



Tāne's Tree Trust Presentation in Hawke's Bay

Tāne's Tree Trust was invited by Ngati Kahungunu Iwi Incorporated (NKII) to make a presentation at Lake Tutira at the end of January. Ngati Kahungunu and the Hawke's Bay Regional Council have signed a MOU, the Kahutia Accord, to plant millions of trees on the 250,000 ha of erosion-prone land across Hawke's Bay. The aim of the workshop was to show how native species could be utilised in the project, and in particular how indigenous forest species could provide a viable alternative to *Pinus radiata* and other exotic timber species.



Rob McGowan, Tāne's Tree Trust. Photos: M Bergin.

Lake Tutira provided a very appropriate venue. Not only has there been extensive restoration plantings done over many years around the lake, but it is also an area where the HBRC have done major plantings of both *Pinus radiata* and manuka. The manuka was planted both for honey, but in particular, for erosion control. Much of the land is erosion prone and unsuitable for *Pinus radiata* because of

the difficulty in extracting logs without causing major environmental damage. It is also only a few moments' drive from the Holt Forest.

More than 40 people attended from various Ngati Kahungunu hapu, Regional Council, land owners, and others with an interest in forestry. A number were specifically interested in growing indigenous forestry species. There is an increasing resistance to relying only on exotic species, particularly *Pinus radiata*. The presentation from Tāne's Tree Trust, focusing on the viability of growing indigenous timber trees not just for timber production but for multiple purposes: landscape rehabilitation and erosion control, honey production, cultural uses, etc., was much appreciated.

The brief visit to the Tutira plantings gave a practical insight into the realities of revegetation planting. One message made by the host of the wananga, Blue McMillan, was to heed the advice of local people!



Blue McMillan, manager of the Tutira farm and restoration project.

Too often consultants brought in to help with local issues overlook the advice of those who have been on the land for a long time. Planting has been happening at Tutira for more than 20 years. Already significant natural regeneration is happening. A key reason for that has been the significant increase in native birds, particularly kereru and tui who are



The attendees gather among the 40+ year old totara at Holt Forest and listen to David Bergin describe the growth rates and characteristics of the stand.

distributing the seeds. That is to a large degree thanks to including an exotic species, tagasaste – tree lucerne (*Chamaecytisus palmensis*) in the planting programme. Kereru love tagasaste and will return to it when no other food is available. It was a good demonstration of the fact that sometimes exotic species have an important place in working to restore local forest biodiversity.

The key reason for choosing Tutira for the presentation was its proximity to the Holt Forest Trust Arboretum. The Holt Forest is an arboretum that was established by Harold Holt, a local business man, and his wife. The forest has an area of 15 hectares (38 acres). In 1933 they started planting trees, shrubs and plants over a period of 45 years.

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There is a variety of over 500 different species. In 1962 the land was donated to the people of New Zealand and is now run by the Holt Forest Trust.

Included in the arboretum is one of the most significant plantings of New Zealand indigenous timber species. (*Cf the TTT website for more detail*).

The site visit gave the opportunity to evaluate the different species, particularly kauri, totara, rimu and kahikatea, and to discuss the issues involved in their management. Planting native trees for future timber production is much talked about these days. To actually see a long established plantation helped bring the talk back to earth. One point that came through very clearly in the discussion is that native trees, like any other timber species, do need some management; care in site selection, pruning and thinning, etc., to achieve their full potential. Things just don't happen by themselves, especially in the time frames necessary to make timber production viable.

The workshop was fortunate in having Dean Evans, from the Hawke's Bay Regional Council, as a participant. For many years he had worked on the site with Harold Holt himself. Dean gave us an insight into the passion and the foresight of the man. That was a good reminder of another key point; things happen because people make them happen. Money is not enough. For TTT to fulfil its vision the most important ingredient is people with the foresight and the drive to re-establish over much of New Zealand the forest trees that first belonged there.



Dean Evans used to work at Holts Forest helping Harold Holt tend the plantations 20+ years ago.

What's ahead for Hawke's Bay?

The Kahutia Accord is an ambitious project that involves the whole of the region. Hawke's Bay's future relies on the productivity of its land. This can only be

sustained in the long term if the major issues of erosion, sedimentation and water supply and quality are adequately addressed. Re-establishing native forest in the headwaters of the major rivers that feed the Bay is the key to achieving that.



The marginal high country of Tutira that has been planted in manuka.



Rob talks to the group on the shores of Lake Tutira looking across the restoration and high country planting at Tutira.

The TTT workshop was arranged to contribute towards the knowledge and understanding needed to make that happen. It was a good beginning. TTT looks forward to being part of Kahutia coming to life.

- Rob McGowan

Trustee Ian Brennan concentrating on launching his drone.

He says, "I learned at a field day recently that drones do NOT like flying in damp conditions - especially around wet forests. To be precise, flying it was not such a problem - getting it back was the problem. Also, the memory card is in the drone, not in the controller. So if the drone goes AWOL I lose all the video on the SD Card as well."

See Ian's videos at:

<https://vimeo.com/306744731> Continuous Cover Forestry

<https://vimeo.com/275610535> 24 Years of Trial and Error



Sustainable Farming Fund Projects - an update

Adaptive Management of Coastal Forestry Buffers

The Project

Sand dune exotic forests typically have a sacrificial exotic forest buffer zone providing critical salt and wind shelter to production forest stands landward.

This project focuses on the upper North Island as a pilot study exploring practical options to transition failing exotic coastal buffers to resilient permanent buffers comprising indigenous coastal forest species based on an adaptive management approach. It involves a review of existing experience, field surveys and establishment of planting trials in collaboration with the forest industry, iwi, landowners, councils and communities to develop preliminary guidelines.

The indigenous buffers will assist FSC-accredited forestry companies meet their requirements and will provide more sustainable and effective protection to production forests. The guidelines will be applicable to other productive land uses along our coasts, and provide benefits in the face of expected climate change.

Background

Extensive areas of exotic production forest occur on dunelands around the New Zealand coast. These production forests typically have a sacrificial exotic forest buffer zone along their seaward margin to provide shelter from onshore salt-laden winds. These buffer zones, often extending up to 500 m inland of the coast, are critical to survival, growth rates and timber quality. At present, the buffer zones are invariably composed of exotic species including radiata, macrocarpa and maritime pine.

Forestry managers are concerned that these exotic buffers which are many decades old are now failing with significant risk of catastrophic collapse. Most are showing signs of degradation with significant dieback and opening of the canopy to form large gaps allowing prevailing onshore winds to funnel through. The expected impacts of climate change including more frequent and severe storms, along with increased sea levels and potential retreat of some parts of the coastline, will likely add further issues with management of these exotic buffers.

There is a significant opportunity to progressively replace these exotic forest buffer zones with indigenous coastal dune forest sequences. Establishment of a diverse species native coastal buffer is to be expected have greater resilience to impacts of climate change including increasing sea level rise and increased frequency of major storms compared to short-lived exotic dominated coastal buffers. Furthermore, the significant environmental benefits reflect the fact that indigenous coastal duneland forest sequences have now largely been lost from the New Zealand coast.

Work so far

An initial literature review of available information on indigenous duneland forest along the northern New Zealand coastline has been completed. The Project Team has been liaising with partners around the establishment of planting trials at Te Hiku/Aupouri Forest, Kawhia and Opoutere. Initial planting of trial sites will begin in autumn 2019. The project team has also undertaken assessments of plantings and/or naturally regenerating indigenous coastal dune shrubs/trees at Te Hiku (Aupouri Forest), Whananaki Spit, Piha, Muriwai, Woodhill Forest, Kawhia and Opoutere/ Ohui.

This is a collaborative project including input, advice and field support from our project partners including forest companies Summit, Hancock, Ngā Maunga Whakahii o Kaipara, Rayonier and Tainui-Kawhia Inc; Northland Regional Council, Whangarei District Council and Auckland Council staff; Department of Conservation staff; Far North and Kawhia iwi; and local community volunteers. The project is partially funded by the Ministry of Primary Industries' Sustainable Farming Fund, with project management and ongoing peer review from Tāne's Tree Trust.

- Meg Graeme, David Bergin, Jim Dahm, Michael Bergin

The Planting Native Forestry Toolkit

Introduction

The first six-month milestone has been completed for the Planted Native Forestry Toolkit. This project aims to provide a free comprehensive on-line toolkit from planning to implementation for those planting native forestry to meet multiple objectives from environmental to sustainable production. This will include a suite of online calculators on productivity, carbon sequestration and economics for planting and managing native forest generated from the Tāne's Tree Trust Indigenous Plantation Database.

Work completed to date has focused on interrogation of the Tāne's Tree Trust Indigenous Plantation Database. This has involved preparing the growth data, checking for integrity and standardising it across all sites and plots ready for importing to the web system. The data structure in the web system has been completed by Robin Sallis of Cerulean Design and Development to accommodate the plantation database.

Summary of the Tāne's Tree Trust Indigenous Plantation Database

A summary of the characteristics of the site and growth data within the TTT Indigenous Plantation Database is listed below which has imported to the web database and will be used in subsequent milestones in development of models and calculators.

- **Regions** - includes all 12 regions based on Regional Council and Unitary Authority boundaries from Northland to Southland
- **Sites** - 110 separate sites where plantations occur nationwide with plots established. These are individual properties, council parks, farms, iwi land, etc
- **Species** - 78 native shrub and tree species measured using the Landcare Research National Inventory Vegetation (NIVs) system of 6 letter species codes
- **Species descriptors** - used in categorising species for modelling into species groups or types comprising canopy tree, subcanopy tree, shrub, tree fern
- **Stand descriptors** - description of stand density including fully stocked stand, scattered stand, shelterbelt or screen
- **Plots** - 255 plots established either as Permanent Sample Plots (PSPs) or Growth Plots. Plot data collected in during field assessment includes:
 - ♦ Location - GPS coordinates, mapping, etc...
 - ♦ Plot size (square metres)
 - ♦ Plot shape/type - circular, square, rectangular, PSP, growth plot
 - ♦ Stocking - stems per ha calculated from plot area or average tree spacing from minimum of 30 intra-tree plant distance measurements
- **Tree measurements** - comprises field measurements of over 10,000 native trees and shrubs that occur within PSP and growth plots including:
 - ♦ Height (m)
 - ♦ DBH - diameter at breast height taken at 1.4 m above ground
 - ♦ RCD - root collar diameter taken at 100 mm above ground for shrubs where multiple leaders occur near ground level

Next stage

The next stage of the toolkit project is the development of a growth and yield calculator for the key native timber species. Initially this will be for aggregation of the species into broad groups including native conifers (e.g. podocaps, kauri, tanekaha), tree hardwoods (e.g. puriri, beeches, kohekohe, rewarewa, etc), and shrub hardwoods often used as nurse cover (e.g. manuka, kanuka, tarata, karamu, kohuhu, etc). Work will involve developing front-end access controls including design of the growth and yield calculator interface to allow for testing by selected users prior to launching on the website toward the end of the project.

Refinement will include creating growth and yield models for individual key species where there is sufficient growth data, and if practical by region and site type. This may provide an opportunity to develop a basic site index for planted native species based on different site quality, management history, and growth rate for a selection of the most commonly planted native trees within the Indigenous Plantation Database.

- David Bergin, Robin Sallis and Michael Bergin

AN UPDATE ON THE NON-TIMBER VALUES PROJECT

Current thinking on non-timber values (NTVs) was reviewed and analysed as part of the Our Forest Our Future programme, funded by The Tindall Foundation. The focus was New Zealand's native forests outside of the conservation estate, planted or regenerating, and sustainably managed for multiple purposes. NTVs are any products or services associated with forests, other than timber or wood fibre. The term NTVs was used rather than 'ecosystem services', as it was more appropriate in this context.

Over 200 references were examined and synthesised. NTVs were summarised under the following categories: (i) non-timber forest products (NTFP), also known as secondary forest products; (ii) environmental services; and (iii) socioeconomic and cultural services. Note that these categories are not discrete - there are overlaps and linkages between them. Knowledge gaps and deficiencies were also identified and recommendations made for further work.



The leaves of kawakawa have been long used in rongoā, traditional medicinal use. Photo: J Aimers.



Native tree species, such as pōhutukawa, provide early season nectar flow that is vital for the honey industry. Photo: M Bergin.

New Zealand's economy relies on forests for:

- clean air and water;
- biodiversity conservation;
- stable soils and prevention of sedimentation;
- meeting international climate change commitments;
- helping mitigate against the effects of climate change;
- supporting our international branding as a clean, green country;
- providing ambient environments for outdoor recreation and tourism;
- being part of our natural landscapes, cultural identity and spiritual well-being; and
- non-timber forest products, e.g., honey, wild foods, natural pharmaceuticals and rongoā.

These benefits have often been overlooked in land-use policy and decision making, to the detriment of forestry. A recent OECD report stated that New Zealand's growth model is approaching its environmental limits, largely due to intensification of land use, particularly dairy farming. However, there is now increased awareness of the importance (and vulnerability) of New Zealand's natural capital and ecosystem services (including NTVs) are becoming important in planning and policy matters.

Recognising NTVs as quantifiable assets would encourage afforestation. Unfortunately, NTVs are currently not easily monetarised, other than carbon forestry and honey derived from the nectar of native species. There is the conundrum of 'valuing the invaluable', i.e., ecosystem



Native forest is important for outdoor recreation and cultural identity. Photo: N Haisman.

services without direct material benefits, but important nonetheless.

There are widely differing methods for quantifying NTVs, often involving subjective judgments with caveats and extrapolation from site-specific examples to other sites, resulting in wide margins of error. Ideally, NTVs should be determined on a case-by-case basis, with stakeholder engagement, and qualitative values included in addition to quantitative NTVs.



Native forest is important for conservation of indigenous biodiversity. Photo: M Bergin.

Preliminary research indicates that, in many cases, aggregated NTVs of native forests are likely to be greater than for exotic plantations managed under clear-fell regimes – particularly in regards to scenic, cultural and spiritual values, and conservation of indigenous biodiversity; as well as protection of water quality, erodible steeppland, downstream infrastructures and ecosystems. Native forests managed for NTVs alone, or under continuous cover regimes, are likely to have the highest aggregated NTVs, which in many cases is likely to exceed timber values. The research indicates that native forests deserve a higher profile as an economically viable land use, which can be achieved through accounting for NTVs.

This research will soon be formally submitted for publication in multiple forums. The full report will also soon be made available on the Tāne's Tree Trust website.

- Jacqui Aimers

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