Northland Totara Working Group

July 2008

Totara regenerates naturally on farmland in many regions throughout New Zealand – including Northland. The very slow growth rates often observed are thought to be due to competition from high densities of trees that establish, often in the thousands per hectare. Although farm totara has notoriously poor form especially when grown in open conditions, trees grown in stands can have very good form and potentially could make a productive contribution to the farm.

The Northland Totara Working Group was established in September 2005 to support and promote research and technology transfer in the productive management of totara from both naturally regenerating stands and plantations. The group is coordinated by NZ Landcare Trust. Current members include landowners, Farm Forestry, FNDC, NRC, wood millers and processors, Tane's Tree Trust, NZ Forest Owners Association, and Scion(formally Forest Research Institute). The Working Group meets on a regular basis to discuss progress and provide direction and input into the initiatives underway. Interested people are welcome to come along to these meetings.

The Northland Totara Working Group has five broad objectives:

- To quantify the resource of naturally regenerating totara
- To establish demonstration trials, evaluating a range of thinning and pruning options
- To determine wood qualities and uses of farm grown trees
- To investigate the feasibility of developing a supply chain
- To identify and overcome hindrances to sustainable management of naturally regenerating totara.

Silvicultural Trials in Naturally Regenerating Stands of Totara on Farmland in Northland

Thanks to funding from MAF's Sustainable Farming Fund, Tanes Tree Trust, Far North District Council and the Northland Regional Council Dr David Bergin from Scion is running a three year trial for the group on sustainable management options for wood production from naturally regenerating stands of totara on farmland. The aim is to provide landowners with a greater understanding of management options for totara, including optimum times and levels of intervention.

38 Permanent Sample Plots (PSPs) were established on 10 farms in mid-late 2007 in 3 clusters – Whangarei (18 plots), Kaeo-Okaihau (13 plots), and Herekino (7 plots). A range of thinning regimes have been applied to these dense pole stands, and growth responses will be monitored and compared with growth of unthinned/unpruned controls at each site. An additional 4 plots had been established in a 20 year-old totara plantation near Auckland.

Before silvicultural work began, all stems within each plot were measured for diameter at breast height (DBH at 1.4 m above ground) by species including all under story vegetation and saplings greater than 0.5 cm DBH. Average stand height was estimated for each plot. Average diameters of the plots range from 10 – 18 cm and heights from 8 – 15 m.

Stands were thinned from densities of over 6000 stems per ha down to varying levels of stocking ranging from 700 to over 2000 stems per ha influenced by natural variation in species composition, tree size and maintaining a consistent stocking over plot areas. Form pruning involved removing all branches from 2 - 8m above ground level on all residual crop trees including multiple leaders and larger steep angle branches. Height of pruning was determined on tree size, with the aim of leaving at least one third of the green crown.

Photo courtesy of Jonathan Barran

Re-measurement in subsequent years will show whether the improved growth rates anticipated due to thinning and pruning are achieved! Further information and trial reports are available from the group.

Photo courtesy of Jonathan Barran

Wood quality assessments

Over 60 cross sectional discs have been sampled to estimate stand ages. Assuming one ring to be one year of growth, estimated ages of thinned stands range from 62-95 years in the Whangarei cluster, and from 47-78 years in the Kaeo-Okaihau cluster. These pole stands were targeted for thinning as they are intermediate between young very dense sapling stands and older self-thinned low-density stands.

A sample of sixteen discs were analysed at the Wood Quality laboratory at Scion in Rotorua. Consistent with earlier studies, it proved difficult to count growth rings. Percentage heartwood ranged from 3-20% reflecting the variability in age and size of discs sampled. Heartwood densities ranged from 402-558kg/m3 with similar values for sapwood. The overall disc weighted value of 476 kg/m3 was higher than wood density recorded for a small sample of mature totara assessed by Entrician, Ward and Reid (1951) from the Taupo region. The higher density values for the Northland study would largely be due to their northern location compared to the central North Island site. An assessment of air-dry shrinkage values found the Northland samples were typical of the species which has a reputation of low shrinkage and excellent stability.

Preliminary wood utilization studies therefore indicate the wood in relatively young, naturally regenerating totara on farms has many of the inherent wood quality properties found in trees logged from old-growth stands.

Watch this space:

* Thanks to the NRC and an Envirolink Grant from the Foundation for Research, Science and Technology, David Bergin has received funding to develop a reliable, cost effective technique that farmers can use to quickly assess the extent, quality and potential of the regenerating totara on their farms. This will be a great resource for those farmers that are keen to determine the characteristics of their own developing totara stands and their potential for sustainable management as a long term timber resource complementary to their existing pastoral landuse.

Field day well attended – despite the rain!

Despite heavy rain nearly 50 people attended the recent field day held at Hamilton's property, Whangarei Heads. The good turnout at the field day reinforced the level of interest in this project. This pastoral hill country lifestyle block has naturally regenerating totara at several stages of development typical of many parts of Northland. Three pairs of trial plots have been established on the property for the project.

Stand characteristics pre and post-thinning for regenerating totara stands, Hamilton's property, Whangarei Heads:

Plot	Treatment	Plot size (ha)	Height (m)	Pre-thin assessment			Post-thin assessment				% thinned
				Stocking (stems /ha)	DBH (cm)	Basal area (m^2/ha)	Stocking (stems /ha)	DBH (cm)	Basal area (m^2/ha)	Volume (m^3/ha)	
TODD 1	control	0.04	14.92	1850	19.02	52.52	1850	19.02	52.52	355.48	0
TODD 2	thinned	0.04	14.80	1300	17.63	31.72	650	22.85	26.64	191.34	50.00
TODD 3	control	0.011	12.37	6372	11.46	65.69	6372	11.46	65.69	350.39	0
TODD 4	thinned	0.011	13.45	4602	13.78	68.59	1416	16.99	32.10	192.12	69.23
TODD 5	control	0.04	9.91	2425	14.15	38.10	2425	14.15	38.10	178.65	0
TODD 6	thinned	0.04	8.65	3000	11.69	32.20	1600	13.39	22.52	97.22	46.67

Topics discussed at the field day also included issues around retaining productive potential under subdivision of properties, MAF permits and plans, what can be done to manage poor form paddock totara, and development of a market for sustainably harvested totara.

Legal Issues around Harvesting of Naturally Regenerated Totara

A workshop was held in 2007 to discuss legal issues around harvesting of naturally regenerated totara. Members of MAF's Indigenous Forestry Unit (IFU) made presentations to workshop

Photo courtesy of Wooden Earth Creations

Contrary to the common perception, it is possible to harvest and sell native timbers. However, steps must be taken to ensure that the harvesting is sustainable. Harvesting of naturally regenerated timber is controlled by two pieces of legislation. The first is the 1993 amendment (Part 3A) of the Forests Act (1949) and the second is the Resource Management Act (1991).

Part 3A is administered by MAF and landowners have four options for harvesting and milling native timber:

- SFM Plan – aimed at larger properties, based on a comprehensive, robust inventory and projection of sustainable harvest. Have a minimum term of 50 years.
- SFM Permit – A lower level of assessment is required (in some cases a visual assessment/use of available district resource information may be adequate but a sample is recommended). Have a 10 year term and maximum volume of 250 m3, providing the proposed harvests do not exceed 10% of the resource of timber on a species basis. Can be a one off harvest.
- Personal use – up to, 50 m3 maximum in any 10 year period (by application of the landowner only), timber cannot be sold and MAF apply a sustainability criteria to approve harvest where applicable.
- Milling Statements – are issued to legalise milling of windthrown, dead standing, and salvage trees, and trees felled for creation of an accessway etc. Require completion of a simple application form.

With Plans, Permits and Personal Use applications MAF must consult with the DOC prior to granting the approval. Harvesting under a Plan or Permit must be at a rate that is no greater than the forests ability to replace the harvested timber and the approval may contain requirements around restocking, and animal and plant pest control. Both are registered against the title.

All sawmills that mill indigenous timber must be registered with MAF. A registered sawmill may mill any indigenous timber for which an approval has been granted.

The Resource Management Act gives district councils the right to manage land use, which can include clearance of native vegetation. The good news for Northland is that all three district councils make the clearance of indigenous species for productive use a "permitted activity", provided it is covered by a plan or permit under the Forests Act. So landowners don't have to go through a second approval process, provided they have a permit or plan for their harvesting from MAF.

There are still a number of legal issues which the Northland Totara Working Group considers to be problematic to the sustainable use of Northlands totara resource. These include milling of scattered pasture trees (which are not classed as 'indigenous forest' and therefore not covered by the Forests Act) and the potential for simplified inventory requirements and guidelines to be developed for regenerating totara in Northland. These issues will be followed up by the group with MAF's Indigenous Forestry Unit.

Another outstanding issue is the need to develop a market structure whereby landowners are able to profitably utilise their totara resource. This is another facet that the Working Group is starting to grapple with. Many furniture makers and other end users are very enthusiastic about the potential to utilise totara for a wide range of high value products.

Issues of supply vs demand, similar to the old chicken and egg debate dominate – but the Working Group are confident that they will have more progress to report in the next issue of this newsletter!

Photo courtesy of Wooden Earth Creations

Opportunity for the future...

* The Afforestation Grants Scheme (AGS) has been launched as part of the Government's package of climate change initiatives. The scheme, administered by MAF, is a contestable fund aimed at encouraging more forestry planting based on an annual tender process.

* Half of the funding will be available to regional councils to help them meet their sustainable land management objectives. The other half will be available to the general public via a public tender pool. More importantly for the Northland Totara Working Group – 15% of the grant will be targeted to slow-growth forests with a preference for broader environmental considerations such as soil erosion, water quality, and biodiversity enhancement. The implementation of this scheme is still to be shown, but the Northland Totara Working Group will be reviewing the relevance of this project to the development of a totara market.

Inventory of the Totara Resource in Northland

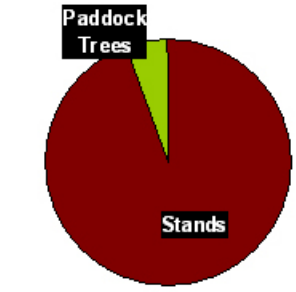
A project to develop a method for estimating the resource of totara is one of the initiatives underway by the Northland Totara Working Group.

Thanks to funding from ASB Community Trust, Chris Kennedy of Geo Info Kerikeri with assistance from Paul Quinlan, landscape architect and landowner in Kaeo, carried out a preliminary survey of totara regenerating on farms. The survey indicated there is likely to be hundreds of thousands of hectares of totara in Northland that could be managed for long-term specialty timber production.

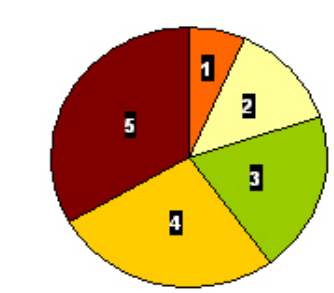
The survey methodology has been trialed in the Whangaroa area using aerial photography, digital mapping technology and forestry inventory methods.

In total 1226 ha were mapped in the mapping sample (2.6% of the total 47,579 ha study area). Of this 444.6 hectares were mapped as totara stands.

Proportion of total volume m3



Total Stand Trees m3 by Form



The results of this pilot study provide a preliminary estimate of the quantity and quality of the existing totara resource on private land. This confirms a large resource of regenerating totara exists.

Although the resource is often judged by the scattered individual trees seen in open paddocks, the largest proportion are actually found in dense groups, stands and in scrub areas. Most of the trees within stands, however are small to medium in size with highly variable form.

This survey reinforces the scope to improve tree quality through silvicultural operations – potentially leading to significantly improved quality of recoverable timber in the future. The challenge now is to utilize the methodology developed to better understand the resource over the whole Northland region.

ASB Community Trust
Te Kaitiaki Putea o Tamaki o Tai Tokerau

Thanks to the ASB Community Trust for funding the inventory project. NRC also assisted with printing of the report.

The total tree volume estimated in the study area was 453,860 m3 for stands and 27,340 m3 for paddock trees. Photo of paddock tree

Totara were placed into one of five tree form classes:
1. Excellent
2. Good
3. Fair
4. Poor
5. Non merchantable

Northland Totara Working Group thank the FNDC and NRC for their support of this project.

For more information on anything in this newsletter, please contact:

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Far North District Council

NORTHLAND REGIONAL COUNCIL

NZ Landcare Trust
landcare action on the ground