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Overview and updates in brief

In this second newsletter we are now not only able to describe research projects we plan or have just started, but also include some research results as well as important general interest articles.

PROJECT:

FOREST MANAGEMENT: KERERŪ

The Manaaki Whenua Kererū team will be looking to use mist nets to live capture about 10 adult kererū during June and attach radio-tracking transmitters. We need birds to carry the transmitters so we can find their nests and monitor breeding success and what predators are taking eggs or killing adults and/or chicks.

1080 IMPACTS

Once again James Ataria (Manaaki Whenua), Shaun Ogilvie (Lincoln University), James Waiwai (Lake Waikaremoana Hapu Restoration Trust), and Jim Doherty (Tūhoe Tuawhenua Trust) are seeking funding, this time to establish a small Māori research team to review current literature on the environmental fate and impacts of 1080.

MĀORI KNOWLEDGE AND USES OF FUNGI

Rebekah Fuller (Te Rarawa) recently interviewed members of the Tuawhenua Trust as part of her MSc studies on Māori knowledge and uses of fungi. Among all the iwi the Tūhoe people interviewed had the greatest knowledge of the forest fungi.

NEW THREATS TO FORESTS

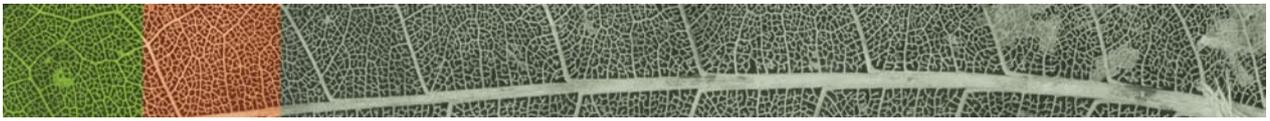
Rob Allen successfully negotiated funding from the Foundation for Research, Science and Technology for new research that will include Tuawhenua forests as a key component. The research starts in July and will study pest, weed and climate change impacts on forests.

For more information about the overall project:
 Contact: **Rob Allen**
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 Email allen@landcareresearch.co.nz

Relationship between Manaaki Whenua and Tūhoe Tuawhenua Trust: 2004 – 2005

Project	a) Forest management: podocarp restoration	b) Forest management: kererū	c) Forest management: climate warming	d) Bioactive compounds	e) Fungal systematics	f) Invertebrate systematics	g) 1080 impacts
Tūhoe contact	Jim Doherty Basil Tamiana	Jim Doherty Spady Kutia	Jim Doherty	Jim Doherty	Jim Doherty	Jim Doherty	Jim Doherty
Manaaki Whenua contact	Rob Allen Fiona Carswell David Wardle	Rob Allen Phil Lyver	Matt McGlone Sarah Richardson	Peter Johnston Oliver Sutherland Andrew Broadwell (Bidiscovery)	Peter Buchanan	Trevor Crosby Robert Hoare Rich Leschen	Jamie Ataria
Funding	FRST	FRST	FRST	FRST	FRST	FRST	AHB





Wharekiri Rangikawhetiu Biddle



Credit: Tuawhenua Trust

“Wharekiri he moemoeā nāhau kihai koe i kite i tōna pūāwaitanā, he rangatira i pouā iho tana maiohā Tūhoe whakakotahi i a koe...”

He kupu ēnei no te waiata-ā-ringa o te kapahaka o Ruatāhuna Kakahu Mauku i haere nei rātou ki nga whakataetae o te motu i tenei tau. E whakaata ana te waiata nei i te mamae o te parekura nui o Tūhoe, i tihaea ai te pae tapu o Ruatāhuna ka ngaro i te tirohanga kanohi nga rangatira o Te Urewera hapū, a Te Wharekiri rāua ko Mihaka. No reira he poroporoaki nā ngā tamariki o nga hapū o Te Tuawhenua ki o rātou rangatira. He maha ngā kaupapa i whāwhātia e Te Wharekiri mo tana nui, otiia mo tana rahi. Engari ko te kaupapa nui rawa i pa tana ringa ko te whakāra i te kerēme a Te Tuawhenua ki te Roopu Whakamana i Te Tiriti o Waitangi. Kīhai i whai wahi a Te Wharekiri ki te whakatakoto i ana korero ka tangohia e te ringa kaha o aitua. Ka waiho iho e ia ana whakaaro ma tana tamāhine e tuku i mua tata o tana matenga. Waihoki, i a ia ka pānia e te mate, kua kite noa atu a ia i te totarawahiruatanga o tana iwi. Ka waihanahia mai tana maiohā, na tana tamāhine i tuku ki te aroaro o tana iwi, i roto i tana whare runanga i Te Whāi-a-te-motu, kia whakakotahi a

Tūhoe. Moe mai e te kurupounamu, moe mai i te urunga tapu i te moenga tapu o tīpuna.

Wharekiri Rangikawhetiu Biddle carried the names of his ancestors and the mantle of leadership for his hapu of Te Urewera, Ngāti Tawhaki and Ngāti Rongo. He descends from a long line of leaders of the Tūhoe tribe, and was raised in the home of rangatira. When his time came, he stepped into the role of a leader of his tribe and of his hapu of Ruatāhuna. He was coming to the pinnacle of his leadership and his contribution to the future of the Tūhoe people when he was taken by a cruel illness, passing away in the winter of 2004, aged only 68 years.

Wharekiri knew well his responsibilities as a rangatira to uphold mana whenua – to maintain hapu authority over the lands of his ancestors as had been done over the generations. Wharekiri was also a man of enterprise. He tried working for others in younger days in Wellington and Rotorua, but returned home to Ruatāhuna before too long, determined to work for himself and to establish enterprises that would employ others of his whanau, hapu and iwi. He had no formal business

training but he had innovative ideas, he was a hard worker, he could muster the effort and skills of others, and he believed in himself and a better future for his people.

Wharekiri led the development of a number of initiatives in Ruatāhuna. With others of his whanau, he established Te Rehuwai Safaris, a tourist trekking business, in the 1970s. He loved this work. He met people from all over the world and throughout New Zealand, some of whom became his very good friends. But most of all, this was work, earning something of a living, on his own hapu lands, that celebrated the pristine surrounds and the past homes of his ancestors.

But work on the safaris was only seasonal. Wharekiri sought other opportunities. He joined up with others in the capture and slaughter of feral deer off ancestral lands in the 1970s but this was short-lived. He also rallied his whanau to establish a seed potato scheme in Ruatāhuna. Wharekiri led this development until the venture progressed to the stage of commercial production, when the need for more flat land turned the project over to the Ruatāhuna Farm. Wharekiri was also active in the buoyant possum industry of the 1970s. The theme of Wharekiri's career as an entrepreneur is striking – utilise the resources and the lands of the ancestors in a way that protects the land and provides work for the hapu. This was the essence of his enterprising leadership.

It was Wharekiri's understanding of and commitment to mana whenua that underpinned his approach to enterprise development. It was also the reason for him actively engaging in the politics of Tūhoe at large, and in claims relating to the lands about Ruatāhuna – the



Tuawhenua. In the late 1970s, Wharekiri worked with elders and others of his whanau to take a case, eventually to the High Court, to have the lands of the Tuawhenua returned to hapu ownership. In the 1980s, the High Court, in an unprecedented decision, found in the owners' favour, and the lands of the Tuawhenua were then generally organised under the administration of trusts, one of which is the Tuawhenua Trust. Wharekiri became a trustee for the Tuawhenua lands in time, and continued to pursue initiatives for these lands through this role.

Whilst Wharekiri felt some sense of achievement in the progress made with the authority and development for the Tuawhenua lands, by the 1990s he was looking further afield. He had always felt like the whole of the Urewera was his home. His parents and elders had always talked of the Urewera in this way. So how did most of the Urewera fall into the hands of the Crown and become National Park?

Other questions plagued his mind since the time of the Tuawhenua court case. How did the land about Ruatāhuna get allocated to owners as it did? And how did the Crown get lands at the Ruatāhuna township and at points along the Whakatane River valley? How was it that paper roads were plastered all over the Urewera allowing access for the public across his ancestors lands?

More questions emerged as he dwelt, in deep thought, on the state of his people in Ruatāhuna. Why were the roads still not sealed into and about Ruatāhuna? Why did Ruatāhuna parents have to send their children away at such high cost to boarding school when others in the country could have 'free' secondary education? Why were most of the people of Ruatāhuna unemployed?

Why was there no public transport anymore to Ruatāhuna? No post office? No doctor or district health nurse? No economic development? No visits from government agencies? Why had Ruatāhuna, once in the days of his ancestors the centre of Tūhoe wealth and power, become so poor, so bereft and so disadvantaged?

In year 2000, Wharekiri filed a claim against the Crown with the Waitangi Tribunal for a number of specific issues relating to the lands of the Tuawhenua and the Urewera at large, and generally for all acts, policies and omissions by the Crown that led to disadvantage for the people of Ruatāhuna. This was a courageous step for Wharekiri to take. He had no knowledge of Treaty claims and what he would face in the claims process, and he had little support amongst his own people who at the time understood little of these matters. But Wharekiri knew he had to do this, even if it meant doing it on his own.

Wharekiri's claim was unique. His claim covered not only matters of loss of land and those impacts, but also the impacts arising from the Crown's omissions and policies in social services and economic development. Thus his claim sought a comprehensive examination of the relationship between the Crown and the hapu of Tūhoe in the Ruatāhuna district. This novel approach to claims in the Urewera was adopted by many other Tūhoe claimants in the Urewera hearings. Consequently, it can be said, that the claims of Tūhoe have been comprehensively put before the Waitangi Tribunal. This was the measure of the contribution of the man.

But Wharekiri never saw the fruition of his boldness, wisdom and foresight in taking the Tuawhenua claims. In May 2004, as his hapu of Ruatāhuna prepared his marae at Mataatua

for the hearing of his claims by the Waitangi Tribunal, Wharekiri lay deathly sick at his home. The people of Ruatāhuna pulled together to support the kaupapa of Wharekiri's claim, saddened though that he was unable to stand to lay out his claim before the Tribunal. But no one was prepared for the tragedy that struck Ruatāhuna in that week. On the first day of the hearing, Wharekiri's cousin, Mihaka Herewini died suddenly at the hui. By the end of the second day of hearings, Wharekiri himself had died. Thus began what Ruatāhuna has called the "parekura" of 2004. Many others, of all the hapu of Ruatāhuna, died in this last year. There seemed to be few weeks when there wasn't a tangi in Ruatāhuna, and the people of Ruatāhuna grieve still.

But it is the legacy of Wharekiri's vision and efforts for the lands of the Tuawhenua, and his entrepreneurial, determined spirit that will live on long past when the great pain of his loss and the loss of others will have eased. This is Wharekiri's true gift for the future generations, for the children and mokopuna of his hapu, and it is for them to realise the dreams that he dared to dream. Part of facilitating the dream to reality was his unstinting belief that the whenua, the taonga tuku iho of his ancestors, was handed down to conserve, to preserve, to provide and to sustain his people. He saw the convergence of āhuatanga Māori and Western science as imperative and welcomed the partnership with Manaaki Whenua in assisting to drive the dream towards a better social, economic and cultural reality for his people.



Regeneration of Tuawhenua forests

WHO'S INVOLVED?

Tuawhenua Trust:

Jim Doherty, Tim McManus, Basil Tamiana

Ruatāhuna:

Katiana Tamiana

Manaaki Whenua:

Rob Allen, Fiona Carswell, Susan Wisser, Sarah Richardson, Melissa Brignall-Theyer

WHY ARE WE DOING THE RESEARCH?

The Tuawhenua Trust has been concerned that some forest tree species (toromiro, rimu, mātai, tōtara and kahikatea) have not been regenerating as well as they used to. We are trying to discover exactly where these species are regenerating and are then trying to see if their growth is restricted because of light or nutrients. Maybe tawa is better able to survive in the current conditions following past logging of Tuawhenua forests?

big rivers so we probably missed them during our survey. We found most toromiro seedlings in stands of tawa where the forest canopy was dense. They didn't grow where the area had been obviously disturbed by past logging (e.g. on bully tracks) or where there was a high concentration of phosphorus in the soil. They grew where there were lots of rātā trees. Rimu seedlings were also found mostly in closed forest. They didn't grow where there were too many tree ferns though or where the amount of calcium in the soil was very high.

WHAT ARE THE RESEARCH RESULTS?

Numbers of seedlings per hectare of each of the species in the Kakānui, Tarapounamu and Te Waiiti forest blocks are given in the table below. We converted the number of seedlings in the area surveyed to the number we would expect in a whole hectare.

For the next phase of the research we have tagged 300 seedlings of tawa, toromiro and rimu and Katiana has dug trenches round half of them to stop tree roots of big trees nearby from stealing all the nutrients from the seedlings. We will now see if this has allowed them to grow more than where there are no trenches. We have these seedlings in the light and in the shade so we will see if plants in the light grow faster than ones in the shade.

We can see that there were a lot more tawa seedlings in all blocks than other species. Kahika seedlings are generally only found close to quite



Block	tawa	toromiro	rimu	mātai	kahikatea
Kakānui	1565	305	93	40	0
Tarapounamu	2268	531	146	66	106
Te Waiiti	1167	133	146	27	0
Average of all blocks	1667	323	128	44	35

(Top) Rimu. Credit: Manaaki Whenua Collection

(Bottom) Melissa, Katiana, Kori and Jim hard at work. Credit: Fiona Carswell

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Ecological impact of removing trees

WHO'S INVOLVED?

Tuawhenua Trust:

Jim Doherty

Ruatāhuna:

Katiana Tamiana

Manaaki Whenua:

David Wardle, Susan Wiser, Rob Allen,

Karen Boot, Fiona Carswell, Melissa

Brignall-Theyer

WHY ARE WE DOING THE RESEARCH?

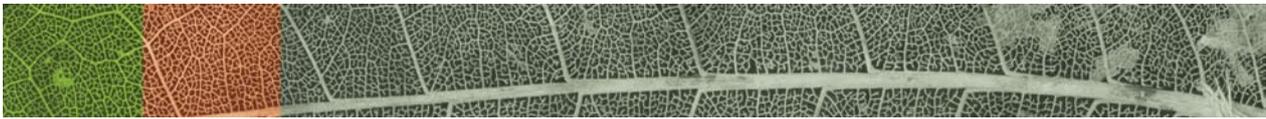
Logging of native forest frequently involves selectively removing individual trees of species with desired timber properties (e.g. rimu, toromiro, mataī), while the remaining forest is left uncut. The effects this type of single tree selection has on the forest ecosystem is largely unknown. For example, when a single large tree is removed what effect does this have on the surrounding vegetation? And do these effects follow through the rest of the ecosystem, by affecting such things as rotting of dead leaves, release of nutrients through the soil, and those soil organisms responsible for supplying nutrients required for plant growth? These effects may depend on the tree species removed. Rimu trees, for example, produce slow-rotting and highly acidic leaf litter, and therefore we may expect their selective removal to have important consequences for the rest of the ecosystem some distance out from the tree trunk.

metres. For each plot we observe which plant species are present. We are also assessing belowground properties such as the amounts of key nutrients in the soil, the communities of microbes (bacteria and fungi) that control nutrient cycling in the soil, and the rates at which dead leaves break down and release nutrients to the soil. In combination, these measurements should give us useful insights into how removals of individual rimu trees affected the rest of the forest ecosystem. In the future we aim to use tree-ring measurements to determine whether the removal of individual rimu trees has enabled nearby tawa trees to grow faster.



WHAT DOES THE RESEARCH INVOLVE?

The patch of forest we are studying is a 2-km strip along the border between Tuawhenua Trust land and Te Urewera National Park. On the Tuawhenua Trust land, several large rimu trees were selectively removed by logging 40 years ago, while those in the National Park remained undisturbed. This unintended experiment enables us to study the effects of removing individual rimu trees on the rest of the forest ecosystem 40 years later. For our study we have selected 20 living large rimu trees, and 20 stumps of large rimu trees that were harvested in the 1960s. For each live tree and stump, we have set up plots at three distances from the base of the trunk: 0 – 4 metres, 4 – 8 metres and 12 – 16



Trip to Te Waipounamu

Jim Doherty and Tim McManus from the Tuawhenua Trust were invited to Lincoln for 3–6 August, 2004 to see Manaaki Whenua at home and to visit some different indigenous production forests.

Two forests were chosen to represent quite different models of indigenous forestry. The first was John and Rosalie Wardle’s “Woodside Forest”, which is managed as a “continuous cover” forest with the aim of providing an income indefinitely. The second forest is Crown-owned but managed by Waitutu Incorporation where cutting rights have been sold for 80 years and the forest is being coupe harvested.

Jim’s impression of the two forest systems:

1) John Wardle’s private forest is a mixture of beech and exotic (pine and hardwood). The forest is approximately 100 ha and provides an income for three families.

- John and his wife make their living from milling dead and fallen beech, which is covered by a Sustainable Management Plan (MAF). John also has a comprehensive tending and silvicultural system both for beech and exotic timber. He cuts, extracts, mills and dries the timber, which he sells to furniture and cabinet makers.
- Beekeeping – Honey provides an income for the second family. One hundred hives are located throughout the forest. Bees collect the honeydew from the beech (produced by a scale insect) and turn it into honey. According to John this could be further utilised.
- Income from the exotic timber (i.e. radiata pine) sold at \$64 per tonne at stump.

Jim believes this system has a place in the Tuawhenua area, given a lot of hard work and most of all commitment.

2) The Waitutu Incorporation forest in Southland is regenerated beech approximately 100 years old. Lindsay and Dixon owns the cutting rights for a period of 80 years. The system adopted is known as a grid coupe system. This is based on a one-hundred-year turnaround, which at first visit looks to have some faults. According to the contractor regeneration occurs at year 10. When Jim questioned the MAF staff they said 25 years. Jim tends to accept MAF’s estimate because he visited sites that were cut 3 – 4 years ago and there was very little sign of beech regeneration. The site was covered in 2-metre-high makomako, cutting out any chance of beech regeneration. The other very interesting part is that most of the land is Crown-owned but Waitutu Inc. has the cutting rights in perpetuity as part of their Tribunal settlement.



(Top) Beech harvest at Woodside Forest. Credit: Ian Platt, Indigenous Forestry Unit, MAF

(Bottom) Jim in Southland. Credit: Susan Wiser

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The response of Tuawhenua forests to climate warming

WHO'S INVOLVED?

Tuawhenua Trust:

Jim Doherty, Basil Tamiana

Ruatāhuna:

Katiana Tamiana

Manaaki Whenua:

Rob Allen, Matt McGlone, Chris Morse,
Fiona Carswell, Sarah Richardson

Taihoro Nukurangi:

Jim Renwick

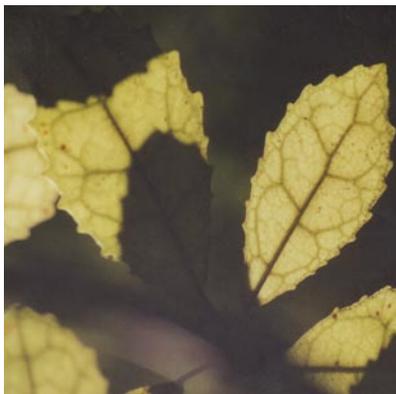
WHY ARE WE DOING THE RESEARCH?

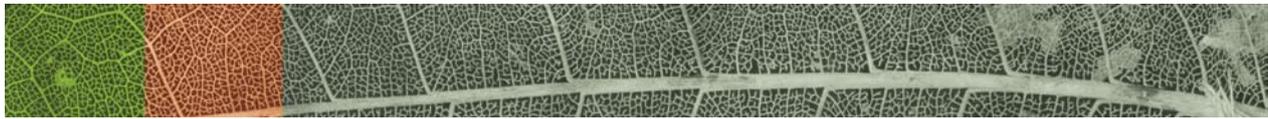
Climate change is expected to have a large effect on Tuawhenua forests. As temperatures increase and frosts become less frequent, the climate of Te Urewera will gradually become similar to that of present-day Northland. Rising temperatures will affect the growth and survival of tree seedlings, and eventually, this could bring about changes in the distributions of tree species. The effect of temperature on the distribution of tree species in Tuawhenua forests can be seen by the way that forests change with altitude: tawai (beech), which can tolerate frost, grows at high-altitude sites where temperatures are cool and frosts are common; tawa, which is frost-sensitive, grows at low-altitude sites where temperatures are warm; rimu and toromiro, which can tolerate moderate frosts, grow in between tawai and tawa. Warmer temperatures may enable tawa seedlings to grow at higher-altitude sites where toromiro and rimu currently grow. Because these two species do not commonly become canopy trees in closed tawa forest, the uphill advance of tawa may reduce the abundance of toromiro and rimu.

WHAT DOES THE RESEARCH INVOLVE?

The first part of our research will involve measuring climate at a number of places throughout Tuawhenua forests so that we can get a good understanding of how climate varies across the area. We will measure temperature, rainfall and humidity every hour from a permanent climate station in a forest clearing at Ngāputahi. We will also measure temperature and humidity inside the forest at different altitudes in order to understand the climate that tree seedlings experience inside the forest. The second part of our

research will involve growing and measuring tree seedlings of six important tree species at a range of altitudes. The results from this experiment will help us understand how temperature influences the growth and survival of each species. Four of our species will be ones that naturally occur in Tuawhenua forests (rimu, toromiro, tawa, tawai), and two will be weed species (radiata pine and Douglas fir). There is concern that these two weed species are spreading into the forest and, worse still, that warmer temperatures may help them to spread faster. By comparing the growth of weed species with that of natural tree species at a range of altitudes, we will be able to judge whether this is likely to happen and whether management steps should be taken to slow weed invasions. To start the project, a selection of the people involved will meet in Ruatāhuna to survey the forest looking for a suitable site where seedlings can be grown. Once a site is found, we will plant out tree seedlings at a range of altitudes. These tree seedlings will be protected from deer and pigs, using small cages. We will return to the seedlings at least once a year for 5 years and take measurements to assess their growth and survival.





Hui in Tamaki Makaurau

BY OLIVER SUTHERLAND



(Top) Kōkako. Credit: Manaaki Whenua Collection

(Bottom) Tūi. Credit: Manaaki Whenua Collection

TUAWHENUA TRUST MEETS RESEARCHERS "AT HOME"

Hui between the Tuawhenua Trust and the scientists with whom the Trust works are always fun and last December's get-together was no exception. For the second time, the Trust visited Tamaki Makaurau to meet with staff of Manaaki Whenua and BioDiscovery NZ on their own turf. First stop was at Manaaki Whenua's new premises at Tamaki. A powhiri for the Tūhoe manuhiri included a welcome from Manaaki Whenua's new Board Chairman, Rob Fenwick, as well as senior managers Dave Choquenot, Maggie Lawton and Charlie Eason.

After 2 days of discussions and demonstrations on forest ecology, pest management and fungal and insect biosystematics, the Trust members were happy to take a break from the science and stretch their legs on a day-long "overseas trip". A fast and bouncy launch ride from Whangaparaoa took the Trustees to Tiritiri Matangi Island where they were able to see the successful restoration of this once-farmed island. University of Auckland Professor John Craig who had overseen the restoration project from its inception 30 or so years ago guided the group through the replanted and restored bush accompanied by the calls of kōkako, tieke (saddlebacks),

hihi (stitchbirds) and tūi as well as the murmuring of penguins nesting in a glass-walled inspection chamber.

In their fourth and last day in the city, the Trustees visited the laboratories of BioDiscovery in Parnell where the staff welcomed them with a powhiri, led by Peter Wigley and Andy Broadwell. BioDiscovery is a small research enterprise that aims to develop biological pesticides from the microscopic bacteria and fungi from the natural environment, including litter and soil samples from the Trust's forests. A tour of the laboratories included demonstrations of isolating and growing up colonies of bacteria and fungi and then testing them to see if they kill insects and other pests. Myra Doherty, who was accompanying her husband Jim who chairs the Trust, found it all so exciting that she announced that she planned to start on a science career!

Overall, the 4-day hui was a great success, further strengthening the relationship between the Trust and the collaborating researchers. It also provided an opportunity to celebrate the newly announced 12-year FRST funding of Rob Allen's Ecosystem Resilience (New Threats to Forest) Outcome-Based Investment of which the work in Te Urewera is a key component.



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