



TE KAAHU O TUAWHENUA



Issue 10 September 2016

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E te tii e te taa, tahuri mai ano ki te reo o Te Tuawhenua me Manaaki Whenua e karanga atu nei ki a koutou katoa, koinei te paanui mo te tau 2016. Haruru mai ana te Wao i te hinga mai o te totara e tiraha ana ki raro, koutou nga mate e kore e warewarehia, haere whakangaro atu. Tenei te mihi a Te Tuawhenua me Manaaki Whenua kia koutou katoa e takatu nei, nau mai ki nga pukorero a Te Tuawhenua.

The Tuhoe Tuawhenua Trust and Manaaki Whenua (Landcare Research) continue to work closely together. In this edition of Te Kaahu we report on the year for the activities of the Tuhoe Tuawhenua Trust, featuring our honey business Manawa Honey NZ. We also feature our project for bio-cultural monitoring of our forest biodiversity, which has involved the kaumatua of the Tuawhenua, and has become a major collaboration with Manaaki Whenua. We also report here on research examining the issues and opportunities for products and markets for tawa timber, which informs us for tawa timber production from our forests.



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TUHOE TUAWHENUA TRUST
with support from



Landcare Research
Manaaki Whenua

Tangiara Tawhara (centre left) and Korotau Tamiana (right), holders of forest knowledge for the Tuawhenua begin work with researchers Phil Lyver (Manaaki Whenua, centre right) and Mereru Beale (Tuhoe Tuawhenua Trust, left) identifying indicators traditionally used for assessing condition and changes in our forests and environment. This research is a key component of our bio-cultural monitoring project, reported herein. (Photo; Tuawhenua Collection)



Tuhoe Tuawhenua Trust in 2016

WHO'S INVOLVED

Trustees of the Tuawhenua: Tahae Doherty (Chair), Korotau Tamiana, Doris Rurehe, Hekenoa Te Kurapa, Tane Rua, Brenda Tahī (Executive Trustee)

TE KAUPAPA O TE TUAWHENUA

Our year for Te Kaahu now follows the timing for Matariki, and her time in the night sky. It also follows our beekeeping season, for when Matariki is ascendant is when we are resting (like our bees) and preparing for the next season. This is the time when we have some time to write about how the last year went for all that we do. 2015-16 brought us another challenging year that we now reflect on and see some real momentum on our strategic plan 2014 to 2017.

Our kaupapa set out in that plan remains:

- Te Iwi me Te Whenua: Te Whakapakari (Development of our people and the lands of the Tuawhenua)
- Te Taiao: Kaitiakitanga me Te Whakaoranga (Protection and enhancement of our ecosystems)
- Te Matauranga me Te Tuhonohono: Whakawhiwhinga (Contributing to knowledge development and linking of networks)

Particular priorities for us in 2015-16 have included job creation and training, growing the honey business in products and markets, contributing to our networks and our key projects for monitoring biodiversity and for restoring forest ecosystems.

We report on all of these priorities in this edition of Te Kaahu, either briefly following as part of this overview or as standalone articles.

CONTRIBUTION TO NETWORKS

In 2015, we sent Puke Timoti to represent us at a conference about Maori and CRIs, where he presented the development of our relationship with Landcare Research Manaaki Whenua over the years. Puke reports on the conference in the article following.

Brenda Tahī also represented the Trust at the annual conference of the NZ Ecological Society in Christchurch in November 2015. Brenda explained there the approach of the Tuawhenua Trust to conservation:

- Our lack of resources to turn around the degradation of our forests by introduced pests
- Our current focus on economic development that will sustain our people first and then gain the resources to invest in our people, land and forests in the future.

JOB CREATION & TRAINING

From our training programme in 2014-15, we have brought The Uamairangi Rangihau on as lead beekeeper, and Raymond (Harry) Te Kurapa has come on as a beekeeper apprentice, with others continuing to upskill as they work on a casual basis for the beekeeping business. We maintain a focus in training and development for beekeeping and queen raising in our operations, with Hekenoa Te Kurapa soon to complete formal qualifications in beekeeping from Telford Polytechnic in Lincoln. We will continue in this vein of training and development for staff in the future.

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Te Ara Putaiao Conference 2015

WHO'S INVOLVED

Tuawhenua Trust: Puke Timoti, Researcher, Biodiversity and Matauranga

TE ARA PUATAIO

Puke Timoti reports his appearance as a guest speaker at the Te Ara Puataio Conference held in Rotorua, June 2015:

“Te Ara Putaiao is a collective of Māori managers and scientists from each Crown Research Institute (CRI) established to bring Māori and CRIs to a forum to share knowledge and experience, that in turn helps identify opportunities to support Māori growth through science collaboration. The two-day symposium was the first of its kind, where New Zealand’s top research science companies and leading figures in the Māori economy joined forces to bring together a programme to showcase science and innovation through a broad range of case studies.

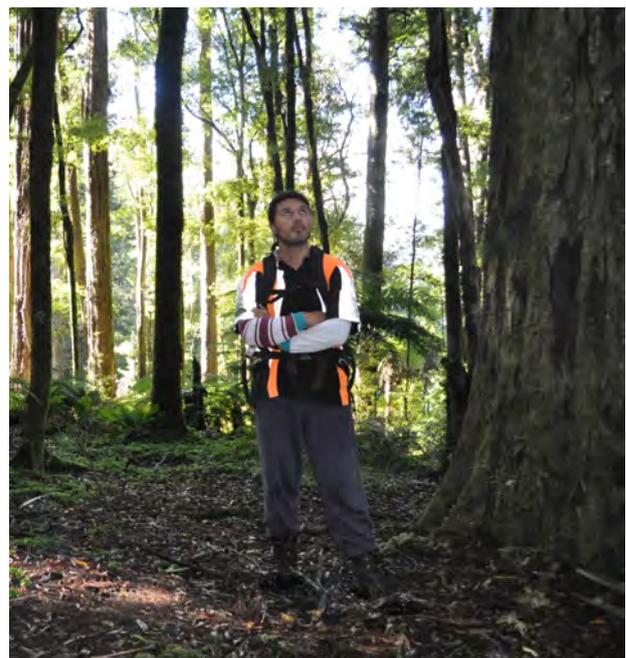
THE TUAWHENUA STORY

It gave us a great opportunity to share our story from the Tuawhenua, where we outlined the benefits of partnering with the CRIs, in particular our long and fruitful relationship with Landcare Research Manaaki Whenua. I explained how through working with the CRIs we have been able to advance our goals and aspirations of sustainable environment, self-sufficiency and economic growth.

I connected with many researchers in CRIs and other Maori driving development in their regions for their people. It was great too to see that Marino Tahi of Tuawhenua origins is the Chair of Te Putaiao, which role he executed so well for the conference. The programme consisted of a number of key note speakers and case studies including

workshops and discussion sessions. The conference dinner was another opportunity to network, and the entertainment by Tuaiwa Rickard and our very own ‘Nga Tamariki o Te Kohu’ of Ruatahuna completed a fantastic conference!

I was privileged to be part of an amazing line-up of presentations at the conference by scientists, entrepreneurs, business leaders, and government officials who are making a positive contribution to Maori growth and innovation throughout the regions. Because the event was so successful, there will be another held in 2016. I’ll be there!!”



From a conference in the city to the wonderment of Te Waonui a Tane... Below, Puke Timoti stands in awe of the forests of the Tuawhenua. The photo was taken during an excursion with kaumatua of the Tuawhenua into the forest as part of a project being undertaken with Manaaki Whenua. (Photo: Tuawhenua collection)

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Manawa Honey NZ

WHO'S INVOLVED?

Tuawhenua Beekeepers: Hekenoa Te Kurapa, Nick Mitai, Te Umairangi Rangihau, Harry Te Kurapa

Manawa Marketing Team: Brenda Tahī, CEO; Hinerangi Biddle, Executive, Sales & Marketing.

BEEKEEPING OPERATIONS

We have consolidated our beekeeping operations in 2015-16, increasing hive numbers, expanding the reach of our operation and introducing queen rearing to support our operations. Setting up the queen rearing was a major challenge for us but after a trial in 2015 and some mentoring from experts, Nick Mitai, our most experienced

beekeeper delivered the first season of good queens for the beekeeping operation. Te Umairangi Rangihau and Raymond Te Kurapa carried the beekeeping operation for the year with oversight from Hekenoa Te Kurapa.

Whilst the season in 2016 was not a good one, particularly for manuka flowering, good bee-keeping by the team gave us a reasonable production overall, whilst we also continued with increasing our hive numbers.

The patterns for flowering of native trees are hard to define. This year, rewarewa had a good year, but manuka was poor; tawari was good in some places but not so good in others. Rata and mahoe, our memorable first honey, remain elusive for us.



Sometimes it's hard to find the queen!! Hekenoa Te Kurapa and Nick Mitai are carefully examining these frames of bees to check the hive has a healthy queen. (Photo: H Te Kurapa, Tuawhenua Collection)





Rewarewa trees have emerged poplar-like in characteristic form above the shrubbery that has regenerated over the last century from early farmland development above Paripari flats, to the north of Ruatahuna, along the Whakatane River. (Photo: B Tahi, Tuawhenua Collection).

REWAREWA HONEY

The Manawa range of forest tree honeys includes rewarewa, alongside tawari and manuka. Rewarewa (*Knightsia excelsa*) is our indigenous honeysuckle tree that gives an outstanding honey rich in taste, antibiotic properties and anti-oxidants.

Rewarewa grows in groves in well-lit parts of our forest, and stands above the forest shrubbery as a fine tree of up to 30 metres in height. The flowers are clustered together on stalks with about 50-80 flowers in each cluster. The flower is designed for pollination by birds such as tui and bellbird, so it gives a bounty of nectar which our bees find to make this delicious honey.

Traditionally, the nectar of the rewarewa tree

was collected by our ancestors for a sweetener as it contains about 45% sugars – a true honeysuckle! The medicinal properties of rewarewa came to the fore where the inner bark was used for bandaging over wounds to check bleeding and help in healing.

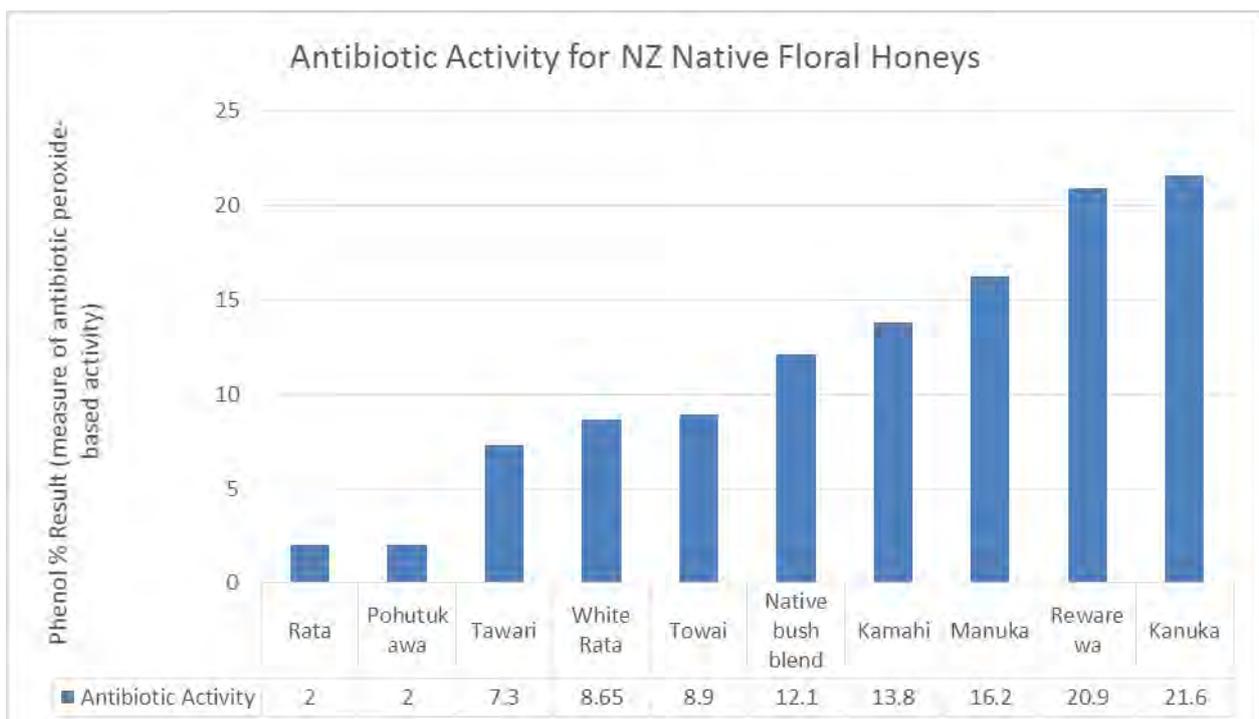
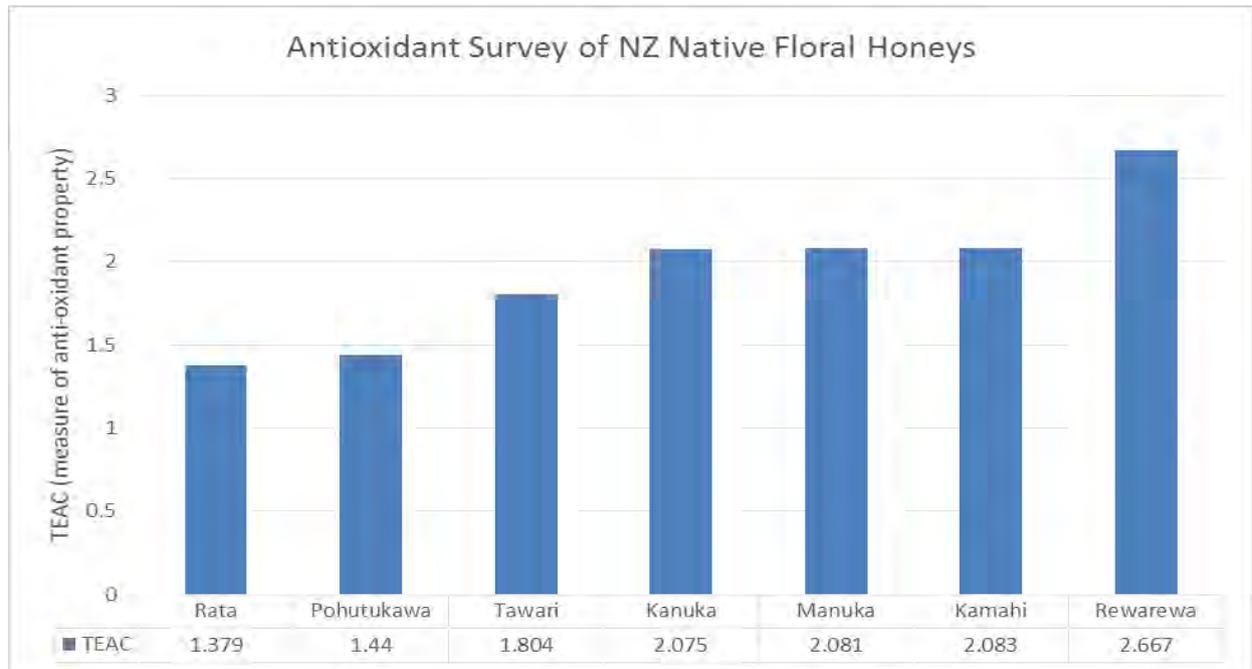
For us, rewarewa is a special honey that reflects the beauty and subtleties of our indigenous forests. It has a beautiful deep reddish amber colour and a rich, full-bodied taste. It also has exceptional properties (see the next section). Rewarewa is favoured by chefs for use in savoury and spicy dishes to create culinary delights. We recommend that rewarewa honey be used daily, straight from the jar, for your toast of course any time of the day, but especially good in tonic drinks with a dash of lime or lemon.

The fascinating form of the rewarewa flower is shown here. The flower literally drips nectar and is an important source of food for birds and insects, including our bees. (Photo: Kerewai Morunga, Tuawhenua Collection)



PROPERTIES OF REWAREWA AND OTHER NZ NATIVE FLORAL HONEYS

Rewarewa honey is known to have the highest peroxide activity of any NZ native honey which gives it anti-biotic properties. It is also high in anti-oxidants so is a very special health-giving honey from our indigenous forests. The results below are drawn from research by Dr Peter Molan – see <http://www.petermolan.com/> and <https://waikato.academia.edu/PeterMolan> for research papers on these topics.



MARKETING MANAWA HONEY

From small beginnings in 2013, we have now grown our product range and market presence throughout the country, mainly in the tourist sector, but we are also stocked in some food stores. Our gift packs featuring our range of honeys are particular favourites for 'take-home' gifts for tourists, and our larger sizes are widely sought after by discerning honey-lovers!!

We are working on export markets and are hoping to get first orders away this year.

See our website www.manawahoney.co.nz for more information on our honey products. Shop on-line if you would like to buy our honeys, or contact us if you would like to resell our honeys here in New Zealand or to them to export overseas.

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Honeys of Te Urewera by Manawa: Manuka 5+, rewarewa and tawari honeys in three sizes (500g, 250g and 110g) and a range of gift-packs.



Tuawhenua Forest Restoration

WHO'S INVOLVED?

Tuawhenua Trust: Richard Tumarae, Restoration Project Officer; Brenda Tahī Executive Trustee

THE PROJECT

This project arose out of a biodiversity assessment undertaken by the Tuawhenua Trust in 2012-13 that found that even in our seemingly pristine region nearly all of the forest in the Tuawhenua lands of over 9000 ha is degrading from the impacts of introduced pests. The best patch of our forests actually sits at Onini and Rangiora right in the heart of the Ruatahuna valley near the village and school, because parts of these areas have been fenced to exclude stock and deer. Our project aims to further protect these areas, with improved fencing and pest control to facilitate the rejuvenation of plant and bird-life. The project has delivered great results.

The project began with fencing the School Block (Rangiora) in July 2014 and pest control began in May 2015, with baseline monitoring finding very high infestation of the area with a range of pests, especially rats and mice.



Pest control is the major component of the restoration programme. Stoats are the one of the worst enemies of our forest ecosystem preying on our birds' chicks and eggs. This one (above left) has met its demise in our trap – a prize of our pest control programme! Blackberry (above right) has spread into parts of this forest and control has been undertaken to knock it down and avoid further spreading. (Photo: Richard Tumarae, Tuawhenua Collection)

THE RESULTS

The knockdown of pests in the first stages of the control programme killed rats, mice, hedgehogs and stoats. A check on infestation undertaken in early 2016 found that 90% of the tracking tunnels showed no tracks—that is pest levels were very low. These are outstanding results that we now see reflected in resounding birdlife in the protected bush areas.

Other measures have also improved the regeneration of vegetation in the forest. Fencing has impeded the entry of stock into the forest and blackberry has been sprayed throughout this forest plot. The land owners have also removed pine trees that stood within this block.

This project is funded by Biofund of the Department of Conservation and it will continue until 2018, maintaining the pest and weed control programme. We are hoping to extend this programme in the future so that we maintain at least this small part of the Tuawhenua forest in pristine condition. We also seek to work with neighbouring blocks to expand the scope of the programme to cover the areas of forest adjacent or near to the restored forests at Onini and Rangiora.



Tuawhenua Community-based Monitoring System for Assessing Forest Health

WHO'S INVOLVED

Tuhoe Tuawhenua Trust: Puke Timoti, Ecosystems & Maturanga Researcher; Celia Edwards, Mereru Beale (Researchers; Tahae Doherty, Korotau Tamiana, Tane Rua (Trustees); 'Kaumatua o Ruatahuna'.

Landcare Research: Phil Lyver, Science Project Leader, Sarah Richardson, Chris Jones, Andrew Gormley

THE RATIONALE

*Toitū te marae a Tāne
Toitū te marae a Tangaroa
Toitū te marae a Iwi*

Our opening whakatauki represents a fundamental principle of kaitiakitanga that

underpins the relationship between mana whenua their environment. The challenge for iwi and hapū however is to understand and describe how the realms of Tane (or Tangaroa) may have changed over the last 50 years or even 5 years? For example, how do you detect change in your environment? How do you decide when and what management action to apply? And how do you know when you have achieved your desired goals if you do apply management interventions?

Knowing how your environment is changing in response to different influences (e.g. climate change) or management action (e.g. predator-control operations) is critical for looking after the well-being of the forest and whanau. These are questions that confront



We took groups of kaumatua and bush experts of Ruatahuna into the bush as part of the development for this project, so that our monitoring system springs directly from the Maturanga o Te Tuawhenua. This group included Kohu Tawhara, Tane Rua, Kirituia Tumarae, Lenny Te Kaawa, photographed here with researchers Puke Timoti (left), Celia Edwards and Mereru Beale (centre left back) of Tuhoe Tuawhenua Trust, and Phil Lyver (right) of Landcare Research. (Photo: Tuawhenua Collection)



the Tūhoe Tuawhenua Trust in their management of the Tuawhenua forests.

Diverse societal worldviews however create differences in the way cultures relate to, understand, and measure the environment. We were conscious that members of the Tuawhenua community recognise different signals and understand their forest in a different way to that of scientific monitoring systems, with much of the understanding emerging from their relationship with the forest.

THE PROJECT

To tackle these questions, the Tuawhenua Trust and Landcare Research have been working with the Ruatāhuna community over the last 2 years to understand how people ‘measure’ changes in their forests and rivers. We were interested in developing a cultural monitoring system for the Tuawhenua forests that could be used by the community to record changes in their

forest.

Eighty semi-directed interviews were conducted with 55 kaumātua and community members to identify forest health indicators and the gradient of metrics to assess each indicator. Indicators were grouped under nine themes (*Pae Tukutuku*):

- Food procurement (Mahinga kai)
- Natural productivity (Hua o te whenua)
- Nature of water (Āhua o te wai)
- Nature of the land (Āhua o te whenua)
- Nature of the forest (Āhua o te ngahere)
- Perpetual occupation of land and place (Ahikaaroa)
- Spiritual dimension (Taha wairua)
- Physical health (Taha kikokiko)
- Mental health (Taha hinengaro)

Under these nine themes, all the indicators and metrics were aligned to either:



Kaumātua Te Whenua Te Kurapa (centre) and Tewi Teka (right) are assessing the forest canopy whilst researcher Puke Timoti looks on. Above, researcher Mereru Beale works with Kohu Tawhara to record his observations of the river (and take a well-deserved rest!) (Photos: Tuawhenua Collection).



- **A Field Survey Approach (Nga Pae Tata):** These indicators and metrics are used to measure short-term changes in the forest (e.g. sound of birds; amount of pellet or dung on forest floor); or
- **An Interview-based Approach (Nga Pae Tawhiti):** These indicators and metrics are used to measure longer-term changes (months or years) in the forest (e.g. timing of fruiting; openness of forest). An interview-based approach would be better aligned with assessing how community wellbeing indicators link to the forest. The different approach determines how and what information is collected.

A substantial decline in the percentage of the community venturing into the forest over the last 60 years for activities such as hunting, fishing, camping, and collecting plant resources was reported (Figure 1). This poses an issue when it comes to

detecting and monitoring changes in the forest. The decline in regular forest use by the Tuawhenua community suggested that a field survey approach could be an effective method for applying community-based indicators and to gain an understanding of forest health and condition. For this we asked community members to prioritise the field survey indicators they felt would be best to use to monitor the forest. The top 25 indicators and their measures were identified for implementation within a forest survey approach (See tables following this article).

A field survey approach provides an assessment at a fixed point in time, although the impressions formed of the forest by forest users is highly likely to incorporate their prior experience and knowledge of past forest health. The assessment of an indicator will therefore sit on a continuum depending on how an individual perceives or gauges the indicator (e.g., none, few, some and a lot) in relation

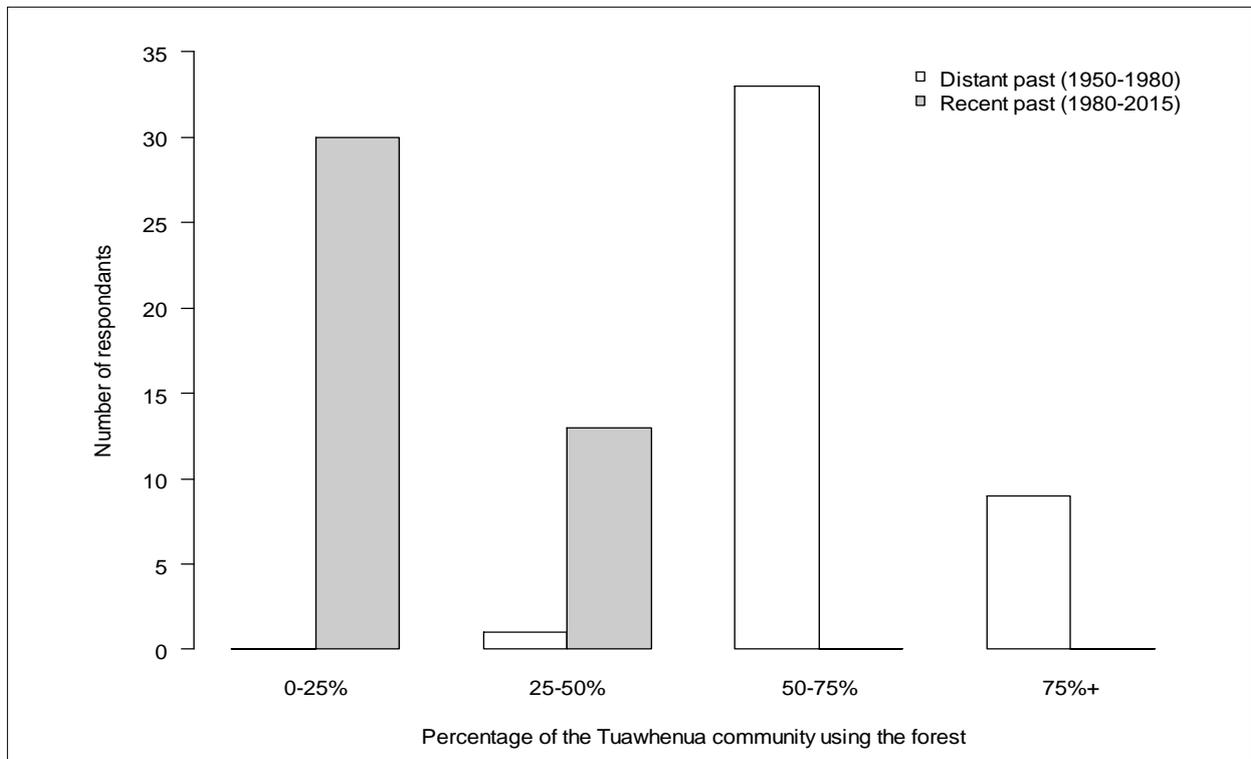


Figure 1. Percentage of people in the Ruatāhuna community using the forest in the distant (1945-1980) and recent (1981-2015) past, based on a survey of 43 individuals over the age of 55 years.



to the past. As with any primarily subjective indicator, there is likely to be marked individual heterogeneity depending on individuals' age, experience and frequency of forest use. For example, community elders who have seen the massive flocks of kererū (200–300 birds) in the past might grade a flock of 30 kererū quite differently to a younger community member who has only experienced kererū populations in their depleted state and therefore would consider 30 birds to be a large flock.

This “shifting baseline” or “ecological amnesia” is a characteristic feature of community-based monitoring systems where populations or ecosystems are changing over generational timeframes. It is also an issue for scientific quantitative monitoring systems which might lack historical monitoring records and can only report on population and ecosystem states ‘as of now’. In part, this reflects the imperative for measures to reflect the outcomes of current management responses such as pest control. However, an alignment of quantitative measures with

indicator gradients as understood by elders within a community as part of an assessment would provide context in which to view the current state of an ecosystem, support cross-generational consistency, and enhance the interpretation of results. It would help minimise the shifting ecological baseline effect.

The application of an indigenous community-based monitoring system in conjunction with a scientific-based approach therefore is likely to be highly informative over time. It also gives indigenous communities an important stake in the interpretation and decision-making processes, ensuring that biodiversity and cultural values relevant to their people are protected and maintained.

PROJECT SUPPORT BY:



Landcare Research
Manaaki Whenua



**Ministry of Business,
Innovation & Employment**

Here Sonny Te Kiira (centre) shares his knowledge with researcher Puke Timoti, whilst Tahae Doherty (right) looks on. Our researchers worked closely with each kaumatua in order to gain a good understanding of the knowledge and experience they were applying when assessing different aspects of the forest ecosystem. (Photo; Tuawhenua Collection)





Celia Edwards, researcher for the Tuawhenua Trust, works here with Hokimoana Hekerangi (above) recording her biodiversity assessments. Below, it looks like maybe these kaumatua don't always agree! Tangiora Tawhara (left) in deep discussion with Korotau Tamiana (on the right). The matauranga and perspectives of each kaumatua have been woven into the rich fabric we have developed as our framework for monitoring our forest biodiversity. (Photos: Tuawhenua Collection).



Culturally-relevant themes (Pae tukutuku)	Indicators (Ngā pae tata)	Metrics for assessing indicators	
Procurement of food (Mahinga kai)	The abundance of native birds in forest (visual observations)	<ul style="list-style-type: none"> • Full of birds; A lot • Heaps • Quite a few / Quite a lot • Not that great / Very few 	<ul style="list-style-type: none"> • Nothing (Kore); Diminished • Absolutely nothing (Tino kore nei) • Unknown
	The abundance of native bird in forest (sound of birds)	<ul style="list-style-type: none"> • Thunderous (Haruru); Deafening; Great noise – cannot hear yourself speak • Loud and noisy, but less intense • Noise faded; Not that great 	<ul style="list-style-type: none"> • Silent / Muted • Dead silent • Unknown
	The amount of possum and deer pellets or pig, cow or horse dung	<ul style="list-style-type: none"> • Everywhere; Carpet • Heaps • Quite a bit; Some • Hardly any (Kare i rahi); Not much 	<ul style="list-style-type: none"> • Nothing (Kore); Diminished • Absolutely nothing (Tino kore nei) • Unknown
	The condition and size of tawa fruit	<ul style="list-style-type: none"> • Large; Plump; Sweet • Pretty good size; Juicy • Mediocre; Some juice; Mildly sweet 	<ul style="list-style-type: none"> • Small; Dry; Bitter • Unknown • Not relevant
Natural productivity (Hua o te whenua)	The extent of flowering in the forest canopy	<ul style="list-style-type: none"> • Heavy flowering; Intense colour of blooms; Powerful strong fragrance or scent • Lots of flowering; Less intense colour of blooms; Some fragrance or scent • Sparse flowering; Faded colour of blooms; Little fragrance or scent 	<ul style="list-style-type: none"> • No flowers; No; colour; No fragrance or scent • Unknown • Not relevant
	The abundance of fruit on the trees in the forest	<ul style="list-style-type: none"> • Over-loaded (Matomato); Heavily laden (Makuru) • Plentiful (Manomano); Loaded; Heaps • Some; Quite a bit • Not a lot; Poor fruiting; Bigger all 	<ul style="list-style-type: none"> • Nothing (Kore); Diminished • Absolutely nothing (Tino kore nei) • Unknown • Not relevant
	The abundance of medicinal plant (rongoā) in the forest	<ul style="list-style-type: none"> • Over-loaded (Matomato); Everywhere (Makuru) • Plentiful (Manomano); Heaps • Quite a bit; Quite a lot • Few plants; Scattered plants 	<ul style="list-style-type: none"> • Nothing (Kore) / Diminished • Absolutely nothing (Tino kore nei) • Unknown
	The abundance of hen and chicken fern plants (mauku) in the forest	<ul style="list-style-type: none"> • A Lot (Matomato); Makuru (Everywhere); Countless plants • Plentiful (Manomano); Heaps • Pockets of mauku • Sparse and scattered 	<ul style="list-style-type: none"> • Gone; Nothing (Kore); Not there • Absolutely nothing (Tino kore nei) • Unknown • Not relevant; Wrong habitat for mauku





	The condition and quality of hen and chicken fern fronds (mauku)	<ul style="list-style-type: none"> • Long and luxurious; Good length and colour • Short and sparse • Short and withered 	<ul style="list-style-type: none"> • Unknown • Not relevant
	The abundance of tawa fruit on the forest floor	<ul style="list-style-type: none"> • Ground very slippery; A carpet of fruit on the ground • Ground slightly slippery; Heaps of fruit on the ground • Ground not slippery; Some fruit on the ground 	<ul style="list-style-type: none"> • Nothing (Kore); Scattered fruit on ground; Fruit is scarce on the ground • Absolutely nothing (Tino kore nei) • Unknown • Not relevant
Nature of water (Āhua o te wai)	The appearance of the river	<ul style="list-style-type: none"> • Beautiful; Free of weed or algae; No sediment disturbed when rock dislodged • Appealing; Some weed or algae; Some sediment disturbed when rocks dislodged • Not as beautiful; Quite a bit of weed or algae; A lot of sediment disturbed when rock dislodged • Offensive or ugly (Anuanu); A lot of weed; Weed or algae thick and slimy on rocks; Muddy looking • Unknown • Not relevant 	
	The quality of water in the river (in a normal flow)	<ul style="list-style-type: none"> • Beautiful; Crystal clear; Clean • Still clear; Some suspended sediment; Not bad • Murky; Cloudy 	<ul style="list-style-type: none"> • Dirty; Muddy • Unknown • Not relevant
	The language or sound of the river	<ul style="list-style-type: none"> • Crisp clear sound of water flowing; Sharp 'clack' of rock hitting rock • Sound of water flowing muffled; Sand and silt moving through water; Dull 'thud' of rock hitting rock • River still and stagnant; River noiseless; River muted over rocks • Unknown 	
	The structure and vegetation canopy cover of the riverbed	<ul style="list-style-type: none"> • Trees growing to edge of river right along channel; Stable river channel; Shaded river channel • Some trees growing to edge of river but with widening river bank in places; Partially shaded river channel • No trees growing to edge of river; Wide open gravel river flats; Unshaded river channel • Unknown • Not relevant 	
Nature of the forest (Āhua o te ngahere)	Appearance, beauty, health and condition of the forest	<ul style="list-style-type: none"> • Beautiful; Lush; Pristine; Thriving; Flourishing; Whole • Beautiful but rereke (changed); Patchy; Ragged; Scruffy 	<ul style="list-style-type: none"> • Barren; Bereft; Broken; Diminished; Lonely; Withered • Dead • Unknown
	The shape and layering of emergent forest canopy	<ul style="list-style-type: none"> • Beautiful; Full canopy • Canopy uneven; Canopy patchy 	<ul style="list-style-type: none"> • Prolific gaps in canopy; Canopy broken and dead • Unknown
	The colour of the forest canopy	<ul style="list-style-type: none"> • Glossy dark green • Olive green with patches of dark green • Olive green with shades of lighter greens and yellow 	<ul style="list-style-type: none"> • Grey and brown • Brown and dry • Unknown





	The language or sound of forest	<ul style="list-style-type: none"> Loud and noisy; Full diversity of sounds Still lively and active but less forceful Muffled; Quiet; Little sound 	<ul style="list-style-type: none"> Dead silent; No noise Unknown
	The abundance of saplings in the forest	<ul style="list-style-type: none"> A lot; Crowded; Dense thickets Plentiful; Heaps; Quite a few Not many; Sparse; Scattered; Isolated poles; Nothing (Kore) 	<ul style="list-style-type: none"> Absolutely nothing (Tino kore nei) Unknown
	The abundance of seedlings in the forest	<ul style="list-style-type: none"> A lot; Crowded; Carpet of seedlings Plentiful; Heaps; Common Not many; Sparse; Scattered; Isolated plants; Nothing (Kore) 	<ul style="list-style-type: none"> Absolutely nothing (Tino kore nei); Forest floor bare Unknown
	The amount of vegetation browse and damage (by deer and livestock) in the forest	<ul style="list-style-type: none"> Forest understory thick and impenetrable; No damage or browse Forest understory dense in places; Quite thick; Some browse and damage Forest understory sparse; Quite a bit of damage; Vegetation trampled 	<ul style="list-style-type: none"> Forest understory bare and eaten out; Vegetation absent; Easy to walk through Unknown
	The amount of possum sign (possum dung, bite marks and scratchings on trees) in the forest	<ul style="list-style-type: none"> A lot Common; Quite a bit Nothing (Kore); Not much 	<ul style="list-style-type: none"> Absolutely nothing (Tino kore nei) Unknown
	Amount of vegetation cover (e.g., ferns, seedlings) on the forest floor	<ul style="list-style-type: none"> Carpet of vegetation; Wide range of species present; Thick and luxurious; Soft underfoot; Little leaf litter exposed Pretty good vegetation cover; Reasonable range of species present; Ground still soft underfoot in places; Patches of leaf litter Not much vegetation cover; Few different species present; Ground feels firmer; Much leaf litter covering large areas Forest floor bare and open; Ground feels hard and compact; Leaf litter covering all of forest floor Unknown 	
Spiritual dimension (Taha wairua)	Strength and presence of the life essence or life-force within the forest (<i>mauri</i>)	<ul style="list-style-type: none"> Active and flourishing; Alive; Healthy Persists; Still present but waning Diminished; Reduced capacity 	<ul style="list-style-type: none"> Sleeping; Dormant; Hidden Unknown
	Strength and presence of the energy flow or natural current in the forest (<i>ia</i>)	<ul style="list-style-type: none"> Overwhelmed and frightened / Chilling or powerful force Strong feeling or vibes Fairly strong feeling or vibes 	<ul style="list-style-type: none"> Not a strong feeling but still present (Kare e rongō i te ihiihi) Absent Unknown



Tawa Timber: an Updated Perspective on Opportunities and Issues

WHO'S INVOLVED

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THE RATIONALE

In his 1994 book titled “*New Zealand Timbers*” Norm Clifton concluded that the “writing is on the wall” for tawa timber. Certainly the use of tawa timber has declined ever since this valuable book was produced. At the same time there has been a marked increase in the importation of special-purpose timber products into New Zealand. As a consequence, it is worth periodically asking if there is a wealth-creation opportunity through the sustainable management of privately-owned indigenous forests. An industry based on this resource could satisfy demand for high-value timber products and provide revenue to forest owners.

THE PROJECT

In response the Ministry for Primary Industries’ Sustainable Farming Fund supported a Tūhoe Tuawhenua Trust led project titled “Expanding economic viability for sustainable managed tawa forests”. This project has four subprojects, the first three of which have been completed:

- Summarise the properties and past and present uses of tawa timber
- Identify where the tawa resource is located, who owns it, and its availability
- Review opportunities and issues faced by tawa timber products in the market place
- Develop a strategy to increase the value of, and demand for, tawa timber products

This article summarises the findings of the third subproject around opportunities and issues for tawa timber and was derived from interviews with industry representatives; searches of the World Wide Web; and, assessment of relevant literature. It considers activities along the whole value chain.

OPPORTUNITIES: PRODUCTS

Of New Zealand’s hardwood species, it is southern beech and tawa that have a timber resource of sufficient size to support moderate-sized industries. The total tawa-dominated forest area available under stringent practical constraints is around 100 000 ha with a potential tawa timber production of around 14 000 m³ each year, although very little is currently being harvested.

Tawa has always been a speciality timber, but never produced in great volume. The specific uses have changed through time. Long bird spears were manufactured by Māori in pre-European times because of the distinctive property of tawa that allows it to split into long, straight shafts of timber. Butter churns were produced in colonial times – in part because of the odourless property of tawa timber. Subsequently the timber was used for flooring, turned handles and furniture. By the 1990s the predominant use was for short-fibred pulp for fine papers.

The potential scale of tawa timber production is often considered too small for export markets because the distribution networks of overseas retailers is commonly too large. The export opportunity is then for distinctive products being sold into selective markets. For example, swamp kauri is marketed as the oldest workable wood in the world with a relatively small amount left.





Tawa timber does have distinctive properties (e.g., odourless, excellent turning across the grain, splits straight, flecking in the grain that gives a 3D figure, black fungal streaking in the light coloured timber) yet unique export opportunities have not emerged. Although odourless and tasteless timbers have long found a place in food storage and packaging – suggesting high-value, nature orientated food products. Timbers with such properties have been used elsewhere in markets for baby orientated products such as cots.

The domestic market opportunities are currently viewed as more appropriate. Industry representative suggest products orientate around a more strategic approach to competing with existing imported products on the domestic market. Examples included:

- There is a demand for wide-board flooring but it is argued by flooring specialists that this needs new technology. Currently light coloured oak is imported for wide-board flooring and boards can be greater than 170 mm wide. A key question is whether you can produce wide boards from tawa timber?
- There is an opportunity for increased tawa veneer for use in interior panels and furniture. This is in demand because solid timber is too expensive for some uses but can be viable when used in combination with veneer. A challenge is obtaining trees of good enough quality to support an enlarged industry.
- Solid timber bench tops which have finishes that are both attractive and serviceable.

OPPORTUNITIES: MARKETS AND DEMAND

The global and domestic need for hard wood timber products has increased since

the Global Financial Crisis in 2008. For example, the value of global furniture production was estimated at \$480 billion in 2014, an increase of almost 10% over 2013. Domestic consumption of imported timber has also grown dramatically. The total value of solid timber imports increased from \$284.0 million to \$531.9 million between 2003 and 2013. It is the value of imported furniture and parts that is responsible for this growth.

Lower prices for some imported timbers from the Northern Hemisphere appears to be partly the result of scale – which New Zealand industries will find difficult to achieve. However, several factors support an upward pressure on the price of imported timber:

- International trade agreements (e.g., Trans-Pacific Partnership) will attempt to open up trade. One intent is to tackle trade-related environmental issues such as illegal logging by demanding legal and regulatory requirements within countries.
- Financial investors hold an increasing share of the world's industrial timber supply as part of a diverse investment portfolio. These investors expect high returns from forests and will reduce the level of harvest in weak markets.
- Global uncertainty, low export prices and a low outlook for domestic interest rates mean that the New Zealand dollar is assumed to depreciate further. Already some light coloured oak timber users have experienced a >40% increase in price over the last two years.
- Increased demand may reduce net exporter position (e.g., USA has high timber component houses). Supply will be less assured and create the opportunity for domestic sources.



Today, tawa is a lesser-known timber species and requires promotion in the market place. Creating a market opportunity for tawa timber could be around developing a rich story behind any products. Current opportunities based upon intrinsic properties of the timber itself and a wider set of extrinsic values are:

- There is a trend toward lighter coloured woods like tawa (Photo 1, right)
- A unique sustainability case could sometimes be argued. For example, where podocarps have been logged from a forest, which in turn promoted tawa, then harvesting tawa could provide a rich story about restoring podocarp regeneration in forests.
- Develop use of timber “to help humanise” new large-scale building complexes.
- Special projects that exhibit natural or cultural values.

ISSUES: PRODUCTS

Production requires a consistent supply of quality logs and timber from a sustainable resource. Problems in achieving this include:

- A poor knowledge of several resource issues has important impacts on viability. There are opportunities to use an increased understanding of the natural variability in log quality, productivity and wood properties of existing stands (Photo 2, right). This has strong implications for harvest networks.
- A delay in supply was a common negative comment about tawa timber. Certainly the New Zealand Farm Forestry Association’s Specialty Timber Market is a positive move in the direction of a collective approach.



Photo 1. The light coloured sapwood and heartwood of tawa turns to a creamy-brown colour on seasoning. (Downloaded from www.nzwood.co.nz/learning-centre/tawa/)

Photo 2. Te Urewera tawa forest showing the range in form of adjacent trees. While there is considerable variability in form within and among stands it is poorly known how this is controlled by stand-level and regional-level factors.



- The light heartwood and the sapwood are liable to attack by *Anobium* and *Lyctus* wood borers, and although these can be treated such treatment cost money.
- One of the challenges is in treating sapstain. Milling the timber in winter, when the sugar content of the wood is low, and rapid kiln drying can overcome this problem but winter harvesting can be damaging to the soil.
- A positive trajectory for tawa timber products is also constrained by infrastructure.

Producing engineered boards from tawa, which are wide and stable, is challenging. The technology is cheaply available elsewhere (Indonesia) but not possible under existing legislation for tawa. Notwithstanding this, suitably designed and tested engineered floor board could overcome the width and stability issues for tawa timber. Engineered products do use glues that may not meet some sustainability requirements.

It is likely that wide boards and light timber may not remain in vogue in the longer term. Staining of tawa timber needs further testing and offers an opportunity to broaden the market and also allows the timber to find a home in successive fashions.

Placing tawa products in the market place not based upon distinctive properties has risks. This is because low-cost manufacturers may copy a product and usurp the market. This supports the case to pursue an iconic New Zealand component.

ISSUES: MARKETS AND DEMAND

It is important to resolve the appropriate business model(s) to meet market demands.

There are several options to consider:

- Innovative products can be produced at a range of scales, with the demand and price for scarcity offsetting the advantages of economies of scale.
- Co-operatives to ensure continuity of timber supply to customers.
- Demand driven production of various commodities (e.g., honey, wood) and only harvest timber when the price is right.
- Government supported development at various scales. Indigenous forestry would benefit from long-term strategic support (e.g., procurement) from Government.

Whatever the business model enterprises need to decide how widely to operate along the value-chain and how to integrate this with other enterprises. Industry representatives suggested that an enterprise with a forest resource should maximise how widely it operates along the value-chain, provided that it is in a quality way. To decide on positioning along the value-chain it is important to know the demand and price points and how elastic prices are to changes in volume of anticipated timber products.

Because it is proving difficult to competitively place existing tawa timber products in the market place we need to understand the cost of production and how this might be contained. Industry representatives suggested the reasons for the high costs of production include:

- Costs of compliance. Legislative, regulatory and certification requirements for indigenous forestry are more stringent than other forms of forestry in New Zealand.



- Small scale and fragmentation. An increased number of operators, and level of production, could benefit consistency and flexibility of supply.
- Efficiency along the value-chain. There are many factors that affect efficiency and includes strategically thinking about resource size, quality and distribution.

There remains a negative perception of indigenous forestry in New Zealand. Yet we import large volumes of indigenous timbers from elsewhere. New Zealanders appear happy to use imported timbers with little thought to their source. There is an opportunity to highlight this transfer and the strength of New Zealand environmental requirements. There is a need to increase familiarity with tawa timber including:

- Architects, designers and builders may be compelled to use tawa if they have a stronger appreciation of properties and limitations.

- There is an opportunity to brand tawa timber for certain markets.
- There needs to be a rich story around tawa timber whether it is promoted as new, high-value products or for more traditional uses

CONCLUDING COMMENT

Currently tawa timber products are essentially absent from the market place. Developing a market place position for these products now requires a rebuilding of consumer familiarity and confidence in the timber and the way it is produced. This involves, and integrates, all components of the value-chain. As a consequence, probably the greatest immediate progress could be made through developing an initiative that uses quality tawa timber products (e.g., flooring and veneer panels) in an “iconic” building project to showcase the timber.



Tawa is an appealing furniture timber, as well shown by this board table with its stunning grain patterns and colour variation. The board table was made from tawa harvested from Tuawhenua forests in 2012, and sits in the boardroom of Watson and Son, Masterton. (Photo: Tuawhenua Collection).

