



TĀNE'S TREE TRUST

*Native Forests for our Future
Hereherea te Wao-nui-a-Tāne*

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Submission for

Aotearoa NZ Taxonomy for Climate Change Substantial
Contribution Criteria for Agriculture, Forestry and Other
Land Use including:

- (1) Mitigation
- (2) Adaptation and Resilience

Submitted to

Centre for Sustainable Finance Toitū Tahua
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Executive Summary

Overall, Tane's Tree Trust (TTT) firmly supports the kaupapa of the NZ taxonomy.

TTT particularly supports nature-based solutions as a key part of the strategy for New Zealand to meet its international obligations and reduce the impacts of climate change and prepare for its future effects. This will simultaneously help address the biodiversity and freshwater crises, and provide important cultural and socioeconomic benefits.

TTT is a nation-wide organisation with a vision to support landholders in successfully establishing and sustainably managing native forest, for all the benefits provided. We currently have 661 members across the motu. We are a charitable trust managed by a CEO and 12 trustees who have a wide range of expertise – from conservation and forest ecology through to forestry science, farm forestry, and forest management. We also work with associates who have complementary skills including carbon modelling and reporting, biometrics, etc.

We are committed to scientific research as a base for best practice guidelines. We have an applied R&D work programme that includes work on continuous cover forestry (CCF), transitional forestry, and options for cost-effectively establishing native forest at landscape scale, i.e., assisted natural regeneration and use of seed islands. We have field trials throughout NZ, including project work in highly erodible country in Tairāwhiti and elsewhere.

We are deeply committed to seeing native forest cover woven back through our landscapes, and promoting all the benefits associated with native forests, including (but not limited to) carbon sequestration and adaptation to climate change. We are also firmly committed to technology transfer. Our resources are freely available via our website -

<https://www.tanestrees.org.nz/resources/>

While our focus is on native forests, **we support a balanced approach to incentivising carbon sequestration in native and exotic forests.** We believe there are roles for different types of forests with different species, as part of wise, sustainable land use.

We advocate for continuous cover forestry (CCF) systems, as opposed to clear-fell systems, as the many benefits associated with forest cover are retained. **New Zealand urgently needs alternative forestry regimes for climate resilience**, protection forests managed primarily for ecosystem services and the public good. However, landholders need revenue for maintaining forest cover on their land (whether exotic or native). Economic drivers are essential, i.e., investment, markets, industries, and incentives.

Investment in applied research programmes is also needed to help counter the major knowledge gaps and aid in development of appropriate management practices. There has been an enormous investment in research into plantation forestry with radiata pine in NZ, but very limited research on our native forest species and alternative forestry regimes managed for the wider values that forests can provide.

There is an urgent need for financial incentives to bridge the gap between native trees becoming established and increasing their growth rate sufficient to earn enough carbon credits to reward landowners. Apart from carbon, there are few opportunities for those establishing (or restoring) permanent native forest cover to realise ecosystem services, **benefits that accrue to the wider community** - locally, regionally, and nationally - but particularly to downstream communities and businesses.

Therefore, **TTT wholeheartedly supports the development of the Aotearoa NZ Taxonomy** for investment in climate change mitigation, and adaptation and resilience. However, we recommend some tweaks to the criteria, as outlined below, and in more depth within this submission.

SPECIFIC RECOMMENDATIONS:

1. **As well as planting, the importance of assisted natural regeneration needs to be recognised** for cost-effective, landscape-scale native afforestation of marginal hill country, particularly in remote areas. In many cases, blanket planting is too costly and difficult in marginal steepland, but this is the type of landscape has been identified as a high priority for native afforestation.
2. **TTT is unhappy that transitional forestry has been removed from the Taxonomy.** Transitional forestry involves transitioning existing exotic plantations to native forest. A recent Forest Growers Research (FGR) report showed that Maori forestry interests have a strong desire to transition from radiata pine monoculture to native species forestry on their erodible steeplands. This has been largely driven by recent extreme weather events. 87% of Maori trusts want viable native options that provide positive cashflow without necessarily matching radiata pine returns. There is strong interest in CCF regimes and a need for investment to assist with transition.
3. **It is unclear whether CCF is allowable under the Taxonomy** but it needs to be allowed for multiple reasons. The benefits associated with permanent forest cover are retained under CCF regimes. Only a small amount of timber is harvested periodically. Small gaps created in the forest by the harvest of single trees or small groups of trees, encourage the release of previously shaded and suppressed saplings, thus encouraging further sequestration of carbon dioxide in the forest. The capacity for carbon sequestration is likely to be higher in a mature coniferous forest managed under a CCF regime (due to its multi-tiered, multi-aged structure) than in a clear-fell plantation regime. As mentioned above in #2, Maori forestry interests have a strong desire to transition from radiata-pine, clear-fell systems on their highly erodible steeplands to native species CCF regimes.
4. **The mention of ‘shallow rootedness’ as the basis for stand collapse in high erosion risk areas is incorrect.** The major factors in land slipping are the underlying geology, steep topography, shallow soils, and extreme weather events (particularly intense rainfall events and strong winds). However, there is a risk, associated with fast-growing, large tree species being planted on such sites. Therefore, the focus needs to be on identifying adverse geologies and selecting species less likely to achieve the height and mass that will predispose the land and forest to wide-scale collapse.

TTT also wishes to endorse the NZ Institute of Forestry submission. We were privy to a near final draft of this.

Thank you for the opportunity to submit to this consultation. We would be happy to provide further clarification on any points made. We are best contacted via office@tanestrees.org.nz

Ka ora te whenua, ka ora te tāngata – When the land is well, we are well

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Introduction

Details of Submitter – Tāne's Tree Trust

- **Tāne's Tree Trust (TTT) was established in 2000**, as a non-profit, Charitable Trust with the vision to support landowners in successfully establishing and sustainably managing native forest, for all the benefits they provide – <https://www.tanestrees.org.nz/>
- Our resources are freely available to all – <https://www.tanestrees.org.nz/resources/>
- **We are a nation-wide organisation** with 661 members throughout NZ.
- We have a CEO, Admin Officer, and 13 trustees who have expertise in forestry management, farm forestry, applied forestry research, ecological restoration, conservation, carbon sequestration, landscape architecture, rongoa, Wai 262, and sustainable land use. We also work with associates who have a wider set of skills including carbon sequestration measurement, modelling and reporting.
- We are researching options to **cost-effectively establish native forest at landscape scale**, including assisted natural regeneration and use of seed islands.
- **We are committed to scientific research** as a base for best practice guidelines.
- **Our Annual Report details our research & development programme** – www.tanestrees.org.nz/site/assets/files/2476/ttt_agm_final_report_2024_for_website.pdf
- **We are highly qualified and experienced.** Between us, we have many decades of experience in CRI research positions, government organisations, university academia, technical roles and private consulting, and professional forestry management; as well as extensive hands-on experience in farm forestry, conservation and ecological restoration.
- **We manage NZ's largest national database** on planted natives with over 60 different native tree and shrub species measured throughout NZ from over 100 stands, age 5 to 100+ years.
- **We have field trials throughout NZ** that underpin our databases, applied research and development of resources.
- **We have an online Native Forest Toolkit** <https://toolkit.tanestrees.org.nz/> - a suite of calculators designed for those planting and managing native trees to meet multiple objectives. It draws on scientifically robust data from **TTT's Indigenous Plantation Database** to provide stakeholders with realistic expectations for their plantings. Includes a Planting & Budgeting Calculator, a Growth and Yield Calculator, and a Carbon Calculator.
- **The Carbon Calculator:** <https://www.tanestrees.org.nz/resource-centre/carbon-calculator/?highlight=carbon+calculator>. The Look-up tables significantly underestimate C sequestration in planted, managed native forest – <https://pureadvantage.org/carbon-sequestration-by-native-forest-setting-the-record-straight/>
- **A fact sheets series** has been developed to assist those establishing and managing native forest for multiple objectives. These are available via - <https://docs.tanestrees.org.nz/>
- **We hold workshops throughout NZ.**
- **We have expertise in and are proponents of continuous cover forestry (CCF):** https://www.tanestrees.org.nz/site/assets/files/1069/continous_cover_forestry_-_web.pdf
- **We convene the Northland Tōtara Working Group** and facilitate research into the sustainable management of this naturally regenerating native forest resource on farmland.
- Several trustees have hands-on experience in sustainable indigenous forestry management via CCF regimes, under part 3A of the Forests Act.
- Five of our trustees have worked across forestry with indigenous species and exotic plantation species, and we believe there are roles for different types of forestry regimes with different species - as part of wise, sustainable land use.

Scope of this Submission

This submission pertains to the public consultation documents released by the Centre for Sustainable Finance as part of the second consultation for the NZ Taxonomy. This includes:

1. Climate Mitigation criteria.
2. Climate Adaptation & Resilience criteria.
3. Survey questions.

TTT's focus is on native forestry, our raison d'être. We believe that there are many benefits of weaving native forests back through our rural working lands and urban environments and coastal areas.

Our submission focuses specifically on native forest establishment and ongoing management, for climate change mitigation, adaptation and resilience. However, we also purport that there are roles for different types of forestry with different species in New Zealand - as part of wise, sustainable land use. (Five of our trustees have experience in forestry management or research with exotic as well as native species).

General Comments

TTT wholeheartedly supports the development of the Aotearoa NZ Taxonomy to guide investment in climate change mitigation, adaptation and resilience. However, we recommend some tweaks to the criteria, as outlined below in Specific Comments and Recommendations.

TTT endorses the NZ Institute of Forestry submission. TTT trustees were able to look at a near final version of the NZIF submission for the Taxonomy and give feedback. The NZIF submission was written by Kit Richards who is a leading authority in environmental forestry, forest policy, and forest certification schemes.

TTT supports alignment and recognition of forest certification schemes (FSC & PEFC) and Sustainable Forest Management Systems in the Taxonomy. This is important as it will prevent duplication and bureaucratic complexity.

While our focus is on native forests, **TTT supports a balanced approach to incentivising carbon sequestration in native and exotic forests**, and nature-based solutions for climate adaptation and resilience. We believe there are roles for different types of forests with different species, as part of wise, sustainable land use.

The importance of restoration of permanent forest cover to our highly erodible steep lands has been well documented in academic, scientific papers and reports. According to a Manaaki Whenua Landcare Research report - *Rapid assessment of land damage - Cyclone Gabrielle*¹ - the reduction in landslide probability in land clothed in woody vegetation was substantial in Hawkes Bay through to Tairāwhiti, particularly where there was indigenous forest cover.

The extent of severe damage from Cyclone Gabrielle was large, with over 300,000 landslides (each typically comprising a thousand tonnes of soil)². This removed huge amounts of soil and

¹ McMillan, A., Dymond, J., Jolly, B., Shepherd, J., & Sutherland, A. (2023). Rapid assessment of land damage – Cyclone Gabrielle. Manaaki Whenua Landcare Research.
<https://environment.govt.nz/assets/Rapid-assessment-of-land-damage-Cyclone-Gabrielle-Manaaki-Whenua-Landcare-Research-report.pdf>

² Ibid. Page 24.

deposited sediment on floodplains. The total mass of landslides is estimated at 300 million tonnes, with an economic cost of approximately \$1.5 billion.

If mature native forest had been on all the land classified as highly erodible (HEL) in the badly impacted Esk catchment, then the mass of eroded soil would have reduced from 5.7 million tonnes to 4.0 million tonnes and the average depth of deposited sediment on the flood plain would have reduced from 80 cm to 50 cm (~ 30% reduction)³. If there was native forest on highly erodible land and if 80% of non-HEL land had soil conservation plans, then the mass of eroded soil would have reduced from 5.7 million tonnes to 2.8 million tonnes and the average depth of deposited sediment on the flood plain would have reduced from 80 cm to 40 cm (~ 50% reduction).

New Zealand urgently needs alternative forestry regimes for climate resilience – protection forests managed primarily for ecosystem services and the public good, as espoused in a TTT Factsheet on *Resilient native forest in an era of climate change*⁴ published in partnership with Te Uru Rākau (NZ Forest Service). However, landholders need revenue for maintaining forest cover on their land (whether exotic or native) or for afforestation projects, particularly retiring steep, erodible, marginal land. Economic drivers are essential, i.e., investment, markets, industries, and incentives.

As well as planting, the importance of assisted natural regeneration needs to be recognised in the criteria - for cost-effective, landscape-scale native afforestation of marginal hill country, particularly in remote areas (see Appendix 1)^{5 6}. In many cases, blanket planting is too costly and difficult in marginal steepland, but this is the type of landscape has been identified as a high priority for native afforestation.

TTT advocates for promoting integration of native forest within our rural working lands that will enhance existing productive land uses, not compete with them and will result in environmental gains to existing land uses – including carbon sequestration and climate change adaptation and resilience.

There is a strong dichotomy in land management in New Zealand between conservation and production, and indigenous and exotic ecosystems (PCE 2002)⁷. This is unusual from an international perspective, and it is particularly evident in forestry land use and limits the realisation of the wider value of native forests in our rural working landscapes, and their ecosystem services, including climate mitigation and adaptation⁸.

³ Ibid. Page 25.

⁴ Resilient native forest in an era of climate change - <https://docs.tanestrees.org.nz/resilient-native-forest-in-an-era-of-climate-change/>

⁵ Natural regeneration of native forests - <https://docs.tanestrees.org.nz/natural-regeneration-of-native-forests/>

⁶ How to establish “seed islands” of natives - <https://docs.tanestrees.org.nz/how-to-establish-seed-islands-of-natives/>

⁷ Parliamentary Commissioner for the Environment (PCE) (2002). Weaving Resilience into our Working Lands: recommendations for the future roles of native plants. Parliamentary Commissioner for the Environment, Wellington. ISBN 1–877274–05–4.
https://www.pce.parliament.nz/media/pdfs/weaving_pdf.pdf

⁸ Aimers, J., Bergin, D., Horgan, G. (2021). Review of non-timber values in sustainably managed native forest in New Zealand. Tāne’s Tree Trust bulletin, Hamilton, New Zealand. 119 pages.
https://www.tanestrees.org.nz/site/assets/files/1099/non_timber_values_in_native_forests_-_web.pdf

In New Zealand, there is a misconception in the general public that forestry only encompasses clear-fell plantation regimes with exotic species. Elsewhere in the world, forestry has a broader scope that includes exotic and native species, and management of planted and natural forests for multiple ecosystem services. It is this broader concept of forestry that TTT embraces.

TTT has expertise in and advocates for continuous cover forestry (CCF) regimes⁹ with native and exotic species, as opposed to clear-fell systems, where it is an appropriate land use (see Appendix 2).

It is unclear whether CCF is allowable under the Taxonomy, but it needs to be included for the reasons described below.

The benefits associated with permanent forest cover are retained under CCF regimes. Only a small amount of timber is harvested periodically under Sustainable Forest Management Permits and Plans (SFMPs), as regulated by Part 3A of the Forests Act, and administered by Te Uru Rākau (MPI). Small gaps created in the forest by the harvest of single trees or small groups of trees, encourage the release of previously shaded and suppressed saplings, thus encouraging further sequestration of carbon dioxide in the forest.

Barton (2008)¹⁰ contends that the capacity for carbon sequestration is likely to be higher in a mature coniferous forest managed under a CCF regime (due to its multi-tiered, multi-aged structure) than in a clear-fell plantation regime.

The greatest carbon sequestration in our native forest species is in our lowland and midland areas. There is strong interest from landowner groups to restore native forest throughout our rural working lands, particularly in riparian areas and in erodible and flood-prone land, i.e., not just marginal land. It is worth noting that much of our remaining lowland forest is on farmland and within commercial forestry estates. Only a small amount is on Conservation land. There are extensive pockets of native forest that are managed by commercial forestry companies¹¹ for their non-market values (biodiversity conservation, water quality and aesthetic landscape values).

We must urgently develop models to incentivise native afforestation, and protection and management of existing native forest - and reward landholders for provision of ecosystem services, for the benefit of all.

Sustainable native forest management – including selective timber harvests under CCF regimes, can have a useful role as a nature-based solution and effecting more appropriate land use. It is important that native forestry is supported, incentivised, and perverse outcomes (disincentives and impediments) are avoided or removed. Controls and protection via MPI approved SFMPs ensure the maintenance of the forest's natural values in perpetuity and effect a greater level of management and protection than is required of SNAs (Significant Natural Areas) under the NPSIB (National Policy Statement for Indigenous Biodiversity).

⁹ Close to Nature Forestry. Continuous Cover Forestry - and its role in our changing landscape
<https://www.youtube.com/watch?v=0vrmeVqoEP4>

¹⁰ Barton, I.L. (2008). Continuous cover forestry: A handbook for the management of New Zealand forests. Tāne's Tree Trust, Pukekohe. 104 p.
https://www.tanestrees.org.nz/site/assets/files/1069/continous_cover_forestry_web.pdf

¹¹ Page 57 of the booklet - approx 19% of all certified forests include native reserves of some sort.
www.nzfoa.org.nz/images/FGT_4234_Facts_and_Figures_2021_22_Internals_FA_web_updated_1feb2023.pdf

Consequently, the NPSIB specifically acknowledges such harvests under the Forests Act, recognising they can be compatible with the maintenance of indigenous biodiversity values – within and outside SNAs.

Another important consideration is transitional forestry, which involves transitioning existing exotic plantations to native forest (see Appendix 3). The commercial plantation forestry industry is looking for advice on how to retire radiata-pine stands safely and cost-effectively on erodible steeplands, which are not economical to harvest and/or pose increasing environmental risks in an era of climate change - and where the best option is a managed transition back to native forest. This is highly pertinent to a requirement of the updated NZ FSC Standards.

Another driver is that many Maori landowners are currently actively seeking technical advice in transitioning clear-fell radiata-pine plantations back to native forest.

TTT is unhappy that transitional forestry has been removed from the Taxonomy.

A recent Forest Growers Research (FGR) report on *The case for change - Increasing resilience in NZ forestry through diversification*¹² highlights the importance of transitional forestry, particularly for Maori. The report was based on extensive consultation (interviews and workshops) with the forestry and wood processing industries, including Maori forestry trusts.

The FGR report indicates that Maori interests in alternative options are largely focused on transition from radiata pine to native species forestry, with recent extreme weather events helping drive this. Maori are major plantation forestry land owners in New Zealand, and this ownership will expand with further Treaty settlements.

Historically, in the process of colonisation, Maori tribes lost much of their land, particularly their prime land. Many have been left with mostly unproductive land, including highly erodible steeplands. The FGR report highlighted that **87% of Maori trusts interviewed want viable native options** that provide positive cashflow without necessarily matching returns from radiata pine. They are interested in permanent native forest cover but want to manage their forests under CCF regimes so that they can generate some income while protecting the land, water quality, biodiversity, downstream infrastructures, and cultural values.

TTT believes that nature-based solutions must be a key part of the strategy for New Zealand to meet its international obligations regarding climate change, as well as prepare for its future effects and reduce the impacts. This could simultaneously help address the biodiversity and freshwater crises, and provide important cultural and socioeconomic benefits.

As part of nature-based solutions for climate mitigation, adaptation and resilience, TTT recommends the following:

- Highly erodible, vulnerable hill country is transitioned back into permanent native forest.
- Exotic forest transitioned to native forest on these vulnerable sites, based on science and demonstrated best practice - currently being researched and developed by TTT and partners (see Appendix 3).
- Continuous cover forestry (CCF) considered as an option, where appropriate.

¹² *The case for change - Increasing resilience in NZ forestry through diversification* - FGR report - <https://fgr.nz/document/the-case-for-change-increasing-resilience-in-new-zealand-forestry-through-diversification/>

- Appropriate catchment protection upstream of land-based industries, infrastructure, and communities.
- Riparian areas, green infrastructure and flood protection – riparian vegetation decreases peak flows and moderates flood events. Green infrastructure utilises natural and restored ecosystems, as opposed to manmade infrastructures, to take the pressure off downstream stormwater systems, alleviating flooding, and protecting water quality in urban areas.
- Strategic placement of green firebreaks of low flammability native species.
- Coastal buffers, including restoration of native coastal forest, and exploration of mangrove forests for carbon sequestration and climate resilience.
- Programmes or incentive schemes supporting catchment groups, community and tāngata whenua groups in healing the whenua. There is already extensive ecological restoration work that has been successful in not only environmental gains, but also in positive outcomes for local people – but this work is often piecemeal and lacks security of funding.

There is an urgent need for financial incentives to bridge the gap between native trees becoming established and increasing their growth rate sufficient to earn enough carbon credits to reward landowners. Apart from carbon, there are few opportunities for those establishing (or restoring) permanent native forest cover to realise ecosystem services, **benefits that accrue to the wider community** - locally, regionally, and nationally - but particularly to downstream.

Investment in applied research programmes is also needed to help counter the knowledge gaps and aid in development of appropriate management practices, plus enable technology transfer.

Climate Mitigation Criteria

Specific Comments and Recommendations

Forestry Substantial Contribution Criteria

F1. Afforestation and Reforestation:

- TTT recommends that item F in **Process and requirements** is amended. The mention of “shallow rootedness” as the basis for stand collapse in a forest in high or very high erosion risk areas is incorrect. The major factors in land slipping are the underlying geology, steep topography, shallow soils, and extreme weather events, particularly intense rainfall events and strong wind. However, there is a risk, associated with fast-growing, large tree species being planted on such sites. Therefore, the focus needs to be on identifying adverse geologies and selecting species less likely to achieve the height and mass that will predispose the land and forest stands to wide-scale collapse.
- As noted above in Overall Comments, assisted natural regeneration will be the only option for large-scale native afforestation, particularly in more difficult topography (see Appendix 1). TTT recommends that it be included in **Eligible practices**, as per the highlighted text below:

B. Implementing and conducting forestry establishment, planting *or assisted natural regeneration*, and managing activities to create the forest, including sowing seed, exclusion of stock (in establishment phase), and pest, pathogen and weed management.

F2. Rehabilitation

- TTT recommends inserting a caveat in the first sentence as per the highlighted text below:

Restoration and rehabilitation of degraded native forests, whether through natural or human-induced processes, with restoration aiming to return ecosystems *as close as possible* to their original state, and rehabilitation focused on improving the ecosystem’s health and functions.

It is near impossible to return an ecosystem to its original state as there are species of flora and fauna that have become extinct since humans set foot in New Zealand. The natural ecosystems that have survived the extensive land use change imposed by humans all have varying levels of modification. Hence the need for the caveat.

- As above, TTT recommends item F in **Process and requirements** is amended, regarding the mention of ‘shallow rootedness’, which is incorrect. The focus needs to be on identifying adverse geologies and selecting the appropriate species for forest cover, which are likely to be the shrub and smaller tree species that naturally regenerate on this type of country.
- As above, TTT recommends that assisted natural regeneration be included in **Eligible practices**, as per the highlighted text below:

Implementing and conducting restoration and rehabilitation management activities, including those focused on restoring and rehabilitating habitats and species, improving biological connectivity, planting *or assisted natural regeneration*, and eliminating pests, weeds and diseases.

F3. Forest Management

- TTT requests clarification on whether CCF is allowable under the Taxonomy. TTT recommends that this criteria includes the possibility of CCF regimes under a sustainable forest management plan under Part 3a of the Forests Act. The benefits associated with permanent forest cover are retained under CCF regimes, as described in General Comments above. Small gaps created in the forest by the harvest of single trees or small groups of trees, encourage the release of previously shaded and suppressed saplings, thus encouraging further sequestration of carbon dioxide in the forest.
- New Zealand urgently needs alternative forestry regimes for climate resilience – protection forests managed primarily for ecosystem services and the public good. As discussed above in General Comments, there is an urgent need to transition our highly erodible steeplands from clear-fell exotic plantation regimes to permanent native forest cover. However, landholders need revenue for maintaining forest cover on their land (whether exotic or native), particularly where they are retiring steep, erodible, marginal land. CCF needs to be considered as an option, where appropriate.
- This is particularly important for Maori forestry interests, as described above. Maori are major plantation forestry land owners in New Zealand, and this ownership will expand with further Treaty settlements. Many have been left with mostly unproductive land, including highly erodible steeplands. A recent FGR report highlighted that Maori forestry interests want viable native forestry options that provide positive cashflow without necessarily matching returns from radiata pine. They are interested in transitioning clear-fell regimes on vulnerable steeplands to permanent native forest cover but want to manage their forests under CCF regimes so that they can generate some income while protecting the land, water quality, biodiversity, downstream infrastructures, and cultural values.

F4. Conservation Forestry

- TTT recommends considering amalgamating **F2. Rehabilitation** and **F4. Conservation Forestry** – as there appears to be significant overlap. Although we acknowledge that possibly there is a need to include both sets of criteria for inter-operability with taxonomies in other jurisdictions.
- As above, TTT recommends that item E in Process and requirements is amended. The mention of “shallow rootedness” as the basis for stand collapse in a forest in high or very high erosion risk areas is incorrect. The focus needs to be on identifying adverse geologies and selecting species less likely to achieve the height and mass that will predispose the land and forest stands to wide-scale collapse.
- Regarding certification schemes (item H) TTT defers to the NZIF submission. This is only ever likely to be used in the situation of an integrated certified commercial forest estate, where natural forest ecosystems are reserved and protected within a land-use matrix of commercial plantation forests. There are extensive pockets of native forest that are managed by commercial forestry companies¹³ for their non-market values (biodiversity conservation, water quality and aesthetic landscape values).

¹³ Page 57 of the booklet - approx 19% of all certified forests include native reserves of some sort. www.nzfoa.org.nz/images/FGT_4234_Facts_and_Figures_2021_22_Internals_FA_web_updated_1feb2023.pdf

Climate Adaptation & Resilience criteria

Specific Comments and Recommendations

DNSH - Do no significant harm criteria

- The DNSH criteria in general are supported - in particular, the alignment with the already established forest certification schemes.
- The reference to stand collapse due to “shallow rootedness” needs to be amended, as discussed above. The focus needs to be on identifying adverse geologies and selecting species less likely to achieve the height and mass that will predispose the land and forest stands to wide-scale collapse
- TTT recommends that the DNSH should not be optional initially. They should be rolled out as soon as possible for all entities.

MSS - Minimum Social Safeguards

- The MSS in general are supported - in particular, the alignment with the already established forest certification schemes.
- TTT recommends that the MSS should not be optional initially. They should be rolled out as soon as possible for all entities.

Ka ora te whenua, ka ora te tāngata – When the land is well, we are well

APPENDIX 1 – Cost-effective methods for landscape-scale native forest establishment

TTT advocates for assisted natural regeneration augmented by targeted planting:

- **We advise a shift in focus from reliance on mostly planted forests to assisted natural regeneration** – where planting is part of the mix, along with management to limit factors that inhibit natural regeneration of natives, i.e., control of the most aggressive weeds, elimination of pests including predators of bird populations essential for seed spread.
- We support direct planting, but recommend that it is deployed strategically (to complement leverage natural processes), starts on a modest scale, and expands as quickly as capacity permits.
- Concurrent with this is the need to monitor the success or otherwise of planting programmes so that management changes can be made early on to improve performance with subsequent plantings.
- Fixed annual targets should be used with caution, although we understand there is a need to reach carbon sequestration targets.
- Management of natural regeneration coupled with targeted planting must be well planned, adapted to the site, supervised, and the outcome monitored, and the management input sustained.
- Start with a survey to identify potential sites for natural regeneration.
- Identify any existing native forest within bird range that will encourage the spread of seeds of key native tree species.
- Our birds have a good track record, having established forests in Aotearoa for millions of years. Strategic planting of berry-producing shrub species provides an incentive for birds to visit sites. Implement control of bird and seed predators such as rodents, mustelids and possums – to protect and boost natural regenerative processes.
- There will likely be a need for enrichment planting of species no longer locally present. In addition to native forest species that are bird dispersed, this will include species with wind-dispersed seed.
- Let the birds and the wind be our natural drones in spreading seed across vast landscapes of marginal pastoral steep hill country that are a priority for native afforestation. Where there are no native forests within bird range, we can prepare a seed source for them by employing a strategy that has been developed and is being evaluated by TTT, i.e., establishing a network of seed islands comprising a diverse range of bird- and wind-dispersed seeding species.
- TTT has produced fact sheets on assisted natural regeneration and the seed island approach. These will soon be published on our website.
- Assisted natural regeneration could be done at a large scale as resources permit, and there should be no need for delay in getting this underway.
- Monitoring systems are vital as practitioners can act promptly to protect their ngahere, and also learn what does, and doesn't work, and adapt accordingly. This is particularly important in an era of climate change.
- This need not be delayed. Some of the human and financial resources available for direct planting should be diverted towards establishing a framework that supports natural regeneration – including sustainable management of the large area of existing natural regeneration, some of which is being routinely sprayed, cut back or burnt to keep marginal farmland in pasture.

Much of this is described in more detail in an article by Dr David Bergin – *The ten golden rules for establishing native forest at scale*, published as part of the O Tatou Ngāhere campaign <https://pureadvantage.org/ten-golden-rules-for-large-scale-establishment-of-native-forest/>. TTT has also published two factsheets on facets of assisted natural regeneration^{14 15}

Pros and cons of assisted natural regeneration

Advantages

- Scale - significant areas already exist (hundreds of thousands of hectares), that are in the process of regeneration to forest cover, and much more could be encouraged to regenerate.
- Low cost. Nature and time, assisted by the wind and birds, do the greatest share of the work.
- Less pressure. There are no fixed annual targets to be met.
- Flexibility. It is suited to a range of sites, large and small; and a range of different scenarios can be employed. There is scope here for site-specific and creative solutions.
- Plants that germinate naturally have been, by definition, ecosourced, and are therefore adapted to the site.
- Planting can be leveraged for maximum cost/benefit.
- Lower risk of dramatic failure.

Disadvantages

- Forest establishment will take longer. On the other hand, as it is low cost, it can start sooner and on a larger scale (and is already happening over large areas).
- We cannot assume that available open space will be colonised by native species alone. Over time we have introduced too many impediments for that to occur.
- We have introduced a range of weeds, some of which will be better adapted to the changing conditions of a warming climate – these can preclude natural regeneration on some sites, if there is no intervention. And then there are the introduced pests that must be controlled.
- Our remaining forests have been degraded and fragmented, and natural pathways for colonisation have been intercepted by cities, farms, and roads.
- Natural regeneration will need our assistance - weed and pest control is vital.
- All forests require ongoing and active management. There is presently insufficient financial incentive or income potential to encourage and support native forest management on private land – especially regarding regenerating native forest cover.

In summary – working with Nature for landscape-scale establishment

Successful large-scale establishment of native forest will depend on working with nature and integration with supportive economic drivers (i.e., investment, markets, industries, and incentives). Encouraging natural regeneration should be done in tandem with pest animal control to prevent damage to the naturally established seedlings, working with Predator Free NZ, neighbouring landowners, iwi and local communities to boost bird populations and seed production for diverse forest ecosystems, selective weed control to remove or reduce the most aggressive and persistent exotic species, and undertaking strategic supplementary planting to bring back once abundant species now locally extinct or scarce.

¹⁴ Natural regeneration of native forests - <https://docs.tanestrees.org.nz/natural-regeneration-of-native-forests/>

¹⁵ How to establish “seed islands” of natives - <https://docs.tanestrees.org.nz/how-to-establish-seed-islands-of-natives/>

APPENDIX 2 – Sustainable native timber production, encouraging native afforestation in rural working landscapes

The Northland Totara Working Group (NTWG) has demonstrated that farmers have a valuable resource of native timber establishing before their eyes. By creating a small-scale continuous cover forestry (CCF) industry, this has also led to positive outcomes for biodiversity, water quality, landscape aesthetic values and other non-timber ecosystem services¹⁶.

Since stopping logging of primary (old growth) native forests, New Zealand has increasingly turned to importing specialty timber. For example, NZ\$99.6 million worth of sawn timber in 2016 and NZ\$107 million worth in 2017 (MPI 2021¹⁷), plus about twice this value in manufactured products created from specialty timbers. Some of this is from non-sustainable sources, e.g., kwila. There are multiple published discussions on why we are not producing more of our own specialty timbers, including timber from native species, e.g., sustainably grown tōtara would be an excellent substitute for imported western red cedar in many applications, as well as being a culturally important resource highly valued by Maori.

New Zealand is fortunate in having a spectacular range of world-class native timbers. They are part of our heritage, and we should have an opportunity, via sustainable forestry practices, to make use of these timbers for high-value end uses. By applying the principles of CCF, selected trees can be harvested without compromising the integrity of the forest and the myriad of ecosystem services it provides¹⁸.

A good example is the management of totara, which has proliferated in most regions, recolonising our less productive farmland. This is occurring even in the presence of grazing (as it is unpalatable) despite repeated attempts by landowners to control it. In many places, regenerating totara has been treated like a weed and cleared.

The NTWG has established over 60 Permanent Sample Plots in Northland demonstrating the benefits of thinning and pruning this resource as a future high-value specialty species that can be managed under CCF harvesting methods to retain high forest values and benefits. The Totara Industry Project¹⁹ demonstrates the viability of CCF with naturally regenerating totara on marginal hill country. However, a viable native timber industry is required to encourage sustainable native forestry. Government and private investment would help expedite this.

Native forests require ongoing management and that requires ongoing income streams. These could come from carbon, timber, and payments for non-timber ecosystem services, e.g., biodiversity credit systems. However, effective mechanisms, industries and incentives need to be created to support this.

¹⁶ Quinlan, P. 2009. A Role for Totara in Rural Production Landscapes. In Barton, I., Gadgil, R. and Bergin, D. (Eds.), Managing Native Trees – Towards a National Strategy. Proceedings of the Tane's Tree Trust 10th Anniversary Conference and Workshop held at the University of Waikato 18-20 November 2009. Pukekohe, NZ: Tāne's Tree Trust.

¹⁷ Ministry for Primary Industries (MPI) (2021a). Wood product markets. Data on forestry imports and exports and indicative log prices: <https://www.mpi.govt.nz/news-and-resources/open-data-and-forecasting/forestry/wood-product-markets/>

¹⁸ See (https://www.tanestrees.org.nz/site/assets/files/1069/continuous_cover_forestry_web.pdf; and <https://pureadvantage.org/nature-based-forestry-regenerative-forestry-models-for-aotearoa/>)

¹⁹ Totara Industry Project – see <https://www.totaraindustry.co.nz/>

APPENDIX 3 - Early results from the Transitioning Exotic Forest to Natives project

In late 2022, TTT and collaborators started a 5-year research project - Transitioning exotic forest to natives, which is largely funded by the Sustainable Food and Fibre Futures Fund (SFFF) with significant in-kind support from the plantation forestry industry.

An important driver for this research is the opportunity to transition directly from exotic to native forest, avoiding clear-felling on erodible land in regions such as Tairāwhiti where, with correct management, understory regeneration can be supported towards mature native forest. The commercial plantation forestry industry is looking for advice on how to retire radiata-pine stands safely and cost-effectively on erodible steep lands, which are not economical to harvest and/or pose environmental risks and where the best option is a managed transition back to native forest. This is highly pertinent to a requirement of the updated NZ FSC Standards.

Another positive driver is that many Maori landowners are currently actively seeking technical advice in transitioning radiata-pine forest back to native forest. There is also significant concern about the use of radiata pine for permanent carbon forestry. If these forests are not managed to transition to native forest over the long term, they are likely to produce a problematic legacy for future generations.

However, publicly funded research and guidance on transitional forestry management practices has been lacking, which is why this research project was initiated.

PROJECT OBJECTIVE

This project will deliver a comprehensive and well-coordinated research programme on the topic of transitioning exotic forest to native forest. Results will be freely disseminated, including management prescriptions/recommendations, to all stakeholders (e.g., landowners, forest owners, forest managers, policymakers, and regulators).

RESEARCH OUTCOMES

The outcomes of this project are:

- Analysis of existing data sets of native understory development and forest characteristics within existing plantation forests to better understand these forests and necessary management.
- Establishment of a nationally relevant network of permanent sample plots to inform carbon and forestry models and to empirically refine management practices.
- Long-term modelling of the dynamics of transitional forest for a range of contexts and management objectives (e.g., growth, successional change, and carbon profiles).
- Guidelines for the effective management of transitioning exotic forest to native forest including thresholds and levels of effective intervention.

WORKSTREAMS

The research project is now half way through, with the majority of the field work complete. Results from the LUCAS analysis, Bioclimatic and Tairāwhiti surveys are available on the Tanes Tree Trust website - <https://www.tanestrees.org.nz/projects/transitioning-exotic-forest-to-native/>. Three permanent paired-plot trial sites have been established in Northland, Coromandel and Nelson to collect data in existing older exotic stands. These trials will be

monitored until the end of the project. However, early results have been collected comparing natural regeneration and the survival of plantings under live and poisoned pine canopy and with/without ungulate and pig browsing pressure.

RESULTS TO DATE

National LUCAS workstream:

A representative spread of national LUCAS plot data has been assessed to provide a picture of what is currently present in the understory of existing conventionally managed exotic plantations (Kimberley et al 2025a).

Conclusions from the analysis include:

- Understory vegetation, while a small component of total plantation carbon, plays a vital role in increasing the native biodiversity value of a plantation stand.
- Older and lower-density stands foster higher native plant richness, diversity and carbon accumulation, making them potentially valuable for biodiversity co-benefits.
- In general, the conditions in the understory of radiata pine forests strongly favour the development of secondary colonising shade-tolerant native understory subcanopy tree, tree fern and shrub species.
- Although thinning radiata pine stands will encourage understory growth, even in low-density radiata pine stands the carbon stored in the understory will still be only a small fraction of the pine canopy carbon.
- A naturally regenerating native forest without a radiata pine canopy stores more carbon than the carbon found in equivalent aged native understorey of a pine plantation but has a fraction of the overall carbon found in mixed pine/native forest.

The National Bioclimatic workstream:

This bioclimatic analysis (Forbes 2025) has found that sites most conducive to transitional forestry are those with the following combination of attributes:

- Elevated annual rainfall,
- Mid-elevation,
- Older stands with opening structure,
- Areas with >30% native cover within 5 km,
- Warm sites sheltered from strong winds and not affected strongly by high summer temperatures,
- No more than light browsing by introduced mammalian browsers.

Regional Tairāwhiti workstream:

This regional study (Graeme et al 2025) focuses on Tairāwhiti which has experienced severe steepland erosion and requires a change in steepland land use to minimise downstream environmental, social, cultural and economic impacts. This study indicates that:

- The native understory in Tairāwhiti radiata pine plantations is predominantly composed of secondary colonising, mostly shade-tolerant, native species with a mean species richness of 11 for all stems and average 4 species for stems ≥ 2.5 cm DBH.
- Browsing pressure (deer, goats and/or cattle) and closed pine canopies limit regeneration of understory plants.
- Management interventions such as thinning, controlling browsers, and promoting seedling recruitment from nearby native forest, increase the carbon and biodiversity of the understory.

- The abundance of native species in the understory of old radiata pine stands suggests that, if left unharvested, these stands will eventually transition back to native forest. However, the carbon stored in the native understory, even in low-density pine stands, is only a small fraction of that stored in the pine trees. Therefore, as the forest transitions there will be a significant and unavoidable drop in the total carbon stored in the ecosystem.
- The Tairāwhiti understory carbon and density/diversity metrics were higher than the national LUCAS metrics, likely reflecting the older age of the Tairāwhiti stands. The Tairāwhiti sites also generally has suitable biotic and abiotic conditions for understory growth, apart from browsing influence. This implies that an exotic forest to native transition, given time, may be more easily achievable here than in some other regions around NZ.

Long-term modelling workstream:

Our modelling (Kimberley et al 2025b) indicates that interventions or natural disturbances that significantly reduce the pine canopy before its natural lifespan could significantly bring forward a transition from being a predominantly exotic forest to being predominantly a native forest (Figure 1). For example, a transition relying on natural succession may take well over 100 years. In contrast, the models indicate that active manipulation of the pine canopy, (e.g., by coupe thinning or other significant disturbances) could result in a transition to native dominance as early as 50 years. Of course, reducing the pine component of the forest may have implications for income derived from the total stocks of carbon stored in the forest. However, forest owners may wish to expedite an early transition to native for various reasons such as establishing a native cover earlier.

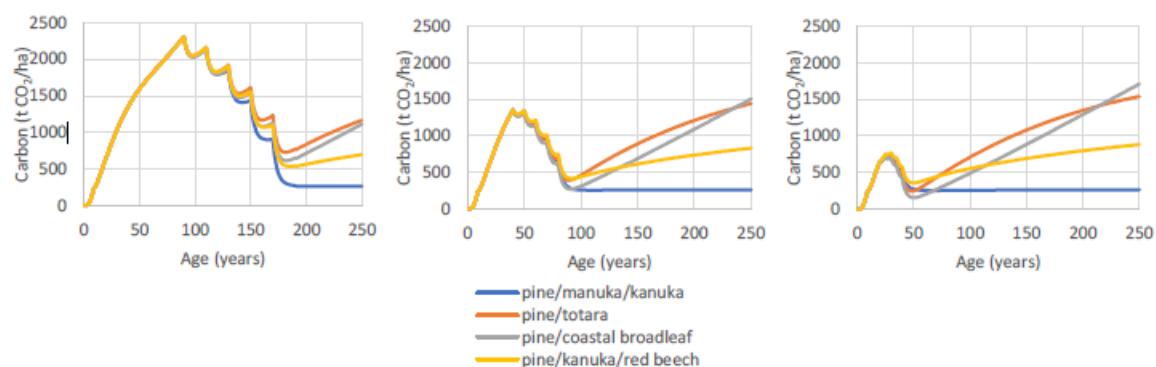


Figure 1: Transition scenarios with varying native forest types - 1. Coupe thinned between 90-170 years (left); 2. Coupe thinned/disturbance events between 40-80 years; 3. Coupe thinned 20-40 years (right).

For these three scenarios, the long-term projection following radiata-pine thinning/disturbance is then modelled on different forest types. These four forest types are used as representatives of the following situations regarding the likely ecological character of the native forest ultimately replacing the radiata pine:

1. Mānuka/kānuka – represents sites with limited seed sources and/or high levels of browsing pressure. This forest type represents a worst-case scenario for natives as it assumes they remain indefinitely as a treeland with limited successional ability and therefore capacity to store carbon. Without limitations, most mānuka/kānuka forest is likely to develop into a diverse forest containing tall canopy species with good potential to store high levels of carbon.
2. Tōtara – represents sites with good seed sources of tall-tree species such as tōtara but with high browsing

3. Coastal broadleaf – represents sites in central – northern New Zealand with good seed sources and limited browsing
4. Kānuka/red beech – represents sites in lowland southern New Zealand with good seed sources and limited browsing. Options for active management will vary according to site specific conditions. Possible actions are discussed below.

Transition guidelines workstream:

The team is currently drafting preliminary guidelines to help direct exotic-to-native forest transitions. These guidelines will be freely available and updated at the end of the research project in 2027.

TEAM

Ecologist and Registered Forestry Advisor Megan Graeme is the project leader. Registered Forestry Advisors Michael Bergin and Paul Quinlan, forestry scientist and ecologist Adam Forbes, and biometrician Mark Kimberley are key team members.

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