



Our forests. Our future.

PHASE II ■ FINAL REPORT OF A TWO-YEAR PLANNING STUDY



Tane's Tree Trust
NATIVE TREES FOR THE FUTURE

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**THE CHALLENGE
AND THE VISION**

1



The Challenge and the Vision

The Challenge

HEALING THE LAND

Before humans arrived, New Zealand was heavily forested with as much as 80% forest cover. That forest provided physical stability to the land, nurtured clean water, conserved nutrients, harboured immense biodiversity and stored massive amounts of carbon in soils and vegetation. Today with only 23% forest cover many of those essential attributes have been compromised and this country is now fast approaching its environmental capacity and is failing to meet its carbon goals under the Paris Accord. The challenge is to make regenerating our forest landscapes a priority in our national thinking and to provide the means to implement this.

The Vision

OUR FORESTS OUR FUTURE

Transforming our working lands - the multiple benefits of native forestry

The Tindall Foundation's vision is to "help build a stronger, sustainable Aotearoa New Zealand so families, communities and our natural environment thrive now, and in the future". The Foundation initiated and funded **Our Forests Our Future** in 2015. It recognised that restoration and sustainable management of native forest on our working lands would deliver significant ecological, cultural and financial benefits, as well as making a contribution to carbon storage.

The project, managed by Tāne's Tree Trust, aims to demonstrate the multiple benefits of integrating native forest into private land, particularly our rural production landscapes. The project was scoped in Phase 1 followed by detailed planning in Phase 2, which is the subject of this report.

Tāne's Tree Trust

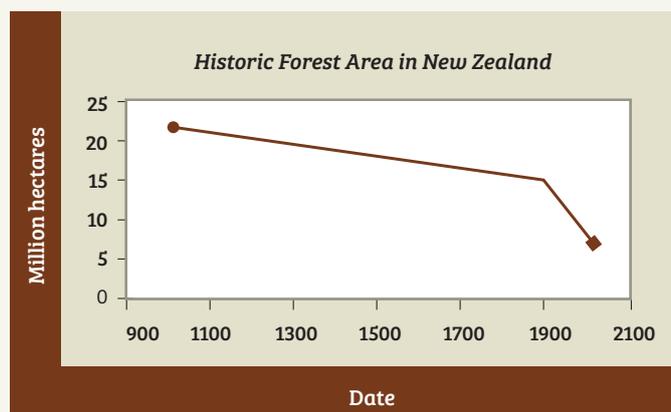
Tāne's Tree Trust is a non-profit charitable trust focused on encouraging establishment of indigenous tree species for biodiversity, landscape, cultural and environmental benefits; as well as providing the option for sustainable production of high-quality timber (www.tanestrees.org.nz). It is the leading organisation in New Zealand for the promotion of native forestry. It initiates and disseminates the latest research information, expertise and support, to individuals and groups interested in establishing and managing native forests for multiple purposes. It also maintains the largest database on growth and performance of native tree species.

Implementing

PHASE 2 OF OUR FORESTS OUR FUTURE

Phase 2 comprised a two-year project with partner organisations across four major objectives:

1. Demonstration plantings and management of native forests on several sites
2. Promoting the sustainable management of regenerating tōtara forests and facilitating the development of a tōtara timber industry in Northland



3. Development of a business case for native forestry
4. Evaluating and quantifying wider environmental and social benefits (non-timber values) of native forests

Reporting

SUMMARY OF OUTCOMES

Work outcomes are briefly summarised below, with more detailed information provided in the body of the report. Digital outputs provide the finer detail of what was accomplished during the last two years and are reproduced in full in the accompanying memory stick.

Summary

A major part of the work has been to identify **sites for demonstration plantings** and liaise with owners to develop possible planting plans. Over 20 sites were investigated and six selected for detailed plans and costings. Three sites have planting underway (20,000 trees), the other three well advanced in planning. The provision and pricing of planting stock has been discussed with major nurseries. A major outcome of this part of the work has been the widespread engagement with many stakeholders and the credibility this has generated.

The tōtara work, under the management of Paul Quinlan, has significantly progressed many initiatives of the Northland Tōtara Working Group. This work is expected to encourage the sustainable management of over 200,000 ha of existing native

regenerating shrubland on private land in Northland and the complementary planting of thousands of hectares of marginal farmland. Extensive stakeholder engagement has also been developed with the launch of a database with over 350 entries, leading to the establishment of on-farm demonstration sites and the successful management of a sustainable farm-tōtara harvest of 40m³ of logs from a 7.6 ha area. Large collaborative proposals for a Tōtara Industry Pilot (TIP) have been developed and submission of a proposal was made to the Ministry of Primary Industries (MPI) aimed at reducing legal and regulatory impediments to sustainable management under the Forests Act.

An extensive review, aimed at developing **a business case** showed that investment in native forest establishment using current technology is not a viable economic strategy within the current reality of discount rates. However, when non-timber values (NTV) are considered, the economic reality may be very different. Measuring NTV is vitally important for leveraging the business case for afforestation with native species.

Current thinking on **Non-Timber Values** was analysed with reference to afforestation with native species. In response to concern about a decade of deforestation in New Zealand, multiple organisations have proposed that NTV be treated as quantifiable assets. The wide variety of NTV were analysed, including the spectrum of environmental services and carbon sequestration.

The report concludes that because the aggregated NTV are likely to be large, managed native forests deserve a much higher profile and should be promoted as an important land use in New Zealand - particularly in environmentally sensitive catchments, on erosion-prone soils, in riparian zones, in scenic areas and for supporting indigenous biodiversity. In many cases aggregated NTV will exceed timber values.

Added value

SPONSORSHIP, FURTHER GRANTS AND IN-KIND CONTRIBUTIONS

The Tindall Foundation provided core **funding for Our Forests Our Future**, which was used to leverage further direct additional funding plus a vast amount of in-kind time donated. A major project on developing a carbon calculator for native trees was funded by MPI. The value of the initial Tindall Foundation grant has been effectively doubled by additional co-funding.

Phase 3 and beyond

It was always acknowledged that Phase 2 would be a planning stage, providing a platform for a much wider programme. With the success we have achieved and the cofounding sourced, we outline some directions in which Phase 3 could progress in Chapter 8 of this report.



**REVIEW OF PHASE 2
SYNTHESIS AND CONCLUSIONS**

2



Review of Phase 2

Synthesis and Conclusions

TECHNICAL SUPPORT - THE EMERGING ROLE OF OUR FORESTS OUR FUTURE

Phase 2 has clearly demonstrated keen interest from landowners, iwi, community groups, councils and corporations in establishing multi-purpose native forests. However, they often lack the planning skills and technical expertise to put together optimal and detailed site-specific planting, maintenance and management proposals.

Tāne's Tree Trust, through Our Forests Our Future, has been able to support such groups with the necessary technical expertise. This includes providing technical support to the Trees That Count project in promoting best-practice establishment, performance monitoring and ongoing management. This has provided a critical service to both projects ensuring that they are well designed and planned to achieve success. The establishment of demonstration planted native forests is essential to the technical support role and promoting the establishment and management of multiple-use native forests.

Technical support is critical to avoid failure of planting – this lack of support and/or confidence has held many groups and councils back from establishing native forests.

PLANTING COSTS VS NATURAL REGENERATION

Another important finding is the significant costs associated with planting native forests, especially establishment of the million hectares of erosion-prone hill country that would benefit from afforestation. Despite efforts to drive the costs down with the nursery industry and those involved in planting, the cost of native plantings remains a significant constraint.

There are many examples of when grazing pressure is reduced, pastoral hill country will revert naturally to mānuka and kanuka. The business case has highlighted the economic advantages of encouraging and working with natural regeneration, especially at a large scale, and the opportunities for carbon offsetting and support from businesses. Natural reversion might also involve a mixture of both exotic and native species (novel ecosystems) which on most sites is likely to succeed to high native forest.

Natural regeneration processes should therefore be an integral part of the Our Forests Our Future project where enrichment planting of native tree species will complement other essential activities such as control of weeds and wild animals and fencing out stock.

“Phase 2 has clearly demonstrated keen interest from landowners, iwi, community groups, councils and corporations in establishing multi-purpose native forests.”

Sustainable harvesting of existing stands of farm-tōtara applies Continuous Cover Forestry principles and retains permanent forest cover - in contrast to exotic plantation forestry.

THE NORTHLAND TŌTARA OPPORTUNITY

The farm-tōtara potential in Northland presents a unique opportunity to pilot a business case and model for native forestry, including demonstrating managed natural regeneration. Our Forests Our Future has a key role to play in co-ordinating and facilitating this, and to ensure sustainable, appropriate and well-managed multi-purpose native forests result.

Continuing to co-ordinate and progress this regional initiative is an essential role for Phase 3 of Our Forests Our Future. This could result in the development of a new, viable regional timber industry relevant to other native tree species and forest types in Northland and in other regions, based on sustainably-managed multiple-use native forests on private and Māori land. Phase 2 has developed a large collaborative Tōtara Industry Pilot (TIP) project proposal.

IMPORTANCE OF NON-TIMBER VALUES

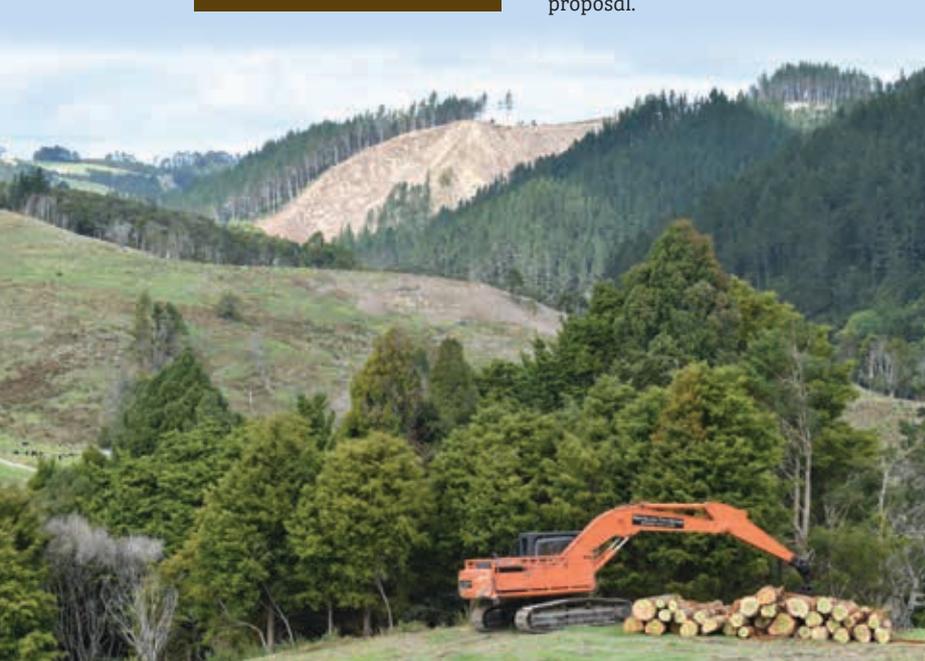
It has become clear that stakeholder motivations for establishing and managing native forests are not based solely on production, or any other single-purpose outcome (e.g. carbon sequestration, water quality, soil conservation etc.). It is the full range of values, including the many non-timber values, that really motivates people and organisations to plant native forests. Exotic plantations are less effective in providing these outcomes.

Our work to date has revealed a lot of interest from investors and purchasers of carbon credits, in the non-timber values of planted native forests. However, much more work is needed to monetise or otherwise quantify these benefits.

THE BUSINESS CASE FOR NATIVE FORESTRY

The business case hinges on demonstrating the wider economic benefits of establishing and managing multi-purpose native forests that include sustainable supply of products and services as well as meeting environmental, social and cultural objectives. This is particularly so when large-scale planting and reversion options are being considered in comparison with other land uses.

Presently, the lack of business case information for native forestry is a significant disincentive for many landowners considering native forestry as a large-scale landuse option. Addressing this gap is a critical need. Carbon sequestration and offsetting opportunities are key components of an economic



“The report estimates that at least a million hectares of marginal farmland could be left to regenerate back into native forest, which would offset about 17% of the biological methane and nitrous oxide currently emitted by the agricultural sector each year for 50 years (PCE 2016).”

analysis in the establishment of native forests on some sites. Growth modelling developed for planted stands for the Tāne's Tree Trust Indigenous Plantation Database will make an essential contribution.

CARBON AND GROWTH MODELLING

The environmental service that is the most easily quantified economically is carbon forestry under the provisions of the New Zealand Emission Trading Scheme (ETS). The ETS was established in 2008 with the aim of reducing GHG emissions and meeting international targets for climate change (OECD 2017). It does this by imposing a cost on businesses for their emissions and providing incentives for emissions reductions and removals (e.g. through carbon forestry) (MPI 2017b; OECD 2017).

The carbon accumulated by trees can only be counted in the ETS if the trees form a 'carbon forest'. Currently, a carbon forest must be a minimum of 30m wide and cover 1ha, with the crowns of the trees covering more than 30% of each hectare, and the trees must have the potential to grow to a height of at least 5m (PCE 2016).

There is significant scope for establishment of large-scale carbon sequestration forests, which provide a low-cost option for offsetting our GHG emissions. However, the carbon market has been through major fluctuations since it was first established and this has discouraged investment

During the initial years of the scheme, a good carbon price of around \$20.00 was being traded (per New Zealand unit tonne of carbon dioxide equivalent). However, over 2012–2014 there was significant price volatility and a decline in overall price. In mid-2014, the price of a New Zealand unit dropped to only NZ\$4.00 (MPI 2015). The current review of the ETS aims to further improve incentives for forestry. The price of carbon in the New Zealand ETS was over \$20 a tonne in December 2017 with predictions of further moderate increases (MPI 2017b).

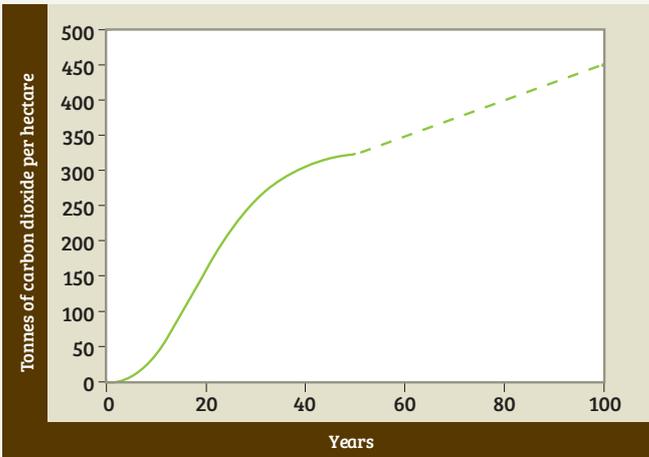
Strong, stable carbon prices will provide incentives for forest plantings, or landowners retiring marginal land for natural forest regeneration. A recent report by the Parliamentary Commissioner for the Environment (PCE 2016) discusses how farmers can be part of the solution – by fencing off marginal land and encouraging regeneration of native forest, or establishing forestry plantations to offset agricultural emissions. A large amount of marginal agricultural land has the potential to revert to shrubland and native forest; many hill-country farmers struggle to control regenerating scrub and keep this marginal land in pasture.

The report estimates that at least a million hectares of marginal farmland could be left to regenerate back into native forest, which would offset about 17% of the biological methane and nitrous oxide currently emitted by the agricultural sector each year for 50 years (PCE 2016).



Fencing erodible, erosion-prone hill country would have the added benefit of preventing erosion and sedimentation, as described below.

The graph below shows the rate of carbon dioxide accumulation in a regenerating podocarp-hardwood forest over a hundred years, based on the ETS look-up table for native forests (PCE 2016). The accumulation rate slows after 40 years as the pioneer species (e.g., mānuka and kānuka) die off and the initially slow-growing climax species emerge. After 50 years of growth, one hectare of regenerating native forest will have accumulated about 320 tonnes of carbon dioxide.



Carbon dioxide accumulation in a regenerating podocarp forest (PCE 2016)

Growth and carbon modelling from established plantations of indigenous forest is critical and an application to the Sustainable Farming Fund for a Planted Native Forestry Toolkit utilising the Tāne's Tree Trust Indigenous Plantation Database, the only one in the country, has been successful. This aims to define and develop species-based growth and carbon models for planted natives to demonstrate that planted natives managed on

good sites will give reasonable rates of growth and carbon sequestration. We should also be looking at putting plots in natural regeneration.

Tāne's Tree Trust has become the leading organisation in New Zealand in the promotion of native forestry. It initiates and disseminates the latest research information, expertise and support to individuals and groups interested in planting and managing native forests for multiple purposes.

As a not-for-profit charitable trust, it is appropriate for Tāne's Tree Trust to continue to expand its critical role as the go-to provider of comprehensive information and technical assistance for native forestry projects. This would not be setting up as a consultancy service, rather amplifying what we already do, in order to bring about the positive landscape and environmental outcomes needed for the future wellbeing of all New Zealanders.



**DEMONSTRATION
PLANTED NATIVE FORESTS**

3



Demonstration Planted Native Forests

Clayton Wallwork and David Bergin

Inspection of a recent planting of tōtara in the Christchurch City Council Stix Mill reserve as an example of successful forest establishment techniques on peaty soils, commonly found throughout the Christchurch area, near the proposed Cranford OFOF Demonstration Planted Forest site.

Introduction

Phase 2 of Our Forests Our Future (OFOF) involved detailed planning and has laid the groundwork for the establishment of a minimum of six Demonstration Planted Native Forests throughout New Zealand that are proposed for Phase 3. Tasks completed as part of Outcome 1 for Workstream 1 are presented along with specific outputs available as links to pdf files as set out in Appendix A.

The key outcomes for Workstream 1 are summarised below under the following sections:

- 1. Demonstration planted forests** - identifying potential sites and project partners, and undertaking design and planning;
- 2. Nursery production** - evaluating options for reducing costs of natives and establishment of native forest;
- 3. Research opportunities** - exploring gaps and opportunities to improve best practice; and
- 4. Community engagement** - involving landowners, iwi, community groups, agencies.



Target Outcome 1 - Phase 2

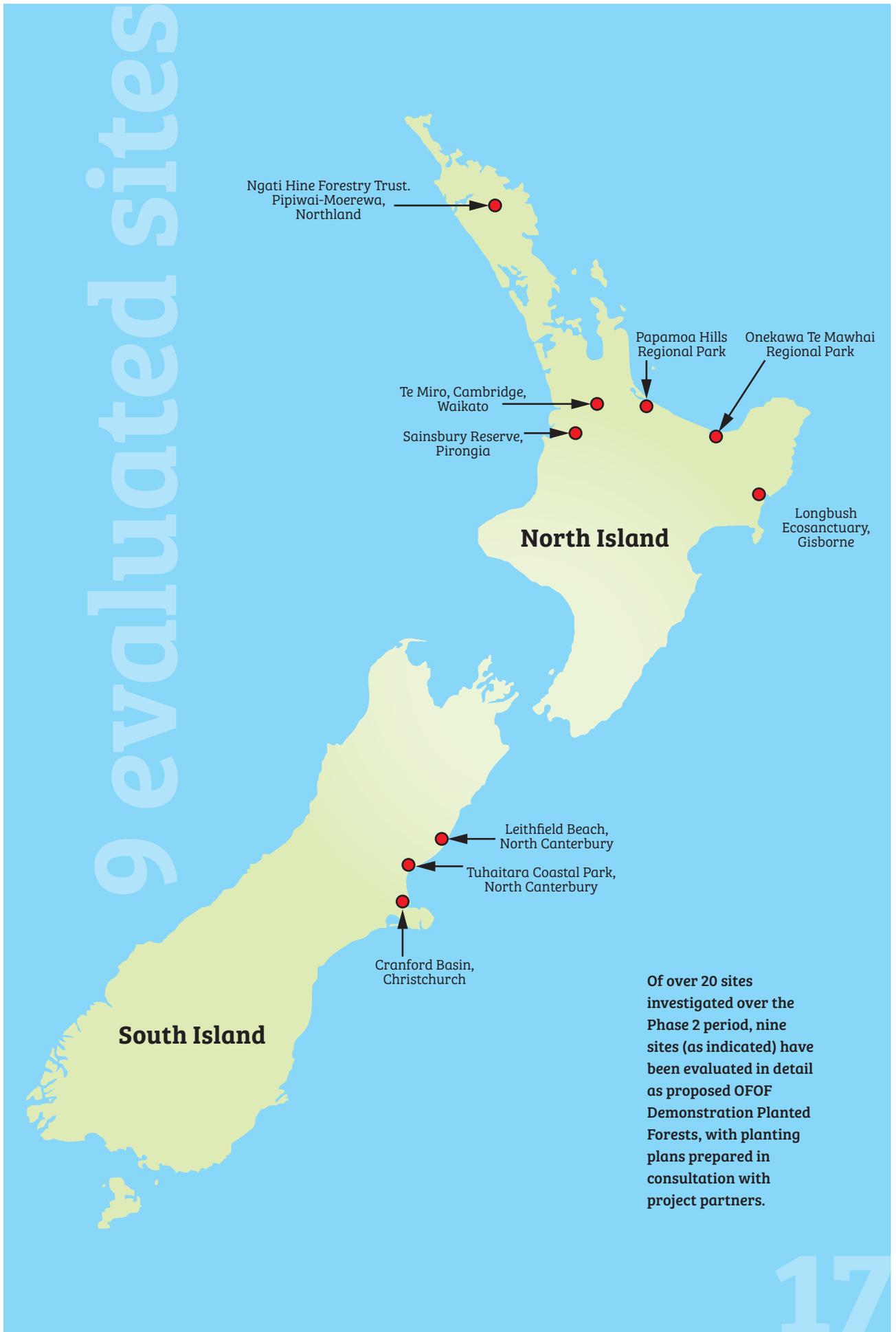
1. DEMONSTRATION PLANTED FORESTS

Significant work completed in Phase 2 on identifying and developing planting and management plans with costings for up to nine potential demonstration sites has included:

- Evaluation of over 20 sites nationwide in liaison with landowners, managers, iwi, local communities, and local and regional authorities as potential demonstration planted forests (Appendix A);
- Nine sites have been investigated in detail chosen on the basis that they are representative of the wider landscape nationwide, cover a range of key native timber species, and provide opportunities to explore a range of issues including scale, tenure, multiple objectives of planting, and with various levels of resources available. They include potential riparian areas through to establishing native forestry on steep hill country building on a multi-purpose native forestry approach;
- These demonstration sites are at different stages of development. The focus has been on targeting sites where proposed project partners have a good track record in best-practice establishment and management of native forests, and where they can contribute to funding for either planting or maintenance or both;
- Of the nine sites evaluated in detail, six sites are 'ready to go' with planting and management concept plans completed (refer separate pdf documents for all plans listed in Appendix A):
 - 1. Te Miro, Cambridge, Waikato** - landowners, New Zealand Farm Forestry Association and Waikato Regional Council; dairy support block where landowners are retiring steep hill country and riparian zones from grazing; planting concept plan completed (refer to PDF 1);
 - 2. Papamoa Hills Regional Park, Te Rae o Papamoa, Tauranga** - Bay of Plenty Regional Council, Tangata Whenua and community; steep hill country, high profile popular recreational park; planting concept plan completed (refer to PDF 2);
 - 3. Onekawa Te Mawhai Regional Park, Opotiki** - Bay of Plenty Regional Council, Tangata Whenua and community; steep hill country, high profile coastal park planting; concept plan completed (refer to PDF 3);
 - 4. Longbush Ecosanctuary, Gisborne** - Longbush Trust, DOC and local community; steep hill country reversion and planting; concept management plan completed (refer to PDF 4);
 - 5. Tuhaitara Coastal Park, North Canterbury** - Te Kohaka o Tuhaitara Trust, local community, schools, service groups, businesses; restoration of coastal podocarp high forest planting; concept plan completed (refer to PDF 5);
 - 6. Cranford Basin, Christchurch** - Christchurch City Council, Lincoln University, local community; restoration of high forest in northern corridor green zone; planting concept plan completed (refer to PDF 6).
- Three additional sites evaluated with plans completed for most are:
 - 7. Ngati Hine Forestry Trust, Pipiwai-Moerewa, Northland** - Ngati Hine Forestry Trust, whanau; steep hill country, riparian zones, marae sites (plan to be completed when site selected);
 - 8. Sainsbury Reserve, Waikato** - Waipa District Council and local community, recreational reserve on slopes of Mount Pirongia; multiple-use native forest and conservation area; planting concept plan completed (refer to PDF 7);
 - 9. Leithfield Beach, North Canterbury** - Ahu Whenua Trust and local whanau, University of Canterbury; consolidated coastal sand country, significant cultural sites; planting concept plan completed (refer to PDF 8).
- Three of the first six sites listed above have already had site preparation and initial planting of up to 20,000 nurse shrubs, with planning for planting by project partners underway for the remaining three sites.
- The design and layout for all Demonstration Planted Forests will showcase a range of options for establishment and management of native forest for multiple purposes illustrating cost-effective best practice methods suited to implementation at an operational scale.



9 evaluated sites



Of over 20 sites investigated over the Phase 2 period, nine sites (as indicated) have been evaluated in detail as proposed OFOF Demonstration Planted Forests, with planting plans prepared in consultation with project partners.



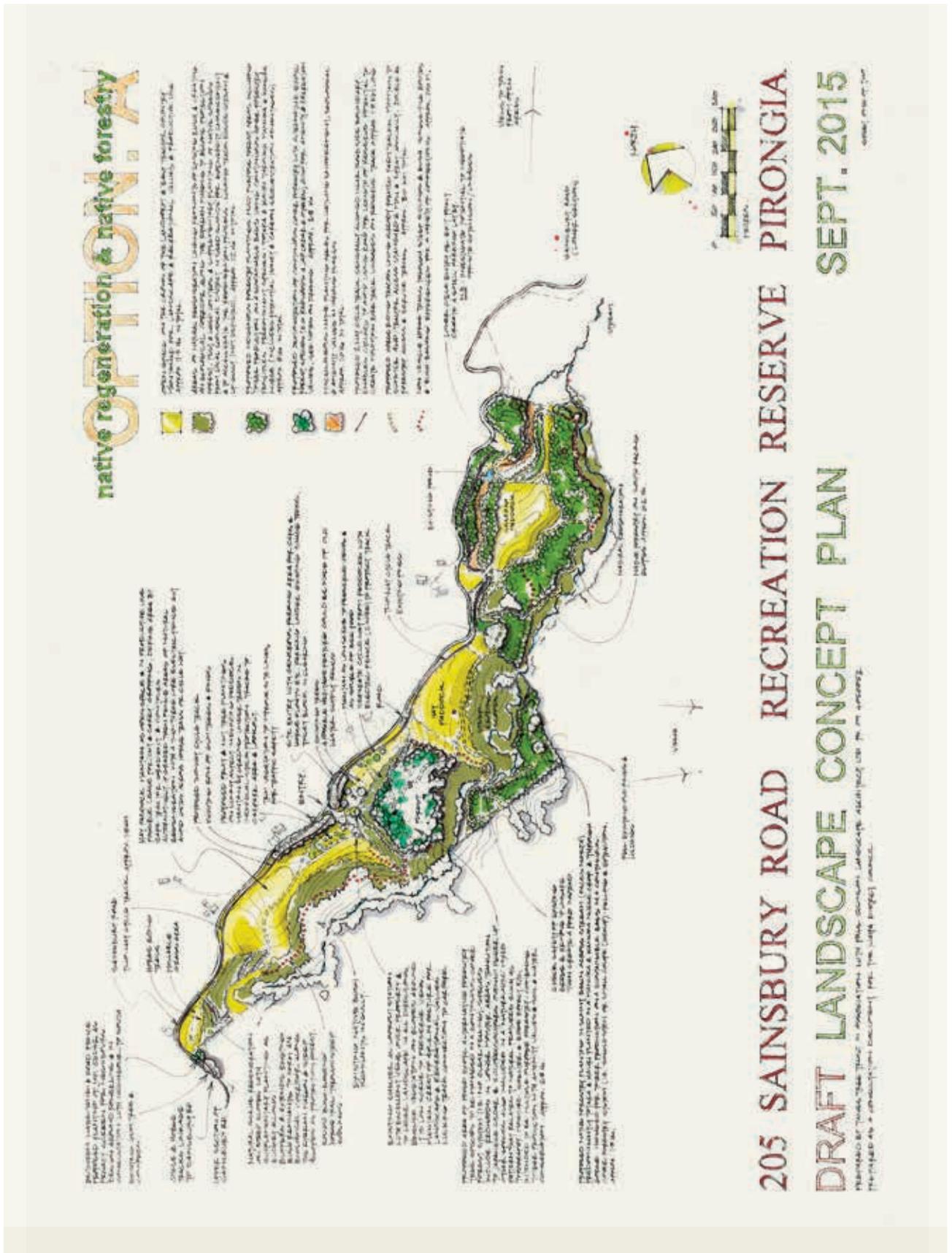
PAPAMOA HILLS REGIONAL PARK, BAY OF PLENTY

Project partners Bay of Plenty Regional Council, Friends of Papamoa Hills Regional Park and local schools and the community have planted 35,000 natives that will include demonstration planted groves of the key native tree species as part of this OFOF project. The park has a rich cultural history - note the series of hill top pa sites.



Longbush, Gisborne

Owners Dame Anne Salmond and Jeremy Salmond and trustee Jennie Harre-Hindmarsh of Longbush Ecosanctuary, Gisborne, at the proposed location of an OFOF Demonstration Planting Site aimed at planted and managed naturally regenerating multiple-use native forest on steep hill country (background), typical of the East Coast.

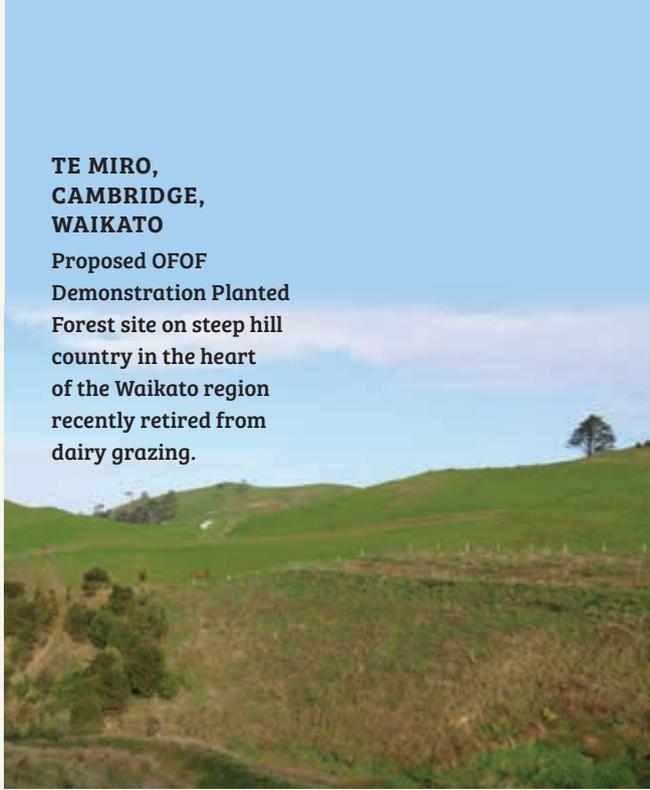


SAINSBURY RESERVE, PIRONGIA

Example of a landscape concept plan for this 40 ha reserve that was previously leased out for grazing but where the local community and Waipa District Council are keen to establish a multiple-use recreational area comprising demonstration areas of native timber trees for long term sustainable management.

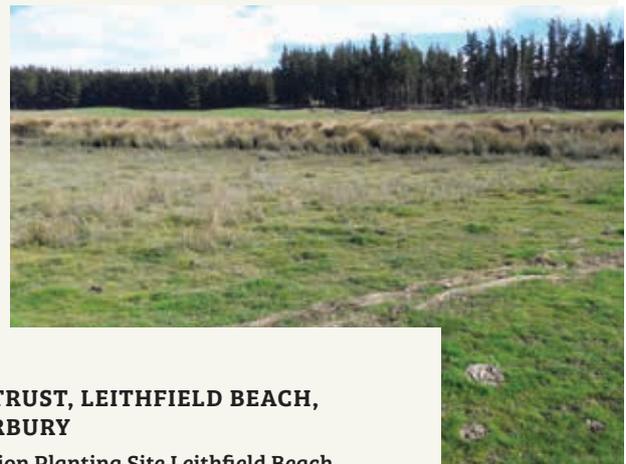
**TE MIRO,
CAMBRIDGE,
WAIKATO**

Proposed OFOF
Demonstration Planted
Forest site on steep hill
country in the heart
of the Waikato region
recently retired from
dairy grazing.



**CRANFORD BASIN,
CHRISTCHURCH**

OFOF Demonstration
Planting Site Cranford
Basin, Christchurch
where 5000 natives have
been planted with project
partners Christchurch
City Council and the local
community as the first step
in establishing a kahikatea
and tōtara dominant
forest, now rare on the
Canterbury plains. Planting
underway (below right) and
measurement of planted
podocarps six months after
planting (far left).



**AHU WHENUA TRUST, LEITHFIELD BEACH,
NORTH CANTERBURY**

OFOF Demonstration Planting Site Leithfield Beach,
North Canterbury where a management plan has
been developed for the Ahu Whenua Trust.

The management plan includes weed control, forest
establishment and waterway enhancement. The plan
also allows for areas set aside for whanau housing,
and the planting around a culturally significant whale
burial site. The plan has been peer reviewed by
Prof David Norton of Canterbury University.



TUHAITARA COASTAL PARK, WOODEND, CANTERBURY

The OFOF Demonstration Planting Site planned for Tuhaitara Coastal Park (left). Park manager Greg Byrnes (right) with a five year old planting of multiple native species established with local schools. There is scope for substantially more planting including a large area adjacent to the Pegasus township. Te Kohaka o Tuhautara Trust has received support from the Trees That Count programme where several thousand tōtara, matai and kahikatea seedlings have been planted.



2. NURSERY PRODUCTION

Liaison with a number of native tree nurseries throughout New Zealand provided insights into the challenges regarding up-scaling supply of plants and options for reducing cost of plants for establishing native forest. This, along with the nearly two decades of research and operational experience by Tāne's Tree Trust and other providers, led to a review of options for reducing the cost of natives in a paper presented to the Trees That Count Advisory Board (refer to PDF 9).

This review and work undertaken as part of OFOF Phase 2 provided insights and recommendations including:

- A need to scale-up planting programmes in the order of hundreds of thousands of seedlings to enable nurseries to reduce plant cost for bulk supply;
- Focus on a limited number of the most hardy shrub and tree species for which it is easy to collect seed, raise seedlings, and which perform well after planting;
- Plan planting programmes one to two years in advance to determine seedling requirements by species and numbers, as well as container type and grade to allow pre-ordering from nurseries; this will give nurseries time to plan for seed

collection allowing for eco-sourcing and to provide supply contracts to those planting at competitive bulk rates;

- Selected native species can be raised in open beds as bare-root plants requiring highly mechanised large-scale production similar to radiata pine but the cost will not be as low as pines. A substantial change in nursery practice scale, skills, infrastructure and logistics is required including at the planting site;
- For large-scale planting and including remote sites, a shift to well-planned programmes undertaken by contractors is required rather than reliance on volunteer community-based planting;
- While the recent surge in mānuka planting for the UMF honey industry illustrates economies of scale can potentially see the cost of nursery-raised natives reduce substantially, care is required in extrapolating to most other native species where it is more difficult to collect seed and raise plants;
- The development of minimum quality control standards including protocols and verification systems for ecosourced seedlings for the native plant nursery industry is required.



The recent interest in planting millions of mānuka for honey has seen many nurseries gear up production of relatively low-cost small plants (left). Other technologies like large-scale mechanised bare-root production of selected natives are an option for reducing costs requiring a major shift in nursery and planting practice (right).

3. RESEARCH OPPORTUNITIES

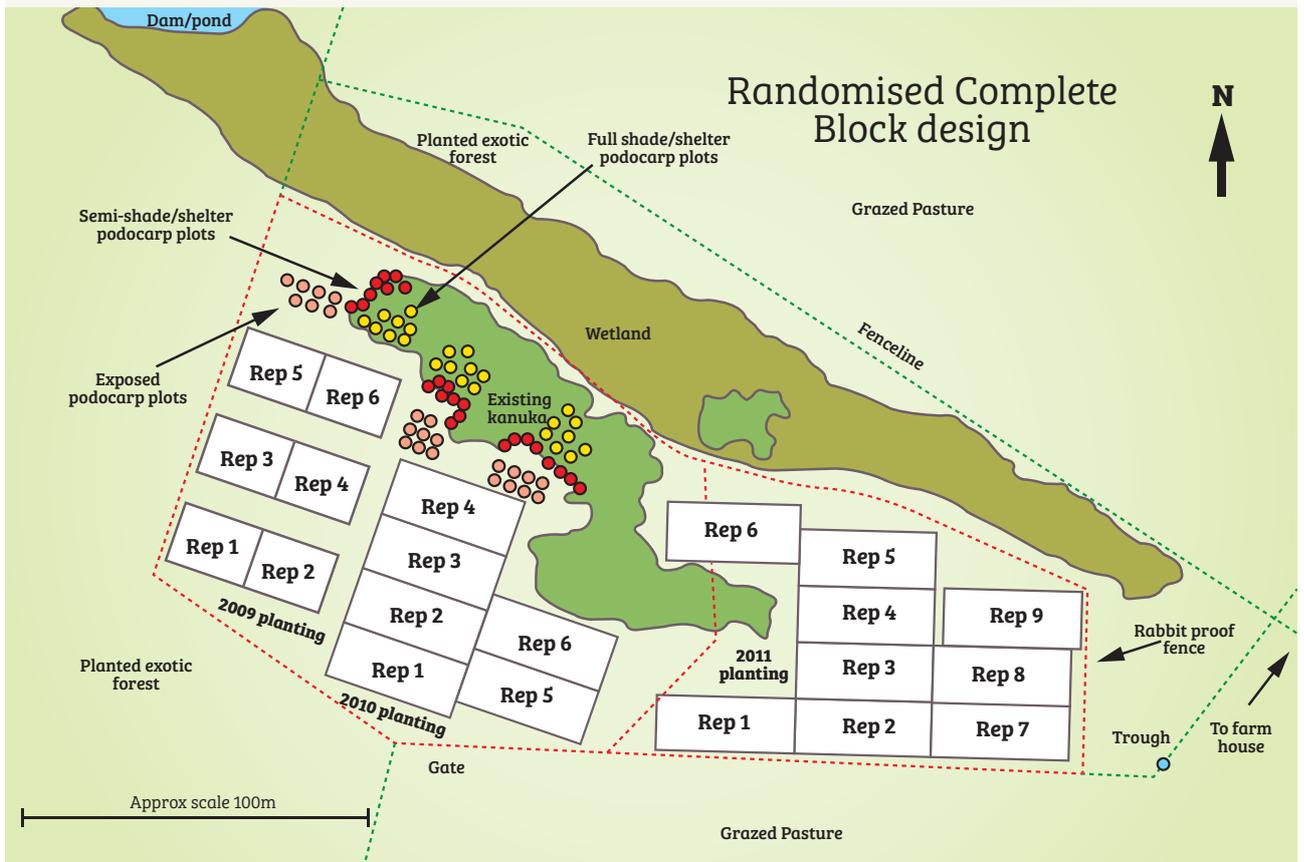
In liaison with stakeholders, a number of research gaps and opportunities for establishment of native forests for multiple-use have been identified to add to existing knowledge and experience.

Managed natural regeneration vs planting

- With the high cost of planting for large-scale establishment, innovative ways that encourage faster and more effective conversion to native forest are required, including supplementary or enrichment planting of later successional tree species.
- Active management of reverting areas is required to speed up reversion to a diverse resilient native forest. This can involve planting of trees species (especially if local seed sources are lost), control of selected aggressive weeds (including wildings), pest animal control and maintenance of fencing to exclude domestic grazing stock.
- For at least one of the selected demonstration sites, Longbush Ecosanctuary which is representative of steep erosion-prone hill country on the East Coast, it is proposed to:
 - Target natural gaps in existing shrubland cover for planting groups of selected tree species;
 - Cut lines or gaps in existing mānuka and kanuka for inter-planting tree species;
 - Plant stands of selected native trees as long term seed sources within large-scale reversion sites where local tree seed sources are non-existent.
- In collaboration with Trees That Count and New Zealand businesses interested in offsetting their greenhouse emissions, we are exploring options involving identifying marginal lands that can be managed to native forest.

Improving best practice planting

- All Demonstration Planted Forest sites will be set up to compare a range of establishment and early management methods, patterns and layouts of planting, type and quality of nursery-raised seedlings, species and site selection, and monitoring and maintenance options.
- These will be in collaboration with research providers to ensure robust science and statistical design is adopted, aimed at ongoing improvement of best practice requiring setting up of replicated trials and monitoring of various treatments (see example planting trial layout below).



A recent planting trial setup testing various nursery raised stock types using a Randomised Complete Block design is part of the essential ongoing research required to continually improve planting practices and lower cost of establishment.



Novel ecosystem approach

- There is scope to explore the paradigm shift from separation of natives and exotics to integration of natives and exotics (novel ecosystems) in one silvicultural model.
- Interest in this approach is increasing in the published literature and in debate considering the use of exotics as a tool for establishing native forests, including support from Dr Bruce Burns of University of Auckland and Prof David Norton, School of Forestry, University of Canterbury.
- This includes developing and demonstrating novel ecosystems comprising mixture of exotics and natives with the exotics uses, as a temporary nurse for inter-planted native tree species.
- Tāne's Tree Trust has successfully obtained co-funding for researching methods aimed at converting coastal exotic forest buffers by underplanting natives and encouraging natural regeneration.
- Māori trusts, landowners and councils are interested in alternatives to radiata pine (e.g. Ngati Hine Forestry Trust Northland 2013; Te Kohaka o Tuhaitara Trust Canterbury 2016; Waipa District Council 2016; Bay of Plenty Regional Council Papamoa Hills Regional Park 2017) and are requiring options and clear advice for replanting with natives.
- This also has implications for management of wilding conifers where there is scope to consider how exotics can be managed over time to facilitate subsequent native forestry options.

Established plantations

- As the proposed OFOF Demonstration Planted Sites are at the beginning of the process, an evaluation of existing established plantations of key native tree species provides valuable insights into growth and management requirements and environmental benefits at the supply and utilisation end of timber production.
- Earlier surveys of native plantations by Tāne's Tree Trust have identified a selection of stands where some would make excellent demonstration sites within older planted sites and where sustainable production has been initiated on some (e.g. 100 year old tōtara stand in Northland; a 70 year old kauri stand selectively logged in Taranaki).

- Along with the sustainable management of naturally regenerating tōtara covered in Workstream 2, these existing plantations, albeit small and with chequered management histories, have the potential to demonstrate that the environment exists to create timber income from such forests.
- Remeasurement of early surveyed native plantations is recommended and to include recently identified older plantations of key native tree species not captured in previous surveys.

Tāne's Tree Trust Plantation Database

- Tāne's Tree Trust manages and holds the only national database on planted native trees and shrubs - the TTT Indigenous Plantation Database - comprising measurements of 15,000 planted native trees and shrubs from five years to 100 years old.
- To date measurements are from over 100 Permanent Sample Plots (PSPs) established in planted native stands across the country.
- PSPs will be established in all proposed OFOF Demonstration Planted Forests following standard forest assessment protocols, and data added to the TTT Indigenous Plantation Database.
- This, along with sampling of selected Trees That Count sites, will substantially increase the national and regional coverage of sites, forest types and species of multiple-use native forest in the database to provide enhanced productivity data for refinement of growth and carbon models.

Planting toolkit

- With proposed ongoing support from Phase 3 of OFOF, Tāne's Tree Trust has obtained partial funding to develop a free, comprehensive on-line toolkit from planning to implementation for those planting native forests to meet multiple objectives from environmental to sustainable production.
- A suite of calculators on productivity, carbon sequestration and economics for planting and managing native forest will be generated from the Tāne's Tree Trust Indigenous Plantation Database. This will allow businesses and landowners to calculate how much native forest they need to plant to offset carbon.



Phase 2 has clearly demonstrated keen interest from landowners, iwi, community groups, councils and corporations in establishing multi-purpose native forests.



- The toolkit will allow users to input site factors and explore a range of planting scenarios to meet objectives within resources and will include case studies and a reference database with links to best-practice planting, management and monitoring guidelines.
- As part of OFOF Phase 3 support, the online web database and easy to use toolkit will comprise the following components and capability:
 - **Calculators** - based on growth models covering growth rates, economics and carbon sequestration for the major species and at regional and national levels where data allows.
 - **Species and site selection** - practical online tools to enable users to make wise species choices to match available sites and objectives.
 - **Planting plans** - easy to develop for on-the-ground planting options and scenarios customised to site, objectives and resources.
 - **Best-practice planting and reference database** - links to best-practice planting and management guidelines including regional species lists, a reference database on establishment and management of natives and proven local methods and sources of information and links to websites such as regional councils.
 - **Mapping** - links to existing mapping tools and farm plans (e.g. local councils, DairyNZ Riparian Planner, Trees That Count GIS mapping system).
 - **Local case studies and demonstration sites** - identification of local planted stands and contacts profiling success of planted native forests in different landscapes including options for organising fieldtrips, workshops and field-based demonstrations.
 - **Monitoring** - guidelines integrated with existing monitoring guides where relevant to planted native trees (e.g. WETMAK, NZ Landcare Trust; Trees That Count Basic and Advanced Monitoring Guides).
 - **Updating and adding new data** - provision to allow users to provide data from new and existing planted native stands for updating and extending the TTT Indigenous Plantation Database.

4. STAKEHOLDER ENGAGEMENT

- Phase 2 has clearly demonstrated keen interest from landowners, iwi, community groups, councils and corporations in establishing multi-purpose native forests. However, they often lack the planning skills and technical expertise to put together optimal and detailed site-specific planting, maintenance and management proposals.
- Technical support is critical to avoid failure of planting – this lack of support and/or confidence has held many groups and councils back from establishing native forests.



Community involvement is ideally targeted at planting easily accessible sites and requires substantial planning and on-site supervision to ensure best planting practice is followed and to ensure an enjoyable and informative experience for participants.

Technical support - the emerging role of Our Forests Our Future

- Tāne's Tree Trust, through Our Forests Our Future, has been able to support such groups with the necessary technical expertise.
- This includes providing technical support to the Trees That Count project in promoting best-practice establishment, performance monitoring and ongoing management.
- In addition to the establishment of demonstration planted native forests it is recommended that a technical support role is established to promote the establishment and management of multiple-use native forest.

Iwi guidelines for establishing native forests

- Engagement with iwi and Māori Trusts is becoming increasingly important with the increasing interest in planting and management of multiple-owned land including return of pine forestry to full iwi ownership.
- There is interest in guidelines for iwi that will empower Māori landowners to establish and manage culturally significant native plants, restoring local biodiversity, providing pathways to enhance matauranga (traditional knowledge) and exploring practical options for sustainable management of culturally important resources on marae and Māori land.



Outline and recommendations for Phase 3 implementation



Liaison with stakeholders across all workstreams has shown there is substantial interest in the aim of the Our Forests Our Future project to demonstrate that planted and managed native forestry can provide both production opportunities and substantial conservation benefits within our productive landscapes.

Phase 3 will deliver an integrated array of services and outputs to promote and facilitate native forestry as a landuse option.

Establishment of demonstration planted forests

Demonstration planted forests will be established at a minimum of six selected sites in collaboration with project partners. Four North Island and two South Island sites are short-listed as ready to go and where project partners have committed resources and initiated work on some sites:

- Te Miro, Cambridge, Waikato (refer to PDF 1);
- Papamoa Hills Regional Park, Te Rae o Papamoa, Tauranga (refer to PDF 2);
- Onekawa Te Mawhai Regional Park, Opotiki - Bay of Plenty Regional Council (refer PDF 3);
- Longbush Ecosanctuary, Gisborne (refer to PDF 4);
- Tuhaitara Coastal Park, North Canterbury - Te Kohaka o Tuhaitara Trust (refer to PDF 5);
- Cranford Basin, Christchurch (refer to PDF 6).

Depending on resources and timelines of project partners, demonstration forests will range in size from 1-30 ha, and be established over a 1-10 year period.

The geographical spread of demonstration forests will allow opportunities to profile a range of species and sites and the involvement of a wide range of stakeholders. Planting design

will vary depending on scale, site characteristics, local species, and site-specific objectives, resources and commitment of project partners.

Native plant nursery production

Liaison with native plant nurseries indicates certainty and forward ordering of plants is required for up-scaling supply and for reducing costs of seedlings. Issues with plant quality and eco-sourcing which require addressing include:

- Defining eco-sourcing in relation to geographic boundaries and elevation, and investigating species-specific requirements;
- Developing an accreditation system for native plant nurseries that provides the native forestry sector with an assurance that seedlings meet minimum plant specifications and eco-sourcing requirements.
- Exploring methods for encouraging forward planning and pre-ordering of seedlings in bulk from nurseries to allow nurseries to grow to order competitively while maintaining quality; and
- Developing methods for providing feedback to nurseries on performance of their stock based on monitoring systems by planters.



Research opportunities

A number of gaps have been identified that provide opportunities for further research including:

- Setting up trials comparing methods for managing natural regeneration with supplementary planting;
- Evaluating the use of exotics, both existing or planted, as a temporary nurse cover for natives;
- Using the Demonstration Planted Forest sites to refine best establishment and early management practice;
- Resurveying existing native plantations and adding key stands to the OFOF Demonstration Planted Forest site network;
- Extending the national and regional coverage of the Tāne's Tree Trust Indigenous Plantation Database; and
- Supporting the development of an online interactive planting toolkit for users that includes growth, economic and carbon calculators.

Technical advisory role for Tāne's Tree Trust

While there are numerous guidelines available nationwide providing excellent information on planting and management of native forest to meet the range of needs, the overwhelming feedback during our Phase 2 consultation with interest groups and stakeholders indicated a lack of confidence to apply those guidelines to their sites and circumstances.

Is there a role for Tāne's Tree Trust to become involved in providing or supporting a native forest advisory and technology service through its existing networks? TTT could not only provide direct advice to landowners but also "train the trainers", by running workshops throughout the country and a national conference on native forestry. In addition to the nearly two decades of research and technology transfer, implementation of Phase 3 of Our Forests Our Future will provide Tāne's Tree Trust with further opportunities to promote establishment and sustainable management of native forests to meet multiple objectives such as:

- Demonstration sites promoting best-practice establishment of both planted and managed naturally regenerating stands;
- The Northland Tōtara Industry Pilot demonstrating sustainable management of established native forestry;
- Provision of economic tools that include wider ecosystem values and benefits of establishing multi-use native forest including carbon;
- In collaboration with iwi, developing iwi-specific guidelines for sustainable management of culturally significant native forest resources.

A record of work undertaken during Phase 2 for Workstream 1 with specific outputs that can be accessed via links to PDF files is listed.

Appendix A

WORKSTREAM 1

Demonstration Planted Native Forests



Demonstration planted forests

Refer to PDF files for landscape, planting and monitoring plans for the Demonstration Planted Forest sites completed during Phase 2:

- **PDF 1** - Planting concept plan, OFOF demonstration planting site, Te Miro, Cambridge, Waikato
- **PDF 2** - Monitoring of demonstration planted native forests, Papamoa Hills Regional Park, Bay of Plenty, Concept Plan. David Bergin and Michael Bergin, OFOF Project Team, Tāne's Tree Trust. May 2017. 13p.
- **PDF 3** - Options for planting demonstration native production forestry, Onekawa Te Mawhai Regional Park, Ohiwa, Bay of Plenty. David Bergin, Gerard Horgan and Michael Bergin, OFOF Project Team, Tāne's Tree Trust. January 2017. 15p.
- **PDF 4** - Planting and management plan, Longbush Ecosanctuary, Gisborne. David and Michael Bergin, Clayton Wallwork, OFOF Project Team.
- **PDF 5** - Planting and management plan, Tuhaitara Coastal Park, North Canterbury. Clayton Wallwork and David Bergin, OFOF Project Team.
- **PDF 6** - Establishment report for native forest trial, Cranford Basin, Christchurch. Outline of establishment treatments and planting design. Clayton Wallwork, June 2017. 19p.
- **PDF 7** - Options and costs for planting native forestry, Sainsbury Road Reserve, Pirongia. Compiled by David Bergin with input from OFOF Project Team of Tāne's Tree Trust – Paul Quinlan, Clayton Wallwork, Kirsten Crawford, Gerard Horgan. Final plan, May 2016. 9p.
- **PDF 8** - Options for planting native forestry, Leithfield, North Canterbury. David Bergin and Clayton Wallwork, OFOF Project Team of Tāne's Tree Trust, January 2016. 20p.

List of other potential demonstration planting sites inspected and project partners evaluated during Phase 2 included:

- Ngāti Manawa Reserve, Kaiangaroa – Ngāti Manawa where iwi
- Linton Park – Rotorua Lakes Council
- Kuruiki Station – Private landowners
- Rewanui Forest Park, Montfort Trimble Foundation - Wairarapa
- Te Muri Coastal Regional Park – Auckland Regional Council
- Pirongia - Waipa District Council
- Belfast By-Pass - Environment Canterbury
- Turners Road - Christchurch City Council
- Brooklands - Christchurch City Council
- Radcliffe Road - Christchurch City Council
- Longbush – Gisborne



- Onekawa Regional Park – BOP
- Leithfield Beach – Canterbury
- Papamoa Hills - BOP
- Ngāti Hine Forest Trust - Northland
- Cranford Basin/Forest - Christchurch
- Ashburton River - Westerfield, ECAN
- Adshead – Kaipara Harbour
- Moturoa/Rabbit Island – Nelson

Nursery production

- **PDF 9** - Opportunities to reduce cost of establishing native forest. Paper prepared for the Trees That Count Advisory Board, David Bergin, November 2017.
- A record of nurseries
- Taupo Native Nursery (The Native Plant Nursery), Taupo, Glenbrook, Christchurch
- Kauri Park, Te Hana, Northland
- DOC Motukara Nursery, Canterbury
- Trees for Canterbury, Christchurch
- Christchurch City Council Nursery, Christchurch
- Treeline Nursery, Rotorua
- Naturally Native Plant Nursery, Oropi, Tauranga
- Forest Floor Nursery, Northland
- Coastlands Nursery, WhakaTāne
- Te Hana Native Plant Nursery, Northland
- Southern Woods Nursery, Christchurch

Research opportunities

Research providers

- University of Canterbury – Leithfield Beach peer review
- SCION Biometrician – Cranford Basin trial
- Lincoln University – Cranford Basin
- Cuttings review article, Pure Advantage www.pureadvantage.org/news/2016/09/26/raising-native-trees-cuttings-edge
- CCC Parks – under-planting poisoned pines with natives trials
- ECAN Park Ranger – Ashworths Beach, planting back dunes trials near Leithfield Beach
- Monitoring of trial sites – Cranford Basin, Christchurch

Community engagement

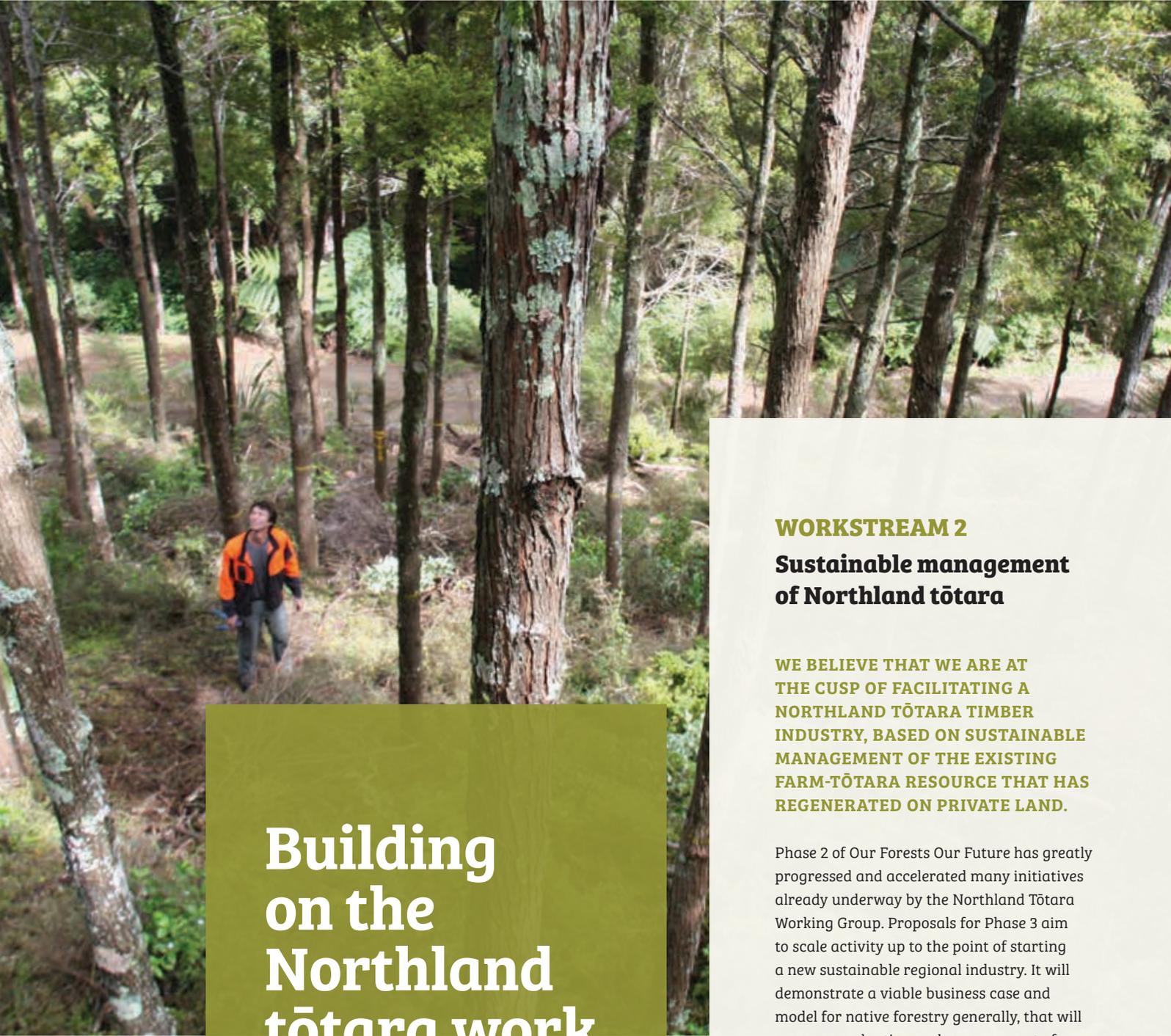
Community group and other stakeholders engaged

- Greening the Red Zone
- Pure Advantage
- Te Kohaha Tuhaitara Trust – Woodend
- Ngāti Hine local Iwi
- Leithfield local Iwi
- Waikato biodiversity forum
- Moturoa/Rabbit Island community trusts - Nelson



**BUILDING ON THE
NORTHLAND TŌTARA WORK**





Building on the Northland tōtara work

Paul Quinlan

A thinned and pruned stand of tōtara that has naturally regenerated on farmland in Northland. An estimated 205,000ha of regenerating forest exists on private land in Northland. Much of this could be managed as a potential commercial forest while providing many other landscape and environmental benefits.

WORKSTREAM 2

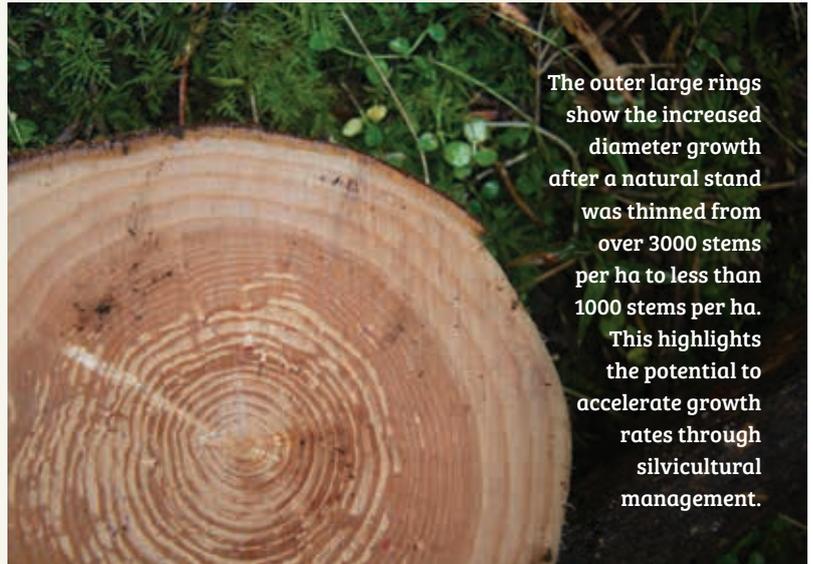
Sustainable management of Northland tōtara

WE BELIEVE THAT WE ARE AT THE CUSP OF FACILITATING A NORTHLAND TŌTARA TIMBER INDUSTRY, BASED ON SUSTAINABLE MANAGEMENT OF THE EXISTING FARM-TŌTARA RESOURCE THAT HAS REGENERATED ON PRIVATE LAND.

Phase 2 of Our Forests Our Future has greatly progressed and accelerated many initiatives already underway by the Northland Tōtara Working Group. Proposals for Phase 3 aim to scale activity up to the point of starting a new sustainable regional industry. It will demonstrate a viable business case and model for native forestry generally, that will encourage planting and management of native forests on private land for multiple benefits. This, in turn, is expected to encourage the sustainable management of over 200,000ha of existing native regenerating shrubland on private land in Northland and the complementary planting of thousands of hectares of marginal farmland.

Key progress during Phase 2 included:

- Extensive stakeholder engagement, and the launch of a database with over 350 registered entries facilitating the co-ordination of all stakeholder interests, including linking resource supply and landowners with processors and the market;
- Large collaborative proposals for a Tōtara Industry Pilot (TIP) project have been developed for Phase 3. These address remaining research gaps to confirm the business case, demonstrate a functional supply-chain and market, and facilitate the start of a regional industry. This has secured nearly a million dollars in funding from government agencies;
- Establishment of on-farm demonstration sites, with growth plots in semi-mature and merchantable-sized farm-tōtara stands that extend and build on existing research trials to better understand the growth and sustainable management of regenerating tōtara forests;
- Successful management of a sustainable farm-tōtara harvest operation under the Forests Act, applying Continuous Cover Forestry principles. This involved the harvest of 40m³ of logs from a 7.6ha area of tōtara forest on a representative Northland farm;
- Submission of a proposal to the Ministry of Primary Industries (MPI), which has resulted in significant collaborative work aimed at reducing legal and regulatory impediments to sustainable management under the Forests Act. This is on-going.



The outer large rings show the increased diameter growth after a natural stand was thinned from over 3000 stems per ha to less than 1000 stems per ha. This highlights the potential to accelerate growth rates through silvicultural management.

In March 2017, Tāne's Tree Trust managed a sustainable harvest trial, under the Forests Act. Continuous Cover Forestry principles were applied and 35 trees were selected from a 7.6ha area of regenerated forest on the farm. 40m³ of saw-logs were extracted with no damage to the residual forest.



Many farms in Northland already have areas of advanced natural regeneration with merchantable-sized trees. Some sustainable regional timber production could start now. It is not a case of planting and waiting for 80 years. Significant areas of existing regeneration will 'bridge the gap' until planted areas come on-stream.





A functioning supply chain is still needed to link the farm-tōtara resource to markets. This requires the creation of a new regional tōtara timber industry based on the appropriate sustainable management principles. A successful native timber industry would give landowners confidence to choose native forestry as a landuse option.



Sustainable harvesting of existing stands of farm-tōtara applies Continuous Cover Forestry principles and retains permanent forest cover - in contrast to exotic plantation forestry. Tāne's Tree Trust managed a trial harvest in March 2017 as part of the Our Forests Our Future project.

In December 2017, Tāne's Tree Trust showed the new Minister of Forestry, Shane Jones, a dairy farm property involved in one of the Northland tōtara projects (right).

THE NORTHLAND TŌTARA OPPORTUNITY

The farm-tōtara potential in Northland presents a unique opportunity to pilot a business case and model for native forestry, including demonstrating managed natural regeneration. Our Forests Our Future has a key role to play in co-ordinating and facilitating this, and to ensure sustainable, appropriate and well-managed multi-purpose native forests result.

Continuing to co-ordinate and progress this regional initiative is an essential role for Phase 3 of Our Forests Our Future. This could result in the development of a viable new regional timber industry relevant to other native tree species and forest types in Northland and in other regions, based on sustainably-managed, multiple-use native forests on private and Māori land. Among other things, Phase 2 has developed a large collaborative Tōtara Industry Pilot (TIP) project proposal (see WS2.11). This is to be implemented in Phase 3.



Phase 2 outputs

WORKSTREAM 2 Tōtara Project

Specific outputs from Phase 2 are listed here with reference to relevant digital files provided on a separate memory stick.



1. Co-ordinating the NTWG and producing a NTWG newsletter (circulated in Oct/Nov 2016 including 400 printed hard copies mailed out). (See: WS2.1)
2. The setting up of a Northland Tōtara Working Group (NTWG) data base (see the NTWG webpage on TTT website). Over 350 entries are now on the NTWG mailing list. (See: WS2.2)
3. An open field day was held on a dairy farm property where a NTWG tōtara project has been conducted. Over 50 people attended. (See: WS2.3 - WS2.3.2)
4. A report documenting examples of borer resistance in tōtara sapwood timber was produced in Jan 2017 – of relevance to NZ Building Code compliance efforts. (See: WS2.4)
5. Three batches of timber from NTWG members were supplied to SCION, for wet frame testing (durability) and Thermal Modification trials, and sample discs for ring counts and heartwood content analysis (with Disc-bot machine). (See: WS2. 5)
6. Supply of a fresh sample disc to Doug Mende (Biotech) – for preliminary tests for totarol (a valuable extractive residue).
7. Management of a sustainable harvest operation, as a joint project funded by SCION, involving 40m³ of tōtara logs, from 35 trees off a farm in Kaeo. The timber was milled and is now with SCION in Rotorua awaiting testing. This involved project conception, planning, operational management, individual tree selection, volume estimation and record keeping and post-harvest forest inspection with MPI forest inspectors. (See: WS2.7 – WS2.7.4)
8. Timber samples (400 slats) were sent to Faber-Castell for a pencil manufacturing trial in Jakarta (and a similar opportunity opened with Staedtler-Germany). See first trial evaluation report by Faber-Castell. (See: WS2.8 & WS2.8.1)
9. Constant stakeholder engagement throughout this phase of the project. This has included private landowners, industry stakeholders, agencies involved with sustainable land management, regional development and social enterprise, local authorities, Māori trusts, MPI and environmental NGOs, and media. (See: WS2.9 – WS2.9.2)
10. Exploration of potential project partner organisations, including Fonterra (Living Waters), AKAU, Reconnecting Northland and Canterbury University School of Forestry. (See example WS2.10)
11. A large collaborative tōtara project proposal called the **Tōtara Industry Pilot Project (TIP)**, prepared and submitted with project partners (Tāne's Tree Trust, SCION, Northland Inc. Te Taitokerau Māori Forestry Collective and Ministry for Primary Industries (MPI)). This has been a major piece of work for this workstream. A TIP Steering Group has been formed with Peter Berg as chair. It involves a \$937,450 project proposal for Phase 3 Our Forest Our Future. (See: WS2.11)
12. As a contingency plan for the TIP project, a \$447,040 Sustainable Farming Fund (SFF) project proposal was also prepared and submitted to MPI, with the NZ Farm Forestry Association as additional partners. Results will only be known around April 2018. (See: WS2.12)



13. An application for \$25,000 co-funding by the Forest Growers Levy Trust has also been prepared and submitted to support the above SFF proposal. (WS2.13)
14. The preparation and submission of a detailed proposal to MPI for a new approach to Sustainable Forest Management (SFM) Plans under the Forests Act. This seeks to reduce the cost but still achieve the requirement for sustainable management. (WS2.14)
15. In response to the above, MPI have agreed to test run and compare new approaches to preparing SFM Plans, on a farm in Kawakawa. We assisted with the field inventory work for this (completed in Sept 2017). This is vitally important work, trying to improve the present legal and regulatory situation that is prohibitively costly and a disincentive for landowners. (See: WS2.15)
16. Provision of information and images for several media articles which have covered aspects of our work in Phase 2 of this project and the long term vision of the NTWG. (See: WS2.16 – WS2.16.2)
17. Ten new graduate intakes to Ministry for Primary Industries (MPI), and three senior staff members were hosted for a day to become familiar with the Northland tōtara phenomenon.
18. The establishment of on-farm demonstration sites on six different farms, extending the network of permanent sample plots (PSPs) into stands of merchantable-sized trees. This complements the existing NTWG PSP network in younger stands and will enable growth rates and changes following potential future harvests to be monitored. (See: WS2.18 and 2.18.1)
19. Presentation for ARC Trees on Farms workshops. (WS2.19)
20. Presentation of Northland Tōtara Industry Pilot Project to Te Taitokerau Māori Forestry Collective. (See: WS2.20)

Phase 3 proposal - implementation

REALISING THE NORTHLAND TŌTARA OPPORTUNITY

WE BELIEVE THAT A VIABLE TŌTARA TIMBER INDUSTRY IN NORTHLAND WOULD GIVE LANDOWNERS AND INVESTORS CONFIDENCE TO EXTENSIVELY PLANT AND MANAGE NATIVE FORESTS.



It has a potential trail-blazer role that would harness the power of a commodity market to pull native forestry, as a landuse, into existence. For this reason, realising the Northland tōtara opportunity has become an important goal for Our Forests Our Future. Consequently, it remains a significant workstream and part of the proposal for Phase 3 implementation.

OBJECTIVES

- Continue to co-ordinate, facilitate and support the Tōtara Industry Pilot project (TIP) development - the business case analysis for an appropriate regional tōtara industry start-up;
- Continue to co-ordinate the Northland Tōtara Working Group (i.e. - landowner and stakeholder interests);
- Continue research into the growth and sustainable management of regenerating and planted tōtara-dominant native forests, including non-timber benefits;
- Continue and fulfil the tech-transfer and information dissemination role of Tāne's Tree Trust;
- Continue to work with MPI and local bodies to reduce legal and regulatory impediments;
- Support the Reconnecting Northland initiatives and landscape-scale connectivity model.

STRATEGY

- Focus on the forest owners'/managers' information needs and collective interests;
- Focus research on understanding the regional forest resource (e.g. inventory description, sustainable forest management, regulatory matters and non-timber values);
- Assist and collaborate with Crown Research Providers (e.g. SCION) and government agencies (e.g. Ministry for primary Industries and Northland Regional Council) for maximum value;



- Continue to work with Te Taitokerau Māori Forestry Collective, to ensure that Māori are integrated as full partners in the project;
- Promote, facilitate and support the development of an appropriate tōtara industry (and native forestry generally), but remain independent from, and outside of, any commercial entity.

METHOD

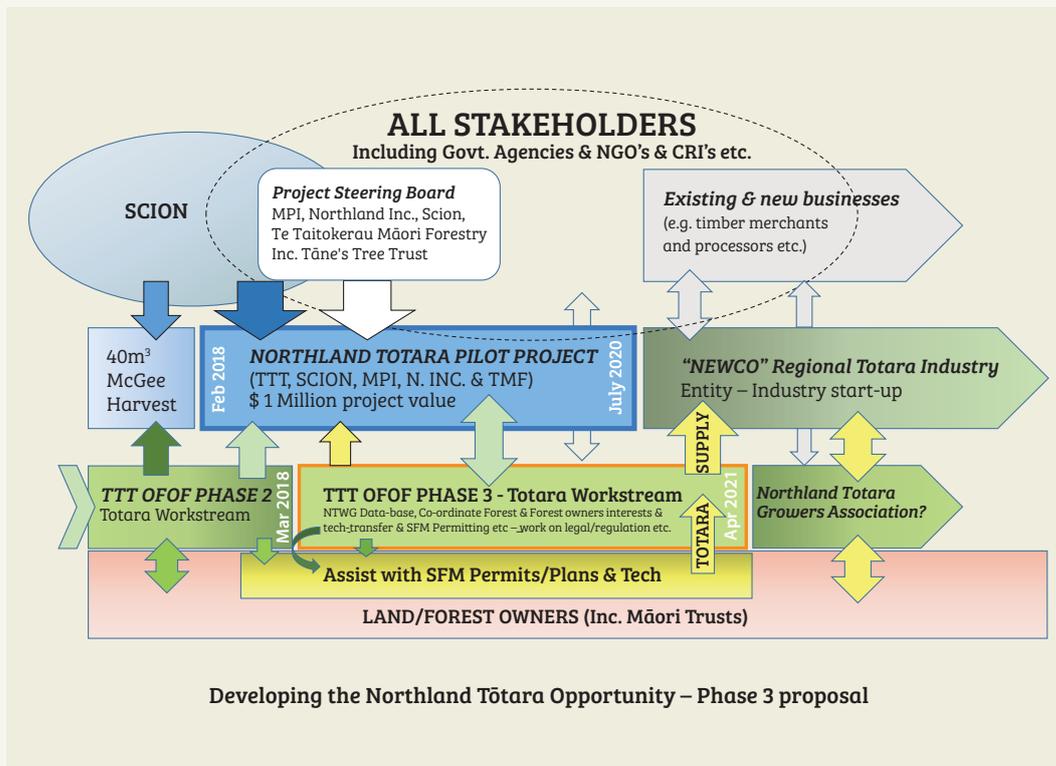
- Provide technical and operational delivery support to the Tōtara Industry Pilot project. (N.B. see WS2. 11 on the Outputs memory stick for project details);
- Co-ordinate the Northland Tōtara Working Group (NTWG) and general promotion/advocacy for forest/landowners' interests (NTWG Newsletters, articles, field days etc.);
- Grow the NTWG into a 'tōtara forest owner's collective/association' (or similar) that has the following roles:
 - Provides advice to landowners on planting and managing tōtara on their land
 - Assists landowners with the SFM Permitting and Plans under the Forests Act to enable a commercial scale of timber supply to market
 - Continues dialogue with MPI and local bodies to improve the regulatory processes
 - Re-measures the existing Permanent Sample Plots (60+) established by the NTWG and in phase 2 of Our Forests Our Future
 - Extends and maintains the existing network of forest sampling plots for the purposes of resource description, regional inventory/growth modelling and to inform forest management practices





- Investigates small-holder and group accreditation schemes (e.g. Forest Stewardship Council (FSC) and PFEC)
- Submits on Forests Act amendments/reviews as the opportunities arise
- Co-ordinates the collective interests of participating landowners (the growers)
- Initiates further collaborative research projects with funding leveraged to obtain maximum value

A schematic diagram below sets out the role and relationships of the proposed 'Realising the Northland tōtara opportunity' workstream of Phase 3 Our Forests Our Future – within the context of the initiatives developed during Phase 2 of this project.





THE BUSINESS CASE

5



The Business Case and Non-Timber Values

Gerard Horgan



BUSINESS CASES

A business case is simply a tool – more specifically, a decision support and planning tool. It projects likely financial results and other consequences of a specific course of action. It does this by outlining the rationale associated with that action and by defining the parameters (assumptions) and management factors involved in the project. It is intended to aid in the design, management and evaluation of a project.

OFOF AND THE BUSINESS CASE FOR INDIGENOUS FORESTRY

So, what are the results/ conclusions from the last two years of work on the OFOF business case workstream? The first one is that there isn't a single business case for indigenous forestry. The work shows that developing a business case is both site and species specific, and also dependent on the objectives of land owners and other stakeholders. Indigenous forestry covers many different species and management regimes. These range from clear-fell regimes through to permanent forest managed solely for non-market services; and forest composition ranging from a single species – a monoculture – e.g., beech, mānuka for honey, kauri or tōtara stands – through to several species grown in a mixture. Non-timber values (NTV) can be maximised in continuous cover regimes that are either left unharvested, or only selectively logged under strict sustainable forest management regulations.

Equally there is a diversity of objectives among those involved in wanting to establish and manage native forestry.

The Demonstration Planted Forests of Workstream 1 have revealed there are a wide diversity of cases with a range of resources, scale and timelines associated with planting indigenous tree crops, which differ depending on who is involved.

ECONOMIC RETURN ON TIMBER PRODUCTION ALONE DOES NOT STACK UP

Financial results are only one aspect of a business case; however, they are usually a major one. If a project can be shown that it is likely to yield an acceptable monetary return for its investor(s), this generally goes a long way towards making the case. As a rule, that situation does not stack up with indigenous forestry. A wide-ranging review of establishment costs, marketing issues and also the economic models/calculators used in looking at indigenous forestry options, generally indicate poor financial returns.





THE RESULTS INDICATE THAT INVESTING IN PLANTING NATIVE TREES FOR TIMBER PRODUCTION ALONE, USING CURRENT TECHNOLOGY AND GENERALLY ACCEPTED DISCOUNT RATES, IS NOT AN ECONOMICALLY VIABLE STRATEGY.

Establishing an indigenous forest on bare land is expensive. The work of Tāne's Tree Trust (TTT) indicates a typical cost for establishing new indigenous forest on bare land is of the order of \$20,000/ha – with that cost ranging from \$5,000/ha (low and applicable in only a few very specific circumstances) to more than \$40,000/ha.

Indigenous timber crops require at least 40 years to produce a commercial crop. Therefore, compounding establishment costs at, for example, a rate of 6 percent until there is a commercial output, will (typically) result in approximately \$210,000 worth of compounded establishment costs.

With a clear-fell management and an assumed yield of 400 m³/ha (with an optimistic assumption of an average growth of the commercial wood output of 10 m³/ha/annum for 40 years) there is \$525/m³ of establishment costs to set against each cubic metre of harvestable output.

However, that is only part of the costs any timber

output will need to cover – if timber production is the sole objective of establishment. In addition, there are the day-to-day management costs for 40 years, a land rental/opportunity cost (to reflect the opportunity cost of using the land to grow trees rather than some other crop), crop protection costs, etc., as well as the costs of harvest, log making, loading and transport to a processing plant or sale point. These additional costs in many cases will easily add another \$475/m³ (or more) to the “cost” of a cubic metre of indigenous log at a processing plant.

Realistically, demand is likely to be limited for indigenous timber with logs costing \$1,000/m³ (or more) at the processing plant, or more than double that for sawn output. Any niche for the product, and by extension to the resource required to produce it, is going to be a small one.

That conclusion is based on relatively optimistic assumptions concerning rotation age, growth rates, yields and an appropriate interest rate for a business case. Longer rotations, slower growth and/or a higher interest rate are only going to make it worse for a business case based solely on timber revenue.

There is also the question of risk. More risky ventures in any business case will

generally be associated with higher discount/interest rates or the de-rating of the uncertain output values into their ‘certainty equivalents’.

CHANGING RISK PERCEPTION

Myrtle rust, a serious fungal disease, arrived in New Zealand last year. There is also increased awareness about the serious long term impacts of kauri dieback.

At this point it appears that the damage myrtle rust will do to mānuka and the mānuka honey industry will be relatively limited.

However, there is a lack of consensus or complete knowledge about the longer-term impacts on other myrtle species, including pōhutukawa and rata.

Of perhaps even greater concern are suggestions that other more virulent variants of the rust, not currently here, could have much greater impact should they ever make it to New Zealand.

In the light of both the changing perceptions over the long term impact of kauri dieback, and the risks to the mānuka honey industry that myrtle rust incursion poses, it is pertinent to consider the type of risk assessment and adjustments that should be included, not only in any new business case involving kauri or mānuka establishment, but in the business case for any forestry.

WE NEED MORE THAN TIMBER VALUES

Even without the impacts any increase in risk perception is likely to have on a forestry business case, timber values alone appear insufficient (and likely always will be) to provide a complete economic/business justification for planting native trees. Timber values can contribute to a business case, but on their own they will not generally be sufficient to make that case a compelling one.

Despite this, small areas of indigenous forest continue to be established. Moreover, there is continued interest in expanding the indigenous estate. If the first conclusion relating to indigenous forestry is that there isn't a single calculator that can be applied to make the business case for establishment, based on timber revenue alone (and assuming rationality in those that continue to express the desire to plant indigenous blocks), the second conclusion is that this type of forestry must have more than a timber income to make a business case work.

THE CASE FOR NON-TIMBER VALUES

Any credible business case for establishing indigenous forests is dependent on non-timber values (NTV). This is another reason why the business case will always need to be site specific. A few NTV, such the one associated with greenhouse gas (GHG) mitigation and carbon storage, may have a general value that is unaffected by the locality where it is achieved. However, the value associated with many NTV, such as preserving/protecting a particular species in its current location, or preserving/enhancing the overall biodiversity of a particular site or area, or reducing erosion in a specific area, or providing recreation for people interested in native species, or more natural landscapes, etc., will depend on precisely where the forest is established, the species planted and the issues of importance to stakeholders.

Our economy relies heavily on forests - natural and planted - for clean air and water, stable soils, providing habitat, meeting climate change commitments, providing the ambient environment for outdoor recreation and tourism, and for maintaining NZ's international branding as a clean, green country. The OECD has recently stated that New Zealand's growth model is approaching its environmental limit, largely due to intensification of land use, particularly dairy farming. There is a growing awareness of the importance of New Zealand's natural capital, and ecosystem services have become important in planning and policy matters. However, while there is increased awareness of non-market ecosystem services and their importance, mechanisms for assigning a defensible monetarised value to these services are both challenging and, in many cases, still being developed.



Growing evidence of the negative impacts of intensive agriculture, particularly on water quality, has strongly influenced public opinion, which in turn has put pressure on government policy makers.

CHALLENGES IN MONETISING NTV

NTV are not easily monetarised other than those associated with carbon forestry. But even here there are complications, as identified in Motu's report on *Maximising the benefits of Native Plantation Forestry: Guidance for designing contracts that combine the revenue from carbon, timber and co-benefits* (attached as an appendix). Motu's paper, commissioned as part of the OFOF study, identifies what is legally required of a forest owner to earn carbon credits and helps identify areas where future work may show it is possible to reduce some of the transaction costs associated with native species-based carbon forestry.

VALUING ECOSYSTEM SERVICES

With many NTV there is also a recognised conundrum of 'valuing the invaluable', i.e., ecosystem services with no direct material benefits to an individual or specific group,

but which are critical to human wellbeing. There is also a general lack of awareness of the full range of NTV provided by forests, and of the full spectrum of forestry management practices, beyond the dichotomy of exotic forest plantations managed under clear-fell regimes, and native forests protected in the conservation estate.

Because the wider benefits of forestry are often not properly accounted for in decision making, this has resulted in a distortion of policies around land use - to the detriment of forestry. Growing evidence of the negative impacts of intensive agriculture, particularly on water quality, has strongly influenced public opinion, which in turn has put pressure on government policy makers. There is now a recognised need for incentives that promote: (i) land management measures that reduce erosion and water quality problems; (ii) carbon sequestration; and (iii) biodiversity conservation on private land.

IDENTIFYING NTV

Part of the work of this Phase 2 OFOF project has involved the development of a Rapid Site Assessment NTV Form used in selecting and assessing the demonstration sites of Workstream 1. In addition, a literature review looking at current thinking on NTV relevant to native forests was commissioned (attached as an Appendix). The focus of this review is native forests outside of the public conservation estate – forests that are either planted or encouraged to regenerate, and actively managed for multiple purposes. The study shows a large number of potential NTV, though some of them are generally forest-based rather than specifically based around native forest. The study groups NTV under three categories: (i) Non-timber forest products (NTFP) - also known as secondary forest products; (ii) Environmental services; and (iii) Socioeconomic and cultural services.





With the estimates of over 1 million hectares of marginal pastoral hill country that would benefit from afforestation, helping nature to achieve a permanent native forest cover is not only more practical, but also makes more economic sense.

However, these categories are not completely discrete and there are overlaps and linkages between the different types of NTV.

NTV can only be accurately calculated on a case-by-case basis and are highly site-specific. However, aggregated NTV of native forests are likely to be larger than that for exotic forestry plantations - particularly in regards to biodiversity conservation, protection of erodible land and water quality and scenic, cultural and spiritual values. Native forests managed for NTV alone, or managed under continuous cover regimes, are likely to have the highest aggregated NTV. In many cases this will exceed timber values. It is clear that on most proposed sites, the aggregated NTV are likely to provide a compelling case for investing in afforestation with native trees. The challenge is in providing a good justification for any assigned value. This is an opportunity to explore with Phase 3 of OFOF - to develop a broader approach to justifying the establishment of native forest that provides multiple benefits that embrace environmental, societal, cultural and economic outcomes at scales to match those resources.

ASSISTING NATURAL REGENERATION OF NATIVES

Establishing indigenous forest on bare land is expensive. Flowing from the business case and NTV work, and the challenges

associated with making a business case for planting a bare site with native trees; there is a case for considering starting with marginal farmland that is already showing signs of reverting to indigenous forest. Enhancing the transformation of these blocks into high indigenous forest is an effective way of increasing the native forest estate and capturing the associated environmental and cultural values. Options could include low-cost enrichment plantings within regenerating scrub with the goal of turning these into quality indigenous forests.

With the estimates of over one million hectares of marginal pastoral hill country that would benefit from afforestation (Landcare Research data), helping nature to achieve a permanent native forest cover is not only more practical, but also makes more economic sense.

It is recommended that the next phase of the OFOF project includes examining the cost effectiveness of enrichment planting of reverting lands, and quantifying the potential NTV. This can be combined with other management opportunities to enhance natural regeneration, such as controlling pest animals to reduce browsing of regenerating native plants, as well as controlling predators of seed (e.g. mice, rats), and controlling predators of birds that act as vectors in seed dispersal for many of the later successional native high-forest species.



FUTURE CONSIDERATIONS

Given the importance of NTV to the business case, the question of cost splitting and how it might be implemented is of interest. There are economic models that split costs between different groups – in this case, between those who want native forests for timber and those who want them for specific NTV. If parties with different objectives can readily agree on suitable management and splitting of costs for projects, the outcome in terms of the number of projects and total benefits is likely to be significantly better.

Cost sharing has been touched on during Phase 2, but at present the information required to confidently implement such schemes is generally lacking. In Phase 3 of the Our Forests Our Future project, it may be worth considering models (e.g., Spliddit) which seek to produce a fair division of costs between parties that gain different benefits from a project as well as evaluating the information (and possibly legal) requirements of these models and whether such models could have relevance in helping establish more areas of native forest.

The review of NTV commissioned as part of Phase 2 recommends several avenues for future work including:

1. Further developing the Rapid Site Assessment Form for NTV for users to identify and recognise the diversity of NTV relevant to their proposed planting sites;
2. Developing methods for easy and consistent collection of NTV data for different types of native forestry regimes;
3. Researching ways to better quantify NTV that are difficult to measure;
4. Building up a database of relevant case studies and of the value ranges for specific NTV in these studies; and
5. Promoting a broader landscape approach to NTV that embraces the wider ecosystem values of establishing and managing multiple-use native forestry.

See also the full versions of commissioned reports on Carbon by Motu and on NTV by Jacqui Aimers contained in the Outputs memory stick Chapter 5.



NON-TIMBER VALUES

6





Summary of Non-timber Values

Jacqui Aimers

Current thinking on non-timber values (NTV) is analysed. The focus is native forests outside of the public conservation estate, which are either planted or encouraged to regenerate, and sustainably managed for multiple purposes. The term NTV covers all elements under the ecosystem services concept, other than the value of extracted timber and pulp products.

A summary of NTV is provided under the following categories: (i) Non-timber forest products (NTFP) - also known as secondary forest products; (ii) Environmental services; (iii) Socioeconomic and cultural services. These categories are not discrete - there are overlaps and linkages between the different types of NTV. Conclusions and recommendations are also provided. A copy of the full report is contained on the Outcomes memory stick.

1. NON-TIMBER FOREST PRODUCTS (NTFP)

Honey production

- Currently the most important NTFP in terms of revenue generated
- Apiculture has a strong reliance on native forest species for providing early season nectar flow
- Based on very limited data, pollination services of native forest is estimated at \$206 per year per ha
- Monofloral honeys have been developed for mānuka, southern rātā, and tāwari
- NZ is the world's second largest honey exporter, with exports of \$315 million in 2016. This was mostly driven by mānuka honey, which contains natural anti-microbial compounds. High UMF mānuka honey has a gate price of up to \$130 per kg
- More plantings of mānuka are needed to meet very high market demand for mānuka honey
- Growing mānuka is a good option for marginal land and environmentally sensitive catchments and can provide a nurse crop for other native forest species

Plant extracts for pharmaceuticals and natural remedies

- There has been a recent resurgence in the use of native plant species for medicinal, natural health remedies and skincare products, e.g., mānuka and kānuka oils, and totarol (derived from tōtara) which all have anti-microbial effects
- Growers can obtain \$500 - \$600 per tonne for raw foliage for mānuka oil extraction

Hunting, fishing and foraging in native forests (and catchments)

- Hunting of wild game and trapping is important for local communities
- Includes whitebait and koura fisheries, which are dependent on forested catchments
- Wild foods are culturally important and sometimes used in contemporary NZ cuisine, e.g., pikopiko



Growing crops under native forest

- Exotic understory crops (e.g., ginseng, truffles) may undermine the aesthetic character of native forests, but there is potential for crops of native species for culinary and medicinal purposes
- Sphagnum moss, worth over \$5 million per year in exports, is important to the Westland economy

2. ENVIRONMENTAL SERVICES

Carbon Forestry

- The only NTV that is currently readily monetarised
- The carbon market was negatively impacted by previous poor policy and unstable prices, which discouraged investment
- Recent improvements in policy and good stable carbon prices (which are predicted to continue steadily improving) will encourage investment in afforestation projects
- Tāne's Tree Trust is currently developing a carbon calculator for planted native trees

Habitat Provision and Biodiversity Conservation Values

- A highly important NTV, but difficult to monetarise
- Native forests generally have better biodiversity values than exotic forests
- Native biodiversity on private land is declining partly due to limited incentives for managing existing native forest ecosystems, or establishing new native forest

- The role of managed native forests in biodiversity conservation needs better recognition, particularly in light of ongoing threats to biodiversity, high extinction rates, under-representation of some vegetation types in the conservation estate (such as lowland podocarp/hardwood forest), threats to iconic species, such as kauri and under resourcing of Department of Conservation (DOC)
- DOC has guidelines for assessing the ecological and biodiversity conservation values of sites
- These guidelines recognise the importance of secondary ecosystems, which can be highly valuable for biodiversity - this has direct relevance to organisations promoting establishment of native forest
- Biodiversity conservation values are likely to be highest where native forest: (i) is dominated by species that are regionally or nationally scarce or threatened; (ii) provides habitat for threatened or endangered native species; (iii) provides ecological corridors to natural areas; (iv) protects other important natural ecosystems, e.g., riparian plantings protecting waterways
- A survey of more than 1,500 NZ households showed that the average household would willingly pay \$264 per year for five years to conserve key native species in planted forests

Germplasm Conservation

- Important for species at risk, particularly species with a limited natural range, e.g., kauri



- Includes planting species away from their natural distribution, if they are under threat in their natural range, due to environmental pressures, or incursion of a serious pathogen
- Important in an era of climate change and significant biosecurity risks

Urban Forests – Environmental Services

- Amenity values highly important, but can be managed for multiple NTV
- Provide important regulating services for water quality, storm water, flood and erosion control (important in an era of climate change) as well as noise control, privacy and improved air quality
- Urban areas are often biodiversity hotspots, because they frequently sit astride convergences of several biomes, and often contain significant remnant natural vegetation that are important for connectivity of natural habitats from mountains to coastline
- Also provide important cultural services, as described below

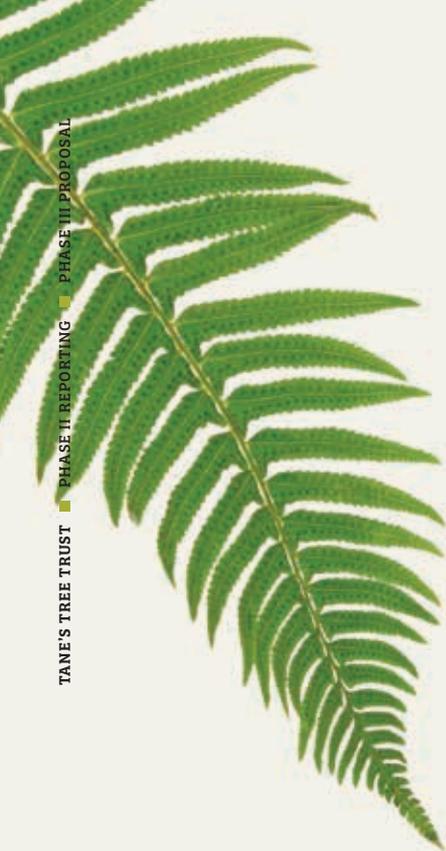
Stabilising Slopes, Riparian Zones, and Overall Catchment Protection

- Forests are vital for stabilising soils, reducing sedimentation, moderating water flows, and protecting downstream ecosystems and infrastructures - important in an era of climate change
- Erosion control by (all types of) forests in NZ was estimated to be worth \$2092 million in 2012
- Erosion of deforested hill country is estimated to cost NZ between \$100 and \$250 million per year
- 1.1 million hectares of land is at serious risk of erosion, which would be reduced by tree planting

- 1.45 million hectares of marginal pastureland would likely revert to native forest following livestock removal, and subsequently provide multiple environmental services, including stabilising soils
- Permanent forest cover, or forests managed under continuous cover regimes, are better at protecting erodible land than production forests, as clear-felling can result in sediment run-off
- Grants for planting erosion-prone land provide an indication of value (society's willingness to pay):
- Sustainable Land Management Hill Country Erosion Programme - annual pool of \$2.2 million
- Afforestation Grant Scheme - grants of \$1,300 per ha for planting new forests (5 ha to 300 ha) with up to \$19.5 million available until 2020 (scheme running 2015 - 2020)
- Downstream flood risk is reduced by maintenance of intact forests, but a lower water yield compared with other land uses can be a negative NTV in arid and semi-arid climates

Reduction in Nutrient Losses and Protection of Water Quality

- Forests have very low nutrient leaching compared with agriculture and forests also have a vital role in nutrient recycling, including retention of excess nutrients from intensive agriculture
- This environmental service currently has no direct market value in much of NZ, but it has implicit value as regional councils apply regulations to control nutrient application and land use change, as already demonstrated in two catchments (Lake Rotorua and Lake Taupo) where there is nutrient capping, nutrient trading and restrictions preventing intensification of land use



- Permanent native forests, or native forests managed under continuous cover regimes, would provide higher environmental services in regards to maintaining water quality than clear-fell regimes
- Central and local government have committed \$526 million over the last decade for cleaning up waterways, giving an indication of the value of clean water (society's willingness to pay) and also value of environmental services lost with loss of forest cover and intensification of land use.
- In 2015, a nation-wide survey showed that spending time outdoors was important for 88% of New Zealanders – forests featured highly in places visited, but respondents were not questioned about the type of forest visited or whether they preferred visiting native or exotic forests
- In 2015, 32% of New Zealanders went fishing and 8% went hunting - forests provide the ambient environment, habitat for game, and the environmental services supporting clean waterways



3. SOCIOECONOMIC AND CULTURAL SERVICES

Recreation and Tourism, Spiritual and Cultural Values

- Forests provide general amenity and ambient environments for recreation and tourism, have significant spiritual and cultural values, and provide environmental services important for other natural environments, e.g., waterways, which are important for outdoor recreation and tourism
- Hunting, fishing, trapping and firewood collection are important for household subsistence and cultural traditions in rural areas; and many city dwellers enjoy recreational hunting and fishing
- Investment in 4WDs and other equipment, travel and time off work, all provide a measure of this NTV; and the value of game meat and fish caught recreationally also provide an indication of value
- NZ has a strong international reputation for game hunting and fishing - many small enterprises provide provisions and guides for commercial trips, generating revenue for the local economy
- Game estates, which include substantial areas of forest, have been established for trophy hunters
- Native forests are culturally and spiritually very important for Māori; and the positive impact native forests have on water quality is vitally important to the mauri (life force) of freshwater ecosystems



- New Zealanders identify with and highly value native species (e.g. silver fern) and natural landscapes; but aesthetic values, such as the distinct character of local landscapes, cultural identity and 'sense of place' associated with native forest, are hard to monetarise – 'valuing the invaluable'

- Research identifies the importance of water views and native forest cover in aesthetic landscape values
- Native forests are mapped in many significant landscape designations in district and regional plans.

Urban Forests – Cultural Services

- Provide important cultural services (recreation, spiritual and physical well being) that are difficult to value economically, but are very highly valued by residents and contribute to quality of life and social capital, which positively impact mental well being, innovation and economic activity

Brand Image, Political and Commercial Reputations

- Forests play a vital role in the Clean, Green and 100% Pure NZ branding due to their contribution to scenic values, provision of ambient environments for outdoor recreation and tourism, and protection of water quality and freshwater ecosystems

- The tourism industry and agricultural exports are top economic drivers of the NZ economy - billions could be lost in revenue if world-wide perceptions of the NZ environment worsened
- It is difficult to quantify the economic value, risks and potential financial fallout linked with this 'green branding' and the part that forests play in this brand image (but it would be substantial)
- Companies are increasingly utilising green branding to gain market leverage and offset environmental impacts of their operations, e.g. Air New Zealand and their carbon offsetting scheme
- There appears to be a preference for supporting establishment of native rather than exotic forest.

CONCLUSIONS AND RECOMMENDATIONS

Measuring NTV is vitally important for leveraging the business case for afforestation with native species. There is a growing awareness of the importance (and vulnerability) of NZ's natural capital, and ecosystem services have become important in planning and policy matters. Our economy relies heavily on forests - natural and planted, native and exotic - for clean air and water, stable soils, providing habitat, meeting climate change commitments, providing the ambient environment for outdoor recreation and tourism, being integral to distinct natural landscapes, cultural identity and spiritual wellbeing and for maintaining NZ's international branding as a clean, green country.

An OECD report recently stated that NZ's growth model is approaching its environmental limits, largely due to intensification of land use (particularly dairy farming).

However, while there is increased awareness of non-market ecosystem services, mechanisms for determining 'monetary' values are still being developed.

A review of various case studies indicates there are widely differing approaches and methods for quantifying NTV. Interpretation invariably involves subjective judgments with inevitable caveats and extrapolation from site-specific examples to other sites, or to a national level, which is likely to involve a wide margin of error.

There is also a recognised conundrum of 'valuing the invaluable', i.e., ecosystem services with no direct material benefits, but which are critical to human wellbeing.

NTV are, therefore, currently not easily monetarised, other than carbon forestry. There also appears to be a lack of awareness (outside of the forestry industry) of the full range of NTV provided by forests.

Coupled with this, there is a lack of knowledge of the full spectrum of forestry management practices, beyond the dichotomy of exotic forest plantations managed under clear-fell regimes, and native forests protected in the conservation estate. Because of these factors, the wider benefits of forestry are often overlooked in decision making, resulting in a distortion of policies around land use, to the detriment of forestry.

The growing evidence of the negative impacts of intensive agriculture, particularly on water quality, has strongly influenced public opinion, which in turn has put pressure on policy makers. There is now a recognised need for incentives promoting:

- (i) carbon sequestration;
- (ii) land management measures that reduce erosion and water quality problems;
- (iii) biodiversity conservation on private land; and
- (iv) a long term vision for appropriate stewardship or kaitiakitanga of the land.

In response to growing concern about a decade of deforestation in NZ, multiple organisations have proposed that NTV be treated as quantifiable assets.

This would result in greater returns beyond timber values alone and would encourage investment in forestry. Carbon prices are predicted to continue to increase and stabilise, providing greater incentive for afforestation.

Establishment of native forests should be preferentially promoted because their aggregated NTV are likely to be larger than that for exotic plantations - particularly in regards to biodiversity conservation, protection of erodible land and water quality and scenic, cultural and spiritual values. Native forests managed for NTV alone, or managed under continuous cover regimes, are likely to have the highest aggregated NTV. In many cases this is likely to exceed timber values.

Based on the above points, sustainably managed native forests deserve a much higher profile as a viable land use in New Zealand. Managed native forests provide opportunities for new and more appropriate primary production and business models for the future. Native forests are particularly appropriate for environmentally sensitive catchments, erosion-prone soils, riparian zones, scenic landscapes and for supporting indigenous biodiversity.





“Native forests managed for NTV alone, or managed under continuous cover regimes, are likely to have the highest aggregated NTV. In many cases this is likely to exceed timber values.”

Whakarewarewa Forest, Rotorua



Recommendations:

1. NTV can only be determined on a case-by-case basis, e.g., avoided erosion is largely only relevant for hill country sites. Relevant case studies should be referenced, e.g., the Northland Tōtara and Riparian Management Project.
2. Determining NTV will aid decision making on the type of forestry regime suitable for a site.
3. The preliminary Rapid Site Assessment Form for NTV should be further developed. Measurement tools currently available internationally for determining ecosystem services should be assessed with the view to developing a tailor-made rapid NTV assessment tool for Tāne's Tree Trust.
4. Procuring site-specific quantitative NTV data is important, but qualitative measures of NTV that are difficult to assess should be regarded as equally important.
5. Engagement with stakeholders to determine NTV is important: including the land owners and managers; also, local iwi for cultural values, DOC for biodiversity conservation values and local regional council staff for other environmental services, e.g., avoided erosion.
6. More funding is needed to collect data on NTV from different types of native forestry regimes. Collecting data over time would allow comparisons with baseline data, e.g., water quality and biodiversity assessments from prior to forest establishment through to stand maturity.
7. More research is needed into methodology for determining NTV that are more difficult to quantify. This could include a nation-wide survey on New Zealanders' preferences for forest afforestation (native versus exotic), aesthetic appreciation and cultural importance of native forests, etc.
8. The Trust could explore possibilities to link markets with NTV to help make native forestry viable – incentivising it as a land-use option. This could include partnerships with commercial organisations wishing to plant native trees to offset the environmental impacts of their operations, e.g., carbon offsetting, or water quality amelioration. This could possibly be done in collaboration with NZFFA or NZ Landcare Trust.
9. The Trust could explore iwi partnerships. Māori organisations would be more likely to embrace native forest plantings due to their wider, holistic viewpoints and affinity with indigenous resources.
10. Sustainably managed native forests deserve a much higher profile as a viable land use in NZ. Local and central government agencies, commercial corporations, other organisations and the general public – they all need to be better informed about the wider benefits of forestry with native species, including continuous cover regimes on environmentally sensitive sites.

*Full NTV Report in Outputs
Memory Stick Chapter 6*



ADDED VALUE

7



Added Value for Our Forests Our Future

David Bergin

WHILE PRIMARY SUPPORT HAS BEEN RECEIVED FROM THE TINDALL FOUNDATION FOR THIS PROJECT, PARTNERING AND COLLABORATION WITH MANY OTHER ORGANISATIONS HAS OCCURRED.

Significant co-funding opportunities for Phase 3 implementation have been actively explored and pursued during Phase 2. Opportunities exist for corporate, iwi, central and local government involvement, as well as local communities and the general public. Such partnerships are important to secure investment in the planting of native species on a large scale.

Opportunities to lever co-funding for Phase 3 implementation have been explored during Phase 2 of the OFOF project and have included:

- Co-funding from potential project partners including iwi, landowners and councils for the OFOF Demonstration Planted Native Forest sites.
- Successful funding applications submitted to Ministry of Primary Industries' Sustainable Farming Fund (SFF) with proposed OFOF support from Phase 3 funding.
- Proposed collaboration and funding with research providers and other stakeholders.
- Potential funding from Trees That Count and corporates offsetting carbon emissions.



OUR FORESTS OUR FUTURE PARTNERSHIPS

Opportunities to leverage co-funding for Phase 3 implementation include:

Demonstration Planted Forest sites and partners

- Proposed demonstration planting sites contributing access to planting sites, undertaking site preparation, cost of nursery-raised seedlings, contractors for planting and management, and in-kind provision of staff management time, liaison with landowners and facilitating local community involvement.

- Across the nine selected Demonstration Forest Sites partner support has been initiated or is planned as follows:

- Ngati Hine Forestry Trust, Northland** - 1.5ha mānuka planted in 2016 and 10ha planted in 2017 available for enrichment planting of native trees by OFOF; monitoring plots established.
- Sainsbury Reserve, Waikato** - Waipa District Council funding of community consultation, development of concept landscape plan, plans for planting 22.8ha of mostly native production and protection forestry including 8ha of native demonstration forest comprising 24,00 trees and shrubs over a five year period at an estimated total cost of \$400,583.
- Te Miro, Cambridge, Waikato** - 6ha of marginal pastoral hill country retired from grazing; fencing and tracking; provision of plants; planting and post-plant management; rapid survival monitoring plots established.
- Papamoa Hills Regional Park, Tauranga** - Bay of Plenty Regional Council have committed up to \$100,000 per year for next 10 years; 30,000 native seedlings per year from 2017; Permanent Sample Plots for OFOF demonstration sites established.
- Onekawa Te Mawhai Regional Park, Opotiki** - Bay of Plenty Regional Council undertaking site preparation, supply of plants, planting and monitoring and management including existing blocks.

- Longbush Ecosanctuary, East Coast** - planting and naturally regenerating sites provided for OFOF project with educational facilities and opportunities; provision of existing planted groves for establishing Permanent Sample Plots.

7. Leithfield Beach, North Canterbury

Ahu Whenua Trust provision of sites, fencing, planting and post-planting management; peer review of OFOF planting plan by University of Canterbury School of Forestry academic.

8. Tuhaitara Park, North Canterbury

Te Kohaka o Tuhaitara Trust provision of sites and local community input; 4000 natives funded by Trees That Count planted 2016 and 2017.

9. Cranford Basin, Christchurch

Christchurch City Council trials established in 2016 and 2017 using OFOF planting designs and treatments, CCC provided \$26,000 towards labour costs of the trial, trees were donated by Trees for Canterbury.

Evaluation of supply chain for established native forest

Support from the Our Forest Our Future project has helped leverage funding and provided opportunities for evaluating the supply and marketing of a managed sustainable resource of native timber from multiple use forests. This includes:

- Wood quality tests by SCION on farm-tōtara timber samples, including durability tests, heartwood-sapwood content, thermal modification trials and ageing from discs.
- A trial harvest of 40m³ of farm-tōtara logs, funded by Scion with TTT/OFOF (\$40,000)
- A large collaborative proposal for a Tōtara Industry Pilot (TIP) project. This is a \$937,450 project proposal with partner organisations (Tāne's Tree Trust, SCION, Northland Inc. Te Tai Tokerau Māori Forestry Collective and the Ministry for Primary Industries).



Economic business case and quantifying wider benefits (non-timber values)

- Successful three year MPI's Sustainable Farming Fund project by Tāne's Tree Trust on developing web-based Planting Native Forestry Toolkit with growth, economic and carbon calculators based on TTT Indigenous Plantation Database - \$178,908 from MPI with \$30,000 co-funding each from TTT Research Fund and OFOF/TTC.
- Successful three year Sustainable Farming Fund project by Tāne's Tree Trust for Adaptive Management of Coastal Forestry Buffers evaluating and demonstrating options for gradual replacement of exotic pines on dunes with coastal native forest - \$264,668 with co-funding from TTT Research Fund.
- Funding from the Northland Regional Council Landuse hill country study \$15,000.

Summary table of co-funding

We estimate that the investment of \$511,000 by The Tindall Foundation into Phase 2 of OFOF over the last two years (2016 and 2017) for planning has leveraged directly and indirectly \$1,862,790 (excl. GST) (refer to table below). This co-funding is relevant across all workstreams aimed at:

- Establishing demonstration planted multi-use native forests to enhance existing landuse within our productive working lands;
- Developing a regional based sustainable timber industry based on planted and managed native forestry; and
- Consolidating a business case for native forestry where non-timber values are an essential component of multiple-use native forests.

Most of this co-funding across all workstreams has been confirmed from project partners and local and central government sources as summarised in the table below.

A conservative estimate of co-funding for 2018 to support Phase 3 Implementation is \$789,367 (excl. GST), again most of which is confirmed to partially cover materials and labour including plants, facilitating community supervision, agency support, fencing and other requirements.

Estimated in-kind funding

In-kind contributions during the two year Phase 2 of OFOF has been substantial, comprising time and resources including:

- Engagement and facilitation of volunteer community group involvement in planting and management of planted native forests;
- Involvement and consultation with organisations such as nurseries, NGOs and trusts;
- Consultation and planning with central and local government agencies such as Ministry for Primary Industries, regional, city and district councils and the Department of Conservation;
- Technical input and peer review by research providers at universities and Crown Research Institutes;
- Landowners and managers including iwi, farmers, trusts and councils in provision of planting sites and resources; and
- Promotion of the overall OFOF vision and of planting projects at local and national levels.

We conservatively estimate in-kind contributions of at least \$100,000 per year, although it is likely to be well in excess of this.



Table of co-funding leveraged during Our Forests Our Future Phase 2 Planning project over the two-year period 2016-17

SOURCE OF FUNDING, LOCATION	PROJECT, ACTIVITIES, ESTIMATED COST	TOTAL LEVERAGED FUNDING (EXCL. GST)	TIMEFRAME	COFUNDING LEVERAGE FOR 2018 (EXCL. GST)	STATUS
Planting demonstration sites					
Ngati Hine Forestry Trust, Pipiwai, Northland	Provision of planting site, supply of native seedlings for 2 ha site; planted 1.5 ha 2016, 10 ha 2017. Est \$10,000 per year	\$10,000	Long term	\$10,000	Confirmed
Waipa District Council, Sainsbury Reserve, western Waikato	1 ha of a 8ha of native demonstration forest comprising 24,000 trees and shrubs proposed for Year 1	\$212,800	5-years	\$26,000	Pending
Private landowner and Trees That Count, Te Miro, Cambridge	6 ha of marginal pastoral hill country, supply of plants. Landowner costing at \$13,000 per ha at 2 years after planting	\$78,000	Long term	\$40,000	Confirmed
Bay of Plenty Regional Council, Papamoa Hills Regional Park, Tauranga	30,000 native seedlings planted per year from 2017; council and community planting and maintenance; budget in 10 year BOPRC Management Plan	\$54,329	10 years	\$26,420	Confirmed
Bay of Plenty Regional Council, Onekawa Te Mawhai RP, Opotiki	Provision of seedlings, site preparation, planting, management and monitoring; silviculture of existing stands. Estimated \$10,000 per year	\$10,000	10 year plan	\$10,000	Confirmed
Longbush, Dame Anne & Jeremy Salmond, Gisborne, East Coast	Planting and naturally regenerating sites provided for OFOF project with educational facilities and opportunities; in-kind		Long term		Confirmed
Ahu Whenua Trust, Leithfield, North Canterbury	Provision of planting site; plan provided by OFOF; peer reviewed by University of Canterbury, in-kind		3 years		Pending
Te Kohaka o Tuhaitara Trust and TTC, Tuhaitara Coastal Park, Woodend Beach	2000 podocarps and shrub hardwoods planted 2016 and 2017; expansion long term for several hectares; community planting; monitoring and maintenance. \$15,000 per year plus in-kind	\$10,000	Long term	\$15,000	Confirmed
Christchurch City Council, Cranford Basin, Christchurch	Provision of site; CCC trials established in 2016 and 2017 using OFOF planting designs and treatments; min 2 ha planted, cost of plants. Est. \$15,000 per year	\$15,000	Long term	\$15,000	Confirmed
Research funding and collaboration					
SCION, Rotorua sawmill and labs	Wood quality tests on farm-tōtara timber samples, including durability tests, heartwood-sapwood content, thermal modification trials and aging from discs; trial harvest of 40m ³ of farm-tōtara logs. Est. \$40,000. Completed 2017	\$40,000	1-2 years		Completed
Tāne's Tree Trust, SCION Northland - Rotorua	Collaborative proposal for a Tōtara Industry Pilot (TIP) project - other collaborators Northland Inc. Te Tai Tokerau Māori Forestry Collective, MPI. Total project \$937,450	\$937,450	3-5 years	\$468,725	Pending
Northland Regional Council and Ministry of Primary Industries	Northland Regional Council/Ministry for Primary Industries Kaipara Hill Country Erosion Project - Economic analysis of native forestry landuse options for hill country in Northland. Completed 2017	\$15,000	1 year		Completed
Sustainable Farming Fund applications					
MPI's Sustainable Farming Fund	The Planting Native Forests Toolkit including growth and carbon models and calculators based on TTT Indigenous Plantation Database.	\$178,543	3 years	\$60,000	Approved
Project Crimson, Trees That Count	Application for co-funding for SFF Native Planting Forestry Toolkit. \$10,000 per year	\$10,000	3 years	\$10,000	Confirmed
Tāne's Tree Trust	Application for co-funding for SFF Native Planting Forestry Toolkit. \$20,000 per year	\$20,000	3 years	\$20,000	Confirmed
MPI's Sustainable Farming Fund	Transition options for exotic coastal buffers to indigenous buffers in the upper North Island	\$264,668	3 years	\$88,222	Approved
Other funding opportunities					
Trees That Count - trees from TTC Marketplace	Funding for seedlings, provision of sites, and facilitating landowner/iwi/community engagement. Potential major sustainable source of funding		Long term		Pending
Total co-funding leveraged during OFOF Phase 2 Planning		\$1,862,790			
Total co-funding for 2018 to support Phase 3 Implementation				\$789,367	
In-kind funding (conservatively estimated at minimum of \$100,000 per year)				\$100,000	



Phase 3 and Beyond

Peter Berg

Introduction

TĀNE'S TREE TRUST HAS BECOME THE LEADING ORGANISATION IN NEW ZEALAND PROMOTING FORESTRY WITH NATIVE TREES.

To do this it initiates research, disseminates the latest information, and works to remove barriers and facilitate, guide and support individuals, groups and agencies interested in planting and managing native trees. As a not-for-profit charitable trust its ability to do this is only limited by the extent of the goodwill it receives

from its members, Trustees and associate organisations, most of whom are volunteers who share our enthusiasm for planting and properly managing native trees and forests.

Phase 2 of Our Forests Our Future (OFOF) has identified the critical nature of technical assistance for parties intending to plant and manage native trees and forests. Likewise, the work of Tāne's Tree Trust in co-ordinating and promoting the Northland tōtara work (with its prospects of developing a native forestry based timber industry), has identified the need to provide comprehensive advice to landowners on the value derived from managing areas of regenerating scrub and developing forests. This same scenario is repeated time and again by parties sharing our goal of having many more native trees planted but lacking the technical capability to do this as effectively as possible.

For example Tāne's Tree Trust has recently signed a Memorandum of Understanding in which it commits to providing the technical expertise necessary to ensure the trees registered as planted by the Trees That Count movement are successful in establishing native forest.

In particular Phase 2 of OFOF has found that while often there is an enthusiastic partner with a vision of a future embracing many more native forests, the technical support and experience that TTT can provide is required to trigger action. The key projects in our strategy to drive this future via Phase 3 are summarised in the table at the end of this chapter and are also set out in more detail in the Workstream Report attached to this report to The Tindall Foundation.





Phase 3 is intended to assist and progress this role for Tāne's Tree Trust (and its partners as appropriate) as the acknowledged go-to provider of comprehensive information and technical assistance for native forestry in New Zealand.

It will enable TTT and its partners to perform the critical role of helping to facilitate the large-scale planting and management of native forests and 'weave resilience into our working lands' as called for by a former Parliamentary Commissioner for the Environment. In an open landscape trees have a presence and permanence that exceeds that of most other land-uses – it is important that they are well sited and managed to maximise the contribution they can make to a resilient landscape without unnecessarily compromising the ability to produce other products (e.g. food and fibre) from the same landscape.

Our partners recognise that Tāne's Tree Trust has an established position, based upon nearly two decades of effort, as a focused and otherwise independent leader in the native tree planting and management area. Such merit is not easily or quickly achieved; it acknowledges the ability and very long term involvement of many of the people most directly involved along with the quality of their advice and the work already undertaken.

A step-change in establishing native forest

The services requested of TTT during Phase 3 are not of themselves unusual; several are the services TTT provides on a much more limited basis presently. However the scale and extent of the interest generated by Phase 2 is such that a step-change is required by TTT, to be mirrored by an equally large step up in the programme of native tree planting and management not yet seen around NZ. Further work based upon better explaining and facilitating this work also requires engagement at a higher level including working with universities, Crown Research Institutes, Government departments and Government itself at all levels. This in turn means we must ensure the right people are able to be present and represent these values as necessary.

Our ability to do this and to ensure that the interest in planting native trees and forests is properly represented could lift planting and forest management activity greatly, even in the quite short term. As evidence of this the new Labour-led Government has a target of planting one billion trees over the next 10 years (equivalent to 100 million trees per year or 100,000 ha of new planting) that will include a substantial increase in establishing multiple-use native forests.



The Minister of Forestry has already consulted with TTT on this matter and acknowledged the leadership they provide on this aspect of forestry. Combined with other international conventions on climate change, and targets Government is setting for water quality improvement, environmental protection and pest control, the opportunities for lifting the level of activity in our arena are as great as they have ever been and are only likely to get better.

For TTT our measure of success will be ensuring anyone planning to plant (or already managing native vegetation) can readily access the information necessary to proceed, secure in the knowledge that in doing so there is a high chance of success and that what they propose is legally, economically and socially sanctioned, while contributing to improved environmental and cultural outcomes.

Summary of Phase 3 proposal

Liaison with stakeholders across all workstreams has shown there is substantial interest in the aims of the Our Forests Our Future project to demonstrate that planted and managed native forestry can provide both production opportunities and substantial conservation benefits within our productive landscapes. While our work to date has appeared to follow separate workstreams in practice, these are all interrelated and contribute to the larger goal of having the planting and management of native trees recognised as a valuable and legitimate use of land. Accordingly Phase 3 is specifically designed to deliver an integrated array of services and outputs helping to promote and facilitate native forestry.

1. ESTABLISHMENT OF DEMONSTRATION PLANTED FORESTS

Demonstration planted forests will be established at a minimum of six sites initially selected in collaboration with project partners, guided by planting plans and designed to demonstrate (and improve) the processes necessary for optimal results. There is scope to expand the number of sites to other sites and regions to provide a comprehensive national coverage. Depending on the resources and timelines of project partners, demonstration forests will range in size from 1-30 ha, and will be established over a 1-10 year period.

The geographical spread of demonstration forests will allow opportunities to profile a range of species and sites and the involvement of a wide range of stakeholders. Planting design will vary depending on scale, site characteristics, local species and site-specific objectives, resources and commitment of project partners. These demonstration forests will showcase a range of options for establishment and management of native forest for multiple purposes illustrating cost-effective, best practice methods suited to implementation at an operational scale.

2. REDUCING THE COST OF ESTABLISHMENT

Liaison with major native plant nurseries indicates certainty and forward ordering of plants is required for up-scaling supply and for reducing costs of seedlings. Issues with plant quality and eco-sourcing which require addressing include:

- Defining eco-sourcing in relation to geographic boundaries and elevation, and investigating species-specific requirements;
- Developing an accreditation system for native plant nurseries that provides the native forestry sector with an assurance that seedlings meet minimum plant specifications and eco-sourcing requirements.

In addition to planting nursery-raised seedlings, technological advances both nationally and globally in evaluating new methods for establishing native forests, such

as use of drones for direct seeding, require evaluation in the context of New Zealand's species and marginal lands that require large scale conversion to forestry.

3. MANAGED NATURAL REGENERATION VS PLANTING

With the high cost of planting for large-scale establishment, innovative ways that encourage faster and more effective conversion to native forest are required, including supplementary or enrichment planting of later successional tree species. **This is becoming increasingly prudent with over one million hectares of marginal pastoral hill country in New Zealand that would benefit from reforestation, and much of these remote steep landscapes are best in natives.**

Active management of reverting areas can usefully speed up reversion to a diverse resilient native forest (vis. gorse on some of the Wellington hillsides). This might involve planting of trees species (especially if local seed sources are lost), control of selected aggressive weeds (including wildings), pest animal control, and maintenance of fencing to exclude domestic grazing stock. At least one of the selected demonstration sites, Longbush Ecosanctuary, representative of steep erosion-prone hill country on the East Coast, will specifically target gaps in existing scrubland and it is expected that this will also be a feature of the Northland tōtara project.

4. DEVELOPING THE NORTHLAND TŌTARA OPPORTUNITY

The extensive areas of advanced regeneration of tōtara-dominated forest on private land in Northland present one of the best opportunities to promote native forestry as a viable land use. Developing and piloting a regional industry trial is an essential part of the equation – the product being landowners who value their forests and who will commit to long term management and retention of the forest more or less in perpetuity.

This, along with management of regenerating beech in the South Island, provides us and future generations with an insight into the sustainable management of our newly established native forests across many forest types along the supply and marketing chain from an improved managed resource, continuous cover forestry principles in selection of trees at the forest level, milling and processing and marketing and utilisation.

5. NON-TIMBER VALUES

Work on this aspect during Phase 2 has demonstrated that the benefits of planting native trees are almost endless – during Phase 3 the emphasis is on re-tuning attitudes to planting native trees, focusing on existing landowners but with a view to changing community attitudes across the board. Seminars, in-field workshops and video are all mechanisms which will be used along with check-lists of all the benefits that native forestry contributes, to demonstrate to landowners, iwi, communities and agencies the diversity and reach of non-timber values.

6. THE BUSINESS CASE FOR NATIVE FORESTRY

For native forestry it is clear that a business case requires a holistic approach to demonstrating the wider benefits of establishing and sustainably managing native forestry. To this extent the business case inextricably links with non-timber values. However for many landowners the cost versus benefit case, especially where discretionary spending is limited, needs to be available.

Phase 3 focuses on developing a new approach comprising a broader landscape view of establishing native forestry across our working productive landscapes that complements and enhances existing landuses, and provides wider ecosystem benefits including improved water quality and reduced erosion and flooding. While quantifying the value of these benefits and the wider ecosystem values are challenging, Phase 3 OFOF will be exploring innovative ways to engage New Zealanders from the individual to corporate levels in collaboration with such initiatives such as the Trees That Count movement, the Environmental Impact Bonds proposed by Dr David Hall, and demonstrating sustainable management and continuous cover forestry. The tōtara project is an excellent case study in this regard where there is a huge resource of “wilding” farm grown tōtara in Northland developing naturally on marginal lands that is presently unprotected and largely ignored, in fact treated as a liability by many farmers.



However if the correct value can be attributed to these trees that includes the wider environmental and landscape benefits, it is likely that landowners and wider society will see this as a valuable resource that can be properly protected and the forests retained and sustainably managed in perpetuity.

7. TECHNICAL ADVISORY ROLE FOR TĀNE'S TREE TRUST

While there are numerous guidelines available nationwide providing excellent information on planting and management of native forest to meet the range of needs, the overwhelming feedback during our Phase 2 consultation with interest groups and stakeholders indicated a lack of confidence to apply those guidelines to their sites and circumstances.

Tāne's Tree Trust strives to become involved in providing and supporting a native forest advisory and technology service through its existing networks, and also looks to continually expand its association with any parties that share its enthusiasm for a future which embraces planting and managing native trees. Seminars, workshops throughout the country and planning for a national conference on native forestry are part of this goal.

In addition to the work described above, implementation of Phase 3 of Our Forests Our Future will target provision of economic tools that include wider ecosystem values and benefits of establishing multi-use native forest including carbon and for which we have already secured some funding from MPI's Sustainable Farming Fund. But most importantly to be most effective in having the case made and heard, TTT personnel must be able to make representations on a regular basis and in relevant fora into the future.

7.1 Proofing and updating growth and carbon modelling data from established plantations

Planted stands of selected native trees established up to 100 years ago continue to provide insight into what the plantings of today will look like. While most of the early plantations are small and with incomplete management histories, growth data from them as part of the Tāne's Tree Trust Indigenous Plantation Database has been essential in the development of growth and carbon models of planted native forests.

Growth data from the Our Forests Our Future demonstration sites will add to the database, and help show the capacity of such forests to offset carbon emissions. For example, Trees That Count has had several requests from corporates keen to support planting and reversion of native forestry to offset their carbon emissions. This is where the Tāne's Tree Trust Plantation Database is proving invaluable in providing robust data to support these enquiries.

These older plantations of key native timber species, some of which are sufficiently developed to begin sustainable harvesting, provide insights into where the newly established demonstration planted forests will be at in 50 and more years. Phase 3 will include ongoing assessments of these established plantations including adding recently discovered stands to increase regional and national coverage of the database.

7.2 Information – websites, videos, seminars, field demonstrations.

These matters are discussed above; they are matters that consume considerable time and cost, however they are also essential to modern communications.

8. TTT IN THE FUTURE – STRUCTURE AND METHOD OF OPERATION.

TTT is undertaking many of these roles and activities to a modest degree presently, although as noted the step-change that Phase 2 of OFOF has encouraged will mean that servicing the programme into the future requires a similar step-up for us in terms of both personnel and associated servicing. For Phase 3 we envisage the structure looking like the outline in Outputs Memory Stick Chapter 8 Appendix 1.

9. TTT PHASE 3 BUDGET

The attached budget (Table 1) summarises the funding and support from parties external to TTT that is available to Phase 3. The right hand column is TTT's best estimate of the support it in turn requires to be able to make the step-up and support the projects involved as required. There is significant other in-kind contribution to be made by the various parties including TTT but the magnitude of the contributions Phase 2 has triggered and of the Phase 3 programme moving forward is apparent. In summary, TTT are seeking support totalling \$690,000 for years one and two of Phase 3 and \$565,000 for years three to five.





Stop Press: The Project Partners that we are engaged with for setting up the Demonstration Planted Forests are enthusiastically embracing the concept of Our Forests Our Future and are very keen to be part of, and provide support for, Phase 3 Implementation. They have offered to be referees or provide letters of support if requested. Contact details are listed for three examples of our Project Partners - an iwi, a regional council and a charitable trust:

- **Te Kohaka o Tuhaitara Trust,**
OFOF planting site planned for Tuhaitara Coastal Park.
Contact: CEO of the Trust
Greg Byrnes tkot@farmside.co.nz
- **Bay of Plenty Regional Council,**
OFOF planting site planned for Papamoa Hills Regional Park.
Contact: Park Manager
Courtney Bell
courtney.bell@boprc.govt.nz
- **Longbush Ecosanctuary,**
OFOF planting and regeneration site planned to complement their Cooks Garden, Gisborne.
Contact: Jeremy Salmond
jeremy.salmond@gmail.com
and Dame Anne Salmond
a.salmond@auckland.ac.nz

Appendix 2 - MoU TTC

Appendix 3 - Letter from Minister

PROJECT	PARTNER	PARTNER CONTRIBUTION	TTT CONTRIBUTION
Work Stream 1 – New planted forests and demonstration Areas			
<p>Demonstration sites</p> <p>Six of these nine sites are ready to go in Year 1</p>	<ol style="list-style-type: none"> 1. Pipiwai-Moerewa, Central Northland - Ngati Hine Forestry Trust 2. Sainsbury Reserve, Waikato - Waipa District Council and local community 3. Papamoa Hills Regional Park, Bay of Plenty - Regional Council and local communities 4. Longbush Ecosanctuary, Gisborne - Longbush Ecological Trust 5. Leithfield Beach, Tuhaitara Coastal Park, North Canterbury - Ahu Whenua Trust et al. 6. Cranford Basin, Christchurch - Christchurch City Council, Lincoln University. 7. Te Miro, Cambridge, eastern Waikato. 8. Onekawa Te Mawhai Regional Park, Opotiki. 9. Te Kohaka o Tuhaitara Trust and Trees That Count, Tuhaitara Coastal Park, Woodend Beach. 	<ol style="list-style-type: none"> 1. Provision of planting site, planting and management, supply of native seedlings est. \$10k 2. 8ha of native demonstration forest comprising 24,000 trees and shrubs- \$26k /yr over 5 years. 3. 30,000 native seedlings planted per year from 2017; council and community planting and maintenance - \$100k per yr. 4. Planting and naturally regenerating sites provided for OFOF project with other opportunities.... In kind, est. \$20k/yr. 5. 2000 podocarps and shrub hardwoods planted 2016 and 2017; expansion long term; community planting; monitoring & maintenance- \$15k/yr 6. Provision of site; CCC trials established in 2016 and 2017 using OFOF planting designs and treatments; min 2 ha planted, cost of plants - \$15k /yr. 7. Planting 6 ha of marginal pastoral hill country, supply of plants and land, \$40k /yr. 8. Provision of seedlings, site preparation, planting, management and monitoring; silviculture - \$10k/yr. 9. 2000 podocarps and shrub hardwoods planted 2016 and 2017; expansion longterm for several hectares; community planting; monitoring and maintenance - \$15k/yr. 	<p>Guidance, leadership and technical capability - includes:</p> <ul style="list-style-type: none"> ■ Liaison with project partners - local communities, iwi, landowners, councils, Trees That Count, etc ■ Developing landscape planting and management plans in collaboration with project partners ■ Incorporate research where relevant including trials and treatment options as part of demonstration sites ■ Demonstrate multiple use aspects for each site including community involvement, recreational values, environmental benefits, long term sustainable production options, cultural benefits, etc... ■ Implementing long term monitoring including Permanent Sample Plots for adding to growth and carbon models ■ Incorporation of growth data into the Tāne's Tree Trust Indigenous Plantation Database ■ Undertake promotion and communication at local, regional and national levels with interest groups, agencies and general public ■ \$150k/yr South Is manager, 5yrs ■ \$150k/yr NIs Manager includes travel and support, 5yrs ■ Communication and publicity - \$80k/yr for 5 yrs.
<p>Facilitating Planting</p>	<ol style="list-style-type: none"> 1. MPI/SFF - Transition options for exotic coastal buffers to indigenous buffers in the upper North Island 2. Trees that Count - Funding provided for nursery seedlings for planting native forest, provision of sites, and landowner, Iwi and community group involvement. 	<ol style="list-style-type: none"> 1. \$30,000 per year for three yrs. 2. Funding for seedlings. 	

PROJECT	PARTNER	PARTNER CONTRIBUTION	TTT CONTRIBUTION
Northland Tōtara Pilot Study – Adding Value			
<ol style="list-style-type: none"> 1. Northland tōtara- demonstrating the real returns from native trees, a tōtara based case study. 2. Manage the Northland Tōtara Pilot Study including general promotion/advocacy with Government, etc and representation of project in relevant forums. 3. Co-ordinate and grow the NTWG into a 'tōtara forest owner's collective/association' including representing forest/landowners' interests (NTWG Newsletters, articles, field days etc.) 	<ol style="list-style-type: none"> 1. Collaborative proposal for a Tōtara Industry Pilot (TIP) project - other collaborators Northland Inc. Te Tai Tokerau Māori Forestry Collective, MPI. 2. NTWG is an informal association of like-minded individual land and forest owners – intent is to formally associate and invest in forests and commercialisation of processes giving value to forest ownership and retention. 	<ol style="list-style-type: none"> 1. \$937,450 (includes \$100k ex Northland Inc, \$300k ex Scion and balance ex Government/MPI). 2. In kind initially although intention is that cooperative will pay its own way once up and running. 	<ol style="list-style-type: none"> 1. Lead, administer, coordinate, promote and represent project - \$75k/yr for 5 years. 2. Management including legal issues, amend Forests Act, extension work with farmers - \$125k/yr for two yrs.
Non – Timber Values			
Re-tuning the communities' attitude to a native forestry future.	<ol style="list-style-type: none"> 1. Seek to improve information available and used to quantify NTV. 2. Represent NTV in other land-use planning and decision making processes. 	<ol style="list-style-type: none"> 1. Work with agencies with an interest and funded in this area. 	<ol style="list-style-type: none"> 1. Representation and leadership - \$30k per yr.
The Business Case for planting and managing native Trees			
Demonstrating that the restoration and sustainable management of native forest on our working lands can deliver ecological, cultural and financial benefits.	<ol style="list-style-type: none"> 1. MPI/SFF- The Planting Native Forests Toolkit including growth and carbon models and calculators based on TTT Indigenous Plantation Database. 2. Project Crimson and Trees that Count - Application for co-funding for SFF Native Planting Forestry Toolkit. 3. Tāne's Tree Trust - Application for co-funding for SFF Native Planting Forestry Toolkit. 	<ol style="list-style-type: none"> 1. \$178,543 (\$60,000 per year over three yrs). 2. \$10,000 per year for three yrs. 3. \$20,000 per year for three yrs. 	<ol style="list-style-type: none"> 1. Project oversight, guidance, maintaining databases - \$30k per yr.
Other			
Representation, communication and promotion of the role for native trees and native forests in the community.			National Hui on planting native trees, benefits, placing trees into a productive landscape, promotion and developing national policy – TTT executive, \$50k per year.
TOTAL - conservative estimate of co-funding for 2018 to support Phase 3 Implementation		\$1,426,993	



Tāne's Tree Trust
NATIVE TREES FOR THE FUTURE

TANESTREES.ORG.NZ