

**SFF Project (L10/145) Report.** For the  
NORTHLAND TOTARA WORKING GROUP



**Existing Uses and Market Development  
Opportunities for Naturally Regenerating  
Totara Timber**



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## EXECUTIVE SUMMARY

The overall objective of the project “Existing Uses and Market Development Opportunities for Naturally Regenerating Totara Timber” is to investigate the current use of naturally regenerating totara and to explore market development. More specifically, the project aims to:

1. survey recent, current and potential future use of naturally regenerating totara timber,
2. document practical experiences and knowledge about the felling, extraction, milling, drying, handling and working and finishing of farm totara,
3. perceptions of stakeholders about potential uses and markets for regenerating totara and its relative position in the timber market,
4. survey some stakeholders’ perceptions about legal issues and use of native timber generally.

Previous work by the Northland Totara Working Group has shown that a significantly scaled resource exists in the region, with substantial capacity for further development, and marked responses to pruning and thinning have been demonstrated confirming the amenability of the species and resource for production forestry.

Development of an industry based on the commercial-scale use of farm-totara is seen as a practical way to encourage the integration and sustainable 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 productive landscapes nationwide. There is potential for the productive use of naturally regenerating totara to play a very significant role in enhancing many environmental and landscape values – particularly in marginal pastoral hill-country where afforestation is an appropriate landuse.

This report documents existing practical knowledge and experiences working with farm-totara, that is, totara trees that have naturally regenerated on private land (particularly farmland and scrubland) following bush-felling, clearances and pastoral farming activity over the past 150 years or so. This information will help highlight the critical issues and more specific opportunities and restraints to address in order to develop a viable industry. In addition, the information collated will be of direct relevance to stakeholders interested in the management of naturally regenerating as well as planted totara stands for timber production.

The project has sought to capture the wealth of practical knowledge and experience that already exists through a targeted survey of experienced people and key industry stakeholders. Seven key stakeholder groups were identified: (a) landowners and others who have had experience with milling and/or using totara timber, but not at a commercial scale; b) portable saw-millers and timber merchants with commercial experience; c) wood processors, furniture makers/manufacturers, joiners and cabinet-makers etc. who have used or do use regenerating totara timber; d) wood processors, furniture makers/ manufacturers, joiners and cabinet-makers etc. who do not use regenerating totara timber; e) architects, architectural designer and interior designer; f) scientists and researchers involved with forestry, wood-quality and wood processing; and g) carvers who have had experience in using regenerated totara timber

for cultural purposes. The survey successfully engaged the participation of a wide variety of very experienced stakeholders.

Key findings can be summarised as follows:

- Timber from regenerated farm-totara was often from trees estimated to be between 50 and 120 years old, but mostly from around 80-100+ year old trees. Many participants also had experience with older trees estimated to be often well over 200 years old. Saw-millers generally consider farm-totara to be a very easy timber to mill. It is considered to be a relatively easy timber to air-dry, but many craftsmen recommend ‘finishing it off’ in a drying kiln or dehumidifier before use. Recommendations for this are for a long slow process with little or no heat. Inconsistency of timber grading is a systemic problem that needs addressing.
- Farm-totara is considered to be a very good timber to work. It machines very well. Some people have found the dimensional stability of totara from younger regenerated trees to less consistent than that of old-growth totara timber. Gluing timber did not appear to be a significant issue. Some problems have been experienced with applied finishes to totara timber, particularly the heartwood, however, a range of satisfactory finishing products and procedures exist.
- Farm-totara has been used for a huge range of applications. Generally, people have been well-pleased and satisfied with the performance of farm-totara timber. Many participants consider totara sapwood to be relatively more durable than most other sapwood timbers and to be much more resistant to the common house borer. Most have not experienced any kind of durability issues with untreated use in interior situations. Totara sapwood can be very successfully treated with CCA treatment. Carvers prefer well-seasoned heartwood from old-growth trees, but consider farm-totara to be a very good timber for carving.
- There was overwhelming support from all stakeholder groups for the promotion of the use of farm-totara timber and development of an industry around this naturally regenerating resource. Farm-totara is definitely considered to have potential in the market place. The timber was generally rated “above average” in respect to its appearance and visual appeal. Opinions generally place its market position to be “*cheaper than rimu and kauri but more than Macrocarpa.*” This indicates that farm-totara should be a relatively valuable specialty timber.
- Interior linings, finishings, joinery and furniture are clearly indicated as being the main target markets for farm-totara timber. Most timber merchants, cabinet-makers, carvers and architects indicated interest in purchasing farm-totara if a reliable supply and continuity of suitable grades was available. Architects and designers indicated a clear preference to specify/use timbers from sustainably managed New Zealand indigenous forests above any other source. Harvesting regenerating farm-totara is perceived as being more

ecologically acceptable to the consumer. This may provide a marketing ‘point of difference’ from other native timbers. Other sustainability issues, particularly with regard to continuity of supply, are considered to be very important by stakeholders.

The results demonstrate that the timber from relatively young naturally regenerated totara trees of farmland has been widely used. Farm-totara is considered to be an excellent native softwood timber, relatively easy to mill, dry, work and finish. It is considered to be suitable for all interior uses, particularly feature linings, joinery and furniture. All stakeholders considered that farm-totara has very good market potential and they support the initiatives of the Northland Totara Working Group to promote its use and the development of a sustainable commercial industry around it. Some potential constraints have been identified related to supply-chain issues, marketing and information gaps and the results of the survey provide clear insights into the direction of further research.

The project has been funded primarily by the Ministry for Agriculture and Forestry Sustainable Farming Fund with co-funding from the Hine Rangi Trust. The NZ Landcare Trust has undertaken the management of the project.

## **PROJECT BACKGROUND**

### **The context/background**

Previous projects completed by the Northland Totara Working Group have demonstrated that a significant resource of naturally regenerating totara exists in Northland, that it responds well to silviculture and has excellent potential for sustainable management (Bergin 2010 and Kennedy 2007).

Now the challenge is to explore market opportunities for the commercial-scale use of the timber in high value products (e.g. furniture). This is a crucial step in developing a viable, sustainable, specialty timber industry and to promote development of this significant resource (Cown et al. 2009).

This project sought to scope the existing use and market potential of timber from naturally regenerating totara trees. While much of the focus is on the resource located in Northland, this project and the work of the Northland Totara Working Group has national application (Quinlan 2010).

### **The issue/opportunity**

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). There is potential for the productive use of naturally regenerating totara to play a very significant role in enhancing many environmental and landscape values – particularly in marginal pastoral hill-country where afforestation is an appropriate landuse and practical solutions to achieve this on large scale are hard to find (Moodie et al. 2007).

Strong interest and support exists to explore and promote the management of this emerging totara resource as a productive, practical and sustainable land-use option. It is clear that a significantly scaled regional resource exists, with substantial capacity for further development (Kennedy 2007). Marked responses to pruning and thinning have been demonstrated confirming the amenability of the species and resource for production forestry (Bergin 2010).

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 the regeneration of this 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 (PCE 2001).

## **PROJECT DESCRIPTION**

### **Purpose and expected outcomes**

The overall objective of this project is to investigate existing uses and market development opportunities for naturally regenerating totara. More specifically, the project aims to:

5. survey recent, current and potential future use of naturally regenerating totara,;
6. determine current market value; and
7. document practical experiences and the perceptions of stakeholders about potential uses and markets for regenerating totara.

This report documents existing practical knowledge and experiences working with ‘farm-totara’ (terminology discussed below). This information will help highlight the critical issues and more specific opportunities and restraints to address in order to develop a viable industry. In addition, the information collated will be of direct relevance to stakeholders interested in the management of naturally regenerating as well as planted totara stands for timber production.

### **Methodology – a survey of stakeholders**

This project has sought to capture the wealth of practical knowledge and experience that already exists, concerning many of the practical wood-quality and handling issues such as kiln-drying and performance, uses, etc. A ‘targeted survey’ of experienced people and key industry stakeholders, was seen as an efficient way to collate and share essential information and to highlight critical information gaps, key issues and actions required to create markets, the setting up of a functioning supply-chain and to develop a sustainable industry.

Seven key stakeholder groups were identified (as listed in table below) and then key members within those groups were contacted about participating in an in-depth interview-style survey. Suitable participants were selected according to relevant experience. In particular, participants with reasonable experience with regenerated totara timber, were targeted.

With one exception, members of the Northland Totara Working Group were not included in the participating stakeholders interviewed. This was a deliberate policy to target new and impartial information rather than collate what we already know.

The interviewees were assured that the information would be treated in an appropriately confidential manner.

### **Practical execution**

Generally, there was very high level of interest shown by prospective participants that were contacted and most were willing to participate. Many of these stakeholders are the 'big-players' in their respective fields. They include some of the largest timber merchants, wood processors, joinery factories, an internationally renowned furniture designer, fine craftsmen – typically with several decades experience with totara (some over half a century), leading scientists from the Crown Research Institute Scion, and master carvers from several iwi. Therefore, the survey successfully engaged the participation of a wide variety of very experienced stakeholders.

Group-specific questionnaire forms were prepared. Many questions were only relevant to certain groups and also within groups some questions were not relevant to the experiences of all participants. Therefore, the recorded results do not always equal the full number of participants for each stakeholder group.

Several interviews were not included as it became apparent that the experiences related only to old-growth totara timber and no comparative experiences with regenerated totara timber could be offered.

After completing two interviews with participants from Group D (wood processors or cabinet-makers etc who *do not use* totara), it was decided that insufficient useful information was obtained for the time investment (particularly of the participant). Consequently, further interviews with Group D stakeholders were not pursued.

Most of the participants were located in the Whangarei area or further north. Therefore, the results certainly have a bias to experiences in the Northland region and with Northland trees.

The surveys were mostly conducted in person with wood samples at hand and examples or items of totara photographed where possible. Some surveys were, due to distances, necessarily completed over the phone or by email.

The results of this project are based on a total of 54 completed survey questionnaires. This captures the information from more than 54 participants. The survey phase of this work was undertaken between the start of August 2010 and end of May 2011. This project has amassed a photographic record from the interviews with numerous images of items made from totara now stored for use in future information dissemination outputs.

### **Project funding**

Funding was provided for this project by the Ministry of Agriculture and Forestry's Sustainable Farming Fund with co-funding from the Hine Rangi Trust. These funding sources have been complemented by co-ordination by the New Zealand Landcare Trust, support from the Northland Regional Council, Tāne's Tree Trust and the

considerable input of time by the project committee of the Northland Totara Working Group, and all the survey participants.

### **Information dissemination**

Ongoing dissemination of the outcomes of this project will further raise awareness of the potential for productive use of farm-grown totara (both planted and naturally regenerated). There are two key targets for sharing of knowledge from this project:

1. Landowners who have totara on their land to encourage them to manage their resource; and
2. Those involved with the potential industry development of totara – end users, purchases etc.

These stakeholder groups will be targeted in the dissemination of results from this survey. A communications plan will be developed detailing technology transfer options.

### **Disclaimer**

The results of this survey project set out within the body, summary and conclusions of this report (or any further dissemination formats), are intended to be available as public information for all stakeholders and interested parties. However, no guarantee as to truth, accuracy or validity of any of the results, comments, implications, recommendations, findings or conclusions are made by the author or by the Northland Totara Working Group or any other party. Users of any of the information, whether contained or inferred, in or arising from this report do so at their own risk. No liability or responsibility will be accepted.

### **Terminology – “farm-totara”**

Throughout the survey and this report, the term ‘farm-totara’ has frequently been used. This is not a technical or well-defined term. However, it generally describes in a very succinct way the subject of this study, namely; totara trees that have naturally regenerated on private land (particularly farmland and scrubland) following bush-felling, clearances and pastoral farming activity over the past 150 years or so. The term ‘farm-totara’ is intended to distinguish the subject from larger and older trees in old-growth forest remnants. Inevitably, there are occasional instances where large trees on farms may be remnants from natural forests. Nevertheless, despite some overlap, it is hoped that the term ‘farm-totara’ is a satisfactory short-hand for the younger naturally regenerated (or planted) trees that have more often established in disturbed and modified environments.

## **STAKEHOLDER GROUPS AND COMPOSITION**

Seven distinct stakeholder groups were targeted for surveying. These are categorised into groups A-G as shown in the table below. These groups span the full range of experiences from felling, extraction, milling, drying, handling, grading, selling, purchasing, processing, working, carving and the finishing of timber from regenerated totara trees.

A total of 54 survey forms were completed and these form the basis of the project results.

A more detailed break-down of the numbers and composition of the participants of the survey are set out in the following table.

<b>Category</b>	<b>Description of interviewees</b>	<b>Subtotal sample size</b>	<b>Total sample size</b>
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<b>Group A</b> <i>Landowners and people who have had experience with milling and or using totara timber for various purposes, but not at a commercial scale.</i>	Landowners who have milled and/or used totara timber for personal use.	8	<b>10</b>
	Consumer or builder who has obtained totara timber for use	2	

<b>Group B</b> <i>Portable saw-millers and timber merchants with commercial experience milling and or buying and selling timber .</i>	Portable saw-miller who has milled totara trees and/or sold totara timber.	7	<b>10</b>
	Timber merchant who has either milled and/or bought or sold totara timber.	3	

<b>Group C</b> <i>Wood processors, furniture makers/ manufacturers, joiners and cabinet-makers etc. who have used or do use regenerating totara timber.</i>	Wood processors.	2	<b>11</b>
	Furniture maker/ manufacturer.	4	
	Joiner, cabinet maker.	5	

<b>Group D</b>  <i>Wood processors, furniture makers/ manufacturers, joiners and cabinet-makers etc. who <b>do not</b> use regenerating totara timber.</i>	Wood processors.		<b>2</b>
	Furniture maker/ manufacturer.	1	
	Joiner, cabinet maker.	1	

<b>Group E</b>  <i>Architects, architectural designer and interior designers.</i>	Architect/ architectural designer.	8	<b>10</b>
	Furniture and product designer.	1	
	Interior & Kitchen designer.	1	

<b>Group F</b>  <i>Scientists and researchers involved with forestry, wood-quality and wood processing.</i>	Research scientist general native forestry.	2	<b>6</b>
	Scientist/ technician re. wood properties.	2	
	Scientist/ technician re. wood processing.	2	

<b>Group G</b>  <i>Carvers who have had experience carving or using regenerated totara timber for cultural purposes .</i>	Who have used totara for cultural purposes in a non-professional capacity.		<b>5</b>
	Professional artists/carvers who have carved totara timber for cultural purposes.	5	
	Manufacturer of art and craft items for commercial sale.		

<b>Total:</b>	<b>54</b>
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## SURVEY RESULTS

The responses to 73 questions in the survey are presented below. Note that the data was analysed by treating each of the 54 completed survey-forms as single individual responses. However, in a few cases, a single questionnaire-form captures the experience and opinions of more than one participant. For example, these involve one from Group F where two expert wood-quality scientists each filled in the sections of the questions relevant to their respective fields of expertise and experience. Another instance was in Group E, where one completed survey actually reflects the opinions and responses from a group of four architects all interviewed at one sitting. In other interviews, comments and expert experience from other staff members was also frequently enlisted during the interviews. However, all these have been entered as a single survey responses. Therefore, in several instances, the completed surveys capture the experience and institutional knowledge and opinions of a small business, joinery factory or whole practice etc. Consequently, the results reflect the views of more than 54 individual participants. This should lend slightly greater confidence in the survey coverage than the sample number indicates.

The 73 survey questions are grouped into one of several broad sections. A brief description is given of the content of each section. The sections and questions relating to each are as follows:

- General attributes of the totara trees used (questions 1-6)
- Harvesting and milling (questions 7-17)
- Drying and grading (questions 18-25)
- Purchasing totara timber (questions 26-36)
- Working and finishing totara (questions 37-40)
- Use and performance of totara timber (questions 41-42)
- Durability of regenerated totara (43-48)
- Market potential (questions 49-58)
- Perceptions around the use of native timber (questions 59-64)
- Legal issues and accreditation (questions 65-73)
- Public profile of the Northland Totara Working Group (question 74)

For each question, information is presented in the following format:

- **Stakeholder Groups** – the Stakeholder Group Category (A-F) for which the question was directed.
- **Results** – a summary of the responses to the question sometimes in tabular form with the number of responses to various options indicated where these were provided within each question in the survey.
- **Remarks/discussion** – a brief interpretation of the survey responses for each question.
- **Conclusions/implications** – some concluding remarks relevant to the survey responses for each question and any implications for further work or management of totara.

Photographs are provided for selected questions to illustrate information provided.

A summary of the project results, key findings and conclusions follow the detailed account of the survey responses in this section.

## GENERAL ATTRIBUTES OF TREES

**Section content:** Regional origin of trees, and forest-types, tree/log quality, size, and age estimates.

### QUESTION: 1

Stakeholder groups asked: A, B, C, F, G (42 total)

*“What part of the country have the totara trees come from that you have had experience with?”*

#### Results

Group	A	B	C	F	G	totals
Totara from Northland	9	10	8	4	3	<b>24</b>
Totara from Central North Island		3	4	1	1	<b>9</b>
Totara from around North Island			4	1	1	<b>6</b>
Totara from all around the country				1		<b>1</b>
Don't know origins for sure.	1				1	<b>2</b>

**N.B.** Some participants had experience from two or more different regions.

#### Remarks/discussion

This survey has targeted and selected participants who have had experience with regenerated totara. Predominantly, participants have had experiences with totara from the Northland region. However, many also had experience with totara from other regions, especially the central North Island area. Other areas included: Manawatu, Wairapa and Westland. Two respondents were not sure about the origins of some of the totara they had used.

#### Conclusions/implications

- The survey participants generally had extensive experience with regenerated totara from the Northland region and many could make comparisons with experiences using totara from other regions - especially the central North Island.

## **QUESTION: 2**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“What type of forest were the trees from?”*

### **Results**

	Group	A	B	C	F	G	totals
a)	Old-growth forest	1		2		2	<b>5</b>
b)	Cut-over and previously logged forest	1	2	1			<b>4</b>
c)	Trees that have regenerated on farmland	7	5	2	3	2	<b>19</b>
d)	Or a mix of all above	1	5	4	2	1	<b>13</b>
e)	Do not know for sure	1		4	1	1	<b>7</b>

**N.B.** Some participants had experience with totara from two or more different forest types and ages.

### **Remarks/ discussion**

Most of the indications of experience with a) ‘Old-growth’ forest were also complemented with experience with younger regenerated trees on farmland. Those who answered d) had experience with both old-growth totara timber and younger regenerated ‘farm-totara’. The Group C participants are generally not involved with the harvest and milling operations and, therefore, frequently could not be sure about what type of forest their totara timber had come from.

### **Conclusions/implications**

- The survey successfully targeted participants that have had experience with timber from totara trees that have regenerated on farmland.
- Many had extensive experience using totara timber from a range of forest types including old-growth forest trees.
- Many of the participants could also compare experiences with regenerated totara from farmland and totara from old-growth and ‘cut-over’ native forest sources.

## **QUESTION: 3**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“What quality were the logs?”*

### **Results**

	Group	A	B	C	F	G	totals
a)	Straight and knot-free	7	2	2		1	<b>12</b>
b)	Slightly knotty	4	2	1	2	1	<b>10</b>
c)	Very knotty			2		1	<b>3</b>
d)	The full range of above	2	6	5	3	3	<b>19</b>
e)	Don’t know		1	1	1		<b>3</b>

**N.B.** Some participants had experience with two or more different grades/quality of totara log.

### **Remarks/ discussion**

Experiences cover the full range of log type and quality. As is consistent with the regenerating farm-totara resource, this includes both clear and knotty timber.

### **Conclusions/implications**

- The survey captured experiences with the full range of log type and quality of totara trees and logs. Of the 47 responses to this question, over one-quarter indicated they had straight and knot free logs.

### **QUESTION: 4**

Stakeholder groups: A, B, C, F, G (42 total)

*“Approximately what size trees were involved?” (approx. DBH range)*

### **Results**

Participants indicated a significant range in log diameters. Generally, only participants from Stakeholder Groups A, B, F and G were able to answer this question (and not all of them could either). The ranges also varied to the extent that the results can not be usefully tabulated.

Many had had experience with trees with diameters of only around 300-400mm. Two had experience with timber from trees with log diameters down as small as 250mm. A common mean range for the farm-totara trees was given as between 400-600mm. However, quite a few participants had also had experience with large forest-trees with diameters ranging more between 900-1500mm.

### **Conclusions/implications**

- Tree sizes ranged widely. Many participants had experience with totara logs as small as 300mm in diameter and upwards to well over a metre.
- The survey captured experiences with small diameter regenerating totara trees and also older large diameter trees. Some of the larger diameter trees are likely to be from bush remnants or from old-growth forest.

### **QUESTION: 5**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“Approximately what was the total length of millable tree bole?” (approx. range)*

### **Results**

As with the previous question, a significant range was recorded that can not be usefully tabulated. Reflecting the varied nature of the log quality of resource, a range was often stated as being ‘everything up to 6 metres or more.’ The log-lengths that were made were often given rather than the actual length of tree bole. The maximum log-lengths were often determined by the capacity length of the portable saw-mill or

practical decisions as to where to cut the log. However, when asked for details on the smallest boles, it was clear that many participants had had experience with short logs around the 2.0-3.0m length. One said he considers 1.8m to be a minimum log-length.

### **Conclusions/implications**

- Most log lengths for milling have ranged from 2.0-6.0metres in length. Many people have milled and used totara logs that are only around 2.5-3.0 metres long.

### **QUESTION: 6**

Stakeholder groups: A, B, C, F, G (42 total)

*“How old do you think the trees were?” (range)*

### **Results**

Only a few participants had made accurate tree-ring counts. Some had made approximations based on counting some sections of legible tree-rings and guesstimating the rest. This was usually done on large old-growth trees. Several were considered to be several hundred years old and one guessed at seven hundred years. However, a few had made ring counts on younger trees. The results varied widely. The lowest was 35 rings, but ten participants estimated the age of farm-totara trees with a range of 80-100 years. There were a couple of estimates with ranges above and below that range (as low as 50 and as high as 120. Another group of estimates clustered around the 200-300+ age.

### **Remarks/discussion**

The two general groupings of estimated tree ages appear to reflect experiences with younger regenerated ‘farm-totara’ and much older old-growth totara.

### **Conclusions/implications**

Many participants estimate the age of the regenerated ‘farm-totara’ trees that they have milled and used at around 80-100 years old, but some as young as 50 and others around 120 years old. Many have also experience with older trees many that they estimate to be well over 200 years old.



**Figures 1 and 2**

**Two fresh totara logs from the Kaitaia area about to be carved by master carver Paul Marshall. The large log on the left had a Large End Diameter (LED) of just over 1 metre and a ring count of 207. The farm-totara log on the right had a ring count of 115.**



**Figures: 3 and 4**

**A trial harvest of farm-totara in Kaeo recorded a ring count of 64 and LED of 53cm (image on the left) and a ring count of 82 and LED of 76cm (image on the right).**

## HARVESTING AND MILLING

**Section content:** Felling, extraction, stumpage rates, harvesting season, machinery/equipment, milling experiences, milling costs, timber recovery percentages, timber defects, and popular timber dimensions.

### QUESTION: 7

Stakeholder groups asked: B, C, F, G (32 total)

*“Does it matter what time of the year the trees are felled?” (any implications for wood quality etc)*

#### **Results:**

- **Yes (9)**
- **No (12)**
- **Don’t Know (9)**

#### **Remarks:**

Recorded comments included: “Avoid summer”; “Most native felled in summer for practical access [ground conditions]”; “Summer to early winter (Nov-June) when the soil is dry.” “Better colour from February onwards to mid-winter”; “Best when sap is down in autumn, but not so important for totara”; “When sap is down – first new moon after the shortest day of the year”; “Autumn only practical harvesting time. End splitting/checking in summer”; “Dries quicker when less sap flowing. More sap flows on a full-moon”; “To avoid sap-stain fell in winter - but I haven’t seen any in totara”; “Have heard that if felled when sap is up then it can get borer”; “There probably is an ideal time, but it just comes down to when it is practical to get it”; “Only practical in summer [for access].”

#### **Comments/discussion:**

Opinions seem well-spread and somewhat inconclusive. Some participants had *heard* that it is better when the ‘sap is down’; however, no-one related any direct experiences of comparison. The 6 wood-quality scientists replied “Don’t Know.” It could be that when the sap is down is a notion that comes from experiences with European deciduous forests. However, it seems that, even if it has some validity in New Zealand, practical access difficulties in Northland, viz. wet and muddy ground conditions, may often limit harvest operations to summer/autumn time in many places.

#### **Conclusions/implications:**

- Bush-lore indicates a preference for cutting native trees in late autumn/mid-winter ‘when the sap is down’.
- Most felling and harvesting in Northland occurs in summer/autumn for practical access reasons.

## **QUESTION: 8**

Stakeholder groups asked: B, C, F, G (32 total)

*Does the time between felling and milling matter (any implications for wood quality etc)? If so how long can logs be safely left?*

### **Results:**

- **Yes (16)**
- **No (7)**
- **Don't Know (7)**

### **Remarks:**

“Fresher the better.” “Should be milled as soon as possible” (N.B. 3 other respondents stated a similar opinion). “Leave logs at least 12 days to settle down and reduce tension [for younger trees].” “Within four weeks to avoid long-tooth borer under the bark” (2 other similar comments). “Can be safely left 6 months.” “Never had sap-stain in totara.” “Mill quickly to avoid fungus.” “[can be left] 18 months to 2 years no problem.” “[For carving] better to season logs a few years to reduce cracking when drying” (3 such comments). “sapwood will decay.”

### **Comments/discussion:**

There seems to be a preference to minimise the time between felling and milling in order to reduce risk potential sap-stain or borer. Within 4 weeks was a common opinion. However, it is not so clear whether this is just generally good practice and possibly influenced by experiences with other native species (such as Tarairae) or if these opinions are based on experiences of problems that have arisen in totara itself.

Some participants were less concerned about the time period between felling and milling. Indeed, 4 out of 10 from Group A had experience milling totara logs that had been felled between 3 months and 1 year previously.

Several participants commented that the ends of the logs should be painted with a proprietary wax-emulsion to reduce risk of splitting of round logs and end-grain checking of sawn timber.

When the focus is solely on the heart-wood, time between felling and milling is not considered an important issue. Several participants, particularly carvers, had experience using and milling old fallen timber where the sapwood had rotted away and only the heartwood was left. Although it was remarked that ‘Pai-cock’ or ‘Honey-comb’ (Kaikaka), was common in such logs, it was generally thought to be associated with old-growth trees rather than the length of time lying on the ground. Kaikaka was not mentioned or identified as an issue associated with regenerated or ‘second-growth’ totara trees at all.

### **Conclusions/implications:**

- Most recommended milling regenerated totara trees within 4 weeks of felling to reduce potential risk of sap-stain and borer in sapwood.
- Painting ends of logs with wax emulsion appears to reduce splitting and end-checking.

## **QUESTION: 9**

Stakeholder groups: B (10 total)

*“What machinery do you recommend for the felling and extraction operation?”*

### **Results:**

- **Light Bulldozer & Winch (1)**
- **Bulldozer and grapple digger (2)**
- **Bulldozer/tractor (or skidder) with winch or digger (2)**
- **Wheeled Skidder with winch and grapple (1)**
- **Wheeled skidder and 12 ton digger (2)**
- **Digger with thumb (1)**
- **Miscellaneous equipment: timber jack, horses.**

### **Comments/discussion:**

Bulldozers and skidders with winches seem to be the preferred machines for extraction and a digger with grapple or thumb for log loading. However, one considered that a digger is the most versatile as it can do everything from assisting with felling dangerous trees to log-loading. Although some farmers have also used large 4WD tractors with winches and front-end loaders, generally a combination of bulldozer/skidder and digger seems to be the favoured machinery for the professional.

### **Conclusions/implications:**

- Heavy machinery involving the use of either a bulldozer/skidder/tractor with winch in combination with a digger with a grapple or thumb is recommended for log extraction.



**Figures: 5 and 6**

**John McGee using a 95 Horsepower 4WD tractor extracts totara logs from around a farm.**



**Figure: 7**  
**John McGee winches a farm-totara log to a farm track with a D6 Bulldozer.**

**QUESTION: 10**

**Stakeholder groups asked: B (10 total)**

*“Do you have rates for cross-cutting and extraction?”*

**Results (all excluding GST):**

- \$100-200/m<sup>3</sup> extraction to on-farm mill or loading site (including cross-cutting). N.B. some consider could be as low as \$50-60.00/m<sup>3</sup> on easy sites)
- \$50-60/hr cross-cutting.
- \$100/hr Skidder.

**Comments/discussion:**

There was a considerable range in estimated costs/rates for cross-cutting and extraction. These ranged from \$50-200/m<sup>3</sup> (excluding GST) to fell and extract logs to an on-farm mill-site and/or suitable truck access and loading point. This reflects the variation in site conditions, access and economies of scale.

**Conclusions/ implications:**

- Costs of felling and extraction vary widely. This process involves cross-cutting (felling, limbing-up, log-making) and extracting logs to a suitable mill-site or truck loading point on the farm. A range of \$50-200/m<sup>3</sup> (excluding GST) was recorded.

### **QUESTION: 11**

Stakeholder groups: B, G (16 total)

*“Have you experienced any practical difficulties or problem issues with the felling and extraction of totara?”*

#### **Results:**

- Yes (5)
- No (11)

#### **Remarks/discussion**

“Relative low yield of sawn-timber- 30% to sale. Splitting trunks with multi-leadered trees.” “Danger with felling multi-stemmed trees.” “Tension in log at felling – splitting.”

#### **Conclusion/implications:**

- The felling of poorly formed (multi-leadered) farm-totara trees can present dangers to the faller due to tension within the tree and the splitting of logs. Therefore, tree falling should be undertaken by experienced operators using best practice safety techniques.
- No practical difficulties with log extraction were mentioned.

### **QUESTION: 12**

Stakeholder groups: B, G (16 total)

*“Have you experienced any legal difficulties or problem issues with the felling and extraction of totara?”*

#### **Results:**

- Yes (2)
- No (14)

#### **Remarks/discussion**

Many participants stated that their harvests predated the Forests Amendment Act. One participant encountered “access and DoC constraints re. waterways.” All were aware that the Forests Act applies to the milling of naturally regenerated totara trees on farms and many had some experience with this process.

#### **Conclusions/implication:**

- All interviewees were aware that the Forests Act applies to the milling of naturally regenerated totara trees on farms.
- Many had some experience with this process.

### **QUESTION: 13**

Stakeholder groups asked: B (10 total)

*“How much does milling cost?”*

#### **Results (excluding GST):**

- \$200-250/sawn m3 and blocked stacked.
- \$ 30/m3 filleted (extra)
- \$ 600 day rate.
- \$ 50-80/hr chainsaw milling.

#### **Remarks/discussion**

Some have entered deals with landowners regarding splitting the volume of recovered timber according to an agreed ratio.

#### **Conclusions/implication:**

- Standard market rates generally apply to milling farm-totara.
- Band-saw mills are generally at the higher end of the range compared to convention portable saw-mills.



**Figure: 8**

**Nuka Woods of Northland Portable Sawmilling is one of many saw-millers with experience milling farm-totara.**

### **QUESTION: 14**

Stakeholder groups asked: B (10 total)

*“Generally how have you found farm-totara to mill in comparison to other timbers?”*

#### **Results:**

1. **Excellent - one of the best. (3)**
2. **Above average. (3)**
3. **Average. (2)**
4. **Slightly below average. (0)**
5. **Very poor or difficult. (0)**

#### **Remarks/discussion**

Two timber merchants had not experienced the milling themselves so could not answer this question. Otherwise, comments included: “Just like Macrocarpa”, “Tight timber, can have tension – tends to close on the saw”; “If it comes off the saw straight it stays straight”; “Some bigger knotty ones have compression tension.”

#### **Results:**

- Ratings vary from “average, to excellent - one of the best” timbers to mill.

#### **Conclusions/implication:**

- Saw-millers generally consider farm-totara to be an easy timber to mill and rated it between average and excellent as a timber to mill. An above average rating would seem to be a fair typical evaluation.

### **QUESTION: 15**

Stakeholder groups asked: A, B, C (31 total)

*“Have you experienced any physical problems or issues with the milling of totara timber? For example: Internal defects, tension wood, sap-stain, bow, crook etc.?”*

#### **Results:**

- **Yes (14)**
- **No (15)**

#### **Remarks/discussion**

Generally, “No” answers meant ‘no more than other timbers’ or no more than one would reasonably expect from the obvious quality of the log. For some participants from groups A and C, the question was not applicable.

Comments included: “Never seen sap-stain” (two similar comments, henceforward x2); “Doesn’t sap-stain” (x2); “Have seen sap-stain in younger trees” (x3); “Does get a discolouration something like sap-stain”; “Tension wood in branchy stems” (x5) – “For tension wood cut smaller dimensions, quarter-sawn is best”; “More resistant to sap-stain than other trees” (x3); “Kaikaka”; “No Kaikaka in regenerated trees”; “Some bark inclusion on very knotty trees in forks” (x2); “Cracks in pith wood”;

“Mills very well”(x3); “Some rot pockets”(x2); “Wire in trees”; “A little bit of crook at knots”; “Internal checking”; “Warping”; “Generally stayed fairly straight, but not as stable as Redwood or Western Red Cedar”; “Never moves [to unacceptable levels] once dried properly” (x2); “No real problems”(x3).

After listing problems or defects encountered, most participants then made statements to the effect that ‘generally, the totara timber is pretty good’.

**Results:**

- Around half participants have encountered problems or defects in timber quality from farm-totara timber. However, none considered the incidence of these various defects in farm-totara to constitute a significantly scaled issue or problem.
- Tension wood has been encountered in branchy and young totara trees.
- Knotty logs often have defects including: tension around knots and bark incasement at the base of forked stems.
- Opinions on sap-stain are contradictory. It has been encountered only by some participants, but many of them consider totara to be relatively resistant to sap-stain problems.
- This survey suggests that Kaikaka may be a defect associated with old-growth or mature trees rather than younger regenerated totara trees.

**Conclusions/implication:**

- Some timber defects have been encountered during the milling of regenerated farm-totara. These include tension wood, knots, small pockets of rot, and occasionally sap-stain. However, the relative incidence of these various defects is not considered to be a significant problem associated with the timber generally.

**QUESTION: 16**

Stakeholder groups asked: A, B (20 total)

*“Do you know how much of the total log volume is typically recovered or converted into (rough-sawn) sawn timber (%)?”*

**Results:**

- Yes (11)
- No (9)

**Percentages given:**

40-50%, 45-50% (small logs), 50%, 50% (basic milling), 57% (mature logs), 55-60%, 65%, 50-70%, 60-70%, 80%, 80%, 60-80% for chain-saw slabbing,

**Remarks/discussion**

There is wide variation in the estimated percentages recorded. These were generally given as standard figures of general mill recovery rather than specifically related to ‘farm-totara’. Slabs record a higher crude recovery, but this does not take into account re-sawing at a later stage.

One timber merchant pointed out that such figures only relate to rough-sawn mill output and that timber requires re-sizing and machining (profiling) before retail sale. In his experience, final saleable recovery is only between 30-38% after re-sawing.

**Results:**

- Recoveries of rough sawn lumber from first milling cut range from 40-80% of total log volume going into mill.
- 50% is the average recovery percentage for saw-mills.
- Slabbing gives higher initial recovery percentages but does not account for loss at next re-sawing.
- After re-sawing and processing, final saleable recovery may only be between 30-38% of the volume of roundwood logs, with ‘farm-totara’ generally at the lower end

**Conclusions/implication:**

- Recovery percentages of farm-totara were generally related as being consistent with standard recovery rates for each respective type of mill.
- These results suggest an average figure of 50% recovery of sawn-timber from log volume and around 70% recovery volume for slab wood from log volume.

**QUESTION: 17**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

*What are the most common target dimensions to mill totara timber?*

**Results:**

<b>Group A:</b> Land owners	<b>50mm slabs, 200x50</b> , 150x25, 100x25, various to maximise recovery from log. 300x150 (lintels)
<b>Group B:</b> Saw-millers and timber merchants	<b>200x50</b> (5), <b>150x50</b> (4), 200x25 (2), <b>50mm slabs</b> (2), 150x25 (1), 100x25 (1), 200x 100 (1), 150,200,300x80 (1), 60,120,220 slabs (1)
<b>Group C:</b> Cabinet-makers and wood processors	<b>200x50</b> (9), <b>150x50</b> (7), 300x50 (2), <b>55mm slabs</b> (1), 300x25 (1), 150x25 (1), 200x40 (1), 100x50 (1), 150x75 (1), 60x50 (1), 100x75 (1)
<b>Group E:</b> Architects/designers/specifiers	<b>150x50</b> (1), 300x60 (1), <b>55mm slabs</b> (1), standard profiles (1), various, <b>200x50</b> (1), 150x25 (1)
<b>Group G:</b> Carvers	Logs, 150mm thick slabs,

**Remarks/discussion**

Above results are nominal dimensions only. Overcutting of these dimensions is recommended. For example, most respondents specified the nominal 50mm

dimension should be sawn at 54 or 55mm and 200mm sawn at 205mm. This is to allow for re-sawing to break into small dimensions again.

A variety of dimensions are usually produced in order to maximise the timber recovery volume from individual logs.

**Results:**

- **200x50** is the most popular nominal target dimension, followed by **150x50** and then 50mm slabs.
- Nominal dimensions should be cut over-size for example 50mm should be milled to a minimum of 54 or 55mm.

**Conclusions/implication:**

- If unsure what dimensioned timbers to mill logs into, 200x50mm would appear to be the most common target dimension followed by 150x50mm or 55mm thick slabs.
- 200x50mm and 55mm slabs retain maximum versatility and options for re-sizing.
- Some furniture and joinery factories have specific requirements for timber in non-standard sizes. Therefore, whenever possible, timber should be milled with an end-use or specific market in mind or alternatively milled into large dimensions for versatility and to keep market options open.

## **DRYING AND GRADING**

**Section content:** Critical time periods between felling and milling. Filleting, stacking, drying and storing timber. Kiln-drying, drying times and defects and grading systems.

### **QUESTION: 18**

**Stakeholder groups asked: B (10 total)**

*“How long can freshly sawn farm-totara timber be safely block-stacked before filleting to dry?”*

**Results:**

- Six opinions were received as follows: i) a matter of days, ii) 2 weeks for sapwood, iii) ASAP but depends on time of year 1 month in winter, iv) 3-4 weeks, v) 1 month or more - it gets mouldy but no stain, vi) maximum 6 months.

**Remarks/discussion**

A range of time periods were given. However, general sentiment was the sooner the sawn-timber is properly filleted to dry the better. The above range of comments

suggests that totara is not as prone to sap-staining as many other timbers, but that weather and seasonal conditions may be factors.

**Conclusions/implication:**

- Although totara may not be as prone to sap-staining as many other timbers, the results suggest that it is still prudent to fillet green sawn-timber soon after milling to reduce risk of mould, fungus and sap-stain.

**QUESTION: 19**

Stakeholder groups asked: A, B, C, F (37 total)

*“How should freshly sawn-timber best be stored for drying?”*

**Results:**

Timber packets filleted and stored:

- a) Outside, uncovered exposed to weather. (1)
- b) Outside but top covered and in shade or semi-shade. (14)
- c) Under roof structure 0-3 walls – out of sun. (17)
- d) Under roof structure 4 walls. (0)

**Remarks/discussion:**

“Locate in a windy place under cover but with no walls best”; “Air flow, air-flow, air-flow!” - This remark was most frequently emphasised although some had a slightly contrasting opinion and preferred to slow the process: “seal ends of timber and not too much air-flow”, “prime ends with acrylic primer”, “slow drying down- keep out of sun and tarpaulins over stack” - Another common message was the importance of shade. Nearly every respondent emphasised the damage that sunlight can do. However, one of the respondents in Group A considered full-sun was OK- this is inconsistent with most advice.

Regarding stacking and filleting, fairly consistent details and advice emerged: “Must keep well above ground level and straight, stacker-boards or pallets best”; “Fillets should be at 600mm centres”; “Inch fillets close to ends 600-800mm spacings - depending on thickness of boards”; “Always put fillets within one inch of end of boards to avoid end checking and cracking”; “Fillets should be a minimum of 25mm wide to avoid distortion from weight transferring down and fillets not perfectly aligned”; “Fillets should be 25-40mm wide”; “Fillet thickness can be reduced to slow drying down to reduce surface checking.”

Regarding maintaining the stack and facilitating the drying process, one opinion was that it was preferable if the stack is wetted from time to time as repeated wetting and drying helped to draw the moisture out of the timber.

## Conclusions/implications

A clear and fairly consistent specification can be distilled from the survey results. This probably reflects best practice for air-drying most timbers. It can be summarised as:

- As soon as possible after milling, freshly sawn timber should be stacked and filleted for air-drying. Stacks should be made in a shaded location, preferably under an open-sided roof structure or otherwise outside with the top of the stack well-covered to keep the weather and sun off. A windy or draughty location will facilitate quicker drying. Stacks should be level and straight and started well above the ground level. 25mm wide fillets should be placed within 25mm of the ends of the stack and then at a maximum of 600-800mm centres (depending on board thickness). Fillets should be aligned exactly above one another vertically through the stack to correctly transfer the weight down and these lines should also align with dunnage (base supports of the stack). Stacks should be weighted and strapped for safety (for example, in windy conditions). If log ends were not painted or waxed, prime ends of the boards with acrylic primer to reduce end-checking and cracking in boards.



**Figures: 9 and 10**

**Farm-totara log slabbed and filleted. It will have the top covered and shade-cloth draped around the side to keep the sun off.**

### **QUESTION: 20          Drying time**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“How long should the timber be air-dried before using? (Relate to thickness)”*

#### **Results;**

- Quicker than 6months/25mm thickness. (4)
- Between 6-12months/25mm thickness. (5)
- 12 months/25mm thickness.(16)
- Longer than 12months/25mm thickness.(1)
- Was used green. (5)

N.B. Not all participants felt qualified to give advice on this matter.

**Remarks/ discussion:**

Generally, farm-totara appears to present no particular difficulties through the drying process. Many people expressed similar opinion to this: “One of the easiest timbers to dry.” However, several respondents have experienced a significant difference in drying time between totara heartwood and totara sapwood: “Heartwood takes twice as long as sapwood [i.e. twice as long as the general 25mm/yr rule]”; “Totara heartwood takes approximately three times longer than other species.” “Sapwood dries quicker. Heart slower because of oil content.” Several from Group B related experiences like: “we didn’t leave it long enough.” Others used it green: “Used green for rails, farming and lintels.” Totara logs have often been used green for carving. Holes can be drilled into the back of carving logs to help control the drying process and reduce cracking.

Groups A and B tended to state quicker drying times than Group C (who work with the finished timber). Therefore, it may be that Groups A and B have under-estimated the time required to dry timber properly and the issue becomes apparent when working with it.

Consequently, many felt that air-dried timber should still be finished-off in a kiln to get the moisture content down to specifically targeted levels before use: “Air-dry for around one year/25mm then finish-off drying in a kiln” (x2); “Easier than most timbers to top-off in a kiln.” Another methodology given was: “Air-dry in shed for three months to one year, vacuum dry down to 6% moisture content and machine within 3 days and then seal it immediately with a two-pot resin at a maximum of 8% moisture content.”

Some expressed the opinion that finishing in a kiln down to “9-10% moisture content is too dry for Northland.”

**Conclusions/implications:**

- Farm-totara is considered to be a relatively easy timber to air-dry.
- Most experiences with farm-totara support the traditional rule-of-thumb of “an inch per year” for air-drying timber. This equates to allowing one year drying time for every 25mm of board thickness.
- Many have found that totara heartwood takes significantly longer (up to twice as long) to dry than the sapwood.
- Group C respondents (cabinet-makers and wood processors) tended to recommend longer air-drying times than many of Group B (saw-millers and timber merchants).
- ‘Finishing-off’ the drying process (such as in a kiln or dehumidifier) before use was often recommended.

**QUESTION: 21 Timber defects during drying**

Stakeholder groups asked: A, B, C, F (37 total)

*Have you experienced any problems or issues with the drying process of farm-totara (i.e. sap-stain, borer, mould, warping etc)?*

**Results;**

- Yes (11)
- No (26)

**Defects listed in order of frequency mentioned:**

Surface mould (2), crooking from tension in small logs (2). Minor sap-stain when timber dried un-filleted and some end splitting (3). Minor surface checking on flat-sawn boards left exposed to weather (2). Sometimes borer under bark of old stored wood (2). Checking on big dimension [200x 200 not in shed] (1). End checking (1).

**Remarks/ discussion:**

“Yes I have experienced all those issues in totara but it is just like other timbers” (x3); “Dried well, quite stable”; “Same as Macrocarpa” (x4); “Similar to Macrocarpa and Redwood”; “Take the bark off to stop borer under bark”; “Very little problem- very stable”; “A ‘Rind’ develops on outside surface of timber and stops moisture getting in or out [slows drying]”; “Totara slower than Macrocarpa”; “Tension - but nothing usual compared to other timbers”; “Can’t stop some warping. Easier than other timbers to top-off in a kiln”; “An easy timber to dry” (x2); “Slower drying than most timbers.”

**Conclusions/implications:**

- Just over one third of participants have experienced some defects developing with farm-totara timber during the drying process. These include: surface mould, crook, sap-stain, surface and end checking, and borer under bark.
- Despite the occurrence of these defects, most respondents did not consider the drying of totara timber to be particularly problematic.

**QUESTION: 22 Comparisons to drying other species**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“Can you compare experiences drying totara with drying other timber species?”*

**Results;**

- Yes (30)
- No (9)

***What comparisons can be made?***

“Easier than most natives” (x5); “Easy to top-off in kiln”; “Not particularly difficult” (x3); “Similar to Macrocarpa” (x7); “Similar to Macrocarpa and Redwood”; “Slower than Mac.” (x2); “Totara heartwood is very slow to kiln-dry”; “Not as difficult as heart rimu, but more difficult than Taraire”; “Similar to other natives” (x2); “Splits if [kiln]dried too hot”; “Totara sapwood dries faster than Kauri”; “Totara is a piece of cake compared to Eucalyptus”; “Grain holds together well [little checking].”

### **Conclusions/implications:**

- Totara timber is considered to be a comparatively easy native timber species to dry, although the heartwood may take longer.
- Drying totara timber was frequently compared with drying *Macrocarpa* timber and generally considered to be similar in this respect.
- Air-drying does not appear to be a problem area in the processing of totara timber.

### **QUESTION: 23 Kiln-drying totara timber**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“Have you ever kiln dried totara timber, or put it in a dehumidifier? If so was it successful?”*

### **Results;**

- **Kiln-dried - Yes (11) Successfully (8)**
- **Dehumidifier - Yes (5) Successfully (5)**
- **Vacuum drier- Yes (1) Successfully (1)**

### **Remarks/discussion:**

There is a wealth of practical knowledge and experience amongst stakeholders regarding kiln-drying totara timber. However, variable results have been recorded. Relevant comments are set out below.

#### Unsuccessful experiences:

- “Timber from young trees moved badly and cracked. However, timber was not seasoned enough – only 3-4 weeks air-drying in fillet stack.”
- “Kiln-dried sap-totara. “stayed straight until machined and then it buckled with tension. High proportion of reject timber.” Reasons not known.
- “Joints did open up on kiln-dried flooring (135 x 20mm), presumably because the timber was not properly done.”

#### Successful experiences with Dehumidifier/kiln.

- “Timber filleted on pallets. 25mm thick boards air-dried to 25% moisture content taken down to 14% over 3weeks. Done at 40 degree temperature – very important not to do hotter!”
- Successfully in convection kiln at 40-60 degrees, 2 weeks. Wet bulb: 100-120%, dry bulb 100%. However, some surface checks on 50mm thick timber, 25mm timber OK.”
- “Don’t cook it! Do not rush. Go slowly.”
- “Air-dry to 20-25% moisture content first. Keep in kiln longer than pine and dry slowly. 14-20 days at 40-45 degrees.”
- “Must do slowly otherwise dries outside and creates tension. Air-dry to 20-25% first. Then one month in dehumidifier room – no heat! Finish to 10-12% moisture content.”
- “Finish-off air-dried timber to get it down to 12% moisture content target for joinery in Northland.”

- “No problems if done properly. Use steaming process. 3-4 degree differential outside of timber. Keep outside of timber wet!!!”
- “Took air-dry moisture content of 15-17% down to 8%.”
- “Do very slowly! Air-dry beneath 30% moisture content first. Use 70/60 degree dry/wet bulb. Down to 12%. Forest Research Institute had a schedule for drying heart-totara.” “It is not considered prone to checking or cracking.”

Success with vacuum drier:

- Air-dry 3 months to 1 year then vacuum dry down to 6% moisture content and then machine within 3 days and seal timber immediately with two-pot resin.”

**Conclusions/implications:**

- 17 people had direct experience with drying (finishing-off) totara timber in a drying kiln, dehumidifier or vacuum drier. Of these, only three had had unsuccessful or imperfect results. One of these appears to be due to insufficient air-dry time before putting in the kiln. The other two involved totara sapwood but the exact details of drying process were not known.
- The results indicate that ‘finishing-off’ the drying process of totara timber in a kiln or dehumidifier can be successfully done.
- Some consistent advice includes: timber should be air-dried first down to 15-25% moisture content; a slow drying process is strongly recommended, with little or no heat (not more than 40 degrees); target finished moisture content varied between 8-14% with 10-12% the most common target.

**QUESTION: 24 Grading of totara timber**

Stakeholder groups asked: B, C, D, F (29 total)

*“Have you used NZS 3631: 1988 NZ timber grading rules for native softwoods? If so, how practical was it?”*

**Results:**

- Yes (2)

**Remarks/ discussion:**

Few people were even aware of these standards. One who had used them said: “I only use them if re-selling to another seller. No-one sticks to it.” “Gets interpreted differently.” “Doesn’t cover farm-totara well.” Another pointed out that they do not suit application for slab or large dimension timber production (i.e. 200 x50mm) where dry-ripping and re-sawing potential exists.

Of those who had used them for totara, one was a timber-merchant and one a scientist. None of the Group E (architects/designers) used the standards.

Many participants described their grading systems, which are very close to the standards. Possibly they were originally based on the standard and have been adopted into general practice without direct reference. However, inconsistent grading has

elsewhere been identified as a problem issue with farm-totara (and other alternative timbers).

**Conclusions/implications:**

- The survey results indicate that NZS 3631:1988 NZ timber grading rules for native softwoods are very seldom used. Most stakeholders were unaware of them.

**QUESTION: 25 Grading of totara timber**

Stakeholder groups asked: B, C, D, E, F (39 total)

*“What grading system do you use?”*

**Results:**

Several respondents mentioned the following “Clears, Dressing (small tight knots), Knotty-grade and Box.” **NB** These categories can be related to similar categories found in the NZS standards- However, usually no specifications of how they are exactly determined were related.

Others grading systems mentioned were far more difficult to understand. For example: “1sts, 2nds and Firewood, Premium, Feature”, “Dressing A –clears and knotty, separated into heart and coloured”, “Building grade, select tight-knot, clear, coloured and clean-heart”, “No.1 & No. 2”, “Clears, enclosed knots, bark incased knots”, “Grade for specific application.” “Cut of log.” “Run of mill.” “Eye-ball.” “Heartwood /sapwood.” “Clears only” (x2). “Visual”, “None” (x3).

One scientist used a modified version of Standards Assoc. of NZ 1988. Another used North American Random Width Grades.

Two architects relied on samples of timber.

**Conclusions/implications:**

- No consistent grading system is used within or between the various stakeholder groups.
- The details of how grades are determined are not transparent. No sets of written technical or measurable specifications were referred to.
- “Inconsistent grading” has previously been identified by the Northland Totara Working Group as a disincentive for some stakeholder groups to purchase farm-totara. However, this appears to be a systemic issue.
- Encouraging the use of the existing NZS 3631:1988 or developing a new standard grading system specifically for regenerated totara may be of value.

## PURCHASING TOTARA TIMBER

**Section content:** Purchasing preferences, volumes used, prices for stumpage, ‘green off-the-saw’ and air-dry totara timber grades.

### **QUESTION: 26 Purchasing preferences**

Stakeholder groups asked: C, D, G (18 total)

*“If buying totara, would you prefer to:*

- a) Buy trees standing (stumpage),*
- b) Buy logs,*
- c) Buy graded packets of sawn-timber green off-the-saw,*
- d) Buy graded packets of air-dry timber,*
- e) Order machined or processed timber,*
- f) Other?”*

#### **Results;**

	Groups:	C	D	G	totals
<b>a)</b>	Buy trees standing (stumpage),				
<b>b)</b>	Buy logs	1		4	<b>5</b>
<b>c)</b>	Buy graded packets of sawn-timber ‘green off-the-saw’	3		1	<b>4</b>
<b>d)</b>	Buy graded packets of air-dry timber	7	1		<b>8</b>
<b>e)</b>	Order machined or processed timber		1*		<b>1</b>

\* One specified kiln-dried.

#### **Conclusions/implications:**

- Most cabinet-makers and wood-processors would prefer to purchase farm-totara in graded packets of air-dried timber. Some are interested in graded packets ‘green-off-the saw’.
- Carvers are interested in logs and large dimension totara timber or thick slabs.
- These results support a point that the Northland Totara Working Group has previously identified: the importance of having air-dry and ‘ready-to-use’ timber and products available to the market.
- Purchases for ‘green-off-the-saw’ are often in order to obtain timber at lower prices.

**QUESTION: 27 Quantities used**

Stakeholder groups asked: C (11 total)

*“Roughly what volume/grades of sawn totara do you presently use annually?”*

**Results:**

Significant variance in useage year by year made this question difficult for participants to answer. Also, the figures were not based on actual records, but are instead indicative guesstimates.

Answers were as follows:

1.0/m3, 1.0/m3, 1.0-1.5/m3, < 3.0/m3, 7.5/m3 (“15 one year 1 the next”), 100+/m3 (“was doing around 200/m3”), “only occasionally”, “varies – intermittent”, “practically none.”

**Conclusions/ implications**

- With one exception, farm-totara only constituted a very minor volume of the annual timber used by Group C businesses. Generally, totara timber was not part of their regular use.

**QUESTIONS: 28-36**

Directed to various groups

**TOTARA STUMPAGE RATES AND SALE AND PURCHASE PRICES**

Questions to Group B	Yes	No	Prices (exc.GST)	Grades
Saw-millers and timber merchants				
Q-28 <i>“Have you ever purchased farm-totara logs standing?”</i>	3	7	(See below)	
Q-29 <i>“Do you know of any stumpage rates for farm-totara? If so how much?”</i>	3	7	\$50/m3 \$80-200/m3 \$80-120/m3	300-600 diameter Clear logs Various
Q-30 <i>“Do you know of any stumpage rates/prices for old-growth totara? If so how much?”</i>	5	5	\$200/m3 \$250/m3 \$280/m3 \$600/ton \$600-800/m3	Clean logs For logs at loading site

<p>Q-31</p> <p><i>“If you were to purchase logs standing on farms, what stumpage rates would you expect to pay – or think would be a fair price?”</i></p>	9		<p>\$50-100/tree</p> <p>\$80-200/m3</p> <p>\$100/m3</p> <p>\$80-120.00/m3</p> <p>\$30-40/m3</p> <p>\$40-250/m3</p> <p>\$250+/m3</p> <p>\$120-150/m3</p>	<p>Depending on size.</p> <p>300-600 diameter</p> <p>Clear logs</p> <p>Reasonably formed logs</p> <p>Depending on grade.</p> <p>Logs less than 600 diameter.</p> <p>Logs between 600-800 diameter</p> <p>Logs 800+ diameter</p>
<p>Q-32</p> <p><i>“Have you ever bought or sold any totara timber green-off-the-saw? What grades/prices?”</i></p> <p><b>N.B.</b> Many of these rates are old and date back over last 20years. Also these are generally wholesale rates.</p>	5	5	<p>\$2-3000/m3</p> <p>\$2700/m3</p> <p>\$2000/m3</p> <p>\$1600/m3</p> <p>\$1200/m3</p> <p>\$800/m3</p> <p>\$700/m3</p> <p>\$600/m3-</p> <p>\$500/m3</p>	<p>Clear heart</p> <p>Clear heart</p> <p>Clear heart</p> <p>Clear heart</p> <p>Dress. Heart</p> <p>Feature sap.</p> <p>Knotty sap.</p> <p>Knotty</p> <p>Dress. Colour</p>
<p>Q-33</p> <p><i>“Have you ever sold air-dry totara timber? What grades/prices?”</i></p> <p><b>N.B.</b> Some of these rates are old and date back over last 20years. Also these are generally wholesale rates.</p>	5	5	<p>\$4000/m3</p> <p>\$3000-3500/m3</p> <p>\$3500/m3</p> <p>\$3500/m3</p> <p>\$1500-2000/m3</p> <p>\$1-2000/m3</p> <p>\$2500/m3</p> <p>\$1500/m3</p> <p>\$600-700/m3</p> <p>\$850/m3</p>	<p>R.S. Dress. A</p> <p>Mature Heart</p> <p>Clear heart</p> <p>Heart</p> <p>Slabs</p> <p>Slabs- Knotty</p> <p>Slabs</p> <p>R.S. Dress. A</p> <p>Coloured.</p> <p>R.S. Knotty.</p> <p>Rough grades</p> <p>Knotty sap</p>
<p><b>GROUP C:</b> Cabinet-makers &amp; wood processors</p> <p>Q-34</p> <p><i>“Have you ever purchased air-dry totara timber? What grades/prices?”</i></p>	8	3	<p>\$4,500/m3</p> <p>“same as rimu”</p> <p>\$1-1200/m3</p> <p>\$1200/m3</p> <p>\$1200/m3</p>	<p>R.S. Clear heart kiln-dried.</p> <p>Clear Heart.</p> <p>Mixed grade/cut of log (1998)</p> <p>Coloured grade</p> <p>“run of log”</p>

<b>GROUP C:</b> Cabinet-makers & wood processors Q-35 <i>“Have you ever purchased farm-totara trees standing on farms? What prices/grades?”</i>	4	7	\$200-300/m3 \$200/m3	Clear logs >600 dia.
<b>GROUP G</b> Carvers Q-36 <i>“If you were to purchase logs standing on a farm, what do you think would be a fair price to pay?”</i>	-	-	\$150/m3 Max. \$300-400/m3 \$< 800/m3  \$1500-2400/m3	(Logs). Northland farm-totara 800 SED clear logs 7.0m long (600 dia. heart) Dry -Premium heart wood logs from Central North Island.

### Results:

- Few saw-millers or timber merchants have purchased ‘farm-totara’ standing (3 out of 10).
- Few cabinet-makers/wood processors have purchased ‘farm-totara’ standing (4 out of 11).
- Many portable saw-millers have obtained farm-totara for free or for an agreed portion of the sawn timber.
- Stumpage rates used by saw-millers for ‘farm-totara’ varied depending on grade and ranged from \$50-200/m3.
- Stumpage rates used by Cabinet-makers/ wood processors were higher and ranged between \$200-300/m3.
- In comparison stumpage rates for ‘old-growth totara’ ranged between \$200-600/m3.
- Saw-millers’ and timber merchants’ estimates of a fair stumpage price for ‘farm-totara’ varied from \$30- \$250/m3 according to grade. These generally indicate a range of \$30-80/m3 for smaller and poorer grades and between \$120-250m3 for large diameter premium grades. This suggests an indicative average stumpage rate value for ‘farm-totara’ may be around \$115.00/m3.
- Half of Group B interviewed had bought or sold totara ‘green off the saw’. Values ranged between \$ 1,600-3,000/m3 for clear heart grades, and \$1,200/m3 for dressing heart grade, and between \$500-800/m3 for knotty grades.
- Half of Group B interviewed had sold rough-sawn (R.S.) air-dry totara timber. Values ranged between \$3,000- 4,000/m3 for Clear Heart Grade, \$1,000-3,500/m3 for slabs, \$2,500/m3 Coloured Dressing Grade, and \$600-1,500 for knotty or feature grades.
- Carvers are interested in log purchases and indicate willingness to pay relatively high prices for premium quality logs – especially if dried.

### **Remarks/discussion**

It was difficult to obtain meaningful information relevant to current market values. Although all participants had had experience with farm-totara, many of the portable saw-millers had cut it for land-owners own use rather than for sale. Those who had bought or sold it could often only relate experiences and prices that are now well dated. Many prices were old – one back to 1986. Several commented that the native timber market has been flat over the last 20 years or more. Nevertheless, many commented that prices should now be higher than those related and recorded above.

Many of the prices given were the wholesale prices where portable saw-millers sold onto timber merchants. This is perhaps indicated by higher prices paid by Group C for both stumpage rates and air-dry timber than was paid by Group B. Presumably, the mark-up is reflected in the difference. Some of the figures – particularly for clear-heartwood grades are likely to come from old-growth or very mature trees rather than younger regenerated totara trees. And higher prices paid by Group C are also likely to only apply to selected premium trees.

Consequently, for many of the reasons noted above, the above figures should not be considered to be an accurate or comprehensive survey of current market values. They do, however, show that there has been some market interest and activity. It is also clear that there are wide ranges in values between and within the various grades.

### **Conclusions/implications:**

- The results above include figures and values that may be well out of date. This has not been a comprehensive survey of current market values. Therefore, it does not constitute an accurate survey of present market values. Nevertheless, it does demonstrate that there has been some market activity and interest in totara timber.
- There are wide ranges in values between and within various grades of totara timber.
- Clear heartwood grades command relatively high value.
- End-users, such as cabinet-makers, have paid higher prices for premium grades than timber-merchants.
- Carvers may pay good prices for premium log grades.

## **WORKING AND FINISHING TOTARA**

**Section content:** Timber problems and defects, workability, gluing and finishing.

### **QUESTION: 37 Problems/defects**

Stakeholder groups asked: A, B, C, F, G (42 total)

*“Have you encountered or heard of any problems/ defects or issues with the refining (machining), working or finishing of farm-totara timber?”*

**Results:**

- Yes (6)
- No (33)

*If “Yes” are these issues that create a significant disincentive to using totara as opposed to other timbers?*

- Yes (0)
- No (4)

**Remarks/discussion:**

“Its fantastic!”, “Beautiful timber to machine”, “Machines very nicely.” These were common comments. Most also were of the opinion that it “planes really well.” However, some contradictory comments to included: “young trees - knots often disintegrate in planner. Need to cut-out loose knots before going through moulder. Not much bark encasement”; “No, but also alive like any timber”; “Better than most but not as good as Kauri”; “Different fish to forest totara altogether, but still got a lot of uses”; “Nice to carve. Ideal carving wood – even the sapwood. It is a high quality softwood!”

Problems experienced: “Oils don’t dry well on heartwood – so should seal it”; “Minor rot or chalky parts of knots in feature-wood”; “Sometimes separation between growth-rings especially near the pith – probably storm-stresses”; “Poor grading and some movement in timber from young trees and trees growing on hillsides or leaning etc”; “Minor end-splitting”; “Yes, salt-crystals appearing under the finish or through oil – even years later [probably bloom from moisture?].”

**Conclusions/implications**

- Farm-totara timber is considered to machine very well.
- Difficulties with finishes due to ‘oils’ in the heartwood and some movement of timber especially from younger trees have been experienced.
- The incidence of defects and issues appears to be relatively minor, and these do not create a significant disincentive around the use of regenerated-totara timber.

**QUESTION: 38 Workability**

Stakeholder groups asked: B, C, F, G (32 total)

*“Overall how do you rate the physical timber properties (workability) of farm totara?”*

- a) *An excellent timber to work and use* (11)
- b) *A very good timber to work and use* (11)
- c) *An average timber* (7)
- d) *A relatively poor timber to work and use*
- e) *A hopelessly unsatisfactory timber*

N.B. Not all participants from these groups had experience working totara.

**Results:**

Opinions ranged between a) an excellent timber, b) a very good or 'above average' timber, down to c) an average timber. The b) rating reflects a fair or average evaluation of opinions on this matter.

**Remarks/ discussion:**

A wide range of comments were recorded. These include: "More workable than just about anything"; "Should be more widely used"; "Looks nice, durable, machines well, sands well, takes oil finish well, stable (if properly graded and worked)"; "Doesn't chip-out much, good to finish"; "Can be stable –if stable off mill"; "Good character grain"; "9 out 10 - one of the best"; "I've not seen borer in it at all – have heard that it doesn't take borer. Rimu is terrible for taking borer"; "I've always loved it and said it is under-rated. I could buy it so cheap, process it and then ask top-dollar for it – and got it!"; "Easy to work and stays straight if dried properly" (x4); "Light [colour] and attractive, no insect problems – never seen borer in totara once sealed"; "Old-timers agreed that Northland totara was more durable than central North Island totara but not as stable"; "When green it is a delight to work and machine"; "Pre-drill holes!"; "Doesn't fluff-up with working or chip-out – on top for working against the grain-finishes well"; "Need to be careful with splitting"; "Harder to nail than pine."

**Comparisons:**

"Very similar to *Macrocarpa*" (x3). "Clear is like Kauri, soft like Redwood- cuts easily, knotty is like *Macrocarpa*." "Like Kauri, as good as Rimu." "Kauri second-best to totara."

**Bending:**

Several participants commented that totara sapwood bends very well. One had found that it has resilience (returns to original shape) and that, when bent, it is very predictable, forming an even and consistent curve.

**Conclusions/implications**

- Farm-totara timber is considered to be a very good timber to work. It is considered to cut and machine very well. Its workability is often compared to *C. macrocarpa* and kauri.
- Totara sapwood is considered to bend well.
- However, some people have found the dimensional stability of totara timber from regenerated trees to be less consistent than old-growth totara timber.



**Figures: 11 and 12**

**A totara side table by Richard Davies-Colley and a totara bowl made by Mark Astill.**



**Figures: 13 and 14**

**The Totara Float, designed by David Trubridge for Design Moebel - presumably out of clear totara heartwood (left). A detail of a chair by Kit Warr, courtesy of Steve Crouch at the Tui Street Gallery, Ahipara (right).**



**Figures: 15 and 16**  
**Heart totara carvings by Paul Marshall, at Piri kit e Paatu marae (left) and Te Whare Marino at Kaitaia Primary school (right). Finished with acrylic paint.**



**Figure: 17**  
**Farm-totara table and chairs by Roger Browning.**



**Figures 18 and 19**  
**Bathroom unit from farm-totara and tall-boy drawers out of feature-grade farm-totara by Roger Browning.**

**QUESTION: 39 Gluing**

Stakeholder groups asked: A, B, C, F, G (42total)

*“Have you experienced any problems gluing totara?”*

**Results:**

- Yes (3)
- No (30)

***What glues have been successfully used?***

- Epoxy (Altex 421), Epoxy resin (x6), ‘Bond-it-on’ by Holdfast, Water-based glues, Aliphatic resins (PVA family) (x3), ‘Gorilla-glue’ (x4), ‘Resourcenol’, M-7 melamine glue for finger-jointing, Gelatine glue (Sheppy & Davis Grippet brands), Urethanes, “All standard white glues, ‘West system’ is best, wipe methylated spirits on each surface first”, ‘Norski-resin’, polyurethane glues.

***What glues should not be used?***

- “Aliphatic glues go blue (staining)”
- “[Totara] doesn’t like PVA glue
- “Gorilla glue and most modern glues”

**Remarks/discussion:**

Problems have traditionally been associated with totara heartwood. One respondent advised to wipe heart-totara with a solvent (like acetone) to remove greasiness first [before gluing]. Answers above include some contradictory experiences regarding the success of Aliphatic glues (PVA family). Three respondents listed PVA as being successful and three as unsuccessful. One respondent warned that they discolour to a blue stain colour. One felt that the timber was not properly dry and, therefore, the glue was unsuccessful. Gorilla glue was specifically listed as successful by 4 respondents, but advised against by one.

### Conclusions/implications

- Only 3 out of 33 respondents had experienced problems gluing totara timber. Therefore, it seems that the problem issues historically associated with gluing totara heartwood may no longer be a significant issue. Presumably, modern glues and lesser heartwood content of the timber are the relevant factors.
- Contradictory information was received about the relative success of Aliphatic glues (PVA family) and ‘Gorilla-glue.’ However, a greater number of people indicated success with these glues. Accurate information to clarify this contradictory result would be useful.
- Wiping the surfaces to be glued with a solvent first, especially for totara heartwood, was recommended.



Figures: 20 and 21

Mark Astill finds totara sapwood bends and laminates well. It has also been used in boat-building for interior joinery.



Figures: 22 and 23

Farm-totara bathroom vanity and table tops glued by Roger Browning.

### QUESTION: 40 Finishes

Stakeholder groups asked: A, B, C, F, G (42 total)

*“Have you experienced any problems with applied finishes to totara timber?”*

**Results:**

- Yes (13)
- No (18)

***What finishes have been successfully applied?***

- Totara primer, Taubman's acrylic primer, "Any finish once sealed first", "For oiled finishes always seal first with 'EstaSeal SU 45'", "Ure-clear" – Wattle industrial grade polyurethane, lacquer, lacquer/sealer, oil, two-pot polyurethanes, "use MDF sealer" Danish oil (x2), "Oil finishes – no problems" (x4), waxed, water-based polyurethanes (such as Watty 'Speed-Clear') although can be blotchy with oil of heartwood, Tung-oil and Turps with 10% polyurethane in mix, 'Liquid-glass' two-pot polymer very effective, Shellac (x2), Mix: (1/3 varnish, 1/3 turps, 1/3 tung oil), Norski resin on sealed timber (hardens the timber).

***What finishes have been unsuccessful?***

- "Polyurethane takes about 3 weeks to dry on heart-totara"
- "Most [single-pot] turpentine or oil-based Polyurethanes won't set"
- "Vegetable oil on a kitchen bench developed unsightly black water-stains"
- Two-pot polyurethanes on totara heartwood
- 'Cabbot's & Sikkens' exterior oil & clear finish paint
- Can get mould under oil finish
- Oil based paints

**Remarks/discussion:**

"Must be sealed with right sealer first – (use rimu sealer)." "Many polyurethanes wont set and some oils wont set. Polyurethane varnishes don't seem to be a problem." Mould or blooms under finishes are likely to be the result of moisture movement within the timber. Thorough drying is essential.



**Figure: 24** An oil finish on exterior joinery from coloured grade 'farm-totara' made by Joachim Kupiec of Wooden Earth Creations.

### Conclusions/implications:

- Nearly half of participants have either experienced or know of problem issues with applying finishes to totara timber – particularly the heartwood.
- Nevertheless, respondents have generally found satisfactory finishing products/procedures and methods.
- There are some inconsistencies with the above experiences.
- Obtaining reliable advice from people with proven experiences is recommended.

## USE AND PERFORMANCE OF TOTARA

**Section content:** Suitable end uses, performance and satisfaction,

### QUESTION: 41 Suitable uses

Stakeholder groups asked: A, B, C, F, G (42 total)

*“What types of end-uses have you used, supplied or recommended farm-totara timber for?”*

#### HEARTWOOD ONLY

a)	Exterior with ground contact	<b>8</b>
b)	Exterior above ground use exposed to weather.	<b>15</b>
c)	Exterior above ground sheltered from weather	<b>9</b>
d)	Interior structural use	<b>8</b>
e)	Interior joinery (windows, doors, kitchens)	<b>9</b>
f)	Interior linings, panelling, sarking or flooring	<b>8</b>
g)	Interior objects such furniture, carving or bowls etc	<b>8</b>

#### COLOURED – (HEART & SAPWOOD MIX)

a)	Exterior with ground contact	<b>3</b>
b)	Exterior above ground use exposed to weather.	<b>9</b>
c)	Exterior above ground sheltered from weather	<b>9</b>
d)	Interior structural use	<b>15</b>
e)	Interior joinery (windows, doors, kitchens)	<b>17</b>
f)	Interior linings, panelling, sarking or flooring	<b>21</b>
g)	Interior objects such furniture, carving or bowls etc	<b>17</b>

## SAPWOOD

a)	Exterior with ground contact	<b>3*</b>
b)	Exterior above ground use exposed to weather.	<b>10**</b>
c)	Exterior above ground sheltered from weather	<b>3</b>
d)	Interior structural use	<b>10</b>
e)	Interior joinery (windows, doors, kitchens)	<b>12</b>
f)	Interior linings, panelling, sarking or flooring	<b>19</b>
g)	Interior objects such furniture, carving or bowls etc	<b>18</b>

\* Sapwood was all tanalised for exterior use

\*\* Includes 3 response where sapwood was tanalised or LOSP treated for exterior uses and 2 responses where surface applications of timber preservative were applied (such 'CD-50').

### **Remarks/discussion**

It was found that heartwood, coloured and sapwood grades of farm-totara have all been used for a wide range of purposes – both exterior and interior.

Totara heartwood has been used more for exterior uses where durability is a main consideration, such as for exterior joinery. However, coloured-totara timber grades have also been used and recommended for such applications by some people. Totara sap-wood has also been used and recommended for exterior applications such as stock-yard rails, gates and weatherboards and joinery. It seems that coloured and sapwood totara timber has been used and recommended by some people for uses requiring durable timbers. In some incidences, it has been treated with preservatives such as CCA or LOSP chemical treatment or had surface applications of preservatives to enhance durability and service-life.

Coloured and sapwood totara timber grades have been most commonly used for internal uses, particularly joinery, linings and finishings and furniture.

### **Conclusions/implications**

- Totara heartwood has been mostly used supplied or recommended for exterior situations where durability is an important issue. In particular, exterior joinery has been a main use. However, it has also been used for all other applications including interior uses such as furniture.
- Coloured and sapwood totara timber has also sometimes been used, supplied or recommended for a variety of exterior situations. In some incidences, it has been treated to enhance durability.
- Coloured and sapwood totara timber grades have predominantly been used, supplied or recommended for interior applications - especially for joinery, linings, finishings and furniture.
- Farm-totara has been used for: posts and rails in cattle-yards, gates, fence battens, house framing, weatherboards, lintels, decking, interior posts (in natural log rounds), a log-house, joinery, ceiling linings, sarking, panelling, architraves, skirtings, flooring, doors, door-jams, window-frames, kitchens, bathroom vanities, furniture items, shelving, wood-turning and carving.



**Figures: 25 and 26**  
**Kitchens made by Natural Timber Creations out of coloured and sapwood grade farm-totara timber.**



**Figures: 27 and 28**  
**135mm wide totara floor boards from feature-grade coloured and sapwood totara by Hamish Cathcart. The floor is 12 years old and although some joints have opened, he is still well pleased with its performance.**

**QUESTION: 42 Performance & satisfaction**  
Stakeholder groups asked: A, C (21 total)

*“How do you rate your overall satisfaction with using totara timber for specific purposes?”*

### Results:

- a) Excellent – exceeded my expectations. (7)
- b) Very good – well pleased with performance. (10)
- c) OK – acceptable/ reasonably satisfied. (5)
- d) Poor – disappointed in performance. (2)
- e) Hopelessly unsatisfactory.

### Remarks/ discussion:

Some interviewees gave two replies specific to different purposes. These are included in above figures. For example, the two d) – disappointed results were specifically for joinery and a trailer-deck. Treated sap-totara used for joinery had moved and the untreated trailer-deck built with sap-wood was rotting now after 16 years service. However, both interviewees also had good experiences with using farm-totara for interior furniture.

For some interviewees, the durability issues are too early to evaluate and, therefore, in some cases the rating does not include an evaluation of practical service life. Two respondents felt their evaluations depended on the grade of timber used. One had also used both totara and rimu for some panelling and flooring within the same house and in comparison was far more satisfied with the appearance and performance of totara (rimu panelling had gaps – the totara had stayed straighter and without gaps. Another (see Figures: 27 and 28 above) had the exactly the opposite experience comparing the stability of rimu and totara flooring (sapwood). However, he considered that the totara floor was not properly dried (nor was it cramped when fixed).

### Conclusions/implications

- Generally, people have been well-pleased and satisfied with the performance of farm-totara timber for a variety of end-uses.



**Figures: 29 and 30**

**A totara ceiling by Owen Moselen and a floor made out of coloured-grade totara by Alan Goodhew. Both found totara exceeded their expectations.**



**Figures: 31 and 32**

**Left: Anthony Collins chisels a coloured piece of totara for a window sill.**

**Right: Peter Griffiths starts on the top section of a Pou for Kaitaia's Te Ahu Centre.**

## **DURABILITY OF REGENERATED TOTARA**

### **QUESTION: 43 Durability of young heartwood**

Stakeholder groups asked: B, C, F, G (32 total)

*“Do you distinguish any significant difference between the heartwood of farm-grown totara and ‘old-growth’ totara heartwood? i.e. transition wood? If so, what differences?”*

#### **Results**

- **Yes (24)**
- **No (4)**
- **Don't know (1)**

#### **Remarks/ discussion**

“Colour difference not deep red like Central North-Island totara.” “Lighter colour is less dense.” “Not as durable –not as much resin.” “Red heart has an oil in it.” “Older trees more durable.” “Tighter grain & deeper colour in older trees.” “Prefer deep red colour.” “Sap and transition wood give character – otherwise bland.” “Lighter colour, is stringier and does not chip as easily as the old wood.” “Older dry heartwood is better to carve and has better colour.” “Younger wood often doesn't finish as shiny as the old heart [when carved].” “Grain can lift on sapwood when sanding carvings.”

### **Conclusions/ implications**

- Many wood properties traditionally attributed to totara related to heartwood timber from old-growth trees.
- Most people distinguish a significant difference in the timber qualities of the heartwood from younger or farm-grown totara trees.
- Colour is the main distinguishing characteristic. The older and darker heartwood is generally considered to be more durable, more 'oily' than lighter coloured heartwood or transition-wood from younger trees.
- Many considered the older heartwood was better or "crisper" to carve but also more brittle.

### **QUESTION: 44 Durability of young heartwood**

Stakeholder groups who answered yes above

*"How durable do you think the pinkish young heartwood from regenerated farm-totara is and can you relate any examples of practical service life?"*

### **Results/Examples**

"Young pink heartwood is semi-durable. Good for weatherboards on northern sides of house and paint with copper naphylate." "Not durable, but sapwood is surprisingly durable when sawn into timber." "At least 15-20 years outside above the ground." "Don't know- still testing it." "Reasonably durable above the ground – coloured verandah posts 12 years old" N.B. – I actually noticed some soft spots/deterioration on parts of some of these presumably from sapwood. "Pinky light-coloured totara timber in some 70 year old fence-posts and still good." "Lighter heart is durable, but I don't know how it compares with old-growth." "Durable- highly prized for kitchens." "Don't know so wont risk it" (x2). "Suitable for interior only." "Comparable to deep red heartwood if well selected boards [presumably no coloured]. "Reasonably durable." "Durable above the ground. Moderately durable in ground." "Pretty durable but needs testing" (x2). "Probably not as durable" (x2).

### **Conclusions/implications**

- Opinions vary on how durable the lighter 'pinky' heartwood (or transition wood) is from younger totara trees. Most consider it has some level of natural durability but less than deep dark red heartwood from old-growth trees.
- The lighter-coloured young heartwood (or transition wood) from younger regenerated farm-totara is not recommended for ground-contact applications.
- Testing of natural durability levels of lighter-coloured 'pinky' heartwood from younger trees may be useful to determine suitability of the timber for above-ground exterior uses.



**Figures: 33 and 34**

**Coloured-grade of farm-totara timber with an oil finish used for exterior joinery.**

**QUESTION: 45 Durability of totara sapwood**

Stakeholder groups asked: B, C, F, G (32total)

*“Do you have any experience of using totara sapwood for exterior uses? If so can you relate any examples of practical service life?”*

**Results**

- **Yes (12)**

**Examples/ remarks:**

“One of the best sapwoods for durability – Its amazing!” “Untreated farm-gates 15-20 years [originally received 1 coating of diesel and creosote] – but tanalises very well!” “average durability similar to young (20-35 year old) Macrocarpa [heartwood] – but old Macrocarpa [heartwood] lasts better.” “Outdoor furniture –been 15 years outside and still good.” “Fence posts painted with waste-oil, no deterioration after 5 years.” “16 year old Trailer-deck now going rotten in places where moisture is held.” “Logs for log house with sapwood on. De-barked and sanded smooth and painted with ‘Metalex’ preservative.” “Needs LOSP treatment then it is good.” “Untreated sapwood showing some deterioration after 10-15 years.” “Sap-totara rails [untreated] 150x 25mm – 10-12 years service life.” “Treated weather-boards.” “Ok for exterior above ground if treated with surface applied preservative such as oils, ‘Metalex’ or CD-50.” “Durability not tested. Recorded by S. Reid as more durable than rimu sapwood, less susceptible to the common house borer.” “Old-time bushman said sap-totara was OK for untreated weatherboards. And agreed that Northland totara was more durable than central North –Island totara but not as stable.”



**Figures: 35, 36 and 37**  
**‘Coloured Grade’, regenerated totara timber used untreated for a veranda and posts. Surfaces received an application of CD50 wood preservative after construction (12 years ago). Some signs of deterioration - a chalky softness - is evident at the bottom fixings of some of the posts, presumably on the ‘sapwood’ parts of various pieces of timber.**



**Figure: 38**  
**Stockyard gates made by John Guy from totara milled off the farm and nearly 20 years old. Note the diagonal cross-brace board has been cut out to the wane (round edge of the natural tree). Therefore, it will certainly comprise a portion of sapwood. The gates received an application of diesel and waste oil approximately 18 months after construction. The gate is still in functional service, However,**

**some rot is now evident where moisture is trapped at the bottom of the cross-brace board where it is fixed at the strap hinge and held against other boards.**

### **Discussion**

A significant discrepancy exists between many interviewees' opinions about the relative natural durability of totara sapwood and the official scientific information on the topic. The official information is that all sapwood is perishable and that totara sapwood is probably no more durable than that of *Pinus radiata*. However, many people have experienced what they perceive to be comparatively greater service-life (for exterior but above ground uses) than that 'perishable' status would suggest. Some examples are documented in this report. For example, see Figure: 38 above. Other examples include a different landowner (such as survey questionnaire no. 26) who has used farm-totara for stockyard rails and, although he acknowledges that some deterioration [rot] is usually apparent in the sapwood after 10-15 years, he is satisfied with the service life.

In some cases, such as untreated farm-gates or stock-yard rails, totara was available on the farm and purchasing treated-timber would have been more expensive. Many people have used timber from younger regenerated farm-totara (sap and coloured timber grades) and experienced what they consider to be a 'reasonable' service-life rather than the timber being properly 'durable'. This experience is reflected in the statement: "I would use it outside again – it got me by when I had no cash."

### **Conclusions/implications**

- Totara sapwood has also been used for exterior above ground situations. Sawn-timber has sometimes provided reasonable service-life, suggesting that it may have some greater level of durability than most other sapwood timber. However, despite these experiences, the untreated timber should not be considered sufficiently durable for exterior applications exposed to the weather.
- The level of durability of totara sapwood is not quantified.

### **QUESTION: 46 Durability of untreated totara sapwood for interior use**

Stakeholder groups asked: B, C, F, G (32 total)

*“Have you experienced any issues with durability of untreated totara sapwood for interior applications? (i.e. borer, dry-rot etc.)”*

### **Results**

- Yes (8)
- No (20)

### **Remarks/ discussion**

The question of whether or not totara sapwood gets borer received contradictory responses. Many with extensive experience stated “sap-totara doesn't take borer” - “Haven't seen any borer in sap-totara”; “I have seen borer in it”; “Never had a problem with it”; “No problem - sealed with Shelac” (x3). Others qualified this with

opinions such as “borer only attack wet timber – dry timber and sealing eliminates risk.” There was no disagreement that “two-tooth borer gets under bark if not removed” (x2). A generally uncontentious position and common comment was “[re borer], no more than anything else, borer will go a lot of other timbers than it will go sap-totara” also: “Don’t think I’ve seen borer in it”; There certainly seems to be some appreciable level of resistance to borer”; “Totara sapwood stored in shed where borer is present still has no sign of attack after 12 months.”

Of those who answered ‘yes’ to the above, none consider untreated totara sapwood to be problematic for interior use. They were observed that they have in certain situations seen incidence of borer or rot etc. For example: “Only seen borer in it when against Kauri frame timber that was riddled with borer” and “Have seen a little bit of dry-rot on stored slabs in garage where moisture gets to it.” Best practice construction should avoid any problem issues.

### **Conclusions/implications**

- Most people who have used totara sapwood for interior situations have used it as untreated timber. Most have not experienced any kind of durability issues with using it untreated.
- Many people consider totara sapwood to be relatively more durable than most other sapwood timbers and to be much more resistant to the common house borer.
- Totara sapwood should not be considered to be durable. Best practice techniques such as using dry timber, sealing it well and keeping it dry is still recommended.

### **QUESTION: 47 Treating totara sapwood for exterior use**

Stakeholder groups asked: B, F, G (21 total)

*“Have you treated totara timber with any preservative like tanalith or LOSP?”*

### **Results**

- Yes (6)

**N.B.** Three participants from Group C and one from Group A also had experience with treated totara sapwood. These are not included in the above figure.

*If so, was treatment successful?*

### **Results**

Both CCA and LOSP treatments were considered successful by interviewees with practical experience. However, the scientific record indicates: “CCA treated fence posts were included in service tests in both Northland and Hawkes Bay in the 1960’s. Copper screening was recorded in the sapwood of larger round and split posts hence some internal decay pockets were recorded but the tests were still largely intact in Northland after 24 years and 15 years in Hawkes Bay when the

test were abandoned. Copper screening was a common feature in CCA treated podocarp timber.”

Group C stakeholders were not directly asked this question. However, three had had extensive experience with treating totara. One was a timber processing plant that had successfully LOSP treated coloured and sap-totara timber for weatherboards. Another was a timber laminator that had used LOSP treated totara sapwood for window joinery. And one joiner had experience with CCA treated totara sapwood for window joinery.

Additionally several other people not interviewed as part of this survey project have experienced good success with CCA treatment of totara sapwood – including Joe Carr of the Hokianga who owned and operated a CCA treatment plant.



**Figures: 39 and 40**

**Richard Davis-Colley shows gates made from tanalised sapwood totara wood that was milled from the farm. These gates are over 40 years and he says they are much stronger than pine.**

### **Remarks/ discussion**

Experience is that both treatment methods are successful, particularly CCA on totara sapwood: “Sapwood gets better penetration than pine. Result is very good and durable.” Experiences with LOSP treatment of totara sapwood are presumed successful by the treatment plant rather than documented: “No one has come back and complained – so I presume it was fine”; “LOSP successful but expensive.” LOSP is an envelope treatment and, therefore, timber should be treated only once profiled and cuts ends treated with an applied preservative.

### **Conclusions/implications**

- Practical experience is that totara sapwood can be very successfully treated with CCA treatment. This experience suggests slightly better results than the limited scientific test records indicate.
- Experiences with LOSP treatment of totara sapwood are presumed successful by the treatment plant rather than documented

**QUESTION: 48 Surface preservative finishes totara sapwood**

Stakeholder groups asked: B, C (21 total)

*“Have you applied any preservative surface coatings to enhance the durability of totara sapwood timber for exterior uses?”*

**Results**

- Yes (13)

**What products:**

Copper-naphthylate, “Metalex”, Oils (x4), Cabbots deck & furniture oil, Danish oil, Tung oil (mixed with turpentine and 10% volume of polyurethane), CD-50, acrylic paints, varnish, Diesel and creosote, waste-oil, Copper-sulphate (sprayed onto logs from back-pack at the rate of 1 cupfull/15litres to prevent mould).

**Remarks/discussion**

Little evaluation of the performance of applied preservatives can be made from the results of this survey. One participant from Group A has found that the oil finish on totara joinery is getting a black and mouldy appearance. This experience is consistent with one participant’s experience of vegetable oil on a kitchen bench.



**Figure: 41**

**Coloured-grade farm-totara used for exterior joinery is showing some surface checking and the oil finish is getting a slight blackish discolouration.**



**Figure: 42**  
**‘Metal-X’ timber preservative has been applied to the finished surface of the otherwise untreated natural round totara logs of the log house. A timber preservative stain has been applied to the otherwise untreated veranda post.**

### **Conclusions/implications**

- Some people have used untreated coloured and sapwood grades of farm-totara timber for above-ground exterior uses, such as outdoor furniture. Surfaces applications of various commonly available timber preservatives appear to have assisted in ensuring a reasonable service-life has been experienced.
- Oil finishes for items exposed to moisture may get a black discolouration.

## **MARKET POTENTIAL**

### **QUESTION: 49 Market potential**

Stakeholder groups asked: A, B, C, D, G (38 total)

*“In your opinion does farm-totara have any potential in the market place?”*

### **Results**

- Yes (33\*)
- No
- Don’t know (1)\*\*

- \* This question was unintentionally omitted from several interview forms in Group B and, therefore, the question was not put to all the participants of that group.
- \*\* This response was from Group D – A furniture-designer who does not use totara.

### Remarks/ discussion

“Huge potential” (x2). “Definitely” (x3). “Excellent.” “Needs to be mature [trees].” “If trees have good form” (x2). “If good quality [grades]” (x2). “Have to be a good marketer, niche market, narrow product lines.” “Rimu is no better than totara.” “Yes but only if volume is there!” “Yes all natives appeal. It has nice timber colour.” “If continuity of supply and well-graded” (x3).

One interviewee from Group D – a furniture maker who had no experience using totara - said: “Don’t know without a retail trial – need to know about availability, price and resistance to discolouration from UV light.”

### Conclusions/ implications

- Those with experience using totara all considered that there is potential for farm-totara in the market-place.
- Those unfamiliar with totara may need more information to convince them that totara has market potential.

### **QUESTION: 50 Appearance rating of various grades**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

Wood samples used.

*“Overall, how do you rate the attractiveness of the clear totara heart-wood?”*  
(consider in comparison with other possible alternative timbers for the same use)



**Figures: 43 and 44**

In response to timber samples:

- a) very attractive- better or as good as anything else (15)
- b) above average (14)
- c) middle of the pack (12)
- d) not particularly attractive – most timbers are better(5)
- e) an unattractive timber (1)

***“Overall, how do you rate the attractiveness of the clear coloured-grade totara?”***  
(a mix of sapwood and young heartwood)  
(consider in comparison with other possible alternative timbers for the same use)



**Figures: 45, 46, 47**

In response to timber samples:

- a) very attractive- better or as good as anything else **(10)**
- b) above average **(21)**
- c) middle of the pack **(14)**
- d) not particularly attractive – most timbers are better **(2)**
- e) an unattractive timber **(0)**

***“Overall, how do you rate the attractiveness of the clear totara sapwood?”***  
(consider in comparison with other possible alternative timbers for the same use)



**Figures: 48, 49**

In response to timber samples:

- a) very attractive- better or as good as anything else **(7)**
- b) above average **(16)**
- c) middle of the pack **(20)**
- d) not particularly attractive – most timbers are better **(4)**
- e) an unattractive timber **(0)**

***“Overall, how do you rate the attractiveness of feature or knotty grade totara that may include some sapwood?”***

(consider in comparison with other possible alternative timbers for the same use)



**Figures: 50, 51, 52**

In response to timber samples:

- a) very attractive- better or as good as anything else **(11)**
- b) above average **(20)**
- c) middle of the pack **(11)**
- d) not particularly attractive – most timbers are better **(4)**
- e) an unattractive timber **(1)**

#### **Remarks:**

“Feature grade should rate higher than rimu for attractiveness.” “Better than coloured rimu and kauri.” “Better colour than kauri.” “Better than any other timber is the wrinkles at roots and branches. When properly polished it has beautiful 3-dimensional colour.” “More stable than *C. macrocarpa* especially around the knots and more stable than feature kauri.” “Better than ‘Mac’ knotty grades.” “I don’t like knotty timber, but compared with other knotty timbers this is better than *Macrocarpa*..”

#### **Conclusions/ implications**

- 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’ or

between b) above average and c) Average - 'middle of the pack'. Therefore, a general 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 – comprising mostly Feature, Coloured and Sapwood grades.

**QUESTION: 51 Appearance rating of fleck in timber**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

Wood samples used.

*“How do you rate the attractiveness of totara with this characteristic fleck?”*



**Figures: 53, 54**

In response to timber samples:

- a) An attractive positive feature (25)
- b) Acceptable – neither good nor bad (12)
- c) An unattractive blemish (10)

**Remarks/ discussion**

It is not uncommon for totara timber to have a peculiar fleck pattern or defect in the timber. It can be seen in one board of the table top in Figure 23. The elongated flecks are seemingly comprised of a reddish-brown bark-like material that is of slightly chalky consistency and slightly softer than the surrounding timber. Although it was widely acknowledged as a common characteristic in totara timber, no-one offered any explanations or opinions as to cause of this defect. (N.B. I have wondered if this is possibly a precursor condition to the Kaikaka found in the timber of old trees?).

Many participants answered that its acceptability would depend on how much of it there was in a line of timber. Some felt that a few incidences on a few boards would be acceptable – even a feature. Others considered it could be graded into a consistent line of timber with this fleck as a feature. Others considered it categorically an undesirable blemish.

### **Conclusions/ implications**

- Although it was often acknowledged as a fairly common characteristic found in farm-totara timber, little seems to be known about this feature.
- Opinions as to its acceptability varied widely. Just over half considered it to be an attractive or positive visual feature in the timber. Around one-quarter were indifferent as to whether it was a visual feature but considered it to be an acceptable characteristic of the timber. One-quarter of those interviewed considered it to be an unattractive blemish in the timber.
- Its prevalence and the variation in opinion concerning it suggest that it is a factor that may need to be taken into consideration during grading of farm-totara timber depending on market preferences.

### **QUESTION: 52 Market position**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

*“Where do you think the relative value of farm-totara could or should be in the market place?”*

### **Results:**

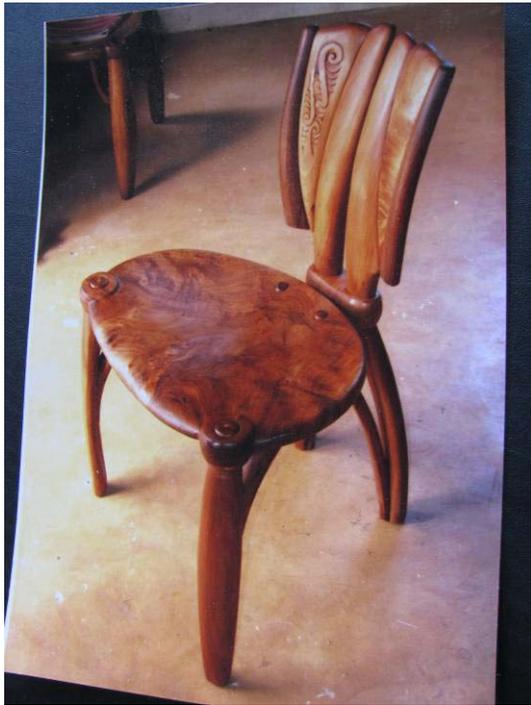
- a) equivalent to kauri and rimu (10)
- b) equivalent to imported timbers (such as island kauri, etc) (10)
- c) cheaper than rimu and kauri but more than *C. macrocarpa* (17)
- d) about the same as *C. macrocarpa* (10)
- e) cheaper than *C. macrocarpa* but more than pine
- f) equivalent to pine
- g) cheaper than pine

### **Remarks/ discussion**

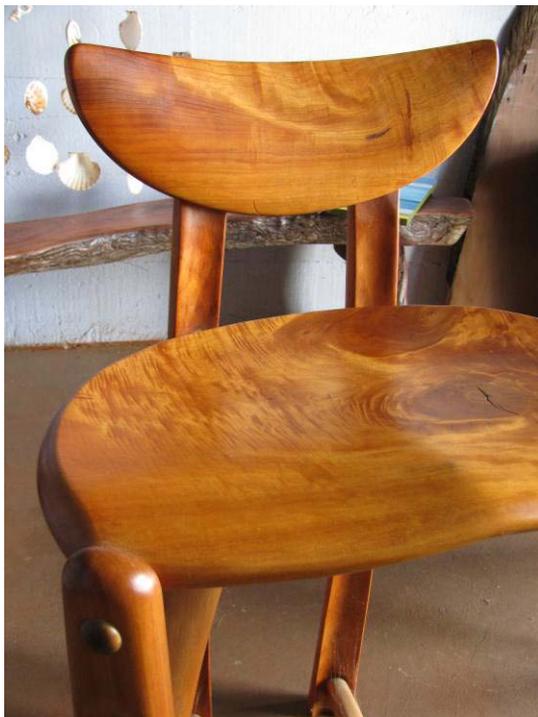
Many participants thought that there would be a market preference for a native timber alternative to many of the imported timbers on the market.

### **Conclusions/ implications:**

- Opinions about the potential relative market position of totara vary between the top of the market (i.e. equivalent to kauri and rimu) down to being equivalent to *C. macrocarpa*.
- The largest group of opinions suggest a market position in the middle of this range and could be generally described as: *“Cheaper than rimu and kauri but more than C. macrocarpa.”*
- This suggests that farm-totara timber could even command similar prices to high-value imported timbers on the market.
- These survey results indicate potential for farm-totara timber to be considered a relatively valuable specialty timber on the market.



**Figures: 55 and 56**  
**Totara chairs by Kit Warr. Courtesy of Steve Crouch at the Tui Street Gallery, Ahipara.**



**Figures: 57 and 58**  
**Left: Totara chair by Kit Warr, in the Tui Street Gallery, Ahipara.**  
**Right: Cabinet from coloured totara by Natural Timber Creations.**



**Figure: 59**  
**Coloured-feature grade totara floor by Alan Goodhew.**

**QUESTION: 53 Target markets**

Stakeholder groups asked: A, B, C, D, E, G (48total)

*“What do you think farm-grown totara could suitably be used for [products/markets]?”*

*Or*

*“What markets exist or do you think could be developed for farm-totara?”*

**Results** (in order of frequency mentioned):

**Heartwood grades:** Exterior joinery- doors and windows (x6), Everything (x4), Carving (x4), Veneer panels (x2), Outdoor furniture (x2), framing (x2), posts (x2), beams (x1).

**Coloured and Sapwood grades:** Interior linings; wall panelling, tongue and groove, ceiling sarking etc (x 16), Interior joinery and finishings; windows and doors, frames, sills and architraves, mouldings etc. (x15), Furniture and cabinetry (x11), All interior applications generally (x8), Kitchens (x3), Flooring (x3), Plywood [veneers] (x3). Carving (x3), Beams (x2), Outdoor furniture (x2) Treated for fence battens and rails (x2), Treated for framing (x2), Treated for exterior cladding (x2). Treated decking (x1). Boat-building joinery (x1). Souvenir market (x1). Exterior joinery if treated (x1). Wood-turning (x1),

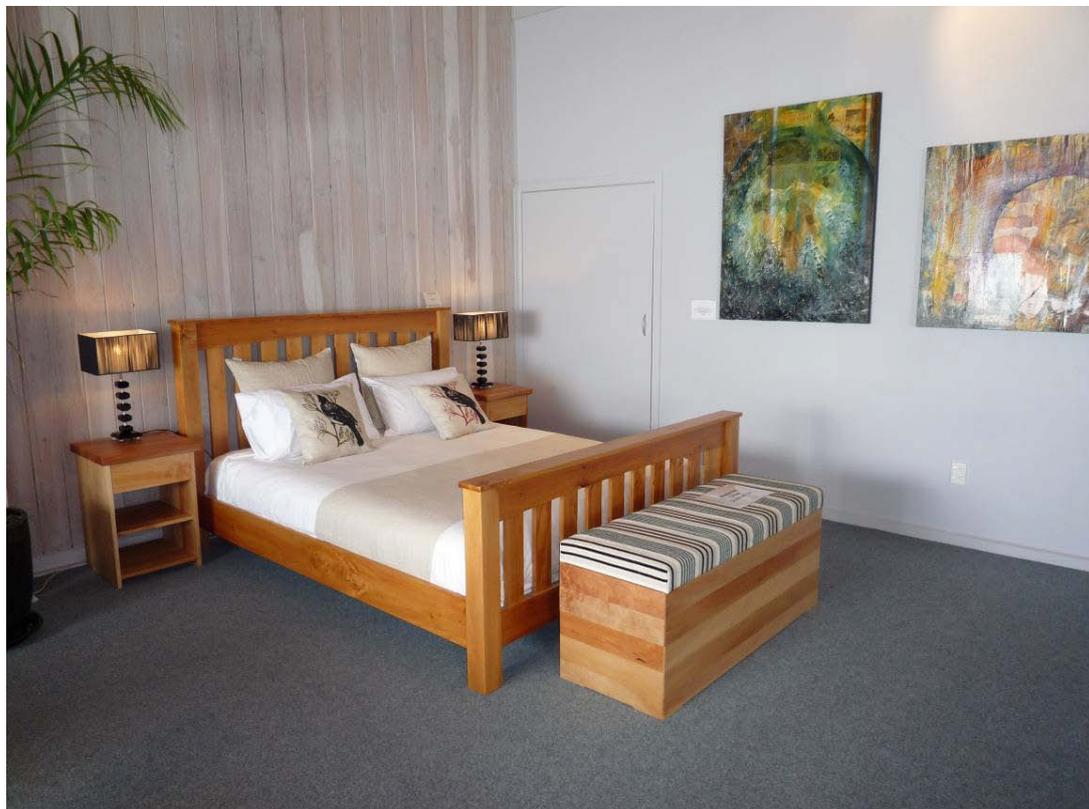
### **Remarks/ discussion:**

Generally, the high-value of clear totara heartwood for traditional uses such as exterior joinery and carving is recognised and reflected in the above results. However, the difficulties in obtaining supply were also frequently mentioned. Several respondents commented that there was probably insufficient supplies available to supply or build markets. Consequently, most of the suggestions for markets for farm-totara concentrated on coloured and sapwood timber. Clearly, most of the opinions point to high-value interior uses for farm-totara timber.

Several specialised niche markets were mentioned, such as for boat building joinery. One comment was: “It is lighter than kauri and holds a shape edge. Some boat-builders prefer it for some applications.” Other specific niche markets mentioned included coffin lids.

### **Conclusions/implications**

- The high value of clear totara heartwood for exterior joinery is a traditional use that is still considered to be the main market for this grade. There is still an existing market for this use, but availability of supply was mentioned as a significant concern.
- By far most opinions on the target markets for coloured and sapwood grades point to interior linings, joinery, and furniture uses. However, some stakeholders also consider there to be market potential for treated sapwood to be used for exterior cladding and structural uses.
- Several specific niche markets, existing and potential, were also mentioned (for example, boat building joinery).



**Figure: 60**  
**Totara bed-set by Dundee Interiors, Kerikeri.**



**Figure: 61**  
**Vanity in coloured/sapwood totara by Natural Timber Creations, Kerikeri.**

**QUESTION: 54 Market impediments**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

*“Do you consider there are any impediments and constraints to totara finding a place in the market?”*

**Results:**

Groups:	A	B	C	D	E	F	G	totals
<b>Yes</b>	5	7	5	1	6	2	3	<b>29</b>
<b>No</b>	5	3	6	1	4	3	2	<b>24</b>

*“If yes- what are these?”*

- Are these;
- a) physical wood property issues (5)
  - b) supply chain issues (17)
  - c) technological or knowledge/ research trial gaps (1)
  - d) market competition with other timbers (specify) (5)
  - e) market acceptance issues (8)
  - f) legal issues (7)

**Remarks/ discussion:**

Just over half the interviewees considered that totara timber faces constraints or impediments in the market place. The biggest problem area identified relates to

supply-chain issues. Predominantly, the concerns expressed on this topic were about scale and continuity of available supply and then about consistency and quality of timber grades.

The next most common area identified as 'Market acceptance issues'. Comments on this topic highlighted two issues. First is the potentially negative public perceptions around cutting down and using native trees - "Greenies against it perhaps?." The second is the fickleness and influence of changes in fashion. It was also pointed out that "Kiwis have a traditional bias towards rimu and kauri." However, on the positive side, comments included: "It's only a supply issue, totara never had a bad name" and "It will become the dominant NZ native timber because of price and availability."

Legal issues were the third most identified constraint. However, no real specific legal problems were outlined. This appears to be more of a general feeling of 'up-against-it' and comments on the topic were only general and often lumped in with other issues: for example, "Legal regulations and anti-perceptions around using natives in general"; "Yes, red-tape – legal issues and supply continuity", "Law doesn't help."

Those who indicated that market competition from other timbers would be a constraint were predominantly indicating that price would be a determinative factor.

Specific issues related to physical wood quality included, first, a need for confidence about its hardness – particularly, suitability for flooring – and also about durability of the sapwood, coloured grades and young-heartwood. Confidence about consistency of grades and wood properties was also raised.

Only one respondent (a wood quality scientist) specifically identified c) technological or knowledge/ research trial gaps as an impediment or constraint. In response to a direct question (below), the role and scope for research and technology and trials to open markets is identified.

### **Conclusions/implications**

- Just over half of those interviewed consider that totara timber faces impediments and constraints in the market place.
- Predominately, these relate to supply-chain issues of sufficient scale, quality grades and continuity of supply.
- Other issues identified (in descending order of frequency mentioned and therefore priority) include: market acceptance, legal issues, competition with other timbers, and physical wood properties.

### **QUESTION: 55 Knowledge and research requirements**

Stakeholder groups asked: B, C, D, E, F, G (44 total)

*“Are there any specific tests, trials, certifications, knowledge gaps or research that could be done to address constraints and/or open potential markets?”*

## Results:

Groups:	B	C	D	E	F	G	totals
Yes	6	5	2	10	5	2	30
No	4	6				3	13

## Remarks/discussion:

Despite not identifying lack of research and technology as a major when asked directly, more than two-thirds of stakeholders identified scope or topics for further testing or information requirements.

The specific topics identified and their relative frequency were as follows.

Information requirements identified	Frequency
<b>Relative durability</b> of young-heartwood, coloured and sapwood of farm-totara timber. Including its resistance to borer (x2).	12
<b>Building code compliance</b> , structural strength values, stress-grades, BRANZ approval etc.	9
<b>Hardness of timber</b> . Particularly suitability for flooring, and possible finishes to improve hardness and (wear) durability.	4
<b>Discolouration</b> . Effects of U.V. light, fading, yellowing, 'Phyto certification'?, colour retention and possible finishes to influence those factors.	3
<b>Dimensional stability</b> . Figures to give confidence to specifiers and specifications on drying and finishes to ensure consistent performance	2
<b>Supply-chain</b> . Studies and market research	2
<b>Treatment for sapwood</b> .	2
<b>Veneer product potential</b>	2
<b>Fire indexes</b>	1
<b>Finishes: Staining potential</b>	1
<b>General timber properties</b>	1
<b>Sound ecological forest management model (and practice)</b>	1

## Conclusions/ implications

- Determining relative durability of farm-totara timber grades was the most frequently identified information gap.
- Determining structural wood property values and assurance/confidence in various code compliance requirements is considered essential to open potential markets and uses.
- More information on the relative 'softness' of the timber and effects of various surface finishes would be useful.
- Trials and information on relative resistance to U.V. light (fading, yellowing etc) and the effects of various surface finishes on a range of factors such as appearance (colour enhancement/protection), wear-durability/ hardness, and fire-indexes is important information for architects and specifiers.

- The above suggests a prioritised list of topics for further research, trials or information dissemination.

**QUESTION: 56 Interest in purchasing farm-totara**

Stakeholder groups asked: B, C, D, E, G (38 total)

*“If there was a reliable supply and continuity of farm-totara timber available, would you be interested in purchasing (or specifying) it for use?”*

**Results:**

Groups:	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>G</b>	<b>totals</b>
<b>Yes</b>	6	10	2	9	5	<b>32</b>
<b>No</b>	3	1		1*		<b>5</b>

\* This respondent would answer ‘yes’ for naturally durable grades.

**Remarks/discussion:**

The results show that most timber-merchants, cabinet-makers, architects and carvers would be interested in purchasing farm-totara timber. Many were specific about it being dependant on certain grades and some gave indicative prices. Several stated interested in the full range of grades, but many were only interested in clear and premium grades.

Scant information was offered about potential volumes and prices. One suggested 2-3m<sup>3</sup>/month and rising to 10/m<sup>3</sup>/ month, another “up to 10/m<sup>3</sup>/yr.” Prices ranged from interest in logs at \$80/m<sup>3</sup>, cut of log @ \$800-900/m<sup>3</sup> air dry, \$1000/m<sup>3</sup> Dressing grades, \$ 1,500-1,800/m<sup>3</sup> for air dry clears, and up to \$ 3,500/m<sup>3</sup> for clear heartwood. These price indications may be less than the findings of questions 28-36 or 52 suggest.

**Conclusions/implications**

- Most of the timber-merchants, cabinet-makers, architects and carvers surveyed, indicated interest in purchasing farm-totara timber if a reliable supply and continuity of suitable grades was available.

**QUESTION: 57 Requirement for natural durability**

Stakeholder group asked: E, (10 total)

*“To what extent is Class 1 natural durability an important attribute for your purposes?”*

## Results:

a)	<b>Absolutely critical</b> –if treatment was necessary I wouldn't be interested.	<b>0</b>
b)	<b>Moderate durability would be OK</b> – a moderate durability rating would be satisfactory for many purposes.	<b>2</b>
c)	<b>Treatment would be OK</b> – If treatment was necessary to guarantee service life or code compliance requirements, it would not preclude me from specifying totara.	<b>7</b>
d)	<b>Treatment would not be OK-</b> If treatment is necessary it would preclude me specifying totara.	<b>1</b>

## Remarks/ discussion:

In hindsight, the question's answer options have been poorly worded. Nevertheless, some useful information has been captured.

Interestingly, Class 1 natural durability was not highlighted by the Group E (architects and designers) as an essential attribute in order for them to be interested in using totara timber. Most consider that interior uses and applications did not need such a durability level. Although most indicated that, if it had to be treated for interior use that that would not necessarily preclude them from specifying it, but that it would make it much less of an interest. As one said "There would be no point in using it then." Nevertheless, it seems that if some clear preservative treatment was considered necessary, say to eliminate any risk of borer, or to meet code compliance requirements, then it would not necessarily preclude them specifying it for use.

## Conclusions/ implications

- Class 1 natural timber durability is not an essential timber attribute for most architects as they consider farm-totara has potential for non-structural interior uses.
- If a clear timber preservative treatment process were required to ensure durability or code compliance, it may make totara of less interest to them but would not necessarily preclude most architects from specifying it.
- Information on relative durability levels and any necessary treatment for code compliant interior uses etc. would be useful information for architects and specifiers.

## **QUESTION: 58** Design trends relevant to regenerating totara timber

Stakeholder group asked: E (10 total)

*“Are there any future trends in architecture, design and building that may have implications for the future prospects of regenerating farm-totara?”*

- **Yes (8)**
- **No (2)**

**Remarks/ discussion:**

Most respondents felt that the ‘green-industry’ or trends towards ‘green-rated’ buildings would assist in generating market interest in sustainably managed timbers including regenerating totara.

A recent return in fashion towards using more timber in houses was mentioned by two participants. However, one felt that this may be a short-term fashion trend. One suggested that lime-washed, stressed and stained timbers was an recent trend and something to explore for totara timber, particularly the sapwood.

Two considered that demand of for interior linings [timber] is likely to increase, especially for veneer on plywood, and ‘off-the-shelf’ products with factory finishes should be explored for the future.

**Conclusions/ implications**

- Future trends towards more ‘green-rated’ buildings and recent fashion trends using more timber for interior linings may have future marketing implications for farm-totara.
- Determining whether totara can be used in processed and factory-finished products, such as veneer on plywood, may be worthwhile.



**Figure: 62**  
Coloured-grade farm-totara sarking over macrocarpa rafters  
courtesy of John Guy.

## PERCEPTIONS AROUND THE USE OF NATIVE TIMBER

**Section content:** Perceptions on harvesting and using native timbers generally and comparisons with regenerating totara timber, importance of sustainability, effects of commercialisation of the species, support for industry development.

### **QUESTION: 59** Support for using native timbers generally

Stakeholder group asked: A, B, C, D, E, G (48total)

*“How do you feel about the harvesting and use of native timber trees (other than totara) generally?”*

#### **Results:**

	Stakeholder Groups:	A	B	C	D	E	G	
a)	Support using other native timber even if it is not sustainably harvested.			1				1
b)	Support using other native timber only if sustainably harvested.	7	10	9	2	10	4	42
c)	Not sure if I support using other native timbers.	2		1			1	4
d)	Do not support the use of other native timbers.	1						1
e)	No opinion on the matter.							

#### **Remarks/ discussion:**

Most participants support the use of sustainable harvested native timber. However, a few supported the use of totara but not other native timbers. Comments included: “Not from old-growth forest.” “Don’t support cutting down bush – even with helicopter logging.”

#### **Conclusions/ implications**

- Amongst all the stakeholder groups surveyed, there is overwhelming support for using native timbers from sustainably managed operations.

### **QUESTION: 59(b):**

Stakeholder group asked: A, B, C, D, E, G (48total)

*“And how do you think the public perceive the use of native timbers generally?”*

#### **Remarks/ discussion:**

Many respondents considered that the general public does have a high regard for native timber but that they hold negative connotations around logging and cutting

down native trees. Many commented that “the public don’t know you are even allowed to cut native anymore” [under the Forests Act]. Therefore, most participants consider that a higher proportion of the public would not support the use of native timber generally. Hence, many prefer to use ‘recycled’ or salvaged timber.

**Conclusions/implications**

- Most stakeholders support the use of sustainably harvested native timbers generally.
- Most stakeholders considered that public opinion is less comfortable with harvesting native timbers for use.

**QUESTION: 60 Is regenerated totara on farms different**

Stakeholder group asked: A, B, C, D, E, G (48total)

*“Do you consider that the harvesting of farm- totara is the same as, the harvesting of other native timber trees from indigenous forest areas?”*

**Results:**

Groups:	A	B	C	D	E	G	totals
Yes	1	3	2		1	2	9
No	9	7	9	2	9	3	39

**Remarks/discussion:**

Several interviewees were careful to draw a distinction between regenerated totara on farms, or previously cleared land, and remnant ‘old-growth’ forests. The distinction between ‘native bush’ and regenerated totara on farms and in modified forest types was clearly a common perception. Others consider that totara is abundant that as a species it is not under threat and, therefore, they were unconcerned about harvesting from any type of forest. One landowner said: “They [totara] are probably our worst weed!”. This result gives weight to the case to review the relationship of the Forests Act to the regenerating farm resource.

**Conclusions/implications**

- Most stakeholders perceive a significant difference between the harvesting of regenerated ‘farm-totara’ and the harvesting of other native trees from areas ‘native bush’.

**QUESTION: 61 Perceived marketing point of difference?**

Stakeholder group asked: A, B, C, D, E, G. (48 total)

*“Do you think harvesting regenerating farm-totara would be perceived as being “ecologically” more acceptable to the consumer than other native timbers?”*

Groups:	A	B	C	D	E	G	totals
Yes	7	9	8	1	10	5	40
No	3	1	1				5
D/know			2	1			3

**Remarks/discussion:**

Most believe there is perceived ethical difference in harvesting farm-totara (as distinct from other native timbers from “native bush”) and that that would be recognised by the general consumer. “It is more ethical [to harvest regenerated totara].” However, a few who, although holding that view themselves, felt the consumer would not differentiate: “Should be but isn’t – general public aversion to using native timbers.”

**Conclusions/ implications**

- Most stakeholders consider that harvesting regenerated farm-totara timber would be perceived as being more ecologically acceptable to the consumer than the harvesting other native timbers from native bush areas.

**QUESTION: 62 Sustainability**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

*“In respect to market acceptance of farm-totara as a native timber, how important are the sustainability aspects and issues around its use to you?”*

	Stakeholder Groups:	A	B	C	D	E	G	totals
a)	Essential	5	1	4	1	2	4	17
b)	Important	3	6	6	1	8	1	25
c)	Neither here nor there	1	3	1				5
d)	Not important							
e)	Irrelevant							

**Remarks/ discussion:**

The question was intended to refer to *environmental and ecological* sustainability. However, many of the stakeholders, particularly in Group C, answered the question in respect to sustainability of available *timber supplies* to market. Therefore, many of these answers reflect sustainability in business and product terms rather than sustainability in ecological terms. There were many comments with the following sentiment: “Must be able to guarantee sustainable supply”(x4) or “Need to be able to get it!”

A landowner who answered c) above, gave the reasoning: “Because it is quick growing.” Another stakeholder who answered d) above reasoned: “It just grows like weeds.”

**QUESTION: 62 (b):**

Stakeholder groups asked: A, B, C, D, E, G (48 total)

*“And how important is it to the consumer?”*

Most considered that, generally, the consumer is less concerned with sustainability than price and appearance. Although most acknowledge that to small sector of the market sustainability issues matter immensely, another sector “don’t care at all.” Many believe that consumers are largely ignorant about sustainably managed native timber and often do not know that native timber can even be legally (and sustainably) harvested. Therefore, a general evaluation is that for most consumers sustainability is not considered to be an important factor. However, most stakeholders believe that consumer awareness and demand for timber from sustainably managed forests will be an increasing trend.

**Conclusions/implications**

- Over half the stakeholders consider the sustainability of harvesting farm-totara is *important* for market acceptance. One third of the stakeholders consider it to be an *essential* aspect for market acceptance.
- Many of these opinions relate to sustainability in terms of timber supply and its bearing on interest in totara on the timber market.
- Most stakeholders believe that the general consumer is not particularly concerned about the ecological sustainability aspects at this time, but that it will become an increasingly important trend.

**QUESTION: 63 Consequences of commercial harvesting**

Stakeholder group asked: A, B, C, D, E, G (48 total)

*“If there was a strong market for farm-grown totara do you think it would change the way land owners view and manage regenerating totara on their land?”*

Groups:	A	B	C	G	totals
Yes	10	10	10	5	35
No			1		1

**Remarks/discussion:**

“They would prune them up” (x2). “Market-led. Market is everything.” “They wouldn’t be clearing it – rather let it grow on steeper hills. Rather have it than pine..” They would look after it.” “It would encourage more of it” (x2). “Encourage it prune it and fertilise it.” “would be a viable options for different land-use.”

One stakeholder from Group C thought it might encourage landowners to “cut it all down.” This respondent may not be fully aware of the workings and requirements of the Forests Act. Likewise, one respondent in Group G, was particularly concerned that it would encourage another wave of exploitation and ‘creaming’ of the regenerating forest – to the detriment of ecological values and genetic quality of the natural forest.

### Conclusions/ implications

- Overwhelmingly, stakeholders believe that a strong market for farm-totara would change the way land owners view regenerating totara and that it would encourage the management of it.
- A few respondents were concerned that, if not properly managed, this could lead to exploitation and degradation of the regenerating totara forest resource.

### **QUESTION: 64 Support for commercial use**

Stakeholder group asked: A, B, C, G (36 total)

*“Should we be promoting the use of farm-grown totara in the market place and development of an industry around farm-grown totara?”*

Groups:	A	B	C	G	totals
Yes	8	10	11	4	31
No					
D/know	1				1

### Remarks/discussion:

All comments were affirmative and several made linkages to benefits to local communities through jobs, industry and wealth creation. Many comments also made reference to stopping the waste of totara trees that presently occurs on farms.

### Conclusions/implications

- There is overwhelming support from stakeholder groups for the promotion of the regenerating totara timber resource.

## LEGAL ISSUES AND ACCREDITATION

**Section content:** Awareness of legal requirements, experiences, credibility, influence of sustainability endorsements and accreditation, perceived inherent “green-rating” of timber, law changes.

### **QUESTION: 65**

Stakeholder group asked: A, B, C, D, E, G (48 total)

*“Are you aware that there are some legal requirements pertaining to the milling of farm-totara under the Forests Act?”*

Groups:	A	B	C	D	E	G	totals
Yes	9	9	9	1	3	4	35
No	1	1	2	1	7	1	13

**Remarks/ discussion:**

Many of those unaware of the legal requirements are in stakeholder groups not directly involved with the harvesting or milling of timber - but not all.

**Conclusions/ implications**

- Over 70% of all Stakeholders were aware that there are legal requirements pertaining to the milling of farm-totara under the Forests Act.

**QUESTION: 66**

Stakeholder group asked: A, B, C, G (36 total)

*“Has all of your totara come from legally approved sources (i.e. a MAF approved harvest operations)?”*

Groups:	A	B	C	G	totals
Yes	3	7	5	1	16
No	4	1		4	9
D/know or n/a*	3	1	6		10

\* Some participants’ experience predate the Forests Amendment Act.

**Remarks/discussion**

Many respondents assured that they do check if timber is legal by asking to see permits etc. Some of the reasons given for not using ‘permitted’ timber include: “Predated the Forests Amendment Act.” “Already cut for firewood.” “Didn’t have time.” Over half of Group C did not know the legal status of the totara timber they had used. For those carving logs, this question is not applicable. When these factors are accounted for, it appears there is reasonably good compliance regarding obtaining legal approval for timber used.

**Conclusions/implications**

- Many stakeholders had used totara prior the Forests Amendment Act coming into force.
- Many stakeholders now ensure that timber comes from legally approved operations.

**QUESTION: 67**

Stakeholder group asked: A, B, C, (31 total)

*“If you have had experience with getting SFM Permits under the Forests Act, how did you find that process?”*

	Groups:	A	B	C	totals
a)	Impractical and too onerous		1	1	2
b)	OK, workable, not too difficult	1	3		4
c)	Very simple, user friendly	1	3		4

**Remarks**

Most of the above experiences relate to obtaining Permits using the ‘Personal–use’ provision under the Forest Act. This is a simple process and, therefore, the results do not correspond well with the responses to question 72 later. Nevertheless, several commented that “MAF staff are very helpful.” One considered the process “Not a push-over - it is well administered.”

**QUESTION: 68**

Stakeholder group asked: A, B, C, D, E, G (48 total)

*“Do you have confidence in the sustainability credentials of native timber produced under a MAF approved SFM Permit or Plans?”*

Groups:	A	B	C	D	E	G	totals
Yes	4	9	9		10	3	35
No	1		1	1		2	5
D/know	5	1	1	1			8

**Remarks/discussion**

Several stakeholders were not convinced that some types of ‘old-growth’ forests could be sustainably harvested. One said: “No, because not enough is understood to be logging ‘old-growth’ forests.” 17% of respondents replied with a “Don’t know” answer. Most however, (over 70%) were content to place trust in the government [MAF] endorsement and made comments like: “If government. agency approve it.” Some qualified the affirmative answer with “If well monitored.” One stakeholder consider “It is very good.”

**Conclusions/ implications**

- Most (70%) of stakeholders have confidence in the sustainability credentials of native timber produced under a MAF approved SFM Permit or Plan.

**QUESTION: 69**

Stakeholder group asked: C, D, E, (23 total)

*“Are you aware that the ‘Greenbuild’ website includes a MAF endorsement of the sustainability of native timber produced from private land under the provisions of the Forests Act?”*

**Results:**

Groups:	C	D	E	totals
<b>Yes</b>	1		2	<b>3</b>
<b>No</b>	10	2	8	<b>20</b>

**Remarks**

Green-build is one website that rates or endorses certain building products. Architects are generally familiar with this web-site, but also use and are influenced by, a range of other sites, information sources and accreditation schemes. However, one stated that “Green-build will become default acceptable solution.”

**Conclusions/implications**

- Most (85%) of relevant stakeholder groups were not aware of the government (MAF) endorsement on the Green-build website of the sustainability credentials of native timber produced under MAF approved SFM Permits or Plans.
- The sustainable status and credentials of native timber production may need better promotion.

**QUESTION: 70**

Stakeholder group asked: C, D, E (23 total)

*“Do such endorsements/ratings influence your choice of timber for use or specifying?”*

**Results:**

Groups:	C	D	E	totals
<b>Yes</b>	4	1	9	<b>14</b>
<b>No</b>	7	1	1	<b>9</b>

*“If yes, to what degree?”*

**N.B. Question only asked to Group E**

<b>a)</b>	A very significant influence	<b>1</b>
<b>b)</b>	An important consideration	<b>4</b>
<b>c)</b>	Of interest and slight influence	<b>5</b>
<b>d)</b>	Of interest but little effect in the end	

**Remarks**

Most Group C timber users are not influenced by any ‘green-ratings’, and related that clients are more influenced by price. However, some reported that a certain sector of the market is interested in such accreditations. Only around one third of Group C (wood processors and cabinet-makers) stakeholders said that such matters

influence their choices of timber and materials. This contrasts greatly with Group E (architects and designers). Nine out of ten from this group are influenced by various ratings, accreditations or endorsements. However, the actual degree of influence varied widely. Half admit that while it is of interest, it is only of *slight* actual influence. The predominant considerations remain, appearance and performance and then availability. As one put it: “If commercially available, we will use it. If it has ratings too that’s great.” Interestingly, price did not seem to be among the first considerations to this group.

Several considered that within the architectural profession the importance of sustainability is well accepted, but the clients are ‘lagging behind’ in this respect. However, they considered that such ratings and accreditations will become increasingly important and influential.

**Conclusions/ implications**

- 60% of relevant stakeholder groups are influenced by “green-ratings”, sustainability accreditations and endorsements concerning the use or specifying of various timber options. For half of these, it is an important consideration. For the other half, it is of definite interest, but often only of *slight* influence.
- Such ratings and accreditation may become increasingly influential.

**QUESTION: 71**

Stakeholder group asked: E, (10 total)

*“How do you regard timber generally as a material in respect to its inherent “green-rating”?”*

N.B. Question only asked to Group E

<b>a)</b>	Excellent and probably the best	<b>6</b>
<b>b)</b>	Very good and better than concrete and steel.	<b>3</b>
<b>c)</b>	Average not better than concrete and steel.	<b>1</b>
<b>d)</b>	Not very good, worse than concrete & steel	
<b>e)</b>	One of the poorest choices	

**Conclusions/ implications**

- Architects and designers consider that timber generally is a material with an inherently high ‘green-rating’.

## **QUESTION: 72**

Stakeholder group asked: E, (10 total)

*“Would you prefer to use/specify timbers from:”*

### **Results:**

**N.B. Question only asked to Group E (10 participants)**

<b>a)</b>	NZ grown exotic plantation forests	<b>1*</b>
<b>b)</b>	Imported exotic plantations	
<b>c)</b>	Sustainably managed indigenous forests from overseas	<b>1*</b>
<b>d)</b>	Sustainably managed NZ indigenous forests	<b>10</b>
<b>e)</b>	Any source	

\* Answers given as equal choices alongside d)

### **Comments/discussion**

All ten out of ten participants from Group E (architects/designers) surveyed would like to use or specify timber from sustainably managed New Zealand indigenous forests. It was selected as the clear choice preference. However, one participant also indicated equal willingness to use timber from source a) and another likewise from c). Two other participants who selected d) as first choice, indicated a) as a second ranked choice. Two others indicated that c) would be their second choice. One respondent commented that b) would be the least favoured and one respondent who indicated a preference for d) then c), qualified the choice by saying “But wood properties override [source considerations].” One commented that “If it is done here [SFM in NZ] we know it is done responsibly – ‘don’t always trust what is coming in from overseas.”

### **Conclusions/ implications**

- Architects and designers indicated a clear preference to specify/use timbers from sustainably managed New Zealand indigenous forests, above any other source.
- Timber from import exotic plantation sources was the least favoured source.
- There appears to be three preference factors: 1) sustainable forest management, 2) NZ-grown product and 3) NZ native timbers. This indication has positive implications for both the sustainable management of our natural forests and planted NZ native forests.

**QUESTION: 73 Law Changes**  
 Stakeholder group asked: A, B, C, G, (36 total)

*“Are any changes in the law required in regard to harvesting farm-grown totara?”*

Groups:	A	B	C	G	totals
<b>Yes</b>	4	7	3		<b>14</b>
<b>No</b>	1	1	1	3	<b>6</b>
<b>D/know</b>	4	2	7	2	<b>15</b>

**Remarks/discussion**

Nearly half of the stakeholders are not directly involved with the harvesting and milling of timber. Therefore, many have no practical experience with the application of the legal provisions of Forests Act and its administration. Nevertheless, that did not stop some from expressing an opinion on the matter. A few of the opinions calling for change were seemingly based more on principle of just wanting less rules and regulation than from actual experience with the process.

However, many did have opinions based on experience. These can be grouped into two general positions. The first would like to see totara exempt from any regulation. Several comments rejected all need for rules and regulation: “Owners should be entitled to mill without consent [need for SFM Permit]. The trees are only there because they have let them be there” and, “Change the law that enables it to be cut for firewood but not milled and sold as timber [without a SFM Permit]”

The second position seeks rather just a relaxing of the rules for farm-totara. This sentiment is reflected in the following comments: “Sustainability requirements seem overly onerous for farm-totara - I wouldn’t like to see it clear-felled, so some control is necessary but a bit looser than the present provisions” (x3) and “Law should be relaxed for regenerating or farm-totara otherwise it won’t be used – just tipped over and burned.” Several opinions were specific in what was required and consider “Farm-totara needs a separate provision under the Forests Act” (x4).

Other comments included: “Make more streamlined, cheaper, quicker, not registered on the land title because that is expensive. Have no controls on regenerating forests, but keep existing controls on old-growth forest remnants.” “Present system does not encourage maximising use of whole tree.” “We need to be able to sell native lumber overseas.” One was concerned that if totara is not as abundant in other regions then the laws need to take that in to account.

**Conclusions/implications**

- Many stakeholder groups have little practical experience applying the SFM Permit or Plan provisions of the Forests Act. Consequently, nearly half (45%) of the respondents had no opinion about whether the law should be changed.
- Of the stakeholders who did have an opinion on the matter, 70% consider the changes in the law are needed concerning the harvesting of farm-totara.
- While some reject the need for any rules, most accept that some controls are necessary, but that rules should be ‘relaxed’ for totara (at least in the

Northland region). Several suggested that regenerating totara requires a separate provision under the Forests Act.

## **PUBLIC PROFILE OF THE NORTHLAND TOTARA WORKING GROUP**

**QUESTION: 74** Profile of the Northland Totara Working Group  
Stakeholder group asked: A, B, C, D, E, G (48 total)

*“Had you heard of the Northland Totara Working Group before my contact?”*

Groups:	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>G</b>	<b>totals</b>
<b>Yes</b>	7	9	7	2	3	2	<b>30</b>
<b>No</b>	3	1	4		7	3	<b>18</b>

### **Conclusions/implications**

- More than half (62%) of survey participants asked had already heard of the Northland Totara Working Group before being contacted about this survey project.
- This suggests that many members of the key stakeholders groups at large, perhaps more than half, may have already heard of The Northland Totara Working Group.

## SUMMARY OF FINDINGS

### Stakeholder groups and composition

- The participants of the survey, listed below, generally had extensive experience using regenerated totara timber from the Northland region and many could also make comparisons with experiences using timber from old-growth totara trees from Northland and from other regions – especially the central North Island.
- The survey successfully targeted and engaged appropriately experienced ‘experts’ from the range of relevant stakeholder groups.

CATEGORY	Description of interviewees	Sample Size
Group A	<i>Landowners and people who have had experience with milling and or using totara timber for various purposes, but not at a commercial scale.</i>	10
Group B	<i>Portable saw-millers and timber merchants with commercial experience milling and or buying and selling timber.</i>	10
Group C	<i>Wood processors, furniture makers/ manufacturers, joiners and cabinet-makers etc. who have used or do use regenerating totara timber.</i>	11
Group D	<i>Wood processors, furniture makers/ manufacturers, joiners and cabinet-makers etc. who <b>do not</b> use regenerating totara timber.</i>	2
Group E	<i>Architects, architectural designer and interior designers.</i>	10
Group F	<i>Scientists and researchers involved with forestry, wood-quality and wood processing.</i>	6
Group G	<i>Carvers who have had experience carving or using regenerated totara timber for cultural purposes.</i>	5
	<b>Total</b>	<b>54</b>

### **Attributes of the trees**

- The survey captured experiences with the full range of log type and quality of totara trees and logs.
- Tree sizes ranged widely. Many participants have experience with timber from both younger regenerated totara trees and also older large diameter trees logs. Many had used timber from logs as small as 300mm in diameter and upwards to well over a metre.
- Log lengths for milling ranged from 1.8 to 7.0metres in length. Many people have milled and used totara logs that were only around 2.5-3.0metres long.
- Many participants estimated the age of the regenerated 'farm-totara' trees, that they have milled and used to be around 80-100 years old, but some were as young as 50 and others around 120 years old. Many have also experience with older forest trees that they estimated to be well over 200 years old.

### **Harvesting farm-totara**

- Anecdotal evidence ('bush-lore') indicated a preference for cutting native trees in late autumn/mid-winter "*when the sap is down.*"
- However, most felling and harvesting in Northland occurs in summer/autumn for practical access reasons. Dry and firm ground conditions are necessary for extraction.
- Most opinions recommended that felled 'farm-totara' trees (younger regenerated trees with less heartwood) should be milled within 4 weeks of felling to reduce potential risk of sap-stain and borer under the bark in sapwood.
- Painting ends of logs with wax emulsion appears to reduce splitting and end-checking.
- Heavy machinery involving the use of either a bulldozer/skidder/tractor with winch in combination with a digger with a grapple or thumb is recommended for log extraction and loading.
- Costs of felling and extraction vary widely. This process involves cross-cutting (felling, limbing-up, log-making) and extracting logs to a suitable mill-site or truck loading point on the farm. A range of between \$50.00-200.00/m<sup>3</sup> was recorded.
- The felling of large poorly formed (multi-leadered) farm-totara trees can present dangers to the feller due to tension within the tree, potential splitting of logs, and multiple limbs falling in different directions. Therefore tree felling should be undertaken by experienced operators using best practice safety techniques.
- No peculiar or unusual difficulties were associated with practical log extraction of regenerated farm-totara.
- All interviewees were aware that the Forests Act applies to the milling of naturally regenerated totara trees on farms.
- Many had some experience with the Forests Act process.

### **Milling farm-totara**

- Standard market rates generally apply to milling farm-totara.
- Band-saw mills are generally at the higher end of the range compared to convention portable saw-mills.
- Saw-millers generally consider farm-totara to be an easy timber to mill and rated it between *average* and *excellent* as a timber to mill.
- Some timber defects have been encountered during the milling of regenerated farm-totara. These include tension wood, knots, small pockets of rot, and occasionally sap-stain. However, the relative incidence of these various defects is not considered to be a significant problem associated with the timber generally.
- Recovery percentages of farm-totara were generally related as being consistent with standard recovery rates for each respective type of mill.
- These results suggest an average figure of 50% recovery of sawn-timber from round log volume. Milling of slabs may provide a higher initial timber recovery of around 70% of round log volume, but this does not account for any later re-sawing.
- Some furniture and joinery factories have specific requirements for timber in non-standard sizes. Therefore, whenever possible timber should be milled with an end-use or specific market in mind, or alternatively, milled into large dimensions for versatility and to keep market options open.
- 200x50mm boards was given as the most common target dimension followed by 150x50mm or 55mm thick slabs. If land-owners are unsure what dimensions to mill timber into, then the above dimensions may suggest common market preferences.
- 200x50mm and 55mm slabs retain maximum versatility and options for re-sizing.
- The above figures are nominal dimensions only. All timber should be milled over-size to allow for re-sizing options and machining. For example recommendations for the nominal 50mm dimension were to mill it to 54-55mm.

### **Air-drying totara timber**

- Although totara may not be as prone to sap-staining as many other timbers, the results suggest that it is still prudent to fillet green sawn-timber soon after milling to reduce risk of mould, fungus and sap-stain occurring.
- Farm-totara is considered to be a relatively easy timber to air-dry.
- A best-practice specification for air-drying totara was generally described as follows:
  - As soon as possible after milling, freshly sawn timber should be stacked 'in fillet' for air-drying.
  - Stacks should be made in a shaded location, preferably under an open-sided roof structure or otherwise outside with the top of the stack well-covered to keep the weather and sun off. A windy or draughty location will facilitate quicker drying.

- Stacks should be level and straight and started well above the ground level. 25mm wide fillets should be placed within 25mm of the ends of the stack and then at a maximum of 600-800mm centres (depending on board thickness).
- Fillets should be aligned exactly above one another vertically through the stack to correctly transfer the weight down and these lines should also align with dunnage (base supports of the stack).
- Stacks should be weighted and strapped for safety (for example in windy conditions).
- If log ends were not painted or waxed, prime ends of the boards with wax emulsion or acrylic primer to reduce end-checking and cracking in boards.
- Most experiences with farm-totara support the traditional rule-of-thumb of “an inch per year” for air-drying timber. This equates to allowing one year drying time for every 25mm of board thickness.
- Many have found that totara heartwood takes significantly longer (up to twice as long) to dry than the sapwood.
- Group C respondents (cabinet-makers and wood processors) tended to recommend longer air-drying times than many of Group B (saw-millers and timber merchants). Possibly this reflects some stability problems experienced with totara timber that was “not quite as dry.”
- Air-drying does not appear to be a problem area in the processing of totara timber. However, ‘finishing-off’ the drying process (such as in a kiln or dehumidifier) before use was often recommended.

### **Timber defects during drying**

- Just over one-third of participants have experienced some defects developing with farm-totara timber during the drying process. These include; surface mould, crook, sap-stain, surface and end checking, and borer under bark.
- Despite the occurrence of these defects most participants do not consider the drying of totara timber to be particularly problematic.
- Drying totara timber was frequently compared with drying *Macrocarpa* timber and generally considered to be similar in this respect.

### **Kiln-drying totara timber**

- 17 people had direct experience with drying (finishing-off) totara timber in either a drying kiln, dehumidifier or vacuum drier. Of these only three had had unsuccessful or imperfect results. One of these appears to be due to insufficient air-dry time before putting in the kiln. The other two involved totara sapwood but the exact details of drying process were not known.
- The results indicate that ‘finishing-off’ the drying process of totara timber in a kiln or dehumidifier can be successfully done.
- Totara heartwood may take 2-3 times longer to dry than the sapwood.
- Some consistent advice for kiln-drying includes the following. Timber should be air-dried first down to 15-25% moisture content. A slow drying process is

strongly recommended, with little or no heat (not more than 40 degrees). Target finished moisture content varied between 8-14% with 10-12% the most common target.

### **Grading totara timber**

- The survey results indicated that NZS 3631:1988 NZ timber grading rules for native softwoods are very seldom used. Most stakeholders were unaware of them.
- No consistent grading system was found to be used within or between the various stakeholder groups.
- The details of how grades are determined are not transparent. No set of written technical or measurable specifications was referred to.
- “Inconsistent grading” is a disincentive for some stakeholder groups in purchasing farm-totara and this appears to be a systemic issue.
- Encouraging the use of the existing NZS 3631:1988 or developing a new standard grading system specifically for regenerated totara may be of value.

### **Purchasing totara**

- Most cabinet-makers and wood-processors would prefer to purchase farm-totara in graded packets of air-dried timber. Some are interested in graded packets ‘green-off-the saw’.
- Carvers are interested in logs and large dimension totara timber or thick slabs.
- These results support what the Northland Totara Working Group has previously identified: the importance of having air-dry and ‘ready-to-use’ timber and products available to the market.
- Purchases for ‘green-off-the-saw’ are often in order to obtain timber at lower prices.
- With one exception, farm-totara only constituted a very minor volume of the annual timber used by Group C businesses (wood processors, furniture makers/ manufacturers, joiners and cabinet-makers etc). Generally, totara timber was not part of their regular use.

### **Stumpage and lumber prices**

- Many of the survey participants mentioned stumpage rates and sale and purchase prices for various grades of totara trees and timber. These figures are set out in a table in Section:7 –Questions: 28-36. However, many of these figures and values may be well out of date. The table does not constitute a comprehensive or accurate survey of current market values. Nevertheless it does demonstrate that there has been some market activity and interest in totara timber.
- There are wide ranges in values between and within various grades of totara timber.
- Clear heartwood grades command relatively high value.

- End-users, such as cabinet-makers, have paid higher prices for premium grades than timber-merchants.
- Carvers may pay good prices for premium log grades.

### **Working with totara timber**

- Farm-totara timber is considered to be a very good timber to work. It is considered to cut and machine very well. Its workability is often compared to *C. macrocarpa* and kauri.
- The incidence of defects and issues appears to be relatively minor, and these do not create a significant disincentive around the use of regenerated-totara timber.
- Totara sapwood is considered to bend well to form predictable and consistent curves.
- The oils in the heartwood and some movement of timber, especially from younger trees, are issues that have been experienced.
- Some people have found the dimensional stability of totara timber from regenerated trees to be less consistent than old-growth totara timber. Insufficient drying was often considered to be the reason for timber ‘moving’. However, some have related stability issues to young trees displaying tension within the timber at the time of milling. This was thought to involve trees growing on leans, steep slopes or at edge locations within stands and possibly unevenly branched. This has implications for the role of silviculture of naturally regenerating totara stands aimed at thinning out poorly formed trees and improving growth and form of residual trees.

### **Gluing totara timber**

- Only 3 out of 33 respondents had experienced problems gluing totara timber. Therefore it seems that the problem issues historically associated with gluing totara heartwood may no longer be a significant issue. Presumably modern glues and lesser heartwood content of the timber are contributing factors.
- Participants’ experiences with successful and unsuccessful glues on totara are listed in Section: 8 – Question 39. Contradictory information was received about the relative success of Aliphatic glues (PVA family) and ‘Gorilla-glue.’ However, a greater number of people indicated success with both of these glues. Perhaps some determinative information to clarify this contradictory information would be useful.
- Wiping the surfaces to be glued with a solvent first, especially for totara heartwood, was often recommended.

### **Finishing totara timber surfaces**

- Nearly half of participants have either experienced or know of problem issues with applying finishes to totara timber – particularly the heartwood.

- Nevertheless, respondents have generally found satisfactory finishing products/procedures and methods. A great range of successful and unsuccessful experiences with various products are set out in Question: 40 Section: 8
- There are some inconsistencies with the above experiences.
- Obtaining reliable advice from people with proven experiences is recommended.

### **Use and performance of totara timber**

- Farm-totara has been used for a huge range of applications. These include posts and rails in cattle-yards, gates, fence battens, house framing, weatherboards, lintels, decking, interior posts (in natural log rounds), a log-house, beams, joinery, ceiling linings, sarking, panelling, architraves, skirtings, flooring, doors, door-jams, window-frames, kitchens, bathroom vanities, furniture items, shelving, wood-turning and carving.
- Totara heartwood has been mostly used supplied or recommended for exterior situations where durability is an important issue. In particular, exterior joinery has been a main use. However, it has also been used for all other applications including interior uses such as furniture.
- Coloured and sapwood totara timber has sometimes been used, supplied or recommended for a variety of exterior situations. In some incidences it has been treated to enhance durability. Mostly coloured and sapwood totara timber grades have predominantly been used, supplied or recommended for interior applications – especially joinery, linings, finishings and furniture.
- Generally those surveyed have been *well-pleased* and satisfied with the performance of farm-totara timber for a variety of end-uses. Two were disappointed in the performance of totara sapwood – one for stability and the other for exterior durability reasons.

### **Durability of regenerated totara**

- Many wood properties traditionally attributed to totara were related to heartwood timber from old-growth trees.
- Most people distinguish a significant difference in the timber qualities of the heartwood from younger or farm-grown totara trees.
- Colour is the main distinguishing characteristic. The older and darker heartwood is generally considered to be more durable and more ‘oily’ than the lighter coloured heartwood or transition-wood from younger trees.
- Many considered the older heartwood was better or “crisper” to carve but also more brittle.
- Opinions vary widely on how durable the lighter ‘pinky’ heartwood is (insipient heartwood, or transition wood) from younger totara trees. Most consider it has some level of natural durability but less than deep dark-red heartwood from old-growth trees.

- The lighter-coloured young heartwood (or transition wood) from younger regenerated farm-totara was not recommended for ground-contact applications.
- Testing of natural durability levels of lighter-coloured ‘pinkish’ heartwood from younger trees may be useful to determine suitability of the timber for above-ground exterior uses.
- This survey found that totara sapwood has also been used for exterior above-ground situations. Sawn totara sapwood timber has sometimes provided reasonable service-life, suggesting that it may have some greater level of durability than sapwood timber from most other tree species. (N.B. However, despite these experiences, a level of durability of totara sapwood is not quantified or proven, therefore the untreated sapwood timber should not be considered sufficiently durable for exterior applications exposed to the weather). This is a priority for further research.
- Many participants consider totara sapwood to be relatively more durable than most other sapwood timbers and to be much more resistant to the common house borer.
- Most people who have used totara sapwood for interior situations have used it as untreated timber. Most have not experienced any kind of durability issues with using it untreated. (N.B.-However, totara sapwood should not be considered to be durable. Best practice techniques such as using dry timber, sealing it well and keeping it dry is still recommended).

### **Preservative treating totara timber**

- Practical experience is that totara sapwood can be very successfully treated with CCA treatment. This experience suggests slightly better results than the limited scientific test records indicate.
- Experiences with LOSP treatment of totara sapwood are presumed successful by the treatment plant rather than documented.
- Some people have used coloured and sapwood grades of farm-totara timber for above-ground exterior uses, such as outdoor furniture. Surfaces applications of various commonly available timber preservatives appear to have assisted in ensuring a reasonable service-life has been experienced.
- Natural oil finishes for items exposed to moisture may get a black discolouration.

### **Carving farm-totara timber**

- Old-growth totara heartwood timber is revered by Maori and considered by the surveyed participants to be the best carving timber of all.
- Younger regenerated totara trees and logs are considered to be inferior to well-seasoned old-growth heartwood timber. Nevertheless, participants still consider ‘farm-totara’ and totara sapwood to be a very good timber to carve.
- Carving well-seasoned or ‘dry’ timber is preferred, but practical constraints mean that fresh or ‘green’ timber is often used for carving. Managing the drying process is important to reduce checking and cracking.

- Traditionally cultural protocols were associated with felling and carving trees. However, all of the carvers interviewed have used totara logs and timber that have not been harvested under such traditional protocols. It was pointed out that this is an individual choice and that it was important to conduct activities with respect.
- All participants of this stakeholder group (carvers) indicated an interest in purchasing regenerated farm-totara.

### **Market potential**

- All survey participants with experience using totara considered that farm-totara has potential in the market-place.
- Those unfamiliar with totara may need more information to convince them that totara has market potential.
- All grades of totara timber were generally well-rated as being ‘*above average*’ in respect to appearance in comparison with other timbers. (N.B. refer to Section: 11, Question: 50, for images of the samples used grade).
- One surprising result was that overall the Clear Coloured and Clear 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 – comprising mostly Feature, Coloured and Sapwood grades.
- A peculiar ‘fleck’ appears to be a fairly common characteristic found in a portion of farm-totara timber. Although it was often acknowledged as being fairly common, little seems to be known about this feature. Opinions as to its ‘acceptability’ varied widely. Just over half considered it to be an attractive or positive visual feature in the timber. Its prevalence and the variation in opinion concerning it, suggest that it is a factor that may need to be taken into consideration during grading of farm-totara timber depending on market preferences.

### **Potential market position**

- Opinions about the potential relative market position of totara vary between the top of the market (i.e. equivalent to kauri and rimu) down to being equivalent to *C. macrocarpa*.
- The largest group of opinions suggest a market position for farm-totara is somewhere in the middle of this range generally described as: “*Cheaper than rimu and kauri but more than C. macrocarpa.*”
- It suggests that some grades of farm-totara timber could even command similar prices to high-value imported timbers on the market.
- These survey results indicate potential for farm-totara timber to be considered a relatively valuable specialty timber on the market.
- The high value of clear totara heartwood for exterior joinery is a traditional use that is still considered to be the main market for this grade. There is still an existing market for this use, but availability of supply was mentioned as a significant concern.

- By far most opinions on the target markets for coloured and sapwood grades point to interior linings, joinery, and furniture uses. However, a small portion of stakeholders also consider there to be market potential for treated sapwood to be used for exterior cladding and structural uses.
- Several stakeholders already have existing niche markets.

### **Market impediments and constraints: further research needs**

- Just over half of those interviewed consider that totara timber faces impediments and constraints in the market place.
- Predominately these relate to supply-chain issues of sufficient scale and quality of timber grades and continuity of supply.
- Other issues identified (in descending order of frequency mentioned and therefore priority) include market acceptance, legal issues, competition with other timbers, and physical wood properties.
- Determining relative durability of farm-totara timber grades was the most frequently identified information gap.
- Determining structural wood property values and assurance/confidence in various code compliance requirements is considered essential to open potential markets and uses.
- More information on the relative ‘softness’ of the timber and effects of various surface finishes would be useful.
- Trials and information on relative resistance to U.V. light (fading, yellowing etc) and the effects of various surface finishes on a range of factors, such as appearance (colour enhancement/protection), wear-durability/hardness, and fire-indexes, is important for architects and designers. These issues should be a research priority.
- Most of the timber-merchants, cabinet-makers, architects and carvers surveyed, indicated interest in purchasing farm-totara timber if a reliable supply and continuity of suitable grades was available.
- Class 1 natural timber durability is not an essential timber attribute for most architects as they consider farm-totara has potential for non-structural interior uses.
- If a clear timber preservative treatment process was required to ensure durability or code compliance for interior use, it would make totara of less interest to them, but not necessarily preclude most architects from specifying it.
- Information on relative durability levels and any necessary treatment for code compliant interior uses etc. would be useful information to architects and specifiers. This should be a research/information dissemination priority.
- Future trends towards more ‘green-rated’ buildings and recent fashion trends using more timber for interior linings may have future marketing implications for farm-totara.
- Determining whether totara can be used in processed and factory-finished products, such as veneer on plywood, may be worth investigating.

## Perceptions around the use of native timber

- Amongst all stakeholder groups surveyed there is overwhelming support for using native timbers from sustainably managed operations. However, most considered that the general public are less comfortable with any harvesting of native timbers for use.
- Architects and designers indicated a clear preference to specify/use timbers from sustainably managed New Zealand indigenous forests, above any other source. This indicates very positive implications regarding the future market potential for NZ indigenous timber from both planted and sustainably managed natural forests.
- Most stakeholders perceive a significant difference between the harvesting of regenerated 'farm-totara' and the harvesting of other native trees from areas of 'native bush'.
- Most stakeholders consider that harvesting regenerated farm-totara timber would be perceived as being more *ecologically acceptable* to the consumer than the harvesting other native timbers from native bush areas. This may suggest a key point-of-difference for the marketing of regenerated totara timber.
- Over half the stakeholders consider the sustainability of harvesting farm-totara is *important* for market acceptance. One third of the stakeholders consider it to be an *essential* aspect for market acceptance.
- Many of these opinions relate to sustainability in terms of continuity and availability of timber supply - leading to stakeholder interest in totara on the timber market.
- Most stakeholders believe that the general consumer is less concerned about the ecological sustainability aspects, but that it will become an increasingly important trend.
- Overwhelmingly, stakeholders believe that a strong market for farm-totara would change the way land owners view regenerating totara and that it would encourage the management of it.
- A few respondents were concerned that if not properly managed it could lead to exploitation and degradation of the regenerating totara forest resource.
- There is overwhelming support from stakeholder groups for the promotion of the use of farm-totara timber and the development of an industry based around the regenerating totara timber resource.

## Legal issues

- Over 70% of all stakeholders were aware that there are legal requirements pertaining to the milling of farm-totara under the Forests Act.
- Many stakeholders have used totara in past before the Forests Amendment Act come into force. Many stakeholders now ensure that timber comes from legally approved operations.
- Many stakeholder groups have little practical experience applying the SFM Permit or Plan provisions of the Forests Act. Consequently, nearly half (45%) of the respondents had no opinion about whether the law should be changed.

- Of the stakeholders who did have an opinion on the matter, 70% consider that changes in the law are needed concerning the harvesting of farm-totara.
- While some opinions reject the need for any rules, most accept that some controls are necessary (or desirable), but that rules should be ‘relaxed’ for totara (at least in the Northland region). Several suggested that regenerating totara requires a separate provision under the Forests Act.
- Most (70%) of stakeholders have confidence in the sustainability credentials of native timber produced under a MAF approved SFM Permit or Plan.

### **Accreditation**

- Most (85%) of relevant stakeholder groups were not aware of the government (MAF) endorsement on the Green-build website of the sustainability credentials of native timber produced under MAF approved SFM Permits or Plans.
- The sustainable status and credentials of native timber production generally may need better promotion.
- 60 % of relevant stakeholder groups are influenced by “Green-ratings”, sustainability accreditations and endorsements concerning the use or specifying of various timber options. For half of these, it is an important consideration and all indicated such ratings to be of interest.
- Such ratings and accreditation are expected to become increasingly influential.
- Architects and designers consider that timber generally is a material with an inherently high ‘green-rating’.

### **Public profile of the Northland Totara Working Group**

- More than half (62%) of survey participants asked had already heard of the Northland Totara Working Group before being contacted about this survey project.
- There is scope for the Northland Totara Working Group to promote itself more widely amongst a wider range of stakeholders both within Northland and nationally.

## **CONCLUSIONS**

This survey project has successfully captured valuable experiences, knowledge and opinions from 54 ‘expert’ participants selected from 7 key stakeholder groups. The results clearly indicate that the timber from relatively young naturally regenerated totara trees of farmland has been widely used. It is considered to be an excellent native softwood timber, relatively easy to mill, dry, work and finish. It is considered to be suitable for all interior uses, particularly feature linings, joinery and furniture.

All stakeholders consider it has very good market potential and they support the initiatives of the Northland Totara Working Group to promote its use and the development of a sustainable commercial industry around it.

Some potential constraints were identified. These are generally supply-chain issues, marketing and information gaps. The inherent quality of the timber has been confirmed. The results of the survey have highlighted various information gaps and provided some insights into the direction of further research.

Dissemination of the results and findings of this survey should help the various stakeholder groups by sharing valuable practical knowledge, identifying areas for further work, and highlighting potential market opportunities.

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