



TE KAAHU O TUAWHENUA



Issue December 2019

CONTENTS

Tūhoe Tuawhenua Trust in 2019	2
Te Whare o Rehua	4
Manawa Honey NZ	6
Manaaki Whenua Scholarship Award 2018	8
More birds in the bush	9
Mushroom endeavour's	10
Do honeybees affect insect, fungi and bacteria communities in mānuka?	11
Te Kura Huna o Te Urewera	14
Tuawhenua Chair James Doherty Retires	15

Te Kaahu o Tuawhenua is an annual publication presenting the activities of the Tuawhenua Trust, in particular research with Manaaki Whenua.

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TŪHOE TUAWHENUA
TRUST
363a Mātaatua Road,
Ruatāhuna



SUPPORTED BY



LANDCARE RESEARCH
MANAAKI WHENUA

“E ngā pakiaka haere whenua, tēnei te tangi kōrihi a Te Tuawhenua me Manaaki Whenua ki a koutou katoa kia rarau mai ki ōna pūrongo mo tēnei tau 2019.”

The Tūhoe Tuawhenua Trust and Manaaki Whenua have continued to work together over 2019 in a range of areas. In this edition of Te Kaahu we report on the activities of the Tūhoe Tuawhenua Trust, featuring not only our honey business Manawa Honey NZ, but also our programme for reconnecting our young people to forest life and knowledge, known as Te Whare o Rehua.

We report on the initiation of a major research project with Landcare Manaaki Whenua in 2019 on ‘More Birds in the Bush’. We also provide updates on a number of other initiatives with Landcare Research Manaaki Whenua - the Manaaki Whenua Scholarship, edible fungi, preview of documentaries ‘Te Kura Huna o Te Urewera’ and research on insect pollinators in manuka.

For both the Trust and Manaaki Whenua, 2019 brings the end of an era with our Chair Tāhae Doherty stepping down from the Trust. We report on the back page on his fond farewell....



We celebrated the achievements of our Chair Tāhae Doherty, when he retired recently after 32 years with the Tuawhenua Trust. Tāhae responds here to the many speeches made at a function held for this celebration, flanked on his left by his wife Māera, and on his right, by Oliver Sutherland, a great friend of many years in research with Manaaki Whenua Landcare Research.

Tūhoe Tuawhenua Trust in 2019

WHO'S INVOLVED

Trustees of the Tuawhenua: Richard Tūmarae (Interim Chair), Korotau Tamiana, Hekenoa Te Kurapa, Tāne Rua, Brenda Tahī (Executive Trustee)

TE KAUPAPA O TE TUAWHENUA

The Trust is towards the end of its third strategic plan that takes us to 2020. We remain focused on our long term goals of Te Iwi me Te Whenua (developing our land and people); Kaitiakitanga (protection and enhancement of Tuawhenua ecosystems); Te Mātauranga me te Tūhonohono (Knowledge and Networks).

In the last year we have advanced a number of priorities:

- Creating jobs and training local people into these roles.
- For Manawa Honey NZ, growing honey production, consolidating domestic markets and growing export markets.
- Completing the documentaries on kereru - Te Kura Huna o Te Urewera
- Partnering in a number of research projects with research agencies and institutes
- Contributing where we can to networks in research and other endeavours, locally, nationally and overseas.

THE PEOPLE: JOB CREATION & TRAINING

Our researcher Puke Tīmoti continued his studies part-time whilst working with Manaaki Whenua in research projects. His thesis relates to kereru as a cultural keystone species so we look forward to the completion of this work.

For the beekeepers, 2019 has seen the training of Tamahou Te Pou and Craig Pearson as beekeepers initiated. In the office, Marama Huiarangi learnt inventory control, orders and logistics; Mel Parker

took on marketing in the domestic market; Atamira Tūmarae led out the new programme Te Whare o Rehua; Tania Blomfield took on learning about Amazon. We have had staff changes at the end of 2019 in the office with Te Kaahuirangi TeRire joining us to lead Te Whare o Rehua and take over responsibilities for the New Zealand market for Manawa Honey NZ.

NETWORKING AND CONTRIBUTION

2019 saw Puke Tīmoti contribute to the development of government's strategy and plan on biodiversity - 'Te Kōiroa o Te Kōiora, which was launched in August of this year. This policy will guide biodiversity management over the next ten years. Puke's involvement was a key contribution to this policy development to ensure that Mātauranga and tikanga Maori are integral to how the environment and biodiversity are managed under national policies.

In January 2019, Brenda Tahī and Atamira Tūmarae visited Thailand for a conference on pollinators along with other indigenous peoples from across the world. The conference was a follow-up on contribution made some years ago by James Doherty and Kirituia Tūmarae in Panama City to an assessment of pollination and pollinators being undertaken by IPBES (Inter-government Science-Policy Platform on Biodiversity and Ecosystem Services). That work showed that pollinators such as bees, birds, bats and butterflies are in decline globally, which threatens biodiversity and food production all over the world.

The programme for Brenda and Atamira in Thailand involved workshops introducing participants from indigenous peoples and research institutes from across the world; homestay and walking workshops in Hin Lad Nai, a traditional village of the Karen tribe of northern Thailand, and a conference at Chiang Mai University.





Left: Atamira presents the Tuawhenua Worldview in our first day of conference held in Chiang Mai City. This workshop was for introducing participants from indigenous peoples and research institutes from across the world. Of particular interest for us were the ways in which indigenous peoples in other parts of the world live in harmony with pollinators (such as bees) in their forests, not just using them for honey harvest but also as a vital component of their culture, their beliefs, their language and their resource management practices.



We learnt about the life of the Karen people of Hin Lad Nai in the mountains of Northern Thailand through 'walking' workshops. This workshop took us along trails used for the sustainable harvest of honey, coffee and tea from hives and plantations set out under the forest canopy. Here's one of the beehives set to catch a swarm when the season is right – a natural way of beekeeping that depends on deep understanding of and spiritual connection to the wild bees of this forest. We were taught by Karen elders to heed their saying that "we should walk like the bees". They say: "When the bees fly, they fly better together and look after each other and the interest of the whole community of bees. They live in harmony together, and increase the biodiversity in the forest with their actions, like we do."



Te Whare o Rehua

WHO'S INVOLVED

Tūhoe Tuawhenua Trust: Taawi Te Kurapa (Tutor and Trustee), Brenda Tahi (Director and Trustee), Kaahui Te Rire (Project Manager), Puke Timoti (Tutor and Researcher).

From our pilot for this programme in 2018, with support from the J R McKenzie Trust and Te Mātāwai, we have taken Te Whare o Rehua to another stage of development in 2019. Te Whare o Rehua is designed to reconnect our younger people to the ngahere, through a range of means including the transfer of Mātauranga about the ngahere and the whenua to the next generations. For each programme we draw on the expertise of tohunga and kaupupuri korero – experts in their fields to lead out and impart our Mātauranga.

In April, we delivered two programmes. Te Oranga o te Ngahere was led by Taawi Te Kurapa, where the main focus was the 'roar', hunting and roughing it in the bush.

Then Te Mauri o Te Ngahere was led by Puke Timoti, and covered the history of the land and people, eeling and te mauri o te kereru.

In July, Lenny Te Kaawa led Te Oranga o Te Whenua which focused on pig hunting and mana whenua. Then in October, Taawi took Te Oranga o Te Hōiho, which focused on how to work with a horse on the ground, with and without rope, and in saddle.

We have had some inspirational tutoring from our kaupupuri korero in these programmes in 2019. We have also had encouraging responses to these programmes from participants that have come from far and wide to join the locals in this learning.

We will continue to develop the content and resources for these programmes over time, with different themes suitable for different age groups and young people of different interests.



Puke Timoti, second from right, works with participants on Te Whare o Rehua programme at Umukahawai camp in April 2019. Hinewai McManus in support, and Atamira Tūmarae, project manager at the time, look on, while the participants are either thinking hard or writing furiously to capture the Mātauranga.





Top: At left, the boys hold the dogs for the programme at Maungapōhātu, where they were successful when they went pighunting, but it's one of the girls on the right that brought home the bacon!



Left: Te Oranga o te Hōiho programme at Waitawa stock yards brought out the talents of the participants. Tauaki Tumoana Te Kaawa looks smart in saddle as he puts his horse through its paces, whilst Ruaeo Te Moni is working with a wild horse, desensitising this one under the guidance of Taawi Te Kurapa.



Below left: Mariana White has learnt how to work this horse on the ground without rope, and has it moving freely for her in the yard.

Below: The programme for deer-hunting in April 2019 saw a kill being carried out here by Noera Nuku.



Manawa Honey NZ

WHO'S INVOLVED

Hekenoa Te Kūrapa (Trustee and Beekeeping Operations); Brenda Tahī (Trustee and Export Markets);

BEEKEEPING OPERATIONS

Our beekeepers achieved a record harvest in 2019 as the operation continues to grow by increasing hive numbers and beekeeping effectiveness.

In the last season we expanded our operation in the Tuawhenua region by placing hives downriver, where our beekeepers service them by horseback and harvest comes out by chopper. In this way, we have been able to produce superb honeys from this untouched environment.

MARKETING MANAWA HONEY

In 2019, we have worked to maintain our position in supermarkets throughout New Zealand. The market for non-manuka honey has however collapsed, so it's challenging times.

Exports to Japan and China in 2019 for Manawa Honey have encouraged us to pursue these markets as a key strategy to continue to grow the business.

We also brought to market in this period Pua-ā-Tāne honey which is a Wild Forest honey, each batch unique to its source.

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New beekeeper Craig Pearson of Ngaputahi, checks the hives down the Whakatane River for condition of the brood for disease and readiness for the new season. These hives produced a wonderful Pua-ā-Tāne Wild Forest Honey in 2019 - from a truly pristine forest region.





Left: Beekeeper Raymond Te Kurapa makes his way on horse-back down river to work our isolated hives there.



Below left: Pua-ā-Tāne Wild Forest Honey, our new honey for 2019. Our bees work a range of floral sources for this honey - tawhero, rewarewa, tawari, hinau, kanuka, even some world-famous manuka.



Below: Taawi Te Kurapa (at left) oversees the group of students from local school, Te Wharekura o Huiarau as they learn about bees within the hive from ace Manawa Honey beekeeper, Raymond Te Kurapa (at right). The students are learning here about finding the queen bee, what drones are good for, and all about brood in the hive.



Manaaki Whenua Scholarship Award 2019

In 2019, this scholarship was awarded to Fabian Mika for his doctorate studies at Te Whare Wananga o Awanuiarangi. Fabian's thesis is about "Tūhoe connection to the land and its wellbeing", particularly as it pertains to "the sustainability of the Hāhi Ringatū Karakia Hākari." He will cover *inter alia* the philosophy and spirituality that enhance distinctiveness and empower Māori and Indigenous communities, with regard to the knowledge of forest ecology, and flora and fauna regeneration.

This scholarship of \$3000 is offered each year by the Tuawhenua Trust in conjunction

with Manaaki Whenua Landcare Research. The scholarship aims to promote development of Tuawhenua people in the fields of forest ecology and environmental sciences and practices, but can also be awarded in more generalist fields such as business studies or leadership. We promote the availability of this scholarship in June each year in tertiary institutions, and through whanau networks.

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Right: Fabian Mika has pursued an academic career that now brings him to his doctorate at Te Whare Wananga o Awanuiarangi. Here Fabian receives his masters degree from that whare wananga.



More birds in the bush

WHO'S INVOLVED

*Tūhoe Tuawhenua Trust: Brenda Tahī,
Tāhae Doherty, Puke Tīmoti*

*Manaaki Whenua – Landcare Research:
Adrian Monks, Jo Carpenter, Phil Lyver,
Anne Schlesselmann, Susan Walker*

BACKGROUND

The “More Birds in the Bush” research programme aims to collate existing knowledge and develop new knowledge to predict ship rat (and other pests) abundance over time for all of New Zealand’s forests and the outcome for forest birds of any management. Our focus is on forests with a diverse range of plant species, generally found in warmer parts of the New Zealand, which have huge potential to support large populations of forest birds. Ship rats in particular are a big problem in these forests, not only eating eggs and chicks but

consuming flowers, fruit and invertebrates which are food for birds. The programme will end in September 2023.

PROJECTS

Manaaki Whenua and the “More Birds in the Bush” program are partnering with the Tuawhenua Trust on four research projects linked to restoring kererū in Tuawhenua forests.

The first project reviewed Tuawhenua mātauranga and western science on kererū to identify where new knowledge could enhance our ability to restore more kererū to Tuawhenua forests. These reviews raised questions about the role of food (fruit, flowers and leaves) in maintaining large populations of kererū and how food availability has changed over time. Some of these questions are being followed up in the other research projects.



Above: Portrait of a kererū in a kowhai tree. Kererū often feed heavily on young kowhai leaves during late winter through spring but will also eat foliage at other times. Kowhai leaves have more than four times the protein content of commonly eaten fruits. Photo: Stock image



The next project, Te Matu o Tāne, will identify key changes in the structure and dynamics of Tuawhenua forest as experienced by Tuawhenua kaumātua. Using past interviews conducted by Puke Tīmoti and Phil Lyver, we will build on the evidence provided by Tuawhenua kaumātua that fruiting cycles, crop size and fruit size of tawa, hīnau and toromiro have changed in the last 40-50 years. Te Matu o Tāne will document the mātauranga on these forest changes and the linkages to fruiting.

The third project will use western science to understand the environmental causes of changes in crop and fruit size of tawa, hīnau and toromiro. Initially, we will survey forests across New Zealand with different temperature, rainfall and fertility conditions to observe the relationships between environment and the fruiting characteristics. More detailed work in Tuawhenua forests will identify how the environment and fruiting

patterns here align with the general relationships obtained from across the country. We will use tree growth rings and their chemical signature to measure how the Tuawhenua forest environment has changed over the last 50 to 100 years.

The final project will undertake a large experiment to understand the role of rats and possums on the availability of fruit to kererū. While we know something about their combined effect on fruit crops, we don't know the effect of having one or the other. This is important because while possums are relatively easy to control for long periods of time, ship rats are not and will often bounce back within months to even higher numbers than previous, following combined rat and possum control.

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Above: Ship rat feeding on a tirairaka caught at the nest. Ship rats are agile climbers and spend much of their time in the canopy of trees. In the spring and summer, before the fruit arrives, their diet is dominated by invertebrates. In autumn and winter ship rats eat more flowers, fruit and seed. Birds are taken opportunistically, but because ship rats are often so numerous, they are the most common predator of New Zealand forest birds. Most predation of kererū by ship rats and other mammalian predators happens at the egg stage. Photo: Nga Manu images.



Mushroom endeavours

There is a small revolution going on down in the laboratory. Chris Smith is harvesting mushrooms from grow bags and he looks happy with the results. And these aren't your ordinary supermarket variety mushrooms. These are three species that were traditionally collected in NZ forests by Maori as a food resource and have largely been lost to history as the ubiquitous button mushroom reigns supreme in the minds of consumers. The mushroom species here are Pekepekekiore, Tāwaka and the NZ Shiitake.

Our first challenge, says Chris, was to see if these mushroom species could actually be grown indoors, testing out a variety of media under controlled conditions of temperature and humidity. With an ideal substrate identified, quantification of each species was undertaken to ascertain what the yield and growth cycle looks like for each species.

Chris has taken the fresh grown mushrooms to a number of chefs in restaurants in the Upper North Island and the response has been overwhelmingly positive – here was a challenge for chefs to produce unique dishes drawing on a truly NZ resource. “It definitely piqued their interest” says Chris “they were asking me when they could order in produce,

but that will have to wait for at least 12 months”. Chris was recently awarded funding by NZ-based technology development group KiwiNet to move beyond the laboratory and set up a small production facility. This is where the project gets really exciting, says Chris, we will have the capacity to produce a reasonable volume of fresh mushrooms and to gauge more accurately the true costs of production. This will allow us to identify and overcome the challenges of setting up a facility that not only produces but also packages and distributes these unique mushrooms. Ultimately, we want to produce a prospectus detailing information on production and distribution of these mushrooms, and within the next 12 months to have enlisted a good number of chefs in key restaurants throughout NZ as initial testers and potential end clients.

With this material in hand we are keen to take cases for production to iwi including TTT. With Tūhoe's Tawa as an ideal growing substrate we see the potential for a strong partnership.

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Native forests in New Zealand offer a number of excellent edible fungi. Our 'mushroom endeavours' with Manaaki Whenua involve at this stage pekepekekiore (left), tāwaka (right) and NZ Shiitake (bottom).





Above: Pekepekekiore is emerging here from growth media in bags, which is a useful way to grow these edible fungi.

Left: Chris Smith is in his element working with New Zealand native fungi that are edible.



Corinne Watts and Celia Edwards collecting mānuka flowers that have fungi and bacteria communities living on and in them.



Do honeybees affect insect, fungi and bacteria communities in mānuka?

WHO'S INVOLVED

Tūhoe Tuawhenua Trust: Brenda Tahī (Trustee)

Manaaki Whenua – Landcare Research: Corinne Watts, Sarah Richardson, Andrew Dopheide, Danny Thornburrow, Carina Davies

Recently, the production and export of honey sourced from native flowers has grown rapidly. However, honeybees are not native to New Zealand and their effects on native invertebrate, fungi and bacteria communities are not known.

We collected invertebrates, fungi and bacteria from two locations at Tuawhenua in mānuka vegetation and at each location we found a site with beehives (Te Waiti) and a site without beehives (Parahaki). We also compared the Tuawhenua to sites in the Tongariro National Park. We used open-sided tents to collect flying insects and collected over 20,000 invertebrates at Te Waiti and Parahaki, with native species being common. Updated results show that honeybees affect invertebrate communities in mānuka shrublands, but these effects appear to vary between different habitats.

Fungi and bacteria are tiny, there are lots of them, they live everywhere, including on mānuka flowers, and they have important roles in ecosystems. We were interested in

whether fungal and bacterial communities on mānuka flowers differ between sites with and without honeybees, as this could affect honey production from mānuka flowers.

We sampled more than 300 mānuka flowers at sites with beehives at Te Waiti and without beehives at Parahaki. Back in the lab, we used DNA to detect fungi and bacteria living on and in the mānuka flowers.

We found that the fungal communities on mānuka flowers from Te Waiti with beehives were different to those on flowers from Parahaki without beehives. Bacterial communities on flowers were also different in areas with and without honeybees, but less strongly than the fungal communities.

This suggests that mānuka flower fungal communities are more strongly affected by the presence of honeybees than bacterial communities. This is probably related to the relative size of fungi and bacteria: bacteria are very small and can be distributed easily by wind and rain. Fungi are a lot bigger than bacteria, and therefore are not moved so easily so they tend to be carried between flowers by invertebrates visiting flowers. The different fungal and bacterial communities on mānuka flowers with honeybees might have implications for honey production but further research is needed.



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Celia Edwards with a tube of mānuka flowers collected from Te Waiti.



Te Kura Huna o Te Urewera

WHO'S INVOLVED

Tūhoe Tuawhenua Trust: Puke Tīmoti (Researcher); Brenda Tahī (Trustee)

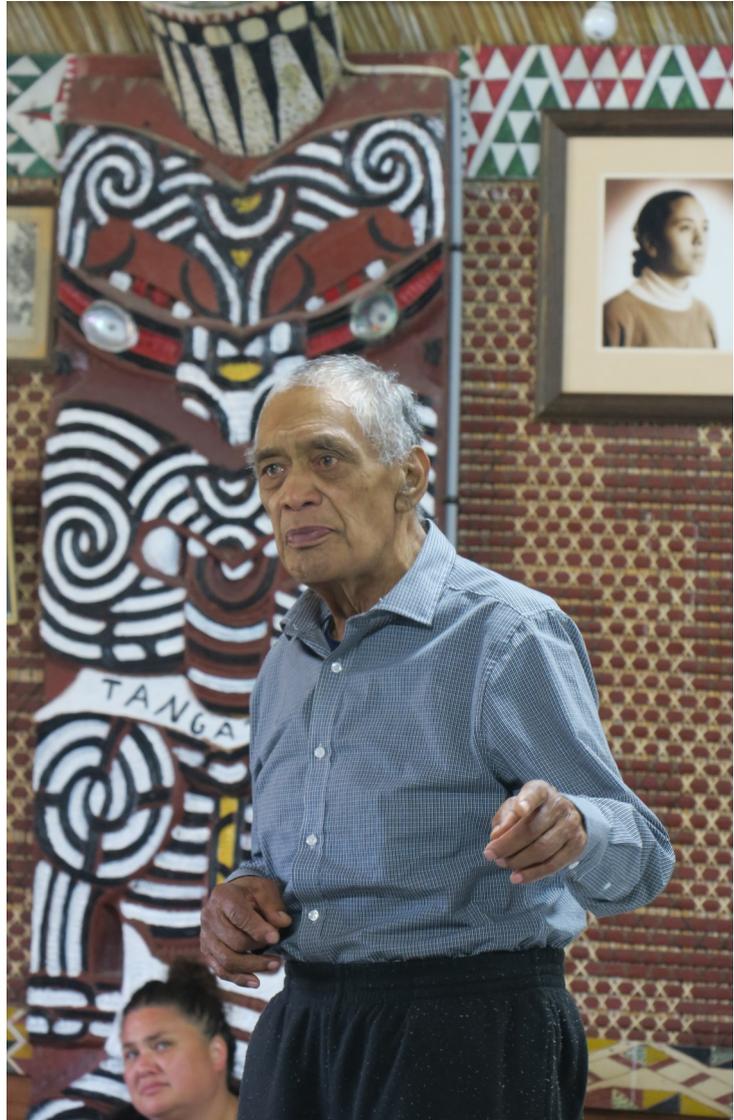
Manaaki Whenua – Landcare Research: Phil Lyver

In November 2019, the contributors to the documentaries about the kereru, Te Kura Huna o Te Urewera, were treated to a pre-view screening. It was a great day to see all the Mātauranga pertaining to the kereru come together on screen. 2020 will see preparation of the documentaries for wider distribution.

Right: Tuawhenua trustee and forest expert Korotau Tamiana, puts his view on the documentaries in the discussion held after the screening.

Below right: Researchers and presenters for the documentaries Puke Tīmoti of the Tuawhenua and Phil Lyver of Manaaki Whenua Landcare Research, share a joke in providing the background to the documentaries.

Below: Te Whai-a-te-motu meeting house at Mātaatua, Ruatāhuna provided the ideal theatre for viewing the documentaries.



Tuawhenua Chair James Doherty Retires

Our Chair James (Tāhae) Doherty stood down after 32 years with the Tuawhenua Trust. Tāhae was one of the original trustees of the Tuawhenua when it was established in 1987, and became the chair nearly 20 years ago.

We celebrated Tāhae's contribution to the Tuawhenua and generally to environmental and biodiversity issues through his roles for other organisations in October 2019 at Papueru Marae in Ruatāhuna. Many of Tāhae's longstanding friends and colleagues from organisations in research and environmental protection such as Manaaki Whenua Landcare Research, Environmental Protection Agency and Scion, joined us on the day to share their stories and memories. Speakers on the day laid out Tāhae's many achievements over the years, and thanked him for his inspirational leadership and contribution at local, regional and national levels.

For the Tuawhenua, Tāhae has been our leader though the establishment of Manawa Honey and the development of our model and plans for sustainable forest management. It has been a busy and challenging time for the Trust that always been tempered by Tāhae's cool wisdom and

his gritty determination for the Tuawhenua to sustainably manage the land and resources of the Tuawhenua for the betterment of future generations. We pay tribute to this humble leader for his unsurpassed Mātauranga o te ngahere (knowledge of the forest), and his achievements in ensuring that Mātauranga is valued alongside western scientific knowledge in regional and national fora.

Below: Tāhae enjoys the photo collection from the Tuawhenua Trust with Lisa Te Heuheu (left), chair of the Maori statutory body of the Environmental Protection Agency and Rob Allen, long time friend and research colleague, formerly of Manaaki Whenua Landcare Research
Bottom: Everyone at the celebration joins into a group photo for the day.





Phil Lyver (right in the photo above) of Manaaki Whenua Landcare Research pays this special tribute to Tāhae Doherty (left in the photo above):

Tāhae (Jim) Doherty received a fond farewell from working life and his role as Chair at the Tūhoe Tuawhenua Trust in late October. His retirement signals an end to the huge contribution Tāhae has made to scientific research over the past 20 years – both with Manaaki Whenua and more recently the BioHeritage Challenge.

Tāhae informed national perspectives through his role on the [Environmental Protection Authority's](#) Ngā Kaihautū Tikanga Taiao. He also made international contributions through the [IPBES](#) Indigenous and Local Knowledge workshop, for the Thematic Assessment for Pollinators, Pollination and Food Production.

Tāhae has been a huge advocate for the importance, relevance and inclusion of mātauranga in all environmental and biodiversity research.

About 60 people attended the celebration of Tāhae's contribution to Mātauranga and environmental research and issues over the years, which was held by the Tūhoe

Tuawhenua Trust at Papueru Marae in Ruatāhuna. Attendees, including representatives from the BioHeritage Challenge, Manaaki Whenua, Environmental Protection Authority, Ngā Whenua Rāhui, the Kaingaroa Village Committee, and mana whenua from Waikaremoana and Ngāti Hine.

On behalf of BioHeritage and Manaaki Whenua, researcher Dr Phil Lyver joined the well-wishers to gift Tāhae two tara pounamu (greenstone spear head for harvesting kererū), which he co-designed with master carvers, Des Herrington and from Waewae Pounamu in Hokitika.

“The tara has relevance as a gift because the saddle behind Tāhae's house at Ngāputahi is called Tarapounamu. The ridge got its name from a tīpuna (ancestor) who speared a kererū there with a tarapounamu, and the tip of the tara broke away from the tao (spearing pole). The story that accompanies that history has especially significance to the Tuawhenua people.

“We hope the tara will be put to good use someday as the Tuawhenua Trust works towards being able to take cultural harvests of kereru one day in the future,” Phil says.

