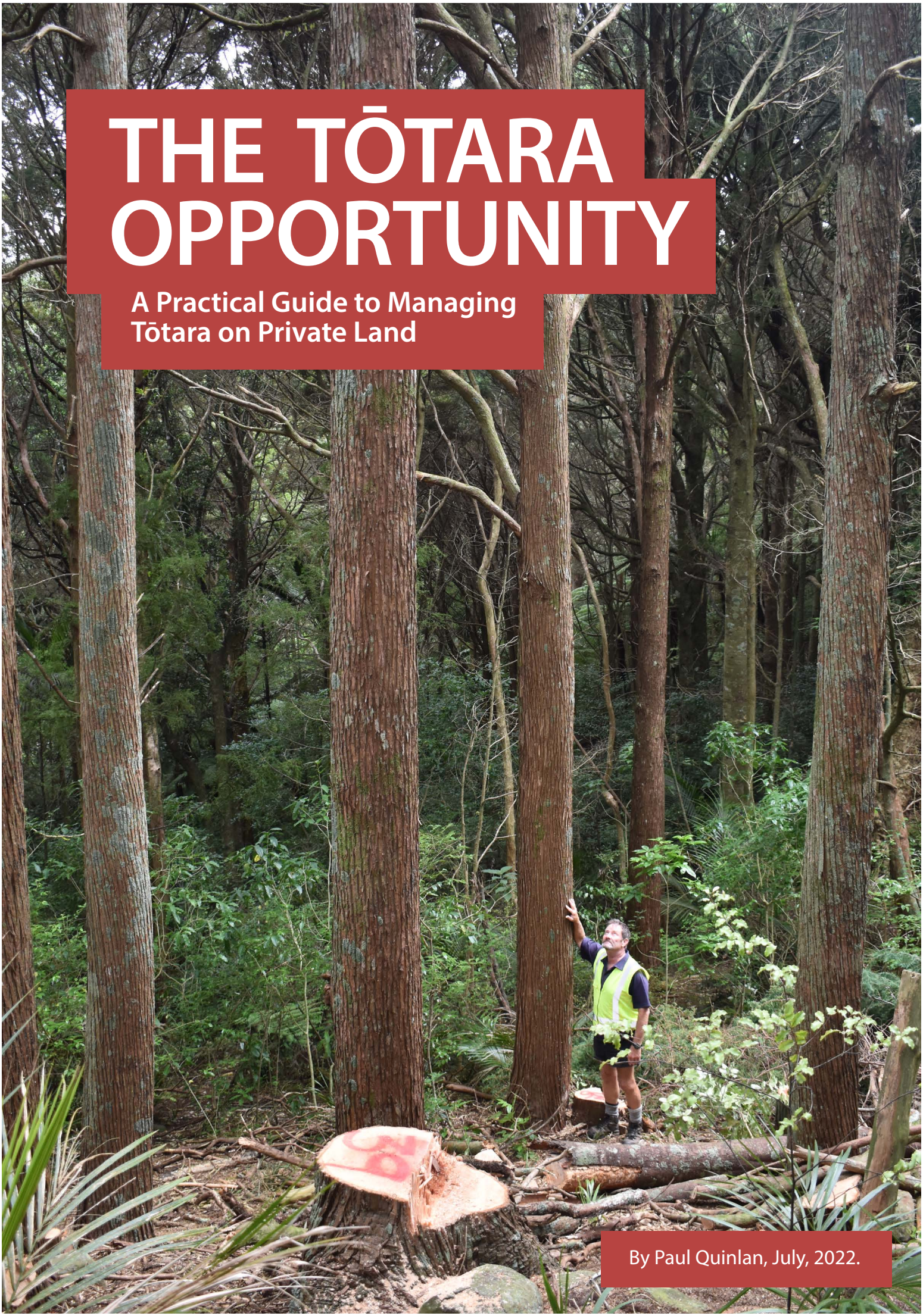

THE TŌTARA OPPORTUNITY

A Practical Guide to Managing Tōtara on Private Land

By Paul Quinlan, July, 2022.

Contents

Acknowledgements

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My fellow trustees and many other people also make up the vanguard of this effort to create a better world. They include landowners, regulators, academics, managers, consultants, trusts, government agencies and advisors, visionaries, policy analysts, journalists, campaigners, and general supporters. They are too many to acknowledge by name. They know who they are, and I'm grateful to them all.

Design and layout by Abby Davidson Design.

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Te Uru Rākau New Zealand Forest Service

1. Introduction

The New Zealand Indigenous Tree Bulletin No. 1: *Tōtara - Establishment, growth, and management*, by David Bergin, was published in 2003. It is based on his PhD thesis and comprehensively covers topics ranging from seed collection, propagation, planting, growth rates, and timber. Furthermore, it highlighted the phenomenal natural regeneration of tōtara in many regions. This provided the necessary science-based platform to encourage renewed investigation into the potential of the species to be planted and managed for both timber and non-timber values.

In 2017, Philip Simpson's consummate book on tōtara - *Tōtara a Natural and Cultural History*, was published. It is a feat unlikely to be bettered and provides an enduring treasure in anyone's bookshelf. It delivers, as its title promises, a rich and complete history. And I defer to it on all such matters. It provides essential perspective as we contemplate the future management of tōtara for multiple values. Simpson stresses the need for conservation, but without closing the door on some sustainable management for cultural purposes, including some timber production. In doing so, he leaves room for complementary efforts, ideas, and visions for the future of the species in Aotearoa. The following is my contribution in that regard.

As the carefully chosen title states, this is to be a *practical guide* and is about *management* of the species on private land. It tries to add to the excellent publications acknowledged above, by focussing on the topics of silvicultural management for timber production and harvesting. The following chapters contain practical information and advice based on my experience with these aspects. It focusses on forest management and leaves milling, timber properties and processing outside of the scope for now. Nevertheless, it is important to point out that studies confirm valuable timber can be produced even from relatively young planted or regenerated tōtara trees.

This guide is specific to private land, including Maori land, because on such lands, the breadth of management objectives and priorities may include many continuums ranging from conservation values, right through to areas where timber production is a major focus. And this guide unashamedly provides considerable information on the latter. There are several reasons for this. Managing tōtara for some timber production will be of interest to many readers, and unlike other topics, this information is not available from other sources. Furthermore, it is considered that timber value could be an effective vehicle to incentivise the planting and management of tōtara forests – for multiple purposes and benefits – on private land.

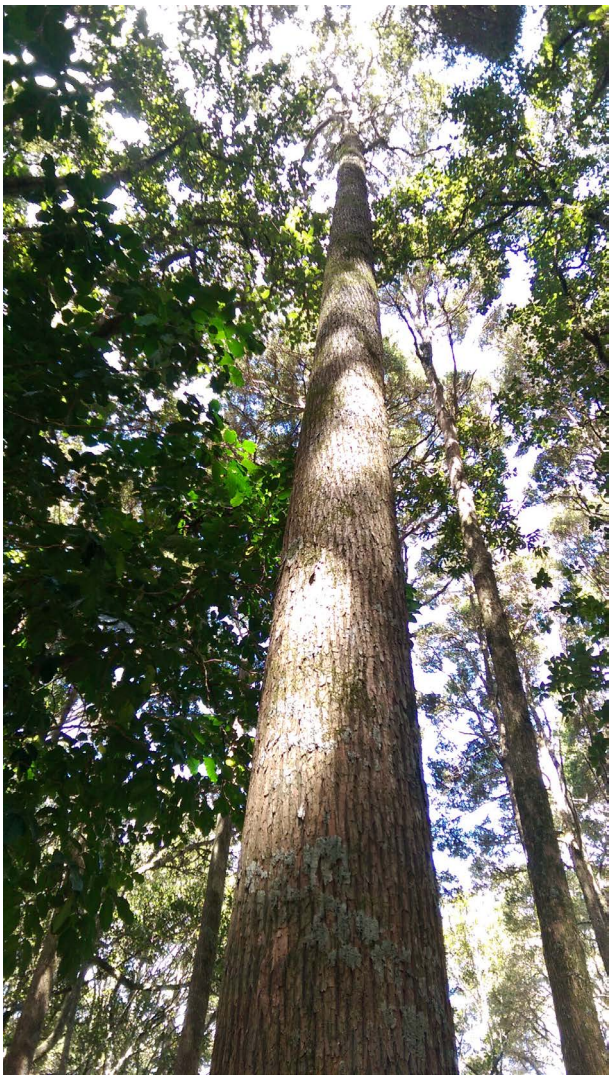
However, it is important to state that this is certainly not part of any wider agenda for timber production within conservation areas. Nor should it be taken as an inference that timber values should always take priority in privately owned forests.

There can be many subtle gradations and weightings of management objectives applied even within and across very small areas of forest on private land. This complicates management decisions. Deciding exactly what to do where, and to what extent, can be difficult. It will be shaped by the interplays between many factors, from the features of the site to personal preferences, perspectives, and even ideologies. However, all forests require active management, even those where conservation is the main objective, and I contend that in many situations management to enhance timber production potential is largely compatible with the maintenance of the many non-timber values within a forest.

Where tensions do exist between non-timber values and management for productive purposes, the owner or forest manager will have to decide what is most appropriate in their situation. And that may vary across micro-spatial scales within each forest. The features, characteristics, opportunities, and restraints present within native forests often vary within very short distances – even a tree length or two. Appropriate management plans and practices should respond to this richness and be accommodating of multiple forest values to protect and even enhance them where possible. The potential to do so, is one of the main advantages of indigenous forestry. This multivalent approach is likely to result in a sophisticated mosaic-like pattern of land use and forest management practices rather than an extensive, simplistic, single-purpose approach to management of a native forest area.

For reasons mentioned above, the content of this practical guide unashamedly presumes that timber production is a management objective and major topic of interest. Indeed, it dominates the content of the following chapters on:

- Planting and establishment,
- Pruning,
- Thinning, and
- Harvesting.



In practice, forest managers can and should apply this advice in a differentiated way to suit their unique situations and varyingly weighted management objectives across and within each forest.

The rest of this introductory chapter will attempt to place the management of tōtara forests on private land within a broader contextual perspective on land use options and issues. This may help readers refine their own thoughts and positions - especially on the controversial matter of harvesting native trees. Hopefully this will assist with deliberations and decisions on land use and management possibilities and especially where tōtara forests may fit in. It will also outline a vision and potential role for tōtara forestry.

Edward Beattie saying a karakia before a harvest as part of the Tōtara Industry Pilot project.

In the beginning...

Simpson's book outlines the Māori creation story and how the tōtara was the first big tree created by Tāne. He also contends Māori legends concerning the whakapapa of tōtara, can be metaphors, and "...the vehicle through which attitudes to the forest (and to life in general) were shaped." As an example, he relates the story of Rātā, the atua of travel, cutting down the tōtara tree which turns out to be a story that teaches the need to respect the forest for its products.

Finding and discussing additional meanings and truths in myths is part of their value. I see a parallel here with the ecological role of tōtara, as one of our few native pioneer tree species, often creating the initial tall forest canopy and a structure within which other smaller trees and shrubs can dwell. And the tōtara that Rātā cut down kept resurrecting itself – is it stretching things too far to relate this to the regenerative capacity of the species? Regardless of any such spurious interpretations, the legendary status and role of tōtara is irrefutable and needs to be acknowledged.

Land uses and forestry inevitably reflect our cultural values. Fortunately, these can and do change. As Simpson contends, myths can shape our attitudes and practices. The lesson to respect Tāne's forest is still relevant and can still help shape our attitudes and approaches to native forestry in Aotearoa, now and into the future.

2. Weaving native forests into our working lands

The challenge of encouraging native afforestation

Back in 2001, Morgan Williams, as the Parliamentary Commissioner for the Environment (PCE), challenged us to find ways to 'weave' more native plants back into our working lands. This reflected the recognition that

"Native plants... are a key to maintaining the ecological health of New Zealand's lands and waters, which underpin the country's social and economic well-being. Reintroducing native plants into working landscapes will also play a role in strengthening New Zealand's 'sense of place', and achieving desired biodiversity outcomes."

Twenty years later, in 2021, He Pou a Rangi – the Climate Change Commission of New Zealand recognised that native forests not only sequester carbon but provide multiple co-benefits, including cultural, biodiversity, erosion control and water quality benefits. And, consequently, it recommended[1] a comprehensive national programme to incentivise the establishment (by planting and natural reversion) of 300,000ha of new native forests. However, it recognised that that would be an ambitious challenge noting:

"...there are currently limited incentives for landowners to change less-productive farmland to native forests".

It also mentioned the need to protect and manage pre-1990 native forests (existing native forest areas that are ineligible for carbon credits through the Emissions Trading Scheme).

Pointing out possible ways to enable the large scale of reforestation needed, the Climate Change Commission's report stated that;

"In some places, if managed appropriately, there is also potential for new native forests to be selectively harvested to provide high-value timber and non-wood forests products, while still being considered 'permanent'"[2].

However, the *"barriers to the expansion of native plants on private land"* that Morgan Williams identified, remain. These were:

- a lack of markets for the range of services and products sustainably managed native plants can provide;
- limited research and knowledge to support the ecologically sustainable management of native plants on private land; and,
- individuals and organisations holding entrenched positions about the use of native plants rather than undertaking to explore the issues through open and informed debate.

With that 2001 paper, Morgan Williams aimed to "stimulate thinking and to encourage debate about the uses and services native plants can provide and how this valuable resource should be managed."

The wide array of ecosystem services, benefits, and values that native forests can provide has been well established. And it is widely recognised that native forest cover would be an elegant way to address the pressing environmental crises of our times – being the freshwater, biodiversity, and climate-change crises. The need and urgency to find effective ways to encourage the 'weaving' of more multi-functional native forest into our working lands, and to protect and better manage the areas of existing native forest on private land, is now acute.

"Establishing more native forest cover is a panacea for our environmental problems."

[1] Ināia tonu nei: a low emissions future for Aotearoa Advice to the New Zealand Government on its first three emissions budgets and direction for its emissions reduction plan 2022 – 2025

[2] He Pou a Rangi the Climate Change Commission. Ināia tonu nei: a low emissions future for Aotearoa, Chapter 18.2, paragraph 27, on page 318.

Naturally regenerated tōtara stands on private land can be managed for multiple purposes – some sustainable timber production and all the environmental benefits that come along with native forest cover.

Weaving more native forest into the rural production zones will be a challenge. However, it is not only important for environmental reasons, but also for landscape character and 'sense of place'. We want native forest to also be a relevant part of our everyday working lives and landscapes.

Native forestry as an appropriate land use option

Successfully integrating more native forest into the rural production landscape, and sustainably managing and enhancing what is already there, will be a significant challenge. Native forest cover will need to take on many different forms and functions. In this context, continuous cover native forestry has a potential role to play. This is not to say that timber production should be a management objective for all areas. But in some places, it might present a way to help make native forest cover a viable land use option on private land. However, greater acceptance of native forestry as a legitimate and appropriate land use activity will still be needed to realise this potential. And this will need to be reflected in policy, regulations, and public opinion.

Fortunately, we already have some good examples of continuous cover and sustainable indigenous forestry in New Zealand such as John and Rosalie Wardle's Woodside Forest in Canterbury, and the Tōtara Industry Pilot project in Northland. These show that it is possible to implement low-impact sustainable native forest management within our working landscapes.

Part 3A of the Forests Act permits some legal harvesting from native forest areas on private land but requires this to be done on a sustainable basis.

"Nature-based forestry is 'a blend between art, culture, and science'. Forests are managed on a continuous cover basis, for multiple values – including timber production where appropriate"

The emphasis should be on management of a whole and healthy natural ecosystem and where timber production is only one objective to be managed in a compatible way with the many other cultural, environmental, and recreational values in each part of a forest. Generally, this means working with natural regeneration, mixed species, mixed ages, and no clear-felling. This is largely congruent with a Te Ao Māori view – and some of us see scope to build on this to create a new forestry model for Aotearoa. One that regenerates not just the environment, but also a more appropriate relationship between people and nature, land use and kaitiakitanga. This is an aspirational vision.

3. The tōtara opportunity

Naturally regenerating tōtara presents an opportunity to realise the sustainable native forestry vision described above. This potential was highlighted by Dr David Bergin's work and has been developed and refined over the years by the Northland Tōtara Working Group (NTWG): https://www.tanestrees.org.nz/about-us/northland-totara-working-group-ntwg

The practicalities and business case for a new native timber industry – based on sustainably managing tōtara on private land, have been confirmed by the Tōtara Industry Pilot (TIP) project. The reasons to support and promote development of such an industry are also well articulated on the TIP website: https://www.totaraindustry.co.nz

In short, it is considered that a sustainable tōtara timber industry – unlike the native logging of the past – would not only encourage the proliferation and management of regenerating tōtara but would also encourage the planting of significant new areas of forest – as a complement to natural reversion.

While cutting down trees to encourage more native forest may seem counter-intuitive, it is based on the understanding of how markets drive rural land use changes – or reinforce undesirable ones. The key premise is that achieving large-scale native forest cover on private land will need the support of markets to become a viable land-use option. If it can become a rational investment or land use option, then it will happen. Morgan Williams called this re-engineering of the production system "Growing for Good" in a later PCE publication with that title.

"The premise is that markets can support appropriate land uses. Engineering that outcome is the challenge."

Markets drive land use changes. Getting markets to support native forest cover as a viable land use option will be essential for native reforestation at a significant scale.

Advanced regeneration and scale

To realise this vision with its ideal landscape outcome, a suitable tōtara timber industry needs to be developed to bring native forestry as a land use into existence and support it. This is no small feat. Fortunately, the significant areas of existing natural regeneration on private land provide a springboard. Unlike other alternative forestry species, which struggle to have sufficient scale and potential continuity of supply to attract a strong market interest, the advanced regrowth of tōtara on farms has a natural advantage. It is not a case of having to wait 80 years for planted forests to reach a harvestable stage. A level of sustainable harvesting can commence now to build market awareness and value. A modestly sized tōtara timber industry could start now.

"We don't need to plant and wait 80 years. Naturally regenerated trees mean a sustainable tōtara timber industry could start now."

Planted tōtara stands have the potential to be the complement to this natural resource. A sustainable tōtara timber industry would give landowners greater confidence to plant and manage more too.

83 years was the average age of the tōtara trees harvested as part of the Tōtara Industry Pilot project. Advanced natural regeneration on some farms could enable a sustainable industry to start now.

Fear of regulations and lack of financial incentives often results in clearances of reverting indigenous vegetation even on steep, marginal farmland. In this case, many pole-sized tōtara amongst the kanuka were just right for pruning up, but have instead been cleared and burnt. The regeneration process will start again.

Forest Ecologist, Dejan Firm from Scion, discusses growth rings of tōtara with Furne Patuwai at Northpine, Waipu.

Good prospects for the species

Te Taitokerau Maori Forestry Incorporated have indicated that they wish to be the entity to progress this tōtara opportunity, at least in the Northland region. For landowners interested in realising any timber value from their regenerated forests, or interested in establishing new tōtara dominant forests, this should be encouraging. Some coordination and or collective management for industry development would be an advantage.

There appears to be good prospects for native forestry based around the management of tōtara on private land.

Similar prospects would exist for some of our beech species in certain regions.

Monocultures verses nature-based forestry

Tāne's Tree Trust fields many inquiries from landowners interested in establishing plantations of tōtara. Generally, the trust promotes mixed-species continuous cover forestry as a more sophisticated form of forestry. However, it would be inconsistent to be too purist about it and treat plantation forestry with native species as being somehow illegitimate while plantation forestry with exotics is acceptable. Therefore, prescriptions for monocultural tōtara plantations have also been included as valid management options in the chapters of this guide.

This is consistent with the idea introduced further above that weaving more native forest into the production landscape will need to take on many forms. Continuums or gradients from more to less natural forest structures, characteristics, and management will exist. Furthermore, native forests are enduring elements in the landscape. Management ideas can and probably will change over time. I believe it should be possible to transition a native plantation to near-natural/continuous cover forestry. Indeed, significant structural changes often occur with natural forest establishment and through long-term successional processes. Many stands of naturally regenerated tōtara on farms have developed with near mono-cultural plantation characteristics. Encouraging more native afforestation is the priority at this point, refining the management prescriptions and options will be a continual exercise.

Trail-blazer roles for tōtara (and beech)

As intimated above, the characteristics of a forest during the establishment phase will be different to the potential climax community of a sustainable mature forest. Pioneer tree species like tōtara and beech are useful for successful forest establishment. Tōtara plantations can provide the first canopy and forest structure or framework to support an increasing diversity of other indigenous forest species – especially the more exposure sensitive broadleaf plant species. In this way, tōtara can be seen as a species with an important role in our country's native reforestation ambitions – perhaps echoing the creation story of Tāne's forest.

There is another trailblazer role too. While many other species also have worthy timber attributes and potential – it is probably wise to first prove success with the most promising native timber species – tōtara and beeches. If we cannot make native forestry work with these species, then the likelihood of success with other native tree species is even more remote. But if successful, other native timber species may ride on the coattails of a sustainable tōtara and or beech timber industry. So, while the focussed emphasis on tōtara - a single species - may seem unbalanced, its potential role as a trailblazer for diverse native forests and native forestry generally, is part of the reason for it.

"Timber value may be a useful vehicle to encourage the sustainable management of naturally regenerating tōtara forests and the planting of more areas in native forest."

4. The aspirational vision

An interwoven world

Imagine an idyllic rural production landscape. One where native forest is an ingrained and prominent feature, forming an extensive web. The many tracts of native forest and wetlands are interconnected with corridors of native bush along riparian margins, and in the steep gullies within pasture or plantation forests, and as shelterbelts defining each paddock or field. In this picture, native forest would occupy all the sensitive areas of the land, like the connective grouting of a mosaic pattern, a local vegetative matrix within which other land uses are nestled – a filter to our waterways and harbours. Native forest would be an inextricable and defining feature of the local landscape character.

Moreover, this web of native forest would also be a familiar part of our everyday working lives. Not just to look at, passively, from a distance, as something that we are alien to, and too scared to touch. But rather as something we know because we have nurtured it, tended it, worked in it. It is in our view. We know how it smells, how it sounds, and what work still needs doing and where.

These areas of bush would also help support our existence on the land, the timber would adorn our houses, we would build with it, treasure it, and take pleasure in the memories created by all these activities, and these connections to place, people, and our cultural heritages. Native forest would be a natural part of any rural scene when we imagine the future.

Peter Berg, chairman of Tāne's Tree Trust, tirelessly promotes all the values of native forests. Photo: @AlistairGuthrie/ ©PureAdvantage #OTātouNgāhere

Importantly, we would be proud of the sustainable management and environmental improvements that result from it - our kaitiakitanga and continuing efforts to learn and understand it. This increasing matrix of native forest would be an integral part of the local economy and an example of the type of regenerative 'nature-based' land use solution that was needed for the twenty-first century.

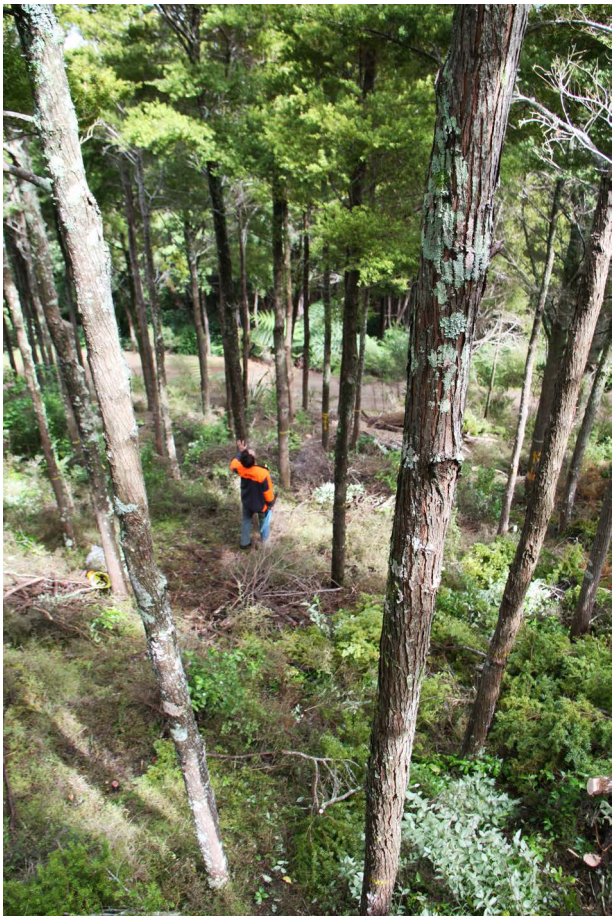
The local co-op would help advise and organise planting, silviculture, planning, harvests, sales, and research. It would ensure the native forest resource is sustainably managed at a landscape catchment level, not just for continuity of timber supply and marketing scale, but also for job continuity and the environmental benefits and enhancements. Local forestry advisors would help landowners with management plans and scope opportunities for further plantings and/or to encourage natural reversion.

Young people would be trained in the complexities of multi-purpose native forest management, both for timber and non-timber values, benefits, and products. Tōtara would be a key timber species in many places. Low-impact harvesting and continuous cover forestry would become standard practice and native forestry would be considered normal forestry. Local people would be doing the work, getting the benefits, but also facing the responsibilities.

Management practices would be adapted and refined in response to research learnings. And long-term monitoring would show continued improvements in the water-quality of local streams and harbours, resilience in indigenous biodiversity, and effective mitigation of climate-change problems...

Imagine that.

5. Realising the potential for tōtara on private land



What is needed to achieve the idyll painted above? The barriers identified by Morgan Williams can be refined more specifically for tōtara as:

- Lack of incentives – There is a need for timber and non-timber markets/industry development to support sustainable native forestry as a viable land use option.
- Limited knowledge - Research, monitoring, and adaptive management approaches to guide new sustainable forest management practices are needed.
- Conducive regulations - Effective controls to ensure sufficient protection and sustainability credentials, without becoming onerous disincentives.
- Public support and understanding.
- Some coordinated management, processing, and marketing to enable the many small forest areas to gain the advantages of a significant cumulative scale.
- An industry model with business plans and practices that are fit for the twenty-first century.

The Northland Tōtara Working Group

In 2005, Helen Moodie of the New Zealand Landcare Trust, and Dr David Bergin of Tāne's Tree Trust formed the Northland Tōtara Working Group (NTWG). It represented a range of stakeholders from landowners interested in the potential to manage regenerating tōtara on their land, to government agencies involved with promoting sustainable land management outcomes.

The NTWG set five broad objectives:

- Quantify the resource of naturally regenerating tōtara on private land.
- Demonstrate the growth response of naturally-regenerating and planted tōtara to silvicultural treatment (thinning and pruning).
- Determine wood qualities and potential uses of farm-grown trees.
- Investigate the feasibility of developing a supply-chain from resource to market.
- Identify and overcome hindrances and disincentives to sustainable management of naturally-regenerating and plantation tōtara.

The group has completed many projects aimed at addressing these objectives. So far all projects have concluded with encouraging results.

Mostly the projects have been funded by the Ministry for Primary Industries through the Sustainable Farming Fund, but with support from many other organisations too. Slow but incremental progress on all the objectives has been made. The results of the various projects are available via the 'Resources' tab of the NTWG pages on the Tāne's Tree Trust website – including the chapters and videos of this practical guide. However, there is still considerable work to do to realise the potential that the Northland tōtara opportunity presents. This will be ongoing and includes submissions and discussion with authorities on the regulatory issues.

Membership

A database of NTWG stakeholders is kept, including landowners with an interest in managing tōtara on their land. It is not exclusive to Northland. Latest developments and project results are sent out in NTWG newsletters to people on the NTWG mailing list. Membership is free. Anyone, throughout the country, who is interested in managing tōtara, is encouraged to join – Click here for the new membership page: https://www.tanestrees.org.nz/about-us/northland-totara-working-group-ntwg/join-ntwg

Taking it nationwide

Tōtara is a common species throughout the country, and its regeneration is observed in many regions. Ultimately, the Northland Tōtara Working Group may be superseded or develop into a more formal group – perhaps as a nationwide tōtara growers association, or the basis of co-op, to represent a tōtara industry's interests.

Cumulative resource scale

Regenerating tōtara on private land comprises many small areas, with a sporadic distribution pattern across many different properties. Few if any properties by themselves have sufficient scale of tōtara resource to offer commercial scale of supply and product continuity to market. Yet, cumulatively, the collective tōtara forest areas - over hundreds of individual properties - amount to a significantly scaled resource. For example, it is estimated[1] that on private land in the Northland region, over 200,000ha of native forest cover, contains tōtara at various stocking rates. Of that, around 30,000ha is estimated to be tōtara dominant forest and potentially available for sustainable management under Part 3A of the Forests Act.

[1] Estimates figures derived from NTWG work by Chris Kennedy in 2007 and later refined by the Ministry for Primary Industries. Excludes all conservation land, council land (e.g., esplanade strips), and QEII covenanted areas.

The cumulative scale of this resource is a significant advantage for the development of a tōtara timber industry and markets for the timber. However, capitalising on this advantage will necessitate some form of coordination of the collective resource. This also brings other opportunities for benefits such as training, permanent jobs, local work continuity, and accreditation etc. Naturally, there are also associated risks. It is imperative that any coordinating entity has the right ethical foundation to develop an appropriate business operation that ensures the long-term management outcomes live up to the potential – i.e., the idealistic vision, presented further above.

Potential to be a model example

The ingredients are all there to create a new and exemplary model for a primary industry – one based on sustainable long-term management of native forests for multiple values and benefits. Native forestry is arguably one the best opportunities to create the type of regenerative primary industry that answers Morgan Williams' call in *'Growing for Good'*.

In this context, I would be extremely disappointed if a twentieth-century styled tōtara industry results. That would squander the opportunity to prove to ourselves that, as species, as a nation, as a community, and as individuals, that we can put the relationship right between culture and nature. In contrast, what is needed is a truly sustainable and regenerative primary industry, with intergenerational perspective and values. Making it work with native forestry, particularly tōtara and beech, is the opportunity to find and guide the way – to create a forestry model that brings hope for the future.

Doing it

Bringing about a new tōtara timber industry will still require the convergence of many things. A mob of issues still need mustering through the gate. A sustainable supply chain needs to be engineered. That involves all the matters outlined further above, including public opinion, market acceptance, and more conducive regulations. It is a slow process. However, we have been making steady progress by keeping our sights on the long-term goal.

While it is important to have lofty aspirational goals, and for people to be working on the many aspects required to enable them to happen, ultimately, these ideas need to be put in to practice. Someone needs to start doing it – in the forest. This is where this practical guide to managing tōtara on private land comes in.

The advice presented in this guide will not be perfect. It is based on the limited experiences to date, observations, and doses of opinion. Management prescriptions will inevitably be revised and improved upon over time. Nevertheless, I hope that it provides inspiration and enough useful information to give people the confidence to take a spade, pruning loppers, or chainsaw, and to get out there and start doing it.

Whatungarongaro te tangata, toitū te whenua

As people disappear from sight, the land remains

For more information on managing tōtara, see the Northland Tōtara Working Group pages on the Tane's Tree Trust website:

https://www.tanestrees.org.nz/about-us/northland-totara-working-group-ntwg/

To join the Northland Tōtara Working Group (NTWG) visit (membership is free):

https://www.tanestrees.org.nz/about-us/northland-totara-working-group-ntwg/join-ntwg/

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