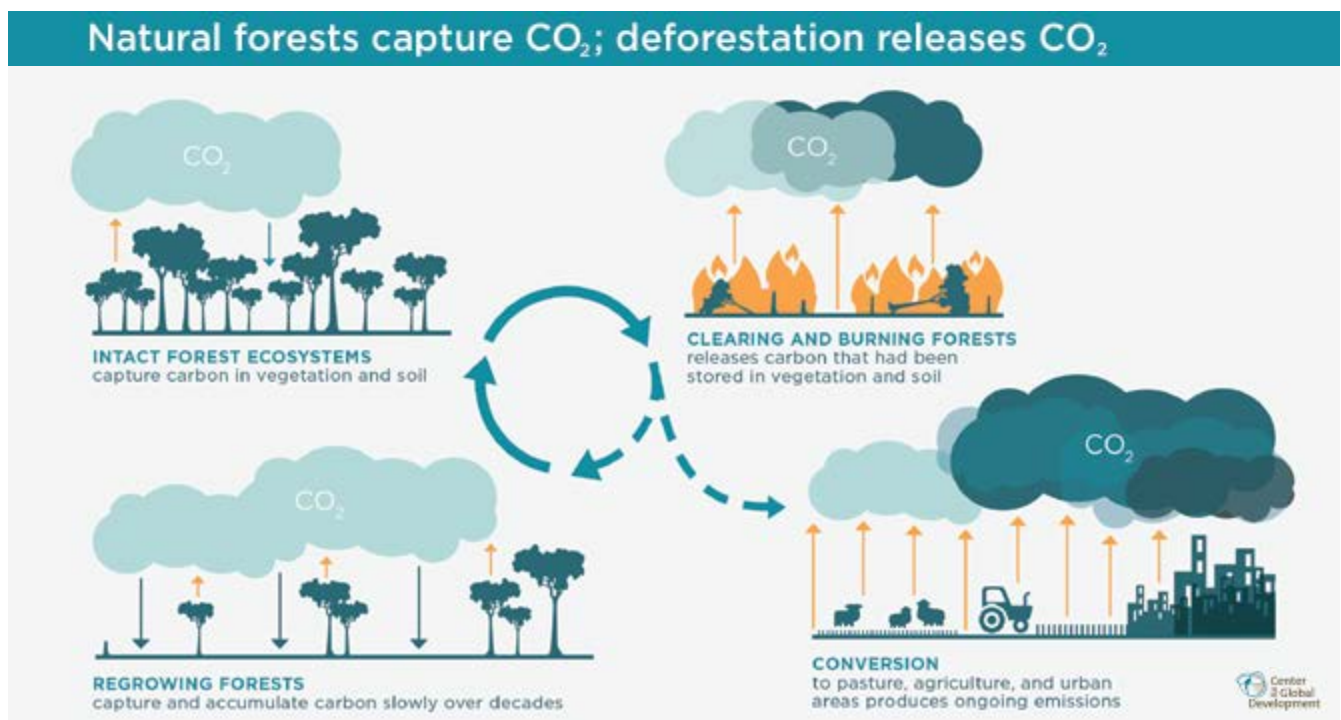
the influence we have on them. I see an unstoppable movement toward sustainability. People demand it. Governments respond with new regulations. Markets respond by insisting on verified products. And pockets of bad practice progressively are squeezed out.

Yes, it's a painfully slow process, but momentum is building. Many more players are signaling that deforestation must be removed from supply chains. In this regard, 2018 was an adrenalizing year.

The Cerrado Manifesto from Brazil enables continued agricultural production in one of the world's most productive landscapes while also seeking to protect important biodiversity.

One example among many is the *Cerrado Manifesto* from Brazil, which enables continued agricultural production in one of the world's most productive landscapes while also seeking to protect important biodiversity. In 2018 the number of signatories for its Statement of Support leapt beyond 70 global brands. Meanwhile, government-backed initiatives such as the *Amsterdam Declaration* grew in strength and the European Union announced its long-awaited roadmap to reduce deforestation.

As a producer, logic demands that you take note. If you can demonstrate your sustainability credentials, you can access any market in the world. If you can't, your options become ever more limited.





For 2019, the TFA will work to encourage more members of the CGF to commit and strengthen action seeing beyond 2020; and crucially we will broaden our attention to key players in the emerging economies. China alone accounts for 62 per cent of the world's soy imports, 32 per cent of pulp and paper and 11 per cent of palm oil. As its economy prepares for the 2020 United Nations Biodiversity Summit, we have a great opportunity to increase engagement – which could make the signals deafeningly loud.

## **2. It's getting easier to distinguish the good from the bad**

With improvements in monitoring comes greater transparency. You more easily can identify deforestation in supply chains. As a consequence, the pressure mounts for companies to report on their performance. Again, we see real momentum.

One of 2018's most significant announcements came from Wilmar, Asia's leading agribusiness group, which committed to transparency across its entire supply chain. Meanwhile, the Roundtable on Sustainable Palm Oil (RSPO), which unites 4,000 organisations globally, agreed to a new certification standard to help distinguish the good from the bad.

For 2019, a priority is to build on this progress by supporting more robust monitoring tools which bring more certainty and granularity to better understand where commodities are still driving conversion. Their availability, in turn, will bring more pressure on more players to report on their performance – and provide more access to their data.

## **3. More players are adopting holistic, landscape approaches**

Increasingly, companies are looking beyond their immediate supply chains and thinking about how they can contribute to the wider economic viability of farming and the rural economy. Related announcements from Unilever and Walmart, and also from the global agribusiness group Olam, were two highlights from 2018. We need more positive examples that showcase how production and protection can work hand in hand in tropical forest landscapes.

For 2019, we aim to focus our collective attention on 10-15 landscapes with strong jurisdictional leadership, where supply chain commitments can be complemented with other measures. And we will work with partners in each region to identify the most promising candidates.

## **4. Innovative approaches to finance are enabling sustainable solutions to achieve scale**

It would be naïve to overlook the role financing plays in agricultural decision-making. Farmers routinely seek third-party finance to fund their next crop, and the related credit terms generally determine what they grow – and how.

In the past we have seen plenty of small-scale, short-term finance initiatives directed at sustainable farming methods. But in 2018, we saw the emergence of

larger-scale, longer-term schemes, including one from Bunge and Santander in Brazil, which incentivises sustainable soybean production.

For 2019, we aim to catalyze the creation of more green finance mechanisms. For example, as finance ministries in tropical countries come to appreciate the true economic potential of a well-managed agricultural and forest sector, we expect more innovative schemes to emerge. And, as funds finally start to flow under REDD+ schemes, there is definite potential for mechanisms that incorporate carbon finance.

## **5. More people are waking up to the role of forests in addressing global warming**

For many years, forests had been largely absent from the climate change debate. Yet they are the planet's single most powerful mechanism for sequestering carbon (or, conversely, releasing it into the atmosphere).

As finance ministries in tropical countries come to appreciate the true economic potential of a well-managed agricultural and forest sector, we expect more innovative schemes to emerge.

In 2018, the tenor of the debate changed. For example, the IPCC 1.5°C Special Report made it clear that, to address climate change, more forests must be protected and restored. Forests also house more than 80 per cent of the world's terrestrial biodiversity so are front and centre of the renewed global effort for a New Deal for Nature and People. For 2019, we all need to push forests and deforestation to the very centre of the climate, biodiversity and food debates.

## **TURNING THE TIDE**

Despite my optimism, I know we will fall short of the 2020 target. But let's not dwell on it. Obsessing over the merits of an eight-year-old target doesn't just tie us to an arbitrary moment in time, it also puts a finite limit on our aspirations. Instead, let's focus on the way forward.

Given everything we have learned and the progress we are seeing, I am convinced the trajectory can be bent. When that happens, even more pressure will be placed on the many laggards in our community, and more encouragement will be handed to the pace-setters. We will then enter a scenario when, instead of simply putting an end to deforestation, we have a chance to improve and restore many of our degraded landscapes.

The Tropical Forest Alliance was set up to advance public-private partnership in the tropical forest space. We stand ready to up our game and support our partners to deliver on the promise of eliminating and, ultimately, reversing deforestation.

**Justin Adams** is Director, Tropical Forest Alliance 2020, World Economic Forum.

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World Economic Forum (22 January 2019). *5 reasons to be optimistic about reducing – and reversing – deforestation*. Retrieved from [www.weforum.org](http://www.weforum.org) on 25 March 2019.

# SOLUTIONS TO DEFORESTATION

Protecting forests will not only preserve biodiversity and defend the rights of forest communities, it's also one of the quickest and cost effective ways of halting climate change. **Greenpeace** is campaigning for zero deforestation, globally, by 2020.

**G**reenpeace is campaigning for a future that will allow our forests to thrive – filled with unique wildlife and able to sustain local people and economies whilst cleaning the air of carbon: a future with no deforestation. This may be ambitious, but it is possible.

In fact, because stopping forest destruction is one of the easiest and most cost effective ways to prevent catastrophic climate change, we think it's essential. To protect these precious ecosystems, the international community, corporations, indigenous communities and individuals will need to work together in an unprecedented, concerted effort.

***Greenpeace is campaigning to realise this vision in several ways:***

## **Corporate action**

If corporations have the ability to destroy the world's forests, they also have the power to help save them. We investigate, expose and confront environmental abuse by corporations around the world, and ask our supporters to take action for the planet. As a result, many multinational corporations have changed their practices – but there is still a long way to go to protect the world's forests.

## **Consumer power**

The conversion of irreplaceable forests into consumer products like tissues, books, paper and ingredients food and toothpaste is one of the great environmental crimes of our time. But, in the battle to protect our forests, consumers have the power. Don't believe us? Just ask Unilever, Nestlé, McDonald's and Kraft, all of whom changed their sourcing policies after our supporters piled on the pressure.

*To protect these precious ecosystems, the international community, corporations, indigenous communities and individuals will need to work together in an unprecedented, concerted effort.*

## **Political solutions**

Greenpeace is campaigning for a meaningful, international mechanism to help end forest destruction globally known as REDD (reduced emissions from degradation and deforestation). If it is done well, REDD could benefit biodiversity, humanity, and the climate.

Yet some governments and industries are lobbying hard to undermine REDD – or unfairly profit from it – and many forest communities are being left out of discussions that will directly affect their lives.

## **Putting 'No Deforestation' into practice**

Tropical forests hold large stores of carbon, are packed full with important biodiversity, and are critical for





millions of people from local communities who depend on forests for their livelihoods. The companies that have been converting tropical forests to agriculture or plantations, for commodities like palm oil or paper, have come under increasing pressure from their customers to prove that their operations and supply chains are not causing deforestation.

Defining deforestation is very complex, as it has to factor in carbon and climate, biodiversity and social implications. However, the urgency for an answer increases every day as more of our irreplaceable forests are destroyed.

Over the last three years, Greenpeace has been working with one of the world's largest palm oil suppliers, Golden Agri-Resources (GAR), and The Forest Trust, on a pioneering initiative on implementing no deforestation and forest conservation – via identifying and conserving High Carbon Stock (HCS) forest areas.

*The conversion of irreplaceable forests into consumer products like tissues, books, paper and ingredients food and toothpaste is one of the great environmental crimes of our time.*

### Forest communities

Greenpeace works with indigenous communities around the world at the front line of forest destruction – supporting the demarcation of traditional boundaries and eco-forestry initiatives, and offering a global platform through which these communities can address the rest of the world. Why? We believe that if these

communities are able to keep control of their forests, they will protect their resources for the future, and the planet.

*Defining deforestation is very complex, as it has to factor in carbon and climate, biodiversity and social implications. However, the urgency for an answer increases every day as more of our irreplaceable forests are destroyed.*

### The Forest Stewardship Council (FSC)

Ecological and socially responsible forest management can, and is, being practised by some companies. This kind of forest management seeks to ensure that the forest ecosystem is not damaged, that only low volumes of trees are extracted, and that the impacts on plant and animal life are minimal.

The FSC, an international, non-profit association, was created in 1993 so that corporate buyers and the public can identify products that come from responsibly managed forests.

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Greenpeace Australia Pacific. *Solutions to Deforestation*. Retrieved from [www.greenpeace.org.au](http://www.greenpeace.org.au) on 26 March 2019.



# CAN FOREST CONSERVATION AND LOGGING BE RECONCILED?

**Logging and conservation are not polar opposites, and controlled harvesting can fund the protection of forests, write [Jerry Vanclay](#) and [Douglas Sheil](#)**

**I**s there a role for logging in ensuring the future of the world's tropical forests and their rich diversity of plants and animals? For many this idea is absurd, because timber production achieving conservation goals have long been viewed as incompatible opposites.

"Loggers" were tarred as planet plunderers, "greenies" were branded ignorant idealists, while researchers found themselves caught between warring factions with little interest in data from outside their own views and experiences. Sadly, this myopic and highly polarised view of preservation versus production rarely helps save vulnerable landscapes. Fortunately these views are changing.

Finding outcomes that offer real improvements for conservation gains depend on recognising some myths and acknowledging the dynamic nature of forests. Many people, especially in Australia, generally imagine all "logging" as broadscale clearfelling. However, timber harvesting takes many forms, and large-scale clearfelling is at one end of a broad spectrum. In well-managed forests, foresters seek to harvest in an ecologically-appropriate way.

Generally, clearfelling is appropriate only in forests that are naturally adapted to major disturbances (such as Australia's wildfires). At the other end of the harvesting spectrum, single-tree selection is appropriate in forests that evolved with small-scale disturbance (such as many species-rich forests where most trees die standing and finally collapse from decay), and where seedlings tolerate heavy shade.

In most tropical forests managed for sustainable timber production, harvesting is selective. Between two and 20 stems are removed from each hectare of forest, once every few decades. When done carefully this leaves over 90% of the trees in place. Thus a logged, rich, tropical forest is still a rich tropical forest and stems regrow to replace those removed.

Many of the technical arguments against timber production in tropical rainforests relate to species loss or to the increased likelihood of forest conversion (i.e. that the forest will then be converted to some other non-forest use). There is ample evidence from various sites that logged forests lack many of the species – especially the larger animal species – found in more pristine forests. There are also many cases where forests that have been selectively logged for timber have subsequently been converted to pasture, oil palm, or other intensive uses. But, we now realise, the implied cause-and-effect relationships are not necessarily



Well-managed production forestry, as part of a larger forest landscape guided by science, offers a vision where once conflicting interests will benefit by working together.

inevitable. Let's deal with these issues one at a time.

First, how does timber harvest affect the biological value of tropical forests? Our recent study summarised over 100 scientific papers from a range of sites and concluded that 85% to 100% of the forest biodiversity was maintained in forests that have been logged once. Other studies of forests harvested repeatedly have found similar results. This doesn't mean that other older observations were wrong – just that they didn't distinguish the cause of the species declines they observed. Areas that are accessible for timber harvest are often accessible for hunting, pet trade collecting, gold panning, and so on.

Certainly, new logging roads often provide access into once inaccessible areas, and can exacerbate and facilitate other harmful activities, but whether they are the cause is a matter of semantics. High levels of hunting can and do occur in strictly protected forests, too – but no one would argue that that is a valid reason not to have strictly protected forests. In both cases, logged or protected forests, the answer is the same – stronger incentives and controls are required to favour the desired conservation outcome.

The question then is how to provide these incentives and controls. On the ground, control of activities like hunting is often more practical in actively-managed production forest than in national parks starved of staff and resources. The need to control, and in some cases prohibit, hunting is now a common element of good practice in forest management and is implemented in many concessions (in Sarawak, Congo, and other con-



cessions accredited by the Forest Stewardship Council).

Secondly, what are the implications of a timber harvest for sustainable forest cover? Experience shows that logged forests have at different times, been cleared, maintained for subsequent harvests, and elevated to national parks.

Clearly the fate of a logged forest depends on many things, including the external pressures on land and the degree to which we are willing and able to value and protect both logged and unlogged forests. But studies of concessions in several parts of the world where law enforcement in protected areas is weak reveal instructive cases where logged forests have been found to resist conversion better than unlogged forests (e.g. in Sumatra and Borneo). These cases, as with the elimination of hunting mentioned in the previous example, show the potential benefits of having local caretakers with the ability, motivation, and support to support forest conservation.

The chief question is how to achieve the best results. Even if we forget the demand for timber and consider only conservation benefits, and draw on the examples given above, it is apparent that logged forests bring options and opportunities.

No one suggests that all forests should be logged. As far as we are aware everyone agrees that some forests should be set aside and protected. Ideally these areas should be as big and as well-connected as we can manage. Low-density, wide-ranging forest-dependent species such as Borneo's clouded leopards will depend on these large areas. But, given other demands on land and resources, such strictly protected areas are unlikely to ever make up more than a minority of the landscape.

This appears especially true in poorer regions of the world where people live on the land and there are massive pressures to generate the funds they need for development from high-value crops like soya and oil palm. In such regions we are unlikely to find the money necessary to protect and manage large reserved areas and meet the aspirations of the people. However, timber production provides one way in which forest lands can provide income

and employment while retaining forest: in simple terms, the forest can pay for its own protection.

From a non-negotiable starting point with islands of strictly protected forests, we can choose the fate of the rest of the landscape: we can strive for a landscape dominated by non-forests (e.g. agriculture) with little connecting forest, or we can seek to maintain productive working forests that provide valuable habitats for most forest species, provide connectivity among populations, and allow the landscape to sustain many wide-ranging forest species.

Even better, these forests can be supervised and managed by people who care about them and can combat alien species, check fires, and confront hunters and other threats. While there are risks, many researchers believe that this latter option comprising a matrix of managed production-forest remains one way to ensure the survival of the world's tropical forests and their rich diversity. Conservation is seldom simple to achieve and there will be challenges. Nonetheless, in our view well-managed production forestry, as part of a larger forest landscape guided by science, offers a vision where once conflicting interests will benefit by working together.

#### DISCLOSURE STATEMENT

From time to time, Jerry Vanclay offers advice to governments, companies and other agencies about sustainable harvesting of forests, and in some cases, receives payment for this advice. Douglas Sheil has conducted and managed various research projects on the impacts of tropical forest management on biodiversity and on local people. Most has been funded through CIFOR, by the EC, ITTO, WB and other major donors. He does not receive financial support from any timber-producing agencies.

**Jerry Vanclay** is Dean of Science, Southern Cross University.

**Douglas Sheil** is Director of the Institute of Tropical Forest Conservation, Uganda.

## THE CONVERSATION

Vanclay, J, and Sheil, D (30 July 2012).

*Can forest conservation and logging be reconciled?*

Retrieved from <http://theconversation.com> on 26 March 2019.





# Managing and conserving Australia's forests

## AUSTRALIA'S NATIVE FORESTS

### AN OVERVIEW FROM A KEY REPORT BY ABARES

#### WHAT IS A FOREST IN AUSTRALIA?

**T**he definition of forest used in this report is the same as that used in Australia's National Forest Inventory, and in all previous SOFRs:

*An area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding 2 metres and with existing or potential crown cover of overstorey strata about equal to or greater than 20 per cent. This includes Australia's diverse native forests and plantations, regardless of age. It is also sufficiently broad to encompass areas of trees that are sometimes described as woodlands.*

Under this definition, large expanses of tropical Australia where trees are spread out in the landscape are forest, as are many of Australia's multi-stemmed eucalypt mallee associations. What many people would typically regard as forests – stands of tall, closely spaced trees – comprise a relatively small part of the country's total forest estate.

Much of Australia's open and woodland forests are available for grazing. However, areas identified by the Australian Collaborative Land Use and Management Program<sup>12</sup> as urban and industrial land, land under horticultural land use (such as orchards), and land under intensive agricultural uses, are not included as forest.

#### AUSTRALIA'S FORESTS

Forests extend across the continent's northern tropical regions, and down the east coast through sub-tropical regions to temperate cool-season wet and cold wet zones in the south-east; they are also found in Mediterranean climate zones in the south-east and south-west.

In some regions, forests extend from these wetter, coastal and sub-coastal areas into central, drier parts of the continent. Through these regions, forests grow on soils that vary from ancient, fragile and infertile soils, to more recently formed, fertile soils of alluvial and volcanic origin.

Australia's forests are assigned to three broad categories in Australia's National Forest Inventory, with each category divided into various forest types (see Indicator 1.1a):



Forest near Bellingen, New South Wales.

*'Native forests', are divided into eight national native forest types named after their key genus or structural form: Acacia, Callitris, Casuarina, Eucalypt, Mangrove, Melaleuca, Rainforest, and Other native forest.*

- 'Native forests', which are divided into eight national native forest types named after their key genus or structural form: Acacia, Callitris, Casuarina, Eucalypt, Mangrove, Melaleuca, Rainforest, and Other native forest. Across the wide range of rainfall and soil conditions that support forest, more than 80% of Australia's native forests are dominated by eucalypts and acacias.
- 'Commercial plantations', which are plantations grown on a commercial scale for wood production. 'Commercial plantations' were previously known as

## Box I.i: National goals set out in Australia's National Forest Policy Statement<sup>13</sup>

The Commonwealth, state and territory governments agree that, to achieve their vision for the forest estate and to ensure that the community obtains a balanced return from all forest uses, eleven broad national goals must be pursued. These goals should be pursued within a regionally based planning framework that integrates environmental and commercial objectives so that, as far as possible, provision is made for all forest values. The eleven broad national goals are as follows:

- **Conservation.** The goals are to maintain an extensive and permanent native forest estate in Australia and to manage that estate in an ecologically sustainable manner so as to conserve the full suite of values that forests can provide for current and future generations. These values include biological diversity, and heritage, Aboriginal and other cultural values.
- **Wood production and industry development.** The goal is for Australia to develop internationally competitive and ecologically sustainable wood production and wood products industries. Efficient industries based on maximising value-adding opportunities and efficient use of wood resources will provide the basis for expansion in wood products manufacturing, which in turn will provide national and regional economic benefits.
- **Integrated and coordinated decision making and management.** The goals are to reduce fragmentation and duplication in the land use decision-making process between the States and the Commonwealth and to improve interaction between forest management agencies in order to achieve agreed and durable land use decisions.
- **Private native forests.** The goal is to ensure that private native forests are maintained and managed in an ecologically sustainable manner, as part of the permanent native forest estate, as a resource in their own right, and to complement the commercial and nature conservation values of public native forests.
- **Plantations.** One goal is to expand Australia's commercial plantations of softwoods and hardwoods so as to provide an additional, economically viable, reliable and high-quality wood resource for industry. Other goals are to increase plantings to rehabilitate cleared agricultural land, to improve water quality, and to meet other environmental, economic or aesthetic objectives.
- **Water supply and catchment management.** The goals are to ensure the availability of reliable, high-quality water supplies from forested land and to protect catchment values.
- **Tourism and other economic and social opportunities.** The goal is to manage Australia's forests in an ecologically sustainable manner for a range of uses, including tourism, recreation and production of non-wood products.
- **Employment, workforce education and training.** The goal is to expand employment opportunities and the skills base of people working in forest management and forest-based industries.
- **Public awareness, education and involvement.** The goals are to foster community understanding of and support for ecologically sustainable forest management in Australia and to provide opportunities for effective public participation in decision making.
- **Research and development.** The goals are to increase Australia's national forest research and development effort and to ensure that it is well-coordinated, efficiently undertaken and effectively applied. This research will expand and integrate knowledge about the many aspects of native forests, plantations, forest management, conservation and forest product development.
- **International responsibilities.** The goals are to promote nature conservation and sustainable use of forests outside Australia and to ensure that Australia fulfils its obligations under relevant international agreements.

'Industrial plantations'. The definition of plantations used in this report is that used in all previous *SOFs* and for the National Plantation Inventory:

*Intensively managed stands of trees of either native or exotic species, created by the regular placement of seedlings or seeds.*

- 'Other forest', which includes non-commercial plantations and planted forest of various types.

*The majority of Australia's native forest area is dominated by evergreen, broadleaf, hardwood tree species.*

## NATIVE FORESTS

Australia's native forests are classified into structural classes based on combinations of crown cover, stand height and form, to provide a better understanding of their characteristics.

In terms of crown cover:

- 'Closed forest' is forest where the tree canopies

cover more than 80% of the land area.

- 'Open forest' is forest where the tree canopies cover between 50% and 80% of the land area.
- 'Woodland forest' is forest where the tree canopies cover between 20% and 50% of the land area.
- Land with trees where the tree canopies cover less than 20% of the land area is not classified in Australia as forest, but is categorised as various forms of non-forest vegetation.

In terms of stand height:

- 'Tall forest' is forest with a stand height greater than 30 metres.
- 'Medium forest' is forest with a stand height between 10 and 30 metres.
- 'Low forest' is forest with a stand height greater than 2 metres and up to 10 metres.

In terms of tree form:

- 'Eucalypt mallee' forests contain multi-stemmed trees.

Australia's definition of forest uses the phrases 'mature or potentially mature' with regard to stand





Closed forest: an aerial view of rainforest showing typical closed canopy. Daintree River National Park, Queensland.



Open forest: Booderee National Park, New South Wales.



Woodland forest: Undara Volcanic National Park, Queensland.



Non-forest carrying other woody vegetation, Northern Territory.

height, and 'existing or potential' with regard to crown cover. Use of these phrases allows forest areas that have temporarily lost some or all of their trees (for example, as a result of bushfires, cyclones or wood harvesting) to be identified as part of the forest estate.

The majority of Australia's native forest area is dominated by evergreen, broadleaf, hardwood tree species. For national reporting, the NFI classifies Australia's native forests into eight broad forest types defined by dominant species and structure. These eight types are described below<sup>14</sup>.

## Acacia

Australia has almost 1,000 species of *Acacia*, making it the nation's largest genus of flowering plants. *Acacia* species are remarkably varied in appearance, habit and location, from spreading shrubs to trees that are more than 30 metres tall.

*Acacia* forests are Australia's second most extensive forest type. They occur in all Australian states and the Northern Territory, with the largest areas in Queensland and Western Australia. *Acacia* forests are predominantly woodland forests in regions where the average annual rainfall is less than 750 millimetres. Mulga (*Acacia aneura* and related species) is widespread in many parts of the arid and semi-arid zones of Australia. Brigalow (*A. harpophylla*) is widespread in Queensland and northern New South Wales, forming dense forests on flat or undulating country with clay soils. *Acacia* forests are also present in wetter areas: in Tasmania, for example, blackwood (*A. melanoxylon*) dominates stands of swamp forest on poorly drained sites.

## Callitris

The genus *Callitris* comprises 15 species, of which 13 occur in Australia. *Callitris* trees are commonly called cypress pines because they are related to, and resemble, Northern Hemisphere cypresses; they are not true pines.

*Callitris* forests typically occur in small patches in drier inland regions, but occasionally cover wide areas. Pure stands of *Callitris* are generally restricted to undulating or flat land with sandy soils, or to upland rocky areas that are protected from fire. More commonly, *Callitris* trees are present in *Acacia*, *Casuarina* and *Eucalypt* forest types that have a shrubby, grassy or herbaceous understorey. White cypress pine (*Callitris glaucophylla*) is a species widely distributed across inland Australia that is used for timber production.

## Casuarina

The family Casuarinaceae occurs naturally in Australia, south-east Asia and the Pacific region. The forest type *Casuarina* includes forests dominated by species of either *Casuarina* (6 species in Australia) or *Allocasuarina* (59 species in Australia). Commonly called sheoaks because of the similarity of their timber to that of European oaks, casuarinas are a distinctive part of many Australian coastal and riverine landscapes.

Most casuarina forests are low in height; the tallest



casuarina forests grow along rivers, where trees can grow to more than 20 metres. Common inland species include belah (*Casuarina cristata*), desert oak (*Allocasuarina decasneana*) and river sheoak (*C. cunninghamiana*).

## Eucalypt

Eucalypts are iconic Australian forest trees. Eucalypt forests are by far the continent's most common forest type, covering about three-quarters of Australia's native forest estate and occurring in all but the continent's driest regions.

The term 'eucalypt' encompasses approximately 800 species in the three genera *Eucalyptus*, *Corymbia* and *Angophora*, with almost all of these species native to Australia. For national reporting, the Eucalypt forest type is divided into 11 forest subtypes based on the form of dominant individuals (multi-stemmed mallee or single-stemmed tree), height of mature trees (low, medium or tall) and crown cover (closed, open or woodland).

Eucalypt species have oil-rich foliage that burns readily, and they display a range of strategies to survive and recover from fire. The majority of eucalypt species are evergreen, retaining their leaves year-round.

River red gum (*Eucalyptus camaldulensis*) is the most widely distributed eucalypt, and is found in all Australian mainland states. The forests of south-eastern Australia contain a wide range of dominant eucalypt species, including major commercial timber species such as mountain ash (*E. regnans*), messmate stringybark (*E. obliqua*), alpine ash (*E. delegatensis*), silvertop ash (*E. sieberi*), blackbutt (*E. pilularis*) and spotted gum (*Corymbia maculata*). Some individual trees exceed 90 metres in height. Eucalypt forests in south-western Australia are dominated by jarrah (*E. marginata*) and karri (*E. diversicolor*). Typical eucalypts of northern Australia include Darwin woollybutt (*E. miniata*) and Darwin stringybark (*E. tetradonta*). Many species of mallee eucalypts are found across the inland regions of southern Australia.

## Mangrove

Although comprising less than 1% of Australia's forest cover, mangrove forests are an important and widespread ecosystem. They are found in the intertidal zones of tropical, subtropical and protected temperate coastal rivers, estuaries and bays, where they grow in fine sediments deposited by rivers and tides. Mangrove trees have a characteristic growth form, including aerial structural roots and exposed breathing roots, to help them cope with regular tidal inundation and a lack of oxygen in the soil.

*Avicennia marina*, known as white mangrove or grey mangrove, is a widely distributed species of mangrove.

## Melaleuca

The genus *Melaleuca* contains more than 200 species, most of which are endemic to Australia. Only a few species develop the required community structure and height for stands to be classified as forests; these taller species are known as tea-trees or paperbarks. Common

species include broad-leaved paperbark (*Melaleuca viridiflora*) and weeping paperbark (*M. leucadendra*).

Melaleuca forests occur mainly as tracts of low woodland forest across estuarine plains and seasonal swamps in the coastal and near-coastal areas of monsoonal northern Australia, as well as narrow strips beside streams. Most of Australia's Melaleuca forest is in Queensland, particularly Cape York Peninsula, and the northern part of the Northern Territory. Melaleuca forest also occurs on poorly drained sites on the east coast of mainland Australia and in north-western Tasmania.

## Rainforest

Australia's rainforests are characterised by high rainfall, lush growth and closed canopies; they rarely support fire, and generally contain no eucalypts or only occasional individual eucalypts as emergent trees above the rainforest canopy. Tree species of the rainforest canopy are shade-tolerant when young, able to establish in the understorey of mature forest, and grow into large trees when events such as tree falls, lightning strikes or wind damage (including from cyclones) create gaps in the canopy.

There are many types of rainforest in Australia, varying with rainfall and latitude. Tropical and subtropical rainforests are found in northern and eastern Australia in wet coastal areas. Temperate rainforests occur in eastern and south-eastern Australia: warm temperate rainforests grow in New South Wales and Victoria, while cool temperate rainforests grow in Victoria and Tasmania, with outliers at high altitude in New South Wales and Queensland. Dry rainforests occur in pockets protected from frequent fire in sub-coastal and inland areas of northern and eastern Australia. Monsoon rainforests occur in northern Australia in seasonally dry coastal and sub-coastal regions.

## Other native forest

The 'Other native forest' type includes a range of minor native forest types each named after its dominant genus, including Agonis, Atalaya, Banksia, Hakea, Grevillea, Heterodendron, Leptospermum, Lophostemon and Syncarpia, as well as native forests where the type is unknown.

## ENDNOTES

12. [Data.gov.au/dataset/catchment-scale-land-use-of-australia-update-2017](https://data.gov.au/dataset/catchment-scale-land-use-of-australia-update-2017).
13. Commonwealth of Australia (1992).
14. The names of the national native forest types have capitalised initial letters (e.g. Acacia forest). The related common names do not have capitalised initial letters (e.g. acacias) unless they commence a sentence. The related formal genus names are italicised and have capitalised initial letters (e.g. *Acacia*).

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Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Department of Agriculture and Water Resources.  
*Australia's State of the Forests Report 2018*, pp. 30-35.  
Retrieved from [www.agriculture.gov.au](http://www.agriculture.gov.au) on 26 September 2019.

# AUSTRALIA'S FOREST AREA

The area, type, tenure and management category of forests provides the base data for describing the state of Australia's forests, and changes over time, according to this extract from a report published by [ABARES](#)

## AUSTRALIA'S FOREST AREA AS AT 2016

Australia has 134 million hectares of forest, covering 17% of Australia's land area. Australia has approximately 3% of the world's forests, and globally is the country with the seventh largest forest area.

Queensland has the largest area of forest (39% of Australia's forest), with the Northern Territory (18%), Western Australia (16%), and New South Wales (15%), making up much of the balance.

Australia's forests can be divided into 3 categories:

- 'Native forest' – 132 million hectares, 98% of Australia's forest area
- 'Commercial plantations' – 1.95 million hectares, 1.5% of Australia's forest area
- 'Other forest' – 0.47 million hectares, 0.4% of Australia's forest area, and comprising mostly non-commercial plantations, and planted forests of various types.

## NATIVE FOREST

Native forest is the most extensive category of Australia's forests, covering 132 million hectares.

Native forests are dominated by eucalypt forests (101 million hectares) and acacia forests (11 million hectares). The majority of native forests (91 million hectares) are woodland forests, which have a canopy cover between 20% and 50%.

By ownership, most of Australia's native forests (88 million hectares) are in private and leasehold tenures. The area of native forest in formal nature conservation reserves is 22 million hectares, and the area of multiple-use public native forests is 10 million hectares.

## THE INDIGENOUS FOREST ESTATE

The area of forest over which Indigenous peoples and communities have ownership, management or special rights of access or use is known as the Indigenous forest estate. This is a total of 70 million hectares of forest (52% of Australia's forests), almost all of which is native forest.

The term 'Indigenous' is used throughout the *SOFR* series to encompass all Aboriginal and Torres Strait Islander peoples.

The Indigenous forest estate is classified into four broad ownership and management categories:

- Indigenous owned and managed
- Indigenous co-managed
- Indigenous managed
- Forest subject to 'Other special rights'

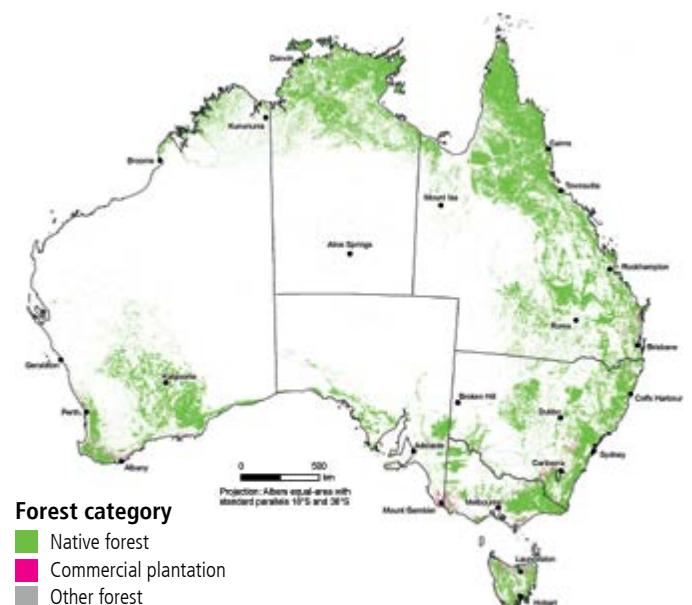
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Australia has 134 million hectares of forest, covering 17% of Australia's land area. Australia has approximately 3% of the world's forests, and globally is the country with the seventh largest forest area.

The geographic distribution of these areas is presented later in this Executive Summary. The area reported

## AUSTRALIA'S FORESTS, BY FOREST CATEGORY

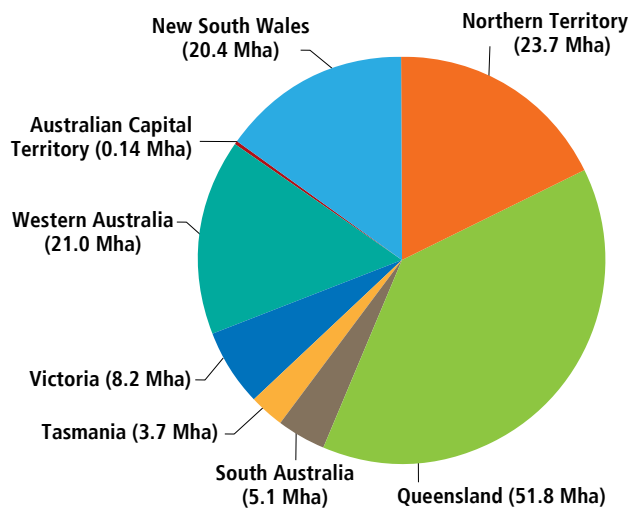


Data source: National Forest Inventory 2016.

Map compiled by ABARES 2018.



## AUSTRALIA'S FOREST AREA, BY JURISDICTION



Mha, forest area in million hectares.

in *SOFR 2018* for the Indigenous forest estate represents an increase of 28 million hectares over that previously reported.

- The increase has been driven primarily by an increase in the area of land over which Indigenous people have 'Other special rights', including through native title determinations and Indigenous Land Use Agreements.

### FOREST AREA CHANGE

Australia's forest area has increased progressively since 2008. The net increase in forest area over the period 2011 to 2016 was 3.9 million hectares.

This increase in forest area is due to the net effect of forest clearing or reclearing for agricultural use; regrowth of forest on areas previously cleared for agricultural use; expansion of forest onto areas not recently containing forest; establishment of environmental plantings; and changes in the commercial plantation estate.

- In each year of the period 2011-2016, the area of forest cleared or recleared was less than the area of forest regrowing from previous clearing.
- In the year 2015-16, first-time clearing was recorded for 60 thousand hectares of forest, 564 thousand hectares of forest regrew on land cleared after 1972, and reclearing of 395 thousand hectares of regrowth forest was recorded. The total area of forest recorded as cleared was 455 thousand hectares.

Native forest is the most extensive category of Australia's forests, covering 132 million hectares. Native forests are dominated by eucalypt forests (101 million hectares) and acacia forests (11 million hectares).

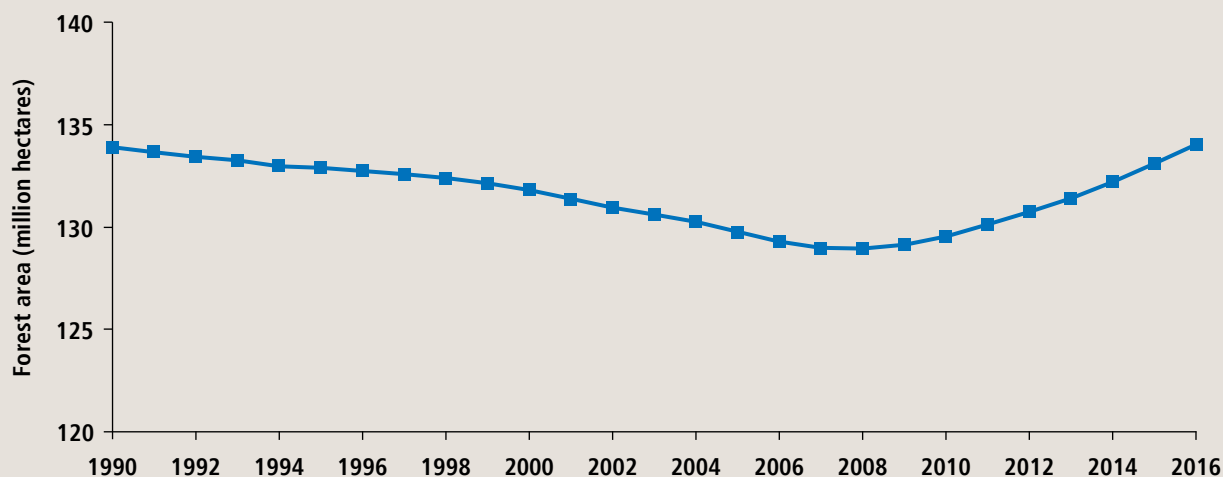
The change in forest area is determined from annual Landsat satellite data interpreted for Australia's National Greenhouse Gas Inventory.

- Temporary changes in forest area or canopy cover that result from a range of short-term factors, such as wildfire, wood harvesting, and regrowth or regeneration from these events, are not included in these area change figures.





## AUSTRALIA'S FOREST AREA SINCE 1990



Calculated by ABARES from data in the National Inventory Report 2016, Australian Government Department of the Environment and Energy.

### FOREST AREA DATA

The forest area dataset prepared for *SOFR 2018* combines data from a wide range of different datasets, assembled using a Multiple Lines of Evidence methodology.

Data on Australia's forest area are assembled in the National Forest Inventory from a wide range of spatial datasets provided by states and territories, and from remotely sensed data sourced from various agencies. When these datasets disagree on whether an area is or is not forest, ABARES uses a formal process to determine the final allocation.

- The forest cover area statements in *SOFR 2018* may therefore not align exactly with figures in individual datasets published in other Commonwealth reports or by individual states or territories.
- Spatial data for Commercial plantations are incorporated from the National Plantation Inventory.

*SOFR 2013* reported a total forest area of 125 million hectares as at 2011, compared to the 134 million hectares of forest reported in *SOFR 2018* as at 2016.

- Most of this difference in the understanding of Australia's forest extent derives from use of more accurate state, territory and national datasets and recent high-resolution imagery, not from actual on-ground changes in forest area.
- The change in reported forest area was greatest in the Northern Territory, where areas of woodland forest not reported as forest in *SOFR 2013* have been identified, mapped, and reported as forest in *SOFR 2018*.

For further information on this theme, see Indicator 1.1a, Indicator 6.4a and Indicator 7.1d of *Australia's State of the Forests Report 2018*.

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# FOREST BIODIVERSITY

In Australia, substantial emphasis is placed on the management of forest ecosystems for the conservation of biodiversity, including through the creation of reserves, development of management prescriptions, and identification and listing of threatened species. This is an extract from *Australia's State of the Forests Report 2018* by **ABARES**

## FOREST MANAGED FOR PROTECTION OF BIODIVERSITY

A total of 46 million hectares (35%) of Australia's native forest is on land protected for biodiversity conservation, or where biodiversity conservation is a specified management intent.

This area is the result of a range of formal and informal processes on both public and private land that are used to protect areas of forest for the conservation of biodiversity. Many areas of forest are protected by, and reported under, more than one process.

- Part of this area is contributed by Australia's National Reserve System, which includes 34 million hectares of forest (26% of Australia's native forests) that have a primary management intent of nature conservation.

Aichi Biodiversity Targets are articulated in the United Nations Strategic Plan for Biodiversity 2011-2020 under the international *Convention on Biological Diversity*, and include the target that at least 17% of terrestrial areas are protected. With 35% of Australia's native forest area managed for the protection of biodiversity, Australia has therefore met this Aichi Biodiversity Target with respect to native forests.

## FOREST BIODIVERSITY AND THREATENED SPECIES

Australia's national lists of forest-dwelling species

(species that use forests for part of their lifecycle) include 2,486 forest-dwelling native vertebrate fauna species (animals), and 16,836 forest-dwelling native vascular flora species (plants).

Of the forest-dwelling native vertebrate fauna species, 1,119 have been identified as forest-dependent species (species that require forest habitat for part of their lifecycle and could not survive or reproduce without it).

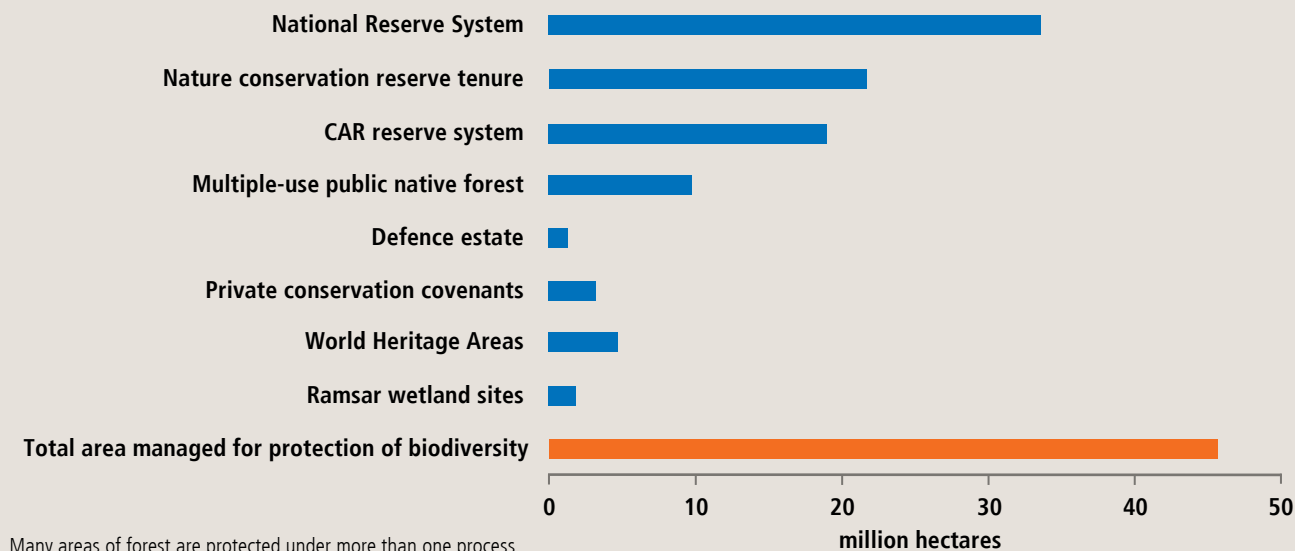
A total of 1,420 forest-dwelling fauna and flora species are listed as threatened species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Of the listed threatened forest-dwelling fauna and flora species, 842 species are forest-dependent.

The most common threats to nationally listed forest-dwelling fauna and flora include forest loss from clearing for agriculture and urban and industrial development; impacts of predators; small population sizes; and unsuitable fire regimes.

- For listed forest-dwelling fauna species, the most common threat categories are forest loss from clearing for agriculture and urban and industrial development, as well as predation by introduced predators.
- For listed forest-dwelling flora species, the most common threat categories are small population sizes, as well as mortality agents and unsuitable fire regimes.
- A total of 57% of Australia's listed threatened forest-dwelling fauna and flora species have genetic-related reasons contributing to their listing. This includes species with populations that are low in numbers or fragmented, or that have low genetic variability.

### AREA OF NATIVE FOREST MANAGED FOR PROTECTION OF BIODIVERSITY, 2016, BY PROTECTION PROCESS



- Based on the emphasis given in listing advice documents in regard to their impacts, forestry operations pose a less significant threat to nationally listed forest-dwelling fauna and flora species compared with other threat categories.

*The most common threats to nationally listed forest-dwelling fauna and flora include forest loss from clearing for agriculture and urban and industrial development; impacts of predators; small population sizes; and unsuitable fire regimes.*

The number of listed threatened forest-dwelling and forest-dependent flora and fauna species per hectare of forest have been separately modelled and mapped across Australia.

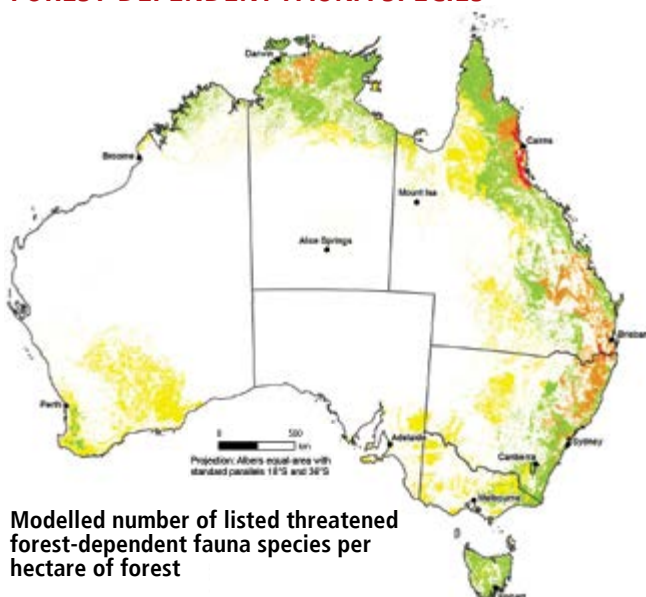
As an example, the regions with the highest density of listed threatened forest-dependent fauna species are the coastal ranges between Townsville and Cooktown in north Queensland, and the border ranges between Queensland and New South Wales.

During the period 2011-16, a total of 68 forest-dwelling species were added to the national list of threatened species, and 77 forest-dwelling species were removed.

- Most additions were based on inherently small population sizes and/or ongoing impacts on habitat extent and quality, including impacts of introduced species and unsuitable fire regimes.
- Most removals of listed species were a result of improved information that indicated that species were no longer considered valid species or were not threatened.

Australia's forest genetic resources are conserved by a variety of means, including in situ in Australia's native forest and in restoration plantings, as well as in commercial and environmental plantations, seed orchards, arboreta and seed banks.

## DISTRIBUTION OF LISTED THREATENED FOREST-DEPENDENT FAUNA SPECIES



Data sources: DoEE 2018 National Forest Inventory 2016.

Map compiled by ABARES 2018.

- There are also tree-breeding and genetic improvement programs for at least 48 native wood-producing and oil-producing species and varieties
- Some Australian native forest species also form a dominant part of the hardwood plantation industry overseas.

**For further information on this theme, see Indicator 1.1c, Indicators 1.2a-c and Indicators 1.3a-b of Australia's State of the Forests Report 2018.**

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*Australia's State of the Forests Report 2018*, pp. 5-7.  
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Rainbow Pitta (*Pitta iris*), a forest-dwelling bird. Credit: Mark Gillow.



# AUSTRALIA'S FOREST POLICIES

## OVERVIEW FROM THE DEPARTMENT OF AGRICULTURE

Australia has a well-established institutional framework to support the conservation and sustainable management of forests. Forest policy in Australia is developed and implemented at the national, state and territory levels. State and territory governments have primary responsibility for forest management.

The Australian, state and territory governments are all signatories to the 1992 *National Forest Policy Statement* (NFPS). The NFPS provides the framework within which the governments work cooperatively to achieve their vision for sustainable management of Australia's forests, while ensuring that community expectations are met.

A key element of the approach adopted in the NFPS involved the negotiation of *Regional Forest Agreements* (RFAs) between the Australian Government and some state governments. RFAs are 20-year plans for the conservation and sustainable management of Australia's

native forests. They are designed to provide certainty for forest-based industries, forest-dependent communities and achieve conservation outcomes.

In addition to the NFPS and the RFAs, the Australian Government has a number of key forest policies to achieve key conservation and management outcomes for Australia's forest and forest industries:

- **National Forest Industries Plan:** The Australian Government's National Forest Industries Plan, *Growing a Better Australia – A Billion Trees for Jobs and Growth*, provides a vision for Australia's forestry industry and supports the economic contributions forest industries make to regional Australia.
- **Illegal logging:** In November 2012 the Australian Parliament passed the *Illegal Logging Prohibition Act 2012* which makes it an offence to import illegally logged timber into the Australian market and to process timber that has been illegally harvested here in Australia. Illegal logging is a major problem for many developing nations, causing forest degradation, loss of habitat and biodiversity, threatening sustainable livelihoods and contributing to global carbon emissions. The Act creates an even economic playing field through ensuring the purchase and sale of legally logged timber products in Australia, and gives consumers and businesses greater certainty about the legality of the timber products they buy.
- **Plantations for Australia: the 2020 Vision:** The Plantations 2020 Vision is a strategic partnership between the Australian, state and territory governments and the plantation timber growing and processing industries. The Vision was launched in 1997 by the Ministerial Council on Forestry, Fisheries and Aquaculture, and revised in 2002. Its overarching principle aims to enhance regional wealth creation and international competitiveness through encouraging a sustainable increase in the size of Australia's plantation estate.
- **National Indigenous Forestry Strategy:** In 2005, the Australian Government published a *National Indigenous Forestry Strategy*, developed in consultation with Indigenous communities and forest industry stakeholders. The strategy aims to encourage Indigenous participation in the forest and wood products industry.

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Department of Agriculture. *Australia's forest policies* (Last reviewed 1 October 2019). Retrieved from [www.agriculture.gov.au](http://www.agriculture.gov.au) on 2 October 2019.

Forest policy in Australia is developed and implemented at the national, state and territory levels. State and territory governments have primary responsibility for forest management.



# RFA HISTORY

## OVERVIEW FROM THE DEPARTMENT OF AGRICULTURE

The recent history of Australia's native forest management is rife with conflict. No one disagreed that the forests were important to us all. The stumbling block was the diverse range of opinions on their management and use.

The first comprehensive national attempt to settle the conflict was the 1992 National Forest Policy Statement. Governments then identified the concept of RFAs as the best means to achieve a win-win outcome for all stakeholders. The Commonwealth and four State governments progressively signed the 10 RFAs between 1997 and 2001.

The RFAs achieved a middle ground. They lay down guidelines, tasks and responsibilities for sustainable forest management. The 20-year agreements are ongoing, not static. The forest debate ranges over a variety of topics. They are listed below.

The RFA process added considerably to our storehouse of knowledge of forest uses and values. It covered the entire spectrum – from their complex ecosystems to their mineral deposits, their heritage values and their importance to tourism and recreation.

### REGENERATION AND REGROWTH FOREST

Regeneration is the re-establishment of a forest following disturbance, such as a bushfire or forest harvesting. Forests regenerate either naturally or from prepared seedbeds. Regeneration can occur after the removal of selected trees. In other instances nearly all the trees are felled to expose seedlings to sunlight to assist the regeneration process. These approaches vary depending on the type of forest and help to develop new forests.

*Many people believe that there is wholesale destruction of our old growth forests by the timber industry. This is not so.*

Regrowth forest describes the plants, particularly trees of similar age, that grow in an area following disturbance. Forests create different fauna and flora habitats as they grow and develop. Each stage of forest growth, including regrowth, provides a suite of conservation values. A range of forest growth stages is essential to maintain the full set of values that they provide.

### OLD GROWTH FORESTS

Many people believe that there is wholesale destruction of our old growth forests by the timber industry. This is not so. Australia's national forest reserve criteria (known as the 'CAR criteria') call for the protection from timber harvesting of 60 per cent or more of existing old growth forests. This increases to 100 per cent where the old growth forest is rare or depleted.

## Regional Forest Agreements

**Regional Forest Agreements (RFAs) are 20-year plans for the sustainable management and conservation of Australia's native forests.**

There are 10 RFAs in four states covering commercial native forestry regions – five in Victoria, three in New South Wales and one each in Western Australia and Tasmania. The RFAs seek to balance competing economic, social and environmental demands on forests by setting obligations and commitments for forest management that deliver:

- Certainty of resource access and supply to industry – building investment confidence
- Ecologically sustainable forest management – ensuring forests are appropriately managed and regenerated
- An expanded and permanent forest conservation estate – to provide for the protection of Australia's unique forest biodiversity.

The RFAs result from scientific study, consultation and negotiation covering a diverse range of interests. Our website contains many historical documents that show the detailed scientific, economic and social processes that underpinned the development of each RFA.

For details on how each of the 10 RFAs have been implemented by the states, see the relevant state forestry website.

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Department of Agriculture. *Regional Forest Agreements* (Last reviewed 4 November 2019). Retrieved from [www.agriculture.gov.au](http://www.agriculture.gov.au) on 14 November 2019.

The application of the CAR criteria in the RFA process has resulted in around 68 per cent of the extent of old growth forest identified in 1997 or 1998 being protected in reserves in RFA regions.

### WOODCHIPS

Woodchips are increasingly being produced from eucalypt plantations grown specifically to produce high quality fibre for papermaking. They are also produced as a by-product from thinning production forests, timber harvesting and saw-milling.

### MANAGEMENT ON AND OFF RESERVES

State governments manage native forest on public land, in conservation reserves and in production forests. The forests are managed according to systems and processes for achieving ESFM (*ecologically sustainable forest management*). ESFM covers the whole range of forest management values, including harvesting at sustainable rates, protecting biodiversity across the forest landscape, protecting wildlife habitats and watercourses, and preventing soil erosion and land degradation.

Each of the RFAs included accreditation by the Commonwealth Government of the State govern-

ments' ESFM systems, based on the recommendations of independent panels of eminent scientific experts.

## PRIVATE LAND

Native forests are found on private as well as public land. Management of native forests on private land is provided for in the establishment of ESFM systems that cover the whole range of forest management values on private and public land. These ESFM systems require that adequate steps be taken to protect native forest on private land. The RFAs established the CAR reserve system from public forests and attempted to meet all reservation targets from public land. Private native forests can also contribute to the CAR reserve system.

## PLANTATIONS

Plantations supply more than 50 per cent of Australia's domestic wood needs. This will increase to around 70 per cent by 2015, as more recently established plantations start producing timber. This proportion could increase as we move closer to the goal agreed by governments under *Plantations for Australia: the 2020 Vision*. This goal is to treble the 1996 area of Australia's plantation estate by 2020.

Plantations are good for the environment. They can help reduce soil salinity, wind and water erosion and waterlogging on agricultural land. Because they absorb carbon dioxide, they can help reduce Australia's greenhouse gas levels.

Plantations can provide an alternative source of income for farmers. They create jobs in planting, maintaining, harvesting and processing in regional areas. However, they can only ever supplement, rather than replace, timber from native forests.

The range of species suitable to establish commercial plantations is limited, restricting their output. Timber is taken from native forests to meet requirements for species not grown in plantations. Examples include high quality ironbark-based structural timbers; craftwood; and specialised appearance products (e.g. furniture for which "timber faults" are a distinctive feature).

## FIRE

Despite the hazards, fire is a part of the Australian landscape and plays an important part in many regeneration processes in our ecosystems. Forest managers are responsible for ensuring the health of our forests and preventing bushfires. The main way they do this is by using planned burns: burning small areas of forest under specific conditions (e.g. on days that aren't too hot, dry or windy). These burns, in harvested areas, have several benefits. Planned burns reduce the fuel on the forest floor by removing inflammable branches and leaves, creating potential seedbeds for forest regeneration.

## REGULATION OF FOREST OPERATIONS

The timber industry is one of the most restricted and tightly regulated industries in Australia. State agencies impose strict limits on both the areas in which the industry can operate and also the amount of wood it

is allowed to remove from native forests. More than 40 per cent of the forest in RFA regions is protected from logging.

Additionally, the amount of wood that can be removed is strictly defined in 'sustainable yield' calculations designed to ensure the forest will re-grow at the same or even a faster rate than it is harvested. As a result, less than 1 per cent of the available area for harvesting is actually harvested each year. A further control is provided by codes of practice that define how and where the forest may be harvested, what must be protected during harvesting and what other precautions are to be taken to safeguard the environment. This level of control over forest operations is an important aspect of Australia's reputation for supplying wood from forests managed in an ecologically sustainable manner.

## OTHER USES, INCLUDING MULTIPLE USE

Forests mean different things to different people. They are important to the environment because they support a variety of plant, animal and other living organisms. They are important to the economy because they support more than 86,000 jobs both directly and indirectly. They also provide a wide range of recreational activities from camping, bushwalking, rock climbing, caving, boating and rafting to four-wheel driving, horse riding, fishing, hunting and prospecting.

Forests not only provide timber but also provide a variety of other forest products and services, such as honey, wildflowers, natural oils, firewood, recreation, tourism, craft wood, fodder, minerals, water, water filtration and carbon cycling.

All activities in multiple-use forests affect the environment in some way. It is important when managing timber harvesting in these forests that the management practices be adaptable and carefully monitored to avoid seriously degrading other forest values.

Multiple-use forests are vital to all Australians. Managed carefully, they will be available for generations to come.

## ENDANGERED, THREATENED, VULNERABLE AND RARE SPECIES AND ECOLOGICAL COMMUNITIES

The RFAs offer protection for endangered, threatened, vulnerable and rare species and ecological communities. The Agreements list the priority species and ecological communities within each region and specify ways to protect them.

These include:

- Protection within the CAR reserve system
- Protection of key habitats, such as rainforest, heaths and swamps, as well as their components, and
- Development of recovery plans and threat abatement plans.

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Department of Agriculture. *RFA History*  
(Last reviewed 4 November 2019). Retrieved from  
[www.agriculture.gov.au](http://www.agriculture.gov.au) on 14 November 2019.



# Native forest protections are deeply flawed, yet may be in place for another 20 years

CURRENT PROTECTIONS FOR NATIVE FORESTS ARE HOPELESSLY OUT OF DATE, CAUTIONS **DAVID LINDENMAYER**

State governments are poised to renew some of the 20-year-old Regional Forest Agreements (RFAs) without reviewing any evidence gathered in the last two decades. The agreements were first signed between the federal government and the states in the late 1990s in an attempt to balance the needs of the native forest logging industry with conservation and forest biodiversity.

It's time to renew the agreements for another 20 years. Some, such as Tasmania's, have just been renewed and others are about to be rolled over without substantial reassessment. Yet much of the data on which the RFAs are based are hopelessly out of date.

Concerns about the validity of the science behind the agreements is shared by some state politicians, with *The Guardian* reporting the NSW Labor opposition environment spokeswoman as saying "the science underpinning the RFAs is out of date and incomplete".

## NEW, THOROUGH ASSESSMENTS ARE NEEDED

What is clearly needed are new, thorough and independent regional assessments that quantify the full range of values of native forests.

Much of the information underpinning these agreements comes largely from the mid-1990s. This was before key issues with climate change began to emerge and the value of carbon storage in native forests was

identified; before massive wildfires damaged hundreds of thousands of hectares of forest in eastern Australia; and before the recognition that in some forest types logging operations elevate the risks of crown-scorching wildfires.

The agreements predate the massive droughts and changing climate that have affected the rainfall patterns and water supply systems of southwestern and south-eastern Australia, including the forested catchments of Melbourne.

It's also arguable whether the current Regional Forest Agreements accommodate some of the critical values of native forests. This is because their primary objective is pulp and timber production.

Yet it is increasingly apparent that other economic and social values of native forests are greater than pulp and wood.

The Regional Forest Agreements and their underlying Comprehensive Regional Assessments are badly out of date. We should not renew them without taking into consideration decades of new information on the value of native forests and on threats to their preservation.



To take Victoria as an example, a hectare of intact mountain ash forests produces 12 million litres more water per year than the same amount of logged forest.

The economic value of that water far outstrips the value of the timber: almost all of Melbourne's water comes from these forests. Recent analysis indicates that already more than 60% of the forest in some of Melbourne's most important catchments has been logged.

The current water supply problems in Cape Town in South Africa are a stark illustration of what can happen when natural assets and environmental infrastructure are not managed appropriately. In the case of the Victorian ash forests, some pundits would argue that the state's desalination plant can offset the loss of catchment water. But desalination is hugely expensive to taxpayers and generates large amounts of greenhouse emissions.

### A DECLINING RESOURCE

Another critical issue with the existing agreements is the availability of loggable forest. Past over-harvesting means that much of the loggable forest has already been cut. Remaining sawlog resources are rapidly declining. It would be absurd to sign a 20-year RFA when the amount of sawlog resource remaining is less than 10 years.

This is partially because estimates of sustained yield in the original agreements did not take into account inevitable wood losses in wildfires – akin to

a long-distance trucking company operating without accident insurance.

Some are arguing that the solution now is to cut even more timber in water catchments, but this would further compromise water yields at a major cost to the economy and to human populations.

Comprehensive regional assessments must re-examine wood supplies and make significant reductions in pulp and timber yields accordingly.

The inevitable conclusion is that the Regional Forest Agreements and their underlying Comprehensive Regional Assessments are badly out of date. We should not renew them without taking into consideration decades of new information on the value of native forests and on threats to their preservation.

Australia's native forests are among the nation's most important natural assets. The Australian public has a right to expect that the most up-to-date information will be used to manage these irreplaceable assets.

### DISCLOSURE STATEMENT

David Lindenmayer receives funding from the Australian Research Council, the Australian Government and the Victorian Government.

David Lindenmayer is Professor, The Fenner School of Environment and Society, Australian National University.

## THE CONVERSATION

Lindenmayer, D (23 March 2018). *Native forest protections are deeply flawed, yet may be in place for another 20 years*. Retrieved from <http://theconversation.com> on 25 March 2019.

Australia's native forests are among the nation's most important natural assets. The Australian public has a right to expect that the most up-to-date information will be used to manage these irreplaceable assets.





# TREE CLEARING IN AUSTRALIA

## A FACT SHEET FROM WWF AUSTRALIA

Forests are one of the planet's most extraordinary natural assets. Covering a little under one-third of the Earth's total landmass area, they provide a home to two-thirds of the known biodiversity and play a critical role in the regulation of the climate and oxygen cycle. Forests help maintain fresh water reserves, limit soil erosion, and provide shelter and sustenance to more than a billion human beings.

**B**ut while this resource is of enormous benefit to mankind, it's also under serious threat from human activity. Satellite studies suggest that the world's forests are being cleared at a rate of 177,000 square kilometres a year, destroying vital habitat for plant and animal species.

While some of the most severe deforestation is occurring in developing countries in Southeast Asia and South America, tree clearing is also a significant environmental threat in Australia.

WWF estimates that more than 80% of the deforestation set to occur globally between 2015 and 2030 will take place in 11 deforestation 'fronts'. One of these is eastern Australia in the states of Queensland and New South Wales, meaning that Australia ranks among the likes of the Amazon, Borneo, the Congo Basin and other threatened tropical regions.

### CAUSES OF DEFORESTATION

The primary cause of deforestation globally is demand for land for use in agriculture, with mining and infrastructure projects also taking a destructive toll. In Southeast Asia, the clearing of land for palm oil and pulp production has had a devastating effect on the region's rainforests.

In Australia, most tree clearing is undertaken to create pasture for livestock. This process was largely halted following the introduction of bans on excessive tree clearing in New South Wales and Queensland in the 1990s and early 2000s, but recent changes to legislation in both states have again made it easier for farmers and landowners to clear trees. Another cause of deforestation is climate change which can lead to increased frequency and intensity of bushfires and droughts.

### IMPACTS OF TREE CLEARING

The impacts of tree clearing are significant on both plants and animals and the wider health of the planet. Some 964 of the 1,250 Australian terrestrial animal species listed as threatened have habitat fragmentation or degradation listed as a threat, while the same is true for 286 of the 390 threatened plant species.

Species under threat due to tree clearing include Carnaby's cockatoo, the southern cassowary, Bennet's tree kangaroo, the Cape York rock wallaby, and the



black-flanked rock-wallaby, as well as the iconic koala, recently listed as vulnerable to extinction in Queensland and New South Wales.

But tree clearing also has wider reaching effects on the Australian environment. Trees play a key role in capturing and storing greenhouse gases, and become carbon sources when killed. Deforestation and forest degradation accounts for approximately 15% of total global greenhouse gas emissions.

Tree clearing also promotes soil erosion, allowing fertile top soil to be swept into waterways where it harms existing ecosystems. Fewer trees in a region can also contribute to drought by reducing the amount of local rainfall.

### PROTECTING FORESTS

WWF-Australia recognises that forests and woodlands are essential to the production of sustainable food, the preservation of threatened species, and the creation of a low-carbon future. We're fighting in Queensland and New South Wales, in particular, for much stronger laws to stop excessive tree clearing.

WWF advocates Zero Net Deforestation and forest Degradation (ZND) globally by 2020, which allows for some limited and carefully controlled clearing for agriculture and settlements across the developing world.

In Australia, WWF advocates net forest cover positive by 2020 – which means increasing native forest cover (not including plantations, but including woodlands). This is because Australia is already well-developed, and has more than enough cleared land to work with already.

© WWF – World Wide Fund for Nature (May 2017). *Tree-clearing in Australia*. Retrieved from [www.wwf.org.au](http://www.wwf.org.au) 26 March 2019.



# FORESTS AND HABITAT DESTRUCTION

- According to WWF, habitat loss is contributing to the permanent loss of species, the weakening of ecosystems, and is impacting on both the overall health of the planet and the quality of human life.
- Globally, human activity is by far the biggest cause of habitat loss. The single primary cause of loss of habitat is land clearing for agriculture. An estimated 177,000km<sup>2</sup> of forests and woodlands are cleared annually for farming or in order to harvest timber for fuel and wood products.
- Earth is estimated to have lost about half of its forests in 8,000 years of human activity, with much of this occurring in recent decades – about 3% of forests have been lost since the 1990s alone.
- Habitat loss is particularly acute in Australia where more mammal species have been lost in the past 200 years than in all other continents combined. Australia holds the world record for extinctions of mammals, with 28 mammals recorded as having gone extinct since Europeans arrived. Of the 1,250 plant and 390 terrestrial animal species considered threatened in Australia, 964 plants and 286 animals have deforestation and resulting habitat fragmentation or degradation as threats.
- Australia's threatened species include Carnaby's cockatoo, the southern cassowary, Bennet's tree kangaroo, and the Cape York rock-wallaby – as well as the iconic koala, recently listed as vulnerable to extinction in Queensland and NSW.
- While tree clearing is a significant cause of habitat loss in Australia, other major contributing factors include increased bushfire frequency and introduced pest species such as cats, foxes and weeds.
- Protected areas alone are not enough to save Australia's threatened species, according to research from the Threatened Species Recovery Hub – a collaboration between University of Queensland researchers, the Australian Conservation Foundation, WWF-Australia and the Wilderness Society.
- The key finding by the Threatened Species Recovery Hub in its report, *Fast tracking extinction*, is that simply reserving land will remove all threats to only about 3% of species. Australia is one of the first countries in the world to reach an international target of having 17% of its land covered by protected areas such as national parks, as part of a strategy to halt biodiversity declines.
- The report found since the *Environment Protection and Biodiversity Conservation Act 1999* took effect in 2000, over 7 million hectares of threatened species habitat – an area bigger than Tasmania – has been destroyed by bulldozing and logging.
- The research found at least 90% of destroyed habitat was not even the subject of an application under federal law. Since the *EPBC Act* was introduced, more than 6,100 projects have been referred under the law since it was introduced – only 21 projects have been rejected outright.
- The analysis found the biggest driver of threatened species habitat loss was agriculture, with livestock pasture being the biggest agricultural driver. Native forest logging, mining and urban development were also significant causes.
- The Threatened Species Recovery Hub researchers used data on over 1,500 species, including threatened plants, mammals, birds, fish, frogs, reptiles and insects. They found well-managed protected areas would address all major threats facing almost half of Australia's threatened species, and address at least one major threat for all threatened species.
- The findings indicate that the only way to avoid future extinctions was to conduct broader conservation efforts, such as managing pest species and weeds and stopping land clearing.

## SOURCES

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Compiled by The Spinney Press.



# To reduce fire risk and meet climate targets, OVER 300 SCIENTISTS CALL FOR STRONGER LAND CLEARING LAWS



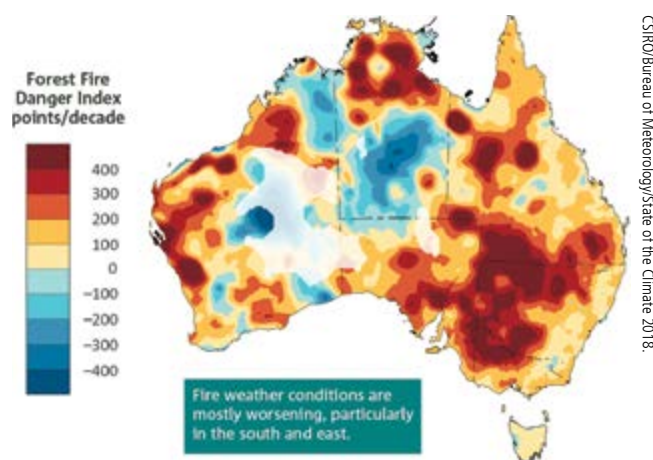
Australia's high rates of forest loss and weakening land clearing laws are increasing bushfire risk, and undermining our ability to meet national targets aimed at curbing climate change. An article from [The Conversation](#) by Martine Maron, Andrea Griffin, April Reside, Bill Laurance, Don Driscoll, Euan Ritchie and Steve Turton

**T**his dire situation is why we are among the more than 300 scientists and practitioners who have signed a declaration calling for governments to restore, or better strengthen regulations to protect native vegetation.

Land clearing laws have been contentious in several states for years. New South Wales relaxed its land clearing controls in 2017, triggering concerns over irreversible environmental damage. Although it is too early to know the impact of those changes, a recent analysis found that land clearing has increased sharply in some areas since the laws changed.

The Queensland Labor government's 2018 strengthening of land clearing laws came after years of systematic weakening of these protections. Yet the issue has remained politically divisive. While discussing a federal inquiry into the impact of these policies on farmers, federal agriculture minister David Littleproud suggested that the strengthening of regulations may have worsened Queensland's December bushfires.

We argue such an assertion is at odds with scientific evidence. And, while the conservation issues associated



**Trends from 1978 to 2017 in the annual (July to June) sum of the daily Forest Fire Danger Index – an indicator of the severity of fire weather conditions.**

Positive trends, shown in the yellow to red colours, indicate increasing length and intensity of the fire weather season. Areas where there are sparse data coverage such as central parts of Western Australia are faded.

with widespread land clearing are generally well understood by the public, the consequences for farmers and fire risks are much less so.

## TREE LOSS CAN INCREASE FIRE RISK

During December's heatwave in northern Queensland, some regions were at "catastrophic" bushfire risk for the first time since ratings began. Even normally wet rainforests, such as at Eungella National Park inland from Mackay, sustained burns in some areas during "unprecedented" fire conditions.





There is no evidence to support the suggestion that 2018's land clearing law changes contributed to the fires. No changes were made to how vegetation can be managed to reduce fire risk. This is governed under separate laws, which remained unaltered.

In fact, shortly after the fires, Queensland's land clearing figures were released. They showed that in the three years to June 2018, an area equivalent to roughly 570,000 Melbourne Cricket Grounds (1,138,000 hectares) of bushland was cleared, including 284,000 hectares of remnant (old growth) ecosystems.

Tree clearing can worsen fire risk in several ways. It can affect the regional climate. In parts of eastern Australia, tree cover reductions are estimated to have increased summer surface temperatures by up to 2°C and southwest Western Australia by 0.4-0.8°C, reduced rainfall in southeast Australia, and made droughts hotter and longer.

Removing forest vegetation depletes soil moisture. Large, intact areas of forest typically have cooler, wetter microclimates buffered from extreme temperatures. Over time, some forest types can even become fire-resistant, but smaller patches of trees are typically drier and more flammable.

Trees also form a natural windbreak that can slow the spread of bushfires. An analysis of the 2005 Wangary fire in South Australia found that fires spread most rapidly through paddocks, rather than through areas lined with native trees.

Finally, Australia's increasing risk of bushfire and worsening drought are driven by global climate change, to which land clearing is a major contributor.

## FARMERS ON THE FRONTLINE OF ENVIRONMENTAL RISK

Extensive tree clearing also leads to problems for farmers, including rising salinity, reduced water quality, and soil erosion. Governments and rural communities spend significant money and labour redressing the aftermath of excessive clearing.

Sensible regulation of native vegetation removal does not restrict existing agriculture, but rather seeks

to support sustainable production. Retained trees can help deal with many environmental risks that hamper agricultural productivity, including animal health, long-term pasture productivity, risks to the water cycle, pest control, and human well-being.

Rampant tree clearing is undoing climate policy too. Much of the federal government's A\$2.55 billion Emissions Reduction Fund has gone towards tree planting. But it would take almost this entire sum just to replace the trees cleared in Queensland since 2012.

In 2019, Australians might reasonably expect that our relatively wealthy and well-educated country has moved beyond a frontier-style reliance on continued deforestation, and we would do well to better acknowledge and learn lessons from Indigenous Australians with respect to their land management practices.

Yet the periodic weakening of land clearing laws in many parts of Australia has accelerated the problem. The negative impacts on industry, society and wildlife are numerous and well established. They should not be ignored.

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**Steve Turton** is Adjunct Professor of Environmental Geography, CQUniversity Australia.

## THE CONVERSATION

Maron, M, Griffin, A, Reside, A, Laurance, B, Driscoll, D, Ritchie, E, and Turton, S (11 March 2019). *To reduce fire risk and meet climate targets, over 300 scientists call for stronger land clearing laws.* Retrieved from <http://theconversation.com> on 25 March 2019.



# AGAINST FOREST BIOENERGY

## A POSITION STATEMENT FROM THE AUSTRALIAN FORESTS AND CLIMATE ALLIANCE

**The combustion of native forest biomass for energy production at the industrial scale poses serious threat to the climate, and to Australia's unique forests and forest dependent species. It also hinders the capacity of nature to remove carbon from the atmosphere and the deployment of genuinely clean, renewable energy technologies. Burning native forest biomass is promoted by its advocates as carbon neutral and simply utilising waste efficiently. In reality this is incorrect and misleading.**

### EMISSIVE

**B**urning forest biomass for electricity production is more emissive of carbon per unit of energy produced than is burning coal. This is scientific fact. These emissions are immediate in their effect on the atmosphere. We need to urgently move away from emissive power sources like coal and other fossil fuels, but should not make the mistake of substituting with an emissive alternative.

### CREATES A CARBON DEBT

The simplistic claim that the large greenhouse gas emissions generated by combustion of wood biomass are recovered by subsequent regrowth of forests ignores the crucial point that such regrowth takes time – a lot of time. It creates a carbon debt that will take many decades or even centuries to repay – if the forests are ever actually allowed to recover to their carbon carrying capacity.

### TIME MATTERS

We have only a short time in which to turn around human-induced climate change, hence targets for 2030 and 2050 in the Paris Agreement. Time taken for forest restoration to naturally replace the carbon removed from the standing forest carbon stock and burnt, is measured in many decades and in centuries for the carbon-dense natural forests of south-eastern Australia. During this time carbon is in the atmosphere contributing to global warming. This is therefore an exacerbation of climate change not capable of breaking even on its carbon balance within relevant time frames, let alone reducing emissions.

### VITAL CONTRIBUTION OF FORESTS TO REMOVE CARBON FROM THE ATMOSPHERE IS UNDERMINED

To successfully restrain climate change to 1.5 or 2 degrees of temperature rise it is vital to achieve two things: deep cuts to greenhouse gas emissions and removal of carbon from the atmosphere. The only proven method of pulling carbon back out of the atmosphere at scale is through sequestration in natural ecosystems.

Forests contain enormous stocks of standing carbon which must be kept out of the atmosphere. Their

continuing growth coupled with strategic ecological restoration of degraded natural forests is a most significant source of carbon sequestration fundamental to turning around the dire situation we face. To cut and burn forests is to undermine the potential for removals from the atmosphere whilst also contributing to large, immediate emissions.

### NOT CARBON NEUTRAL

On top of the simplistic claims that growing trees make burning forest biomass innocuous, the carbon accounting rules developed for the *Kyoto Protocol* and the way they have been applied has also enabled a false perception of carbon neutrality.

The IPCC recognised the emissive nature of biomass burning but in recommending how to account for it advised that the emissions impact be set at zero in the energy sector on the understanding that the emissions would be fully accounted in the land sector. This was meant to avoid double-counting. Not only is the zero in the energy sector misconstrued by some to mean that the impact is actually zero, but emissions from the land sector have never been comprehensively accounted and forest emissions from areas subject to logging not properly accounted at all.

This is a matter of serious concern and debate at the international policy level. Failure to account for substantial forestry emissions due to flawed carbon accounting for the UN creates a false impression of the extent of emissions reduction by developed countries under the *Kyoto Protocol*, but the actual impacts on the atmosphere are real.





## NOT WASTE

Although often claimed to be simply cleaning up 'waste' or 'residues' this is misleading. Large volumes are required on an ongoing basis. The feedstock comes directly from logging operations in the forest and is at volumes much larger than those of sawlogs produced. It is only because it is a lower value product by weight (or volume) that these freshly cut trees are called 'residues'. This 'waste' would be 30% minimum of what was a standing forest before logging, and up to 70 or 80% is not unusual.

The real waste is that intact native forests are destroyed for such purposes. Only a small fraction of feedstock is sawmill residues, and in the case of plans for northern NSW the use of stumps and branches left over after logging is explicitly ruled out.

## THE 'NEW WOODCHIPPING'

Following the collapse of the export woodchip industry, forest biomass burning initiatives are designed to provide a substitute and thus entrench native forest logging when the other prospect is to end it. The high volume pulp log category is explicitly targeted.

## UNSUSTAINABLE, INTENSIFIES LOGGING

Native forest logging in Australia is not ecologically sustainable as evidenced by the increasing levels of endangerment of forest-dependent species and of some forest types themselves. The introduction of an industrial scale forest biomass trade will further intensify the impacts. In places where clearfell logging is not already the norm, such logging regimes are likely to be introduced to scour the forests of trees. This is what is proposed for northern NSW.

## DEEPLY UNPOPULAR

Opinion polls have consistently shown strong community opposition to burning forest biomass for energy. It is at least as unpopular as woodchipping. Retaining our forests for biodiversity, catchment protection, car-

bon retention, recreation and enjoyment are strongly supported.

## UNECONOMIC, REQUIRES PUBLIC SUBSIDY

The income stream generated by forest biomass sales is sought to try and make native forest logging economically viable, although this is doubtful considering the loss-making history of such logging.

The reliance of biomass burning on government subsidies or other forms of support should be taken into account. Government subsidy is the hallmark of this energy source all around the planet; in fact it drives the industry.

## DESTROYS BIODIVERSITY AND RESILIENCE OF FORESTS TO CLIMATE CHANGE

The prospect of continued destruction of the biodiversity of our native forests is alarming. The loss of iconic species such as regional koala populations, the Swift Parrot, Leadbeaters possum, the Numbat, and many more due to ongoing logging is increasingly of serious concern. However the impacts are even broader. As the complex web of forest life is degraded so is the resilience of those forests in the face of climate change, making a perfect storm of threat to the healthy intact forests we need to maintain vital ecological services on which all life depends.

## DISPLACES GENUINELY CLEAN, RENEWABLE ENERGY TECHNOLOGIES

Subsidies directed to biomass burning can displace those available to solar, wind and other energy solutions, especially within a limited renewable energy target. Burning wood in coal-fired power stations, either by co-firing or by complete conversion hinders transition to new ways of non-emissive energy production.

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*Position Statement Against Forest Bioenergy.*

Retrieved from <http://forestsandclimate.org.au> on 30 April 2019.



# Logged native forests mostly end up in landfill, not in buildings and furniture

Almost all native forest logging in Victoria is for woodchips, pulp and pallets, which have short lifespans before going to landfill. By [Chris Taylor](#) and [David Lindenmayer](#)

Victoria has some of the most carbon-dense native forests in the world. Advocates for logging these forests often argue that wood products in buildings and furniture become long-term storage for carbon. However, these claims are misleading. Most native trees cut down in Victoria become woodchips, pulp and pallets, which have short lifespans before going to landfill. In landfill, the wood breaks down and releases carbon back into the atmosphere.

On the other hand, our evolving carbon market means Australia's native forests are extremely valuable as long-term carbon stores. It's time to recognise logging for short-lived wood products is a poor use of native forests.

## THE PROBLEM WITH LOGGING NATIVE FORESTS

Victoria has about 7.6 million hectares of native forests. The most carbon-dense areas are in ash forests, consisting of mountain ash, alpine ash and shining gum trees. These forests can store up to 1,140 tonnes of carbon per hectare for centuries.

But around 1.82 million hectares of Victorian native forests are allocated to the government's logging business, VicForests. VicForests claims logging is the only market for the large area of native forest allocated to it. In other words, its forests are exclusively valued as timber asset, in the same way a wheat crop would be exclusively valued for wheat grain production.

In Victorian native forests, industrial-scale clearfell logging removes around 40% of the forest biomass for logs fit for sale. The remaining 60% is debris, which is either burned off or decomposes – becoming a major source of greenhouse gas emission.

## MYTH ONE: STORING CARBON IN WOOD PRODUCTS

The first myth we want to address is logging native forests is beneficial because the carbon is stored in wood products. This argument depends on the proportion of forest biomass ending up in wood products, and how long they last before ending up in landfill.

On average, logs suitable to be sawn into timber make up only an average 35% of total logs cut from Victorian native forests. Of this 35%, sawmills convert less than 40% into sawn timber for building and furniture. Offcuts are woodchipped and pulped for paper manufacturing, along with sawdust sold to chicken broiler sheds for bedding.

Sawn timber equates to 14% of log volume cut from the forest. The remaining 84% of logs cut are used in short-lived and often disposable products like copy

paper and pallets.

The lifespan of paper products is assumed to be three years. Although around 75% of paper and cardboard is recovered, recycling is growing more uncertain with recovered paper being sent to landfill.

The maximum lifespan of a timber pallet is seven years. At the end of their service, timber pallets are sent to landfill, chipped for particleboard, reused for landscape mulch or burnt for energy generation.

Longer-lived wood products, such as the small proportion of native timber used in building and furniture, have a lifespan of around 90 years. These wood products are used to justify logging native forests. But at the end of their service life, the majority of these wood products also end up in landfill.

In fact, for the 500,000 tonnes of wood waste generated annually from building, demolition and other related commercial processes in Victoria, over two thirds end up in landfill, according to a Sustainability Victoria report.

## MYTH TWO: THE NEED TO LOG SOUTH EAST ASIAN RAINFORESTS

A second myth is using logs from Victorian native forests will prevent logging and degradation of rain-

Our evolving carbon market means Australia's native forests are extremely valuable as long-term carbon stores. It's time to recognise logging for short-lived wood products is a poor use of native forests.







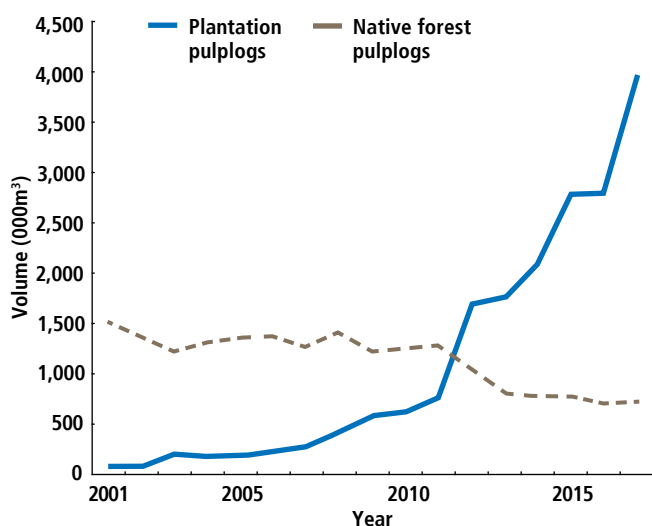
The time is right for Australian governments to develop a long-term carbon storage plan that includes intact native forests.

forests across South East Asia, particularly for paper production.

This is patently absurd. The wood from the Victorian plantation sector – essentially timber farms, rather than trees growing “wild” in native forests – could replace native forest logs used for paper manufacturing in Victoria several times over. In fact, in 2016-17 89% of logs used to make wood pulp (pulplogs) for paper production in Victoria came from plantation trees, with the majority of hardwood logs exported.

And Australia is a net exporter by volume of lower-value unprocessed logs and woodchips. Processing pulplogs from well-managed plantations in Victoria instead of exporting them would give a much needed jobs boost for local economies. With

**Hardwood pulplogs produced from plantations and native state forests across Victoria**



most of these plantations established on previously cleared farmland, they offer one of the most robust ways for the land use sector to offset greenhouse gas emissions.

### NEXT STEPS

The time is right for Australian governments to develop a long-term carbon storage plan that includes intact native forests. Logging results in at least 94% of a forest’s stored carbon ending up in the atmosphere. A maximum of 6% of its carbon remains in sawn timber, for up to 90 years (but typically much shorter). This is patently counterproductive from a carbon storage point of view.

State-owned forest management companies, such as VicForests, can transition away from the timber business and begin managing forests for carbon storage. Such a concept is not new – the federal government has already approved a way to value the carbon storage of plantations.

The same must now be developed to better protect native forests and the large amounts of carbon they can store.

### DISCLOSURE STATEMENT

Chris Taylor receives funding from Australian National University. David Lindenmayer receives funding from the Australian Research Council, the Australian Government, and the Victorian Government for research on forests.

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## THE CONVERSATION

Taylor, C and Lindenmayer, D (23 April 2019). *Logged native forests mostly end up in landfill, not in buildings and furniture*. Retrieved from <http://theconversation.com> on 3 May 2019.



# FOREST CERTIFICATION IN AUSTRALIA

Australia's [Department of Agriculture](#) explains how forest certification and chain of custody schemes work towards reducing illegal logging activities globally

Forest certification has developed as a way of demonstrating the implementation of sustainable forest management practices. To have a forest certified as being sustainably managed, an audit is undertaken by an independent third-party certification body. The audit assesses the forest management practices of a forest manager or owner against the standard for certification. Both native forests and plantations can be certified.

**T**he two major global forest certification bodies are the Programme for the Endorsement of Forest Certification (PEFC) schemes and the Forest Stewardship Council (FSC).

Both the PEFC and FSC are internationally recognised forest certification networks that provide recognition of regional and national standards that meet their criteria for sustainable forest management.

The Australian Government acknowledges internationally recognised forest certification schemes that provide for legal and sustainable forest management. In Australia, forest managers and owners have the option of certifying their forests under the FSC, or the Responsible Wood Certification Scheme which is recognised under the PEFC.

The Responsible Wood Certification Scheme uses the Australian Forestry Standard (AFS) as the relevant standard for certifying forest management, and is administered by Responsible Wood. FSC certification in Australia is administered by FSC Australia.

In 2011, about 10.7 million hectares of native



Responsible  
Wood



forests and plantations were certified in Australia. Currently, 26.7 million hectares are certified under the Responsible Wood Certification Scheme and 1.2 million hectares are certified under the FSC. Some forests can be certified under both schemes.

*In Australia, forest managers and owners have the option of certifying their forests under the FSC, or the Responsible Wood Certification Scheme which is recognised under the PEFC.*

Wood and wood-based products sourced from certified forests can also be tracked (via labelling) through the supply chain using chain-of-custody certification provided by both forest certification schemes. This provides consumers with an assurance that the wood product they are purchasing comes from a sustainably managed and certified forest.

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Department of Agriculture. *Forest Certification in Australia*  
(Last reviewed 4 November 2019). Retrieved from  
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# FARM FORESTRY MANAGEMENT RESOURCES

It is important to manage farm forestry with a well thought-out strategy that addresses the financial, environmental, agricultural, non-agricultural, and personal and business goals of the farm, according to this advice from the [Department of Agriculture](#)

**W**hole business planning has been widely promoted within the farming community under headings such as whole farm planning or property management planning. These approaches use several tools to help landholders define their forestry-related goals and personal performance criteria.

Private Forests Tasmania has developed the 'Farm Forestry Toolbox'. The toolbox is a CD with a collection of user-friendly programs and information. Programs like this can help in farm forestry management.

## **Before taking up farm forestry, remember:**

**Planning** – do all your homework, talk to many people and design the approach that satisfies your particular requirements (whether they are profitability, shelter, landcare, etc). Joining your local farm forestry network can help.

**Establishment** – whichever venture you choose, make sure you set it up properly. Poorly established sites will never be successful and profitable.

**Management** – do what is necessary to ensure the trees meet the market demand. Don't grow trees that no one will want to buy!

**Marketing** – make sure you know or understand from the start all your tree marketing options, including various lease options. Growing good trees is one thing,

## **FARM FORESTRY**

Farm forestry means different things to different people. Essentially however, it is the incorporation of commercial tree growing into farming systems. It can take many forms, including timber belts, alleys and widespread tree plantings.

Farm forestry can provide farmers with an alternative source of income. It can improve agricultural production by providing shelter for stock and crops and can provide substantial environmental benefits such as salinity control.

The Farm Forestry National Action Statement, endorsed by the Natural Resource Management and Primary Industries Ministerial Councils in August 2005, outlines the objectives and actions agreed by the Australian, state and territory governments and the forest and wood products industry to develop farm forestry.

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Department of Agriculture. *Plantations and farm forestry* (Last reviewed 4 November 2019). Retrieved from [www.agriculture.gov.au](http://www.agriculture.gov.au) on 14 November 2019.

but only those who undertake the smartest marketing/sales options will reap the rewards from their farm forestry venture.

## **ESTABLISHMENT STRATEGIES FOR FARM FORESTRY**

Initial establishment and design is an important phase of farm forestry. To ensure your venture meets optimum standards, you must do your initial planning well before developing your farm forestry site.







The site design can be based on a single species, or can be integrated with local natives to promote biodiversity and habitat values. You must take care with design to ensure you achieve optimum environmental benefits without compromising management and returns from the commercial timber species.

#### ***Some designs you may wish to consider are:***

**Plantations** are a long-rotation agricultural crop that can produce large volumes of wood per unit area. In parts of Australia, for example, plantations yield up to 14 times more wood per hectare than native forests for wood production, largely because of plant selection and breeding, and more intensive management techniques.

**Woodlots:** These are small opportunistic plantings of any shape for many purposes. They may include triangles in paddock corners, circles for mid-paddock shelter and firewood blocks near the house. You can easily integrate woodlots with agriculture and manage them to deal with environmental issues.

**Belts** are linear plantings of one or more parallel lines of trees. They can be straight (along a fence), curved or irregular (along a stream). Belts can be easily integrated with other agricultural activities.

**Wide spaced:** This involves trees established several or more metres apart. Wide spaced plantations can be pruned for clearwood and integrated with stock grazing or intercropped with fodder trees and shrubs.

**Native forests:** Using and managing private native forests is becoming more significant with the transfer of State Forest areas to permanent reserves in some parts of Australia. Private native forests can be effectively managed so that they have a commercial value while still ensuring that the environmental benefits of the native forest stand are enhanced.

## **SILVICULTURE – MANAGING TREES**

Through silviculture, we can manipulate forest stands

and the trees within them. Farm silviculture is about designing a regime to suit your needs and aims. Silviculture is the farm forester's most powerful tool and the means by which you may turn 'firewood' into high-value veneer or sawn timber.

There are many silvicultural options. Farmers should not just accept someone else's idea of the 'best bet silvicultural regime'. Think about your options and design your own.

A 'silvicultural regime' is simply a plan of management interventions imposed on a tree or the forest in which trees are growing. Initial spacing and layout, establishment methods, thinning and pruning, fire and grazing, and harvesting patterns are some of the tools used to manipulate the growth of the trees (see the Australian Master TreeGrower Program website for more information).

Once planted, there are three basic silviculture options: leave the stand to grow; thin the stand to improve its growth; or disturb the stand enough to encourage vigorous natural regeneration.

Pruning and thinning the stand, for example, may help improve the quality and value of the timber produced. Pruning involves removing branches from the main trunk of a tree, while thinning removes some trees from the stand to reduce competition for light, soil moisture and nutrients among the remaining trees.

Given that manipulating the growth of trees will affect their quality, there are many things to consider before deciding on a silvicultural regime. Like any business decision, you must undertake research and planning to help make an informed decision.

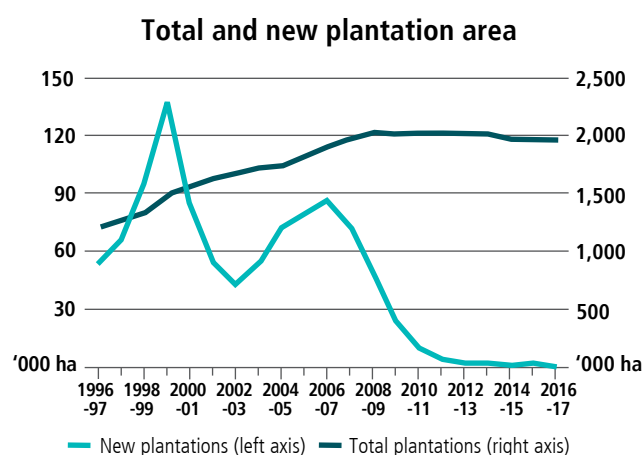
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# AUSTRALIAN PLANTATION STATISTICS

## Research summary from the Australian Bureau of Agricultural and Resource Economics and Sciences

- Australia's total commercial plantation area was approximately 1,955,100 hectares in 2016-17, a decrease of 19,700 hectares (1.0 per cent) from 1,974,800 hectares in 2015-16. These plantations are located within the 15 NPI regions that also contain the vast majority of regional processing facilities (regional hubs) based on plantations.
- In 2016-17 the total area of softwood plantations was approximately 1,036,900 hectares, an increase of around 100 hectares from 2015-16. The total area of hardwood plantations was approximately 908,500 hectares, a decrease of around 19,800 hectares (2.1 per cent) since 2015-16.
- In 2016-17 Victoria continued to have the largest total area of commercial plantations of Australia's states and territories (421,700 hectares), followed by New South Wales (394,400 hectares) and Western Australia (367,900 hectares).
- The total area of new plantations established in 2016-17 was approximately 200 hectares, with half being hardwood and half softwood. All of the new plantations established in 2016-17 were privately owned.
- In 2016-17 approximately 19,900 hectares of Australia's plantation estate was converted to another land use, all from hardwood plantations and the majority (78 per cent) in Western Australia. The largest plantation removals occurred in 2009-10 (38,800 hectares) and 2014-15 (35,200 hectares), all from hardwood plantations.
- In 2016-17 there was approximately 1,485,500 hectares of privately owned plantations, representing 76.0 per cent of the total plantation estate. Public plantations accounted for 20.4 per cent (398,600 hectares) and jointly owned (joint partnerships between state forest agencies and leasehold and freehold land owners) plantations represented 3.6 per cent (71,000 hectares) of the total plantation estate.
- The ownership structure of plantations remained relatively unchanged between 2015-16 and 2016-17. In 2016-17 institutional investors owned 49 per cent of the total plantation area, governments owned 21 per cent, farm foresters and other private growers owned 21 per cent, managed investment schemes owned 5 per cent, and timber industry companies owned 4 per cent.
- In 2016-17 the hardwood plantation estate was dominated by Tasmanian blue gum (51.7 per cent) and shining gum (25.7 per cent), both of which are managed primarily for pulplog production.
- In 2016-17 the softwood plantation estate was



Note: Totals may not tally exactly due to rounding.

Source: ABARES



dominated by radiata pine (74.5 per cent) and southern pines (15.1 per cent), both of which are managed for sawlog production.

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Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Department of Agriculture and Water Resources (May 2018). *Australian plantation statistics 2018 update*, pp. v-vi. Retrieved from [www.agriculture.gov.au](http://www.agriculture.gov.au) on 26 March 2019.



# Economic potential for new plantations

FOLLOWING IS THE SUMMARY FROM A REPORT BY **ABARES**

Australia's commercial timber plantation estate is fundamental to the sustainability and competitiveness of the Australian forestry sector and growing the estate has been a key Australian Government policy objective for some time (*National Forest Policy Statement (1992)* and *Plantations for Australia: the 2020 Vision (1997)*).

However, after decades of substantial growth in Australia's commercial timber plantation estate, the area of plantations declined from 2.02 million hectares in 2011-12 to 1.97 million hectares in 2015-16. This raises questions about the future availability of plantation logs and consequent impacts on the forestry sector.

In light of this decline, Forest and Wood Products Australia and ABARES jointly funded research into the long-term potential for new timber plantation establishment in Australia. This report examines the economic potential of new timber plantation establishment to 2050 under current conditions, referred to as the base case scenario. The modelling builds on previous land use change modelling developed by ABARES (*Burns et al. 2011*) and incorporates a range of factors such as productivity of agricultural land for growing trees, value of land under existing agricultural production and proximity of land to wood-processing facilities and markets. Policymakers and industry can use these projections to anticipate and adapt to expected changes in the industry and to better take advantage of new opportunities.

## KEY FINDINGS

### ***The plantation sector is critical to the forestry industry***

In 2015-16 commercial timber plantations covered 1.97 million hectares, split virtually evenly between softwood and hardwood species. While the total timber plantation area is only a fraction of the native forest area available for wood production it accounts for 87 per

cent of Australia's log production. The 1.03 million hectare softwood estate is primarily managed for sawlog production for the domestic market, but also produces a substantial volume of pulplogs for paper and panel production. In contrast, 95 per cent of logs harvested from the 0.93 million hectares hardwood estate are exported as woodchips, having little impact on the domestic market.

### ***Domestic demand for sawlogs is growing***

While future availability of hardwood sawlogs will likely be sufficient to meet log equivalent demand, ABARES forecasts a shortfall in the volume of softwood sawlogs available to the domestic market. If exports of softwood sawlogs remain at 2015-16 levels the total volume of sawlogs available to the domestic market is forecast to fall short of demand by 2.6 million cubic metres per year between 2045 and 2049.

With continuing growth in demand for softwood sawlogs, ABARES estimates that the domestic log availability shortfall could increase to 3.4 million cubic metres per year between 2050 and 2054. To provide context to these figures an additional 200,000 to 250,000 hectares of new softwood plantations would be required by 2050 to meet an annual deficit of 3.4 million cubic metres per year. However, given the uncertainty around future softwood sawlog supply and log equivalent demand in 2050, it has been proposed that the required area could be as high as 490,000 hectares (*Omega Consulting 2017*).

### ***Future plantation investment may not be enough***

Under the base case scenario, ABARES estimates that around 4,773 hectares of new short rotation hardwood plantations could be economically competitive with current agricultural land use by 2050. However, with expected declines in the existing hardwood estate,



# FORESTRY INDUSTRY FACTS

- The forest sector is a significant employer in rural and regional Australia. Educated workers are integral to the development of the forest and wood products industries, and economic diversity, community wellbeing and capital resources contribute to resilient communities (ABARES, *Australia's State of the Forests 2018*).
- Total national direct employment in the forest sector was 51,983 persons in 2016, a 24% decrease from 2011 (*ibid*).
- A total of 30 Local Government Areas are rated as being dependent on forest and wood products industries through having 2% or more of their working population employed in the sector and containing more than 20 workers employed in these industries (*ibid*).
- The key drivers for the reduction in total forest sector employment were consolidation of processing into larger facilities with higher labour efficiencies, and restructuring of the sector (*ibid*).
- The forestry and wood products sector also creates employment indirectly, in activities that support or depend on this sector (*ibid*).
- Australian forest industries contribute over \$23.7 billion of economic turnover each year (Australian Forest Products Association, *Quick Facts*, 2019).
- Australia has a \$2 billion trade deficit in wood products (*ibid*).
- Forest industries jobs are spread across a huge range of professions including the planting and regeneration of forests, caring of forests, sustainable harvest of forests, haulage of timber and woodchips, timber processing into fence posts, sleepers and sawn timber, creation of paper, cardboard, tissue, paper towels, nappies and renewable biopellets for energy, through to the cutting-edge invention of biomaterials and biochemicals (*ibid*).
- About 80,000 people work directly in forest industries; another 40,000 work in diverse jobs which use the timber from plantation forests and native forests. A further 180,000 people rely on forest industries for their indirect employment (*ibid*).
- Every year the Australian forest industry plants around 70 million trees, covering an area equivalent to 136,000 football fields, amounting to more than 2 seedlings for every Australian (*ibid*).
- The area of commercial plantation forestry in Australia is 2 million hectares (*ibid*).
- 70% of Australia's 123 million hectares of native forest is unavailable or unsuitable for native forestry operations. Only 100,000 ha of the native forest area in Australia is harvested for timber annually (less than 0.06% of Australia's total native forests). All native forest harvested is sustainably regrown, with the regrowth quickly becoming an abundant food source and habitat for native species (*ibid*).
- Timber harvesting has not been a "major threat factor" in the extinction of any Australian mammal since European settlement. Feral animals, bushfires and disease are responsible for the majority of extinctions (*ibid*).
- Over 90% of Australia's commercial native forest operations are independently certified to comply with the world's best sustainable forest management practices, compared to the global average of 8%. Australia is a leader in sustainable forestry practices (*ibid*).



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the total area of hardwood plantations is expected to fall by around 95,227 hectares, or 10 per cent, by 2050.

Around 24,009 hectares of new softwood plantations could also be viable by 2050. However, this is only a 2 per cent increase over the existing estate. Furthermore, ABARES estimates that around three quarters of the logs harvested from the new plantation estate before 2050 will be exported, doing little to meet the growing shortfall.

In order to meet growing demand, the domestic market will become increasingly reliant on imports of sawnwood. ABARES estimates that the volume of softwood sawnwood imports will more than double from 560,215 cubic metres per year in 2020 to around 1.15 million cubic metres per year in 2050. This represents a potential missed opportunity for the Australian forestry sector unless there are new policies or drivers to expand the current softwood timber plantation estate to meet growing demand.

***But there may be potential opportunities in the future***  
In addition to the base case, ABARES estimated potential plantation investment under a range of alternative

scenarios, highlighting potential barriers to and opportunities for the future expansion of the Australian timber plantation estate. While land prices were shown to have a moderate impact on profitability and potential plantation investment, the most significant barrier to investment in new plantations is the long delay between investment and final harvest, particularly for long rotation plantations.

However, changes in future market conditions could open up opportunities. Higher domestic demand for some wood products could allow the establishment of additional softwood plantations and given the high degree of trade exposure faced by the domestic forestry industry, future decreases in the value of the Australia dollar would be highly favourable to expansion of the current estate.

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Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Department of Agriculture and Water Resources (February 2019). *Economic potential for new plantation establishment in Australia Outlook to 2050*, pp. vii-viii. Retrieved from [www.agriculture.gov.au](http://www.agriculture.gov.au) on 26 March 2019.

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# EXPLORING ISSUES

## WORKSHEETS AND ACTIVITIES

The Exploring Issues section comprises a range of ready-to-use worksheets featuring activities which relate to facts and views raised in this book.

The exercises presented in these worksheets are suitable for use by students at middle secondary school level and beyond. Some of the activities may be explored either individually or as a group.

As the information in this book is compiled from a number of different sources, readers are prompted to consider the origin of the text and to critically evaluate the questions presented.

Is the information cited from a primary or secondary source? Are you being presented with facts or opinions?

Is there any evidence of a particular bias or agenda? What are your own views after having explored the issues?

## CONTENTS

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Brainstorm, individually or as a group, to find out what you know about conserving native forests.

**1. What is a native forest? Provide examples of at least three (3) types of Australian native forest.**

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**2. Why are forests important for biodiversity?**

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**3. What is deforestation, and why is it a problem?**

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**4. What is forest degradation, and why is it a problem?**

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## DISCUSSION ACTIVITIES

Complete the following activities on a separate sheet of paper if more space is required.

*“The conversion of irreplaceable forests into consumer products ... is one of the great environmental crimes of our time.”*

Greenpeace Australia Pacific, *Solutions to deforestation*.

Form into groups of two or more people to identify consumer products that could potentially have been sourced from threatened native forests. Use the space below to list five (5) of the items you have identified. Beside each product include why you think they may have been sourced unsustainably, the types of forest impacted, and where. Also discuss how these products could be produced in a way that preserves native forests. Share your findings with other groups in the class.

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*“Forests are a stabilising force for the climate. They regulate ecosystems, protect biodiversity, play an integral part in the carbon cycle, support livelihoods, and supply goods and services that can drive sustainable growth.”*

IUCN, *Forests and climate change*.

Form into groups of two or more people to discuss and plan a presentation on the role forests play in climate change. Consider the elements in the above quotation and include examples to back up your ideas for your presentation. Present and share your ideas with other groups in the class.

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## RESEARCH ACTIVITIES

Complete the following activities on a separate sheet of paper if more space is required.

*“All activities in multiple-use forests affect the environment in some way. It is important when managing timber harvesting in these forests that the management practices be adaptable and carefully monitored to avoid seriously degrading other forest values.”*

Department of Agriculture, RFA history.

Research online the forest areas close to where you live, or within your state. Identify two multiple-use forests and prepare a report for both forest areas. Include where the forest is located, the type of forest, how the forest is used (e.g. forestry, tourism, recreation), and any protections that are in place for forest conservation and management, such as agreements, policies or regulations. List all of your sources.

In conclusion, write a summary discussing your findings. Compare the ways in which the two featured forests are being used, as well as their respective conservation management practices. Discuss whether or not you believe they are being used and managed in sustainable ways, and why.

### FOREST 1:

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### FOREST 2:

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### SUMMARY:

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## MULTIPLE CHOICE

Complete the following multiple choice questionnaire by circling or matching your preferred responses. The answers are at the end of the following page.

- 1. Forests are home to more than what percentage of the world's terrestrial biodiversity?**
  - a. 20%
  - b. 30%
  - c. 40%
  - d. 50%
  - e. 60%
  - f. 70%
  - g. 80%
- 2. The Indigenous forest estate covers 52% of Australia's forests, almost all of which are native forests. How many hectares of forest is this in total?**
  - a. 7 thousand hectares
  - b. 50 thousand hectares
  - c. 800 thousand hectares
  - d. 1 million hectares
  - e. 8 million hectares
  - f. 70 million hectares
  - g. 700 million hectares
- 3. Australia's native forests are put into structural classes based on their combination of crown cover. How much land area does the canopy of a 'closed forest' cover?**
  - a. Less than 10%
  - b. Between 10-20%
  - c. Between 20-50%
  - d. Between 50-80%
  - e. More than 80%
  - f. 100%
- 4. Which of the following are possible causes of deforestation? (Select any that apply)**
  - a. Agricultural land use
  - b. Climate change
  - c. Logging
  - d. Soy production
  - e. Forest regeneration projects
  - f. Mining projects
  - g. Palm oil production
- 5. Deforestation and forest degradation accounts for approximately what percentage of total global greenhouse gas emissions?**
  - a. 5%
  - b. 15%
  - c. 25%
  - d. 45%
  - e. 55%
  - f. 75%
  - g. 95%



## MULTIPLE CHOICE

6. WWF has identified 11 deforestation fronts where the largest concentrations of forest loss or severe degradation are expected in the near future. Which of the following places are included in the list of deforestation fronts? (Select any that apply)

- a. Amazon
- b. Eastern Australia
- c. Sumatra
- d. Germany
- e. New Guinea
- f. New Zealand
- g. East Africa
- h. Congo Basin
- i. Morocco

7. Respond to the following statements by circling either 'True' or 'False':

- |   |              |
|---|--------------|
| a. Commercial plantations are the most extensive category of Australia's forests.   | True / False |
| b. Burning forest biomass for electricity production emits more carbon per unit of energy than the burning of coal.   | True / False |
| c. Earth is estimated to have lost about half of its forests in 8,000 years of human activity with much of this occurring in recent decades.                  | True / False |
| d. There are no sustainably managed forests in Australia.   | True / False |
| e. Due to habitat loss, Australia holds the world record for extinctions of mammals, with 28 mammals recorded as having gone extinct since Europeans arrived. | True / False |
| f. Logging results in at least 94% of a forest's stored carbon ending up in the atmosphere.   | True / False |

### MULTIPLE CHOICE ANSWERS

1 = g; 2 = f; 3 = e; 4 = a, b, c, d, f, g; 5 = b; 6 = a, b, c, e, g, h; 7 = a = f (Covering 132 million hectares, 'native forest' is the most extensive category of Australia's forests), b = T, c = T, d = F (Currently in Australia, 26.7 million hectares of forest are sustainably managed and certified under the Responsible Wood Certification Scheme and 1.2 million hectares are certified under the Forest Stewardship Council), e = T, f = T.

- Forests and trees contribute far more to human livelihoods than is commonly known, playing crucial roles in food security, drinking water, renewable energy and rural economies. They provide around 20% of income for rural households in developing countries and fuel for cooking and heating for one in every three people around the world (FAO, *Forests and trees are key for a sustainable future*). (p.3)
- Between 1990 and 2015, the world lost some 129 million ha of forest, an area the size of South Africa. When we take away the forest, it is not just the trees that go. The entire ecosystem begins to fall apart, with dire consequences for all of us (WWF, *Importance of forests*). (p.4)
- WWF has identified 11 deforestation fronts ... without action to change current trends, up to 170 million hectares of forest could be destroyed in these places by 2030 (WWF, *Saving forests at risk*). (p.6)
- Globally, the biggest cause of deforestation is expanding agriculture – including commercial livestock, palm oil and soy production, but also encroachment by small farmers (*ibid*). (p.6)
- The world's forests absorb 2.4 billion tonnes of carbon dioxide (CO<sub>2</sub>) per year, one-third of the annual CO<sub>2</sub> released from burning fossil fuels (IUCN, *Deforestation and forest degradation*). (p.8)
- Nature-based solutions such as forest landscape restoration can help countries reverse the effects of deforestation and degradation and regain the ecological, social, climatic and economic benefits of forests (*ibid*). (p.9)
- A handful of international logging companies are cutting down the rainforests at record rates. Every year around the world, 7 million hectares of ancient forest are logged, cleared or severely degraded (Greenpeace Australia Pacific, *Forest destruction*). (p.10)
- Indonesia has been awarded a Guinness World Record for being the country with the fastest rate of forest destruction on the planet (*ibid*). (p.10)
- Deforestation accounts for up to 20% of all carbon emissions. This is why Indonesia is the world's third largest greenhouse gas emitter after the US and China (*ibid*). (p.10)
- Forests are home to 80% of the world's terrestrial biodiversity (IUCN, *Forests and climate change*). (p.11)
- Brazil reduced large-scale deforestation in the Amazon by 80% from 2004-2012 by increasing law enforcement, expanding protected areas, recognising indigenous territories, and applying a suite of carrots and sticks to reign in uncontrolled conversion to agriculture, even while increasing production of cattle and soy (World Resources Institute, *Deforestation is accelerating, despite mounting efforts to protect tropical forests. What are we doing wrong?*). (p.13)
- The world lost more than one football pitch of forest every second in 2017, adding up to an area equivalent to the whole of Italy over the year (WWF, *Can we halt runaway climate change? Forests hold the key*). (p.15)
- Just 2% of international climate finance goes to forests, while subsidies and investments in sectors driving deforestation amount to 40 times more than investments in protecting forests (*ibid*). (p.15)
- The companies that have been converting tropical forests to agriculture or plantations, for commodities like palm oil or paper, have come under increasing pressure from their customers to prove that their operations and supply chains are not causing deforestation (Greenpeace Australia Pacific, *Solutions to deforestation*). (p.20)
- Eucalypt forests are by far Australia's most common forest type, covering about three-quarters of Australia's native forest estate and occurring in all but the continent's driest regions (ABARES, *Australia's native forests*). (p.26)
- Australia has approximately 3% of the world's forests, and globally is the country with the seventh largest forest area (ABARES, *Australia's forest area*). (p.27)
- The most common threats to nationally listed forest-dwelling fauna and flora include forest loss from clearing for agriculture and urban and industrial development; impacts of predators; small population sizes; and unsuitable fire regimes (ABARES, *Forest biodiversity*). (p.30)
- Woodchips are increasingly being produced from eucalypt plantations grown specifically to produce high quality fibre for papermaking (Department of Agriculture, *RFA history*). (p.33)
- Plantations supply more than 50% of Australia's domestic wood needs (*ibid*). (p.34)
- A hectare of intact mountain ash forests produces 12 million litres more water per year than the same amount of logged forest. The economic value of that water far outstrips the value of the timber: almost all of Melbourne's water comes from these forests (David Lindenmayer, *Native forest protections are deeply flawed, yet may be in place for another 20 years*). (p.36)
- Extensive tree clearing leads to problems for farmers, including rising salinity, reduced water quality, and soil erosion. Governments and rural communities spend significant money and labour redressing the aftermath of excessive clearing (Maron et al., *To reduce fire risk and meet climate targets, over 300 scientists call for stronger land clearing laws*). (p.40)
- Burning forest biomass for electricity production is more emissive of carbon per unit of energy produced than is burning coal (Australian Forests and Climate Alliance, *Against forest bioenergy*). (p.41)
- Logging results in at least 94% of a forest's stored carbon ending up in the atmosphere. A maximum of 6% of its carbon remains in sawn timber, for up to 90 years (Chris Taylor & David Lindenmayer, *Logged native forests mostly end up in landfill, not in buildings and furniture*). (p.44)



**Biodiversity**

Genetic variety of all life forms – plants, animals and micro-organisms, their genes and the ecosystems they inhabit.

**Canopy**

Uppermost level of foliage formed by the branches and leaves of a tree.

**Clearfelling**

The process of removing all trees, large and small, in a stand in one cutting operation.

**Conservation**

Management of natural environment to ensure its survival.

**Deforestation**

Permanent removal of forest, when the forest is cleared and the land is then used for another purpose, such as agriculture or urban development.

**Degradation**

Loss of specific aspects of a forest ecosystem, such as tree cover, structural features or species, or of habitat characteristics that support the requirements of species or communities, short of being defined as deforestation.

**Ecosystem**

A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

**Farm forestry**

The incorporation of tree growing into farming systems for a range of commercial and environmental benefits. Also known as agroforestry.

**Forest**

An area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding 2 metres and with existing or potential crown cover of overstorey strata about equal to or greater than 20%. This includes Australia's diverse native forests and plantations, regardless of age. Also encompasses areas of trees that are sometimes described as woodlands.

**Forest type**

A classification of a forest according to the dominant tree species, or group of species.

**Forestry**

Establishment/management of forests to meet desired goals, needs, and values, for human and environmental benefits.

**Habitat**

The environment where a plant, animal or ecological community normally lives or occurs.

**Harvesting**

Felling of trees, either as a group selection operation or a thinning or clearfelling operation. *See also* logging.

**Land clearing**

Removal of vegetation to convert land to another land use.

**Logging**

Process of cutting down trees for timber. *See also* harvesting.

**Native forests**

Indigenous forest types. Eucalypts represent the great majority of Australia's native forests.

**Old growth forests**

Ecologically mature forest where the effects of disturbances such as logging, road building and clearing now negligible.

**Plantations**

Intensively managed stands of trees of either native or exotic species, created by the regular placement of seedlings or seed.

**Pulp**

Wood fibre processed to make paper. Pulp logs are processed into wood chips or pulp wood for wood-based panels, paper and paper products. *See also* woodchips.

**Reforestation**

Replanting of a forest on cleared, degraded or destroyed forest areas.

**Regional Forest Agreements (RFAs)**

Twenty-year plans for the conservation and sustainable management of Australia's native forests.

**Regrowth**

Forest stands which are established by natural regeneration after logging.

**Reserves**

Forests set aside from timber production, either by formal means, such as national parks, or by informal means, such as management decisions in a management plan.

**Sustainable forest management**

Management of private and public forests to ensure forests continue to provide a sound supply of renewable timber for present and future generations.

**Sustainable yield**

Amount of trees removed from a forest must at least equal the amount a forest is able to replace naturally.

**Timber**

Sawn wood suitable for building and other purposes.

**Tree**

Perennial plant with a self-supporting woody stem or trunk which usually develops woody branches.

**Wilderness**

Area of land that has been least modified by modern technological society; the most undisturbed expanses of our natural landscapes.

**Wood**

Hard, fibrous, underbark component of stem and/or branches of a tree, often suitable for conversion into products.

**Woodchips**

Small chips of wood produced from logs for use in fibre products or for conversion to pulp for paper manufacture. *See also* pulp.

## Websites with further information on the topic

Australian Bureau of Agricultural & Resource Economics & Sciences (ABARES) [www.agriculture.gov.au/abares](http://www.agriculture.gov.au/abares)  
 Australian Conservation Foundation [www.acfonline.org.au](http://www.acfonline.org.au)  
 Australian Forest Products Association <http://ausfpa.com.au>  
 Australian Rainforest Conservation Society [www.rainforest.org.au](http://www.rainforest.org.au)  
 Department of Agriculture [www.agriculture.gov.au](http://www.agriculture.gov.au)  
 Food and Agriculture Organization of the United Nations [www.fao.org/forestry](http://www.fao.org/forestry)  
 Forest and Wood Products Australia [www.fwpa.com.au](http://www.fwpa.com.au)  
 Forest Education Foundation, Tasmania [www.forest-education.com](http://www.forest-education.com)  
 Forest Learning (Australian Forest Education Alliance) [www.forestlearning.edu.au](http://www.forestlearning.edu.au)  
 Forest Products Commission, Western Australia [www.fpc.wa.gov.au](http://www.fpc.wa.gov.au)  
 Forestry Corporation of New South Wales [www.forestrycorporation.com.au](http://www.forestrycorporation.com.au)  
 Forestry Tasmania [www.forestrytas.com.au](http://www.forestrytas.com.au)  
 ForestrySA [www.forestry.sa.gov.au](http://www.forestry.sa.gov.au)  
 Forests and Climate Alliance <http://forestsandclimate.org.au>  
 Global Forest Watch [www.globalforestwatch.org](http://www.globalforestwatch.org)  
 Greenpeace [www.greenpeace.org.au](http://www.greenpeace.org.au)  
 Institute of Foresters of Australia [www.forestry.org.au](http://www.forestry.org.au)  
 Rainforest Alliance [www.rainforest-alliance.org](http://www.rainforest-alliance.org)  
 Timber NSW Ltd <https://timbernsw.com.au>  
 Timber Queensland [www.timberqueensland.com.au](http://www.timberqueensland.com.au)  
 VicForests, Victoria [www.vicforests.com.au](http://www.vicforests.com.au)  
 Victorian Association of Forest Industries [www.vafi.org.au](http://www.vafi.org.au)  
 Wilderness Society [www.wilderness.org.au](http://www.wilderness.org.au)  
 World Wide Fund for Nature (WWF) [www.wwf.panda.org](http://www.wwf.panda.org)

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