

CHAPTER 14:

Forestry



Forestry

Lead



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Contribution to our long-term vision

By 2050, Aotearoa New Zealand has a sustainable and diverse forest estate that provides a renewable resource to support our transition to a low-emissions economy. Forestry will contribute to global efforts to address climate change and emissions reductions beyond 2050, while building sustainable communities, resilient landscapes, and a legacy for future generations to thrive.



Contribution to Aotearoa New Zealand's first emissions budget (AR5)¹

| | |
|---|-----------------------------|
| Projected contribution without the initiatives in this plan | -24.3 Mt CO ₂ -e |
| Projected average annual contribution without the initiatives in this plan | -6.1 Mt CO ₂ -e |
| Projected percentage of total gross emissions without the initiatives in this plan | -8 per cent |
| Estimated impact from the initiatives in this plan assuming permanent exotics are not restricted into the Permanent Post-1989 NZ ETS category | 0.1 Mt CO ₂ -e |
| Estimated impact from the initiatives in this plan assuming permanent exotics are restricted into the Permanent Post-1989 NZ ETS category | -0.3 Mt CO ₂ -e |

1 Negatives (-) represent removals of carbon dioxide from the atmosphere, while positives (+) represent emissions of carbon dioxide to the atmosphere.

Forestry



Why forestry is important

Forests store carbon from the atmosphere, helping offset other sectors' greenhouse gas emissions. Forestry and wood processing already make an important contribution to Aotearoa New Zealand's bioeconomy.² The actions in this emissions reduction plan will ensure forestry supports the transition to a more productive, innovative, circular and sustainable economy.



Key actions

Actions to support the role of forestry in meeting our 2050 targets focus on the following areas.

- ▶ **Support afforestation** by:
 - considering amendments to the New Zealand Emissions Trading Scheme (NZ ETS) and resource management settings to achieve the right type and scale of forests, in the right place
 - supporting landowners and others to undertake afforestation, particularly for erodible land
 - providing advisory services to land users, councils, Māori and other stakeholders to support choices for sustainable afforestation.
- ▶ **Encourage native forests** as long-term carbon sinks through reducing costs and improving incentives.
- ▶ **Maintain existing forests** by exploring options to reduce deforestation and encourage forest management practices that increase carbon stocks in pre-1990 forests.
- ▶ **Grow the forestry and wood processing** industry to deliver more value from low-carbon products, while delivering jobs for communities.

² Bioeconomy describes the parts of the economy that use renewable biological resources to produce food, products and energy – see chapter 9: Circular economy and bioeconomy.

Our diverse forest estate supports a sustainable, thriving, low-emissions economy

Over the last century, Aotearoa New Zealand has developed a sustainable and productive forest estate and industry. This provides a renewable resource and helps to capture and store carbon.

By 2050 we need to expand, diversify and better utilise this renewable resource to support our transition to a low-emissions economy. This will contribute to global climate change efforts and emissions reductions beyond 2050, while building sustainable communities, resilient landscapes, and a legacy for future generations to thrive.

Reducing gross emissions from the sectors that make up our economy is the Government's priority – but forestry has a part to play in offsetting the emissions of sectors that cannot easily reduce or remove their emissions. It also contributes to lowering gross emissions in other sectors through providing inputs to the bioeconomy. Forestry can provide flexibility in our path to a cost-effective, timely and equitable transition.

In the Government's vision for our forests for 2050:

- ▶ forests continue to play a critical role as carbon sinks, directly offsetting emissions, and as a sustainable source of high-value, low-emissions materials, and bioenergy, which form a key part of our low-emissions economy
- ▶ forests maintain and increase native biodiversity. This provides benefits such as improved soil and water health, recreation, and cultural benefits
- ▶ wood fibre-based products from our production forests provide a substitute for high-emissions materials, and opportunities to develop high-value exports
- ▶ much of our remote, unproductive and highly erodible land is forested, providing a long-term carbon sink to offset emissions that are hard to reduce and remove
- ▶ forests and forest products support the cultural, environmental and economic aspirations of Māori, hapū and iwi
- ▶ our thriving forestry and wood processing sectors provide sustainable, rewarding jobs across the regions and accelerate decarbonisation of the economy.

Forestry provides long-term carbon sinks, supports biodiversity, and contributes to our bioeconomy and equitable transition

Forestry has a critical, ongoing role in reaching the net-zero component of Aotearoa New Zealand's 2050 target. Our forests are a productive source of renewable materials that can provide substitutes for emissions-intensive materials and fossil fuels.

By seizing the opportunity to grow the forest and wood processing industry, we can support regional economies and provide jobs that will contribute to the Government's objective for an equitable transition.

Māori are well positioned to contribute to and lead developments in forestry, both for exotic and native species. Māori own NZ\$4.3 billion of assets in forestry and have ownership of more than 30 per cent of land under plantation forestry and large areas of indigenous forest.

The roughly 1.4 million hectares of Māori customary and freehold land makes up approximately 5.7 per cent of all land in Aotearoa.³ In 2018, around 2,200 Māori were working across the forestry sector.⁴

Much Māori-owned land is landlocked and far from urban centres.⁵ Options for this type of land are narrow, but it is suitable for forestry. Exotic afforestation can add to Māori-owned plantation forestry and provide economic benefits, including employment in forest management and revenue at harvest.

3 Business and Economic Research Limited (BERL) and Land Use Capability Assessments (2021). Māori economy emissions profile – Climate change mitigation impact on the Māori economy. <https://www.mpi.govt.nz/dmsdocument/47929-Maori-economy-emissions-profile-Climate-change-mitigation-impact-on-the-Maori-economy> (accessed 9 May 2022).

4 Reserve Bank of New Zealand. 2018. Te Ōhanga Māori – The Māori Economy 2018 Retrieved from <https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Research/Te-Ohanga-Maori-Report-2018.pdf> (accessed 22 April 2022).

5 Business and Economic Research Limited (BERL) and Land Use Capability Assessments (2021). Māori economy emissions profile – Climate change mitigation impact on the Māori economy. <https://www.beehive.govt.nz/release/new-rules-proposed-carbon-farming-exotic-forests-future> (accessed 9 May 2022).

Careful planning of the right forests, in the right place, is required to ensure the benefits of forestry and the full supply chain are realised. Different types of forests will play different roles.

- ▶ Permanent forests can provide a long-term carbon sink to help offset emissions that are the hardest to remove or reduce, alongside a wide range of other environmental benefits, including supporting indigenous biodiversity. The Government wants to encourage more native forests as permanent forests.
- ▶ We also need production forests to provide a sustainable source of biomass to make biofuels, and wood products to replace emissions-intensive products, like steel and cement in building and construction. Growing our forest products will contribute to a just, fair and inclusive transition by growing jobs in regions.

We have choices about how we grow the forestry sector to support its role in our transition. We need to do so in a way that ensures our forests are managed to get the best outcomes for Aotearoa, particularly in terms of our climate change, biodiversity, and economic goals and aspirations.

Actions to improve forestry's contribution to reducing emissions

The actions set out in this section are focused on what we can do in the next three to five years, as well as laying the foundations for achieving the 2050 vision for forestry.

What are pre-1990 and post-1989 forests?

Forest land is classified differently depending on when it was first established – pre-1990 or post-1989 forest land.

The Kyoto Protocol set 1 January 1990 as the international baseline date for net emissions. Forests established before 1990 are considered part of Aotearoa New Zealand's baseline emissions and removals. They cannot be counted as additional carbon storage in the New Zealand Emissions Trading Scheme (NZ ETS). Forests established after 1989 are considered new carbon sinks. They can be registered in the NZ ETS to earn units for that carbon storage.

Focus area 1: Support the right mix, level and location of afforestation

Strong carbon prices in the NZ ETS are proving an effective driver of afforestation, particularly exotic forests. The significant contribution that forests are playing in meeting our 2050 targets means that we can further tune our afforestation settings to deliver a broader range of outcomes.

This focus area is about supporting the right mix, level and location of afforestation to achieve the carbon removals and storage we need, and to provide wood and other sustainable bio-products, while maintaining the incentive for gross emissions reductions.



PARTNERING WITH IWI TO DEVELOP INTEGRATED FORESTRY SOLUTIONS: OTARAHANGA FOREST

The Otarahanga Forest is a 600-hectare forest established as a commercial partnership between Crown Forestry and Tūwharetoa mai Kawerau ki te Tai.

The forest is planted on land owned by Ngāti Tūwharetoa Holdings Limited, which was established to hold and manage the commercial assets arising out of the 2005 Ngāti Tūwharetoa (Bay of Plenty) Treaty Settlement.

In 2018, following a review of the farming operation, Ngāti Tūwharetoa identified the opportunity to improve the economic returns from the land, create jobs, and protect the fragile volcanic soils through a farm forestry development.

A forestry joint venture was agreed in 2018 and Crown Forestry completed planting in 2021. The farm area targeted for afforestation included undulating hills of volcanic geology unsuitable for grazing. In total, 600 hectares of production radiata pine forest has been established, with the balance of the farm retained by Ngāti Tūwharetoa Holdings Limited for farming activities as well as a significant area of native planting. The forest improves the land's overall productivity, provides alternative revenue streams, and will store around 0.4 Mt CO₂-e during its life.

Otarahanga Forest is an example of applying the right tree, in the right place, for the right purpose.

Action 14.1.1: Ensure regulatory settings deliver the right type and scale of forests, in the right place

To ensure regulatory settings deliver the right type and scale of forests, in the right place, the Government is considering changes to:

- ▶ the NZ ETS, to support a better mix of forest type, retain important productive land uses, to avoid displacing gross emissions reductions and to better manage the potential long-term environmental effects of exotic forests, including:
 - restricting exotic forests from the permanent post-1989 forest category
 - adjusting the application of accounting rules to land which is remote and/or marginal to harvest, to support production on this land.
- ▶ the National Environmental Standards for Plantation Forestry (NES-PF), to ensure environmental management of all exotic afforestation, including consulting on whether greater local control over location and forest types/species of forests is required.

Consultation on these proposals will occur during 2022. It is expected that Cabinet will decide on proposed changes in late 2022 or early 2023.

Action 14.1.2: Support landowners and others to undertake afforestation

Current and historical government grants and other support have driven afforestation which it's estimated will remove and store around 46 Mt CO₂-e over the period from 2022–35 (excluding afforestation driven by the NZ ETS).

The Government is continuing to assist landowners and others to undertake afforestation and conservation projects through:

- ▶ the One Billion Trees Fund (1BT)
- ▶ Crown Forestry joint ventures
- ▶ the Hill Country Erosion Programme
- ▶ the Erosion Control Funding Programme (ECFP).

While the 1BT programme and ECFP have closed to new funding, planting will continue for several years for grants that have already been approved.

Action 14.1.3: Enhance forestry planning and advisory services

Landowners face a future in which traditional land uses may need to adapt to a changing climate or in which better outcomes can be achieved by a transition to production or permanent forestry.

There is an opportunity to provide better planning and advisory services to support afforestation and ensure that the right forests are in the right place, for the right purpose. To achieve this, the Government will:

- ▶ better support and inform current and potential forest growers and the full forestry system by providing advisory services across the full cycle of establishing, managing and harvesting forests
- ▶ work with regional councils, tangata whenua, and other landowners to support climate change work programmes including native afforestation, land reversion and establishment of new production forests in the right location
- ▶ help understand at a regional level where forests will be grown and where harvested wood will be needed so that the forest estate, regional infrastructure and processing capacity align to support the growth of production forestry and domestic manufacturing
- ▶ provide advice on diversifying forestry regimes, including alternative species, in order to develop new types of forest crops that deliver new products or woody biomass for emerging markets (eg, bio-energy)
- ▶ build and share knowledge within the nursery sector to enable the increase in native afforestation.

There will be a focus on:

- ▶ working with councils to increase their capability and capacity to result in more informed decisions
- ▶ working with hapū, iwi and Māori landowners to integrate native and exotic forestry into land-use decisions, to best meet their aspirations.

Focus area 2: Encourage native forests as long-term carbon sinks

He Pou a Rangi – Climate Change Commission (the Commission) recommended greater investment in new and regenerating native forests to deliver a long-term carbon sink to offset emissions that are hard to reduce or remove, improve biodiversity, soil and water health, and realise recreational and cultural benefits.

Current native afforestation levels are well below the Commission’s recommendations, and on current settings are projected to fall further.

There is widespread public support for native afforestation in Aotearoa. Native forests with long-lived tree species (from regeneration and new planting) absorb carbon more slowly than exotic forests. If well managed, they continue removing and storing carbon for centuries as the forest reaches maturity.

However, native forests are slower growing and have high establishment and maintenance costs due, in part, to the availability/cost of seedlings and their survival rates. This is compounded by the slower returns on carbon and lack of downstream wood industry, making the economics challenging.

The Government is considering how to encourage native, biodiverse forest, including on Māori land. This will build on the experience gained through established programmes such as Ngā Whenua Rāhui, which provides a specific mechanism for Māori landowners to protect natural values on their land, providing for generational review.

Action 14.2.1: Update NZ ETS yield tables to include indigenous species

The NZ ETS recognises and rewards the carbon stored by different forest types by using specific NZ ETS yield tables. The yield tables could better recognise and reward carbon stored by native forests, which would encourage native afforestation.

To encourage native forests as long-term carbon sinks, the Government is:

- ▶ investing in a review of the NZ ETS yield tables (carbon look up tables) to ensure their accuracy. The review will look at ways to:
 - develop more accurate indigenous yield tables
 - extend the tables beyond the current 50 years
 - recognise carbon storage resulting from particular indigenous forest management practices, promoting positive outcomes.
- ▶ exploring technologies that:
 - enable accurate measurement of carbon in specific forests
 - provide improved understanding of how current management of forest links to the long-term carbon stock.

These actions will provide an opportunity to better match the recognition of carbon to the specific actions within a forest.

Action 14.2.2: Reduce the cost of native afforestation

The Government is making an initial investment to work with the nursery sector to address the issue of cost and survivability of native tree seedlings and the need to expand production. This includes work to:

- ▶ explore and test science-based practices and technologies to support the sustainable expansion of the sector. This includes demonstrating best practice/ technology, and providing training for the native plant nursery sector
- ▶ harness technology to increase scale and lower the cost of native seedlings. This will focus on developing and demonstrating best practice in seed collection, propagation and forest management
- ▶ investigate options for additional support for early adopters in the nursery sector to gear up for higher native afforestation levels.

Action 14.2.3: Encourage greater levels of native afforestation over the long term

To encourage greater levels of native afforestation over the long term, over the next two years the Government will:

- ▶ investigate options to lower costs, address supply chain barriers and improve the successful establishment of native forests
- ▶ engage stakeholders on a longer-term strategy and action plan
- ▶ undertake research to protect/enhance stored carbon in existing native forests
- ▶ support Māori-led approaches to native forest establishment
- ▶ establish a cross-agency group to improve demand signals to nurseries, to ensure seedling supply.

Focus area 3: Maintain existing forests

Our native forests are significant carbon stores. They are estimated to hold about 1.8 billion tonnes of carbon in their biomass.⁶

Despite a range of policies designed to restrict deforestation of pre-1990 forest, deforestation still occurs at low levels. It was estimated that around 750 hectares of the 7.8 million hectares of pre-1990 native forest lands were deforested in 2019.⁷ This resulted in around 308,460 tonnes of CO₂ emissions.

In addition, native forests experience significant browsing pressure from introduced mammals, leading to a decline in carbon stocks.

There is evidence that some forest management activities can increase carbon removal and storage and protect carbon stocks in the long term, particularly in regenerating forest and successional vegetation. However, pre-1990 forests cannot earn credits in the NZ ETS for the additional carbon stored. There is therefore little incentive to manage forests to increase carbon stocks.

Pre-1990 exotic forests are primarily managed to produce sustainable timber and wood products. While the estate holds large amounts of carbon, this amount tends to fluctuate as the estate is harvested and then the replanted forests grow. Pre-1990 exotic forests only interact with the NZ ETS if they are deforested. Recognising additional carbon stored in pre-1990 forests could also help address historical disadvantages faced by Māori landowners.

6 Ministry for the Environment. 2021. *New Zealand's Greenhouse Gas Inventory 1990–2019*, at p. 260. Retrieved from <https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2019/> (accessed 22 April 2022).

7 Of these 750 deforested hectares, around 401 hectares were regenerating and 349 hectares were tall forest.

The actions set out below address how the Government intends to help maintain our existing forests and improve their contribution to carbon removal and storage.

Action 14.3.1: Explore measures to reduce deforestation of pre-1990 native forests

The Government will:

- ▶ continue to monitor the deforestation of pre-1990 native forests
- ▶ explore how to address the Commission's recommendation to improve and enforce measures to reduce deforestation balanced with the scale of the issue, the need for additional measures, and the need to avoid unintended consequences.

Action 14.3.2: Maintain and increase carbon stocks in pre-1990 forests

To maintain and increase carbon stocks in pre-1990 forests, the Government will:

- ▶ research and investigate which forest management activities will increase carbon storage in pre-1990 forests
- ▶ consider opportunities to incentivise and encourage those management activities, including mechanisms to enable the recognition of additional carbon storage for pre-1990 forests.

Focus area 4: Grow the forestry and wood processing industry to deliver more value from low-carbon products

Aotearoa New Zealand's forestry estate is a vital strategic asset. It provides significant potential to further reduce emissions by replacing emissions-intensive materials and fossil fuels with domestically manufactured wood products and wood-derived biomaterials, biochemicals and bioenergy, such as biofuels (also see [chapter 9: Circular economy and bioeconomy](#)).

Long-lived wood products, such as engineered wood products, are a viable substitute for emissions-intensive materials such as concrete and steel, and store carbon for many decades. The residues from timber processing and harvesting skid sites can be used to generate solid heat energy and produce biofuels, displacing carbon intense fossil fuels, like coal. There is economic potential to make more of the environmental properties of our wood fibre, with opportunities emerging from specialist chemicals through to biopharmaceuticals.

Maximising the contribution of the sector to the Government's climate change and wider economic development objectives – including growing jobs in the regions and supporting growth in the bioeconomy – will require strategic management of our current forestry assets. This includes ensuring the right forests are grown to meet future needs, increasing the amount of wood processed onshore, and developing new export markets and domestic demand for wood products.

Action 14.4.1: Develop forestry and wood processing industry transformation plan (ITP)

The forestry and wood processing industry transformation plan (ITP) is being developed in partnership with Māori, industry, and workers to deliver more value from our existing and future forest estate, stimulate production of new cost-effective low-emissions products and wood-based biofuels and provide sustainable jobs across the regions. It will:

- ▶ set out a cohesive set of actions to transform the forestry sector, grow the domestic wood processing industry and get more value from our logs
- ▶ consider options to attract investment in the production of low-emissions wood products and biofuels, including how forests can provide a more consistent supply of wood fibre
- ▶ provide a transformation roadmap to lift value from the forestry and wood processing sector while delivering for communities and our climate change goals
- ▶ identify specific actions to:
 - increase wood processing and accelerate the bioeconomy
 - lift productivity and resilience across the forestry and wood processing supply chain
 - scale up internationally competitive wood-processing clusters
 - support increased use of wood in construction and improve export outcomes.

The draft of the ITP will be released for public consultation in 2022.

Action 14.4.2: Invest in expanding supply of woody biomass

To secure sufficient supply of woody biomass to fuel the bioeconomy, the Government will investigate options to:

- ▶ work with landowners to increase planting of commercial forest crops to replace coal process heat and/or as input to biofuels and biomaterials
- ▶ undertake research to support cost effective recovery of harvest residues to supply biomass
- ▶ undertake operational research to support species selection and forest management of short rotation crops.

Action 14.4.3: Develop policies that support Māori to meet their aspirations

The Government is working with Māori groups, including forestry experts, to identify priorities for Māori. The aim is to develop and implement forestry policies that support Māori rights to exercise kaitiakitanga and rangatiratanga and meet Māori aspirations.



SUPPORTING MĀORI LAND USE ASPIRATIONS: WHENUA OHO (AWAKEN THE LAND)

Whenua Oho is a three-year initiative funded in 2020 by the One Billion Trees Fund to assist Māori landowners to achieve their aspirations for their land. Whenua Oho means “awaken the land”. It provides a trusted and independent entity with subject matter experts in forestry, tikanga and iwi issues.

The initiative aims to increase Māori participation in the forestry sector – including both exotic and indigenous forestry. Māori experts provide education, assistance and connections, empowering Māori landowners with information and partners who can best help them with decisions for their land and their aspirations.

The services of Whenua Oho have resulted in land management decisions being made by Māori landowners which contribute to both iwi and emissions reductions goals, including tree planting, carbon removals and storage, and erosion prevention on vulnerable land.

As well as working with Māori landowners, Whenua Oho has created a network of relevant government agencies to provide assistance, removing some of the barriers Māori face when engaging with government agencies. Whenua Oho has also created a suite of like-minded investment-ready partners to provide capital and resources for ventures, including planting. By December 2021, planting of around 2,000 hectares was planned, as part of investments of more than NZ\$10 million.

What this means for the emissions budgets

Aotearoa has a sustainable and diverse forest estate, which is already playing a critical role in meeting our international commitments and achieving net-zero long-lived emissions by 2050. Growing the estate and making it more diverse will ensure that forestry continues to play this vital role.

Across all emissions budget periods our forestry⁸ baseline projections are estimated to deliver around 144.5 Mt CO₂-e in carbon removals and storage. Our forests will provide significant mitigation for other sectors, before proposed policies and measures deliver gross emissions reductions in those sectors and the wider economy in the third emissions budget.⁹

Table 14.1. Baseline projections for forestry

| | FIRST EMISSIONS BUDGET (2022-25) | SECOND EMISSIONS BUDGET (2026-30) | THIRD EMISSIONS BUDGET (2031-35) |
|---|----------------------------------|-----------------------------------|----------------------------------|
| Forestry baseline removals | (24.3 Mt CO ₂ -e) | (49.6 Mt CO ₂ -e) | (70.6 Mt CO ₂ -e) |
| Forestry total estimated removals and assuming permanent forests are not restricted into the PP89 NZ ETS category | (24.2 Mt CO ₂ -e) | (55.8 Mt CO ₂ -e) | (119.1 Mt CO ₂ -e) |
| Forestry total estimated removals and assuming permanent forests are restricted into the PP89 NZ ETS category | (24.6 Mt CO ₂ -e) | (52.4 Mt CO ₂ -e) | (77.7 Mt CO ₂ -e) |

Table 14.1 shows the baseline projections calculated in June 2021, and the estimated impact of policy proposals and actions included in this chapter.

⁸ Emissions budgets include sequestration from post-1989 forest until the long-term average carbon stock only and all forest deforestation. For production forests, the long-term average carbon stock represents the average amount of carbon sequestered over harvesting and replanting cycles. For permanent forests this represents carbon sequestered at maturity.

⁹ Emissions budgets are based on June 2021 projections and reflect policies and measures at that time.

In June 2021, the Government updated its baseline projections for forestry, after the Commission delivered its final advice in May 2021. These projections are based on policy settings at that time and use the results of the 2020 Afforestation and Deforestation Intentions Report,¹⁰ New Zealand's Greenhouse Gas Inventory and other completed research and evidence to projected future emissions and removals from forestry.

The level of carbon removal and storage from forests in the Commission's demonstration pathway falls within the range the Government has projected for each of the three budget periods. Continued new forest planting over the coming decades and the prevention of deforestation is needed to continue on the trajectory for meeting emission budgets.

We need to work together to fine-tune the role that forestry plays in reducing our emissions

We need to work together to make sure we are using our forestry sector to its full potential – to offset those emissions that are hard to reduce, and to replace high-emissions products with biomaterials and biofuels.

Local government has a role to play both as regulators and land users in implementing national direction to make sure the right trees are planted in the right place, for the right purpose. Councils can facilitate the use of forests in adapting to the risks of climate change by encouraging the use of marginal land for forestry where that will mitigate the impacts of extreme weather events. They can also encourage production forestry to provide biofuels and materials (see [chapter 9: Circular economy and bioeconomy](#)).

Consultation is underway on whether greater local control over location and types/species of new forests is required. The outcome of that consultation may change the role of councils in influencing the location of forests.

The private sector has a key role in planting, maintaining and funding forests. Businesses and innovators are key to seizing the opportunities from the bioeconomy as the world moves away from fossil fuel products to bio-based materials, fuels, chemicals and products.

¹⁰ Ministry for Primary Industries. July 2021. [Afforestation and Deforestation Intentions Survey 2020 Final Report](#). MPI Technical Paper No: 2021/14. Prepared for MPI by Professor Bruce Manley, School of Forestry, University of Canterbury. Retrieved from <https://www.mpi.govt.nz/dmsdocument/46564-Afforestation-and-Deforestation-Intentions-Survey-2020> (accessed 22 April 2022).

Helping the forestry sector adapt to the effects of climate change

The National Climate Change Risk Assessment identifies risks and opportunities to forestry from a changing climate. Increasing temperatures and shifts in seasonality and rainfall patterns will drive changes in tree growth and forest maturation, as well as increase risks from pests and disease, wildfires and severe weather.

This will directly impact on forest productivity, carbon removal and storage, and the ecosystem services our forests provide. These factors may influence efforts to increase afforestation and maintain permanent carbon sinks.

The Government and industry will need to consider timescales of decades for plantation forests or longer for permanent forests – as well as the ability of tree species and forest ecosystems to adapt to potential changes in climate over these timescales. A forest established today will reach maturity in a climate that is quite different. The impacts on tree growth rates, and the associated impacts on carbon removal and storage, will likely vary around the country.

Wildfire risk is predicted to increase with a climate that is projected to become drier. Some forest types may amplify this risk by providing fuel for these fires (noting that most forest fires start from non-forest sources). Addressing these risks will require well-considered adaptation preparation and fire risk management (see action 14.5 below).

There are also opportunities our forests can provide us in adapting to a changing climate. Forests and trees can improve the resilience of production systems and communities by reducing erosion, landslips, and peak flooding, and offering shade for stock.

The Government is committed to ensuring that innovation, investment, policies, and planning controls enable these opportunities for future climate changes

Policies and measures will be reflected in Aotearoa New Zealand's national adaptation plan, to be released in late 2022.

Action 14.5: Improve fire management planning

To increase awareness of forest fire risk and improve planning for fire management, the Government will:

- ▶ consult later in 2022 on options to require fire management plans for all exotic forests over one hectare.



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Te Kāwanatanga o Aotearoa

New Zealand Government