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Concurrent Session 4: Forest Extension

Topic 1

Promoting the management of a naturally regenerating native forest resource for commercial timber production. A case-study based around *Podocarpus totara*.

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ABSTRACT

Podocarpus totara (totara) is one of New Zealand's most renowned indigenous timber trees. It was widely used both by Maori and European settlers and continues to be respected for its exceptional wood properties. Yet today, in common with most other native species in New Zealand, it is seldom sawn or utilised in any significant commercial quantities.

Naturally regenerated stands of totara are found in many pastoral areas throughout New Zealand. In Northland, totara regrowth is remarkably vigorous and abundant on pastoral hill-country and along riparian margins. Like manuka (*Leptospermum scoparium*), totara is often considered a weed problem on farms. The Northland Totara Working Group (NTWG) was formed in 2005 to explore the potential for land owners to manage this regenerating resource for timber production.

This case-study outlines the achievements of a community of interest based around the exploration of the potential to manage and realise commercial value from this emerging 'second-growth' resource. Initiatives have included quantifying the resource, establishing silvicultural trials, surveying timber utility and market potential, and working to reduce legal impediments and disincentives.

Development of an industry based on the commercial-scale use of this native timber tree is also seen as a practical way to encourage the integration and management of this regenerating native tree species on private land within existing largely pastoral land use. This vision is aligned to broader policy goals of weaving resilience and sustainable land management practices into our productive landscapes nationwide.

INTRODUCTION

Totara (*Podocarpus totara*) is one of the most widely-distributed indigenous softwood timber trees in the old-growth forests of New Zealand. It was extensively used both by Maori and European settlers and was respected for its exceptional durability, stability and machining properties. Only small quantities of totara are now available from private or Maori land. Totara on Crown land under the Stewardship of the Department of Conservation are reserved for infrequent Maori ceremonial use.

In contrast to its limited availability from old-growth forest, totara regenerates naturally in productive landscapes throughout New Zealand. In Northland, totara regrowth is remarkably vigorous and abundant on pastoral hill-country and along riparian margins. Like manuka (*Leptospermum scoparium*), totara is often considered a weed problem on farms.

A vision for a productive role for naturally regenerating totara on private farms and scrubland is presented with a focus on Northland. A case is made for promoting commercial-scale use of totara as an appropriate and practical way of integrating more native trees into our rural production landscapes. To do this the characteristics of this species are outlined, the latest research and the specific opportunities and restraints for managing totara are presented, and the potential for realising commercial opportunities to utilise the emerging resource of totara at a regional and community level will be discussed.

This will also be telling the story of the Northland Totara Working Group. For this is about their vision and activities. It is a story based on practical experience and observation, but also has the support of rigorous science through funded research projects. It involves a collaborative effort by a team of people encouraged by a wide "community of interest". Much generous giving of time and effort by those involved reflects the belief that promoting the commercial use of this native timber species will also bring about many other worthwhile environmental, ecological and economic benefits to the region and its local communities.

TOTARA IN THE LANDSCAPE

Promotion of native trees: their use and conservation

Native trees are highly-regarded and perceived by many people to enhance landscape values. Research has shown that people value landscapes with high degrees of "natural character" (Fairweather & Swaffield, 2003). This is consistent with priorities expressed in Section 6 of the Resource Management Act. Tall vegetation, particularly of indigenous species, is often associated with the perception of higher natural character values (Fairweather et al, 2003). This is also recognised in many District Plans which consequently often have objectives, policies and rules relating to the protection of native trees on private land.

For many reasons associated with environmental resilience, indigenous bio-diversity and other landscape and landuse values, farmers are increasingly being encouraged to plant more native trees on their property (PCE, 2001) – that is, within the space used for conducting their business.

However in Northland, totara trees are very common on farms; in fact so much so that many farmers view regenerating totara as a weed. Nevertheless, some of the trees are often used to shade and shelter animals, for erosion control and for their aesthetic value. What about commercial-scale timber production? Can we re-conceptualise this problem into an asset?

In New Zealand there is a tradition of spatial separation of conservation and production activities. Thoughts of felling native trees still tend to be associated with many negative connotations of "native logging" and exploitation, but are these attitudes perhaps limiting our thinking and the opportunities to integrate more native trees on private farmland? In some other countries there is far less conflict between utilisation and conservation. One facilitates the other. In this respect, naturally-regenerating totara presents us with a unique opportunity. The Northland Totara Working Group was formed in 2005 to explore the potential to sustainably manage the developing resource of totara and integrate this with existing landuse practices.

Attributes of totara

Totara has the following remarkable characteristics:

- It is a pioneer light-demanding tree species, ecologically suited to disturbed environments such as those created from bush clearance and extensive pastoralism.
- It is "stock-resistant" readily establishing in the presence of grazing animals.
- It regenerates naturally and abundantly, seeding as soon as eight years after planting with birds readily dispersing seeds.
- It responds well to silviculture (pruning and thinning).
- It has excellent potential for sustainable management.
- It is a significantly-scaled regional resource (important for commercial mass and supply continuity).
- It occurs throughout New Zealand, regenerating on farmland in many regions.

These attributes present a unique and practical opportunity for integration of this native tree species into the pastoral environment (Moodie et al., 2007; Quinlan, 2010).

Lifecycle of totara on farms

The following is a brief account of a common life-cycle of totara on farmland:

- Because it is stock-resistant, the species has a weed-like ability to colonise grazed sites and in particular within poor-grade pasture such as that on steep slopes. Establishment of totara on steep slopes is positively correlated with the presence of species typical of poor pasture (Bergin, 2001).
- Birds spread seed from existing tree stands; grazing seems to assist seedling establishment by reducing grass competition.

- Dense thickets develop in paddocks either as pure stands or often in association with gorse (*Ulex europaeus*), manuka (*Leptospermum scoparium*) and kanuka (*Kunzea ericoides*).
- Within 2-3 decades, highly-stocked pole stands are formed and with intense competition stem diameter growth slows to only a few millimetres per year.
- Natural attrition (self-thinning) occurs as faster growing trees increasingly dominate and as other species like kanuka die out.
- Without intervention natural thinning continues and merchantable-sized trees develop within a hundred years as the stand matures.

Human-induced large-scale forest clearance and disturbance of our landscapes over the last 1-2 centuries has created the favourable open conditions for natural regeneration of totara. In some situations these modifications have developed a unique type of native forest within the farmed environment. These characteristics combined with its amenability to silviculture, means totara has considerable potential for sustainable management (Bergin, 2003).

The vigour of natural regeneration

Regeneration is typically associated with previously-cleared land with reversion to forest remarkably rapid. In Figure 1 the central block is a 35 ha portion of a large hill-country sheep and beef farm. Since the 1960s, trees have spread naturally from a small bush remnant. By 1981 39% of the area was covered, mainly by totara. Despite continued grazing, cover has increased to 61% of the area during the past 27 years.

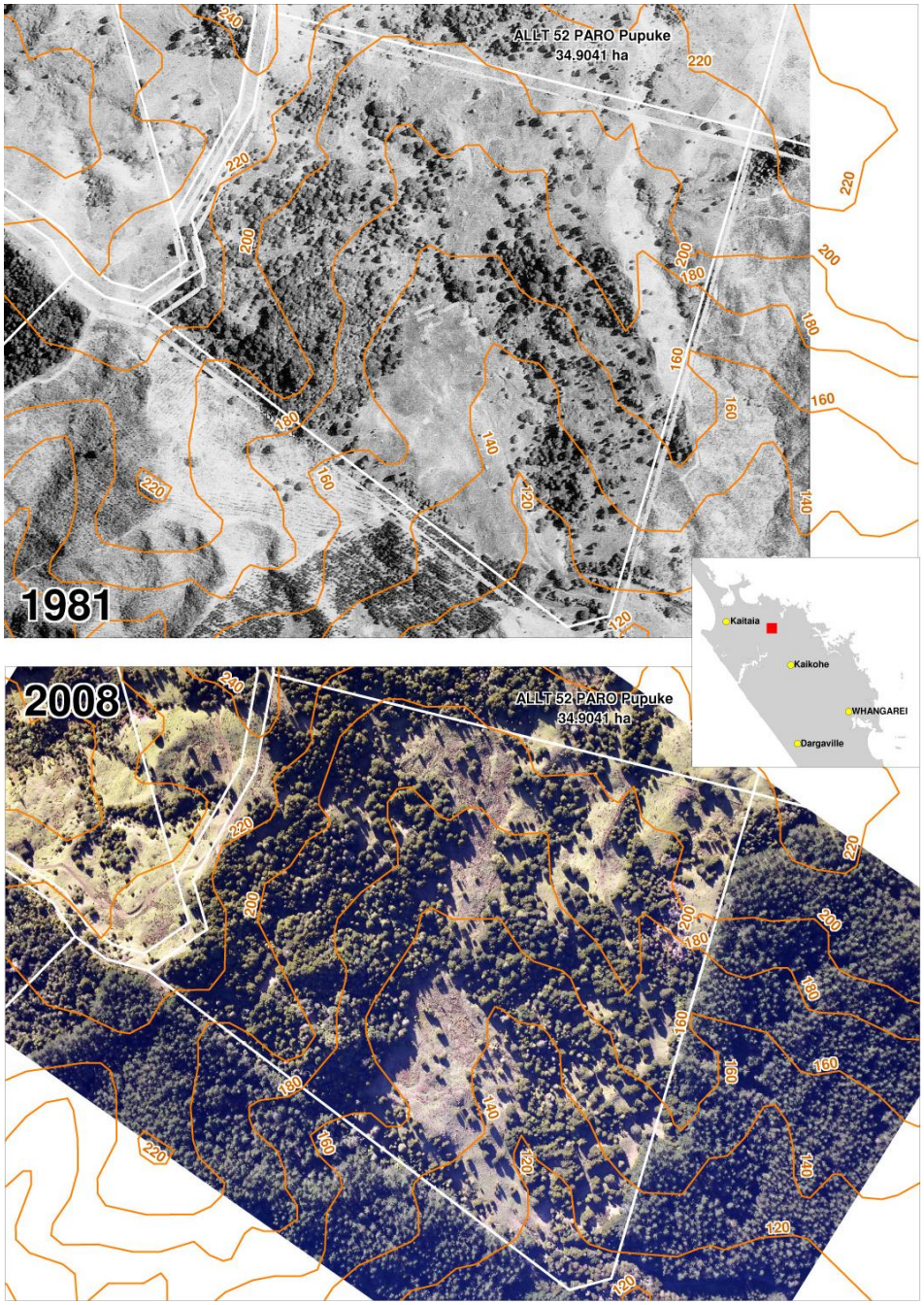

Figure 1: Natural regeneration of totara is remarkably vigorous on many Northland farms despite continued grazing. In 27 years, cover of naturally-regenerating totara on this Far North sheep and beef farm has increased from less than 40% (above) to over 60% estimated cover (below).

The characteristics of the regenerating totara resource are often related to the modifying influence of past and current farm activity. The distribution and pattern of regenerating totara varies including scattered single trees or groups of trees in semi-mature secondary forest, areas of regenerating shrubland comprising various proportions of totara, and scattered small groups and individual trees in paddocks. It is therefore difficult to define and map the totara resource as "forest" area. This presents difficulties in applying the Permit and Plan provisions of the Forests Act as administered by the Ministry of Agriculture and Forestry. The dispersed and variable

resource of totara regeneration on farmland also has practical implications for management and harvesting of relatively small quantities of timber.

Scale and characteristics of the resource

An important step has been determining the scale and characteristics of the resource. Funding was obtained from the ASB Community Grants Scheme to carry out an inventory project designed to estimate the amount of totara already existing on private land. A pilot study using high-resolution aerial photography (Kennedy, 2007) surveyed more than 47 000ha of private land in the Whangaroa area within the Far North district of Northland. Paddock trees were counted, and different forest types and ages were mapped. Randomly-located sample plots were established within these strata and within which all totara were measured and recorded. Results were combined with the land cover information from the Landcover Database 2 (LCDB 2) and extrapolation produced a regional estimate of the totara present in the area.

Allowing for a wide margin of error (more inventory work would be required to refine the estimate), there is evidence that a totara resource of significant size already exists in the Northland region. Approximately 344 000 ha of private land currently contains totara at various stockings comprising up to an estimated 8 million m^3 in total tree volume. The volume of the actual stems will be less than that figure and the proportion of merchantable size and quality logs at present will only be a fraction of this amount. Natural growth will see this substantially develop in the future.

It is clear that there is a substantial regional resource of totara in Northland. Only 6% of the totara population consists of large-crowned coarsely-branched paddock trees - the majority is found in scrub areas and in stands or small groups on farmland. Of these about half are considered to have stems with reasonable form quality to potentially produce a merchantable bole or log. The majority of these will still have relatively short boles and some branches or knots.

Nevertheless many farms already have some harvestable-sized and merchantable-quality trees that have resulted from regeneration on previously cleared land at various times over the last 150 years. It is not a case of planting now and waiting for 80 years or more. Some sustainable regional production could commence in the immediate future.

An age-class profile of the population shows that it is predominantly a young resource. Most of the stem diameters at breast height (DBH) are presently less than 30 cm. This implies good potential for silvicultural intervention and sustainable management for a substantial proportion of the resource.

ESTABLISHING SILVICULTURAL TRIALS

Slow growth in unmanaged natural stands

Much of the natural regeneration on farms ranges between 50 and 120 years and occur as small to large stands. Seedlings have either germinated in pasture and developed into pure stands of totara or form a major component of scrub mixtures containing kanuka, manuka and gorse. Stocking rates are typically very high – up to 60,000 stems per ha in dense sapling thickets. Poles and semi-mature trees emerge as

natural thinning occurs with age (Bergin, 2001; Bergin 2003). Although stocking rates continue to reduce over time through natural thinning, they are typically still at thousands of stems per ha several decades after establishment with severe competition significantly slowing growth. Silvicultural treatment (principally thinning) is therefore expected to improve tree growth rate in these naturally-regenerating stands.

Thinning and pruning

In mid-2007 38 permanent sample plots (PSPs) were established as part of an extensive silvicultural trial to test the growth response to thinning and pruning (Bergin and Kimberley 2010). Clusters of sites representative of totara-dominant regenerating forest were selected in the Whangarei, Kaeo/Okaihau and Herekino areas. At least two plots were established in each stand, one plot being left as an untreated control, and the others receiving thinning and pruning treatment. Treated plots were thinned from densities of more than 6000 stems/ha to stocking rates of 700-2000 stems/ha. Thinned plots were also pruned with height of pruning determined by tree size, the aim being to retain at least one third of the green crown. The growth response over the first two years since thinning has been monitored.

Figure 2: A typical naturally-regenerating totara-dominant pole stand where a non-thinned control plot was established (above). Stand density is 2300 stems per ha. Immediately adjacent a thinned and pruned plot has been established (below) where stand density was reduced to 1600 stems per ha.

Early growth response

Two years after thinning and pruning treatment was carried out, mean diameter growth rates of residual trees were on average 2.5 times greater than in controls (Figure 3). Growth rate in the second year following siliviculture was greater than in the first year, especially in thinned plots, and may be related to overall better growing conditions in the second year.

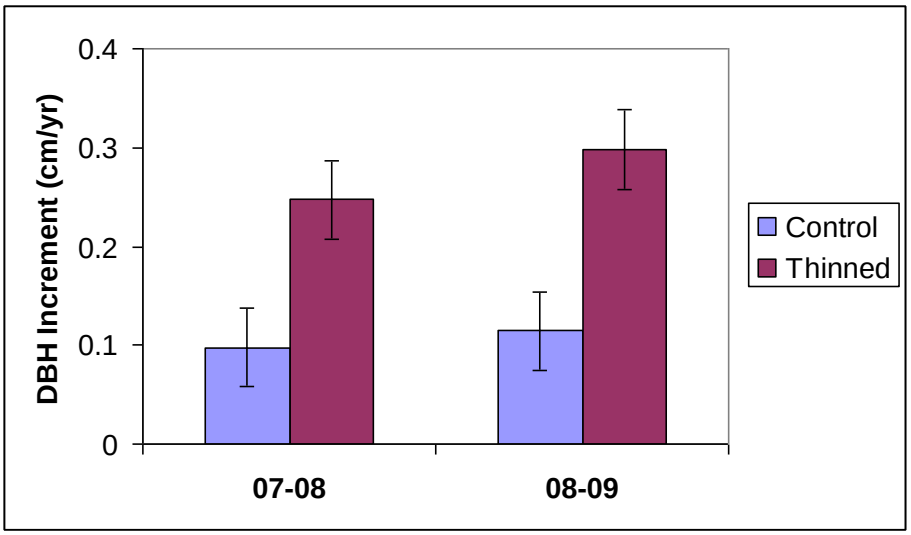

Figure 3: Mean annual diameter increment in unthinned and thinned stands of naturally-regenerating totara in Northland during the first and second years after treatment. Means have been adjusted to a common initial DBH value for thinned and control plots in order to eliminate thinning selection effects. Vertical bars show standard errors.

Mortality over this period was three times greater in control plots than in thinned stands (Figure 4). There were few windthrown losses in thinned stands. When mortality and growth are combined, thinned stands have produced 5 m^3/ha/yr more stem volume than unthinned stands.

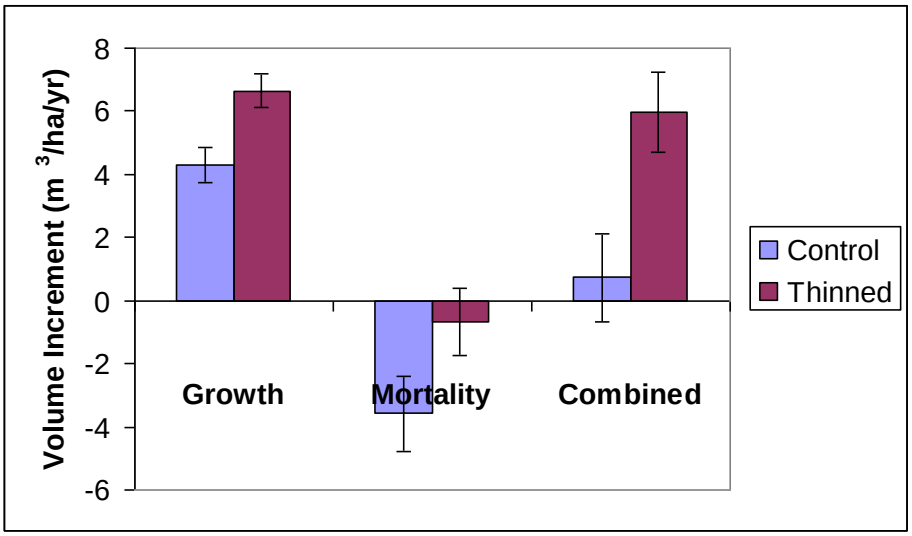

Figure 4: Mean annual volume increment and decrement in unthinned and thinned stands of naturally-regenerating totara in Northland. Vertical bars show standard errors.

Implications for silvicultural management

Natural pole-stands of totara-dominant forest have shown clear increases in growth rates during both first and second years following thinning. This occurred despite the loss of a portion of green-crown from pruning. A high degree of between-stand variability is likely to be related to a combination of factors including thinning intensity and site characteristics. A conservative approach to thinning intensity proved to be unnecessary, since loss of trees through windthrow in thinned plots has been negligible. These results clearly support many landowners' experiences that totara respond well to silvicultural intervention.

Further research in this area seems warranted. Ongoing monitoring of the PSPs and some more aggressive thinning of some plots will be instrumental in developing practical management models to guide decisions on the most cost-effective and timely management interventions.

The age-class profile of the regenerating totara resource in Northland whereby a significant proportion of the totara resource is in young regenerating stands on farmland, indicates that widespread opportunities exist for silvicultural operations to improve both growth-rates and tree form (Kennedy, 2007). This could have significant effect on the productivity and recoverable log quality of the emerging regional resource.

HARVESTING AND SUSTAINABLE MANAGEMENT

In the late summer of 2010, Podocarpus Ltd (Paul Quinlan & Chris Kennedy) conducted a trial harvest of totara on a Northland farm. The harvest was from trees that have naturally regenerated on the farm and are now covered by a Sustainable Forest Management Permit under the Forests Act. Concepts of Continuous Cover Forestry (CCF) were applied to evaluate and quantify a production harvest with the vision of responsible long-term forest management.

In nearly every instance, harvested trees were individually selected from either a dense group of stems or from a pair of trees at close spacing. The policy was to leave the best trees standing and to use the harvest as a stand improvement tool. In many cases the decisions were fairly easy. The larger dominant trees usually had thinner but better formed (taller boles and less branched) trees right beside them (Figure 5). The removal of some of these bigger trees will improve growth of residual trees and ultimately improve the quality of this regenerating forest.

Figure 5: Before & After. An example of harvest selection from group of totara trees. Two shorter but larger diameter trees were harvested (left) and the two tallest and less branched trees were left (right). N.B. the central tree (right) was ring-barked and left standing to avoid damaging the residual stems.

In a few areas appropriate selections were not so obvious. Harvestable sized trees were also taken from areas where the abundant natural regeneration of saplings and poles will need to be relied upon to replace them over the next decades. Trees were felled with care to minimise damage to adjacent thickets of regenerating saplings and advanced pole-sized trees. Sustainability is ensured in these instances by the conservative harvest volume of the permit relative to the actual forest resource. A Ministry of Agriculture and Forestry (MAF) forestry advisor inspected the field operations following tree felling and log-making.

The success of the natural regeneration process is clearly evident on this farm. In several instances the trees that were harvested were only metres away from stumps of totara trees that had been harvested up to 50 years previously.

The size and forms of the harvested trees varied considerably. The mean diameter at breast height (DBH) of the harvested trees was 56.3cm and the mean bole length was 6.7m. However these values ranged between 30 to 88.5cm for DBH and 3.1 to13.0m of bole length.

Growth rings were counted on some tree stumps and logs. Many of the harvested trees were younger than expected and ranged between 60-100 years. The growth rate of some trees exceeded 1cm increment in trunk diameter annually. This indicates the growth rates that could be expected for selected trees in managed forests.

A characteristic of this farm-grown totara resource is that it tends to occupy the fringes of paddocks. Consequently the trees were easily accessible. Most of the logs were pulled out with a 95 horse-power 4wd tractor using short a short wire rope or chain (Figure 6). A D6 Bulldozer with a winch was also used to get some logs out of a steep gully. The winch meant that the machine did not need to enter the forest area. It was easy to avoid bruising or damaging residual trees due to the short pull distances involved (Figure 7).

Figure 6: Much of the resource is located close to the fringes of the farm.

Figure 7: Example of a careful harvest from a small stand of totara within the farm and leaving good quality residual stems for the future.

Logs were pulled to collection points around the farm and then gathered by a truck. A skilful operator managed to load the truck using only the forks of the tractor's front-end loader. Milling was completed on-site. Two different types of portable sawmill were used for comparison – a Mahoe circular blade straddle mill and a Wood-mizer band-saw mill. A milling study will determine final recovery rates and timber grades so that they can be related to tree-form characteristics in the field.

The high proportion of knotty and poor quality logs is a strong characteristic of this resource. Nevertheless, from this practical perspective it appears that sensitive harvest operations of farm-gown totara are possible. In some places careful harvest selection may even present opportunities for stand improvement. In other areas long-term management of the natural regeneration will be necessary to ensure sustainability of the resource.

WOOD QUALITY

Old-growth totara has a well-established reputation as one of the most durable of our native timbers, easily worked and very stable. It is still revered by Maori and used for Waka and carving. It was highly valued by early settlers for fence posts, house piles and exterior claddings and joinery. It is very much part of our cultural heritage. But how does the quality of 'second-growth' or regenerated 'farm-totara' timber compare with the old-growth trees that was widely used in the past?

Wood quality and utilisation survey

The Northland Totara Working Group is currently involved in surveying a range of stakeholders involved or potentially interested in development of a sustainable industry based on utilising and marketing totara as a specialty timber. This is funded by MAF's Sustainable Farming Fund (SFF). It involves a survey of the use of 'farm' or regenerated totara and its market potential.

In-depth interviews, with over 45 key members of six targeted stakeholder groups have already been completed. These included: landowners, saw-millers, wood processors, cabinet-makers, architects and wood-quality scientists.

Preliminary findings

Although the project is not yet finished, it is already clear that farm-totara is a very fine timber, suitable for many uses and has a highly rated appearance. It has been used widely for a range of purposes from virtually everything from stock yard rails to the kitchen sink! However we have not found it being used at a significant commercial scale.

The results of this project will document a wealth of practical experience and knowledge uncovered around the milling, drying, handling, working, and use of farm-totara in Northland. It also surveys perceptions and opinions around its potential in the market place. In short, the results are all very encouraging.

Experiences show that farm-totara is considered to be very easily milled and handled. It is typically air-dried, but can be successfully 'finished-off' in a drying kiln. It is also very easily worked. It machines and finishes particularly well and is considered to be relatively stable. In these respects it was frequently compared to macrocarpa (*Cupressus macrocarpa*) and usually favourably. Traditional problems with glues and varnishes appear to be overcome with the modern glues and water-based finishes.

Laboratory testing of discs from thinned trees of totara in the Northland silvicultural trials (R. McKinley, Scion, pers. comm.) indicate that timber from young trees (with a mean age of 33 years) has, with the exception of durability, many of the inherent qualities and properties associated with the old-growth totara timber. Also little difference in density and shrinkage values between the heartwood and sapwood of the young trees was found. Perhaps most surprisingly, in comparison to previous studies of totara from the Taupo region (Entrician et al., 1951), was that the Northland samples had a higher basic density (476 kg/m3 compared to 412 kg/m3), which is equivalent to New Zealand-grown macrocarpa, given as 475 kg/m3 (Mortimer, 2003). This is thought to be predominantly due to the northern location. These results lend support to opinions encountered in the survey that Northland's regenerating totara timber is stronger than both radiata pine (*Pinus radiata*) or totara from the central North Island.

However a significant difference between old-growth totara and younger farm-grown trees is seen in the relative proportion of heartwood and sapwood (Figure 8). Trees that have regenerated on farmland typically have a very high proportion of sapwood (Cown et al., 2009). There is often a transitional zone containing insipient heartwood and a very small core of heartwood. Consequently there are important questions around relative natural durability of timber from younger trees.

Figure 8: The above cross-sectional views of logs from farm-totara trees show varying amounts of heartwood. Log number 35 displays the deep reddish-brown colour traditionally associated with heart-totara. In contrast, log number 7 (a top log in this case), shows the more typical characteristics of younger stems; a larger proportion of sapwood, and often an in-between area of insipient heart, and a small core of darker heartwood.

Our survey project found some examples where totara sapwood has been used in exterior situations such as stockyard rails and farm gates and had provided surprising good service-life – probably greater than what would be expected from sapwood from other species. However it can still not be recommended for exterior or structural use without suitable treatment. The sapwood can be preservative treated for exterior use.

Farm-totara has been widely used for interior linings, finishings, joinery, kitchens, cabinetry and furniture. Landowners and cabinet-makers who had used totara for these purposes were asked to rate their overall satisfaction with using totara. Six participants in the survey were “extremely satisfied”, nine were “reasonably well satisfied” and two responded with “average or neutral” and one was “disappointed”.

Market perceptions of appearance and appeal

Thirty-eight of 40 interviewees considered that there is potential for farm-totara timber in the market place. One responded with "Don't know" and another felt it was dependant on establishing its natural durability levels. Survey participants were shown samples and asked to rate the appearance and market potential of various grades of totara in comparison to other timbers generally. These grades were;

- Clear Heartwood,
- Clear Coloured (a mix of heartwood and sapwood on the same board),
- Clear Sapwood,
- 'Feature grade' (boards that included partial or fully intergrown knots). This included a wide board with a combination of knots and sizes that exceeded the specification of "Dressing" appearance grade as specified in NZS 3631: 1988 New Zealand Timber Grading Rules (For Native Softwoods).

The results indicated that samples from all of the above grades of totara were generally well-rated in respect to appearance. This is predominantly an evaluation of the colour and grain qualities of the timber samples. Individual opinions and preferences varied considerably and ratings ranged from; a) 'very attractive - as good as or better than any other timber', through to e) 'an unattractive timber'. However when combined it is clear that for each sample grade, the bulk of the responses are grouped around b) –'above average'. Therefore, this rating of above average can be considered to represent the overall scores for relative attractiveness or visual appeal.

One surprising result was that overall the Coloured and Sapwood samples were generally attributed only slightly less appeal than the clear Heartwood grade. This finding is perhaps fortuitous considering the characteristics of the bulk of the regenerating totara resource (Kennedy, 2007) – comprising mostly Feature, Coloured and Sapwood grades.

Positive market indications

Nine of 10 architects surveyed indicated that if there was good continuity of available supply then they would be interested in specifying farm-totara. On a broader level, this was reinforced by a positive indication regarding the use of native timbers generally. The same proportion of architects also indicated they would prefer to source timber from sustainably managed New Zealand indigenous forests than from any other source.

Farm-totara may even have a unique edge over other native timbers. Thirty-three of 39 participants perceived that there is a difference between harvesting totara trees that have regenerated on farmland and the harvesting of other native trees from other indigenous forest areas. Thirty-two of 39 considered this difference would also make 'farm-totara' more ecologically acceptable to the consumer.

The survey also shows there is clear support from landowners, sawmillers and cabinet-makers to promote the use of regenerating totara. Participants from those groups were asked: "Should we be promoting the use of farm-totara in the market place and the development of an industry around farm-grown totara?" Twenty-four of 25 of the interviewees answered "Yes" and one replied with "Don't know".

Clearly there is nothing wrong with the quality of regenerated totara timber. It is suitable for many purposes including high value speciality uses. A resource of regionally significant scale is already developing. The species is very amenable to silviculture and sustainable management. There appears to be positive market interest. Given the positive indications of all the above, the inevitable question is perhaps what is holding things back? Why has a commercial-scale industry not self-started?

Constraints

On a broad level the Northland Totara Working Group has identified the following problem issues to address with regard to developing commercial use of the farm totara resource:

Lack of market awareness and incentives

There is little market-awareness or demand for totara timber. Its traditional uses have been overtaken by the introduction of aluminium joinery, new materials and treated timbers. People do not think of using totara timber unless they have the trees on their land. Many people incorrectly believe that it is no longer permitted to mill native trees and therefore do not consider native timber options. For some consumers the milling of native timber is still associated with the negative connotations of exploitive "native logging". Market difficulties beset the native timber industry generally (May 2007)

Lack of functioning supply chain, scale and full product range

When demand or interest for totara timber does arise, it is often frustrated by a lack of ready to use supplies or a full range of products. It can be hard to locate sufficient quantities of consistent and well-graded lines from a single source. Consequently there is a lack of market confidence in availability of ongoing supply continuity. This is something of a chicken-or-egg dilemma. Functioning supply-demand chains are required. The characteristics of the regenerating totara resource create practical, organisational and efficiency issues to do with coordination of collective supplies, timber grading, scale, the need for complementary products (for example veneer panels) and the holding of sufficient stock.

Legal impediments

There are perceived and actual legal impediments. The Forest Act applies to the milling of this resource and requires its management to be on a sustainable basis. However the Forests Act did not envisage being applied to a highly modified 'second-growth' resource existing within a 'grazed' environment. Consequently there are no specific or particularly suitable provisions under the Act to accommodate the unique features of this forest type that is typically scattered on farmland. Livestock access to the forest area continues to be a stumbling block. Nevertheless while harvest permits in some places can be obtained, applying the Act is often difficult and very time-consuming. There appears to be no political appetite to propose any suitable changes to the Act.

The Resource Management Act also applies through District Plans. In some districts this adds additional legal constraints and /or consent processes and

costs. For many land-owners, dealing with these legal issues and extra cost are major disincentives to managing and valuing totara on their farms.

These issues are not only relevant to harvesting and timber supplies but also remain disincentives for the management and silviculture of the resource for the future.

NORTHLAND TOTARA WORKING GROUP

The Northland Totara Working Group (NTWG) was established in September 2005 to support and promote research and technology transfer in the productive management of totara from naturally regenerating stands. The group is coordinated by the NZ Landcare Trust. Current active members include local landowners, Far North District Council (FNDC), Northland Regional Council (NRC), wood millers/processors, Tāne's Tree Trust, NZ Farm Forestry Association, NZ Forest Owners Association, Scion, and the Ministry of Agricultural and Forestry (MAF). A database of interested people (more than 250 nationally) is maintained.

The activities of the Northland Totara Working Group outlined above, reflect a sustained and collaborative effort to realise the unique opportunities presented by this native tree species. There is still a lot of work ahead to realise this vision and make this effort worthwhile. While the group is actively engaged with working on the reduction of the constraints, building knowledge and promoting the potential of the timber, as yet still no clear conceptual model of how to collectively manage this emerging regional resource has been developed.

While timber production is a primary focus of the group, the environmental benefits that accompany it are also an important part of the bigger picture. These include increasing indigenous biodiversity, erosion control, enhanced soil and water quality, riparian management, and landscape and amenity values. It is for these reasons the group is coordinated by the New Zealand Landcare Trust, and has received funding support for projects from the MAF's Sustainable Farming Fund (SFF). Development of a sustainable industry around the commercial-scale use of this native timber species, is seen as a practical and appropriate vehicle to bring about these multiple non-timber benefits.

Developing this vision into a viable land use option for landowners is the goal. Success of this initiative has the potential to result in social, economic and environmental gains for many local communities in the Northland region and other areas around the country.

ACKNOWLEDGEMENTS

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