



Story: Hayley Leibowitz Photos: Tōtara Industry Pilot Project

Continuous cover forestry: A vision for Northland Tōtara

WHEN A GREAT MĀORI LEADER PASSES IT IS not uncommon to hear the phrase, a great Tōtara has fallen. Yet the cultural, spiritual and historical significance of this majestic tree has, in the past few decades, been largely put aside, with the *Podocarpus Tōtara* being viewed as a pest on otherwise farmable land.

The Tōtara Industry Pilot Project (TIP) has once more brought Tōtara to the fore, with its intention to use continuous cover forestry in the Northland region to harvest suitable trees for sustainable timber production at a commercial scale. The two-year project comes to an end later this year and, so far, the results show tremendous promise with the ultimate aim to establish a new Northland regional industry.

TIP has just received its first commercial order for Farm-Tōtara timber from JSC Timbers of Riverhead – 10m³ of KD25mm boards,

to be used for interior applications such as exposed beams, fins and rafters, and sarking – with further orders for the milled timber in the pipeline.

Paul Quinlan, consultant and TIP Steering Group member, was involved in the project from the start. Also responsible for operational delivery, he sources properties, assesses tree selection and arranges harvesting.

It all started in response to the increasing regeneration of Tōtara on farms over the past 50 years. “The stock don’t graze it, so it’s able to naturally colonise the farm environment and is therefore quite prolific,” says Paul. “This natural regeneration is particularly prevalent in Northland but there are other regions that have abundant regeneration of Tōtara.”

Past the harvest and milling phases, with two harvests so far, the Pilot project is now entering into the sales and performance

Facing page: Farm-Tōtara canopy with small crowns.

Above: Paul Quinlan re-measures a Tōtara tree in a permanent sample plot, to estimate the merchantable volume in the regenerated forest area and its growth rate. Such forest inventory is required to calculate what is a sustainable annual harvest volume.

Below left: Wide-spaced Tōtara trees, with branching crowns with no saw logs present.

Below right: Regenerating Tōtara seedling.





Top row: Careful tree selection and extraction is the basis of continuous cover forest harvesting. A total 300m³ of sawlogs were taken from three properties in Northland for the project.

Below left: Farm-Tōtara stand after harvest.

Below right: Logs were skidded to multiple loading sites on each farm.

analysis stage, says Paul: “So it will help provide all the information we need to really determine a business case for a regional industry. There’s still a lot to find out but I guess it’s fair to say that the results are encouraging.”

He says this encompasses the trees themselves, the timber harvested, the potential to execute sustainable harvest, and

continuous cover forestry practices in action: “Putting the forest management theories into practice demonstrates that it can be done, that the harvest has been successfully conducted, the timber’s been milled and the mill has wood that is easy to mill with good grade recovery. Typically farm-Tōtara has been milled with portable sawmills but in this project we’ve used commercial pine mills.”

Embracing continuous cover forestry

Continuous cover forestry is not a new concept but it is relatively uncommon in NZ. “It’s a case of adapting existing principles and models from around the world to our own unique environment, situation and ecology, interpreting and translating it to our situation,” explains Paul.

“We’ve had terrific support from landowners,” he adds. “When we first started the Northland Tōtara Working Group, I had a farmer say to me, ‘I’ve been saying for 30 years we should be doing something with these’. Those landowners are the ones that can see the resource, they understand the way it grows and many of them have been frustrated for a long time that they’ve been unable to make anything of it.”

He can also see the potential for workers to be involved in the silviculture, management and tending of developing areas: “It’s different to plantation forestry. It’s a lot more complex in terms of the decisions to be made and the choices of what to do. That’s what makes it really interesting. If this project is successful and an industry can start up, then there will be a need to have people that are trained to use these concepts and apply them, monitor and refine them in the field.”

And it’s different to the clear-fell plantations that dominate the NZ forestry industry in other ways too, he says: “It has to be done on a sustainable basis so that the harvest rate is less than what the forest is growing at. There’s no clear-felling. You’re individually



On one property a grapple digger and forwarder were used for assisted-felling and extraction. They worked from the paddock edge without needing to enter the stand.



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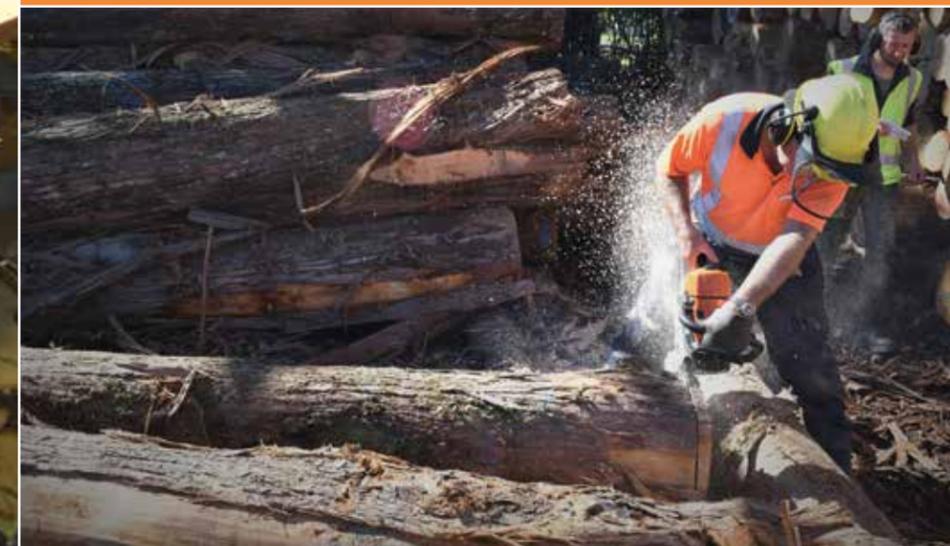
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Left: All boards were graded after sawing, according to the NZ Timber grading rules (NZS 3631:1998).

Above: Assessment of heartwood content in extracted logs.

Below: Taking discs from log ends for assessment of tree age.



selecting those stems from within the forest or small groups of trees for removal, with the emphasis on what's left behind, on the existing forest and making sure that's in good health and good shape for the future."

Essentially, in line with the Forests Act 1949, it's a case of selecting and extracting individual stems from the entire forest area to a single loading point. "It can be thought of as a production-thinning exercise in some ways," says Paul. This "stand improvement tool" effectively removes some of the poorer trees from the forest to the benefit of the better trees left behind. "The tree selection is probably the most critical part of continuous cover forestry, maintaining a healthy forest structure by careful tree selection and low-impact harvesting," he says. The average age of the harvested trees is 85 years, but they range between 50 and 150 years old.

"Typically, it involves a thicker-diameter tree with a shorter bole

and large crown, heavily branched, so it can be very difficult to remove some of those trees. And around those trees are often much better formed, younger trees with potential better recovery. In some cases, we come across groups of good trees side by side but the removal of one of them will still be of benefit to those left behind. So it's a case of looking at a small area of the forest and trying to imagine what the implications of that harvest will have on the structure and the future growth of that area – trying to leave it as well stocked as possible with trees that have the best potential for the future," Paul adds.

Of course, this involves plenty of logistical challenges when it comes to efficiency. Pre-selecting the trees for harvest and measuring and numbering them takes time and skill. "I select more than is going to be harvested, just so that we have some flexibility in the field. In the last harvest, I selected 101 potential trees and we

harvested 77 on that particular property. We keep a running tally on the volume and when we get up to the specified target harvest volume, then it's complete," he says.

The machinery used for the first harvest was a grapple digger for extraction and a forwarder, and for the second harvest was a D4 TSK skidder with 30m wire rope for extraction and a grapple-digger only for the loading of the logging trucks (standard truck and trailer units).

Paul explains that sustainable forest management shouldn't require any replanting for the forest to regenerate and replace the volume lost or harvested. However, he says there is scope for planting to be a natural complement to establish new forest areas: "Those areas will be 60 or 80 years away from harvest, so in the meantime it is this naturally regenerating area that already exists and is already growing at various stages that is the resource we

have to work with at present – it's almost the bridge to the planted resource."

Farms versus forestry

So for now, it's the stands of Tōtara in paddocks and the least productive areas of the farm, like the steep south-facing slopes where they manage to get a toehold, that are on the radar. The areas that are too steep to drive a tractor over, where trees are close enough to be winched out from the edge without machinery needing to enter the forest and where careful directional felling avoids damage to the remaining trees.

And that, of course, comes down to manual felling. "It requires operators skilled in directional felling and the tree selection is also heavily influenced by ensuring that what is selected can be extracted with minimal impact to the residual stand," says Paul.



All: These photos show a selection of how logs were milled, graded and dried at Northpine, Waipu, to trial operating at a commercial scale.

Health & Safety too, is paramount: “With the manual felling and the extraction, getting credible contractors that are capable of managing all those Health & Safety aspects competently is a critical aspect.”

Intended as a high value resource that will appeal to the domestic market, it has been difficult to find contractors for this small-scale type of harvesting. “They’re geared up with machinery that’s not suitable for farm-scale work in small volumes and spread across the landscape. So, finding contractors with suitable equipment and experience, small enough to do these harvests is a bit of a challenge,” says Paul.

He points out that this is also what makes it “a wonderful opportunity to integrate forestry with farming”. “In this project we’re

dealing with a forestry resource that has already established itself naturally on private land, typically where poorer pasture grows. So, it’s specifically occupying those areas of a farm that are arguably better-off forested anyway,” he says. “The remarkable characteristic of this resource is that it is woven into the farm’s landscape, so it’s complementary. Continuous cover forestry is the most suitable land-use option for much of the region’s marginal farmland.”

As to concerns about conserving this natural resource, the Tōtara, Paul says the project is about encouraging native forests to produce positive environmental outcomes. “Most people are actually very supportive of it. This isn’t about the timber, it’s really about forests and more native forests and it’s about land use... finding a sustainable land use option.”

So, it all comes down to conservation, biodiversity enhancement and landscape value with more native trees on the farm, he says.

On a wider scale, he says there would also be opportunities to integrate Tōtara and native forestry into areas of plantation forest – especially areas where continuous forest cover is desirable.

Quintessentially Kiwi

That’s on the practical side of things, but then there are the social benefits, points out Project Spokesman Peter Heath: “We envisage a Northland-based native timber industry that creates regional wealth and employment in parts of this region where jobs are hard to find and training opportunities are needed, so there are very definitely social outcomes here that we’re looking at.”



Above: The TIP project used local forestry contractors for all harvests and coordinated with landowners to ensure operation fitted with other farm activities.

Briefly at a standstill under Level Four Covid restrictions at the time of publication, Peter says they are using this period to conduct stakeholder briefings by phone. “It is important to the project that opinion-formers and decision-makers across the region understand what the project is about and can discuss it with other people,” he says.

And there are no shortage of those. The TIP is a highly collaborative project, with a range of partners including Scion, Tee Uru Raku, Northland Inc, Tane’s Tree Trust and Te Taitokerau Māori Forestry Collective. “There’s a whole raft of organisations involved in trying to deliver these outcomes,” says Peter, “and Māori are integral to the project. They’ve been involved every step of the way.”

Hēmi Rolleston, General Manager, Māori Forestry Futures at Scion, has embraced his role of identifying opportunities for Māori in the forestry space and across the value chain. Nothing could encompass that better than this project with its centrepiece being the Tōtara and he says it’s the connection between Māori and the forest that was the starting point for the TIP: “The intrinsic connection between Māori and forestry is very very special. Without doing a history lesson, the creation of mankind came from the separation of the sky and the earth, by the god of the forest.

I’m not a forester and I’m not a scientist, but when you talk about pre-European, pre-settlement, our country was covered in native forest.”

Himself Māori, Hēmi likens this project to another story which he was privileged to play a part in, the development of the Gold Kiwifruit. And it’s the story that comes with the Tōtara that matters he says. While the Gold Kiwi is unique to NZ and Māori, the Tōtara is already a number of steps beyond that, endemic to this country, going back centuries. “You could say the Gold is a Māori grown Kiwifruit. You can say that it was created in NZ and has been grown on a Māori land orchard by Māori people. Then you think of how far you can go back with the native tree species and when I take you right to the end where you think that product might end up, then you think of high value Māori carvings... it’s a special resource that is great for carving but obviously has other applications. That’s powerful... there aren’t many resources that we can trace across the whole value chain right to the end that could be for cultural purposes all the way along.”

The fact that the kaupapa of the TIP project is: “Kei te tohunga te whakaaro – the carver brings the wood to life,” speaks volumes.

Hēmi stresses that this is more than just a fledgling industry but is also about reconnection with the Tōtara and with the land,



Above & below: Product evaluation trials were set up for several interior and exterior products such as weatherboards, decking and wall panelling, and the performance of a range of coatings was assessed.



about a restoration of mana. “It’s allowing the people of the North to reconnect with the Tōtara because there’s a lack of knowledge, a lack of understanding, a lack of importance because over time we have, for want of a better word, been modernised and become distant from those areas. Even if the application is overseas or for walls and doors, furniture and tables... we’re still exploring... this is always going to be a value-based project, not volume-based,” says Hēmi.

With Tōtara already used to restore the floor of the Samuel Marsden Memorial Church at Matauri Bay, Northland as part of the project and with the thumbs up from Waka carvers and craftsmen, it is “the preferred carving timber among the Māori and certainly a treasure”.

“There does appear to already be strong interest in Tōtara. It has a terrific pedigree and there is significant interest in naturally durable timbers and NZ native timbers – enjoying that connection to the landscape and the history,” adds Hēmi.

Peter elaborates, explaining that this restoration is about the move away from treating the Tōtara like a pest, back towards “the old traditional respect and love that the people used to have for this tree”.

Of course, that sentiment has to be put into practise says Hēmi:

“We thought we were aiming primarily at a domestic market but the indications at this point are that to make it a viable business, we will need to go global and we will need partners. Māori have been identified as a key partner from the beginning, so they’ve had input at every point, from a sociocultural to environmental and economic perspective.

“To be frank the project doesn’t really exist without Māori. We’re still building a business, building a market, and only Māori will be able to authentically tell this story. It’s long term, intergenerational and with strong relationships around the environment and protecting the resource – we don’t want somebody else telling it.”

Challenges and rewards

As a new forestry model, the project comes with its own set of inefficiencies and challenges, for instance taking Kiwi dogs through the forest prior to harvest, to make sure no Kiwi birds could be injured in the harvesting operations.

“It does involve a lot more complexity and steps,” says Paul. “But getting a sustainable model is a lengthy process, it’s time-consuming and it’s very costly harvesting in this low impact, responsible way. There’s logistical challenges and economies of scale and getting the right harvest crew and equipment and



Tōtara is an iconic tree species and revered by Maori throughout the country for traditional carvings of cultural significance. The kaupapa of the TIP project is: “Kei te tohunga te whakaaro – the carver brings the wood to life”.

machinery. It’s been a fascinating project to be involved with.”

Peter adds that the final stages of the project have been to make recommendations on changes that might need to be made to legislation to enable a viable industry: “The real nugget coming out of all of this is that it all needs to be done based on the principles of continuous cover forestry, so that it’s achievable – but not by sacrificing any of the management principles. If it can’t be done to those strict principles, then it won’t be done. The question is: Is it viable? That’s what the pilot project is trying to find out.

“This is not competing with pine trees.

A Tōtara industry could even add value and complement plantation forestry, for example, with veneer products. However, questions remain around the actual existing volume of good quality logs.

“There is a significant resource out there already, but it is an untended, unmanaged resource. If landowners no longer view it as a problem, but actually encourage the natural regeneration of Tōtara on farms, sustainable management of that resource on a modest-scale, offers huge potential. That necessarily requires a long-term view and a vision, but it has significant growth and promise for the future.” ^[NZL]



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