

# tongariro

August 2015

The journal for Tongariro National Park is produced by **Project Tongariro** with assistance from the Department of Conservation

30

years since Project Tongariro (Tongariro Natural History Society) was formed

37

Whio released in the North Island from the Whio Hardening Facility

10

years ago Kiwi Forever began its vital work saving kiwi

11043

volunteer hours worked in the park and area during the year

TONGARIRO  
NATURAL  
HISTORY  
SOCIETY







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## President's corner

Paul Green

President Project Tongariro

*The Tongariro journal provides an opportunity to share the work of DOC, Project Tongariro and others working in Tongariro National Park and the Central North Island*

We are delighted to publish another Tongariro journal and are most grateful for all the contributions together with a small grant from DOC enabling us to do so. The Tongariro journal provides an opportunity to share the work of DOC and others working in Tongariro National Park and the Central North Island. It is a valuable archival history of key events and opportunities but also provides an opportunity for contributors to express a view on conservation generally. In 2013 DOC indicated it was no longer in a position to produce the Tongariro journal because of the resources required. Project Tongariro decided to assist by undertaking the production and publication but I want to stress it is the Tongariro journal rather than being seen as simply a Project Tongariro publication. DOC stories are the core ones but it is a chance for Project Tongariro and others to share their stories, just as it was when DOC was able to produce and publish

My role has been planning articles to include and targeting those that I think may be interested in helping. But I stress we are willing to publish articles from anyone and I think this gives a nice balance. Thank you Dave Wakelin, for taking on the task of editor for a second time. Many of you will recall that Dave was the editor for many years when DOC published the journal. I also wish to give a special thanks to Amy Satterfield from DOC Whakapapa for taking on the role of being DOC coordinator and chasing up articles in a most efficient manner.

Project Tongariro continues to increase its profile in the local community. This has occurred with our decision to undertake local projects like Te Matapuna restoration and Greening Taupō. There is a community connection that does not always exist inside the National Park where the community is national or even international. The National Park remains our core identity and the Rotopounamu -Mt. Pihanga restoration project is our cornerstone project.

The dilemma for Project Tongariro remains the need to carefully ensure we have the capacity and capability to undertake projects. To undertake a suite of projects we need a staffing resource, key volunteer advocates and general volunteer help. Experience has shown that projects receive the most impetus when carried out with partners including DOC. Having a staff capability is essential for most projects and funding our basic overhead costs is our biggest challenge. Even DOC - our traditional supporter has moved towards funding outcomes rather than providing funds that could then help us seek operational grants. DOC does fund project management costs for successful projects but that relies on being successful with applications on an ongoing basis.

The second main challenge is extending our network of volunteers and supporters. Our traditional volunteers are those who have supported our projects inside the National Park. This

## tongariro the journal

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**Right:** The native Kingfisher (*Halcyon sancta vagans*) known as Kotare to Māori has a wide habitat range which includes lakes, rivers, estuaries as well as open country and forest edge.

Photo: Rafael Ben-Ari



is a difficult group to grow because of the lack of easily identified community. Te Matapuna restoration and Greening Taupō have shown us that there is an opportunity to grow our support at locations like Turangi, Motuoapa and Taupō. Our capacity and capability are currently stretched but we would like to see a future project directed towards the Ohakune and Whakapapa / National Park communities.

As noted Rotopounamu-Mt. Pihanga restoration is our core project. We value our partnership in this project with DOC and are seeking a relationship with iwi as this project evolves towards reintroduction of species like weka as well as successful breeding of kaka and kakariki. We are currently working with DOC and TB Free New Zealand towards a long term integrated management cycle of 1080 control over an extended area with the support of adjacent Māori land owners ensuring that the ecological benefits inside the National Park are strengthened. This project has been very reliant on the long term funding support of the Pharazyn Trust and a core of volunteers maintaining stoat trapping lines. The Adopt a Hectare scheme adds valuable financial support and there has been a number of hectares added this year by public who have walked the lake track and been impressed by the birdlife.

We are very excited about the chance of developing an education app for this site where schools in particular could learn about the management going on at the site as well as learning about the

***“The dilemma for Project Tongariro remains the need to carefully ensure we have the capacity and capability to undertake projects.”***

project goals. There would also be an opportunity to be involved with survey or monitoring work. So far our funding applications for this resource have not been successful.

The Te Matapuna wetland restoration continues to evolve and results of the work are clearly visible to those travelling between Turangi and Motuoapa. Corrections are providing 10000 trees per annum but are no longer able to provide prison labour for planting and for releasing plants. To a large degree this work is being picked up by a new group of volunteers based around Motuoapa and Turangi. Local hapu remain committed to the project and are working with Māori trusts and landowners to advance the work on their land. It is a great partnership of



shared goals with the three hapu and DOC. The DOC Community Conservation Partnership Fund and the Waikato Catchment Ecological Enhancement Trust [WCEET] remain the primary funders of this work.

The big news with Greening Taupō this year is the introduction of Kids Greening Taupō (see separate journal article) together with funding from WCEET to start restoration work on the Waikato River corridor. This work is in partnership with Bike Taupō who have an experienced crew and equipment to undertake difficult pine poisoning or removal and the poisoning or crushing of weeds on steep slopes along with the planting of tree lucerne. Tree lucerne establishes rapidly and provides an ideal nursery for native revegetation with the help of birds dropping seed. We are thankful for the partners involved in Greening Taupō including the Regional Council, Taupō District Council, Tuwharetoa Māori Trust Board, Mighty River Power, DOC, Contact Energy, WCEET, the Business Studio and many others.

Mahi Aroha [the Summer Programme] remains very much part of the National Park tradition for us and DOC.

At the end of last year we transferred ownership of the Tussock Traverse to Jason Cameron. DOC was very helpful in facilitating this and with the assistance of Jason we have remained as 'the charity of choice' for this event and it contributes greatly to our annual fund-raising. We are also very grateful to the Bay Trust for supporting the work of our organisation. A special thanks to DOC and staff in enabling us to share office space at the various locations.

Last October we celebrated our 30 year anniversary with a great dinner at the Chateau Tongariro. I want to pay tribute to Kathy Guy, the hotel General Manager who has been a great supporter of Project Tongariro for 20 years. It was a superb dinner and evening. Project Tongariro remains committed to its over-arching partnership with DOC and its commitment to conservation in Tongariro National Park and its environs.

**Below:** Children from Four Seasons Kindergarten love to explore on their Bush Kindergarten days.

*Photo: DOC*





## Kindara – Tauhara College's sponsored kiwi

Hayleigh Pine,  
Tauhara College student  
Year 12, 16 years old



To be offered the chance to be involved first hand in the release of a kiwi bird into the wild, I already knew I was lucky; but when I got to feel Kindara in my arms and be the last human he was in contact with, I felt blessed.

Kindara is a special bird to my school community; he represents the sisterhood of our school Tauhara College and Kindai School in Japan. We named him Kindara, which is the blending of the two names of our schools.

I believe he also represents the growth we all wish to see in our community. As soon as we were told in assembly our school had organised to sponsor this bird, there was a real sense of achievement, we had all (as a school) raised money to take care of another life form. A life that helps create the identity of our country and the icon we are so well known for.

Kindara is special for many reasons. He has a ginger coat which makes him even rarer than other kiwi birds. Although his



sibling was also ginger, the bird never picked up the vibrancy that Kindara has. Kindara has been of interest to the media since day one when his ginger coat first showed through.

Another reason Kindara is so special is he was watched all through his journey, from his birth at Rainbow Springs in Rotorua, to his release into the Karioi Rāhui forest from the Wairakei Golf and



Sanctuary kiwi crèche. Tauhara students who helped to organise the sponsorship, and students who held an interest in conservation, were always offered a chance to go and check up on our baby. There were trips organised for these students who were lucky enough to see Kindara grow into the right size for release. Kindara grew fast for his age, reaching the release weight of 1 kg much before the estimated time.

**Right top:** Kindara the ginger kiwi chick.  
*Photo: Rainbow Springs Kiwi Encounter*

**Right below:** Kindara's ginger colouring compared with Raidata's brown feathers.  
*Photo: Rainbow Springs Kiwi Encounter*

**Below:** Tauhara students picking Kindara up from Rainbow Springs Kiwi Encounter in Rotorua, ready for his journey to crèche at the Wairakei Golf Sanctuary in Taupō.





DOC organised a trip into the Karioi Rāhui at the base of Ruapehu for the release of Kindara. I went along hoping to see Kindara for the last time before he was in the wild. This was before Jenny Hayward, a DOC ranger I knew from the Kiwi Forever programme I had recently been on, asked me if I wanted to release the kiwi from my arms. This was an opportunity I could never turn down. How many people can say that they have not only touched a rare New Zealand Kiwi bird, but were the last one to do so? Not many at all. I took Kindara in my arms, posed for a few photos and then Kindara was gone. Jenny helped create a small opening into a burrow, I crouched down and Kindara, full of life and enthusiasm, jumped out and ran straight into his new home. I've never been so happy to see an animal scurry off and seem already at ease in a completely new place.

I would like to thank everybody involved in Kindara's journey. He will put all your love and support to good use in the forest where we hope he will live a long and happy life.

## RAINBOW SPRINGS

Where Kiwis Play



**Above top:** Tauhara students supporting the juvenile Kindara as he leaves his kiwi crèche at Wairakei Sanctuary for the Karioi Rāhui, with DOC rangers Renee Potae & Jenny Hayward, with Emma Bean from the Rainbow Springs Kiwi Encounter holding Kindara.

*Photo: Catalina Amaya-Perilla.*

**Above bottom:** Hayleigh happy to help release Kindara into the Karioi Rāhui, Southern Mt Ruapehu, with kiwi ranger Jenny Hayward.

### Sponsoring kiwi

If you are interested in learning more about how you can help save kiwi, or to make a secure online donation, please visit

[www.kiwisforkiwi.org](http://www.kiwisforkiwi.org)

If you are specifically interested in supporting the work of the Rainbow Springs Kiwi Encounter please donate at

[www.rainbowsprings.co.nz/donate](http://www.rainbowsprings.co.nz/donate)

or for naming rights please email [sponsorship@nkt.org.nz](mailto:sponsorship@nkt.org.nz)



## An amphitheatre rescue

Bob Stothart  
ex President Project Tongariro

I joined the Ruapehu Ski Patrol in 1975 when it was a volunteer organisation operating as an incorporated society under the auspices of the Department of Conservation (then Lands and Survey). The members came from all walks of life, farmers, professors, wharfies, doctors, teachers, lawyers, businessmen and women, nurses and so on. A real cross-section of New Zealand society. We also had a mixture of skills in mountaineering, skiing, first aid, triage and management. We were all expected to hold advanced first aid qualifications and every weekend we were on duty there would be training of some appropriate kind. The real skill of the collective members of the patrol was to manage severely injured skiers safely and efficiently off the mountain, often in appallingly adverse weather. We learned to ski the awkward sledges and carry patients to safety before they were transported off to Taumaruanui Hospital, which must be the most up-to-date hospital in New Zealand for the diagnosis and treatment of orthopaedic injuries.

I needed all of my improving skills to assist in a very bad accident in the Amphitheatre in my first year of duty (1975). I was patrolling mid-week at the old Far West T Bar when I received a call to take a rescue sledge into the Amphitheatre. The conditions for skiing were marginal with poor visibility and an accident in the Amphitheatre posed serious questions of personal safety and accident management.

It was late in the day, the lifts were due to shut down and we had to find the patient in less than favourable conditions. The patient was lucky to have been found in the first place by a skier quietly going back to his lodge, skiing a route that he commented later,

“was a bit eerie” and an area of the mountain rarely skied. He saw blood on the snow, saw the patient, reassured the patient he would get help and hurriedly skied back to the lift line to alert the operator. The patient was extremely lucky to have been found when he was and had he not been seen, the chances of his survival were low. Mid-week, bad weather, infrequently skied area of the mountain, isolation and a serious accident combined to create a scenario of anxiety and at the same time, a determination to do the best we could no matter what was thrown at us. The challenge of finding a patient in poor weather in a remote area in marginal weather as darkness approached would not have been an optimistic proposition.

The DOC Safety Ranger, Dave Sidwell, and I had to take a sledge to the top of the T Bar, ski it down to a seldom-used entry point into the Amphitheatre, belay the sledge down a difficult slope and then go looking for the patient through wind, mist and near white-out conditions.

We found him with another experienced Ski Patroller, John Moynihan, already there holding his head together in what immediately looked to me like a major mountain accident. He had skied off the edge of the piste into space, hit the slope and tumbled and rolled downhill, his skis flailing around like a helicopter, and lacerating his head, before coming to a stop in a crumpled heap. We set to work as a team and on examination, the patient had a suspected fractured skull, a broken leg, lacerations around his head caused by the flailing skis, broken collar bone, blood and vomit everywhere and no doubt other injuries under his tight-fitting ski clothing. He was going in and out of consciousness and moaning pitifully. It was very, very







serious. We had alerted the lift operators to keep the access lift running and we stabilised the patient as best we could in the conditions, put him in the sledge and moved him gently downhill to the lift line. It was the old access single chairlift which ran from Top of the Bruce to the Far West. We took him down, put him in the ambulance and John and Dave escorted him to Taumaranui Hospital as darkness fell.

On reflection, I realised that I had been tested in the extreme and all the training and preparation I needed to become a Ski Patroller came to the fore. This experience set me up for many years of enjoyable ski patrolling helping people with minor maladies, splinting fractures, applying bandaids, dealing with hypothermia, finding lost people, giving directions and generally helping the public to enjoy their time safely in that awesome environment, but I never experienced an

accident like that first major one.

Sometime later we learned that our Amphitheatre patient eventually made a full recovery and lived to ski another day.



## Life in a rainforest

Anirudh Chaoji  
Pugmarks Eco tours



Anirudh Chaoji [Ani] is Director of PUGMARKS ECO TOURS a leading ecotourism organisation in India. Ani is committed to sustainable tourism and has a particular emphasis on training youths in community villages as naturalists and how to participate in eco tourism.

Paul Green met Ani at a conference at the Changbai Nature Reserve in China in September 2014 and *'was very impressed with his passion for conservation and his desire to share his knowledge. It was great to have Ani present in a large forum where most of the attendees were scientists or academics. He was able to demonstrate the value of conservation including economic benefits at a practical level.'*

In this article Ani describes a trip into a rainforest that is dear to him.

**Below:** Forest stream.

**Opposite page:** Interior of Sharavati Wildlife Sanctuary.

*Photos: Anirudh Chaoji*



The lure of rainforests brought me back to Sharavati for the third time within a span of just one year... and obviously not without a reason. I have had two of my most cherished wildlife sightings in these very visits. The first was that of the elusive bird of the nights - Sri Lanka Frogmouth and then the beautiful nocturnal mammal Slender Loris. The more that I have explored this forest, the more have I been tempted to go deeper to study this amazing natural factory.

Located in Shimoga district of Karnataka and close to the rail head of Bhatkal, Sharavati Wildlife Sanctuary boasts of a pristine evergreen rainforest. Sharavati incidentally is not on the crest of the Western Ghats, instead is less than half way up. The famed Jog falls just about 45 kms from here is actually on the crest.

Like other rainforests, the dominating factor responsible for the formation of this forest too is a good rainfall, well-

distributed throughout the year, though monsoon months do bring in intense downpours. An interesting point to note is that the heavy rainfalls for the last thousands of millions of years have leached out most of the minerals from the soil here, making the soils strongly acidic and are very often lacking phosphorus and potash. Yet these very areas support the most prolific growth of rainforests and this paradox is one of the most intriguing aspects of rainforest ecology

Many people, without understanding this very ecology, went on to destroy rainforests to create lands for agriculture - assuming that the soils which supported such rich forests would also support good agriculture. What they didn't realise was that when the forest went from the land, all the supporting actors - bacteria and fungi - that broke down the continuously falling leaf litter and other organic matter, also left the great theatre. What remained was a crumbly, porous and well drained red-brown or yellow soil rich only in iron and aluminium oxides. Forests had vanished in vain and agriculture wasn't sustainable on this land. The end product was a land completely devoid of green cover.

As we walked deeper into the rainforest, we realised that the organic matter was actually passing through a perpetual cycle. The evergreen trees here were continuously shedding their leaves and branches. The dead plant and animal matter fell on the warm and moist forest floor full of hungry populations of decomposers. Here the insects, fungi and bacteria must have broken down the dead organic matter to release the mineral nutrients, which in turn must





have almost immediately been taken up by the roots of billions of plants. These roots act as super-efficient pumps that absorb the mineral nutrients through the ever-present water that percolates into the ground. Little wonder the rainforests give the effect of a huge dimly lit hall ... the luxuriant growth of trees allows only a very small portion of the sunlight to penetrate down to the forest floor - but soon as the eyes roamed, we were awe struck by the sheer variety of plants that co-existed in this multi-

cultural community. But what was the most evident was the large number of vines holding the trees together and then dropping off from the canopies. These thick monkey ropes appropriately called lianas or woody climbers (like the giant *Entada sp.*) are actually rooted in the ground and use other plants to reach out to the sunlight way above the forest floor of the rainforest.

Another prominent feature of these forests, and one of my personal

favourites was the Cane palm. With their slender stems, many of these plants were often seen reaching almost fifty to sixty feet into the canopy. On closer inspection, we found spines and hooks on the stems and leaves that actually helped the plant in clawing its way up... These reverse turned hooks are believed to get deeper into your skin never 'letting go' of you - giving them their rather interesting name of Lawyer vine. In an open canopy that allowed much more light to penetrate than would





have been possible in a closed rain forest, this light then supports a thick growth of tangled understory of small trees, large shrubs and a rich mosaic of luminous green mosses and ferns.

As we took the trail into the forest from the nearby church, we found tall trees that apparently don't find the need to send their roots deep enough and instead had very shallow root systems. We walked over many such exposed roots and then saw this enormous tree with huge buttresses supporting it. One reason for the shallow root system is the fact that the nutrition-bearing organic matter is confined to the surface and another reason is that the decomposing humus actually takes up oxygen causing its deficiency in the deeper soils. Buttresses themselves also contain pores that improve oxygen supply to the tree.

One further interesting phenomenon that we observed was the presence of fruity covered

seeds in plenty. Flying squirrels, giant squirrels, flying foxes, rodents and birds like hornbills, all gorge themselves on the fruits like the figs. Their droppings in turn ensure successful dispersal of seeds throughout the rainforest. Many *Ficus* seeds germinate on other tree tops and the roots slowly grow down to reach the soil. On reaching the soil, they get plentiful supply of nutrients helping the *Ficus* tree to grow up rapidly to eventually cover up the original tree and strangulate it to death. Many such strangler fig trees then become the emergent trees in this rainforest, as they get a head start over many tall trees to rise up high in the canopy. In this forest too, some of the Banyans (*Ficus bengalensis*) are the bulkiest of all the rainforest trees. Two groups of plants that decorate most rainforests are epiphytes and ferns. Sharavati is no exception. While epiphytes like orchids perch up on the tree branches and flower profusely, ferns in varied sizes and forms clothe the soils.

Epiphytic orchids do not parasitise their host, but just collect water and moisture by their unique roots from the barks and the surrounding environment. Orchids represent an adaptation which is a method of sharing space and obtaining light. They are thus in a more favourable situation than the other plants that are obliged to struggle upwards from the forest floor. The flowering of orchids has always fascinated man. Little wonder then that the large inflorescences in vibrant colours attract passing insects too. But then it is the shape of the modified petal called the lip, that actually ensures that the insect 'has to' assist in its pollination. Another adaptation that the orchids have is in the form of extremely light seeds which can disperse horizontally as well as vertically with slightest air currents.

As we explored, we observed interesting ferns like the sword ferns and bird nest ferns on the trees in epiphytic forms. But the real exuberance of ferns was on the ground where they were sheltered from the drying effects of the wind and were shaded from the sun by the higher canopies.

Here, the temperature variation was minimal and the humidity was always very high. Some 300 million years ago, ferns evolved and took over the planet and even grew into trees. Some like the tree ferns can still be found in our evergreen forests. Geological movements and possibly volcanic ash and overburden must have covered this whole mass of ferns, which have now become the world's richest coal beds. In fact this period is now referred to as Carboniferous era.

But what really got dwarfed by the enormous trees, numerous ferns and other undergrowth plants in this forest were the animals.



Animals that brought about the greatest influence on the vitality and appearance of this rainforest were actually so small that they are hardly to be seen. Hidden in these wet forests - from the canopies to the leaf litter below - were the armies of nectar feeders, termites, insects and borers. Along with the others like stick insect, mantids, beetles and flies, they all are ceaselessly feeding on the vegetation, boring holes, laying eggs and otherwise preventing an uncontrolled growth of the plants in this kingdom.

Sharing this complex community of life forms were animals that included mammals, birds, amphibians, and reptiles, each occupying its own niche in the community.

The most conspicuous by their calls, especially after dusk, were the frogs. The most obvious were the frogs belonging to the Rhacophoridae family of gliding frogs and very special tree frogs with their pads or discs on the end of each toe. These suction mechanisms assisted them in climbing and reaching out to gulp insects of various sizes and forms. We found the Malabar gliding frog (*Rhacophorus malabaricus*) on a banana leaf with a foamy nest over a small water body. The tiny tadpoles would drop into the water directly to kick start their life naturally.

Other species like the *Nyctibatrachus* were found to use plants and trees near streams and waterfalls as a suitable habitat. Whenever danger threatened them, they plunged into the foaming water, later to find a grip on a boulder with their pads and then crawl to a safer shelter. One very interesting group of amphibians that we came across

here were Caecilians, with their unique limbless, elongated and segmented bodies.

Amongst the snakes, we were on a look out for the King Cobra (*Ophiophagus hannah*) that is frequently reported here. Instead, we only ended up getting a massive specimen of an Indian Rock Python (*Python molurus*), along with a number of smaller snakes. On the earlier visits, we had come across Beaked Snake and Vine Snakes. The leaf litter and warm moist forest floor was an excellent habitat for the King but our short visit was not sufficient for a thorough search.

Some of my favourite sightings were in the feathered kind. Numerous Malabar Pied Hornbills (*Anthracoceros coronatus*) would come to feed on the ripe fruits of the lofty Ficus tree just behind the campsite. But what I will remember forever was the night walk when we spotted the elusive Srilanka Frogmouth (*Batrachostomus moniliger*). But, what was more interesting was the fact that we repeatedly heard the calls of this bird in different parts of the forest. A couple of months ago I had heard a number of these birds

in the Molem Wildlife Sanctuary in Goa. Until then, I had thought that I would have had to remain content with a single sighting that I had in the Annamalai long ago, or then plan a trip to Thattekad Bird Sanctuary in Kerala.

Sighting big mammals in Indian forests calls for very special luck, more so in a dense rain forest like in Sharavati. But flying squirrels, giant squirrels, mouse deer and civet cats were regularly sighted. What made this trip so special was the sighting and photographing the "Kadupappa" the vernacular name for Slender Loris (*Loris tardigradus*) on the first night itself. I had been waiting for this sighting for ages. The closest I had come was in the form of its wailing calls.

We look forward to exploring this enchanting forest on many more occasions to be able to appreciate one of our last remaining virgin rain forests. Sure enough I shall be going back.

**Opposite page:** Malabar Pied Hornbill

**Below:** Frogmouth is a native bird of the Western Ghats.

*Photos: Anirudh Chaoji*





## 'Team rat' attacks South Georgia pests

Karen Williams, with assistance from island pest eradication specialist Keith Springer



**Above:** The mind-boggling spectacle of around half a million King Penguins on Salisbury Plain, South Georgia. One Ocean's expedition ship 'Akademik Ioffe' can be seen anchored offshore in the Bay of Isles.

*Photo: Karen Williams*

New Zealand's conservation expertise is helping to make a large, isolated sub-Antarctic island in the South Atlantic Ocean, more than 8000 km from New Zealand, rodent-free. South Georgia, a British overseas territory, is an important breeding ground for more than 100 million seabirds.

Inspired by the success of rat-eradication efforts in our part of the world, a Scottish charity, the South Georgia Heritage Trust (SGHT) conceived the South Georgia Habitat Restoration Project. Their goal was to eradicate the Norway (or brown) rat (*Rattus norvegicus*) and house mouse (*Mus musculus*), brought to the island by sealers and whalers from about 200

years ago. These abundant pests were decimating the eggs and chicks of many ground-nesting bird species such as South Georgia pipit, South Georgia pintail, Antarctic prion and several species of petrel. Some species were no longer present in rat-infested areas.

The project is easily the largest of its kind to be attempted in the world. At 3,500 km<sup>2</sup>, South Georgia is many times larger than New Zealand's Campbell Island (113 km<sup>2</sup>). Campbell, this country's largest rat eradication project to date, was declared rat-free in 2005. Australia's 128 km<sup>2</sup> Macquarie Island was declared rat, rabbit and mouse-free in 2014.



The trust recruited several New Zealand helicopter pilots and pest control experts previously involved with rat-eradication on the sub-Antarctic Islands of Campbell and Macquarie. The Kiwis involved include Keith Springer and Nick Torr (eradication specialists), Gary Patterson (GIS technical support, Kingston), Bryan Beck (pilot, Oamaru), Peter Garden (chief pilot, Wanaka), Denis Browne (radio technician, Oamaru), Dave McLaughlin (pilot, Ohakune) and Tony Michelle (pilot, Hanmer Springs).

As on Campbell and Macquarie islands the target pests on South Georgia were well known. None of these islands have native mammals. Therefore, an Australasian-inspired rat eradication programme began with a pilot project in 2011. GPS and GIS technology was utilized and applied to bait-spreading methods to ensure full coverage of the target area.

Ridding South Georgia, a rugged mountainous island 170 km long and half covered by ice, of pests was never going to be easy, even though not all of the island had rats and needed to be baited. However, 'Team Rat' has now succeeded in baiting the entire non-glacierised



portions of the island, some 1,050 km<sup>2</sup>, using bait pellets containing the poison brodifacoum. The pellets were dropped by helicopter across infested areas. The third and final baiting strike (95 tonnes) finished in April 2015.

The cost of undertaking the world's largest rodent eradication project comes at a hefty price tag. Last summer's work alone cost £2.5 million and the SGHT currently has a several hundred thousand pounds shortfall. It has been successful in gaining grants and continues to actively fundraise via its website ([www.sght.org](http://www.sght.org)). It also seeks funds from private donations and runs a 'sponsor a hectare' campaign. Certificates are issued to those who donate more than £100. Tourists on cruise ships to the region are among those who continue to help to fund the project.

There has been another major environmental breakthrough on this remote island in recent years. The Government of South Georgia and the South Sandwich Islands has rid the island of its introduced reindeer population. Norwegian whalers introduced reindeer onto the island for food on three occasions from 1909. The whaling era ended and the stations all closed more than 50 years ago. But, in the interim, the reindeer herds had grown to more than 7000 strong causing erosion and trampling effects on vegetation and

**Above:** Trustees of the South Georgia Heritage Trust are met on the beach at Gold Harbour in February 2015 by staff from One Oceans Expeditions and a delegation of King Penguins. The British supply ship Ernest Shackleton (red) and the Akademik Ioffe are anchored offshore.

*Photo: Karen Williams*

**Left:** New Zealander Keith Springer (who led the Macquarie Island pest eradication project) at work in South Georgia earlier this year.

*Photo: Oli Prince*



**Above:** Keith Springer and pilot Bryan Beck preparing to pick up a bait hopper. Incidentally, Bryan was a pilot on the pest eradications on Campbell and Macquarie as well as South Georgia.

**Right:** Oamaru helicopter pilot Bryan Beck about to pick up a hopper loaded with bait on South Georgia in March 2015. Bryan was one of three New Zealand helicopter pilots carrying out the bait-drops on the island earlier this year.

*Photos: Oli Prince*

sea bird burrows. All the reindeer were eradicated over three seasons (2012–2014). Meat was recovered from a third of the animals and proceeds from the sale used to offset some of the costs of the eradication.

Now, with the reindeer gone and the rodent-baiting programme completed, the SGHT expects to see some remarkable changes. These include a rapid recovery in vegetation, invertebrate populations and ground-nesting birds such as the South Georgia pintail (an endemic duck) and the endemic South Georgia pipit (the southern-most songbird in the world). In February 2015, this endangered pipit was seen at Salisbury Plain (an area baited in 2013) and other locations where previously it was rare or locally exterminated.

Next year the SGHT will be monitoring the effectiveness of the rodent-baiting programme. If successful, it will defy predictions of scientific experts in the 1980s who concluded, “no management procedures would be possible” to rid the island of rats. That this is possible

at all is largely due to the aerial baiting techniques developed in New Zealand where the same ‘not possible’ view once prevailed with regard to large islands like Campbell.





## “Turn out your pockets please” – biosecurity Antarctic style

Longtime Project Tongariro members Harry Keys and Karen Williams travelled to South Georgia in February 2015 on board the ‘Akademik Ioffe’. They worked as presenters, zodiac drivers and guides for Canadian company, One Ocean Expeditions. The company has assisted the South Georgia Heritage Trust in recent years by transporting pest control equipment and personnel to the island.

Harry and Karen note that strict biosecurity measures operate on board ships to the region. This is self-regulated but follows rules set by IAATO (International Association of Antarctica Tour Operators) working within the Antarctic Treaty System. The risks of biological invasion were underlined by a study on South Georgia and Antarctica a few years ago that surveyed many hundreds of people (including scientists, tourists, support personnel and ship’s crew) headed for the region on short trips. Many seeds and fragments of foreign plants were found during this survey\*.

Nowadays, much more care is taken to reduce the risk of spreading introduced species to sub-Antarctic islands or Antarctic Peninsula landing sites. The threat is real as many of these environments are similar to where the foreign plants come from (e.g. alpine and arctic regions) and the climate is mild enough these days for some foreign plants to get established and reproduce.

‘Vacuum parties’ are held on board during the two-day ocean passage from Ushuaia to the Antarctic Peninsula. Shipboard passengers including scientists, tourists and crew must all bring their ‘go-ashore’ clothing, camera cases and packs for close inspection. Pockets are vacuumed and Velcro checked for any visual sign of seeds and soils. Footwear is also scrubbed and dipped in disinfectant.

\* Reference: S Chown et.al., 2012, Continent-Wide Risk Assessment for the Establishment of Non-Indigenous Species in Antarctica; International Polar Year Project, Aliens in Antarctica; [www.pnas.org/cgi/doi/10.1073/pnas.1119787109](http://www.pnas.org/cgi/doi/10.1073/pnas.1119787109)



**Left:** A spectacular old volcanic remnant called Brown Bluff near the tip of the Antarctic Peninsula. Native lichens and moss are found here naturally but ice-free sites like these are also vulnerable to plant introductions.

*Photo: Karen Williams*



## Inspiring passion for conservation

Lou Sanson  
Director General of  
Conservation

DOC's leadership role in conservation is to inspire people's passion for conservation and to connect groups and individuals to opportunities to get involved. DOC is proud to work alongside many partners - Community conservation groups, whanau, hapu and iwi, businesses and philanthropic trusts. But what about people's differing values? What about people who are just not on the radar?

A discussion arose in a provincial newspaper recently with letters to the editor complaining about the council planting native trees rather than oak trees, roses and rhododendrons. The native plantings were to re-establish

wildlife corridors between remnants of lowland forest. Pest control was undertaken by the local conservation volunteers but not everyone in the community understood why the council was planting natives nor understood the value of those plantings. Those who opposed the native plantings wanted deciduous trees with seasonal variation.

Not everyone sees nature through the same lens. Communities are a mix of values and the concept of conservation has many different interpretations. Perspectives change depending on where you are standing.

New Zealand is losing its indigenous biodiversity at an alarming rate and some people just don't even know. DOC and its established partners need to inspire and support others to get involved so they understand the value of conserving New Zealand's natural point of difference.

*Photos: DOC*



Friendly advice goes a long way  
(Queen Charlotte Track).



If DOC or councils are to engage more people in wanting native species conservation, we have to understand other people's perspectives. We have to use the right language and know what makes people tick. It's about being part of the community and adapting values to be part of a continuum rather than taking a polarised position that leads to conflict. Many conservation values overlap. The ones that come to mind are those of iwi, hunters, trampers and others who go into the hills. We value the outdoors for the way it completes us. Our values are closely aligned and there is a broad understanding of each others' perspectives.

*"The skills needed by a modern conservation advocate are those of the negotiator, the strategist and the deal-maker."*

The recent Battle for Our Birds campaign is a case in point. Wanting to preserve native species is an integral part of Māori tikanga and a core value of outdoor enthusiasts. Although we may not always agree on methods of pest control, our differing values are sufficiently aligned that there was a broad level of support for saving the threatened species during the massive beech seeding that drove predator numbers to record levels.

Conservation needs more deep-rooted general community support and that must come from those whose idea of wilderness is the uncut grass on the side of a football pitch. To expand the understanding of conservation values, DOC has to look beyond comfortable relationships and make conservation relevant to everyone. The less people know about nature's role in their own wellbeing, the less they are inclined to save nature for itself and the roles it performs in sustaining our lifestyles.



Take a walk on the wildside (Abel Tasman track).



DOC works closely with businesses to develop mutually beneficial outcomes (Genesis Energy in the Mangatepopo)

The skills needed by a modern conservation advocate are those of the negotiator, the strategist and the deal-maker. Being passionate is great but, to the person whose view is widely different, passion can appear as if someone is zealous. That's a blunt instrument in negotiations.

DOC's operational work covers approximately 30% of the physical area of New Zealand in more remote priority areas on Public Conservation Land. That's where the DOC work is seen to be done. But DOC's advocacy role of promoting a conservation ethic covers the whole country. We need people to understand the value of nature to their environment – urban or rural.

New Zealand is a primary producer – we depend on the land. Our open spaces, natural landscapes, our culture and 'clean green image' are part of how the world sees us. We have a 'natural advantage' that few other countries can compete with. Protecting it lies in all of our hands.

Over the next few years, DOC will focus on developing relationships with a broad spectrum of community interests. We do this because our natural legacy will shape New Zealand's future and conservation is an integral part of that investment.



## Whio-ew!... a busy but successful first season at the Whio Hardening Facility

Heather Morison  
Ranger Services, Biodiversity

### A hardening facility...what's that?

Locally referred to as the "whio crèche" or "bootcamp", the facility is made up of two large aviaries with fast flowing water and space for training flights to accommodate whio ducklings bred in captivity preparing for their release into the wild. They

Our first season started December 4<sup>th</sup> 2014 when the hardening facility was opened by the Minister of Conservation, the Hon Maggie Barry, and then the fun began!

We all underwent a steep learning curve, supported by the local Tongariro whio



**Above:** Release of whio that arrived from Christchurch (Peacock Springs).

*Photo: Bubs Smith*

normally inhabit fast-flowing rivers and streams, and past experience has found these ducklings stand a much better chance of adapting after release, once they've had at least two weeks or more practising their white-water skills in a safe environment. It is a 'seasonal' facility, in use between November and April each year following the breeding season.

The young birds learn to surf the rapids, dive and feed on invertebrates, practise their flight paths and socialise with other whio in the facility.

team, the Whio Recovery Group and the Isaac Wildlife and Conservation Trust (aka Peacock Springs) in Christchurch who are part of the 'Breed for Release' programme.

The Turangi facility is staffed by a mix of local DOC staff and volunteers – the two volunteers this season were a student studying Ecology at Massey and a recent graduate in Zoology/Animal Husbandry from Otago. We also received great support from VetPlus in Taupō and Massey University who provided advice and training in various aspects of health assessment.



## Why do we need one?

Previously ducklings raised by captive breeders in the North Island needed to be flown to Christchurch to spend some time in the hardening facility down at the Isaac Wildlife and Conservation Trust facility. After a few weeks, they would then be flown back to their North Island release sites. This resulted in a lot of effort, not to mention hassle for the birds. Thanks to the Whio Forever programme (a partnership between Genesis Energy, Forest and Bird and DOC), a North Island facility could be built. Now all birds hatched in the North Island are only a short car-drive away from their local 'bootcamp'.

## Where is it?

The Tongariro National Trout Centre was identified as a prime location as it is centrally located and close to captive holders and potential release sites. This minimises the time of travel for ducklings to and from the facility. It also brings great advocacy opportunities to support the goals of the Tongariro National Trout Centre Society, the Taupō



for Tomorrow education programme and the Whio Forever programme, who are seeking to increase the level of public support and involvement in whio protection and raise recognition of their plight in the wild.

**Above:** Double raceway showing food shelter with roosting shelter behind.

*Photo: DOC*



**Left:** Sally Aitken from VetPlus in Taupō and Heather Morison check out the health of one of the whio.

*Photo: Bubs Smith*

## What happens at the facility?

### A day in the life of ...

The ducklings are usually up at dawn checking out each other's wing spans, competing in posturing and preening ready for the arrival of the rostered 'wing commander' who starts the daily routine around 8am. Their job is to make sure the enclosures are clean and the birds are fed. Unfortunately for them, doing a poop check is a part of each day's schedule to check for parasites or bacteria.

Moving in and around the ducklings gives ample opportunity for each duckling to receive a quick visual scan for any potential health issues and volunteers quickly become experienced with identifying when a bird looks a bit 'down and out'. Just like the school yard they also have to make sure bullying is kept to a minimum (you'd be surprised how mean some of these cute cuddly ducks can be).

Throughout the day observations are made while the ducks are playing tag, chasing each other under water and searching the rocks for invertebrates.

**Below:** Heather Morison in a Whio enclosure.

*Photo:DOC*



The aviaries are in general quarantine at all times as there can be a large number of birds at any one time, so to minimise the presence of parasites and bacteria that can naturally occur or be introduced by various equipment/footwear etc, we follow basic quarantine practices throughout the season.

Catching these characters for individual checks, micro-chipping, weight check or in particular, on release day, is more in the line of a sheep dog trial, thanks to Bubs Smith's invention (soon to be patented I'm sure). We use some large black plastic drainage pipes with shade cloth secured at one end and we simply 'herd' them behind one of their shade shelters and into the pipes sitting at the back. Until this system was in place it was a very entertaining experience for visitors! This has proven to be less stressful for the ducklings and provides for a much faster processing rate.

## What happens at the end of the season?

On release days (often weather dependent towards the end of the season), ducks are transported in specially designed boxes to the release site by the local area team involved in the release. It's often a bittersweet feeling seeing the aviaries starting to empty as each release occurs, but knowing they are going back to the wild to help supplement the wild population helps.

At the end of the season the aviaries are given a thorough clean, any maintenance required undertaken and then 'rested' until the next season. This 'rest' will break the cycle for any parasites or bacteria present in the surrounding plants/soil and helps us to manage the health of the birds when in residence.

During our first season we 'hardened' 33 whio, with 13 from Isaac Conservation and Wildlife Trust, 15 from Pukaha Mt Bruce and five from Orana Wildlife Park. A further five from the Isaac Conservation and Wildlife Trust travelled up from the





**Left:** Herding pipes

*Photo: Bubs Smith*

South Island for release at the end of the season, making a total of 37 birds released in the North Island.

Rivers released on:

No.	Release site
7	Little Maketawa (Taranaki)
10	Manganui (Taranaki)
4	Whakapapanui (Ruapehu)
1	Waimarino (Kaimanawas)
4	Tongariro (Turangi)
2	Kaiwhakauka Stream (Whakahoro - Blue Duck Lodge - Whanganui)
9	Lower part of the Upper Retaruke (Whanganui)
1	Auckland Zoo – permanent captive breeding opportunity

One duck from Orana Wildlife Park suffered an injured wing, which involved a check up from Sally at VetPlus and two separate trips to Massey for x-rays and assessment. Unfortunately Massey advised he was unsuitable for release as the repaired wing was showing signs of arthritis which would eventually prevent any wing movement at all. So thanks to the Whio Recovery Group's Captive Co-ordinator, Peter Russell, he will be flying courtesy of Air New Zealand to Auckland Zoo where he will reside in

their large whio aviary, providing an additional opportunity for breeding under the auspices of the 'Breed for Release' programme.

Having been lucky enough to be involved in an amazingly successful first season, the team at DOC in Turangi and the Tongariro National Trout Centre can't wait to see what the next season will bring.

So call in and see us, take a tour of the Trout Centre aquarium and hatchery before finishing with a walk around the aviaries. As we are 'seasonal' and release dates are not set in concrete, it might pay to give the Trout Centre a call first to ensure whio are resident in the bootcamp when planning your visit (07 386 8085).

Checkout the website for opening hours and location map -

<http://www.troutcentre.com/>



## A summer with the birds

Juliet Jones  
Tauhara College

If you're not yet a Mahi Aroha fan, you should be! My family and I took full advantage of the DOC and Project Tongariro summer programme again and our choices this year had a decidedly birdie flavour. Kids today learn a lot about conservation at school and just how interested they are in this stuff might surprise you. Mahi Aroha is rich with conservation activities and is a great way to get out there in the field with your kids, interact with and discuss the flora and fauna of this great country – and all during their summer holidays.

Expectations hit par, as Marco got to meet and pat a rare ginger North Island Brown Kiwi chick, who not surprisingly was not quite as pleased to see us as we were to see her. We also enjoyed an incredibly scenic golf-cart ride, informative talks by the golf-course and DOC staff on the sanctuary's history and the success of the kiwi crèche, close encounters with noisy frogs and the flittering behaviours of a curious tom-tit. This left my 11 year old fully satisfied with his afternoon out at the golf course. At a cost of only \$5, I was a



**Above:** Marco meeting a rare ginger North Island Brown Kiwi and enjoying the golf cart drive around Wairakei Golf + Sanctuary

**Above right:** Marco at Wairakei Golf and Sanctuary

*Photos: Juliet Jones*

### Wairakei Golf + Sanctuary

Hitting birdies might be something you don't want to do at Wairakei Golf + Sanctuary. This special character golf course, home to at least 50 species of bird both indigenous and imported, is a superb example of how business and conservation can work together for the betterment of all. My 11 year old son Marco, who is a veritable tree-hugger and animal-lover, was very excited to go on this trip, especially by the prospect of holding a live baby kiwi.

little surprised that Marco was the only child on the trip.

### Wet and wild with who

My teenagers, who are a little more difficult to get excited about bird watching, were easily convinced to go who tracking because it came with the lure of white water rafting on the Tongariro River.

The trip was led by DOC who ranger Bubs Smith, who took his first who conservation trip as a 10 year old, and now considerably longer in the tooth, is



still out their protecting these precious birds. Bubs was a wealth of information on the birds, and it was fascinating to hear about their habits and behaviours as we bobbed down the river. We learnt the hazards of living and breeding on a river, the difference between shag and whio poo, and stopped to turn rocks over looking for yummy whio tucker. The Tongariro River Rafting guides, despite their effervescent gung-ho river tomfoolery, were also genuinely interested in the birds and quick to slow the rafts to watch the two mating pairs we did manage to spot. Of course this was all interspersed between squeals of terror and delight as we shot down rapids and bounced off rocks, which made for not only a thrilling but educational day out.

### Black Backed Gulls - Tama Lakes

I couldn't convince any family members to come out in January's 'heat-wave' for a six hour hike upon the dry and dusty volcanic lava flows of Mt Tongariro.

However our small party of hikers had their average age significantly reduced by the two teenage boys that joined us for the day. The boys were there as part of their summer job doing odd jobs for DOC thanks to parental contacts. As a high-school teacher I couldn't have been more impressed with these two boys, by how mature and interested in the world around them they were. They showed

respect for their environment carefully dodging the sensitive vegetable sheep, and were eager to learn the names of the delicate mountain flowers and orchids they found. They constantly grilled the Project Tongariro guides with questions. After a few hours picking our way up and down ancient lava flows we found ourselves on a small flat plateau, smack-bang in the middle of the black-backed gull colony. The boys were fascinated with the gulls circling and squawking above their nesting area, not happy about our presence, and were completely blown away to see the eggs in the nests. The highlight was the close encounter with a black-spotted baby chick that was doing a runner off its nest due to the presence of the intruders. "Wow, so cute, they look just like their eggs!" says one of the boys.

### Poronui MTB

Thanks to the new owners of Poronui, there is access across their farm into the northern end of the Kaimanawa Range, which hasn't always been the case in the past. Access is normally by foot only, but once a year during Mahi Aroha, 60 participants are allowed to mountain bike their way through. With January's heat wave in full swing, this trip took its toll on my skinny son Marco, who was not too impressed with the arduous, hot and dusty ride across the farm. However his mood took a much happier turn when we finally hit the walking track through



**Above:** Marco on the long mountain bike ride out of Poronui Station

**Below right:** Spotted Black-back Gull eggs.

**Below:** Whaiora and Nikau Raharuhi enjoy a ridge top view of Tongariro National Park.

*Photos: Juliet Jones*







**Above:** Javier Browne, Jude Carpenter and Marco playing in the freezing waters of the Mohaka River not far from Oamaru Hut.

**Right:** Looking for sign of Whio on the Tongariro River.

*Photos: Juliet Jones*

the beautiful and much cooler beech forest into Oamaru Hut. He also got to buddy up with two of the three other children on the trip who took no time at all to jump and play in the ice-cold river by the hut. After lunch and an all too brief relax at Oamaru hut overlooking the Mohaka River it was time to saddle up and head back to our cars.

### Footnote and thumbs up

Mahi Aroha's closest translation is 'volunteer' and is a fitting term to accompany the Summer Programme, as conservation is no longer solely the job of DOC, nor should it be. More and more businesses, conservation groups, clubs and local iwi are volunteering time and money to help DOC with the enormous task of looking after the ecological health of our country.

So a special thumbs up the following businesses and organisations that made the four trips I took this summer possible: Project Tongariro, DOC, Greening Taupō, Wairakei Golf + Sanctuary, Tongariro River Rafting,

Poronui. I encourage you to support these groups wherever possible.

### Mahi Aroha 2016

The 2016 programme will incorporate new and exciting opportunities for audiences of all ages. Innovative trips are being added, with some of the favorites being revamped into experiences that involve greater specialist knowledge and cultural components. Experiences such as getting up close and personal with an active volcanic crater, or mountain biking around the Great Lake Trail are just a couple of trips that may occur in the 2016 programme. Keep up to date with the latest news, trips and information through our Facebook page at "[Mahi Aroha - Doing it for Conservation](https://www.facebook.com/mahiaroha)".







## A volunteer year to remember!

During the period from 1 July 2014 to 30 June 2015 Project Tongariro members and community volunteers contributed approximately 11,043 hours to projects around Tongariro. That's more than 1,800 days through various activities!

Volunteer days are valued at \$150 per day to cover time, materials, petrol and other resources. On this basis, Project Tongariro volunteers contributed the equivalent of a whopping \$276,075 during the 2014/2015 year.

Success breeds success and Project Tongariro, with the community's help, is making a huge difference to conservation in the Central North Island.





## Students learn the complexity of conservation

Stephen Moorhouse

Conservation Partnerships Ranger, Tongariro District

From 22-27 March, 2015 eighteen high school students from the Tongariro/ Taupō area attended 'Kiwi Forever', a week long, conservation focused programme that is hosted at Tiorangi Marae, near Ohakune.

The 'Kiwi Forever' programme seeks to provide our future conservation leaders with a greater understanding of conservation in the 'real world'. It is jointly supported by local iwi Ngāti Rangī, the Department of Conservation, Genesis Energy and the Untouched World Charitable Trust.

Those selected to take part get to experience hands-on work with endangered species; gain a greater understanding of iwi links to the environment; participate in

environmental monitoring and predator control; debate the pros and cons of different pest control methods and tread the fine line to balance the competing demands on our natural resources.

The programme now runs once a year, and since the first programme was delivered in 2006, more than 200 students have participated. 'Kiwi Forever' is a part of a wider network of complementary programmes that seek to develop our future leaders.

Bhrent Guy, Conservation Services Manager-Biodiversity at DOC, who was a key figure in the birth of the programme, said, *"the chance to get these young people out into the natural environment, exploring the impacts that we, as humans, have on it, is invaluable. You can read about human impacts in a book or research it online but to see it in front of you is, I think, a much more profound experience"*.

Ohakune's Sophie McElrich, now a student at Whanganui Collegiate and a 2015 programme participant found the experience to be 'transformational' and that she had now gained a far greater understanding of human impacts on the environment. Lais Morris, of Ruapehu College, said that students were pushed to achieve well beyond their comfort zones and that all participants were able to rise to the challenge.

The chance to work with some of New Zealand's endangered species was especially appealing. Participants were able to accompany DOC rangers into the field to track kiwi, or to follow whio on their journey as fledglings from the whio hardening facility in Turangi to their release on the Whakapapanui River.



**Above:** Conservation services manager Bhrent Guy leads the morning briefing prior to students going out to check trapping lines in the Rangataua Forest.

*Photo: Stephen Moorhouse*



A previous participant, Waipuna-o-te Aroha Ratopu-Williams described her emotions while kiwi tracking, *"It was exciting because the longer we waited the more determination we had"*. Of the experience she said, *"Seeing the kiwi in real life was an unforgettable milestone in my life. I now can say I am a real kiwi after touching it"*.

The students also had the chance to see another side of species recovery, pest control. They constructed DOC200 stoat traps as well as clearing trap lines.

DOC Biodiversity Ranger Danial Van der Lubbe said *"It was a real pleasure to be out in the bush with such a keen bunch of young people. They were quick to learn the practical side of predator trapping, whilst also learning the overall conservation goals of both DOC and local Iwi"*.

Being immersed in Māori culture staying on the Ngāti Rangī Marae Tīrorangi was one of the highlights for many of the students. They enjoyed the warm manaakitanga / hospitality of the whānau. Local kaumātua Keith Wood shared Ngāti Rangī Māori cultural views of the natural world, conservation, human impacts on waterway management and restoration.

Keith explains, *"Our role as Ngāti Rangī Kaitiaki is to guide our young people through experiences that allow our natural environment to teach them first-hand the interconnected relationships within the natural world. If we can help open their hearts to the wisdom of our mountains, forest and rivers, they will learn great lessons from nature and strive to achieve greater balance for the future"*.

The Lead Teacher, Amanda Simpson from Taupō-nui-a-Tia College, whose role is to coordinate student involvement in the programme, stated that 'for students, this opportunity was a great learning experience about the interconnectedness between the health of habitat and the species living in it'.

Genesis Energy is a key sponsor of the programme. Company staff contributed to programming during the week and gave students the opportunity to discuss how power generation companies maintained the balance of using freshwater resources to meet the needs of water users.

Participants gave presentations on their experiences and knowledge gained on the final day. The presentation topics grasped big ecological and social responsibility ideas such as 'Everything is connected', 'Striking a Balance', 'Conservation is an investment, not a cost', and 'The Ngāti Rangī world view and how it fits into the modern world'. Taupō for Tomorrow sustainability educator Mike Nicholson said *"It was a really proud day to hear how the students had grasped the big ideas surrounding conservation and resource use. Learning to think critically will contribute to good future decision makers in conservation issues"*.



**Above:** Students listen to the morning briefing prior to releasing kiwi and whio.

*Photo: Stephen Moorhouse*



## Summer Angling Report 2014-2015

Mark Venman  
Senior Fisheries Ranger



**Above:** Steve Dickson with a 2.8 kg rainbow caught in January at the southern end of Lake Taupō.

*Photo: John Morgan*

Personally I can't remember such a good summer of boating weather like the one we have just had.

The long hot days with minimal wind and no rain just seemed to never end. I sit here writing an update on fishing over summer regretting not getting out on the lake more, not only due to the

perfect weather conditions but also the overall improvement in fish size and quality evident this summer. Although the fishing was a little slow to start in November, the presence of some very large smelt in the stomachs of trout prior to Christmas provided an insight into some of the fish that were to be caught in 2015.

This summer, the Taupō Fishery Rangers completed more than 750 interviews of anglers fishing from boats and measured in excess of 300 trout from Lake Taupō which is consistent with last year's efforts. The team covered all the busy weekends and holiday periods from Labour Weekend through until Easter with a strong presence on the lake over the very busy Christmas and New Year period.

Thanks to those anglers who were checked and provided their catch information including anglers surveyed numerous times throughout the summer season. Your catch information and fish provide us with important data to help us directly manage the fishery and these interactions with the rangers allow you to provide us with direct feedback.

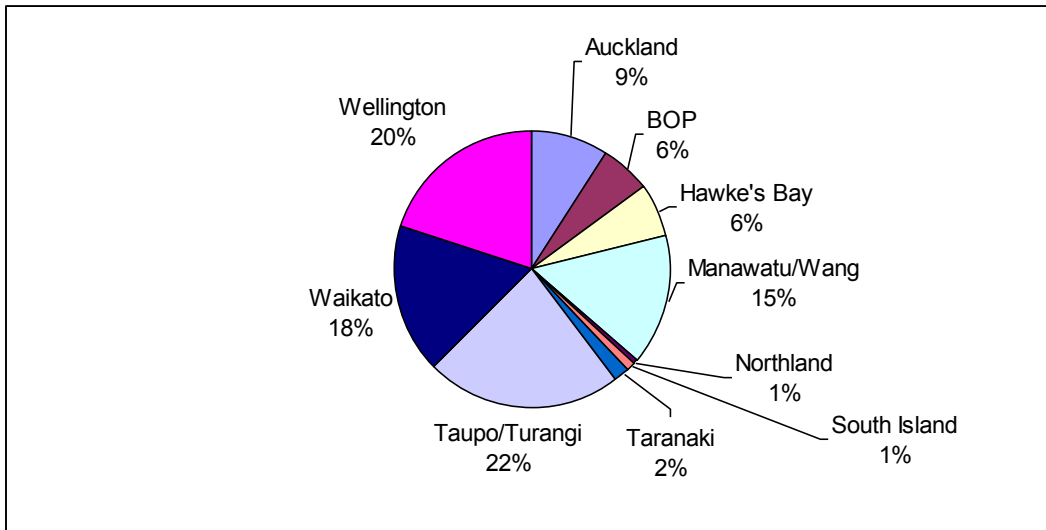
So where do these anglers come from? Based on the survey data collected, 'local' anglers from Turangi and Taupō made up just over one fifth of all kiwi anglers that fished on Lake Taupō over the summer (Fig. 1). The Taupō Fishery remains a visitor fishery with Wellington producing the highest percentage of anglers from outside of the local region on 20% followed closely by Waikato (18%) and Manawatu / Wanganui (15%). Auckland was a distant fifth on 9% followed by Hawke's Bay and the Bay of Plenty on 6%, respectively. Anglers from the South Island as a whole made up just 1% of all kiwi anglers interviewed. Less than 15 anglers were interviewed



from Taranaki and Northland combined. If we include Taupō and Turangi anglers in the Waikato region, the Waikato region accounts for 40% of all NZ resident anglers. A further 23 anglers were also interviewed from overseas with the majority coming from the UK (39%) and Australia (18%).

compared to visiting kiwis on 0.31 fish per hour (1 legal fish every 3.25hrs).

The catch rate for all anglers fishing on Lake Taupō this summer was calculated at 0.34 fish per hour (1 legal sized trout every 2 hours & 56 minutes) based on 667 complete angler interviews where anglers had been fishing for at least 15



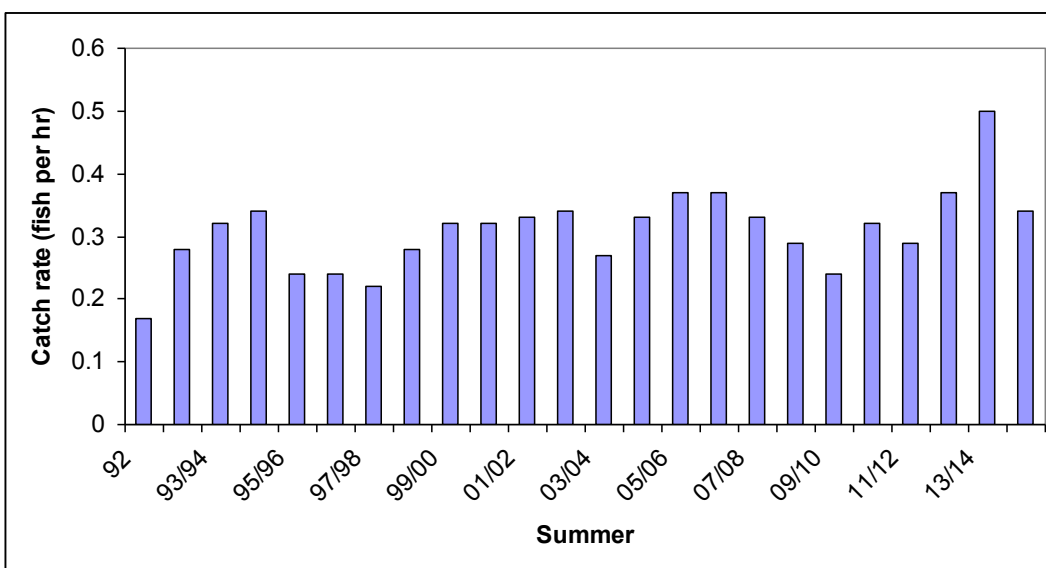
**Figure 1.** Graph showing where NZ based anglers come from to fish on Lake Taupō during the summer of 2014/15.

Anglers living in Taupō and Turangi were classed as 'local' anglers

### Catch rates

So who was more successful this summer - local anglers or anglers from the rest of NZ? The old adage of local knowledge helps you catch more fish was proven once again with local anglers having a catch rate of 0.44 fish per hour (1 legal sized trout every 2.25 hrs)

minutes. This is down on the peak catch rate of 0.5 fish per hour calculated during the summer of 2013/14 but is similar to summer 2012/13 and just above the 24 year summer average of 0.31 fish per hour (Fig.2). Catch rates were lower than expected in November at 0.21 fish per hour (1 legal sized fish every 4 hours & 45 minutes) before peaking in December at 0.40 fish per hour (1 legal sized trout



**Figure 2.** Summer catch rates for guided & non-guided anglers fishing on Lake Taupō since 1992

every 2.5 hrs). After Christmas, the catch rates remained high with a slight drop observed during February before picking up again to 0.37 fish per hour during March which is consistent with recent years.

### Angling methods

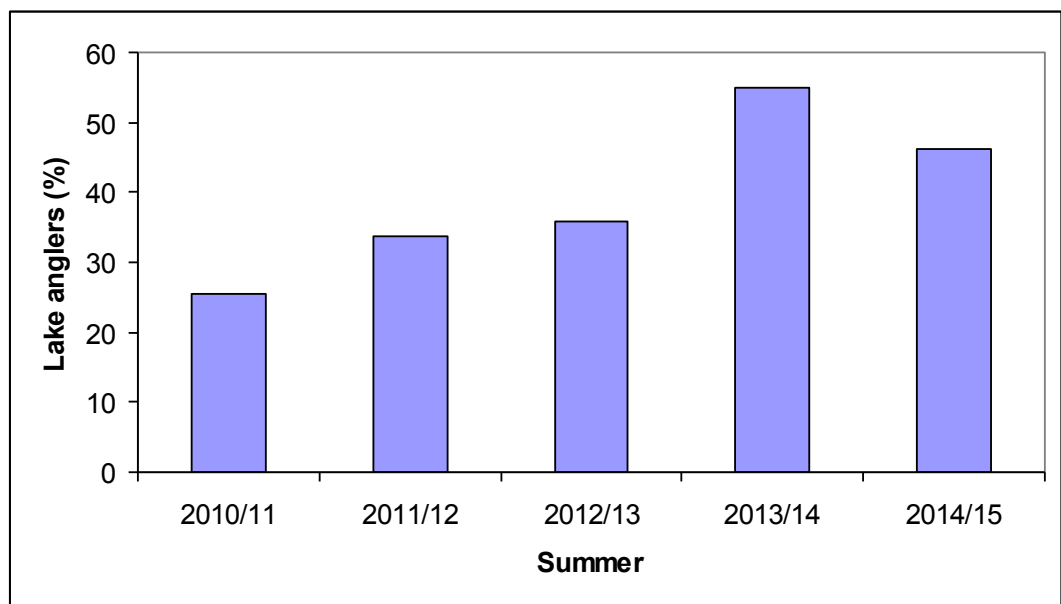
Jigging was the preferred method of fishing on Lake Taupō over summer with 46% of anglers interviewed using this method and continues to be very popular (Fig.3). Over the past decade, the popularity has doubled from about 25% to 50% of anglers with a peak of 55% observed during the summer of 2013/14.

Anglers jigging had an estimated catch rate of 0.32 fish per hour (1 legal sized fish every 3 hours) based on more than 300 interviews. Trolling with 3-10 colours of lead line still remained

of all anglers interviewed. The use of downriggers has remained relatively constant among non-guided anglers on the lake since their introduction twenty years ago. Shallow trolling or 'harling' accounted for only 7.5% while deep trolling with wire lines accounted for less than 1% of anglers surveyed.

### Fish caught

A total of 293 legal sized rainbow trout were measured by staff over summer as part of the licence check and angler survey process. Four undersized rainbows were also measured ranging from as small as 370mm. Anglers are reminded of the need to take care when measuring trout caught on the lake to ensure they are of a legal size to avoid unnecessary paperwork, fines and the risk of losing both their fish and their fishing gear.

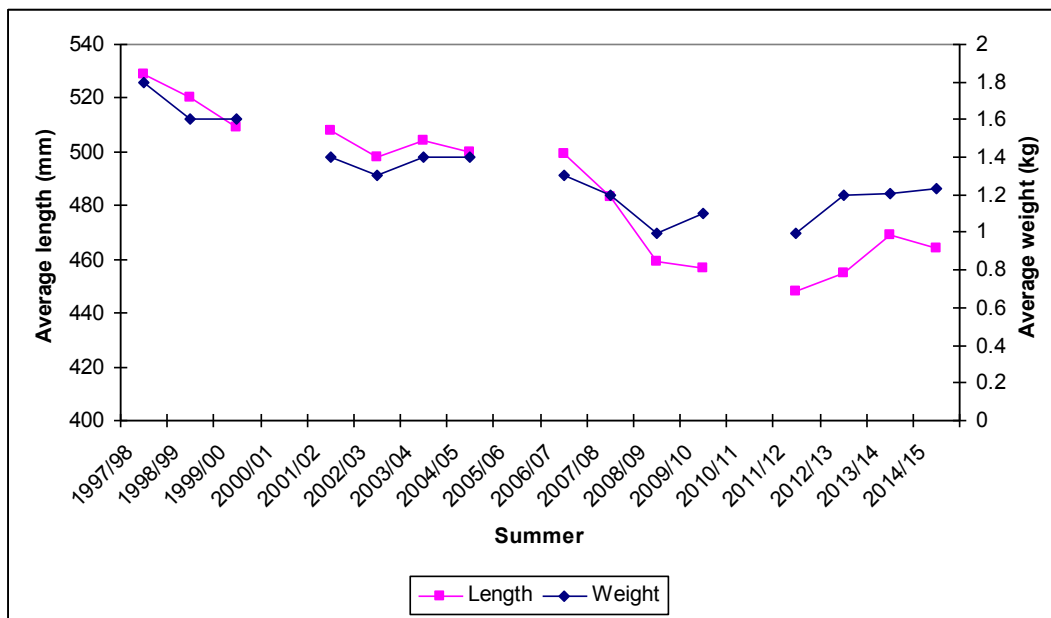


**Figure 3.** Trend in the popularity of jigging over the last 5 summers on Lake Taupō

popular among lake anglers despite more sporting and effective methods such as downriggers and jigging being readily available. Just over one third of anglers interviewed over summer were lead lining with an overall estimated catch rate of 0.31 fish per hour (1 legal sized trout every 3.25 hrs). Downriggers produced the highest catch rate at 0.51 fish per hour (1 legal sized trout every 2 hrs) but were used by less than 9%

The rainbows kept by anglers averaged 464mm and 1.2kg with an overall condition factor of 44.2 (Fig.4). The heaviest rainbow measured over summer was a jack measuring 590mm and weighing an impressive 3kg (6.6lbs) with a condition factor of 53. Another jack of the same length but weighing 2.8kg was also measured by staff with both of these notable fish coming from the northern end of Lake Taupō. The





**Figure 4.** Average lengths and weights of rainbow trout caught in Lake Taupō by anglers since the summer of 1997/98, where data is available.

rainbow trout that won the local Taupō Fishing Club competition in March was another male measuring 585mm and weighing 2.97kg with a condition factor of 53. The heaviest rainbow trout weighed from the southern end of the lake was yet another jack measuring 565mm and weighing 2.5kg with a condition factor of 50. This particular fish was caught by jigging near Motutere point on the eastern side of the lake. The heaviest rainbow hen checked by staff measured 560mm and weighed 2.26kg (5lb). Figure 5 shows the length distributions of male and female rainbow trout kept by anglers and it is noticeable there were more larger males than females kept this summer according to the survey data.

A total of five brown trout was also weighed and measured during the summer surveys and these fish averaged 592mm and 2.8kg with an average condition factor of 47.3. The heaviest brown measured was a jack measuring 630mm and 3.4kg (7.5lbs) with a condition factor of 50 from the northern end of the lake.

Anglers chose to keep 59% of all trout recorded during the scheduled angler surveys this summer. They returned 17% of legal size and 24% under the legal limit of 400mm. Of the legal fish landed, anglers chose to kill 77% which is higher

than the 64% recorded during summer 2013/14 but down slightly on the 80% recorded during summer 2012/13. With anglers choosing to keep three out of every four legal sized fish caught this summer, it would indicate the trout were in very good condition for the table.



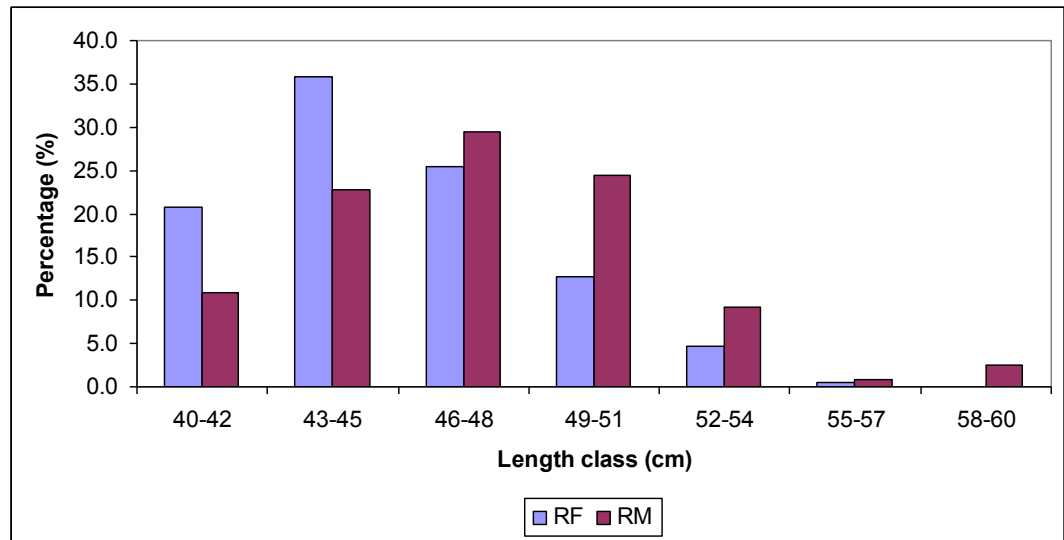
**Above:** Gail Wolf from Auckland with a 2.5 kg rainbow caught at Motutere in February.

*Photo: Mark Venman*

## Angler satisfaction

Given the positive feedback from anglers this summer regarding the general state of the Taupō Fishery, it was encouraging to see this reflected in the angler satisfaction scores given by anglers this summer. Anglers rated the trout they were catching at 7 out of 10 which is on par with last summer. Anglers were also asked to rate how satisfied they

**Figure 5.** Length distributions of rainbow trout kept by anglers during the summer of 2014/15



were with their catch rate and rated it at 6.3 out of 10 this summer. This is down slightly on the 6.9/10 calculated for the summer of 2013/14 but reflects the peak in catch rate observed that summer. Anglers were also asked to rate their angling enjoyment and rated it at 9.5 out of 10 which is on par with the previous summer and the joint highest out of the last nine summers.

Anglers were also asked a question in relation to what spoiled their fishing experience while out fishing on Lake Taupō. 67% of anglers couldn't cite anything spoiling their lake fishing experience over summer. Anglers did mention jet skiers and water skiers (8.2%), bad boating manners and poor etiquette (6.8%) as the main detractors followed by fishing regulations (2.3%), overcrowding (2.2%) and weed (2.2%).

**Below:** Jigging in the Tokaanu hole.

*Photo: Mark Venman*



Not surprisingly, 'weather' was cited as a detraction for just one angler – perhaps it was too hot out there on the lake this summer!

## Summary

A summer of perfect boating weather and some very nice fish made for a lot of happy anglers. Although the average length and weight of the rainbows is not quite where we would like it to be, based on historical data, the young maiden fish maturing over summer have done well and are in very good condition for their size. It was encouraging to see the presence of some very large rainbows among angler's catches that were not only long and heavy but also in great condition. With winter just around the corner and a bit of a chill in the air, the early runs of spawning trout have already started with some nice rainbows already being caught at the Tongariro Delta. Time will tell, but we could be in for a good run of trout this winter with some very nice fish in amongst them!





## World Park Congress Sydney Australia

Paul Green  
President Project Tongariro

In October 2014 IUCN and Australia hosted the World Park Congress (hereafter referred to as Congress) in Sydney. This event is held every 10 years and is the primary forum for all those involved or interested in protected area management to share their experiences and to discuss issues concerning their management or in extending their representation.

This Congress saw Bruce Jefferies, Dave Bamford and Paul Green from Project Tongariro present as part of over 6000 attendees. We found much of the benefit was the opportunity for informal networking opportunities. The Mountain Network dinner was a highlight for us as it is a group of 60-100 who take the opportunity to get together whenever there is a congress or an international forum.

It was very difficult to choose priority sessions to attend as there could be up to 30 forums, workshops, lectures, poster sessions or permanent displays going on at any one time.

To give the best overview I am providing a thoughtful insight from Jeff McNeely who has had a lifetime of experience as a scientist, advisor and lecturer in protected area management throughout the world.



## A political future for protected areas

Jeffrey A. Mcneely  
ex Senior Science Advisor, IUCN

The World Parks Congress has been organized by IUCN every decade since 1962. The first two Congresses were held in the USA (Seattle, 1962; Yellowstone and Grand Teton National Parks, 1972), with the next three in developing countries (Bali, Indonesia, 1982; Caracas, Venezuela, 1992; Durban, South Africa, 2003). (Full disclosure: I was Deputy Secretary-General at Bali and Secretary-General at Caracas.) Sydney, Australia, hosted the sixth Congress on 12–19 November 2014, welcoming over 6,000 participants from 170 countries. The purpose of the Congresses, broadly speaking, is to review progress in protected areas over the previous decade, assess the current state of protected areas, and chart a course for the coming decade.

Protected areas continue to grow in importance as a land-use. The latest assessment lists over 200,000 protected areas, covering 15.4% of the land and inland waters and 8.4% of seas within national jurisdiction. This brings within reach the Convention on Biological Diversity's target of 17% for terrestrial protected areas and 10% for marine protected areas by 2020. Percentage coverage is easiest to track but improving ecological representation, management effectiveness and connectivity are perhaps more important to the success of protected areas, although more difficult to measure.

So while much of the Congress celebrated success, storm clouds loomed over the gathered masses. The expansion of the number and size of



**Above:** Green Turtle (*Eretmochelys imbricata*) swims across the Great Barrier Reef.

Photo: Vlad61

protected areas carries a price tag that many governments are finding difficult to pay, in terms of both social and economic costs. When protected areas covered less than 4% of the land, it was possible to think of them as 'untouched' and protected from human disturbance. But new approaches are needed when responsibilities have grown so substantially, along with the pressures of a growing and wealthier population that often seems reluctant to face serious environmental issues.

The effective design, management and governance of protected areas have therefore become significant political issues. Many symptoms were on display in Sydney. Some governments are reducing their financial support to protected areas or even eliminating some. World Heritage sites, established because they are 'of outstanding universal value', are not immune. For example, Indonesia's growing demands for economic expansion are leading to significant encroachment on the Tropical Rainforest Heritage of Sumatra, a World

Heritage property that includes iconic sites such as Sumatra's Gunung Leuser National Park, home of Sumatran rhinos, orangutans, Asian elephants and many other species categorized as threatened on the IUCN Red List. The spread of oil palm, driven by global markets, is making a mockery of this natural heritage and more widely posing a scourge on Southeast Asia's tropical forests and the protected areas established to conserve them for public benefit.

Even the host country, Australia, is no longer an enlightened model for protected areas. Under economic and political pressure, the Great Barrier Reef Marine Park, a World Heritage site, is suffering from overfishing and the construction of three new harbours for exporting coal, a major contributor to climate change. Perhaps even worse are plans to open up 75,000 ha of the Tasmanian Wilderness World Heritage Area to logging.

Each World Parks Congress seeks to be innovative, but the issues are familiar.







Economic language was heard a lot in Sydney, perhaps to communicate protected areas issues more effectively to the politicians who set policies and budgets. Terms such as 'natural capital' and the 'economics of biodiversity loss' helped to express protected area values. Protected areas were shown to provide 'public goods' in the form of ecosystem services, earning a significant return on investments and therefore worthy of greater support as part of public budgets. A focus on the values of protected areas to society could expand their constituency. Victoria Parks, for example, effectively promoted its Healthy Parks, Healthy People initiative, earning public support through encouraging more people to enjoy the outdoors and the multiple health benefits that can follow. Protected areas were also recognized for their contributions to reducing risks to food security and helping address the effects of extreme natural events.

With half the world's people living in cities, protected area agencies must reach out to the urban constituency. Some major cities, such as Rio de Janeiro, Sydney, Nairobi, Hong Kong, Cape Town, San Francisco and London, have significant protected areas within them or on their boundaries. A third of the 100 largest cities depend on protected areas for their water supply, and protected areas depend on cities for political and social support, including through urban people visiting the protected areas and voting for politicians who support them. Climate issues, already raised at the 1992 and 2003 Congresses, received greater attention at Sydney, reflecting their place on the political agenda.

The links between climate change and ecosystem services were highlighted, along with the role of protected areas in helping the public understand climate change and its implications for people. Protected areas may store more carbon than any other land or sea use, especially in old-growth forests, wetlands, mangroves and coral reefs. Protected



areas can help adapt to climate change by linking sites to enable species' movements, becoming part of regional land-use strategies, and conserving ecosystems that reduce the risks of damage from extreme natural hazards. Protected areas need to become a politically palatable investment in addressing climate change. Insufficient political support reflected by budgetary constraints is also pushing protected area agencies to work more closely with the private sector. Companies have expertise in management, technology, finance, spatial planning, political influence and other fields that could be useful to protected areas. Many protected area agencies remain cautious about working with the for-profit sector, insisting on no-go status for at least some categories of protected areas. In the coming years protected area agencies will need to become more businesslike, finding politically acceptable ways to work more efficiently and develop creative ways to finance protected area operations. The entrepreneurial skills of the private sector could be helpful in this regard, although private profit motives must not trump the public good of conserving nature.

The Sydney event brought the political dimension of protected areas into sharper focus, although sadly it did not

take full advantage of the opportunities available by giving political issues a more explicit focus and a media splash at the event's conclusion. After all, protected areas are a reflection of public will, so the public constituency for protected areas needs to be strengthened and mobilized to ensure they can stand up against those who would prefer to use protected area resources for private gain. For the first time at a World Parks Congress, youth was identified as its own constituency and given a significant portion of the agenda, a shrewd political move for an important demographic that is ready to step up.

The major Congress outcome, called The Promise of Sydney, will be released online only in March 2015, with a vision statement, 12 Innovative Approaches to transformative change, a panorama of Inspiring Protected Area Solutions, and promises by governments, funders and NGOs to improve protected area management.

A continuous flow of results from the Congress is available at [www.panorama.solutions](http://www.panorama.solutions). Out of the chaos of 6,000 people, each with enlightening stories to tell and too little time to tell them, will come the Promise of Sydney. The future of human well-being may well depend on keeping the promises made. The political dimension will be critical to their success.

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## The Promise Of Sydney

The Promise of Sydney is a commitment to transforming perspective, policy and practice to enhance protected areas as one of the best investments in our planet's and our own future. This vision articulates a set of high-level aspirations and recommendations, emerging from the World Parks Congress 2014, for the change we need in the coming decade to enhance implementation of conservation and development goals for parks, people and the planet.

For a full overview of 'THE PROMISE OF SYDNEY' go to:  
[http://worldparkscongress.org/about/promise\\_of\\_sydney.html](http://worldparkscongress.org/about/promise_of_sydney.html)



## An automatic weather station on Tongariro

Harry Keys  
 Technical Advisor-Volcanology  
 Department of Conservation

An automatic weather station was installed on December 16, 2014 on an eastern peak of the Tongariro massif, 2 km east of Blue Lake (Figure 1) by DOC and Communication Network Management Ltd (CNML). This may not be a permanent installation, but it is contributing to the reduction of volcanic and weather risks which are major aspects of visitor safety on the Tongariro Alpine Crossing (TAC). Volcanic hazards are also relevant to surrounding communities in the Rangipo basin, and infrastructure such as State Highway 1. These safety matters are consistent with the designation in 1962 of the northeast part of the Tongariro massif as Te Tatau Pounamu ("greenstone door") "wilderness" area: this concept or philosophy represents to Māori an agreement for peace or safe passage. Installing equipment for visitor and public safety purposes for limited periods following the 2012 eruption can perhaps be viewed as a contribution to this.

The weather station has three important management objectives:

1. to provide local wind data for Geological and Nuclear Sciences (GNS) to interpret data from the new DOC-owned gas spectrometers that monitor gas emission, and provide warning of potential further eruptions from Upper Te Maari crater;
2. to provide TAC concessionaires and DOC with real-time wind data for decision-making aimed at minimizing hypothermia and other weather risks to their customers and other visitors trekking the TAC; and
3. to allow the Meteorological Service to improve weather forecasting for the Crossing area.

Objectives 1 and 2 have been achieved while objective 3 is still in progress. There are other spin-offs as well, such as monitoring wind conditions contributing to 'false positive' activations of parts of our Volcanic Alarm Network, and rainfall that may also affect the lahar hazard zone on the northern TAC.

At 1700 m this is one of the highest Government-owned automatic climate stations in New Zealand, and the highest in the NZ network linked to Harvest Electronics Ltd. It was designed by Clint Swain (CNML) and Peter Munn (Harvest Electronics) with assistance from Peter Hollingsworth (NZ Meteorological Service). It uses commercially available, cold-tolerant components to provide data in near real-time used by or for GNS, DOC concessionaires, the public, climate scientists and weather forecasters.

A Vaisala WXT520 weather transmitter sensor unit provides horizontal wind speed and direction, air temperature (dry bulb equivalent), humidity and pressure, and a semi-quantitative measurement of rainfall. The WXT520 has a heating unit with an output of around 10 watts so it is designed to withstand cold moist periods where icing or wind-driven snow affect the wind sensors (an array of three sturdy, equally spaced transducer prongs). The station is powered by a high capacity battery bank supplied by a solar panel. Data is telemetered via cell network, and publicly available on Harvest's website <http://harvestalarms.com> (Region; Waikato: Subregion; Tongariro Alpine Crossing). A free email containing key wind and windchill data is also sent each day at 4 am from Harvest to concessionaires and others operating in association with the Tongariro Alpine Crossing.



The station is operating successfully under sometimes extreme conditions although as expected it struggles during cold periods of extreme riming and/or blizzards. Weather extremes recorded to date are 186.9 kilometres per hour wind gust (29 April),  $-7.3^{\circ}\text{C}$  minimum air temperature (22 June),  $-14^{\circ}\text{C}$  calculated wind chill and an estimated 350 mm of rain in a single 24 hour day (20 June)! This is a significant overestimate as the maximum rainfall at the Tongariro huts recorded by Jimmy Johnson in the years to c. 2013 was 284 mm/day and this produced major flooding in rivers off the mountain. The figure probably represents 100–200 mm/day.

So far there have been 14 periods longer than an hour (e.g. Figure 2) when severe riming and/or driving snow have blocked one or more of the transducer prongs before the rate of melting overcame the ice/snow accumulation on the unit, and the wind data resumed. So far internal temperature in the housing of the Industrial Telemetry Unit has been as low as  $-7.0^{\circ}\text{C}$  (23 June) but the whole system can cope with air temperatures down to  $-15^{\circ}\text{C}$ . The sensor heating system is enabled below  $5^{\circ}\text{C}$  and as expected, it has been working hard at times especially



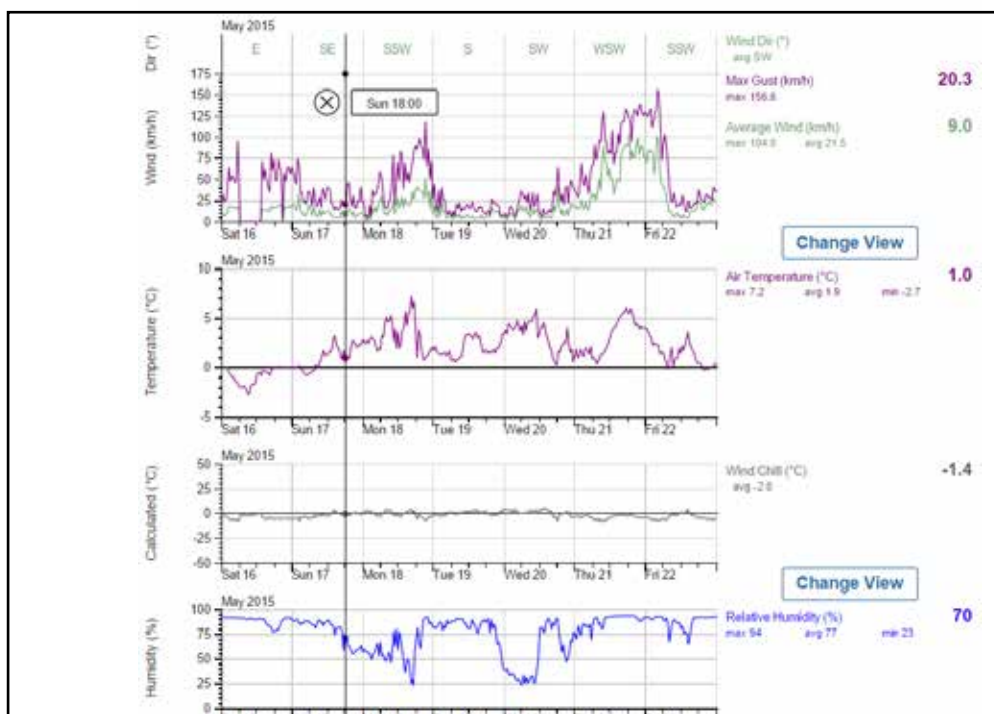
when the temperature drops below  $-1^{\circ}\text{C}$ . But so far the battery supply and solar panel have kept up with the power demand, and battery voltage has not dropped below 12.6 volts. This is well above the 12.0 and 11.6 volt levels where data reporting or logging are set to stop in order to protect the batteries.

We expect the winter period to be the most challenging season for the weather station.

**Above:** Figure 1: The new automatic weather station on the Tongariro massif showing the view south-westwards to the peaks of Ngauruhoe and Red Crater. The Vaisala sensor unit tops the mast while the black box (heavily insulated) contains Harvest's Industrial Telemetry Unit.

*Photo: Harry Keys*

**Left:** Figure 2: Wind and temperature graph from Harvest's website showing the wind speed, air temperature and calculated wind chill for the period 15–22 May. A storm early in this period stopped wind data for about seven hours on the 16<sup>th</sup>, but the data resumed without problem as it did after the wind data loss for 62 hours on 21–24 June following a major storm on 19–22 June.



**About the author:**

Dr Shaun Eaves first visited Tongariro National Park in 2007 as part of a second year undergraduate geography fieldtrip from the UK, and recently completed a PhD thesis on the glacial history of the central North Island volcanoes at Victoria University of Wellington (VUW). Shaun is now employed as a Post-doctoral Research Fellow at the Antarctic Research Centre, VUW.



## Fire and ice: Reconstructing past glacial activity on Tongariro and Ruapehu volcanoes

Dr Shaun Eaves  
Post-Doctoral Research Fellow

I am a physical geographer who uses records of past mountain glacier fluctuations to reconstruct the timing and magnitude of past changes in climate. Mountain glaciers are intimately

shrink repeatedly. In doing so, the glaciers have modified the landscape in a distinctive manner. As ice flows down valley under gravity, the bedrock below this ice is eroded, and rocky debris is deposited at the glacier margins. The landforms created by glaciers can remain in the landscape for tens of thousands of years after ice retreat. Identifying relict glacial landforms preserved in the modern landscape thus provides key information about past ice extent and past climate change.

On Tongariro and Mt Ruapehu volcanoes, there exists abundant evidence for former, more extensive ice cover in the geological past. Large linear ridges composed of glacially-transported rocky debris, known as 'moraines', line many of the deep valleys that radiate from both volcanoes. At higher elevations, polished and scratched bedrock shows where ice once flowed downhill. Geologists have recognized these landforms for almost a century. However, until recently, the necessary tools and techniques to determine the exact age of these deposits have not been available. Without knowing when the glaciers advanced or retreated in the past, it is difficult to interpret their climatic significance.

In recent years a new geochemical technique has been developed, which allows geologists to determine when glacially transported boulders were deposited at the margins of



**Above:** A former glacial valley on SE Mt. Ruapehu.

*Photo: Dougal Townsend/GNS Science*

connected to climate, in particular temperature and precipitation. For example, if the air becomes a little colder, then glaciers receive more snow and undergo less melting. Thus, lower air temperatures cause glaciers to increase in size, which ultimately leads to a terminus advance. In the opposite case, climatic warming leads to reduced snowfall and greater melting, which causes glaciers to retreat.

Over the last million years, natural fluctuations in Earth's climate have caused glaciers around the world to grow and





former ice masses. Rocks exposed at the Earth's surface are subject to bombardment by high energy cosmic rays, which originate in supernovae explosions within our galaxy. Some of these rays have enough energy to reach Earth's surface, where they collide with common earth elements, such as oxygen, to produce new and rare isotopes. These rare isotopes, which are known as 'cosmogenic nuclides', build up in surface rocks over time. Thus, the concentration of these nuclides in a rock sample provides a measure of how long that rock has been exposed at Earth's surface. This technique is useful for dating glacially transported boulders, which have been often been quarried from depth and subsequently deposited at the Earth's surface.

For my PhD research, I used a combination of geological mapping and cosmogenic nuclide dating, to identify and date moraines on Tongariro and Ruapehu. Prime examples of moraines can be found lining the lower reaches of both sides of Mangatepopo valley. These moraines converge at about

the position of the car park that marks the start of Tongariro Alpine crossing, indicating that a glacier once terminated at this location. The cosmogenic nuclide concentrations in boulders on these landforms indicate



that the former 'Mangatepopo Glacier' last reached this position approximately 20,000 years ago.

On Mt. Ruapehu, I have found that glaciers such as the Mangaehuehu Glacier (just to the east of Turoa skifield), were more extensive than present for much of the last 14,000 years. The sharp-crested

moraines immediately in front of the present-day Mangaehuehu Glacier terminus returned exposure ages of 200-500 years. These ages are consistent with historic photos from the early 20<sup>th</sup> century that show this glacier has retreated from these landforms during the last 100 years.

The final part of my research utilised computer models to investigate how much colder and/or wetter the climate must have been in the past for the glaciers to have been more extensive than present. Developed at Victoria University of Wellington, these numerical computer models simulate snowfall, snow/ice melt and ice flow. This work involved running experiments of different climate change scenarios (e.g. making it 2°C colder than present, or 20% wetter), and comparing the resultant, simulated ice masses to my geological data.

**Above left:** Glacially polished and scratched bedrock in front of Mangaetoetouenui Glacier.

**Above:** Large moraines indicate the past extent of the former 'Mangatepopo Glacier' approx. 20,000 years ago

*Photos: Shaun Eaves*



From this work I found that it is necessary to reduce present day mean annual temperature by 6°C in order to produce a glacier that fills Mangatepopo valley and matches the 20,000 year old moraines. In contrast, only 1°C of cooling is necessary to make the terminus of the Mangaehuehu Glacier extend out to where it was approximately 200-500 years ago.

My research has shown that glaciers on Tongariro and Mt. Ruapehu have fluctuated in synchrony with those in the Southern Alps over the last 60,000 years. For example, research conducted by my colleagues has shown that the basins now filled by Lakes Pukaki, Tekapo and Ohau, in the central Southern Alps, were also last filled by ice approximately 20,000 years

ago. Computer simulations show that a similar degree of cooling (~6°C lower than present) is also required to cause such an advance of these glaciers. These spatial comparisons tell us that the climatic changes were similar over a large area. Such geologically-based climate reconstructions provide useful data with which to evaluate global climate model simulations that seek to explain the drivers of past climate change.

I am very grateful to Project Tongariro for a 2012 Memorial Award that helped fund the exposure dating of glacial landforms in Tongariro National Park.

**Above:** Young moraines on Ruapehu illustrate recent glacial retreat.

*Photo: Shaun Eaves*



## Bringing bikes to the children of the Taupō District to build a cycling culture

Cath Oldfield  
Bike Taupō



At the Taupō Cycling Summit in 2012 it was pointed out that although Taupō did events well, our children were not riding bikes regularly. Bike Taupō (BT) had been involved with a cycling road safety programme for 10 year old children and noticed that many of these kids could not ride well enough to be taken on the road, even if they were lucky enough to have a bike of their own. There was a big gap between those riding on our mountainbike tracks and our kids.

BT member, Cath Oldfield worked for the Taupō District Council (TDC) After School Programme and there were a few bikes there. She borrowed a TDC van and began taking bikes into schools at lunchtime. That was fun for a while, but there were better biking opportunities. She was regularly taking kids from the After School Programme to Spa Park and the BMX track. Bike Taupō could see

the potential and things began to grow. Bike Taupō purchased more bikes and with funding from the Lake Taupō Cycle Challenge, via Taupō Moana Rotary, a dedicated van for the bikes was found. Kids Bike Taupō was born.

Over the past two and a half years, Kids Bike Taupō has been evolving. Today, we see ourselves as 'pre road' specialists. Our goal is to get the children of the Taupō District riding bikes well. We go to the schools and on biking adventures. The kids are having fun, getting exercise and learning how to handle a bike in all sorts of situations. When they finally get on the road, the idea is that controlling their bikes will be very natural so they can concentrate on the traffic and the roads.

We are blessed with so many great riding places, without having to ride on the road. The Kids Bike Taupō Programme goes



everywhere and this introduces the kids and their adults to the fun of riding in beautiful places. We cover 23 schools right around the lake. The most popular riding places are the Tongariro River, the BMX Track, Spa Park, Craters Mountainbike Park, the Lions' Walk and we regularly use the little road on Crown Park. The schools with the resources have been out to the Great Lake Trail, so more people are getting access to our new tracks. We have a core of lovely volunteers who will come and ride if groups have trouble getting enough adults.

There are many other biking programmes around the country. They focus on skills and road safety. Our point of difference is that we are mobile and we provide bikes that work. Schools don't have the energy to run a fleet of bikes, unless their community has adults prepared to take it on. It's sad but it cannot be assumed that all children in the Taupō District have a bike of their own that is well maintained. This is across all schools and socio groups. Many families have other priorities.

In June 2015 our focus is turning now to early childhood centres. If children can ride a bike well before they get to school, it makes things

**Above left:** You are never too young to try out junior BMX skills!

much more successful when we run sessions at school. With the small bikes we have access to these days, we see kids riding on two wheels at 3 years old. They are all capable at 4 years old, if they have the opportunity. We encourage the use of balance bikes and then straight onto two wheels. Training wheels can be a barrier.

The most successful session Kids Bike Taupō runs would have to be the Random Ratbags BMX on a Monday afternoon at the BMX Track in Crown Park. This facility is fenced and locked because of the vandalism in the area, so this Monday session is the only opportunity for kids to ride there. It is amazing how some of these big guys do not have their own bikes, but ride like pros. We have kids aged from 3 to 16 years old. With a little help from some parents, we can have up to 60 kids at the track on a nice day. These riders are not going to become Olympic champions, but they are developing a love of riding a bike. It's a feeling that they will take into adulthood and



maybe they will choose to make a few journeys by bike when they are older.

The programme is diversifying and we are getting some unusual gigs. Kids Bike Taupō

had a very interesting day of filming in Craters Mountainbike Park, Wairakei Forest with The Moe Show. This is a children's television programme. Moe, a muppet-type puppet, goes on adventures around the country and he came to Taupō to learn how to ride a bike. Look out for the show when it airs in August. The Bike Taupō website will certainly have a link to see the finished product, when it is available.

To June 2015 we estimate that there have been 13,000 'rides' on the Kids Bike Taupō bikes, with over 300 learning to ride on two wheels for the first time.

**Above:** Rascals on BMX bikes - fun and spills in a safe controlled environment

**Left:** Kings and queens of the castle - Riverside Park, Taupō

*Photos: Bike Taupō*





It is extremely rewarding to recognise those who learnt to ride with us now able to enjoy biking with all their friends at more adventurous sessions. Another major, unexpected, benefit is that children riding are putting pressure on their adults to get onto a bike. They have to, so they can keep up!

Kids Bike Taupō offers a free service to local schools and is funded in part by the TDC, a portion from Bike Taupō subscriptions, Taupō Moana Rotary as needed, and with support from many businesses and people in the district. Sport Waikato gave start up funding that helped to see where this programme could go.

## Be a Bike Benefactor

It is not well known that Kids Bike Taupō is run on donations and funding applications. If you can see the benefit the programme is bringing to the children of the Taupō District, you may like to visit <http://www.bikeTaupō.org.nz/category/100434> to make a contribution.

Volunteers are sometimes needed or if you have any children's bikes in the shed that could be put to better use, please contact Cath Oldfield at [kids@bikeTaupō.org.nz](mailto:kids@bikeTaupō.org.nz) or on **027 280 4005**.



Bike Taupō caters for big kids too through its involvement with and construction of more than 200 km of bike tracks including Lake Taupō's Great Lake Trail, Craters MTB Park and Waikato River trails.



## Tongariro Alpine Crossing visitors surveyed on effectiveness of new electronic light signs

Harry Keys  
Technical Advisor-Volcanology  
Department of Conservation

### Introduction

The Tongariro Alpine Crossing (TAC), across Mt Tongariro, is the most popular day trek in New Zealand and its use continues to increase. In the 2014 calendar year the number of people making the 20 km trek reached 100,000 for the first time according to estimates based on the Ketetahi counter. As at mid-year 2012, there had been no volcanic activity from any of Tongariro's numerous vents for close to four decades. Not surprisingly, the emphasis on safety on the crossing was focused not on the danger from possible eruptions but on the weather and the importance of being properly equipped for a day trek in this alpine area. There has been a constant battle to impress on visitors the dangers of the alpine conditions, including risks from hypothermia, falls and rockfall.

**Figure 1.** International visitors from two separate parties discuss the implications of the flashing red light at the light sign (partially obscured) below North Crater, TAC, during the survey in 2014. Just after this photo was taken they were advised it was a test and with great relief they were able to proceed.

*Photo: Harry Keys*

However, the sudden eruption from multiple vents on the north eastern flanks of Mt Tongariro in August 2012 and again in November 2012 brought volcanic risk sharply back into focus. During those eruptions, the track was affected by various severe volcanic hazards: (hot pyroclastic density currents, volcanic bombs and lahar (mudflow) over a distance of 2-3 km (see last year's Tongariro Journal).

The Department of Conservation began a programme to reduce volcanic risk on the TAC following these events. Various agencies were involved including GNS Science, Ngāti Hikairo, concessionaires and other companies involved with the TAC. Dr Nick Smith (Minister of Conservation at the time), visited the TAC in Easter 2013. He suggested investigating a light system to notify visitors if the volcanic hazard changed. Such was the seriousness of the volcanic hazards involved it was recognised to be a practical approach. A four-light system was built and installed, with assistance from contractors, for the summer – autumn of 2013/14.

Dr Smith agreed risk management tools needed to be effective, including the light system, otherwise a reduction in the level of risk to visitor safety would not be assured. This is very important given the number of visitors to the track. DOC's visitor risk management system indicates the volcanic risk to visitors on the TAC is close to prohibitive based on the large size of the visitor population involved. Accidents on the track can quickly gain prominence in the minds of politicians and NZ tourism managers who recognise its importance to international visitors coming for outdoor activities. We





realised a visitor survey was required to assess effectiveness, but in discussion with recreation advisors and social scientists in DOC it was concluded that some tools could not easily be reliably assessed.

Therefore, we focused on the light signs and developed, tested and ran a questionnaire survey with assistance from GNS under considerable time pressure to obtain a statistically reliable number (> approximately 150-200) of completed questionnaires. We achieved this by interviewing 203 hikers on the TAC exposed to the signs showing the red on/off and green lights. Interviews were carried out mainly at the single red light sign at the saddle between Blue and North craters (Figure 1), with some near the triple light sign at Ketetahi car park (Figure 2), and the track above it. Interviews were held over four days between March 11 and May 11 2014 using a questionnaire filled out by interviewers.

## Survey results

The primary objective of the survey was to determine the effectiveness of the light signs placed on the TAC.

There were three key issues to examine:

- were the lights seen?
- were the messages understood?
- and did people understand what they should do if the light was red?

As it happened we were also able to analyse the influence of nationality/first language on key issues b) and c).

The survey results revealed most people saw and understood both the triple and single light signs especially when these were activated to show the red flashing lights. 98% of those surveyed saw the lights when they were on red (Figure 3) and 90% understood the key message at the time (Figure 4). 73% knew red meant they should turn back and a further 10% waited at the signs

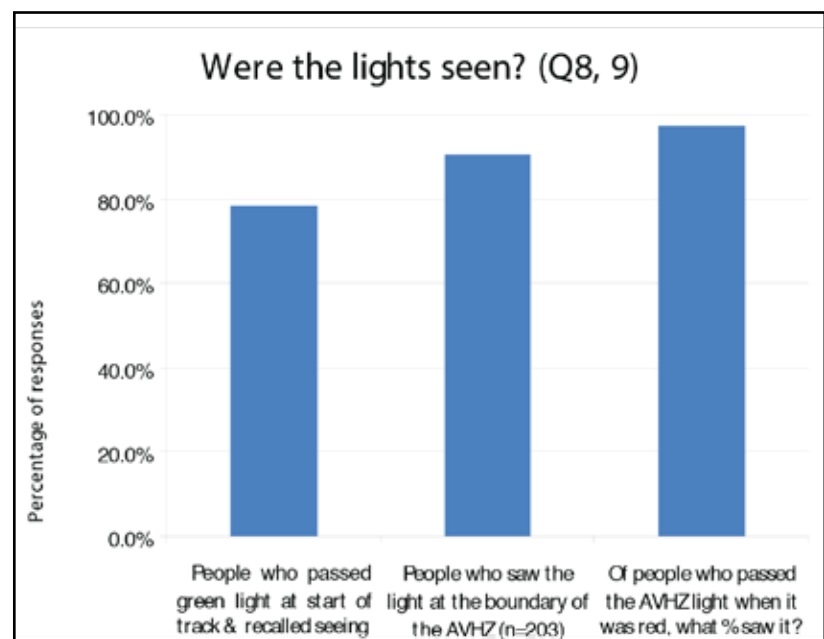


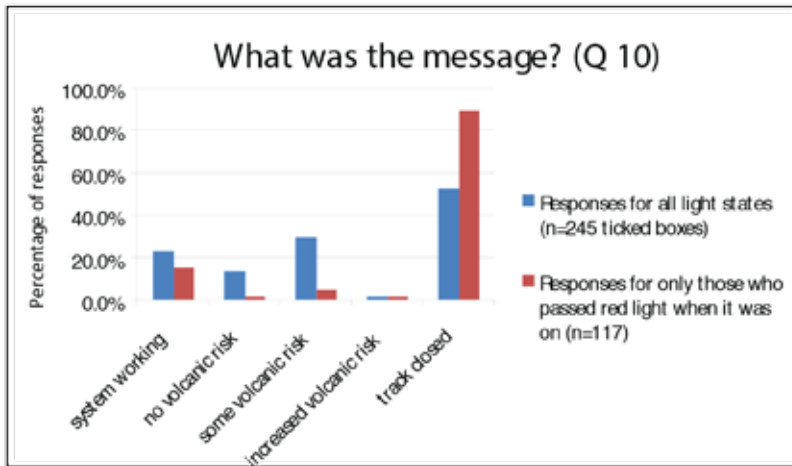
or otherwise sought more information (Figures 1, 5), rather than proceeding into the Volcanic Hazard Zone. Language was not a significant barrier to understanding (Figure 6) which is a very important result in the TAC situation where 75% of people are transient international visitors and English is not the first language for more than half of them. It was also clear that the light signs had more impact on people than the static signs. Public perception of the light signs was very favourable.

**Figure 2.** Triple light sign at Ketetahi car park with the green light flashing.

*Photo: Karen Williams*

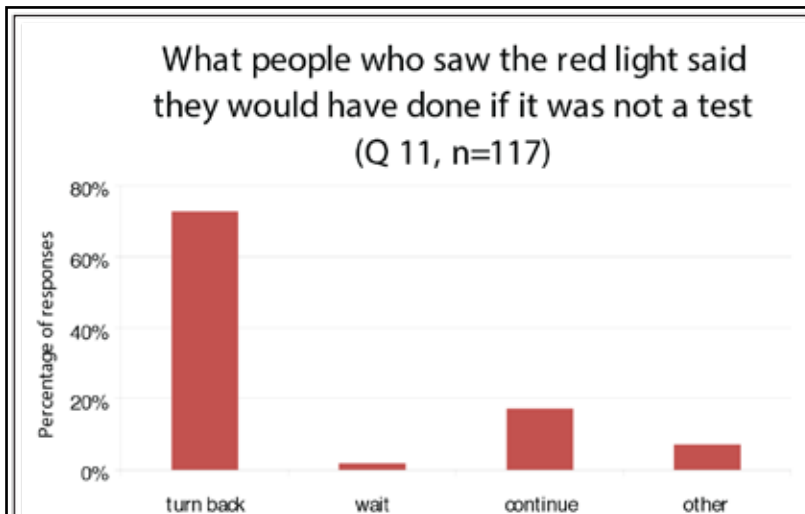
**Figure 3:** Visitor response to key issue a), indicating that most people saw the lights, especially when the red light was on.





**Figure 4:** Visitor response to key issue a), indicating that most people understood the messages on the light signs, especially when the red light was on.

These survey results and the comments made showed people's decision making is affected by the length of the TAC and its relative difficulty. The Active Volcanic Hazard Zone surrounding the Te Maari craters straddles the last part of the usual walking route over the TAC. This means if the red light sign at Blue-North saddle is



**Figure 5:** Visitor response to key issue b), indicating that most people said they would have complied with the light signs, especially when the red light was on.

activated people could face a return walk of at least 12 km or some four hours, including the climb back over past Red Crater, and back to Mangatepopo car park. Many walkers found this thought too difficult to face, and it would certainly be beyond the normal limits of some.

The survey confirmed previous understandings and surveys including the pivotal role commercial transport operators play in briefing the majority of visitors to the TAC. Transport operators provide consistent and up to date information first hand on a daily basis

to large numbers of people travelling by bus or van to the start of the track. Demographics, experience and nationality of visitors were very similar to those found in previous surveys except the proportion of international visitors is continuing to increase over time. Of those surveyed, 92% were trekking the TAC for the first time. In response to questions, 87% replied correctly that Tongariro was active, 79% knew Ngauruhoe was active (both more than in the 2005 survey by GNS), 59% answered the last eruption was in 2012 or 2013, but only 35% correctly said the vent was on Tongariro.

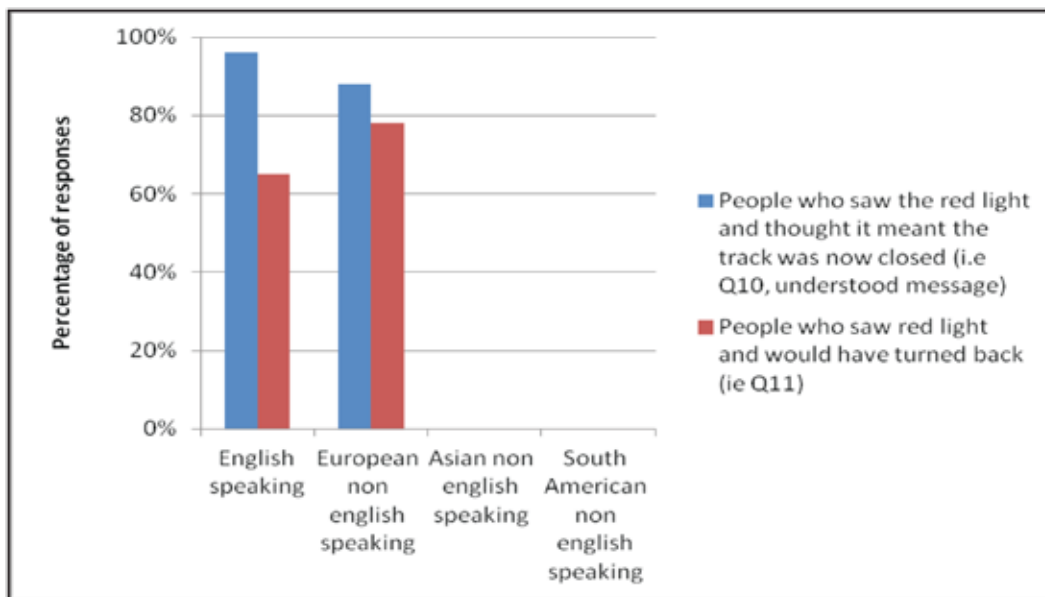
Responses to survey questions indicated the need for some changes on the ground. These were:

The Mangatepopo triple light signs at the start of the TAC needed to be moved to be more conspicuous;  
 Minor amendments needed to be made to the wording of signs to reduce the chance of confusion, including the addition of a phone number to call;  
 To increase compliance, an additional single light sign was needed before Red Crater summit giving trekkers advance notice of a change in volcanic risk. From this location at the turn off to Tongariro Summit it is 8 km back to Mangatepopo car park (i.e. before the mid-way point of the TAC). A single light sign would still need to be deployed between Blue and North craters at the southern boundary of the Active Volcanic Hazard Zone.

## Conclusions

The results of this study have improved park managers' understanding of how visitors (New Zealanders and international visitors) respond to the management of volcanic risk. The light signs appear to be effective at reaching a wide-ranging audience and correctly conveying important messages about volcanic risk. Therefore during periods of volcanic risk these signs should be deployed and lights operated as necessary. However should activity die away for a substantial period then it may be appropriate not to reinstall





**Figure 6:** Visitor response to key issues b) and c) using cross tabulations between Q9 (red), Q10 (only those who saw the red light) and Q1 (nationality/language background). This indicates most people said they understood the messages correctly and would have complied with the red lights, irrespective of their language background. There were too few Asian and South American respondents to graph here but their responses are consistent with the conclusion: two of the three Asians and both South American respondents understood red meant track closed and all five said they would have turned back. Note the percentage of English first-language speakers who said they would have turned back is less than the percentage who saw the red light, suggesting the issue is not in translation but more about correct behaviour and how to motivate it.

the signs.

### Update to the end of the 2014/15 season

The system of light signs installed on the TAC and its two car parks in the spring-summer-autumn periods from late 2013 has operated satisfactorily to date. A fifth sign was installed on Red Crater for the 2014/15 season as a result of a recommendation made consistently by a significant percentage of surveyed visitors on the TAC (see above). Wording was changed on this new sign and on the sign in Blue-North crater saddle. The Mangatepopo sign was placed just beyond the shelter at the start of the track. When GNS raised Ngauruhoe's Alert Level from 0 to 1 in late March we debated whether to turn the car park lights to orange but agreed the risk was not great enough to warrant this. While there have been minor and infrequent power and communication outages during prolonged periods of cloud or storm, monitoring and testing

have shown the lights are operating well with minimum input necessary during the season. Data suggests the lights, together with the Eruption Detection System at Ruapehu, are the most effective public warning components of the Volcanic Alarm Network in TNP.

This report is not a sufficient analysis and documentation of the survey. It does not examine the influence of the artificial test nature of the survey or margins of error in these results. A fuller write-up, ideally for a scientific journal, and peer review are necessary to make conclusive results.

### Acknowledgements

Karen Williams and Graham Leonard made major contributions to the survey for the TAC lights and Jo Johnson assisted with interviewing. Karen Mitchell provided supporting information about transport operators.



## Kids Greening Taupō

Robyn Orchard  
Advisor Communications, DOC

### Kids to run new environmental education project in Taupō



**Above:** Climbing and collecting is what Taylor Keremete likes most about Discovery Days with Hinemoa Kindergarten.

*Photo: Tania Wells*

There is a new environmental education project in Taupō, and it is being led by the same students it is educating and empowering.

Kids Greening Taupō (KGT), an 18 month pilot project involving five local schools is based on the very successful Kids Restore the Kepler project in Fiordland.

Kids Restore the Kepler is a major conservation project with a difference. As well as having conservation goals seeking to restore birdsong in the area, the project also has a strong education focus.

The Taupō pilot is about taking the key ingredients of Kids Restore the Kepler, a project led by the Fiordland Conservation Trust set in a national park, and transplanting it to retro-fit biodiversity into the local Taupō urban setting. The Taupō project will piggy-back on the community conservation initiative, Greening Taupō, a collaboration between the community, Tūwharetoa Māori Trust Board, the Department of Conservation, local schools, businesses and the Taupō District Council.

Greening Taupō's objective is to improve the Taupō environment for people and native wildlife. This involves restoration planting and pest control to create ecological corridors allowing the number of native birds to flourish. Particular attention will be focused on access routes in and out of Taupō to help create a sense of arrival for visitors to Taupō.

With this in mind a team from Taupō visited Kids Restore the Kepler to look at how DOC and its community partners could go about transplanting the southern programme into a northern urban environment.

The five schools taking part in the pilot were selected because they had already indicated an interest in taking part in the Greening Taupō community initiative. Tauhara College, Taupō and Waipahihi Primary Schools and Hinemoa and Four Seasons Kindergartens have committed to the 18 month pilot.





**Left:** Taupō Native Plants Nursery experts gave hands on experiential learning in seeding, pricking out, tubing and propagating at another workshop. Amy Wake, Tauhara College, Bay Boocock, Hinemoa Kindergarten and Nina Manning, Greening Taupō Coordinator getting their hands dirty while learning.

*Photo: Tania Wells*

## Preparation and Planning

Preparation and planning for the pilot to go live began with presentations to the schools' Boards of Trustees and staff late last year and early this year.

This was followed by a series of teacher workshops to ensure teachers were confident in some of the collaborative and strategic thinking required for such a conservation education programme.

Five teacher workshops have been held in Taupō since late last year for those involved in the pilot. The first two explored the aspirations of the teachers taking part, the goals of the pilot and what teachers need to be successful in conservation education.

The three more recent workshops were practical skills workshops at Waipahihi Marae, Taupō Native Plant Nursery and Taupō Botanical Gardens attended by around 20 teachers from the five schools taking part in the pilot.

The Waipahihi workshop was led by Dylan Tahau, Environmental Manager for the Ngāti Tūwharetoa Māori Trust, a member of the pilot steering group. The workshop also included a group of Tauhara College Ngāti Tūwharetoa students who led

and supported the teachers in their experiential learning.

*"We will grow cultural environmental leadership through the college students who will then pass on that cultural view to the younger students," says Dylan.*

The workshop brought teachers together to learn about traditional Māori customs and our connection to the whenua (land). Teachers learnt about the significance of powhiri (welcome), whareniui (meeting house), wharekai (dining room) and pepeha (introductions) as well as how to harvest and use native plants like harakeke (flax) and kawakawa.

They will take this knowledge back to school with confidence and incorporate aspects of this into learning programmes for students.

The second workshop at Taupō Native Plant Nursery involved native plants experts giving hands on experiential learning in seeding, pricking out, tubing and propagating of native plants.

Again teachers will return to their classrooms with increased confidence, skills, knowledge and a deeper understanding of not only the propagation of native plants but also some of the tools



**Above:** DOC Ranger Ian McNickle gave the Kids Greening Taupō student leadership team a predator trapping practical demonstration during their team building day.

*Photo: Tauhara College*

and equipment needed to set up small units back at their schools.

Teachers learnt about tracking tunnels and trapping at the fifth workshop hosted by volunteers from the Taupō Botanical Gardens Society.

### **Student involvement**

Three Tauhara College photography students Sian, Zoe and Shannon have been attending the teacher and student workshops to record the KGT pilot.

The student photographers will provide photos for a blog to be set up by students, for media stories to be written by students and eventually for a new website to be designed and developed by students taking part in KGT.

*“The pilot is not only about empowering teachers, it is also about giving students the skills and learnings to lead conservation not only across curriculum, but also across levels and age groups,”* says the

Taupō partnership ranger Tania Wells who is leading the project from a DOC perspective.

Students were selected for the KGT student leadership team early in May and the team spent their first session together in a day long team building workshop where they bonded as a cross-schools team.

The team’s first meeting included a presentation from the Taupō Mayor David Trewavas about meeting etiquette and how his leadership team works. They also discussed team ground rules, and reported back on their school projects.

The second student leadership team meeting served as a local launch for the project where the team presented to media, teachers and invited guests and included presentations from the two kindergartens involved. They held the meeting in the Taupō District Council Chambers where Mayor David Trewavas once again met with them.





**Left:** Tauhara College Ngāti Tūwharetoa students led and supported the teachers in their experiential learning. The cultural workshop included a visit to Onekeneke Stream where students spoke of the cultural significance of the stream.

*Photo: Tauhara College*  
**Below:** The student leadership team with Mayor David Trewavas and Partnership Ranger Tania Wells. Back from left Serine Panossian, Joanna Zhong, Tui Preston, Zoe Rainbow (Tauhara College); Middle from left Alana French, Emma Billington, Jazmine Frewen, Andrew Bullock (Waipahihi Primary); Front from left Rebekah Porteous, Austin Gibson, Samuel Murtagh and Tajshan Ram (Taupō Primary)

*Photo: Tania Wells*

### Teachers enthusiastic about pilot

Bay Boocock of Hinemoa Kindergarten likened the project to the life cycle of the tree. *"We've been given a seed to plant and the children will be able to grow the tree. It will flourish, the seeds will drop and through the children the process will start again. This will go on for generations to come."*

"Through environmental education we are giving children the knowledge and skills to make a difference," says Karen Watson of Taupō Primary School.

One feature of the project that excites Richelle McDonald, Deputy Principal of Taupō Primary School is the strong focus on inquiry learning and action outcomes, 'doing something that means something'. Another is the collaboration the project will create. Everyone will be working together from the kindergartens to the primary, high schools and the community.

### Measuring and monitoring research

University of Waikato Master of Education student, Thea DePetris, will undertake research working alongside the pilot measuring and monitoring its success.

*"This project unites my key passions of education for sustainability and connecting children with nature," she says.*

Thea says the monitoring and measuring research will be key to being able to implement this project in other schools in other areas both rural and urban.

### Involvement with others

A key component of the pilot is the involvement of many different organisations and individuals.

Taupō ecologist Nick Singers who designed the Greening Taupō project says he is humbled to see the vision gaining



**Right:** Finding a weta on one of their Discovery Days provided Kasey Harmer from Hinemoa Kindergarten with an up close experience of bush life.

Photo: Tania Wells



traction and he is excited to be involved in the Kids Greening Taupō pilot.

*"Kids Greening Taupō has the potential to bring the extraordinary into the ordinary day. There are amazing benefits for all of us in having a green environment - the benefits of this project are all positive."*

Ngāti Tūwharetoa Māori Trust Board Environmental Manager Dylan Tahau says the board supports the framework of the pilot programme by helping to grow a cultural view of understanding the environment through tuakana teina (older brother younger brother approach).

*"We will grow cultural environmental leadership through the college students who will then pass on that cultural view to the younger students,"* he says.

### **DOC wants best practice Conservation Education**

*"Kids Restore the Kepler is a really good example of best practice environmental education happening in New Zealand,"* says Kerryn Penny from DOC's Outreach and Education team. *"We want to learn from it, and adapt it for other local places, particularly urban landscapes."*

*"We need to be working towards empowering the teachers and their students to get involved in creating quality conservation and education outcomes,"* she says.

The project has a unique approach to integrating genuine real-life opportunities into teaching and learning programmes. It is a community and place-based project that involves real collaboration at a community level, and it is these attributes that are earning it the reputation as a 'best practice' model of community conservation education.

Kids Restore the Kepler is a cross curriculum and vertical level approach using restoration at place (Kepler Peninsula) to provide an authentic context for teaching and learning. It is also unique in that it hands leadership of the project to the students.

*"What we have here is a solution for the future of conservation. These kinds of projects are the new normal for our kids. It's inspiring, it's a new way of teaching kids and it's leading the way in protecting our natural environment and building conservationists of the future".* says Ruud Kleinpaste



## Learning from others

The Taupō site visit to Te Anau was about schools collaborating and learning from each other, about teachers learning from students and other teachers, and about looking at best practice and figuring out ways to make it work in a more urban environment.

Andrea Mertens, Tauhara College Assistant Principal, was impressed by the contribution and commitment that the overarching organisations are making to the project, from the school Board of Trustees to the Fiordland Conservation Trust to the local businesses.

She says for her it was the collaborative nature of the project that made it so robust. *“Everyone was working together in a very positive way. There were no barriers that were a problem or could not be worked around.”*

Amy Wake, Tauhara College Science and Mathematics teacher, was impressed by the variety of opportunities for authentic

student learning and involvement in the project.

She liked that everyone had something to contribute, and there was a variety of skills that would add value in some way to the project.

Nina Manning, Greening Taupō Coordinator says it was seeing the students in leadership roles, making decisions and calling the shots that got her excited.

*“Another aspect of Kids Restore the Kepler that was stimulating was the vertical nature of the project – from Early Childhood through Primary and Intermediate and on to upper Secondary.”*

*“This is a ‘real life’ project involving people, tasks and real outcomes. Real life business world structures and models were evident throughout from students chairing the leadership meeting to students getting quotes and pricing out costs for branded clothing,” she said.*

## KIDS GREENING TAUPŌ COORDINATOR APPOINTED

Project Tongariro and Greening Taupō are delighted to welcome Amanda Jones as the inaugural Kids Greening Taupō Coordinator. This is a milestone in the evolution of Greening Taupō and has been made possible by DOC allocating seed funding. Thank you.

Amanda has a passion for education and the environment and is well known in Taupō education as she has been involved in the Enviro-School programme in Taupō for the last five years. For the last three years she has also been the Outlook for Someday Regional Coordinator. Outlook for Someday is a programme aimed at developing skills for film making and sustainability. Amanda believes there will be great synergy between these various part-time roles.

Prior to these roles Amanda had teaching experience with Waipahihi and Taupō Primary schools.

Amanda has been involved with Greening Taupō programmes since the brand was developed and with her knowledge of schools, students and community is keen to see the Kids Greening Taupō programme evolve to its potential.

Amanda, her partner and two children enjoy living in the Taupō community and being able to enjoy its environment.





## GREENING TAUPŌ

Paul Green

Project Tongariro was able to initiate Greening Taupō because of a seeding grant from DOC and a generous fundraising opportunity provided by Gary Lane from the Wairakei International Golf Course and Sanctuary in 2012. There was a natural fit between the goals of Wairakei Sanctuary with its predator proof fence and a desire for Taupō community to benefit from having an improved environment that would be attractive to our native birds as well as benefiting the town in a social sense as being a better place to live and for tourists to visit.

Project Tongariro with the help of ecologist Nick Singers developed a scoping study with these goals. Early requirements were to identify land suitable for planting and to gain the support of these landowners for planting native plants on their land. DOC, Taupō District Council, Waikato Regional Council

and Contact Energy were key parties. A Partner Steering Group was established and Nina Manning appointed as a part time coordinator. A brand was developed remarkably quickly and a newsletter and face book page developed. These have enabled Nina to plan planting days and communicate with the community.

A large number of business partners have come on board and helped in a variety of ways such as making land available, purchasing plants and free advertising of the brand and activities. Taupō Native Plant Nursery has provided discounted plants.

In the scoping study Nick stressed that the need was to plant species that were attractive to native birds and provided food over a 12 month period. It was important to do this on both large land blocks administered by agencies like DOC but also in residents' gardens. Nick

**Below:** Many hands make light work of planting out an area of Whakaipo Bay.

*Photo: DOC*







emphasised that garden plantings could be both native and introduced species and that consideration needed to be given to landscape design by choosing the correct plantings to maintain sun and views.

At this point of time Greening Taupō has assisted over 35,000 plants to be planted. The key requirement now is to establish community planting groups to care for the plants to ensure they are not smothered by weeds and grasses in the first few years of their life. This 'releasing' work makes all the difference between plantings being successful or not. At this point we have to give a special thanks to Forest and Bird for the releasing work they do at Whakaipo Bay and to Mary Monzingo and her helpers who have adopted an area in Otumueke Stream.

Nina Manning has been our coordinator since the inception of Greening Taupō. Nina went on maternity leave in May and her son Nico was born in early June. We are most fortunate that Robyn Ellis has taken her place. Robyn has been a supporter of the project and has extensive previous experience with DOC in their biodiversity team.

Greening Taupō has recently received a grant of \$100,000 spread over three years from the Waikato Catchment Ecological Enhancement Trust [WCEET] towards the restoration of the Upper Waikato River with a focus on pine

removal, weed clearance and planting. We particularly thank Bike Taupō for their support and for their specialist skills and resources to poison trees and for clearing weeds in steep difficult locations.

Taupō District Council has also announced a \$20,000 per annum service agreement for three years with Greening Taupō. This highlights how many organisations, business partners, community groups and individuals who have come on board to help Greening Taupō. It is a community project and one the community can do best by combining all its resources, skills and enthusiasm.

**Below:** Age is no barrier for getting involved with Greening Taupō!

*Photo: DOC*







## Luxury retirement home for rare takahē

Anna Elwarth  
Partnerships Ranger



**Below:** Releasing the takahē at Wairakei are from left, DOC takahē ranger Phil Marsh, Reverend Sonny Garmonsway of Ngāti Tūwharetoa, Mhari Baty from Ngāi Tahu, Martin Williamson from Mitre 10 Taupō, Gary Lane from Wairakei Golf + Sanctuary and DOC takahē ranger Helen Dodson.

*Photo: Anna Elwarth*

It would be many a retired couple's dream to retire to live on a world class golf course! One such lucky pair of retired breeding pair of takahē have moved to the Wairakei Golf + Sanctuary in Taupō, thanks to work undertaken by its bird-loving owner Gary Lane to secure the site from predators.

This leaves room on Mana Island for a young pair to breed to help boost national numbers of the critically endangered bird. We are all hoping, and it's not impossible, that the magic and beauty of Wairakei may just inspire the couple to rekindle the passion and produce some small black fluff balls.

Grant (12yrs) and Flotsom (9) were released into the sanctuary near Taupō to a small crowd of delighted local students and partners. They are settling in enjoying the long grasses and wetlands that surround the course.





## Young students' delight at the release

It was also a highlight for the team to see the release through the young eyes of the Wairakei Primary School Environment Group. When the topic of takahē were first raised, only one of the 30 children knew what a takahē was. It was set as a homework assignment, in which some of the children brought in presentations and reference books, not knowing that this would win them a prize place at the release ceremony.

## Big birds can run!

The advantages of being shorter than adults is that 8 year old Danica Pearson was in the front row and took amazing video footage of the release.

For being big birds the takahē surprised the audience by running for cover when the boxes opened. "I loved the colour of the takahē. I thought they'd be slower than that!" said Isabel McAuley-Hughes.

## Takahē Recovery Team Update

Through its 10-year partnership with Mitre 10 DOC has made significant progress in its Takahē Recovery Programme. With 40 chicks produced this year, the team has seen its best captive breeding season by far.

This year's incredibly successful breeding season has meant that we are under more pressure than ever to find safe homes for takahē away from the jaws of introduced predators, particularly stoats. Thanks to Gary Lane's vision of offering a haven for New Zealand's rare birds and plants, Wairakei provides non-productive takahē a safe place to live out their days without taking up vital breeding territory.

Once presumed to be extinct, the takahē is one of only two of New Zealand's iconic herbivorous 'mega fauna' to survive human contact; the other being the kākāpō.



In order to secure the future of the species, DOC has been working to increase the number of breeding pairs in secure (predator-free) islands and sanctuaries across New Zealand.

**Above:** Danica Pearson's Project on takahē for the Wairakei Primary School Environment Group (age 8)

In time it is hoped that more takahē will be retired to Wairakei.





## Conservation in the Central North Island

David Speirs  
Director Conservation Partnerships,  
Central North Island Region

The Department of Conservation is now two years into its new operating model, changing the way we work to grow conservation and to enhance the benefits nature delivers to all New Zealanders.

In the Central North Island Region (CNI) there has been a significant shift towards this direction, and we are really starting to see the results of these efforts.

The development of a region wide Partnerships Growth Strategy outlines our focus for conservation partnership opportunities: how we want to work with iwi, community and business in a range of areas, from native animals and plants to environmental education and outdoor recreation.

In terms of community engagement, the CNI region has seen the number of groups applying for Community Conservation Partnership Funding (CCPF) double in the last year. The latest round in March this year saw the region receive 65 applications for funding to the tune of \$9 million for conservation projects – a third of these coming out of the Tongariro Taupō district.

**Below:** Taupō Primary School going out exploring for one of their Kids Greening Taupō days.

*Photo: DOC*

As well as the high number, the quality of applications seen this round has been exceptional, showing the department's ability under the new model to engage early with prospective applicants to work through the CCPF process. It is fantastic so many groups are keen to work with us to grow conservation.





Environmental education is another key area of growth with the development of the Kids Greening Taupō pilot programme. This programme will be officially launched in September this year, and is a collaboration between the Department, Greening Taupō, Ngāti Tūwharetoa, council and local kindergarten, primary and secondary schools.

Kids Greening Taupō is a pilot for future programmes across New Zealand based on the successful Kids Restore the Keplar. It aims to create conservation kids by developing students as conservation leaders and up-skilling teachers in Environmental Education for Sustainability (EEFS).

The CNI Partnerships Strategy sees the department working alongside iwi to lead a clear understanding of the existing and new treaty settlements, and developing joint plans to enable iwi to grow conservation in the region. In particular the Tongariro National Park treaty settlements will be a key area of focus over the next 12-24 months.

Working with both local and national businesses has seen some great gains for our native wildlife. The relationship with Wairakei Golf and Sanctuary is going from strength to strength with the Sanctuary not only providing a crèche for our local North Island brown kiwi, but also a safe haven for a pair of takahē recently retired from the breeding programme on Mana Island.

Whio recovery with Genesis Energy has also gained momentum with a bumper breeding season, and the opening of the new whio crèche at the Tongariro National Trout Centre. The whio facility has proven to be very popular with visitors to the Centre as it enables them to watch this special native species at close range. This year has seen a shift towards growing conservation through outdoor recreation and nature tourism with Destination Management Planning. This process, led by the Department, encourages active engagement from a range of stakeholders to develop strategic directions and objectives for recreation and tourism across a destination. To date plans have been developed for Taranaki (Mounga), Pureora, Taupō, and the Tongariro District.

Nationally, the Department of Conservation's partnership with Air New Zealand through the Great Walks campaign is connecting people with New Zealand's natural and cultural heritage. At a local level our partnerships with the regional tourism organisations Destination Great Lake Taupō and Visit Ruapehu are significantly lifting the profile of Tongariro Taupō District's natural areas.

Working towards the Department of Conservation's vision for New Zealand as the greatest living space on earth is alive and well in the Tongariro Taupō and greater CNI region, the success stories from this year giving us and our partners confidence to move ahead.



**Above:** Nina Manning from Greening Taupō with teachers at their first KGT skills training workshop at Waipahihi Marae in Taupō.

*Photo: DOC*



## Whanganui River Enhancement Charitable Trust

Warren Furner

To assist wider community aspirations for enhancing the Whanganui River, Genesis Energy, the Wanganui District Council (WDC) and Ruapehu District Council (RDC) have formed the Whanganui River Enhancement Charitable Trust (2003) (WRET). Genesis Energy provides funds annually to allow the Trust to meet its objectives.

The Trust aims to:

- promote enhancement of the quality of waters and catchment of the Whanganui River;
- make funding available for social, economic and environmental river enhancement projects;
- contribute to education about the health and well-being of the Whanganui River.

The three year strategic plan (2013-16) outlining the major funding initiatives

An ex DOC staff member, Warren is now Manager Land Transport and Economic Development with Ruapehu District Council. He also chairs the Whanganui River Enhancement Charitable Trust

that the Trust is supporting continued to be implemented during the reporting period. Table 12 identifies key projects underway and the outcomes to date. Key highlights for the reporting period were the priority catchment project and the demonstration farm plan concept. Both projects seek to demonstrate medium term gains in water quality within priority Whanganui River catchments.

During the reporting period the Catalyst Group began implementing a programme of works for the Piopioatea stream catchment and collecting baseline monitoring information from the Kakahi catchment.

The brooding mystical Whanganui River.

Photo: [www.freewallpaper.co.nz](http://www.freewallpaper.co.nz)





Horizons – Water Quality Enhancement Project Model Farm Project	To promote water quality enhancement in the Whanganui catchment by targeting erosion “hotspots”, implementing farm plans and education.	A Memorandum of Understanding was signed by Horizons, Whanganui River Enhancement Trust and Evan and Roseanne Parkes to undertake an array of works to establish a demonstration farm concept.
		Poplar Pole Nursery - Funding was provided to set up three new nursery sites to help meet demand. A site has been selected for this year and stakes are currently being cut to plant.
		43 new erosion programmes approved.
		100 ha – of erosion reduction works in Whanganui Catchment Strategy. Resulting in 391.3 ha protected.
The Catalyst Group Model Catchment Project	To promote water quality enhancement in the Whanganui catchment by targeting smaller catchments	Funding for the Piopotea and Kakahi Streams Project was approved and implementation on a programme of works has begun.
River Enhancement Funding -social, economic and environmental projects	To promote projects in the Whanganui catchment that are focused on social, economic and environmental outcomes that relate to the use and enjoyment of the Whanganui River or its tributaries and show clear benefit to a wide component of the community.	Dallas Murdoch - funding for the beautification of Upokongarongo/ Whanganui Area
		Wanganui District Council - funding towards the Bank Reinstatement for the Wharf Street Boat Ramp.
		Daryn Te Uamairangi - funding for a Whanganui River Drinking Water Iwi Initiative.
		Wanganui Events Trust - funding towards the Mountain to Sea event.
		Riri A Te Hori Papakainga Environmental Restoration Project - funding fencing wetland planting and excavation.
		Wanganui District Council - funding for a healthy streams facilitator for the Wanganui Catchment.
		Ruapehu District Council - funding towards the Pipiriki Waste Water treatment upgrade.

Table 12: Whanganui River Enhancement Charitable Trust (WRET) result areas during the recent past

A Memorandum of Understanding was signed by Horizons, the Whanganui River Enhancement Trust and Evan and Roseanne Parkes (Farm owners) to undertake an array of works to establish a demonstration farm concept.

will now widen the scope of how it targets educational assistance.

Challenges for the trust are to encourage participation in scholarships grant applications for tertiary study. The trust



## Protecting our place: Celebrating Check Clean Dry at Tongariro National Park sporting events

Brenda Lawson  
Freshwater Threats Ranger

We celebrate the sporting community embracing and supporting the Check Clean Dry (CCD) habit helping to protect the beautiful headwaters of the Whanganui River which start in the Tongariro National Park.

Advocacy at sporting events is one great way to get the Check Clean Dry message to those enjoying our pristine waters. This helps create habits to protect these waters from the spread of invasive freshwater threats like didymo and hornwort. The campaign has now matured beyond 'obvious' water sports such as fly-fishing and kayaking, to include other sports like tramping and mountain biking which can make river crossings enabling the spread of invasive freshwater threats.

**Right:** T42 marathon competitor Matt Jensen getting enthusiastic for Check Clean Dry

**Below:** Spray gun fun – CCD advocates Annette Richards of DOC and Andrew Watt of Horizons.

*Photos: Brenda Lawson*



T42, the Goat and the Tussock Traverse. Competitors come from all around the country for the unique opportunity to race in the incredible alpine environment. We want to make sure they can play here and return home to their beautiful areas without carrying invasive hitchhikers with them.

### Support for protecting our place

Since 2008 the DOC and Horizons Regional Council Check Clean Dry advocate teams have had cleaning stations at these sporting events - with loads of support.

Jason Cameron and Luke Garea from Victory Events hold the mountain running events "The Goat" and the "Tussock Traverse". Jason's aim was to get people to the Tongariro National Park, and enjoy the beauty. His support has gone above and beyond the DOC concession requirements that Check Clean Dry be adhered to during events that cross waterways in the national park.







The T42 mountainbike and offroad marathon event is organised by Aaron Carter and Dave Franks from Total Sport. Aaron says, "I think you guys do a great job. Not only are the people delivering the CCD messages cool and super positive, the presence of you and your team create an extra benefit at our events, and add legitimacy around what we do and the events we put on."

Project Tongariro are partners in these events with Victory Sports and Total Sport, where these events help further raise the profile of conservation in the park. Further collaborative partners working in Central Plateau Check Clean Dry messaging are Ngāti Tūwharetoa, Genesis Energy, and the Waikato Regional Council.

### **A softening in the approach to sporting competitors**

The CCD process has changed in the Central Plateau over the last few years from a hardline compulsory washing of all bikes and shoes, to a campaign based

on good conversations educating people on how they can best protect this place with good CCD habits. We aim to inspire competitors to choose to protect NZ waterways themselves, and to pass the message forward to others.

I remember DOC ranger Anna Elwarth telling me making T42 Marathon runners run through an icy detergent filled bath before embarking on their 42km run was always a dreaded calendar date. My own first experience of T42 registration was taking part in a mass wash of 300 to 400 bikes in six hours, as well as enthusiastically trying to pass on the CCD message to inconvenienced competitors.

Total Sport and Victory Events have always supported us by including Check Clean Dry information on their websites and sending out pre-event emails requesting competitors to CCD their own equipment being used in the race. The majority take this very seriously, and arrive with their gear clean and dry. In the past two seasons instead of compulsory cleaning, we now talk

**Above:** Team Check Clean Dry at the 2015 Iron Man. DOC rangers Gordon Crabb, Catalina Amaya-Perilla, Mike Nicholson, Brenda Lawson and Project Tongariro intern Antoinette (Andy) Wilson.

*Photo: Brenda Lawson*



**Above:** Brenda Lawson having a pro-active Check Clean Dry chat with a T42 competitor.

An example of advocacy from sporting events. Original photo taken during The Goat by Jamie Troughton.

with each competitor at registration to determine if they have recently been through any other streams or rivers (if they have they are decontaminated). We then educate them why, how and when they need to CCD. We rely on the honesty of competitors, and appeal to their sense of keeping these amazing places unspoiled.

This approach is working really well today. In 2014 thirty bikes at the T42 (of 400 total) were decontaminated. Some of these had been at a recent event in

didymo infected rivers in the South Island which did not have a post-event cleaning station. Others had recently been through other North Island rivers. This year only six bikes were decontaminated.

Spray bottles and boot-cleaning kits are offered after the Goat and Tussock events. After the T42 the CCD team give a free detergent spray down of your bike following the gold coin Owhango Fire Brigade mud wash down - encouraging competitors to protect the next river they cross. Despite being non compulsory most riders happily line up for this - we think this is a great indication that people are buying into our important CCD message.

### Protecting Blue Duck habitat

There are many unique and treasured native animals in the Tongariro National Park and one that could be badly affected by didymo is our amazing native blue duck - the whio. Mats of didymo would make in-stream foraging difficult and smother larger invertebrates like mayfly nymphs which whio feed on, and they would expend more energy to find less food.

# PLANNING ON RUNNING THROUGH FRESHWATER AGAIN SOON?

Feel free to take a Check Clean Dry spray bottle or boot pack to stop the spread of invasive pests.



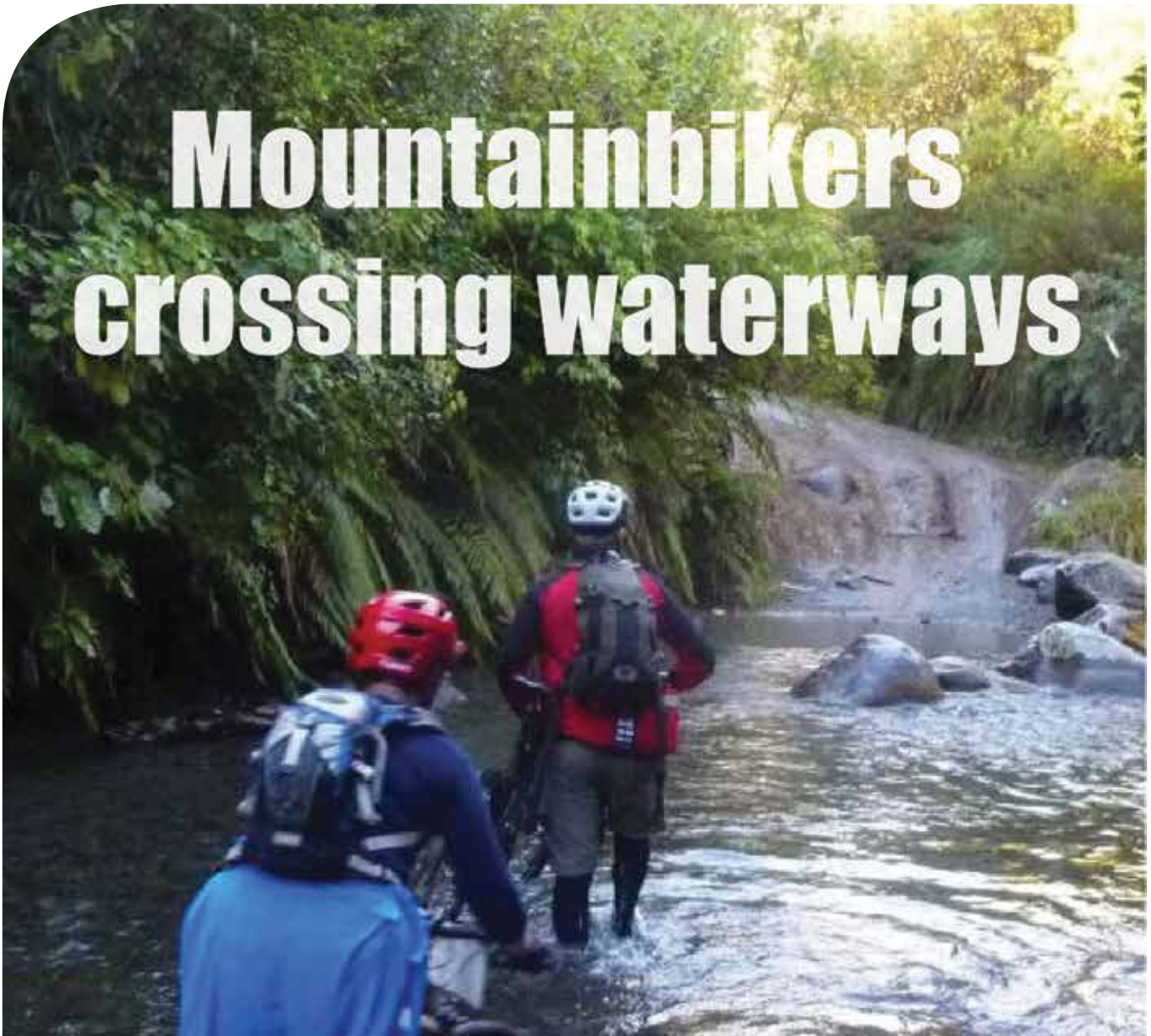
PROTECT OUR PLAYGROUND



BETWEEN WATERWAYS



# Mountainbikers crossing waterways



**Bikes and shoes can spread freshwater pests.  
Clean your gear between all waterways**



**OUR PLAYGROUND,  
OUR RESPONSIBILITY**



BETWEEN WATERWAYS





DOC Ranger Bubs Smith believes the headwaters of the Whanganui are home to the highest density of whio

Island waterways, but the Cawthron Institute have grown it in water from the Tongariro in a laboratory (and 14

*"It's vital we keep aquatic pest weeds such as didymo out of these waterways, to ensure the existence of such an iconic endemic species (as whio)." Bubs Smith*

in the country and the population is of both regional and national importance. Intensive trapping, 1080 application and a well-supported breeding programme are having great results. In just one 4 km stretch of the Whanganui River there are 28 resident breeding pairs and in the next 5 km another 20 pairs. This is an indication of the quality of those pristine waters and the crucial need to protect the whole ecosystem needed to sustain such a healthy population.

"It's vital we keep aquatic pest weeds such as didymo out of these waterways, to ensure the existence of such an iconic endemic species," says Bubs.

### Keeping vigilant for our wonderful North Island

There is an unhelpful rumour that didymo may not survive in North

other North Island river samples). With no scientific evidence to prove it can't grow in our area it is important we don't become complacent about protecting our water.

It's now ten years since didymo arrived into a southern river in New Zealand. Since then the invasive algae has been spread by us wilderness and water loving adventurers to 184 catchments throughout the South Island.

Thankfully, as best as we know, it has not yet crossed the Cook Strait. Taupō and the Central Plateau area are still on high alert, and Check Clean Dry is the method we ask people to use when moving around our precious waterways without transferring didymo. Our playground – our responsibility. Keep up the good work!



## Awarding conservation volunteer efforts

Anna Elwarth  
Partnerships Ranger



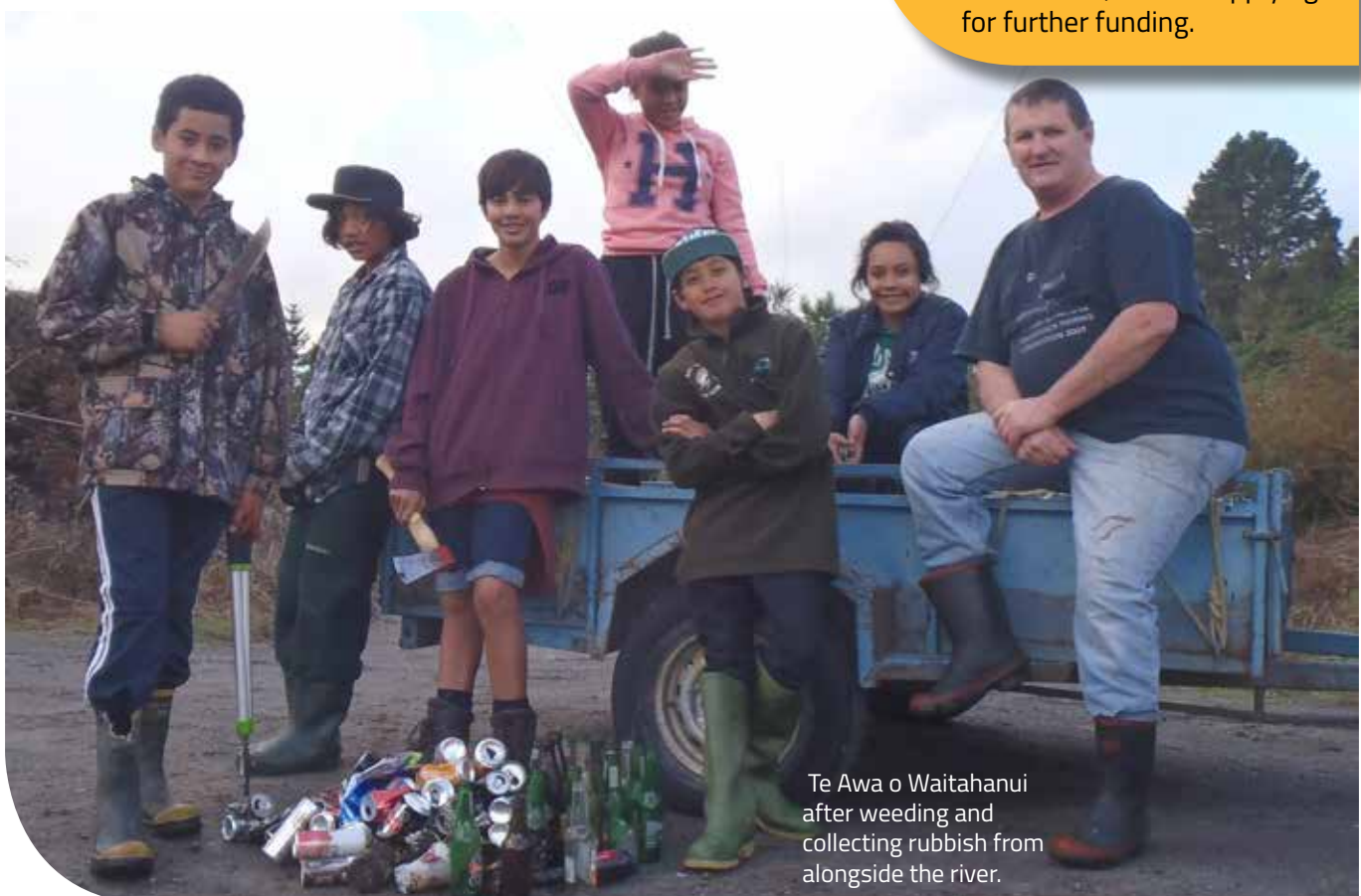
The Tongariro Taupō community celebrated outstanding conservation work being undertaken by groups and individuals during Conservation Week in November last year. The Tūroa te Ao – Act for Nature awards were presented at the new Taupō DOC office.

**Te Awa o Waitahanui** received the community conservation group award for being kaitiakitanga for the Waitahanui River, and taking care of the awa with respect and hard work. The group of ten Māori youth between the ages of five and 15 years are being mentored by David Cade, also known as Didymo Dave. The youth are predator trapping, weeding, picking up rubbish and advocating for the Check Clean Dry campaign.

*"We were impressed with how much this small group has achieved for conservation in only a year and a half. There are also social benefits from this project such as the rising mana of the youth involved, and the momentum and pride gathering in the community,"* said judges Colin Paton of the Tongariro Taupō Conservation Board and DOC Partnerships Manager Natasha Hayward.



**Update:** The group are doing more of the same good work, recently having treated 2.5 kms of riverbank of weeds and have pulled more than 150 vermin from their traps. The group continue to set target goals with fun team rewards for their efforts, and are applying for further funding.



Te Awa o Waitahanui after weeding and collecting rubbish from alongside the river.

**Nick Singers** was awarded the individual leadership conservation award, described as a visionary and an inspiration to multiple community conservation projects, who also lends his technical expertise. Project Tongariro president Paul Green who nominated him said, *"Nick's enthusiasm, knowledge, skills and ability to identify both resources and funding sources, significantly aids the conservation projects he assists with"*.



**Update:** Nick continues to donate 4-8 hours per week for Project Tongariro, recently focusing on improving pest control at Rotopounamu, including the use of 1080 on a three yearly cycle, working with the Animal Health Board and DOC, with the goal of re-introducing weka and ultimately restoring other threatened species. Over the summer he developed operational plans and monitored willow control at Te Mataapuna, and restoration planting plans for Waitetoko Scenic Reserve. He also played a large role in mentoring the two Project Tongariro interns, with them assisting him on who work on the Tauranga-Taupō and Waimarino Rivers, a project Nick secured funding for in association with Lake Taupō Forest trustees and NZ Forest Managers. He is happy to report 22 fledging whio on the Waimarino, an increase from four last season. Nick is also a trustee for the Blue Duck Project Trust which had its largest season with 16 fledging whio produced. Nick is also leading the Kuratau School to develop a wetland restoration project which includes native planting and trapping with the school children.

**Above:** Nick Singers with a trophy sized stoat on the Tongariro River as part of the Blue Duck Project Charitable Trust.

*Photos: Anna Elwarth and DOC*



**Wairakei Golf + Sanctuary** was awarded the business conservation award for providing a local sanctuary, experiences and advocacy for conservation. The building of a predator proof fence around the golf course in 2011 enables DOC to crèche kiwi chicks until they reach a stoat proof weight, before being returned to the wild. This also provides opportunities for local volunteers and school children to experience kiwi up close and personal, and to learn how they can help kiwi.

**Update:** In March a new threatened species was released into the safe haven, the rare and endangered takahē (read more on page 56). A lot of noise was also created around a uniquely coloured ginger kiwi who is a BNZ Operation Nest Egg chick from the Karioi Rāhui (read more on page 6).



**Left:** Community volunteers watching kiwi ranger Renee Potae undergoing a health check on one of the kiwi chicks at Wairakei Golf + Sanctuary.

**Hilltop School Weedbusters** won the school conservation project award for hard physical labour in weed busting, and re-planting natives in the Oruatua Conservation Reserve. The students are weeding broom and cotoneaster and are moving the piles of weeds off site so they don't re-grow, areas cleared have been replanted, watered and protected from pests like rabbits.

*"The impact and pride of this project for the school has seen the project adopted into the Hilltop year seven and eight syllabus, with a two year programme, designed around a new intake every year,"* says Shirley Potter, Oruatua resident and conservationist.

**Update:** The team have been out for two working bees this year with their new intake of year seven students. This year the technology class is designing solutions to assist the project. Ideas such as tool belts and large handled carry mats for transporting weeds, and tree protectors woven from harakeke to keep the rabbits off the kōwhai. It doesn't stop at weeds either; they have expanded their conservation work by building their own predator traps.



**Right:** The Hilltop School Weedbusters on ground removed of weeds at Oruatua.

**Matthew Dickson** was presented a memorial scholarship by Project Tongariro. Matthew is a Massey University student studying a Masters of Science in Ecology, towards his thesis researching carbon sequestration in tussock grassland.

**Update:** Matthew has now completed his field work measuring plant productivity in different tussock species (genus *Chionochloa*), as well as collecting specimens and litter. He is currently in the middle of his plant decomposition laboratory trials, which involve incubating litter from different *Chionochloa* species in jars on different soil types, and laboratory analysis of litter quality.



Taking plant measurements in the field in Tongariro is Matthew Dickson's field colleague Matt Krna.

### Looking forward to the 2015 Awards

The Tūroa te Ao – Act for Nature awards will be run again this year and are likely to be an annual event to recognise the outstanding conservation efforts of groups and individuals in the Taupō Tongariro area. The Tongariro Taupō Conservation Board was active in reinstating this local event last year, formally known as the 'Conservation Awards.'

This year, the Conservation Board and DOC are looking for businesses to be part of the process by sponsoring one of the four awards. As a sponsor you will be invited to present the award, and have your logo included in the marketing and communications alongside the neutral Tūroa te Ao – Act for Nature logo.

If your business is interested in this opportunity, please contact Taupō King Country partnership ranger Amelia Willis [awillis@doc.govt.nz](mailto:awillis@doc.govt.nz) Ph: 07 376 2435

Nominations for the 2015 awards will be invited by the Tongariro Taupō Conservation Board and DOC in August 2015 via [www.doc.govt.nz/TongariroTaupōAwards](http://www.doc.govt.nz/TongariroTaupōAwards)





## Mount Pihanga Forest Sanctuary - a new direction

Nick Singers  
Ecologist/Botanist



Mount Pihanga contains some of the best native forest and associated biodiversity within the central North Island. While relatively small in size the altitude range creates opportunity for a diverse sequence of forest types, from regenerating rewarewa and kamahi at the base of the mountain, to dense rimu and matai forest, then kamahi miro forest followed by red and silver beech and finally a dense band of subalpine scrub. It's a microcosm of nearly all of the forest types that occur on the central volcanic plateau and consequently, it is ideal habitat for native plants and wildlife including several species which are threatened.

Conserving this rich biodiversity has been the primary cause of the Mt Pihanga-Rotopounamu project.

Fortunately the Animal Health Board started pest control here to control TB in cattle in 1994 and has thereafter been repeating this control approximately every six years. While this provided reasonable control for possums, the rat and stoat populations remained uncontrolled in five of the six years. With a low population of possums the vegetation has recovered and many palatable species have become common. Rodents are by far the biggest predator of small native birds, such as rifleman, robin and tui and control of these pests once every five - six years meant that in most years nests got predated.

To improve this situation Project Tongariro, in partnership with DOC, started ground poisoning around Lake Rotopounamu over 10 years ago, in a 500 hectare area. More recently a mustelid trapping project over 1100 hectares was added to this protection in order



to protect kaka and kakariki, which are vulnerable to predation while nesting. We are indebted to the enthusiastic team of locals who have been operating the mustelid trapping under the coordination of Shirley Porter. Such is their enthusiasm some of the lines are being played year-round. There is a working group who regularly travel from Te Awamutu to do one of the longer lines (five hours).

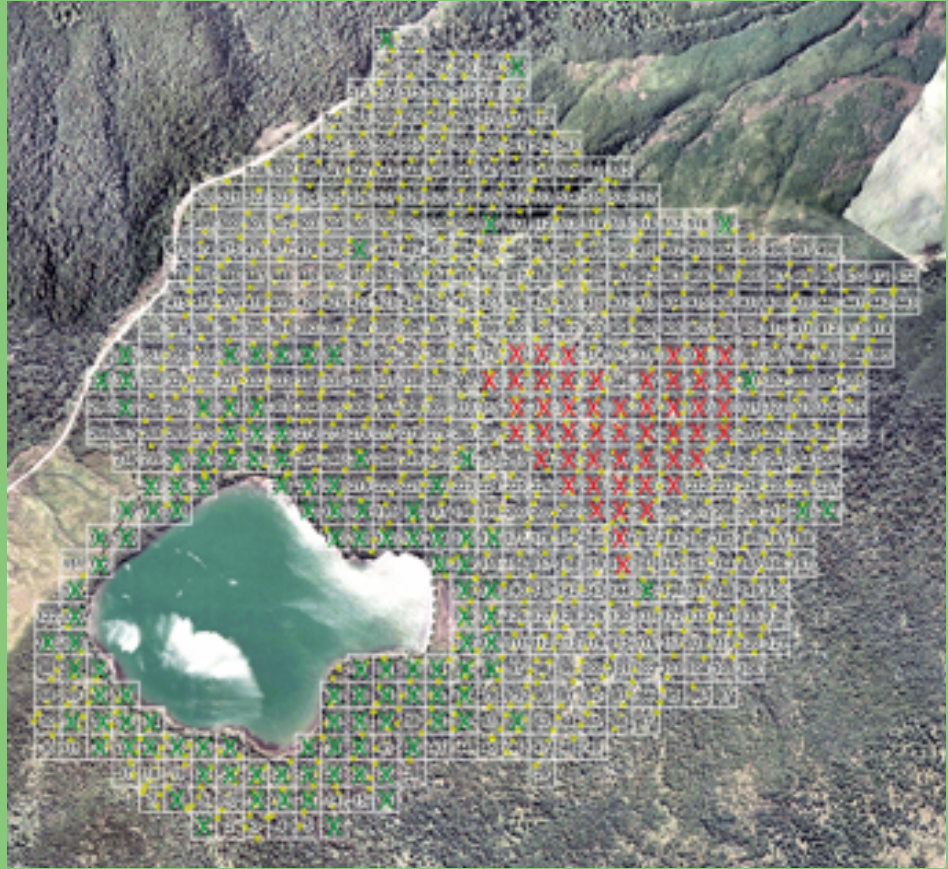
The long term vision for the Mt Pihanga-Rotopounamu restoration area has always been to conserve the full range of biodiversity over the entire mountain (approx. 2990 Ha) and controlling possums, rats and stoats is a minimum requirement to achieve this. Undertaking pest control, especially of rats over the whole mountain using ground based baiting is simply unaffordable and would require a considerable increase in resources.

Project Tongariro, in partnership with DOC and TB Free N.Z recently signed a memorandum of understanding to collaboratively manage pests at Mount Pihanga using aerial 1080 on a three-year cycle - twice as often as has been

**Above:** Lake Rotopounamu, site of the predator control programme.

*Photo: Redditpics*

## Adopt a Hectare



A heart-shaped block in the bush surrounding Lake Rotopounamu has been sponsored in memory of two young park staff. Derek White and Marie Williams became engaged (to be married) at Rotopounamu early in 1982. Tragically, they died later that year in a helicopter crash on Mt Ruapehu. On the 30th anniversary of their deaths, members of both families adopted 50 hectares, on an ongoing basis, as a living legacy to their memory.

About 170 people currently make annual donations to the Rotopounamu 'adopt a hectare' project managed by Project Tongariro. The Pharazyn Trust, based in Wellington, is also a major long-term supporter of work in this forested area on the slopes of Mt Pihanga in Tongariro National Park.

These funds have significantly contributed to our predator trapping and monitoring. In the future the funds will be used to support the reintroduction of locally extinct species.

Rotopounamu is easily accessed from the Pihanga Saddle road (State Highway 47). The scenic 5 km loop walk round the lake offers lots of bird watching opportunities. Tui, fantail, rifleman, silvereye, whitehead, North Island robin, kakariki and kaka can be seen often.

It costs \$100 a year to adopt a hectare and there are still lots of hectares available. If you would like to help restore the dawn chorus at Rotopounamu, go to [www.tongariro.org.nz/adoptahectare](http://www.tongariro.org.nz/adoptahectare)



occurring since 1994. Additionally we also plan to increase the area of mustelid control and also to start targeting feral cats and ferrets which are present in low numbers on the forest edge.

### Why use aerial 1080 on a three-year cycle?

The two most compelling reasons for using aerial 1080 are because it works better than other methods and because it is cheaper. Aerial 1080 poison is the most effective method for controlling small mammalian pests such as possums, rats and stoats, so the number of pests that survive after control is much lower than with other methods and it is considerably cheaper too. For example, on average the annual cost of control of ground poisoning targeting rats in the 500 hectare core area around Lake Rotopounamu has been between \$25,000 and \$35,000 sourcing resources from a range of charitable trusts and more recently donations through our adopt a hectare. Over three years this amounts to between \$75,000 and \$105,000. For about \$75,000 once every three years, possums, rats and stoats will be controlled over about 3000 hectares of Mount Pihanga. That's about twice as much area treated when you add up three treatments of 500 hectares in the core area.

Our own trapping data from the last two seasons from 300 DOC200 traps shows just how effective it is. Aerial 1080 was applied at Mount Pihanga last in June 2013 and the number of stoats and weasels caught is much higher when aerial 1080 isn't used. From 1st August 2013 to 31st May 2014 16 stoats and 8 weasels were caught, while in the following year over the same period 37 stoats and 80 weasels were caught. That's 93 more predators caught over the same period of time!

The conservation outcomes are the most compelling evidence though. Bird numbers are increasing including the most threatened ones. I have witnessed a lot more kakariki and for the first time flocks



**Left:** Kaka (*Nestor meridionalis*) has been seen in and around Lake Rotopounamu - a very good sign of the positive effects from the control programme.

*Photo: Greg Brave*

of kaka, both species which are vulnerable to nest predation. Recently I found two plants of the North Island's yellow mistletoe (*Alepis/Flavida*) a highly possum palatable plant which had only ever been seen once previously in 1987.

This change to aerial 1080 pest control and increasing the area of mustelid control will be a major step forward to achieving our goal. Importantly it leads to new opportunities and we should be able to move into the exciting phase of reintroducing locally extinct species such as North Island weka, and possibly brown teal, kokako and maybe even sea birds which most likely once nested on Mt Pihanga.

The work undertaken over the last 11 years would not be possible without our generous funders. In particular the Pharazyn Trust has funded \$120,500 over seven - eight years. We hosted one of their trustees around Rotopounamu last year and he was delighted to see and hear the difference this conservation project has made. The Trust has made a further two year commitment and have indicated to us that they'd like to see another funding partner come on-board.

This had been made possible - as the old adage goes - success breeds success - with the advent of the DOC CCPF funding and the MOU with the Animal Health Board. Other funders in previous years include the Rainbow Warrior Trust.



## Taupō for Tomorrow - an exciting journey

Mike Nicholson

Teacher: Taupō for Tomorrow Education Programme



**Above:** Learning in the Genesis Energy Freshwater Aquarium.

*Photo Anna Elworth*

'Taupō for Tomorrow' is an education programme run out of the Whakapumautanga Down's classroom at the Tongariro National Trout Centre.

The programme was established in 2005 as a partnership between Genesis Energy, the Department of Conservation and the Tongariro National Trout Centre Society. It was developed to use our engaging and very special local freshwater environments as teaching mediums.

The programme aims to:

1. Encourage freshwater conservation
2. Examine the concept of sustainability in reference to some of the region's renewable resources
3. Raise awareness of the importance, value and management of the Taupō Fishery

The partners in the programme value our natural environment, our young people and the long term health of both. They recognise our youth are the future

leaders in conservation, community and business, and they are the ones who will promote conservation messages and take action through future application of their developing ecological literacy.

For the Department of Conservation, education and partnerships with community and business are very much seen as the way forward. The rationale is as we look to the future we need to view conservation as an 'investment not a cost' and we all need to be involved in investing.

To assist in developing and supporting this emerging 'ecological literacy' in our young people, Taupō for Tomorrow has been able to use and present an ever increasing selection of engagement tools at the site.

During the formative years of the programme, Taupō's Rainbow and Brown trout and its world famous fishery, were very much the stronghold of what we had available to engage students in conservation messages. When teaching and learning about freshwater themes,





**Left:** Catching a rainbow trout in the Children's fishing pool (Havelock North High School)

*Photo Kim Turia*

trout certainly are engaging, and once learners are 'hooked' it is easy to explore key themes like 'everything is connected', for example, in a meaningful way. Trout will always be one of the mainstays of teaching and learning at the site.

As the years have progressed, we have developed a significant number of other opportunities for students to engage with our natural world and freshwater species. The Genesis Energy Freshwater Aquarium has introduced many thousands of learners to a plethora of other iconic native species dependent on our freshwater environments, many of which are less recognised or understood by New Zealanders. Learners are now able to engage with species like whitebait species (Galaxiids), Tuna, Torrent fish, and Koura, for example, in an environment enabling them to see, recognise, and hopefully, value them.

The whio aviary and associated 'hardening programme' at the National Trout Centre provides another exciting opportunity for learners to connect with our iconic species. Whio, being the tremendous freshwater 'indicator species', enable learners to explore a range of conceptual ideas, with the species at the centre of learning. Learning

about who reaches across the curriculum strands seamlessly, whether focusing on Science, Social Science, or Technology, students are encouraged to inquire about the importance of whio to them and their values. They are supported into making clear links between whio, their personal connection to them and conserving the species as an investment in their own well being, and in the end, in big picture terms, New Zealand's future prosperity.

When students visit the programme, it's not only DOC and National Trout Centre Society staff they observe engaged with the natural world and conservation efforts. They are also connected with the idea of commercial operators like Genesis Energy having a valued and significant role in caring for the environment and the increasing recognition in doing so, it's good for business.

Students get the opportunity to engage with Genesis staff and are exposed to the fundamental idea of 'striking the balance'. In other words, they are challenged to think about how to have our cake and eat it too – renewable energy to run our lives, from sustainable natural systems that provide for the biological and cultural aspirations of society.





**Above:** Learning on site at the Tongariro National Trout Centre (Hastings Intermediate)

**Below:** Looking for invertebrates in The Tongariro River (Hastings Intermediate)

*Photos: Catalina Amaya-Perilla*

A mainstay of the education programme for the entire time it has been in operation has of course been the volunteers from the National Trout Centre Society. The goal here is to encourage our youth to engage with the natural environment in a recreation sense, particularly trout fishing in the Taupō region. This is where the volunteers come to the fore and offer learners the opportunity to catch a trout, and in doing so make clear connections between recreation, water quality and sustainability. When fishing at the centre learners are surrounded by people passionate about fishing and motivated to care for the natural environment that drives this world class fishery. Without the dedication and support of the volunteers assisting the education programme, we simply could not offer this engaging and meaningful experience to our young people.

The Taupō for Tomorrow education programme has developed significantly over the years. It offers in excess of 3000 learners and associated adults a year, the chance to engage with their natural environment and explore how they are personally connected to it. Learners are offered the opportunity to work with a number of groups and individuals from

various government, community and business groups who are all actively and passionately involved in conservation efforts.

With many education providers and schools now including environment and sustainability as a key part of their conceptual framework for learning, and a curriculum document that is flexible and exciting enough to support this learning, Taupō for Tomorrow will continue to develop to assist schools and their learners in providing engaging and meaningful learning experiences.

The future looks very bright indeed for the Taupō for Tomorrow education programme and all associated with it.





## Project Tongariro Celebrates 30 Years

Bob Stothart  
ex President Project Tongariro



It was an inspired decision to form the Tongariro Natural History Society as a living, dynamic memorial to the people who lost their lives (including three park rangers and a park assistant) in a helicopter crash on Mt Ruapehu as they were night testing rescue floodlights in 1982. The Society was formed in 1984 to remember those lost in the tragedy: thirty years on a group met in the dining room of the Chateau to remember them and to celebrate three decades of contributing to conservation in the park. We honoured those who died: Keith Blumhardt, Bill Cooper, Doug McKenzie, Derek White and Marie Williams.

Bruce Jefferies who was the Chief Park Ranger at Tongariro National Park had seen the American natural history societies in operation and urged interested people to form a kindred organisation to be a special memorial to the people lost in the tragic accident. The idea met with immediate enthusiasm from people who love the park and who are prepared to donate time and energy to its ongoing sustenance. Members came from all over the North Island. At first we met over a weekend, tramped in remote areas of the park on Saturdays and on Sundays we contributed volunteer time, rather in the nature of working bees, to various projects identified by the Department of Conservation (DOC).

Of particular importance is the memorandum of understanding (MOU) that we reached with DOC. This engendered a unique and privileged relationship between the two parties signing the document. One outcome was the welcome presence of Senior DOC staff (originally Chief Park Ranger Bruce Jefferies and later District Conservator, Paul Green) on the management committee. This enhanced planning and

ensured that our activities were in accord with the aims of the department.

Very early in our existence we published a few books, *Volcanoes of the South Wind* by Karen Williams being our runaway best seller. This book has been widely used in secondary schools and universities and has been reprinted and revised several times. Other books included *Roots of Fire* by Isobal Gabities, *Round the Mountain* by Karen Williams, *Tongariro Crossing*, *Ruapehu Erupts* and *Tongariro Activity Book*. Revenue from the sale of the books was returned to



the park for signage, equipment and other needed resources. In fact, over 30 years, Project Tongariro members have contributed in time and revenue hundreds of thousands of dollars to assist with on-going park interpretation.

A visit by Greg Moore from the Golden Gate Natural History Society was important in urging our organisation to become more involved in planned conservation work. This led us, with the

**Above:** The Tongariro Alpine Crossing travels through areas of the park covered in detail by a number of Project Tongariro's publications.

*Photo: Dmitry Naumov*



**Above:** Project Tongariro project was very active in the tussock revegetation of areas off the Desert Road.

*Photo: DOC*

help of Transpower and the community awareness fund from DOC, to employ an executive officer, originally Anya Hambach, part time, and later Sarah Gibb. When Sarah moved to another position, Nina Manning was appointed and when she took parental leave, Kiri Te Wano was appointed in her place. These appointments improved our ability to seek funding from other sources. We also increased our volunteer commitment by becoming engaged in some longer term activities such as sustaining the Alpine Garden, developing a App for the Tongariro Crossing, pest eradication at Rotopaunamu, recognition recording of various historical sites, replanting native species, lodge pole pine eradication, wetlands restoration at Te Matapuna Wetland in collaboration with DOC and three hapu. Project Tongariro initiated Greening Taupō and there are now other partners in this important community project.

Another international connection arose from DOC staff being invited to attend conferences in Japan organised by the Fujisan Club, a group akin to Project Tongariro, set up to engender and strengthen conservation ethics in the management of Mt Fujiama. From these encounters came a visit to the park by some Fujisan Club members. Their theme has been, the mountains cannot meet but the people can. A small group of members was able to pay a return visit to the Fujisan Club and we were hosted with great warmth and sincerity.

The organisation also became involved in the restoration of the historic Waihothono Hutt, a heritage listed building of great significance. A more recent large scale activity has been the restoration of the Hapuawhenua viaduct. The viaduct became marooned in the bush when the main trunk railway line was realigned. With some generous funding, Project



Tongariro led the working parties and in association with Ohakune 2000, set about restoring the viaduct to become an integral part of the Old Coach road walk and national cycleway project.

Members have also been heavily involved in the park's Summer Programme (recently re-named Mahi Aroha), organising and leading trips, working in the Visitor Centre, offering advice to park visitors and generally communicating the ethos of conservation and recreation.

A notable development has been the organisation of Kite Day held on New Year's Day every year on the golf course in front of the Chateau - a colourful spectacle of particular interest for families. Another significant development has been the Tussock Traverse from the Dessert Road to the Chateau. This event was developed by Project Tongariro and organised by them until late in 2014 when we transferred ownership to an event manager while maintaining the position of charity of choice and benefiting from entry fees and sponsorship opportunities associated with the event without having the health and safety responsibility. The event has grown in popularity since its inception and now attracts serious as well as recreational runners.

Two items of interest relate to the employment of two interns from the University of Waikato each summer season and the annual award of scholarships to students from any tertiary institution for academic work of interest to the park. A considerable library of essays and theses has been accumulated.

Kaye Rabarts, who has been on the Chatham Islands on several occasions led groups to explore the multiple treasures of the rarely visited part of New Zealand. Apart from enjoying the kai moana, members undertook local volunteer work.

Recently, the organisation, known from its inception as The Tongariro Natural History Society, re-branded itself as Project Tongariro. Initially we had generous and mutually beneficial sponsorship from the Range Rover company. This arrangement came to an end not at the wish of the New Zealand Range Rover agent but from a change of international sponsorship priorities.

Those celebrating the 30 year event filled the Chateau dining room to capacity and many stories both true and unlikely were exchanged. Honoured guests included members of the families lost in the helicopter tragedy. The occasion was entertainingly MC'ed by Dave Bamford and speakers included Lou Sanson newly appointed CEO of DOC and an inspirational address from Sir Lloyd Geering. The occasion was a fitting and sincere tribute to those we had gathered to remember. I commented five years ago "*... from a tragedy ...*" has come "*... a vibrant organisation that recognises in all its endeavours and activities, the spirit of the people who died that night on the cruel but starkly beautiful slopes of Mt Ruapehu. From despair and sorrow have come fresh ideas and the progressive realisation of an enduring dream.*"

**NB** I acknowledge the assistance of Paul Green in the preparation of this piece.



## Volcano Watch 2014-15

Harry Keys  
Technical Advisor-Volcanology

### Introduction

2014-2015 has been relatively quiet for volcanic activity in Tongariro National Park, so far, but all three volcanoes have exhibited unrest. Risk management has continued unabated as we continue to consolidate previous measures, assess their effectiveness and refine them to ensure they are as effective as possible. Preliminary estimates suggest that our public volcanic warning systems and GeoNet monitoring/GNS Science advisories are the two most effective tools, and collectively reduce risk to visitors in areas where the warnings can be heard or seen by about 95%.

**Figure 1.** The revised Volcanic Alert Level system for NZ volcanoes. Ruapehu and Te Maari (Tongariro) are currently at level 1 and Ngauruhoe is at level 0 (at 20 May 2015)

New Zealand Volcanic Alert Level System		
Volcanic Alert Level	Volcanic Activity	Most Likely Hazards
Eruption	5	Major volcanic eruption
	4	Moderate volcanic eruption
	3	Minor volcanic eruption
Unrest	2	Moderate to heightened volcanic unrest
	1	Minor volcanic unrest
0	No volcanic unrest	

**Most Likely Hazards:**  
 Level 5: Eruption hazards on and beyond volcano\*  
 Level 4: Eruption hazards on and near volcano\*  
 Level 3: Eruption hazards near vent\*  
 Level 2: Volcanic unrest hazards, potential for eruption hazards  
 Level 1: Volcanic unrest hazards  
 Level 0: Volcanic environment hazards

**An eruption may occur at any level, and levels may not move in sequence as activity can change rapidly.**

**Eruption hazards** depend on the volcano and eruption style, and may include explosions, ballistics (flying rocks), pyroclastic density currents (fast moving hot ash clouds), lava flows, lava domes, landslides, ash, volcanic gases, lightning, lahars (mudflows), tsunami, and/or earthquakes.

**Volcanic unrest hazards** occur on and near the volcano, and may include steam eruptions, volcanic gases, earthquakes, landslides, uplift, subsidence, changes to hot springs, and/or lahars (mudflows).

**Volcanic environment hazards** may include hydrothermal activity, earthquakes, landslides, volcanic gases, and/or lahars (mudflows).

\*Ash, lava flow, and lahar (mudflow) hazards may impact areas distant from the volcano.

This system applies to all of New Zealand's volcanoes. The Volcanic Alert Level is set by GNS Science, based on the level of volcanic activity. For more information, see [geonet.org.nz/volcano](http://geonet.org.nz/volcano) for alert levels and current volcanic activity, [gns.cri.nz/volcano](http://gns.cri.nz/volcano) for volcanic hazards, and [getthru.govt.nz](http://getthru.govt.nz) for what to do before, during and after volcanic activity. Version 3.0, 2014.

### New Volcanic Alert Level system

On 1 July 2014 GNS released a revised system of Volcanic Alert Levels (VAL) for all NZ volcanoes. Volcanic Alert Bulletin NZ 2014/01 noted the 'old' VAL system had been reviewed between 2010 and 2014 as part of a research project (by local scientist Sally Potter) focusing on improving the communication of information about volcanic activity.

This research found the system was perceived to be too complex, and that developments in volcano monitoring over the past 20 years have created an opportunity to improve the system. The improvements in volcano monitoring have come about through the GeoNet project (funded by the Earthquake Commission EQC). Ways to make the system more understandable and useful were identified during the revision process, leading to the development of a 'new' Volcanic Alert Level system, which is now in use.

The new system is shown in Figure 1, and can be accessed on the GeoNet website (<http://info.geonet.org.nz/display/volc/Volcanic+Alert+Levels>). The additional level 2 ("moderate to heightened volcanic unrest") is particularly useful and DOC's volcanic response planning is taking such changes into account.

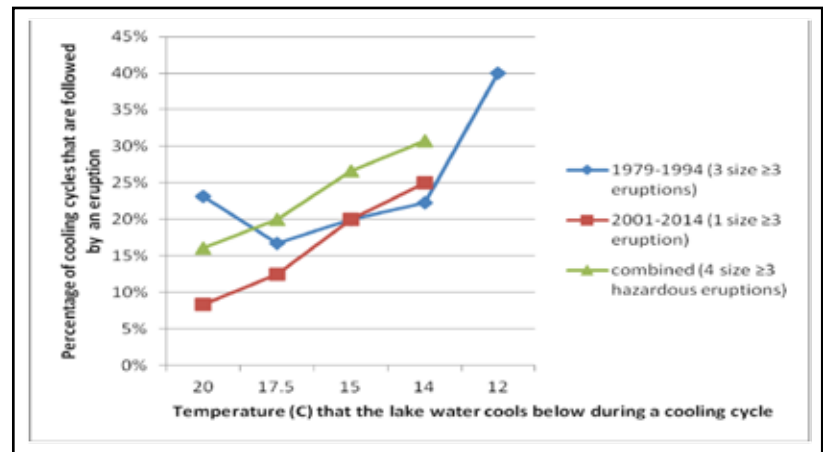
### Ruapehu

Crater Lake has been through a complete cooling and heating cycle since the peak of the previous heating cycle in June 2014. While such cycling is the normal behaviour for Ruapehu, the temperature cooled to 15 °C (late November). The cooling temperatures



dropped below 20°C in late September which is the DOC-Tongariro volcano team's initial "watch temperature: conservative analysis of records implies an increasing frequency of eruptions as the cooling cycle continues below 20°C (Figure 2) although the statistical strength of this analysis is not strong. Following our internal procedures we increased our monitoring and testing of the Eruption Detection System. We also worked closely with Whakapapa Ski Area patrol to enhance our readiness and mitigation of risk from a possible eruption until GNS results became available. At that stage, scientist Dr Bruce Christenson's analysis (see his new theory explained in last year's Tongariro Journal) suggested there was no blockage in the vent below, so we could relax. Heating resumed in December without increased unrest or an eruption, and peaked at 41.5°C in late January 2015.

Second short "sub-cycles" of cooling and heating followed, with a period of increased seismic tremor in April 2015. On 29 April GNS issued a Volcanic Alert Bulletin (VAB, RJA 2015/02) noting this tremor had been some of the strongest since 2006 and 2007 although they emphasised that no direct relationship has been seen between volcanic tremor and eruptions or sequences of eruptions at Ruapehu. So they did not increase the VAL for Ruapehu which remained at its normal 1. However, an Auckland emergency management agency put the Bulletin into social media with a different title. This led to an intensification of the information in national media and consequent incorrect reactions and myths promulgated by many users of social media. Meanwhile the tremor continued intermittently at a lower level until mid June and the lake had cooled, reaching to 20°C by 29 June. On 11 May GNS noted that other observations including recent lake water analysis had not shown any other changes.



**Figure 2.** Approximate likelihood of an eruption of Ruapehu large enough to be hazardous to people in the Summit Hazard Zone and one or more lahar paths, during comparable periods of activity. ("Large enough to be hazardous" is taken as GNS size class 3 or larger). Note that the number of eruptions is too low for this analysis to be more than a rough guide. A similar trend appears with one less eruption if the start of this record is taken as 1982 or 1983. (The eruption details are based on Scott 2013 but the best periods for comparison are not clear).

## Ngauruhoe

Local earthquake activity around the volcano increased above the normal background in early March 2015 so GNS issued a Volcanic Alert Bulletin (VAB, NGA 2015/01) on 23 March raising the VAL to 1. The number of seismic events ranged up to 67 per day, similar to previous episodes between 2006 and 2010. GNS deployed two additional temporary seismometers with the concurrence of Ngati Tuwharetoa leaders and DOC, and fumaroles and ground temperature were re-measured around the summit area. The maximum temperature was 87°C (on the northeast old crater rim) similar to temperatures measured over the last 17 years and the warmest area inside the 1954 crater was only 35°C showing continued cooling since the 1974-77 eruption episode. Art Jolly (GNS Seismologist) analysed the seismicity and concluded it was a family of similar earthquakes showing continued evolution of the seismic source since at least 2006.

On 20 April GNS issued VAB NGA 2015/03 noting it had been three weeks since GeoNet last recorded an elevated number of the shallow volcanic earthquakes and that no anomalous



**Figure 3.** One of the new lahar bridges in the lahar hazard zone of the TAC showing stream flow in Easter 2015. Since then heavy rainfall events (five days with > 100mm/day estimated rainfall at the new weather station on Tongariro) have contributed to movement of stream courses here.

*Photo: Paul Carr*

ground temperatures or unusual levels of gas emission had been detected at the summit. They concluded that the minor unrest had ceased and accordingly lowered the VAL from 1 to 0.

### Tongariro

Activity at Upper Te Maari has continued to decline. We have assisted GNS to improve gas monitoring using new DOC-owned spectrometers, recently relocated closer to the crater. Emission of the magmatic gas sulphur dioxide is now down to or below the 10 tonnes per day level and the temperature of the main fumaroles has cooled to approximately 390°C. Local earthquake activity around the volcano is continuing at the post-eruption background rate of 1-2 small events per week. The chance of another eruption continues to decrease.

The stream courses through the Lahar Hazard Zone on the Tongariro Alpine Crossing continue to be a minor threat. They are still more unstable than before the 13/14 October 2012 secondary lahar. One of the causes of this is a sediment deposit near the upper boardwalk. Water is continuing to erode this especially during heavy rain periods. However, so far the lahar bridges

(Figure 3) and new boardwalk installed by DOC have kept the TAC track above water and trampers' feet dry!

### Volcanic warning systems tested

We regularly test all our systems on various scales of time and comprehensiveness. Time scales range from automatically every few seconds, to manual or automated daily, weekly or yearly. Depending on feasibility, we may test all or parts of each system on a scheduled timetable or on an ad hoc basis (random tests) to provide a more realistic scenario. Unexpected "false positives", where non-volcanic environmental forcings or events (e.g. non-volcanic earthquakes, storms, instrumental faults, or human error) result in system activation can be valuable to managers because they provide training and test our response.

Public response to the Whakapapa Village Lahar Alarm System (VLAWS, e.g. Figure 4) was tested on 14 May after a deep earthquake near Rotorua, a storm on Ruapehu and a fault in the tripwire at Skipper's Fence all coincided to cause a false positive event. The VLAWS sirens and pre-recorded broadcast message led the residents and transient public to evacuate to higher ground away from areas at risk from a potential large lahar in the Whakapapanui. Relatively little encouragement was needed from concessionaire staff or DOC. The DOC response focussed on confirming whether the event was real or not and ensuring the areas at risk were evacuated. This was confirmed within 13 minutes which is comfortably less than the 20 minutes we expect a typical large lahar to take from the time the sirens start to the time the lahar passes by the Tussock Tavern.

The event also confirmed that there are some aspects of the response plan that need to be revised. We had begun working on these changes, including a training programme for 2015 that started 36 hours before!



Communications were not as efficient as usual due to internet problems in the Village creating delays in the automatic messaging to first responders and actually preventing the GNS Duty Scientist from being notified. Efficient communications are essential in lahar response because of the speed of these hazards. As noted last year, lahars large enough to create the risk to the western side of the Whakapapa village may have occurred twice in the last 1800 years (Manville and Scott 2008). Smaller events that could threaten people (on

*“One of the most significant research projects in recent years is the GNS-led mapping of the surface geology of Tongariro National Park.”*

the road bridge above the village, the footbridge near the Holiday Park or beside the stream) have occurred at 100-300 year intervals on average in the last 1800 years. The last such event was in April 1975.

The Tongariro Eruption Detection System (TEDS) has been operating live for 16 months now. It has a higher false positive rate than we would like. There have been seven false positives caused by regional or local earthquakes coinciding with high winds i.e. about one every two months which is the highest rate for any part of the alarm network. Because the public do not hear or see TEDS alarms we think this is acceptable given TEDS' early stage of development and its roles (backing up the lights and GeoNet, and speeding up emergency response if necessary).

## New research

One of the most significant research projects in recent years is the GNS-led mapping of the surface geology of Tongariro National Park. The aim is to produce a high quality, upgradeable map at 1:60,000 scale that synthesises new and previous information about volcanic, magmatic and glacial history with an associated booklet. This is a spin-off

from the Q-Map series of NZ geological maps. Spurred by a \$40,000 contribution from DOC spread over several years GNS made the project a priority. This represented a major multiplier, funding major portions of two principal scientists and a number of PhD students, including those supported by Project Tongariro's Memorial Grants. This

wonderful new resource is expected to be published initially late in 2015 or in 2016 and will be available in the DOC Visitor Centre at Whakapapa. It will help us manage volcanic risk better as well as providing a springboard for further improvements in volcanic information.

Universities continue to work to improve understanding and quantify the severest volcanic hazards. Canterbury's work on ballistics (flying rocks) is looking more at impacts on structures while Massey has focussed on pyroclastic density currents and debris flows as well as lahars. Manuela Tost from Massey has completed her PhD studying large debris flows and lahars from Ruapehu including from the largest known collapse of the volcano. This occurred 120,000-150,000 years ago from the southeast (Wahianoa) flank: areas of >260-380 km<sup>2</sup> were inundated, debris travelled for more than 60km and andesite boulders up to 4m in diameter were deposited.

## Activity at overseas volcanoes with large numbers of visitors

In September 2015 Ontake Volcano, the second highest peak in Japan, erupted killing over 60 visitors around



**Figure 4.** Harry Keys and Blake McDavitt at Skippers' Fence after successful commissioning test of VLAWs in July 2013.

*Photo Karen Williams*

the summit craters area. The volcano is a popular hiking area. It has religious shrines close to the summit and has two ski areas one of which is serviced by a gondola. At the time of the



**Figure 5.** Teams recovering victims of the Ontake eruption in buildings damaged by ballistic projectiles.

*Photo: Google*

eruption there were about 250 people within or close to the summit hazard zone of the volcano. There was some precursory seismicity but possibly not enough to allow a warning to be made about a potential eruption. The eruption produced many flying rocks (ballistic projectiles, Figure 5) which were reported to have caused most of the fatalities. A pyroclastic flow also occurred which apparently enveloped hikers some of whom luckily escaped from it. Ashfall buried some of the victims. This tragedy may have important lessons for us in TNP, especially at Tongariro which seems to be a similar volcano. We hope to learn more about the eruption and the response to it through an exchange of information that will help both New Zealand and Japan mitigate volcanic risk. As this article was completed Hakone Volcano southwest of Mt Fuji and Tokyo was seeing enhanced unrest. This area has a major tourism-based economy

with the highest number of visitors to any volcanic area in the world (103 million visitors in 2004, Erfurt-Cooper 2010). Additional resources have been deployed which aim to manage risks to public safety including the provision of information. Authorities have closed down an area around the main area of concern including ski lifts for summer sightseers. Preparations have been made to expand the closed area if necessary and evacuation plans have been prepared. Efforts have been made to minimise economic damage including use of social media to combat false rumours. A recent aerial survey using a drone found there has been some damage to hot spring supply facilities. The website <http://the-japan-news.com> is one of the best for monitoring the progress of the situation. On 30 June a small eruption occurred at Hakone.

## Acknowledgements

Blake McDavitt, Brian Mason, Bhrent Guy, Jono Maxwell, Paul Carr, Serena Taylor and others contribute to DOC'S management of volcanic risk. GNS Science is a vital part of this process and many GNS staff have helped including Nico Fournier and Gill Jolly (new and former heads of GNS Volcanology section), Steve Sherburn and rest of the Volcano Duty officer team, Graham Leonard, Agnes Mazot, Bruce Christenson, Richard Johnson, Mark Chadwick and others. Karen Williams and Graham Leonard made major contributions to the survey for the TAC lights. Clint Swain, Bill Clinton, James McKenzie, Simon Cole-Baker, Mark Mullins and Geoff Torr have helped keep the Volcanic Alarm Network operating while Ruapehu Alpine Lifts, the NZ Army, Transpower, Genesis Energy, Kiwi Rail, Ruapehu District Council and the Ruapehu and Whakapapa mountain communities have contributed funding.



## Hut Rangers in Tongariro National Park

Stephen Moorhouse

If you love hut rangers then the 2014/15 summer season in the Tongariro National Park would have been your lucky year!

For the first time ever we had hut rangers on both the Northern Circuit and the Round the Mouāntain Track.

Paid hut rangers were 'in situ' for the duration of the 'Great Walks season' from October 2014 until April 2015, on the Northern Circuit and volunteer hut rangers were in place on the Round the Mountain Track from the beginning of December 2014 until the end of February 2015.

Previously rangers on the Northern Circuit were also voluntary but with a shift in service levels for the Northern Circuit it was decided to make the hut ranger positions on this track paid positions. Due to continuing demand for volunteer hut ranger opportunities in the Tongariro National Park, volunteer hut ranger opportunities were created on the Round the Mountain Track for the first time.

For the summer 2014/15 season we had 22 volunteers on the Round the Mountain hut ranger programme and recruited six staff for the Northern Circuit. Rangers for the Northern Circuit were recruited locally, including two young people from Ngāti Tūwharetoa, while the Round the Mountain rangers were a mix of local and overseas volunteers.

Although the two roles were the same in title, expectations differed between the paid and voluntary staff.

The rangers on the Northern Circuit were expected to undertake tasks usually associated with the volunteer hut ranger roles such as delivering hut talks and keeping the facilities clean. They

were also expected to do track work, compliance and concession monitoring, advocacy work and to fulfil other duties while they were rostered on but not in the huts.



The Round the Mountain rangers were primarily concerned with activities that related directly to the huts they were in such as cleaning and hut talks. Anecdotaly though, to the visitor on the track, the ranger on the Northern Circuit was doing the same job as the ranger on the Round the Mountain track.

The volunteer Hut Rangers contributed more than 2200hours of volunteer time across the season. They were based at Mangaehuehu, Blyth, Whakapapaiti and Rangipo huts and worked on an eight day on six day off roster. One volunteer was

**Above:** It's a hard life being a hut ranger!

*Photo: Stephen Moorhouse*



**Above:** Practising survival skills at induction of programme.

**Below:** View from Waihohonu hut looking towards Mount Ngauruhoe.

*Photos: Stephen Moorhouse*

with us for the entire season and several committed to extended periods of time. One volunteer was a German sausage maker currently working in Te Aroha (and I can definitely recommend visiting his place of employment) and another was a laboratory technician. Volunteers came from as far away as South Korea, Australia, the United States, Italy, England, France and Tauranga!

Providing hut rangers for the Round the Mountain huts was definitely a bonus for the Department. While there is a cost associated with the delivery of this programme having rangers in these locations definitely enhanced visitor experience in the Tongariro National Park according to feedback from visitors to

the huts and people on the track.

The same can be said for the experience of visitors to the park who walked the Northern Circuit. With the enhancement of the paid hut ranger programme visitors had a much better experience when they walked the Northern Circuit.

### **So what did DOC gain from this experience?**

Having the Rangers in more locations allowed DOC to engage with visitors 'in place', to trial out new initiatives, to keep visitors safe, to monitor, to do compliance work, to provide information about the Park and to make it a personalised experience for visitors.

The Round the Mountain volunteer ranger programme and the Northern Circuit hut ranger programme were both resounding successes. There were some early teething problems, as one would expect with two brand new programmes, where each presented its own unique set of challenges, but with time came experience and the programmes grew and grew.

And what of next season, well it is more of the same. Bigger, brighter and better.

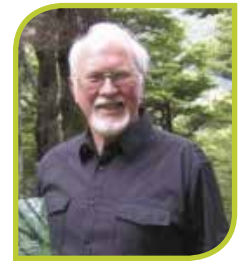
Such a tough life being a hut ranger!





## Some thoughts on wilderness in and around Tongariro

Les Molloy



Dr Les Molloy has been involved in natural World Heritage identification and evaluation over the past 25 years – in New Zealand, East Asia/Central Asia, and the Pacific. He is a past member of the Taupō-Tongariro Conservation Board and chaired the scientific group which produced the natural candidates for New Zealand's tentative list of World Heritage sites.

Many of us at some time have climbed to bushline on the Urchin or Umukarikari tracks and gazed across at the imposing massif of Tongariro National Park. Then most of us retrace our steps, turning our backs on one of the North Island's true wilderness landscapes – the Kaimanawa Mountains, source of the great rivers of the North Island (Tongariro/Waikato, Rangitikei, Ngaruroro, and Mohaka). I first experienced the vastness of the Kaimanawa wilderness landscape 50 years ago, when I tramped in early winter from the Desert Road to the remote Ngamatea Station in the Taruarau valley far to the east. The three of us were university students, united in our desire to meet the challenge of travelling for a

week without tracks and huts through mountainous country unknown to us. It was a memorable wilderness adventure. I still vividly remember the beautiful blue pools of the Waipakihi River; waking to severe frost in our tentcamp on the summit of Thunderbolt and then crunching through 10 cm-thick frost-heaved erosion pavement along the tops; the thrill of watching the eleven blue duck we encountered as we waded

**Below:** Subalpine shrubland south of Pinnacles in the Rangitikei REZ, looking NW towards Karikaringa (1694m).

*Photo: Les Molloy*



through the pools of the upper Rangitikei River and the gorges of Ecology Stream; the striking magenta colour of the groves of curled-leaved nei-nei (*Dracophyllum recurvum*) as we emerged into the fellfields above the Mangamaire valley and along the rolling summits of the Tawake Tohunga Range; and eventually descending in snow flurries into the vast tussockland terraces of the 'Golden Hills' locality in the headwaters of the Taruarau.

Four years later in 1969, Kaimanawa Forest Park (KFP, currently 74,603 ha in area) was formed and the NZ Forest Service was very open to the concept of a Kaimanawa-Kaweka Wilderness Area

Forest's Wilderness Advisory Group, who recommended a much smaller 21,000 ha 'Kaimanawa Wilderness Area' which contained 7000 ha of Māori land – the inclusion of which was essential for wilderness area criteria to be met.

But 35 years ago trampers, hunters and government agencies had far less regard than today about the views of the traditional Māori owners of the lands at the heart of the Kaimanawa Mountains. To us it was a wilderness of open space, devoid of any visible signs of human occupancy, and who would worry about a few hardy trampers threading their way through it from time to time? Two small wilderness areas (Te Tatau Pounamu



**Right:** Looking south from Thunderbolt (1638m) along Middle Range with Makomiko Stream and Rangitikei REZ to left.

*Photo: Les Molloy*

promoted by Federated Mountain Clubs of NZ (FMC) at their 1981 Wilderness Conference. FMC's concept was a large wilderness area of 47,000 ha (including 13500 ha of Māori and Defence Department land), straddling this most remote part of the North Island – from the south-eastern edge of the Central Volcanic Plateau eastwards to the Kaweka Range beyond the upper Ngaruroro River. The proposal was then evaluated by the Minister of Lands &

and Hauhangatahi) had already been established in remote corners of Tongariro National Park and two sizeable ones have since been declared elsewhere in the North Island (Raukumara in Raukumara Forest Park and Ruakituri in Te Urewera). But the vision of a large 'Kaimanawa-Kaweka Wilderness Area' gradually got 'lost in the wilderness'!

When the Department of Conservation was formed in 1987, the Forest Service's



interim concept of a 'Rangitikei Remote Experience Zone' (REZ) within the park was carried on. Because of the awkward shape of Kaimanawa Forest Park, this 'remote experience zone' covering 15,841 ha of the upper Rangitikei River and the entire Otamateanui Stream catchment, was not large enough to constitute a legal wilderness area.

### **A Kaimanawa Forest Park Management Plan – 'To be or not to be?'**

Nearly 20 years later, a change in senior management in DOC precipitated several years of uncertainty and conflict with the conservation boards through a desire to do away with conservation park management plans. Boards rightly considered that both the National Park and Conservation Acts were quite clear about the need for detailed park management plans – as distinct from the more generic and generally worded 'conservation management strategies' (CMSs) being promoted as all that was necessary. The Tongariro-Taupō Conservation Board (and indeed the Conservancy staff) objected strongly to the likelihood of DOC doing away with decades of valuable and effective citizen input to the Kaimanawa Forest Park management plan.

During 2003–6, the Tongariro National Park Management Plan was reviewed and the two wilderness areas within the national park confirmed as important zoning entities. All the other conservation park (mainly 'forest park') management plans ceased as stand-alone documents (but were hopefully subsumed into regional CMSs). Kaimanawa Forest Park alone among the 20-or-so conservation parks was allowed to continue with a specific management plan. Indeed, the KFP plan drafts produced by DOC Tongariro/Taupō staff generated 224 submissions during 2005–6 and several days of hearings were required to hear many stakeholders vigorously submitting in person.

Interestingly, the critical need for a robust KFP management plan (and process) was clearly demonstrated to out-of-touch DOC senior management in Head Office by the fact that the Kaimanawa issues – threats to biodiversity, public access, the management of deer and recreational hunting, and the protection of wilderness values in the Rangitikei Remote Experience Zone (REZ) -- were sufficiently controversial to generate 50% more submissions than the number for the Tongariro National Park management plan review (despite the latter being one of our most important national parks and a world heritage area to boot!). Indeed, the reviews of both the Tongariro NP and Kaimanawa FP management plans spanned five years (2003–7), and the successful outcome was the result of a lot of hard work by both DOC staff and members of the Tongariro/Taupō Conservation Board, and their willingness to listen to the views of a wide range of stakeholders – iwi, skiers, trampers, hunters, concessionaires, fishers, conservation NGOs and others. It was a good demonstration of how much a wide cross-section of the interested public care about the wise management of their natural and cultural heritage.

### **The Wilderness Character of the Rangitikei Remote Experience Zone**

It is now eight years since the release of the Kaimanawa Forest Park Management Plan (KFPMP) in July 2007 and it is worth reflecting on some of its excellent provisions for wilderness protection – and how well DOC and park users have respected them. The preface to the plan states:

*"Kaimanawa Forest Park is a place with unique values. Its wilderness character, natural resources, and outstanding recreational opportunities attract people looking to 'get away from it all'. Protection of the park's wilderness character is emphasised throughout the plan."*



**Above:** Looking from Middle Range across upper Rangitikei to Makorako (1727m) at the north-eastern edge of the Rangitikei Remote Experience Zone.

*Photo: Les Molloy*

Accordingly, the plan stipulated that there would continue to be no facilities in the Rangitikei REZ, and helicopter operations would only be for emergencies and management purposes. The previous policy of allowing landing on the Whakamarumaru and Otamateanui tops and within Ecology Stream to facilitate recreational hunting of deer was to be discontinued. The *“ecological benefit of the number of deer shot has been minimal and the noise and presence of aircraft conflicts with ..... the Rangitikei REZ’s wilderness character”* (KFPMP, p.102).

Other provisions to retain the wilderness character in the REZ were the restricting of any new concessions, limiting the total number of concessions, and restricting the number of people in any commercial party to three (including the guide).

It would be interesting for readers of **tongariro** journal to respond with articles on their own views on this

wilderness entity, particularly any first-hand experience of how well DOC is administering these policies outlined within the KFPMP. Furthermore, Jamie Stewart, FMC Administrator, has recently written about the challenges involved in wilderness protection in the Kaimanawa Mountains in his article “The Possibilities of North Island Wilderness” in the June 2015 “FMC Bulletin”.

Finally, the long-standing idea of a fully-fledged ‘Kaimanawa Wilderness Area’ is not dead and the option is there for any future park users and/or kaitiaki to pursue. For the final word in the KFPMP leaves the door open....

*“The possibility of establishing a Kaimanawa Wilderness Area has not been abandoned. A remote experience classification is established over this area to prevent irreversible management decisions which would compromise any future Kaimanawa Wilderness Area option.”* (KFPMP, p.47)



## Te Matapuna - South Taupō Wetlands

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The Te Matapuna wetland is the largest wetland within the Taupō basin and covers 1500 hectares of which a third is public conservation land. The wetland was formed after the Taupō eruption as pumice sediment was washed into the lake forming a large bowl of low lying land. The wetland is heavily influenced by the water height of Lake Taupō as well as flood flows from three major rivers, several streams and upwelling of ground water. Te Matapuna is nationally significant because of its large size and variety of ecosystem types.

The wetland is in relatively good health despite the best efforts of the invasive grey willow and human impacts. Grey willow is currently the biggest threat to the wetland as it quickly colonises all other vegetation types and turns the area into a mono-forest choking waterways in the process.

Since 2005 we have been working in conjunction with DOC in working how best to manage the spread of willows and how best to kill them. Today our work is coordinated and integrated with DOC and the hapu of Ngati Hine, Ngati Rongomai and Ngati Te Rangīta.

Last August the project received a significant boost with the announcement of a Community Conservation Partnership Fund [CCPF] grant from DOC for \$208,000 spread over three years. The focus of the grant is to plant up to 10000 plants a year as well as extending willow removal to adjacent areas at Motuopa and Oruatua. This work will nicely complement the existing work being carried out with Waikato Catchment Ecological Enhancement Trust [WCEET] and DOC funding.

The CCPF grant was presented at a large public planting at the site by the then Minister of Conservation Hon Nick Smith. A significant contribution to the new project is the growing of the plants at a nursery provided by the Department of Corrections. Initially inmates from Rangipo and Tongariro were available to carry out much of the site preparation, planting and site maintenance [releasing]. Unfortunately policy changed in late 2014 and inmates are no longer available for offsite work. This required a review of our approach. We resolved we could use volunteers



**Below:** Hapu and volunteers planting trees at the ceremony to present Community Conservation Partnership funding.

*Photo: DOC*





**Above:** Hon Nick Smith former Minister of Conservation addressing hapu, volunteers and guests at the planting.

**Below:** the Minister, hapu representatives and Nick Singers planting kaikikatea.

*Photos: DOC*

to carry out the planting and some of the 'releasing' but that we would need to use contractors for 'releasing' work at critical times as well as for much of the site preparation. Successful planting is very much dependant on regular 'releasing' throughout the first three years. Experience has shown that the work at each site will vary depending on the type of weeds and grass present along with the soil types.

We have been most fortunate to have had a local team of volunteers evolve from the Turangi and Motuopa communities and a number of local planting days held to enable the first years plantings. Major planting days are planned for our AGM day on 17 October and a volunteer week planned from 13-20 March 2016. We have supplemented local 'releasing' days by the use of contractors and reduced the impact of weed or grass smothering by utilising carpet squares when planting trees. Old woollen carpet has been obtained and transported to the prison where it is cut into squares suitable for protecting the plants.

The amount of work required at the site has required us to employ Shirley Potter on a casual part time basis to plan, supervise and monitor the site "preparation, planting, monitoring and reporting at the site. We recognise this is only a small compensation for the hours and commitment Shirley dedicates to the site! Without a high level of coordination our work will not be successful and resources will be wasted. We are also grateful for the ongoing support of DOC in extending the willow control work and for the experience of Ian McNickel in supervising the willow poisoning contracts.

Looking ahead we have prioritised the areas for willow poisoning on a conservation value but in the case of private Māori land it is necessary for our hapupartners to obtain the approval of the owners for each specific block of land. This can be very time consuming as some blocks do not have registered Trusts and may have in excess of a thousand owners! The hapu have shown a strong commitment to informing the owners and seeking their endorsement.

The visual impacts of the work are starting to be noticed by travellers on the State Highway and commented on favourably by the community.





# Volunteer Week

13-20 March  
2016



As noted in the Te Matapuna Journal story we are seeking volunteers to help plant up to 10000 trees in the Te Matapuna wetland.

This is an opportunity for members who live outside the Central North Island and locals to participate.

Join us for a day or two or stay for the week. We can be flexible. We will provide a programme early in the new year that will include a series of plantings for three-four hours each day together with opportunities to undertake other volunteer work or to visit particular sites of interest or participate in presentations on conservation interest.

We will ensure there is work or activities available for peoples of any fitness level.

Please note this in your diaries. We will provide accommodation and a number of meals for those attending.