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Landcare Research  
Manaaki Whenua

## Overview and updates in brief

The relationship between the Tūhoe Tuawhenua Trust and Manaaki Whenua remains active in promoting research to improve management of lands administered by the Trust for its beneficiaries. Manaaki Whenua is currently involved in re-bidding the research that pays for its involvement in research to benefit the management of the ngahere. This involves justifying some new directions for the research in a process with the Ministry for Science and Innovation (MSI).

### CLIMATE CHANGE IN TUAWHENUA FORESTS

Taawi and crew put up lots of fences round seedling plots at Mangapae, Tarapounamu and Te Waiti. From these we will be able to see what the interaction is between deer browsing and temperature on tree regeneration.

### PODOCARP REGENERATION AT TAWHIWHI

We have set up a few deer enclosure plots near Tawhiwhi hut to test whether podocarp regeneration is limited by browsing or by seed availability.

### DIRECTION OF NEW BID FOR FURTHER RESEARCH IN TUAWHENUA LANDS

If we are successful in our current bid for more funding to work in the ngahere around Ruatahuna we will focus on the opportunities for sustainable use of the forest. We hope to show that small-scale harvest of tawa and intensified honey collection can provide jobs and revenue for the area as a whole, whilst also benefitting regeneration of the podocarp trees and increasing pollination of neighbouring species of economic value.

For more information about the overall project, contact: Rob Allen

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## The TTT in 2011

Prepared by Brenda Tahī, Executive Trustee

*Nga mihi ki a koutou nga rangatira o nga whenua o te Tuawhenua me nga hoa mahi i nga mahi e hangai ana ki te kaupapa o Te Tuawhenua*

*Te aroha, te mamae hoki mo nga mate o te wa, me o tātau kuia, koroua kua riro ki te pō, kua wehe atu i te kitenga kanohi, haere, haere, haere atu ra koutou.*

The TTT had an exciting year in 2011, and we've been busy coming into 2012. Highlights in our projects and activities are summarised below. We look forward to advancing these developments and bringing to fruition some of our goals.

### TRUST MATTERS

Our AGM in 2011 dealt with the Trust's Report for 2008–11 and our long-term Strategic Intent, review of our trust order and appointment of a new trustee. Doris Rurehe of Ohiramoko, Ruatāhuna, is our new trustee and she joins Jim Doherty (Chair), Hekenoa Te Kurapa, Tane Rua, Anthony Te Kurapa, Korotau Tamiana and Brenda Tahī (Executive Trustee).

We are also thrilled to have on board Kerewai Morunga, who has been with us since August 2011 and has been doing a sterling job for the Trust. During the last 12 months we have also employed lots of people locally in project work for logging and milling trials, honey production, blackberry eradication, podocarp restoration, and the collection of matauranga. Providing jobs for our people is a key objective for us, even though at this stage most of these are only project jobs.

### TE TUMANAKO O TE TUAWHENUA – OUR STRATEGIC INTENT

*Kai te tau te noho a te iwi me te whenua...*

- ❖ Ngā rākau nunui ikeike a Te Wāo Nui a Tāne e puāwai ana ki tō rātau ake tū
- ❖ Haruru ana te ngahere i ngā manu
- ❖ Kei te tau te noho a te tangata whenua
- ❖ He penapena he rokiroki he rakei whenua...Kei te pai te whenua me ōna hua hei oranga mō ngā whakatipuranga e tū mai nei
- ❖ E matatau ana te iwi ki ngā abuatanga katoa o te whenua me ona hua

Kei roto i ngā tau tekau neke atu ranei e puawai ai etahi o ngā mahi a Te Tuawhenua

Kei roto i nga tau kotahi rau neke atu ranei e taea ai te tiketiketanga o nga tumanako o Te Tuawhenua

*The people and the land are in tune and thriving...*

- ❖ The great podocarps of our ngahere have regenerated to former glory
- ❖ Our special bird-life is flourishing
- ❖ The whenua, ngahere and awa contribute to our sustenance and good health as a people
- ❖ The land and resources are managed in a sustainable way over the long term for the enjoyment and benefit of future generations
- ❖ Our people know about, care for and make good use of the land and resources of the Tuawhenua

It will take at least 10 years to make some real progress towards Te Tumanako o Te Tuawhenua

It will take at least 100 years to actually attain Te Tumanako o Te Tuawhenua



## OVERARCHING GOALS

*Te Iwi me Te Whenua*  
*People and the Land*

*Kaitiakitanga me Te Whakaoranga*  
*Protection and Enhancement*

*Whakawhiwhinga Contribution*

- ❖ Make good and lasting use of our resources in a way that involves and supports our people
- ❖ Protect and enhance what's special on our lands and in our forests and rivers
- ❖ Contribute, where we can, our expertise and resources to our people, our nation and to the world

Copies of our Trust Report 2008–11 and Strategic Intent are available from the Trust Office.

## BLACKBERRY ERADICATION & REVEGETATION

The TTT is determined to exterminate blackberry in the Tuawhenua region. We have continued our blackberry spraying programme into 2012 and have engaged many individuals and organisations in this kaupapa. We are focusing on roadside, school, marae, residential and farm areas in Ruatāhuna this summer but will extend the programme to bush and river areas in the following season.

The Bay of Plenty Regional Council is supporting our project to clean up and plant out natives on a site near one of the local swimming holes known as Sharpies, at the confluence of the Ruatāhuna Stream and the Whakatane River. We are also working with the Whakatane District Council to clear blackberry on the sides of the roads about the Ruatāhuna region.



Blackberry covers the land at Sharpies, Ruatāhuna Bridge



Blackberries removed now & the land cleared

## MATAURANGA O TE TUAWHENUA

This project, initiated in 2011, aims to bring alive the matakura and tikanga of our tipuna in a way that is both meaningful and accessible for the people of the Tuawhenua. Through our project we have collected a vast range of knowledge through individual interviews, group sessions, field interviews, filming and photography of flora and fauna specific to the Tuawhenua region. The methodology for each species in the interviews involved:

- Description of the species
- Significance to Tūhoe
- The uses & harvests
- Kōrero & hītori
- Changes and trends
- Ideas & suggestions



People are engrossed in the material we put together for an expo on our Matakura o Te Tuawhenua project (November 2011)



Ngawhatatoitu Heemi studies some of the material at our expo on Te Matakura o Te Tuawhenua.

This project has raised awareness within our marua around the knowledge (or lack of) that is being passed down and retained by our younger generations. This project will assist in developing a framework and plans for the management of the land and resources of the Tuawhenua based on traditional ecological knowledge.

We have begun planning the next stage of the project, which will include researching archival records and manuscripts to supplement the interviews and field matakura. However, we have come to the end of the first stage of our overall project. In total the project will take about two years part-time for the Trust to complete. We plan to have the outputs complete and available for distribution early in 2013.



Tangiora Tawhara, one of our interviewers for the Matakura project, conducting a group interview along with Wena Morehu in te poho-o-Parahaki, Te Umurua Marae, November 2011.





## PODOCARP RESTORATION

We have continued our podocarp restoration programme into 2011 with another 1500 seedlings being transplanted out at four sites: Apithana, Hiwiotewera, Tarapounamu and Okete, involving a number of local hapū in the process. We learnt about how to release seedling and young podocarps in order to increase their rates of growth and chances of survival (see guidelines below). We applied our learning to

releasing hundreds of seedlings, saplings and poles to provide them with ideal growing conditions.

Our success rate to date with the podocarp restoration has been encouraging – we now have thousands of thriving young podocarps well situated to survive into the future. We are determined to continue our programme in some way into the future.

<b>Releasing</b>	<ul style="list-style-type: none"> <li>• Look above the seedling/sapling/pole.</li> <li>• Make a light ‘well’ so that the plant will be able to see the sky but will still be sheltered on the sides. This may involve just cutting away kaponga leaves. It may involve cutting branches or whole trees. Avoid cutting precious trees – common trees like kaponga, tawhero and tawa are OK. Use your judgment.</li> <li>• Ensure dead kaponga leaves and other litter are not covering up seedlings.</li> <li>• Remove plants nearby (within one metre) especially kaponga as their roots choke the seedlings/poles. Cut kaponga off at the ground or it will just grow again.</li> <li>• Be conservative and don’t cut too much away at once – you can always cut some more away another year, but you can’t put back what you cut away.</li> <li>• If the plant is too exposed it may suffer from frost or drying out, so not too much exposure at once.</li> </ul>
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Raniera Te Kurapa and Raymond Te Kurapa putting tags on podocarp seedlings.



One of our rimu seedlings tagged and ready to grow!





## GRAVEL EXTRACTION

The trust is investigating gravel extraction & quarrying as a commercial development for the future. We have permits for extracting small amounts of river gravel currently and we are investigating further potential opportunities. While this will be a positive development for work and contractors in Ruatāhuna, the Trust is also keenly aware of the need to ensure that any development in this area is done on a sustainable basis that at the same time takes good care of our awa habitats for our precious river life.

## LAND CAPABILITY ASSESSMENT

In 2011 we worked with the Bay of Plenty Regional Council to complete a land capability study for the whole of the Tuawhenua region. The assessment involved recording rock type, soils, slope, erosion and vegetation, and mapping them using a system based on Class 1 (high quality land) to Class 8 (severely limited land). This is then used to assess the land's potential for sustained production.

It is no surprise that over 80% of the Tuawhenua lands outside of the Ruatāhuna Farm are Class 7 land, which has 'moderate to severe limitations for pasture or forestry land use (although it can be farmed in conjunction with better country if carefully managed)'. While there is some 'severely limited' Class 8 land there is also some easier Class 6 country and interestingly some pockets of good soils on river flats and terraces. The much better class of lands in this region are of course included in the Ruatāhuna Farm. This report and the maps now provide an information base for our planning for land uses and development across the Tuawhenua region.

## OTHER ACTIVITIES

The Trust has also been busy with a number of other projects, including:

- Deer recovery has been trialled in partnership with a helicopter operator, which had mixed results due to less than ideal conditions at the time. We have decided to leave this activity till later in the year before we consider another trial.
- Survey of wild pigs caught in the Tuawhenua region for TB infection in conjunction with the Animal Health Board. To date we have had about 35 pigs tested with no TB detected. We will continue this survey till mid-2012.
- Assessment of the biodiversity 'values', risks and opportunities in the Tuawhenua. Landcare Research will be advising us in this project, which will provide us with the basis for biodiversity management plans to be developed later in 2012. To date in the project, Wildlands Consultants of Rotorua have completed preliminary analysis of literature and data, along with most of the fieldwork. So far we have found that we still have some precious species like kiwi, whio, kākārīki, kākā, bats and northern rātā in fair numbers on our lands. We will report on the biodiversity assessment in July 2012.
- Assessment of the environmental and pest issues in the Tuawhenua. This project will link with the biodiversity project and will look at water and waste issues, and the incidence and relative impact of toxins and pest animals and plants on our environment. We are just about to start this project with the support of the Bay of Plenty Regional Council.

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## Can Possum Trapping Provide a Living and also Protect the Ngahere?

### WHO'S INVOLVED?

**Tuawhenua Trust:** Hekenoa Te Kurapa, Brenda Tahī, Anthony Te Kurapa

**Landcare Research:** Chris Jones, Phil Lyver, Morgan Coleman, Mandy Barron, Graeme Nugent, Bruce Warburton

Landcare Research has been working with the Tuawhenua Trust to design a strategy for possum fur harvest that not only provides a sustainable income over the long term for trappers, but also leads to benefits for the ngahere. The researchers used a range of different information:

- Interviewing trappers to find out how long they trapped a line for and then how long before they returned to that line to trap again
- How the number of possums trapped per day on a line changed over time
- How far away from a line possums were still vulnerable to trapping.

The researchers then looked at how the distance between trap lines, the trap-catch when trappers stop trapping on a line and the time between returning to trap on a line affected the numbers of possums caught (to work out the income from the line) and also how quickly possum numbers recovered after trapping (to look at effects on the ngahere).

Using possums marked with ear-tags, at different distances from a trap line, the researchers worked out that trap lines need to be at least 400 metres apart so that trapping on one line doesn't affect possum numbers around a nearby line.



The best strategy for sustaining a good income from harvest required access to 8–10 trap lines per year, and stopping trapping when about one trap in every four catches a possum, before leaving them to recover for 3 years. Unfortunately this was unlikely to keep possum numbers low enough to prevent them damaging the ngahere. However, trappers could trap to the levels required to achieve these outcomes if subsidised by management agencies that, in return, would benefit from keeping possums at the same level, but at lower cost, than current standard ground-control methods.

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## Te Nanao Miere – Honey Production in the Tuawhenua

### WHO'S INVOLVED?

Hekenoa Te Kurapa, Korotau Tamiana, Nick Mitai, Brenda Tahī, Kerewai Morunga

### A HISTORY OF TE NANAO MIERE

This is the original term used in the Tuawhenua for honey gathering. In those days, it was honey from wild bee hives – set in a hole in the side or base of a tree. 'Te nanao' is simply to 'feel' or 'lay hold of' with the hand. 'Miere' is of course honey – a transliteration of the French word 'miel' for honey. This describes how our old people gathered honey – simply reaching in and pulling out the honey from the hive. Some people would simply be in tune with the bees and with the aid of just a little smoke they could harvest the honey without really disturbing the bees or getting stung.

Korotau Tamiana, one of our trustees, tells of how he would go with his father Tamiana Kanuehi – 'he toki ki te nanao miere'. They had two hives that they would harvest twice a year. One was at Te Punarehu, along the Whakatane River, and another was on the horse track going up to Te Houhi (these are places in the Tuawhenua frequented by the old people over the generations). Both hives were in mataī trees that had splits or hollows<sup>2</sup> in them where the bees had built their hives. Tamiana would prepare a 'smoker' – a bundle of mānuka or such material to burn with a smoke not a flame. Then he would climb the tree with a rope. Once in position he would let down his rope to get the 'smoker' and proceed to smoke the front of the hive, and then reach in with his hand and remove the honey from the back of the hive. The honey, comb and all, would be placed or dropped into a billy for returning home and sharing with the whanau.

Korotau explains that they would harvest these hives only twice a year – at the beginning of the season to just get a taste and then later at the end of the season when there was plenty of honey. Sometimes the hives grew so much that they would extend out into the open! Obviously Tamiana knew all about how to look after the hives as they were never depleted at the time and they were able to harvest year after year in this

way. Korotau knows that his father always practised the tikanga of karakia and whakamoemiti when hunting or harvesting in the ngahere o te Tuawhenua.

Korotau knows others harvested wild honey too – Wikiriwhi and Temara are two koroua that he recalls. And we know that Te Taite Tawhara would have been the last of our kai-nanao miere.

In 2006, Issue 3 of *Te Kaahu o Tuawhenua*, we reported on our interest in the development of bee-keeping for the Tuawhenua. We indicated then that we would be pursuing our interest in development around bee-keeping, honey and bee-products. Our keen trustee Korotau Tamiana took up and completed training in



Our trustee Korotau Tamiana at his training course in bee-keeping in Gisborne 2005.

bee-keeping in Gisborne. In recent years, other trustees Anthony Te Kurapa, Hekenoa Te Kurapa and Brenda Tahī all put their hand to a spot of hobbyist bee-keeping too.

### FEASIBILITY STUDY: WOULD IT BE WORTHWHILE?

In 2008, we worked with Hinepukourangi Trust to hold a Hui Taumata for Ruatāhuna, which brought together all the organisations and hapū of Ruatāhuna to define a shared vision for the future of Ruatāhuna and to identify strategies to get us to that future as soon as possible. One of the priorities identified by the hui was





to grow the Ruatāhuna economy, and we identified honey production among other things, as a potential commercial development.

We conducted a feasibility study in 2009 with the much appreciated support of Te Puni Kōkiri. The nature of bee-keeping and the industry structure for honey production were examined. Assessments of honey production potential were made for the Tuawhenua region, and a business case completed. The key findings of the study were that although mānuka is the most valuable honey and we do have some stands of

mānuka in the region, unfortunately the bees generally prefer to collect nectar from other trees in our bush like tawhero and rewarewa, which are lush with nectar at the same time. Not to be discouraged, we focused our study on the honeys of our bush, which have some potential and overall concluded that it is worthwhile to go to a honey production trial.

Trustees Hekenoa Te Kurapa and Brenda Tahī kept a couple of hives over last honey production season of 2010/11 and kept records as part of further feasibility testing. **See the summary of their diary below.**

HONEY/BEE DIARY 2010–11 SEASON	
31 July	Wattle is flowering
7 August	Hive is quiet Few dead bees at the front
16 August	Apricot at Jim's is starting to blossom
18 August	Few bees moving during fine warm hours
27 August	Wattle is over its flowering Kuiiki (hawthorn and barbary) has not yet started flowering We start feeding the bees; a little syrup to start then some honey Bees are working on fine days; bringing in yellow pollen. See bees at the apricot blossom
28 August	Plums and apricots in full blossom Peaches are budding but no blossom yet
31 August	Kuiiki is not flowering yet Put honey into hives to keep them going
4 September	Bees are working madly; bringing in yellow pollen; looks like they are going up the hill, whereas the willows are down the hill – so what are they going to? Bees are cleaning out the frames of old honey we gave them
5 September	The apricots are in full blossom and the bees are working them
8 September	Plum at Heemi's still in blossom and has some bees on it
11 September	Lots of rain so bees can't be flying – no break in the weather Poananga (clematis) is developing flowers Apricots are just about over Peaches and nectarines have started to blossom
14 September	Kuiiki (hawthorn with white blossom) is starting to flower Yellow broom is in full flower Māori plum and golden queen peach starting to blossom Waiting for apple to blossom then will open up the hives
15 September	We check hives as we think they are starving but they're not! They're exploding – they have hit the top with brood
26 September	Bees are working well Put in varroa control strip One hive is humming; loads of pollen are going in
3 October	Pear at marae in full blossom; also kotukutuku (cherry laurel). Nothing on hawthorn yet unlike last year. Yellow kuiiki just starting to come out
14 October	Kotukutuku (tree fuchsia) in bush flowering
16 October	Heaps of queen cells in hives – we kill them to avoid swarming
20 October	Give more room to one hive and find more queen cells – kill these
23 October	Yellow-flowered barbary flowering now – just Apple in full blossom and bees all over it Tutu is flowering; poananga; kotukutuku in bush all flowering
25 October	Prim Tait helps to check hives – they are brimming and working well. He gives them lots of new frames to give them room. Queen cells everywhere; kill these. Bees are packing fresh honey
1 November	Barbary in full (yellow) flower; white hawthorn just starting Tawhero starting to flower Tutu been in flower for a while; also wharangi (rangiora)



2 November	Back into hives – killed queen cells. One has now eggs or fresh brood – queen dead or absconded. The other has new eggs and brood – we give it some room by lifting a frame to the top Hinau is flowering maybe for a week or two at this stage – heaps of it Get a new queen and get it into the sad hive
10 November	Check for queen cells and kill them; but there's no fresh brood – not sure what to do!!
11 November	Tawhero flowering and covered with native bees and flies. Don't see our bees on them yet. Don't see bees on hawthorn or barbary either so where are they going?? Ramarama also flowering (on manawaru) Rewarewa not yet flowering Clover and buttercup are out too but bees not on them Parapara (five finger) has formed fruits already so it was flowering much earlier – missed when
12 November	Blackberry just starting to flower Bees have pollinated in the orchard as there's fruit on all the trees
19 November	Tawhero is seriously flowering Rewarewa is starting to flower Red clover is also flowering & white clover but despite the heat we don't see any bees on them Bees going straight to the bush we think
21 November	Have young brood but not much in hive with new queen The other has queen cells – nearly capped – this hive is pumping Each hive has 2 brood boxes; then excluder then full box of honey (already!) then 2 ¾ boxes on top for supers to fill
23 November	Red & white clover out but bees not on them Tawhero pumping; also tarata (pittosporum) Native bees on these trees (along road at Len's) but not many of our bees. Where are they going?
<b>1 December</b>	Clovers and dandelion flowering. Bumble bees on them but don't see honey bees
5 December	Kaikomako flowering Privet is flowering but only native bees on it
9 December	Found eggs, larvae and queen (with Kristian's help) Hives doing well; has filled half of first super Mānuka flowering; native bees on it but not our bees Rewarewa flowering Rata starting to bloom
12 December	One hive has 2 boxes full (1 full size ; 1 ¾ size); 1 ¾ box half full and another not touched Other has 1 full box and 2 x ¾ boxes full of honey; top box has a few frames with honey Can do an extraction soon!
17 December	Rewarewa has finished flowering Mānuka is flowering but bees not on it Tawhero starting to redden off
23 December	Flax is flowering and the bees are on it Hives are working strongly
29 December	Rātā in full bloom Dandelion flowering but only bumble bees on it Start clearing honey boxes of bees to do extraction Honey is fabulous!!!! Total harvest 98 kg
<b>4 January</b>	Rātā is still flowering
18 January	Hives are full again – that just from New Year's Eve. Heaps of honey Rātā is still flowering Koromiko (kokomuka) is starting but doesn't seem to be much else Clover and dandelion in full bloom but no bees on it
<b>6 February</b>	Extraction: 3 boxes full on one hive (yellow bees) but some brood up the middle (forgot to put excluder back on when we returned boxes to the hive at the New Year) Other hive (black bees) has 3 half-full boxes of honey Total harvest 32 kg Beautiful light honey – must have rātā and tawhero?
28 February	Kokomuka (koromiko) and houhi are flowering
<b>12 March</b>	Final extraction: some beautiful tasty honey in this lot. Lot of light honey in this lot (like the last lot) but also some darker (not too dark) stuff with fab taste Have seen bees on dandelion Also houhi and kokomuka, which is getting late now Wasps are a nuisance but no robbing as yet Got 100 kg this time Total for the season is 230 kg off two hives!!
28 March	Kokomuka is still flowering. Houhi has finished. Pennyroyal flowered in March. Bees on all sorts. Seen them on native creeper that looks like a passionfruit vine (has a green flower; saw wasps and bumble bees on it too)
<b>3 May</b>	Checked hives – still some honey in the top boxes – left it for early winter feed
27 May	Wasps still flying – they are vicious



The season was one of the best for weather and flowering of our native trees, including the rātā. Their two hives made record production over the whole season – over 100 kg per hive!! So we know that we might not have mānuka honey but we can potentially produce a lot of honey.

The Trust has moved this kaupapa forward in 2011 by gaining assistance and guidance from a well-established business in the honey industry. Fifty hives have been supplied and lots of advice, all of which has been instrumental in setting up our honey production trial this summer.

### ENTER OUR BEE-KEEPER APPRENTICE!

The other key step was to find an apprentice in the marua to undertake the necessary training, to learn the trade and to lead future developments in this area. We learnt from the feasibility study that you can't be a successful honey producer without a skilled and dedicated bee-keeper!

Nick Mitai has taken up the apprenticeship opportunity, and has done stints training on-the-job in the autumn and spring of 2011. Nick learnt a lot by being 'thrown in the deep end' and working with hundreds of hives doing different things in just short periods of time. We also awarded our first TTT Scholarship to Nick, who is studying to qualify at the Telford Polytechnic Correspondence Course for Apiary (bee-keeping).

### HONEY PRODUCTION TRIAL UNDERWAY...

The season started off with a boom as the spring in Ruatāhuna was warm and the bees got a great early boost from the local willow and all the flowering trees and shrubs in the bush. The hives were in great condition to take advantage of the first nectar flows in November and December. Some of the hives swarmed and it's all been a great learning curve for the apprentice bee-keeper, but the trial has been a great success to date. The first harvest at New Year for local consumption delivered the most delicious honey with all the tastes of the Tuawhenua nectars coming through. Mean!

The first local honey crop sold out in a hurry, and we have done a second extraction for local sale. The latter part of the honey season has not been great with lots of periods of rain and wind, which the bees don't like much. But our bee-keeper is not discouraged. He has proceeded to split some of our hives to make more hives ready for next season. He is on the look-out for wasps that plague weak beehives at this time of the year, and is making sure that his hives are well fed to get them into good condition before they are bedded down for the winter.



Nick Mitai, our apprentice bee-keeper, working the hives for the Tuawhenua trial in honey production.

### NEXT STEPS IN TUAWHENUA HONEY PRODUCTION

We want to know what special honeys come from our bush and Landcare Research has been immensely helpful in this respect. See the article by Janet Wilmshurst on their test of some of our honey from the 2010/11 season. We will also be testing our honeys from different times in this season and look forward to identifying special honeys of the Tuawhenua that we can produce and bring to market in the future.

We will test markets later in the year for our honeys and see what we should focus on for future production. Our aim is to move from this year's trial to a commercial operation in the next honey season.

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## Pollen in the Honey

### WHO'S INVOLVED?

**Tuawhenua Trust:** Hekenoa Te Kurapa, Brenda Tahī, Nick Mitai, Kerewai Morunga

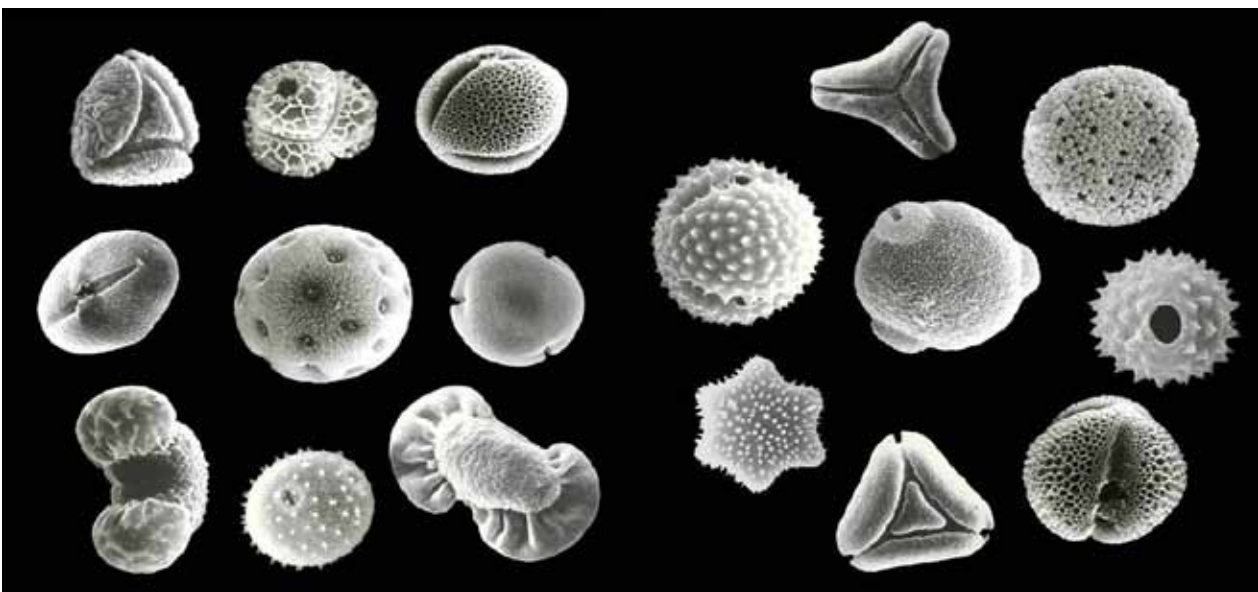
**Landcare Research:** Janet Wilmshurst, Neville Moar

After their last visit to Ruatāhuna in September, Fiona Carswell and Sarah Richardson (from Landcare Research) brought me back a pot of te miere o te Urewera. I was delighted thinking it was for me to spread on my toast, and I pulled the lid off the pot and inhaled the delicious-smelling creamy-white honey. However, it turned out they were bringing me the honey from Taawi to find out exactly what type of honey his bees had made. My disappointment was brief because it's always fun to find out which flowers honey bees have been visiting to make a particular batch of honey.

How do you find out what type of honey you have? It's pretty simple, as honey is rich in distinctive tiny pollen grains that the bees have collected during flower visits. Pollen grains from a particular species have a unique pattern on their outside walls, which means you can identify the species of most of the grains with the aid of a microscope. To concentrate these pollen grains onto a microscope slide so we can identify and count them,

we dissolve about 2–4 teaspoons of honey in some warm water, and then spin it in a centrifuge at high speed to remove the water. The remaining pollen grains are then treated with some strong acids that remove their cell contents but do not damage the unique patterns on the outside of the pollen grains. We then mount them on a glass microscope slide and count them. My retired colleague Neville Moar, a Zen master of pollen identification, helped us to count and identify the grains at Landcare Research and find out what flowers Taawi's honey bees had been visiting.

We found the most abundant pollen grains in Taawi's honey sample were from rātā trees and vines (about 40%), followed by about 20% exotic flowers including clover and willow, and the rest from native forest trees and shrubs. When identifying the origins of a honey in terms of locality and floral source, a minimum amount of 45% rātā pollen is required to identify a pure rātā honey, along with other characteristic pollen types for this honey including dandelion, tawhero, lotus, quintinia, and clover. All of these other pollen types were also found in Taawi's honey that we analysed, so we can say it was pretty close to being defined as a pure rātā honey. Nice work bees.



pollen grains down a microscope





Results of Pollen Research Sample from Hekenoa Te Kurapa's Hives for Season 2010-11

Pollen types identified * = not native	Common Names	Percent of total (300) pollen grains counted
Metrosideros (cf diffusa)	rātā (small vine)	21.52
Metrosideros (cf robusta)	rātā	19.87
Melicytus	māhoe	8.28
*Trifolium	clover	8.28
*Salix	willow	7.95
Epacridaceae	mingimingi	4.30
Rubus	blackberry, tātarāmoa	4.30
Viola?	viola?	3.97
Myrsine	māpou	3.64
Pseudopanax	hohoeka, koparapara	2.32
Meuhlenbeckia	pohuehue	1.99
Schefflera	patate	1.99
*Lotus	herb birds foot trefoil	1.66
Hebe	kokomuka	1.32
*Lactuceae	puha	1.32
Macropiper	kawakawa	1.32
Quintinia	quintinia	1.32
Coprosma	raurekau, karamuramu	0.99
Hoheria	houhi	0.99
*Brassicaceae	mustard family	0.66
Poaceae	grasses	0.66
Weinmannia	tāwhero	0.66
Apiaceae	carrot family	0.33
*Rosaceae	apples, pears, plum cherry etc	0.33
Asteraceae	heketara and other daisies	0.10
*Cirsium	thistle	0.10
Dacrydium cupressinum	rimu	0.10
Knightia	rewarewa	0.10
Leptospermum	mānuka	0.10
*Pinaceae	pine	0.10
*Ranunculus	buttercup	0.10
Streblus	streblus	0.10
Unidentified	unidentified	0.10





## Indigenous Forestry Development in the Tuawhenua

### WHO'S INVOLVED?

Jim Doherty, Hekenoa Te Kurapa, Tane Rua, Ngati Manunui, Elvis Miki, Raymond Te Kurapa, Roy Edwards, Brenda Tahī, Kerewai Morunga

Over 2011, we have been investigating natural indigenous forestry – how can we use our timber resources to create work in Ruatāhuna and provide some return for owners and at the same time protect and restore the special nature of our forests. Landcare Research has been instrumental in advising us in this project.

### LESSONS FROM THE PAST

While we are keen to generate some industry in Ruatāhuna we are also keenly aware of the history. During the forestry of the last century, logs were sold for just a royalty, and were paid out to owners at the time, leaving little or no legacy for current and future generations. Although Ruatāhuna people benefitted from jobs created in the logging and milling industries, these jobs were, in relative terms, short-lived. Most of those employed had secure jobs for at most only ten years.

The people of Ruatāhuna saw forestry as part of a broader development strategy. The forest would be cleared to bring land into pasture, just like everyone else had done in high country across the nation. But this was not to be so in Ruatāhuna, where forestry was restricted for soil conservation and scenic reasons. The land could not be cleared but logging of most of the podocarps was allowed, leaving the ngahere as simply cutover.

Different approaches to a forestry operation have been tried since the milling days. In the 1980s the Steering Committee for these lands tried out the recovery of 'dead and down' rimu but this never came to fruition as an ongoing operation. The native timber option was revisited about 10 years ago by the TTT with an assessment of the harvestable timber on a few of our land blocks. The Trust, under direction by the owners, was focused on 'dead and down' only for a limited

period but the logging company they courted at the time as a partner wanted a forestry licence to include live trees over a period of up to 50 years! As we have reported, the relationship turned sour and once bitten we are now twice shy.

Thus we find it hard to trust operators in the timber industry as partners, but we need some of their skills and market knowledge. We are still exploring options on the best approach but we are leaning towards an approach that is about starting small and doing most if not all of the operation ourselves. We believe this approach is not only consistent with the Tūhoe principle of mana motuhake, but it also allows us to ensure it is done in a way that ensures the forest is restored and protected for future generations. Further, by building and controlling our own forestry operation we believe we will also be able to realise more value and economic opportunity for our trust and our beneficial owners.

### THE QUEST BEGINS

We believe we need to have a good understanding of how our ngahere lives and changes before we even think of intervening again in our forest ecosystem. We have worked with Landcare Research to research podocarp regeneration in our forests and found that regeneration was not occurring at an adequate rate for sustaining or restoring our forest in either logged or unlogged areas. A key factor impacting on regeneration appears to be the tawa that forms the understorey for most of our podocarp forest. Essentially nothing much grows under tawa but tawa.

As we see it then, our forest will never be the same again if we leave it as it is – tawa is becoming more dominant and the podocarps will never reign again as our great trees. We proceeded then with our podocarp restoration project, which is covered elsewhere in this report. The 3-year project was designed to test a number of matters including how and where best to grow seedling podocarps in our forest and to

Project funded by MAF's Sustainable Farming Fund





Preparing sawlogs

enhance seedling and sapling growth through canopy manipulation.

As part of the canopy manipulation, we have also been investigating the feasibility of tawa harvest and marketing, thereby dovetailing our economic development intent with that for forest restoration. We completed a milling trial of tawa in March, and intend to conduct further trials, including assisting Ngāti Manunui to extract tawa for flooring their dining hall at Te Umuroa Marae. Podocarp seedlings have been removed from tracks required for the log extraction, and coupes formed from the tawa harvest have been planted out with podocarp seedlings.

### TRIAL IN HELI-LOGGING

In January 2012, we conducted a trial in heli-logging to test the feasibility of this approach for the harvest of tawa and podocarp dead-and-down. Jon Dronfield of New Zealand Sustainable Forest Products assisted us in this trial by training two of our local bush-men in such an operation.

Overall, we found the whole operation is feasible but not at all easy to do. It all takes a lot of planning and smart thinking on the day to get it right. Turnaround times of the chopper need to be kept to a minimum to keep costs down and logs need to be cut to optimum weights for the heli-lifting to make each trip worthwhile.



The bandsawmill at work

Safety is a major factor – this is dangerous work for the uninitiated. Our bush-men learnt key safety aspects like working around a helicopter and using a long line and grapple or strops for lifting the logs. We now have more confidence to approach such an operation as part of our future forestry development plans.



The Iroquois helicopter is about to land a tawa log from the Otekura bush at the Tahora milling site.





Some good logs came out for this trial, giving the team some work with cant hooks to get the logs into position for the mill. On the right, Elvis Miki helps miller Rob Mansell while Raymond Te Kurapa positions a platform for the log. On the left, Pat Mansell heaves on the other cant hook!



A tawa log plucked by the helicopter into the sky from our bush. This log was clearly a bit light for the optimal lift for the Iroquois.



The Iroquois helicopter used in our trial. This helicopter is stationed at Murupara, which is less than a quarter of an hour from Ruatāhuna. The relatively short ferry-time for this chopper will be of some advantage to us for future operations.

### CONCLUSION

This programme has been most useful as it has given us the time and resources to test our ideas and to gain further understanding through our practical work and through consulting many experts that have helped us along the way. Our conclusions from this project are clear:

- We can assist podocarp regeneration in our bush by planting out seedlings and manipulating the canopy.
- Certain sites and methods for podocarp seedling transplanting and release will give better results.
- Tawa harvest and marketing is a viable proposition even on a fairly small scale.





## HOLISTIC MODEL FOR FOREST DEVELOPMENT

The podocarp programme has been part of a journey for us as a trust. Some years ago, our Chair, James Doherty, with support from Landcare Research, visited the Black Forest of Germany, where he observed age-old methods of 'ecological silviculture', which work to maintain the forest in a near-natural state. Our research on changes for our ngahere, such as in podocarps and kererū, have signalled the need for us to do something for our special species. We need a model for dealing with our forest that is not just about management but about development – taking it to be more than what it is today. We also need a model that dovetails our goals for biodiversity and restoration with economic opportunity for our people. Further, we go nowhere without the knowledge and guidance of our ancestors. Thus, we have now been inspired to develop a holistic and natural approach to the utilisation and restoration of our ngahere, which is based on our Tūhoetanga. The principles for this model that have emerged for us are:

- Holistic integrated approach: It's not just about logging, it's about supporting and working with the whole of the forest ecosystem to ensure it's around for the next generations.
- Maturanga (knowledge and understanding): Our old people worked with the forest in ways that respected and understood the mauri, its very essence, of all that resides there. This knowledge must form the foundation of our forest development approach. Further, we believe we should only consider forestry and forest restoration when we understand our ngahere and how it lives, how it works as an ecosystem and how it is changing. Thus, strategy development and implementation for the Trust must be based on our research and knowledge about our ngahere.
- Biodiversity matters: Some species of flora and fauna have a traditional cultural significance for our people and need to be restored or cared for. Some are critical for their role in the ecosystem, such as birds in dispersal of seeds. Some are potentially critical for sustaining our people in economic, health or recreational ways.

- Natural forestry: Any forestry activity is to involve maintaining the natural composition and structure of our forest.
- Development not just management: Intervention is not only acceptable but desirable. If we don't do something our forest will change so much that we will lose special species in our forests for future generations
- Small scale is not only OK it is desirable: Small scale allows us to manage any forestry operation ourselves. It also allows us and pushes us to realising more value from the harvest. In turn this approach reduces the incentive for us to harvest more than what we need to sustain our operation.
- Future generations: We are not here just for the benefit of this generation; we must also be mindful of the needs of future generations.



Fiona Carswell, Landcare Research, admires a very healthy transplanted rimu!

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## What Were the Forests Like around Ruatāhuna in the Past?

### WHO'S INVOLVED?

**Tuawhenua Trust:** Katiana Tamiana

**Landcare Research:** Janet Wilmshurst,  
Sarah Richardson

Have you ever wondered what the forests around Ruatāhuna might have looked like in the past, before they were logged, or before people started living among them? One of Tuawhenua Trust's goals is to restore podocarps to pre-logging levels, so finding out about what the forests were like in the past and what role the podocarps have played in the forests over the past few thousand years is important to help answer this question, and to help guide future forest management. One way of reconstructing the past history of the Urewera forests is to look at tiny pollen grains preserved in sediments that have accumulated over thousands of years at the bottom of a lake.

A few years ago, Katiana Tamiana helped us collect a lake sediment core from the bottom of a small lake just north of Kanohirua Hut, about 5 km directly east of the Mataatua Marae. We retrieved just under 5 metres of lake sediment, the base of which was about 5000 years old. The core contained four thick volcanic ashes from the central volcanic region. The ashes are well known to geologists, and these helped us to date the age of the sediments. At the bottom of the lake sediments we hit river gravel and rocks, and these were the former base of the lake catchment. It is likely that this lake formed after a large earthquake-induced landslide that blocked the drainage in the small basin, and created an instant lake. There are many such lakes in the eastern North Island that date to the same period; that earthquake must have been bigger than any of the recent Christchurch earthquakes.

We took the cores of lake sediment back to the laboratory at Manaaki Whenua in Lincoln, where small samples were taken of the sediment every 10 cm along the core from the surface right down to the base. We counted the pollen in these samples, identifying over 92 species or types of plants, allowing us to reconstruct what the forest used to look like over the past 5000 years. In the pollen diagram shown below you can see

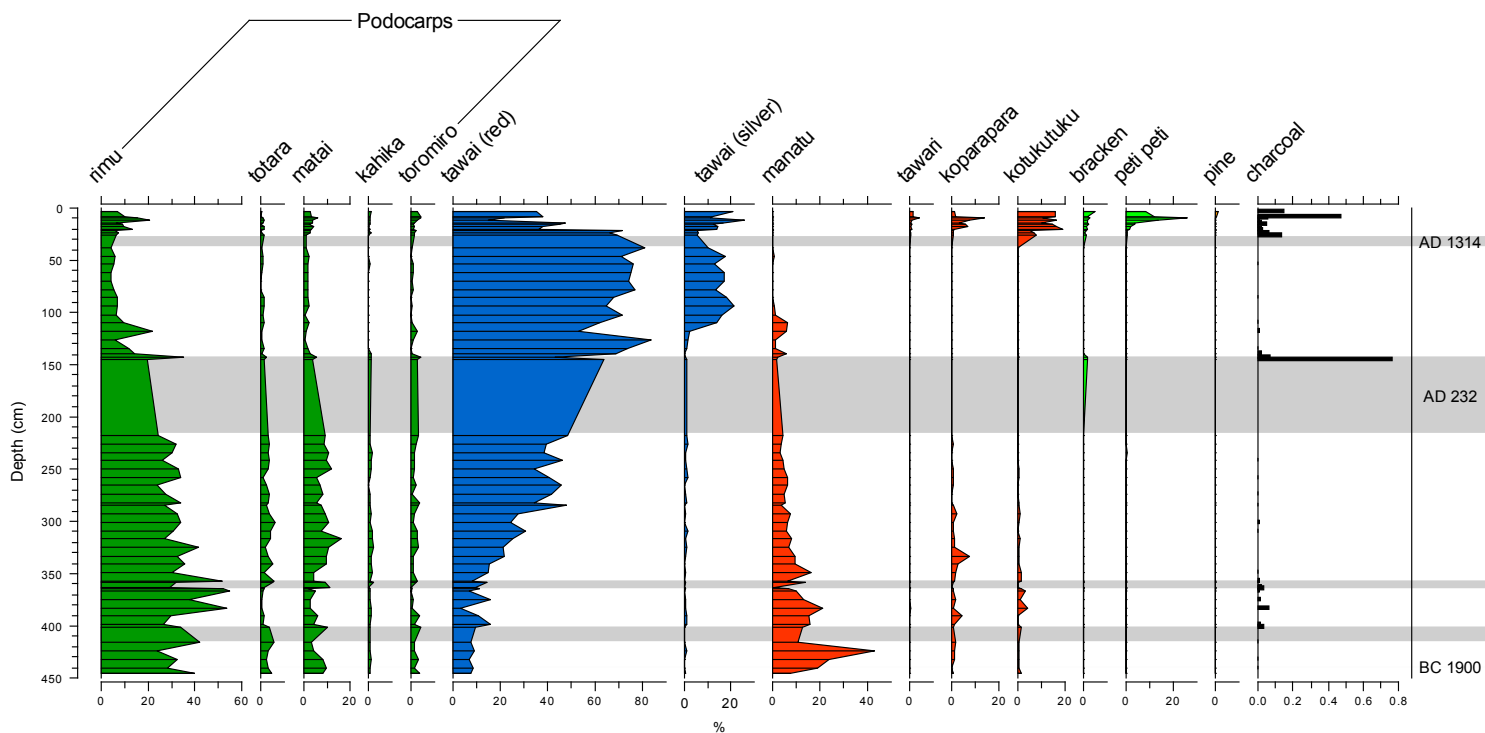
a summary of the most abundant plants, and the grey zones that represent the position of the volcanic ash layers.

At the base of the core you can see that rimu and mānatu were the most common species and tawai less so. The mānatu probably colonised the freshly disturbed landscape after the earthquake-induced landslide about 5000 years ago. Moving forward to about 700 years ago, however, all these species become less abundant as tawai (red beech and then silver beech) then increase to become the most dominant tree types in the forest. Unfortunately, we can't tell what tawa, a common forest dominant, was doing in the past, as it is one of only a few major tree species in New Zealand that doesn't leave a trace in the pollen record.

Despite a background of disturbance from a number of large volcanic eruptions over the last 5000 years, the pattern of gradual change from podocarp dominance to beech dominance is not unique. This pattern is also seen in more southern regions of New Zealand that were unaffected by such disturbances. The transformation of forest species represents a response by the trees to changing climates and seasonality over the last 10,000 years. Volcanic and other natural disturbances do not appear to alter the trajectory of the forest composition over long periods; they merely cause short-term responses in the way of an increase in species that occur as a result of disturbance.

In the year AD 1314 an eruption from the Tarawera Volcano left its mark in the lake by way of a 10-cm-thick ash layer called the Kaharoa Tephra, which is neatly preserved in the lake muds. Immediately above the volcanic ash there is a short-lived spike of charcoal indicating small fires that probably burnt damaged vegetation after this eruption, and this response is similar after each volcanic eruption captured in the core.

In the last 700 years fires lit by people became common and transformed the forests in a unique way – in that fire frequency increased to levels never experienced in New Zealand before. This new fire regime resulted in



disturbance-loving plants responding well to this, including kōtukutuku, tāwari and the ferns rarauhe (bracken) and petipeti. Rimu and matai appear to have increased slightly during this period too compared with the preceding 1000 years, and were probably profiting from patchy clearings in the fire-disturbed beech forest.

The pollen record shows clearly that what you see today hasn't always been that way. The composition of forests is not static; many of our long-lived and shorter-lived tree species continue to jostle for space and resources. Their composition can change for a number of reasons, including natural disturbances, human-lit fires, cyclones, disease and logging. The snippet of forest history that Kanohirua lake muds reveal show that restoration and management of forests for timber and other resources can benefit from a longer-term perspective.

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Top left: Kanohirua Lake. Top right: Katiana helping collect cores, using a pounder to push through thick pumice layers. Bottom left: Collecting cores on the lake. Bottom right: A core section showing the grey coarse, medium and fine pumice layers that fell over the region 2000 years ago, after an eruption from Lake Taupo. We found evidence of at least four large volcanic eruptions preserved in the organic brown lake sediments.

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