

tongariro

February 2018

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

43

years ago Ranger Herb Spannagl and a school party witnessed Mt Ngauruhoe's eruption close up!

43

Whio released in the North Island from the Whio Hardening Facility during 2017

54

Kiwi chicks made Wairakei Golf Course + Sanctuary their home between 2012-2017

8164

volunteer hours worked in the park and area during the year

TONGARIRO
NATURAL
HISTORY
SOCIETY



Department of
Conservation
Te Papa Atawhai

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President's corner

Paul Green
President Project Tongariro

It is clear that an increasing number of New Zealanders value our special places and wildlife as part of what it means to be a kiwi. Recent opinion as to improving water quality is a great example. People regard it as a basic value being able to drink water from our rivers and lakes or to swim at their favourite location. They are passionate.

This love of our environment has not always transferred as to how we prioritise its care and management! A very good reason for this failure is that so much of our country is under stewardship from the Department of

of community organisations, business, councils and iwi do a great job in helping to protect our special places and make them available for locals and an ever increasing number of overseas tourists to visit.

There are so many good news stories of wildlife protection, pest control success or a new track provided for walkers or mountain bikers that everything is painted as being positive! The media is overwhelmed with 'good news' conservation stories. Organisations are good at telling the local stories and the media and public like hearing



Conservation and is physically and scenically outstanding, that the public are unaware of pressure on the very values being protected. The Department of Conservation with help from a suite

about them. We mask the problem with our own success! The reality is that our protected wildlife and plants continue to decline at an alarming rate, our biosecurity threats thrive and we

tongariro

the journal

PUBLISHER

Project Tongariro in cooperation with Department of Conservation

EDITOR

Dave Wakelin

CONTRIBUTORS

James Barnett
Theo Chapman
Thea DePetris
Robyn Ellis
Stacey Faire
Sarah Gibb
Paul Green
Mirja Heinrich
Harry Keys
Anthony Moss
Rebecca O'Sullivan
Renee Potae
Lou Sanson
Bob Stothart
Karen Williams
Amelia Willis

DESIGN

Tark Communications Ltd
Phone: 021848355
Email: dave@tark.co.nz

COVER PHOTO

Ngauruhoe in eruption, 1975.
Photo: Herb Spannagl

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PHOTOGRAPHY

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GENERAL ENQUIRIES

Project Tongariro (Tongariro Natural History Society Inc.)
P.O. Box 238
Turangi
Ph: +64 7 386 6499
Fax: +64 7 386 6491
Email: email@tongariro.org.nz
Website: www.tongariro.org.nz

ENVIRONMENTAL

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struggle to manage the impacts of visitors at key sites.

Reality is that conservation needs to be seen as an investment and not a cost. It enables us to sustain our tourism, farming and fishing industries. It provides us with a New Zealand that we recognise as part of our identity. We need to actively manage impacts by providing good infrastructure like the provision of toilets. We must improve our water quality through better farm management and treatment of waste throughout the country.

There has been a great deal of discussion as to how our special places and wildlife together with our visitor facilities should be funded.

Our tax revenue should provide basic protection and infrastructure. Increased government investment in conservation is justified by the huge increase in GST alone from visitors to our country. 'User pay' should apply for special services and businesses using access to the conservation estate should contribute equitably for that opportunity. But we also need to consider a tourist levy or access fee to key sites as a way to fund the care of our places and species. We cannot continue to increase visitation



and to deal with additional biosecurity costs from a core conservation budget that has seen little increase.

However, funding alone is not the solution. We need to manage visitor numbers and get used to limits at key sites like the Tongariro Alpine Crossing and having areas that are spelled or even closed to development. More is not always better and good planning is needed to ensure there are areas available for public access but that other areas are managed for their wilderness or remote values.

Project Tongariro greatly values its relationship with DOC and appreciates the great work done by DOC staff. Our volunteers enjoy working with DOC and on projects to supplement what DOC can do. We thank DOC staff as well as our own team for their stories outlined in the Tongariro journal. We do think it

important to tell these stories and to build an historic record of conservation stories in Tongariro National Park and the Central North Island.

The key new developments for Project Tongariro in the last year have been to initiate 'Predator Free Taupō' and greatly extend Kids Greening Taupō. But our core projects remain and I thank all our volunteers for all the work they do trapping pests, carrying out weed control, planting native trees, marshalling at events, fund-raising or assisting visitor or education projects.

Without your help we would achieve nothing. We thank the Trusts, individuals, businesses and councils who have helped with resources. And a recognition to our small staff team who are both dedicated and flexible in working in a small team continually seeking funds and volunteers to achieve our mission.

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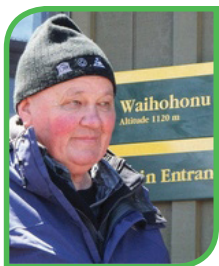
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OUR PLAYGROUND, OUR RESPONSIBILITY

About Bob



Sarah Gibb
ex Director Project Tongariro



Paul Green
Project Tongariro President

Robert Athol Stothart was born in Pahiatua on 11 October 1934, married to Margaret (nee Boleyn) and had two children, John and Megan.

He was brought up in Island Bay Wellington. He and his siblings enjoyed playing in the neighbouring coast and bush and so he developed a love of nature and the outdoors that would include Boy Scouts.

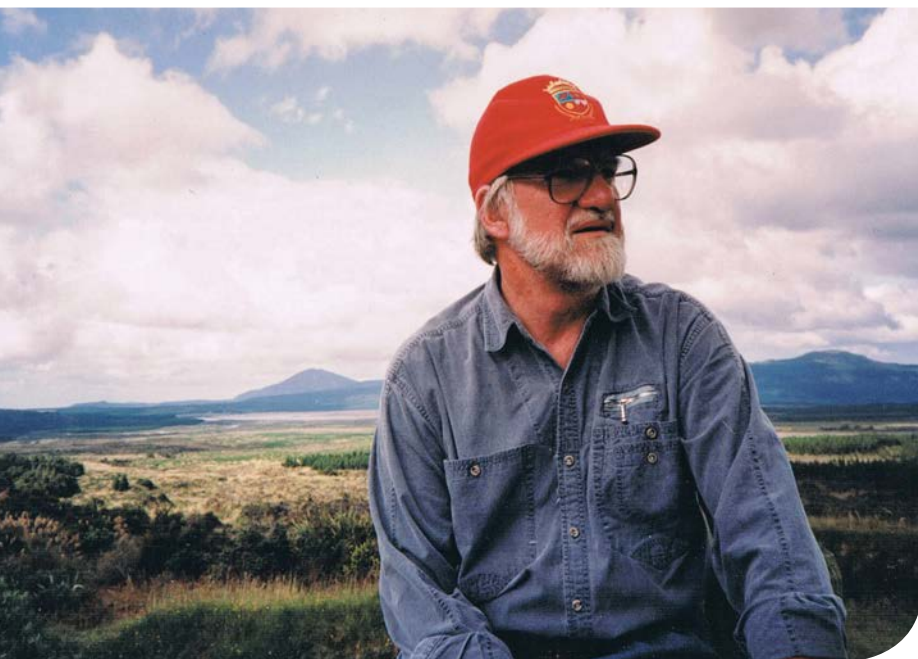
a request to not report the incident –even to those back home! Many months after his return to New Zealand his mother learnt of his involvement in the accident when she was approached by a Scottish neighbour.

Bob was passionate about education and after leaving Wellington Technical College as Head Boy, went on to Wellington Teacher's College, for the start of a lifelong career in education.

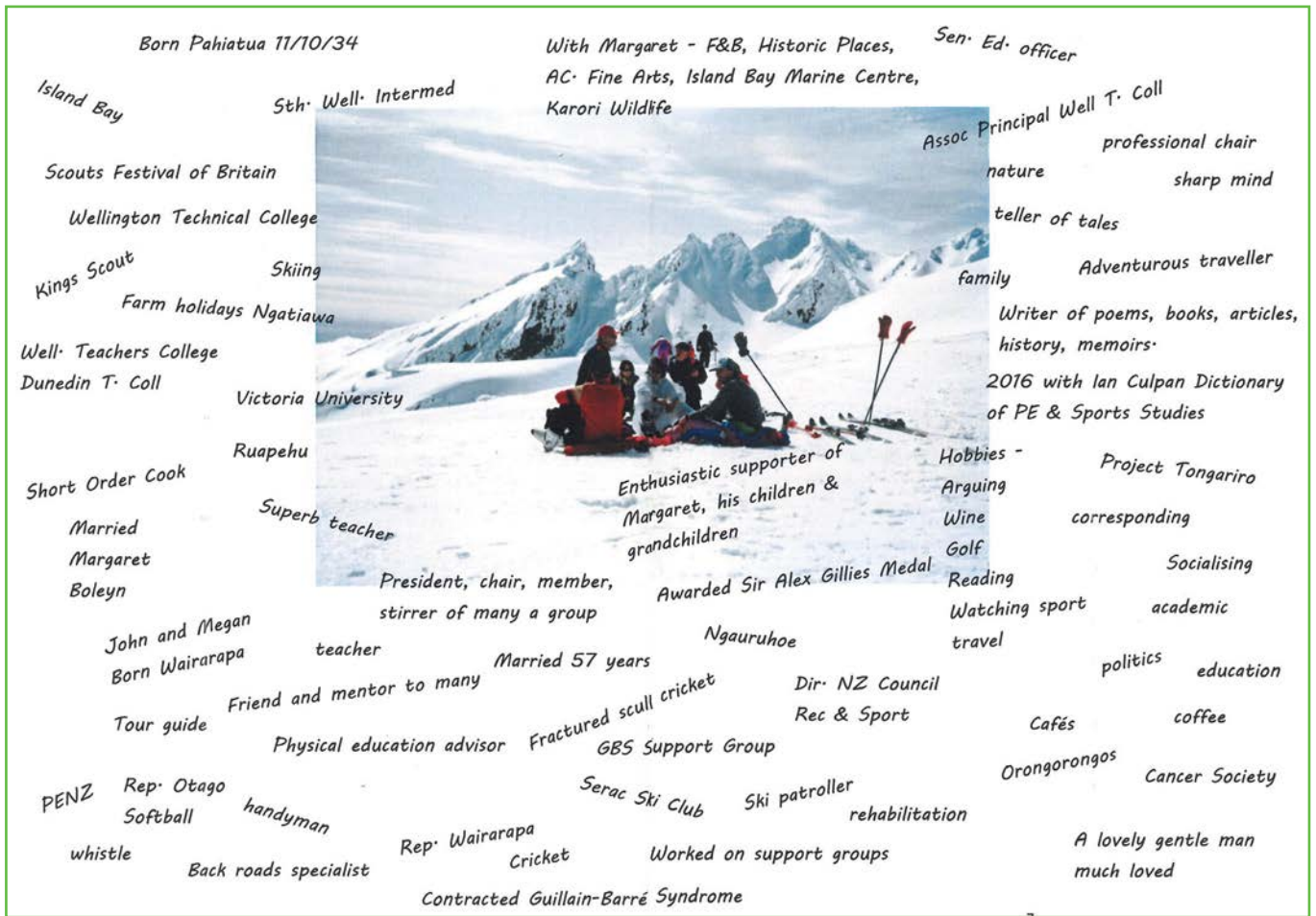
Physical Education and Recreation was his specialty; teacher, advisor, lecturer, director of programmes, senior education officer and Associate Principal Wellington College of Education. Bob was a published author of a number of books related to physical education in New Zealand but also happy to write articles for the Listener or local publications.

Alongside his 'work' he was committed to community and held a number of governance roles across health, education and his passions connected with Tongariro National Park - Serac Ski Club and Tongariro Natural History Society. Bob was a great conference attendee and presenter. A great example of his contribution and value was invites to professional medical conferences on Guillon Barre Syndrome where he used his own experience and considerable research to make presentations.

The list of his contributions are too long to list and unfair to name only a few, fair to say Bob, along with wife Margaret, was all about people and so humble in acknowledging his generosity of knowledge, time and creative leadership.



Bob's leadership potential was recognised in 1951 when he was selected as one of six New Zealand scouts to represent the country at the Festival of Britain and to then travel to Austria as one of 32 representatives at an International Jamboree. This was an extended journey of nearly five months for a 15 year old. In Scotland Bob was travelling in a car involved in a fatal accident with a motor cyclist. Bob's care and discretion were evident when he helped care for the cyclist and followed



Bob had two lengthy terms as President of the Tongariro Natural History Society and his contribution was immense and valued by all and recognised by his award of life membership.

As Chief Rangers at Tongariro National Park, both Bruce Jefferies and Paul Green valued Bob as someone who dearly loved the Park and was always available to listen and provide wise advice when needed. Bob was a key person in the establishment of the Tongariro Natural History Society following a tragedy in 1984 when four rangers lost their lives in a helicopter accident.

Above: Prepared by wife Margaret and daughter Megan this graphic best depicts Bob's community spirit.

Black-billed gulls: a conservation conundrum



Amelia Willis
Community Ranger
Central Plateau



A colony of critically-endangered gulls has been making life difficult for its neighbours on the shores of Lake Taupō.

That's right - endangered gulls. They may walk and squawk like a standard seagull, but the black-billed gull has the unfortunate status of being the most threatened gull species in the world.

Black-billed gulls – or tarāpuka are an inland gull, nesting mainly on braided riverbeds in the South Island; only

around five percent of the population are found in the North Island. For the past few years the Taupō colony has made a nuisance of itself firstly at its nesting site near the Tokaanu Power Station, then at the Motuoapa Marina. Not only are the gulls noisy and messy, but when their chicks arrive in December they can be quite aggressive.

The local Department of Conservation (DOC) team devised a plan to avoid the same issue in the future, working with the Department of Corrections at Rangipo to fabricate a colony of plaster decoy gulls, which can be laid out to encourage the birds to nest in a more ideal habitat.

In November 2016, the fake colony and audio equipment was set to play gull calls morning and night and rangers watched over the following weeks as a few pairs started to show interest in the fake gulls at the chosen Tongariro River delta site. Rangers did, however,

Below left and right:
Rangers setting out the "ready-made" colony at the Tongariro River delta.
Photo: Mike Hill





Opposite page and left:

The gulls began laying in early December at the Motuoapa Marina.

Photos: *Opposite page: Amelia Willis, Left :Dave Lumley*

remain puzzled as to where the rest of the birds were nesting.

The mystery was solved when the colony of more than 150 was discovered unexpectedly by a passing ranger at Motuoapa in early December 2016. Despite DOC's best efforts to steer them to the delta, the fickle birds had decided to take up residence on a gravel pile at the marina construction site instead.

The area was cordoned off and the gulls had little impact on the marina redevelopment project. The colony in fact had a successful breeding season, where at least 70 chicks fledged late January 2017.

With the official opening of the Motuoapa Marina in November 2017, the gravel used as breeding site last year by the colony has long gone, so the gulls will be on the lookout for a new habitat.

Black-billed gulls are identifiable by their long, thin black beaks, easily distinguished from the shorter, bright red beak of the red-billed gull. Although this species is not known for scavenging like the larger, more common black-backed gull, they can be seen on the Taupō lakefront, in the

Turangi town centre and at Kinloch picking up stray fish and chips. They should not be fed as our food can be harmful to the gulls whose diet is made up of mainly insects and small fish such as smelt.



Project Tongariro - highly motivated DOC partner



Lou Sanson
Director General of
Conservation

It gives me great pleasure to once again contribute a few words to the annual Tongariro Journal.

It always excites me to see the range of things that are undertaken from year to year in our longest established National Park and the areas around it.

in this area will generate significant contributions to the Predator-Free New Zealand vision.

Of course the work of Project Tongariro is wider than that and the Kids Greening Taupō initiative is a ground-breaking educational model which the Department is keen to see implemented in other communities across the country.

Investment in our youth is the key to a New Zealand which lives with, and treasures, its natural and cultural heritage as one of its core values. It is a credit to Project Tongariro that you have seen this need and harnessed the passion of their community to bring it to reality.

Even as I see this clear future focus, I know that at its heart this is an organisation which has its roots in Tongariro National Park; being formed as the Tongariro Natural History Society to support the work needed to maintain one of New Zealand's most culturally-important landscapes.



Above: Thea DePetris, Robyn Ellis and Nina Manning are three whose work for Greening Taupō, Kids Greening Taupō, Predator Free Taupō and Project Tongariro has greatly strengthened the bonds between conservation and the community.

Right: A fantail at Oruatua. Community trapping around the Taupō/Tongariro area is ensuring we will continue to hear fantail and other birdsong in our forests.

Photos: DOC

Knowing much of that work is driven by Project Tongariro, an enduring and highly-motivated partner to the Department, makes it all-the-more satisfying.

That is why I am proud to see Project Tongariro successfully apply for a DOC Community Fund grant that will allow them to employ a co-ordinator to drive the Predator Free Taupō project.

We know that investing in these kinds of community-driven initiatives is the way forward for the greater conservation challenges and helping Project Tongariro realise their ambitions





Because of that heritage, there remains a very keen interest in what happens in the Park.

The Department has faced challenges in recent times, especially with the continuing pressure on key sites such as the Tongariro Alpine Crossing.

Happily I can report, through working with iwi, hapū and whanau along with stakeholders including yourselves, the management changes implemented for this season and the investment in further visitor infrastructure have been largely successful and will underpin further efforts to ensure we have an enduring world-class visitor experience.

We have also made significant progress with a partial plan change application which would allow limited access to parts of the park for cycling. While yet to be fully determined, this process is a good example of how the balance between competing interests has to be found to maximise the benefits for all the various stakeholders and interest groups.

Such challenges will continue to arise, but I am confident that through the goodwill of iwi, hapū and whanau, and organisations such as Project Tongariro, the future for Tongariro National Park and the wider conservation landscape is a bright one.

I congratulate you whole-heartedly on what you have achieved and wish you every success with what you have planned.

Nga mihinui

Above: Project Tongariro volunteers and DOC staff on Mt Pihanga take a break for lunch. Lake Rotoaira and the volcanoes of Tongariro National Park form a perfect viewpoint.
Photo: DOC



Bridge Hut

Anthony Moss
Former Volunteer Ski Patroller

Bridge Hut was a lot of things to a lot of people. A telephone exchange, a hospital, a public shelter and ski patrol headquarters to name a few. For me it was a pool of light at the top of the rock garden, a beacon to aim for when leaving the carpark on a Friday night with my pack on my back and some friends or family for company. It was the place I stayed while doing my duty as a volunteer ski patroller. I say duty but it was really a privilege to be part of Ski Patrol and spend many memorable days and nights in that little hut.

It wasn't flash by any standards, but once you got the fire going you could hunker down and listen to the wind scream and howl outside, sure it was trying to pick the building up of the knob it was built on and throw it into Tennant's Valley. It wasn't pretty but it was hardy and withstood everything nature could throw against it.

Named after Bill Bridge, the founder of Ski Patrol on Mt Ruapehu, the hut was originally built to house the telephone exchange that was the only means of communication on the mountain. In the case of an emergency there were telephones located around the skifield that would connect you to an operator at the hut. The operator would then send out a ski patroller to respond to the emergency.

Later on a hospital was added to the building and all patients would be diagnosed and minor injuries treated in the Hut. Anyone who couldn't be treated there would be carried down to the Top of the Bruce and a waiting ambulance would take them to Taumarunui Hospital.

A bunk room was added on that allowed patrollers to stay in the hut. Prior to that patrollers would have to stay in ski lodges or travel and congregate each day. This brought a real sense of camaraderie to the patrol with an evening debrief of events from the day and stories of exploits going on into the night. The small kitchen and adjoining lounge area were the focal point with a large wood burner providing warmth. If the hut was empty on your arrival, the first priority was to get that temperamental beast burning. This usually required a large pile of paper and kindling, having the dampener wide open, the flue half closed, the wind in the right direction and several prayers to Mahuika (the fire goddess) to be successful.

With the introduction of a hospital at Iwakau, the Bridge Hut hospital was converted to more bunk rooms which allowed up to 18 people to stay. If the hut was full the two toilets and one shower were in high demand and with warm water generally running out after two showers you had to be quick. Having a cold shower encouraged users to stick to the 3 minute maximum rule and thereby conserve water which came from roof runoff and was stored in a single tank located under the floor in the middle of the hut. I'm not sure why it was located there, but it made cleaning the sludge out after the 1995 eruption a slow and messy process. We took turns standing in the knee deep sludge filling buckets and passing them out through the trap door to be carried through the hut and deposited outside. After that the downpipes were connected with a quick release so that in the event of future eruptions they could quickly be disconnected.



Continuous ongoing skills training was a big part of ski patrol with most of it taking place on the mountain. However if the weather was bad the high beams in the main entrance to the hut made perfect anchor points. Entering the front door would often require navigating your way past several patrollers hanging around on ropes practicing their belaying skills.

With the demise of volunteer patrolling on Whakapapa Ski Field in 2002, the hut became a place for ex-patrollers and family to stay and operated more like your traditional ski club. Located adjacent to the top of the Rock Garden chairlift it was easy to access if the lifts were running or a leisurely 30 minute walk up the Rock Garden if they weren't.

It was a fantastic place to stay with the best view to the west when the sun was setting. In the summer for those who likes climbing and hiking it was a place to base yourself for expeditions to the Ruapehu Crater or many of the other walks in the Tongariro National Park.

My children and the families of many other patrollers learnt snow craft and how to ski while staying in that hut and it will forever hold a fond place in my memory.

The hut was demolished in the summer of 2016 to allow for the widening of the ski trail at the top of the Rock Garden which is currently a choke point for skiers and boarders.

Above: Graeme Bryant (Grandad) in front of Bridge Hut. Graeme is a Ski Patrol legend who patrolled from 1960 to 2002 when the Volunteer Ski Patrol was disbanded.
Photo: Anthony Moss

Herb Spannagl's view to die for



Harry Keys
Science Advisor-Volcanology
Department of Conservation

The eruption

On 19 February 1975 Herb Spannagl unwittingly had the best view in the house during one of the climatic episodes of the last (1973–77) eruption episode of Ngauruhoe volcano.

Herb was a Tongariro National Park ranger with the Department of Lands and Survey and he was guiding a party of about 30 school pupils, teachers and parents from Avondale College up onto what is now called the Tongariro Alpine Crossing (TAC). They had come up the Mangatepopo Valley past Soda Springs, climbed up what used to be called the Devil's Staircase and then rested for 30 minutes at the South Crater rest spot below Ngauruhoe.

cloud of dust and rocks hurtling down the north slope towards the spot at the entrance to South Crater they had left some 20 minutes earlier. (Modern maps of surviving deposits of these flows suggest none passed within 500m of the rest spot but it is possible that some finer grained deposits were eroded away before detailed mapping was carried out).

For the next 90 minutes the party watched in awe as eruption after eruption sent similar clouds down on similar paths. Herb started timing them and found that each took about 1 minute to descend so were travelling at an average speed of about 80km/hour. This estimate is a reasonable match for scientific observations that recorded speeds of up to 110km/hour.

These ground-hugging avalanche like clouds are known as ash and scoria avalanches or block and ash flows. They contain incandescent rocks so are very hot and hazardous events which people in the way have little chance of surviving. They are part of a group of phenomena known as pyroclastic density currents or nuee ardentes which are some of the most dangerous volcanic hazards.

Herb was a keen photographer taking slides (the medium of preference at the time). He had 13 slides and no spare film when the eruption started and took 11 photos of the ash flows and red hot boulders rolling downhill before stopping photography to wait for a different climatic event such as a lava flow.

But the volcano started getting ever more active and with a wind change more towards their direction rocks started falling near them. Some exploded on landing firing shrapnel-like fragments around them and forcing them to lie



Above: Burning ash clouds descending Ngauruhoe's north slope, viewed from Oturere-Red Crater ridge.

Photo: Herb Spannagl

Pushing on, they were part halfway up the Oturere-Red Crater ridge about 2.5km from the crater when the mountain erupted. The summit was in cloud and Herb recalls a loud eruption noise followed by a ground-hugging

down and take cover. Herb realised the party needed to get away but couldn't return the way they had come. He crawled between the sheltering groups telling them they needed to head as quickly as possible up the ridge. They made it over Red Crater and past Emerald Lakes onto the muddy area in Central Crater about 3.7km from Ngauruhoe's crater when another huge eruption created a blast which blew them all over.

Tina Freeman was in the school party of teenagers. She recalls hiding under her pack as rock fragments bounced around them thinking they were going to die. She saw the shock wave coming with its decompression condensation cloud just before the blast blew them over. This and other atmospheric shock waves were seen by scientists and others watching from safe distances near Mangatepopo Road and were a feature of the afternoons' explosions. Tina is now a local with strong memories of the event - she has since been up on the northern side of the TAC but not back to the site they watched from.

The 1973 -1977 eruption episode started in January 1973 with upwelling of new magmatic material and discharge of red-hot blocks of lava. This followed many years of intermittent steaming and small eruptions of mainly recycled material. Sporadic activity continued through 1973, building up to highly explosive eruptions of ash in January, March and August 1974 as well as smaller events, and climaxing in February 1975. The eruption episode ended in 1977. The interval since then is the longest repose period on record for Ngauruhoe.

Herb was on the Whanganui River after Christmas 1974 (probably in January or early February 1975) when one of the smaller eruptions occurred. He heard of the eruption and returned to Whakapapa to continue his ranger duties. The Chief Ranger John Mazey, "a great leader" according to Herb, was very keen on rangers taking school groups out into the park. Ngauruhoe was accepted as being



an active volcano with eruptions every few months to years. It was a major attraction in a national park known for its active volcanic landscape but eruptions were not seen as likely when one was climbing on them or passing nearby. John wanted visitors to be given the chance to observe and learn about volcanoes first hand and Herb wanted to take them.

The February 1975 episode began on 12 February and continued until the 23rd. So without realising the risk Herb set off with his party on the morning of 19 February 1975. The eruptions that day were violent and the climax of the whole episode. Herb and his party watched the first phase of the days' eruptions from Red Crater ridge and retreated during the second more violent phase. One of the explosions threw a 3,000-tonne block of lava 100 metres out of the crater and lava fragments were thrown as far as three kilometres away. Blocks up to 20 metres across were projected hundreds

Above: Incandescent lava and boulders erupting and adding to the burning ash clouds as the eruption increased in intensity, viewed from Oturere-Red Crater ridge.
Photo: Herb Spannagl



Above: Ngauruhoe in eruption viewed from the Mangatepopo valley.
Photo: Herb Spannagl

of metres above the vent. During the last and most violent events of the second phase, gases streamed from the crater for several hours, producing a churning plume of ash that towered up to 13 kilometres above the crater. This column collapsed under its own weight, forming ash and scoria avalanches that swept down the flanks of Ngauruhoe, leaving trails of rubble in their wake. Ash fell 160km away on Hamilton.

Reflections

Forty two years on we can reflect on what has been learnt since 1975. The sidle up the slopes of Ngauruhoe on the Tongariro Alpine Crossing track crosses at least three of the multi-cloud paths of these 1975 events (very convenient subjects for study). The traditional rest stop at the entrance to South Crater is not one of those paths but people there could have been affected by the fringe of a burning hot cloud as well as tephra (rocks and ash) fall. Nowadays during the busiest days around 2000 people might be exposed to volcanic hazards at such places. Thanks to monitoring by GeoNet, increased awareness of the nature of volcanic activity, and ability to share information quickly we know when an eruption episode is happening or may be about to, and can reduce exposure to volcanic hazards by a huge amount.

We have also learnt that we can't eliminate risks from sudden eruptions especially those during the quiet periods between the actual explosions during long eruption episodes like 1973-1977.

On Queen's Birthday weekend 1974 a group of us from Victoria University Tramping Club traversed obliviously over Ngauruhoe on a beautiful early winter's day, and the next afternoon watched a small eruption threaten the summit where we'd hiked. Not quite as dramatic as Herb's and Tina's experience but interesting to reflect on. People on the TAC sidle around North Crater to Ketetahi hut during the 21 November eruption of Te Maari had a more powerful experience than ours: but most reaction reported in the media and in DOC was unrealistically melodramatic and inaccurate as regards the actual safety of those people and the relative effectiveness of risk mitigation in place. Despite major advances like GeoNet and vastly improved communications between GNS, DOC and concessionaires, little warning can be given of such individual explosions during a longer eruption episode in which the vent can be regarded as "open".

Response planning for restricting access has improved so facilities like the TAC can be immediately closed for months to years or other access restrictions put in place during volcanic unrest and eruption episodes like 1973–1977 when risk is still elevated. But none of this will reduce the risk to zero.

Most people now take a quiet Ngauruhoe for granted and that hikes in such areas will be safe. Many visitors have little understanding of volcanic or alpine risks or that, by common law and government policy, they need to take responsibility for themselves (unless they are being guided). Too often they are more likely to blame others for poor decision-making, route-finding or preparedness. Their mantras that “they’d close the track if it wasn’t safe” or “we didn’t know” are two of their main defences if they even think about such realities.

Although it seems that only a relatively small percentage of TAC hikers feel this way, that represents a large number of people these days. DOC’s recent review of visitor risk management is requiring managers to take more responsibility for visitors in “High risk, high use” places like the TAC, specifically those who have limited ability to look after or take responsibility for themselves there. This is consistent with societies’ expectations of a high standard of risk management and reasonable for the small percentage of people who really should hire experienced guides but it has wider ramifications for the majority of others for whom the TAC is within their capabilities. Such expectations and economic and commercial imperatives and opportunities mean that as the number of people hiking the TAC grows ever greater the ability to experience wild nature is diminished.

Volcanoes are a great way for people to realise their insignificance and learn respect for the global scheme of things. While such dramatic volcanic experiences as those of Herb and his group are clearly a step too far, those of

our 1974 party and the hikers on the TAC on 21 November may be more acceptable. But they will be harder to come by. We need to ensure opportunities and experiences remain available, rich and rewarding within the constraints. A new interpretation plan is being prepared that will perhaps help some people to think more deeply about risks and their need to take more personal responsibility. We tried this after the Te Maari eruption but failed due to legal and management constraints. If there was better more informed dialogue between concessionaires, iwi and government on what is acceptable risk, it might be possible to reopen the TAC sooner or more often during future eruption episodes like 1973–1977.

Acknowledgments

It was a pleasure to meet Herb, now aged 81, in New Plymouth in June 2017. His memory from 1975 is still fresh and his account of the eruption was fascinating, as was Tina Freeman’s. I am grateful them for sharing their experiences with me and to Angela Mason for arranging the meeting with Herb.

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Community trapping on the rise for a Predator Free New Zealand



Amelia Willis,
Community Ranger Central Plateau

Since the announcement of the ambitious goal for New Zealand to be Predator Free by 2050, the Taupō and Turangi communities have rallied to the cause. 2017 has been a year firstly to celebrate the considerable effort already undertaken by members of the community, but also to kick-start several new community-led projects.

In March 2017 more than 50 volunteers from around the Taupō District gathered to talk all things predator trapping.

They celebrated successes, shared ideas and learnt new techniques from special guests from conservation technology company Goodnature.

The celebration, hosted by the Department of Conservation (DOC), invited the 12 active predator trapping groups from around Lake Taupō to hear Goodnature co-founder Stu Barr talk about the origins of the company,

and update the groups on the latest technological advances.

After introductions by each group, Stu said it brought a tear to his eye to see so many community volunteers together to talk predator trapping.

"I couldn't have imagined this many volunteers when we started up over 10 years ago," he said.

Since then, Goodnature has revolutionised the fight against the predators harming our birds – possums, rats and stoats – with the design and manufacture of automatic traps that humanely kill pest animals and then reset themselves. Instead of volunteer hours spent re-setting single-kill traps, they can now cover a wider area with traps that can take out up to 24 rats or stoats without needing to be checked for six months.

Community trapping in the Taupō area began in 2002 at Pukawa at the southern end of the lake, with local resident Jean Stanley – whose passion for protecting native flora and fauna has spread like wildfire around the lake. Her encouragement inspired projects in Omori and Kuratau and has also swept north with the establishment of the Kinloch community predator control group in 2016.

With the announcement of Predator Free 2050 in 2016, the passion in the Taupō District is a step in the right direction. Greening Taupō president Paul Green said he is bolstered by the achievements of the southern trapping programmes and hopes to see the same appetite for action in Taupō itself.

To encourage action, since May Greening

Below: Goodnature's Stu Barr, Jean Stanley from Pukawa and local DOC operations manager Dave Lumley deal to the celebratory Rat Cake.
Photo: DOC



Taupō have held several meetings and workshops culminating in the establishment of group Predator Free Taupō.

Co-ordinator Robyn Ellis has been impressed by the amount of interest.

"We can see how keen the community are, so we've been working hard to create opportunities for people to learn and get involved," she said. In October the group facilitated the launch of two trapping projects: Acacia Bay and Opepe.

Traps out at Opepe

The Opepe project was launched in October 2017 with the installation of traps by Predator Free Taupō and local Forest & Bird, with support from DOC as part of Conservation Week.

for the traps. An almost one-to-one ratio of rangers to volunteers meant a quality experience for all involved. The volunteers will take on the responsibility



The forty DOC200 traps – which target rats and stoats – were donated to Predator Free Taupō by DOC as part of the group's initial set up to work towards Predator Free 2050.

The volunteers learnt the ins and outs of starting a predator control programme, from the home range of a rat, to GPS skills, lures, and most importantly safe-setting technique

of the day-to-day running of the trapping project.

Opepe Bush Historic Reserve is only 15 minutes from Taupō with two easy walking loop tracks, making it popular with families and dog walkers. It is also the closest example of mature podocarp forest to town where you can see examples of large rimu and matai and a range of native bird species.

Above: Volunteers from Predator Free Taupō and Forest & Bird worked alongside DOC staff to set up the new community led project at Opepe.
Photo: DOC

All this makes it an ideal location for community-led conservation work.

Predator Free 2050 will deliver huge benefits across New Zealand – for the social and cultural links with our environment, for our regional economies

“... even a simple rat trap in your backyard can make a difference.”

Research shows that the vast majority of New Zealanders (85%*) rate conservation as important to them personally, yet still only about one in 10 have actively helped on a conservation project. With a variety of projects around Lake Taupō it is hoped more locals will get involved in Predator Free efforts – even a simple rat trap in your backyard can make a difference.

through primary industries and tourism and for our threatened native species.

It will build on tens of thousands of committed community volunteers and private landowners who are already working on habitat protection.

Predator Free Taupō aims

- To have every household in the greater Taupō area trapping rats, mustelids and possums. A co-ordinated community-based trapping programme will enhance the environment so our birds can thrive.
- To facilitate the application and distribution of funds to our community groups to help grow the programme.
- To co-ordinate larger pest control projects which may involve a mixture of private and public land. Examples are Opepe Bush Historic Reserve, Waipahihi Gully Restoration and the Waikato River Corridor from Control Gates bridge to Aratiatia.



Above: Volunteers from Predator Free Taupō and Forest & Bird worked alongside DOC staff to set up the new community led project at Opepe.

Photo: DOC

Taupō residents keen to take action can contact Predator Free Taupō through Facebook or the Predator Free website (external site).

*Engagement figures come from the Survey of New Zealanders 2016.

Predator Free 2050

Ridding New Zealand of possums, rats and stoats by 2050 is a New Zealand-wide goal. It will require new techniques and a co-ordinated team effort across communities, iwi, and the public and private sectors.

The Taupō Fishery

James Barnett
Community Ranger,
DOC Taupō Fishery Management Team



Vintage Year for Trout Anglers

The Taupō trout fishery has seen an excellent year, with large numbers of good sized fish caught by anglers, both in the rivers and on Lake Taupō. Fishing related businesses such as tackle stores, accommodation providers, and fishing guides reported plenty of positive feedback from customers, with some suggesting anglers had the most productive winter spawning season for a decade.

These sentiments are reinforced by the preliminary findings from the DOC Fishery Management Team's scientific monitoring programmes. Data from the spawning trap on the Waipa Stream revealed the average size of trout this year was 1.6kgs (3.5 lbs.) - the largest since 2006. As a recent comparison, trout from the previous year averaged 1.2kgs (2.6 lbs.).

Information from the spawning trap forms only part of the fishery management jigsaw puzzle. To complete the picture, fishery managers need to factor in data from lake productivity surveys and angler surveys. Detailed analysis for this season is yet to be completed but early indications suggest the productivity within Lake Taupō is very good, especially at the southern end. This indicates bait fish called smelt, which form the main food source for trout in Lake Taupō, are doing well.

In addition, surveys confirm anglers have been catching plenty of fish. The winter spawning runs produced great fishing on most rivers, while boat anglers reported considerable success, with 'jigging' proving to be a particularly effective method on Lake Taupō during the warmer months.



Fishery managers are keen to maintain the positive trend and have introduced regulations to encourage anglers to harvest more trout - the minimum size limit has been reduced to 35cm while the bag size has been increased to six trout per day. At first glance this approach may not appear beneficial to trout, especially in an era of catch and release. However, the Lake Taupō fishery has a plethora of excellent spawning tributaries with the capacity to recruit huge numbers of juvenile trout. Anglers who take fish for the smoker are helping to reduce the level of smelt predation, which in turn ensures more food for the remaining trout which promotes a healthier population.

Other changes this year include the introduction of new licence categories aimed at offering kiwi families' greater flexibility, especially when taking their

Above: Lake Otamangakau.
Photo: James Barnett



Above: Winter Tongariro River.
Photo Jimmy Johnson

kids fishing, and clarification around licence definitions and legal fishing methods. The increase in licence sales suggests the changes are popular with anglers and their families.

Below: Harry Hamilton – long time member of the fishery team who died in 2017. *Photo: DOC*

In other parts of the region, a change in access policy around Lake Otamangakau has resulted in some anglers having to adapt their approach to fishing this iconic lake. Wilderness style camping sites along the western arm of the lake



And on a final reflective note for the year, it is very important to acknowledge the passing of a fishery stalwart staff member. Harry Hamilton, who was a member of the fishery team since its inception, passed away this year within days of his planned retirement, an event which saddened not only his fishery team members, but the great many people Harry had dealings with over his career with DOC. He literally left very large boots to fill, and will be fondly remembered.

E Harry, haere atu rā, haere

Moe mai ra e koro, e te Rangātira, e te hoe

can now only be accessed from a boat due to the introduction of gates across private forestry roads. The Fishery Management Team has been involved in extensive negotiations with landowners and stakeholders to identify alternative camping areas for non-boat users. Discussions have been positive, and solutions are on the horizon.

Looking ahead, 2018 could continue in the same vein, with excellent fishing on offer. Anglers can do their bit to support the management of the fishery by regularly harvesting fish – that should not be a tough challenge given the quality of trout available.

This highly productive wild trout fishery is truly one of New Zealand's most outstanding angling destinations. A wild fishery where management decisions are underpinned by world leading fishery science.

Demolishing the Dome

Clearing the top of Mt Ruapehu of the last building

The Dome Equipment Shed has been removed from Mt Ruapehu as it is no longer needed to house volcano monitoring equipment.

The shed was originally built as the Dome Shelter, but has been destroyed, rebuilt and damaged in volcanic eruptions. Since the 1995-96 eruptions its function has been restricted to an equipment shed for monitoring volcanic activity.

Department of Conservation (DOC) Tongariro District Operations Manager Bhrent Guy says *"The shed hasn't served as an effective shelter for two decades and, since 2011, the important volcano monitoring equipment has been housed*

in the purpose-built 'Matarangi' facility at Glacier Knob as part of the GeoNet project managed by GNS Science with support from DOC and the local ski field operation Ruapehu Alpine Lifts. The Matarangi facility is a crucial part of the Tongariro National Park's wider volcano monitoring network that supplies data to the Ruapehu Eruption Detection System."

Bhrent says removing the shed also acknowledges the cultural significance of Mt Ruapehu's sacred summit plateau.

DOC is sensitive to the history surrounding the building and has been working with individuals and organisations connected to incidents associated with Dome Shelter.

(See also Volcano Watch on page 34)

Top left: Dome Shed after 1995 eruptions showing damage suffered. DOC volcanologist Dr Harry Keys at the shed's entrance. The 2007 eruption injured one of two climbers using the shed's lobby as a shelter. Following a dramatic night-time rescue, the injured climber subsequently had one leg amputated.

Photo: DOC

Top right: Dome Shed buried in snow, winter 2017.

Photo: DOC

Bottom left and right: Dome Shed being demolished late February 2017.

Photos: Theo Chapman



Educationist and Conservationist

11.10.1934 – 2.11.2016



Sarah Gibb
ex Director Project Tongariro

I first met Bob in the foyer of the DOC office in Turangi in 2002. I'd arrived for my interview with Tongariro Natural History Society. Bob came out to greet me with a big grin on his face and a 'Welcome'.

That was to be the start of a very important friendship for me, as Bob and wife Margaret were to mentor and guide me throughout my time at Tongariro.

I loved Bob for how he said a lot with such few words. He answered his phone to 'Bob'. The tone said 'I'm here, talk to me'. He was a great listener. Very quickly

Below: Bob trying out the new Project Tongariro donation box at the Whakapapa Visitor Centre.

Photo Sarah Gibb



I learned that he spoke with purpose and that I needed to listen and learn. He was also a great writer, often writing articles for journals for the organisations he supported.

He was passionate about the history of Tongariro National Park, the cultural perspective, the introduction of skiing to the park and the living legacy that is Tongariro Natural History Society (TNHS). It was very important to him that the society grew, but also remembered its beginnings.

Bob, Margaret and I would quite often talk about the early days of TNHS. Their whole family had grown up with the club activities in the park both with Serac Ski Club and TNHS. Bob told me how Chief Ranger Bruce Jefferies recruited him and then had him 'grow the first membership base'. They would stand at the bottom of the chairlift until they saw a potential family come along. 'We'd push in the line, tell the kids to take the next chair and then have the length of the ride to convince Mum or Dad to join the society. We had a great success rate!'

Yet when I asked Bob to put this important story to paper in 2005, he didn't tell that gem, instead focussing on others. Typical of him.

Bob had some long stints as President of the Society but actually I don't think that will be his lasting gift, more that strategic vision to see the partnerships that would work together in Tongariro, especially between the Department of Conservation and TNHS.

Bob and Margaret were in Wellington and every six months or so he would have me down there for the Wellington embrace. That meant a visit to the Beehive or to meet people he felt should be made aware of the work of TNHS. Bob felt strongly that the Minister of Conservation of the time needed to know what a small environmental organisation could achieve. On one occasion he introduced me to Paul. All I managed



was a hand shake, overwhelmed that I was with Sir Paul Reeves in the entrance to the Beehive. Afterwards, in the lift up to meet Minister Chris Carter, Bob just gave me the grin again, no comment.

Bob and Margaret showed their passion for the park in different ways. Most obvious to most, is that along with other lifetime park advocates Roy and Annette Dench, Bob and Margaret gave up chunks of their summer to help out on the DOC Summer Holiday programme and in the Whakapapa Visitor Centre.

My favourite memory up there was when the new donation panel and box were first on display, I told Bob he'd better put in a donation and I'd take a photo for prosperity. He was reluctant for the photo but I nagged. He said he'd better make it a \$20 then, encouraging others to contribute that amount. We used the \$20 for the photo, then he took it away again and deposited a \$5. We laughed loudly.

Bob didn't mind any new ideas I took to him for consultation. In other words, sounded out first before going any further: Tussock Traverse, Kites, restoration of Hapūawhenua Viaduct and a few that didn't go anywhere!

All these years later, a Kite festival is still held on the golf course in front of the Chateau on New Year's Day. Bob and Margaret were the first to offer to wind the string on to the handles of the kites we made for children. They did that for years. Great fun!

Fond, fond memories and thanks Bob for the everlasting contribution to the people and place, Tongariro National Park.

Above: Bob and Margaret on board the special vintage train en route to the Hapūawhenua Viaduct opening.
Photo: Project Tongariro

Monitoring results for the Old Coach Road – “trifecta of history, scenery and activity”



Stacey Faire
Community Ranger
Whakapapa

The Ohakune Old Coach Road is managed as a Heritage Icon site and provides an opportunity for people to visit the historic Hapūawhenua and Taonui viaducts and enjoy stunning scenery.



The Old Coach Road has been established as a Grade 2/3, shared cycle /walking trail since 2010. The 14km Old Coach Road forms the second leg of the Mountain to the Sea Cycle Trail.

The Tongariro Management Plan requires the Department of Conservation to complete monitoring of the environmental, social and heritage effects from use of the trail. So far the department has completed 12 monitoring reports to adhere to Section 4.3.2.12, policies 6-12 of the Tongariro National Park Management Plan.

The monitoring has:

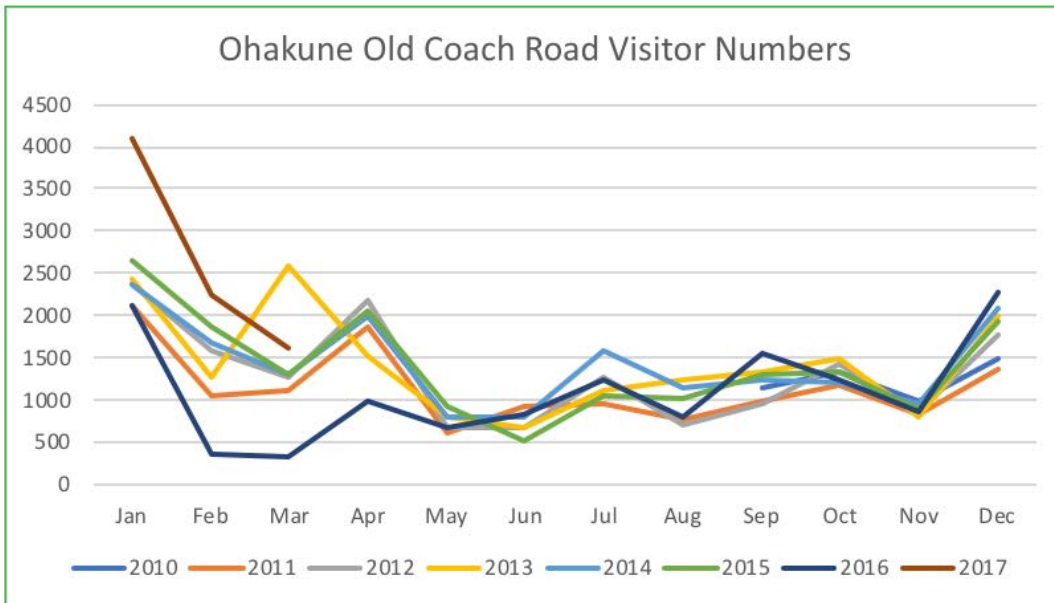
- provided a baseline environmental conditions (2005),
- completed an environmental assessment at the three-year trial period,
- concluded that the impacts of

mountain biking where localised to 0.04%, and

- identified that these minor effects could be minimised through surface maintenance and recommended that impact monitoring is targeted to be cost-effective and specific,
- resulted in the implementation of track maintenance to reduce minor effects of mountain biking,
- focused on specific concession monitoring, which demonstrates general compliance with conditions,
- concluded that interpretation panels are valuable, Old Coach Road is of the most popular heritage icons in New Zealand and more work can be done to share the planning phase for visitors, and
- confirmed that the department provides notification of the shared use status on their website and on the signage.

The Department has been monitoring visitor numbers since the opening of the trail in 2010. As anticipated the trail generated significant interest in the first three years and has continued to build in numbers with a trend developing in recent years of an average of 16,000 visitors using the recreational opportunity per annum. It is important to note that track counter information is only indicative of usage, counters cannot record direction of travel and are prone to technical issues in the damp environment.

Several visitor surveys have been completed for the Old Coach Road by the department. The one that stands out was managed by the department's National Heritage Team. They focused on visitor interaction with interpretation signs



Above: Endless vista to the south from near the start of the Old Coach Road trail

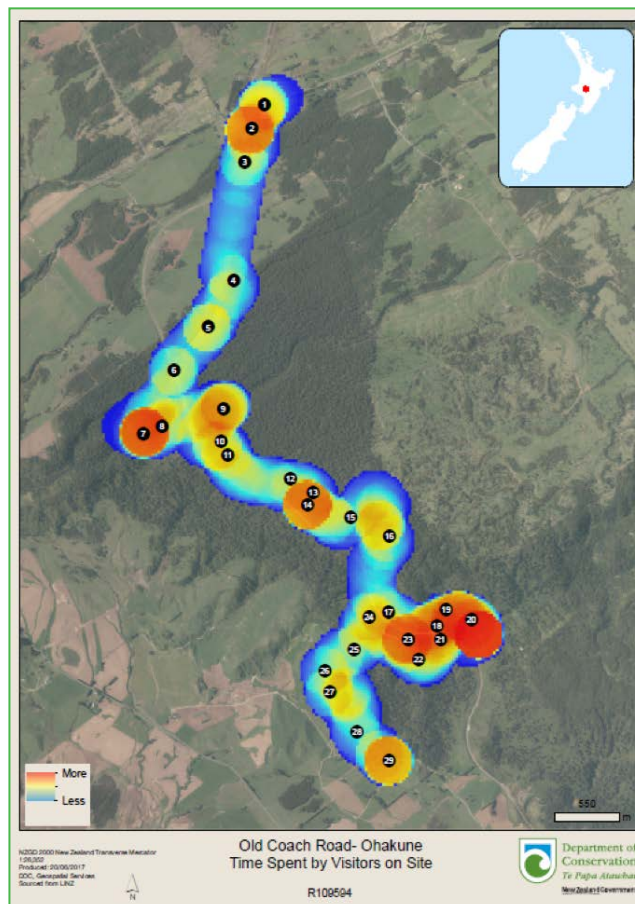
Left Old Coach Road visitor numbers per month recorded from track counters.

Below: Old Coach Road time spent by visitors at the interpretation panels.

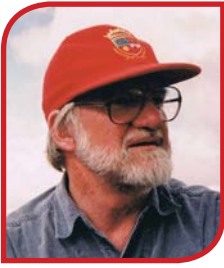
and on social media channels which highlighted:

“Of all the Heritage Icon sites investigated OOCR probably has the most significant and self-sustaining online presence for potential visitors to learn about it when researching experiences available to them in NZ. This is largely because of its connection to Nga Haeraenga, The New Zealand Cycle Trail and promotion by travel bloggers and journalists promoting mountain biking experiences”

The research completed in 2017 provided the visitors with GPS trackers to monitoring their time spent on the track in relation to historic sites and interpretation panels. This work demonstrated that visitors spent time with the interactive signage to learn and play while on their journey. Most of the visitors rate this experience as “Amazing” and report describes the trail as a “trifecta of history, scenery and activity”(2017 Visitor survey).



Lest we forget



Bob Stothart
June 2005

The Tongariro Natural History Society was born out of tragedy following the untimely deaths of five people on the inhospitable slopes of Mt Ruapehu. Testing a searchlight for night flying search and rescue operations the helicopter they were in became disorientated and crashed into the mountain killing all those on board. It was less than two weeks before Christmas, 1982.

Those in the helicopter were:

- Keith Blumhardt – Ranger Whakapapa
- Bill Cooper – Senior Ranger Ohakune
- Doug McKenzie - pilot
- Derek White – Ranger Whakapapa
- and Marie Williams – Park assistant.

The mountain community was stunned by such loss of life. A memorial service was held in the ballroom of The Chateau and people gathered from around New Zealand to grieve. In the weeks that followed the idea of some kind of memorial to those who had lost their lives was discussed and money was donated for this purpose.

In an inspired move Bruce Jefferies, who was then Chief Park Ranger at Whakapapa, and Roy Lynch (who was to be the first president) suggested that a natural history society be established to work alongside park staff in the promotion of park interpretation and conservation. Natural history societies are common in America associated with national parks. The idea caught the imagination of some enthusiasts and when the Society was formed officially in 1984 it became the living memorial to the night fliers. The money donated was incorporated in a memorial fund and was used to publish *Volcanoes of the South Wind*. This book by Karen Williams (sister of Marie Williams) has been a trail blazer for the Society and has given confidence to members to continue to publish information about Tongariro National Park.

This is one of many articles Bob wrote for the Tongariro Journal. He wrote at least one article every year and was invariably the first to get his article(s) to the editor!

An essential connection was forged with the Department of Conservation (originally The Department of Lands and Survey) with the development of a Memorandum of Understanding between the Society and DOC. This gives the Society a special status in it's relationship with DOC and has enabled both parties to plan cooperatively to meet conservation ideals. The mutual benefits are on-going and strong.

The new society published a second book, *Roots of Fire* by Isabel Gabites, and has subsequently published several other books. In the first few years members met to explore the park, often to interesting places not on or near the main tracks. The following day was usually spent providing volunteer services for various tasks within the park. Along the way finances increased and contributions were made to the Ohakune Visitor Centre, the current park handbook, signs at Rotopounamu, the audio visuals at Whakapapa and to many other projects. Members also assisted with the Summer Programme, at the Whakapapa Visitor Centre and in other ways helped Department of Conservation.

Following the filming of Lord of the Rings in the park, the society received a considerable boost in funding (for restoring the film sites to their original state) and the employment of staff became possible resulting in increased volunteer activity and the accessing of funding from significant organisations. Members will be aware of the work at Rotopounamu, with blue duck and on other projects.

The hopes and desires of those who started the society are now being realised in a wide array of activities. Arising from the tragedy of the crash more than twenty years ago is a vibrant organisation which recognises, in all its activities, the spirit of the people who died..

From despair and sorrow have come fresh ideals and the progressive realisation of dreams.

The ascent of three North Island volcanoes

(By telegraph from our special correspondent.) Wanganui, March 13, 1898

This article from The Press, Volume LV, Issue 9984, 14 March 1898 is available today thanks to the digitising of many early newspapers now available on Papers Past. <https://paperspast.natlib.govt.nz/> Digitised in partnership with the Christchurch City Libraries.

Mr and Mrs Malcolm Ross, who during a short holiday tour in the North Island made the ascent of Ruapehu, Ngauruhoe and Tongariro, arrived here yesterday, via Wanganui River.

Mrs Ross is the first of her sex to climb the three great volcanoes of the North Island, and the only woman who has ever set foot on the summit of the active volcano Ngauruhoe. Mr Ross, interviewed by a Chronicle reporter, gave a brief outline of the expedition, which was a most interesting one.

Mr Frank Low and Mr Russell, of Wellington, were among the party who climbed the three mountains. On arrival at the base of operations Ngauruhoe presented a magnificent sight, the mountain being unusually active and belching forth enormous columns of steam, which rose to a height of from 2000ft to 5000ft. Indeed, the mountain seemed too active to be safely ascended. It was noticed, however, that the activity was least in the morning, so it was decided to make a very early start from a camp at the base of the mountain.

The weather was glorious on the day of the ascent, and the party were on the summit of the volcano shortly after 8 a.m. A new route was taken, the ascent being made by the steep but firm rocks of one of the more recent lava streams. Owing to a change in the wind, the climbers had to go round the cone to the westward for some distance to avoid the fumes. They were most fortunate in being able to descend into the basin of the main crater and to approach right



Left: Mrs Forrestina (Forrest) Ross, journalist and mountaineer, the first woman to climb the three central North Island peaks.
Photo: University of Otago

to the rim of the inner, and peer into its cavernous depths, from which steam and smoke came rolling upwards in great puffs.

Very few people have been able to look into the inner crater. On this occasion, it presented a grand and weird sight, the ground trembling, and there was a continual boiling and gurgling in the main vent, which is of large size, and no doubt of great depth. The fumes were exceedingly powerful and unpleasant, and could not be breathed for more than a minute at a time. Jets of steam hissed here and there from the floor of the crater, near the outer rim, and also from the large secondary crater, which is filled up with a mass of sulphur, ashes and volcanic debris. The rocks on the high cliffs that rise above the crater on the eastern side appear to be crumbling away, and falling into the crater, so that the mountain is probably slowly decreasing in height.



Above: Malcolm Ross was born in Dunedin and grew up with a passion for sport, particularly mountaineering, and a talent for writing. He served his apprenticeship in journalism on the Otago Daily Times from 1882 to 1889. In 1890 he married Forrestina Grant, who shared both his love of mountains and his literary ability. During World War I he was an official war correspondent.
Photo: Ministry for Culture and Heritage

Some beautiful specimens of sulphur and other crystals were secured from the sides of the crater. The views on either hand were magnificent, and Egmont towered above the clouds.

The party descended the mountain on the opposite side for 2000ft, then crossed the Great Southern crater and climbed along the Tongariro range. Here the wonders of the red crater, the strange sulphur lagoons, and the beautiful blue crater lake of Rotomahana, which is perched at an elevation of 5670ft, were duly admired. Steam was issuing from the red crater and Te Mare (sic) was active.

Camp was reached after a long day's scramble of fourteen hours, but the wonders of the crater of Ngauruhoe, the glorious views from the summit of the volcano and the interesting features of the Tongariro range were a more than ample reward for all the exertions of the day.

The ascent of Ruapehu was made from a high camp via the large glacier on the eastern face, and four hours were spent on the summit of the mountain. The crater lake was found to be cold—indeed there were lumps of ice floating in it, and cliffs of ice 60ft high on the southern side. Mr Ross therefore thinks that the reported eruptions of Ruapehu as recently telegraphed to the newspapers, are more mythical than real. On the evening before Mr Ross's party made the ascent, what was supposed to be steam was seen rising from the vicinity of the crater lake. On investigation the next day, it was found that the supposed steam was composed of clouds of ashes blown about in the wind, and there was no sign of activity anywhere on the mountain. There can, however, be no doubt that Ruapehu is still an active volcano, for both Mr Low and Mr Cussen, Government surveyors, have seen the crater lake boiling and steaming. Mr Hill, of Napier, also witnessed a similar phenomenon.

Mr Ross mentions that the rainbow trout sent from the Wellington Acclimatisation Society's ponds at Masterton were liberated by Mr Frank Lowe on arrival at Ruapehu in streams flowing from the Tongariro National Park.

Mr Ross secured an excellent photograph of one of the red deer recently liberated in the National Park. He was a fine animal, with a head carrying ten points. He, became unpleasantly inquisitive, however, and the photographers had to retreat hurriedly with their cameras to their waggonette. The stag followed them for eight miles into Tokaanu, and turned out to be a remarkably quiet and docile animal, till some 300 Māoris who had assembled at Tokaanu, and had never before seen a deer, irritated him to such an extent that he became furious and rushed Mr Blake, brother of the hotelkeeper, knocking him down and goring him seriously in the thigh. The night was dark, and no one was at hand at the moment to render assistance, so that Mr Blake had a very narrow escape.

Several other deer have come over the Kaimanawa ranges from the Napier side.

Stoats and weasels have also made their appearance in the National Park, so that the pheasants there are likely to become exterminated. Kiwis are still numerous in the bush on the Kaimanawa ranges, and Māoris occasionally make expeditions, and secure them in considerable numbers. Numerous mutton birds make their home for a time on the slopes of Ruapehu.

The party experienced beautiful weather from start to finish of the expedition and were delighted with the fine forest scenery along the route, the wonders of the volcanic region, and the beautiful scenery of the Wanganui river above Pipiriki.

120 years on ...

120 years after Malcolm and Forrestina Ross traversed Tongariro via Red Crater, Blue Lake and Te Maari (among the first Europeans to do so) visitors come from all corners of the Earth to hike a similar walk, now marketed as the Tongariro Alpine Crossing (TAC). An article in the 2016 Tongariro journal noted how busy the TAC has become and that DOC, Ngāti Hikairo, TAC Transport and Guiding concessionaires, local councils and others have been working together to better protect the dual World Heritage status and other environmental values, and reduce risks to the visitor' experience.

In 2017 DOC removed signs beside the TAC to the summits of Ngauruhoe and Tongariro. This was done for several reasons including safety and promoting respect for the cultural values of the mountains. People may still climb the peaks but are asked not to stand or eat on the summits, similar to arrangements in place for Aoraki-Mt Cook, several other New Zealand peaks, and elsewhere in the world (e.g. the Himalayas).

Another goal is to encourage the majority of people to focus on completing the already challenging 20km TAC track without deviating from it. It is hoped that incidents involving inexperienced visitors on Ngauruhoe's steep-sided cone, rockfall in summer and ice in winter, will be greatly reduced. Ngauruhoe is where the highest number of severe trauma accidents have occurred in Tongariro National Park and already there is evidence that there has been a dramatic decrease in the number of people needing rescue.



Karen Williams
Author

Below: The procession of hikers makes its way down the track from Red Crater rim, Labour Weekend 2016. Management steps are underway to better control the numbers making the crossing and in doing so enhance the wilderness experience.
Photo: Andrew Murphy



Collaboration – what was always intended



Stacey Faire
Community Ranger
Whakapapa

*He Turanga a Te Hau Kainga
He tohu whakahonohono mō te hapū, mō te iwi,
mō te Papa Atawhai hoki*

Manaaki Tangata Manaaki Whenua

A team of people work for Te Hau Kainga Tuwharetoa, a kaupapa (purpose) driven organisation supported by Ngāti Hikairo ki Tongariro, the guardian hapū (sub-tribe) of Tongariro.

Leading the Te Hau Kainga Team are managing Directors, Te Ngaehē Wanikau (Strategic and Cultural Advisor); Hinemoa Wanikau (Administration Management) and Jacqueline Iorangi (Operations Management and DOC Liaison).

Te Hau Kainga provides qualified, experienced staff to the Department of Conservation on secondment in various roles representing the Te Hau Kainga kaupapa.

Based at the Whakapapa Visitor Centre are Tania Konui and Hoani Taoho. Tania is the Supervisor Ranger of the Visitor Centre and Hoani is a Visitor Centre Ranger ensuring that the face of Ngāti Hikairo is present at Whakapapa Village.

At the entrance to the Tongariro Alpine Crossing Te Hau Kainga provides Traffic Management to safely manage the volume of visitors to the iconic walk. Representing Te Hau Kainga at the Mangatepopo car park are Kenneth Grace, Whaiora Raharuhi and Nikau Raharuhi.

Te Hau Kainga has a joint venture to manage the Whakapapa Holiday Park, contracted to DOC. Te Wharerangi Wanikau is the Assistant Manager.

Below: Hoani Taoho providing a blessing to the Tongariro Northern Circuit Hut Rangers October 2017
Photo: Stacey Faire





In the last four months I have been privileged to work alongside Hoani Taoho.

The benefits of having cultural secondments are many. One of which is phasing into the co-management of the Tongariro National Park by sharing operational knowledge with Te Hau Kainga while building relationships between both Department and Te Hau Kainga staff. Another is creating cultural connections between visitors and Ngāti Hikairo. In his time at the visitor centre, Hoani has assisted with making numerous connections with compassion, respect and care.

them and visitors safe on their journey. The weather and context made it a magnificent day. The karakia and closing waiata (song) meant a lot to our hut rangers and created a great start to a busy hiking season.

In hosting our South Korean Officials, Hoani, provided the pōwhiri (formal welcome ceremony) and spent time to acknowledge and provide care for visitors into the rohe (area) of Tuwharetoa. Our guests also wished to experience walking the Tongariro Alpine Crossing the next day and Hoani guided them to provide a cultural understanding of the sacredness of the hikoi (walk).

Above: Hoani Taoho providing a cultural exchange with South Korean Government Officials.

Photo: Stacey Faire

*Ka mihi ki a Ārio,
Tākaka ratou ko Taunāpiki,
nga kaitiaki tūturu o,
nga maunga me te whenua hurinoa.*

**An acknowledgement to Ārio,
Tākaka and Taunāpiki,
the spiritual guardians of,
the mountains and surrounding lands.**

The two most memorable connections which stand out for me is the karakia (blessing) of the Tongariro Northern Circuit hut rangers and a cultural exchange between South Korean Delegates and Ngāti Hikairo at the Whakapapa Visitor Centre.

The hut ranger karakia was a key milestone as it was the first of its kind for the district, to acknowledge the rangers mahi (work), and to keep

I met the group at the end of their journey and Hoani completed a karakia and a haka (ceremonial dance) to acknowledge the end of their time together.

It was one of those memorable moments when you get to experience the cultural connections through the karakia and waiata, the pōwhiri and haka, and the hikoi; and recognise that working together in collaboration is what was always intended.

Volcano Watch 2017



Harry Keys
Science Advisor-Volcanology
Department of Conservation

Introduction

2017 has been another quiet period for volcanic activity in Tongariro National Park. But there has been plenty to occupy DOC's volcano staff including new members of the team Hollei Gabrielsen, and Julian Tovey and since Julian left midyear Theo Chapman. Theo is now the new Senior Ranger Public Safety succeeding from Blake McDavitt who moved with his family to Hawkes Bay. We have been busy with work associated with monitoring Crater Lake/Te Wai ā-Moe in association with GNS/GeoNet, plus the Eruption Detection (Ruapehu & Tongariro massif), Village and Eastern Ruapehu Lahar Alarm and Warning systems, Dome shed, Whakapapa Village, Tangiwai Memorial site upgrade, and reviewing scientific permit requests and papers. Our succession policy for DOC volcano staff is starting to bear fruit.

Figure 1: Hiking through the 2012 Te Maari blast zone during the Mahi Aroha summer programme. Mountain toatoa are all dead here, about 1 km from the crater, but red tussocks and some alpine shrubs have recovered.

Photo: Harry Keys

Tongariro - Te Maari and Red Crater

The Volcanic Alert Level (VAL) for the Upper Te Maari vent system remains at 0 (no volcanic unrest). The visible fumaroles have continued to get smaller with gas

emission normally less than 10 tonnes of sulphur dioxide per day (background level). Trips with Project Tongariro mid-year and Mahi Aroha summer programme in January 2018 made it up to the Upper Te Maari crater via the new western crater. Vegetation in the blast zone of the 2012 eruption is continuing to recover but dead mountain toatoa are still prominent (Figure 1) out to 2km from the crater. Sparse recolonisation of new bare ground had occurred on the 2012 debris avalanche and lake deposits at 1300m (bristle tussock, a rush possibly *Lazula banksiana var migrata*, streamside species and ferns) and ferns *Paesia scaberula* and *Histiopteris incisa* up to 1450m). But no recovery of vascular plants was noticed in areas where geothermally heated ground had previously supported a diverse flora.

The 2012 eruption resulted in a series of transverse cracks (Figure 2) and a large slumped block through the west rim of Upper Te Maari crater above the debris avalanche scar. This area was visited during both trips and no recent movement was evident. Earthquakes since the eruption (largest was magnitude 2.5 during August 2015) have not been sufficient to cause noticeable changes. The magnitude of a shallow local earthquake that could destabilise the rim again has not been calculated but could be greater than M4 (Steve Sherburn GNS Science personal communication). Any resulting debris avalanche would likely to be less than a tenth of the volume of the 6 August 2012 event and therefore unlikely to have any implications direct or indirect on the Tongariro Alpine Crossing track (TAC).

However, the TAC has been significantly affected during flood (secondary lahar)



events since October 2012. Flood events in Mangātipua Stream which runs through the debris avalanche deposit have continued to widen the flood path and carry material downstream. Together with the loose debris already in the Lahar Hazard Zone on the TAC this has resulted in ongoing stream channel instability in the LHZ and track damage during heavy rain events. Since 2013 such events have resulted in damage to the TAC 1-2 times per year on average. However, the frequency of damaging events appears to have reduced in the last two years and the amount of rain needed to cause damage has increased. (For example, no channel changes occurred and only minor mud was deposited on the LHZ boardwalk in a major downpour on 23 January with 82mm of rain measured by Genesis over two hours at Rotoaira and 50 mm over three hours at our Tongariro alpine weather station).

The most serious damage is now being caused north of the LHZ where some of the Mangātipua stream has been forced to the east of the previous channel in a distributary flow (Figure 3). A box culvert built after the 2012 event continues to be overwhelmed resulting in ongoing erosion of the track and the Ketetahi Road. DOC, in consultation with Ngāti Hikairo advisor Bubs Smith has decided to move the track



sideways and raise it to avoid this ongoing damage.

New research has confirmed that significant eruptions have occurred at Red Crater and Emerald Lakes very recently in geological time. Brad Scott and Sally Potter (GNS, 2014) concluded there were 2-3 eruptions here in the 1920s and 30s. Annika Greve, Gillian Turner and Chris Conway (Victoria University) recently refined the ages of several lava flows in TNP: the prominent lava flow in Central Crater was erupted from Red Crater only 200-500 years ago. This is consistent with the findings of Memorial Award winner Anya Moebis

Figure 2: These cracks on the west rim of Te Maari crater (photographed on 21 October soon after the 2012 eruption) were no longer open in 2017.
Photo: Harry Keys

Figure 3: Distributary overflow overwhelming a box culvert on the TAC after heavy rain on 12 April 2017.
Photo: Ben Scrimgeour



Figure 4: Trail of ballistics (marked by red outline) that were erupted from Red Crater-Emerald Lakes less than 200-500 years ago. The fallout was down onto the lava flow in central crater in an area now traversed by the Tongariro Alpine Crossing.

Photo: Harry Keys



et al (Massey University) of significant tephra deposition from Red Crater about 300 years ago and 16 young tephra layers representing eruptions within the last ≈ 300 years. Stephanie Gates (Canterbury University) is studying the risk from boulders and rocks erupted on top of (i.e. even younger than) the lava flow on central crater adjacent to the TAC (Figure 4). This work emphasises the volcanic risk to people near Red Crater.

Ruapehu

Crater Lake/Te Wai ā-Moe has been through another of its normal cooling and heating cycles over the last 15 months (Figure 5). The lake has stayed warm (between 32 and 43°C) from August 2017 for four months, similar to its behaviour in 2015. From October steam was seen rising from the crater several times on cool clear days (see Table 1 in last year's article in Tongariro for weather conditions when this happens) but January 2018 was too warm for that. In late 2017 GNS recorded relatively high levels of sulphur dioxide (SO₂), carbon dioxide (CO₂) (Figure 5), and hydrogen sulphide (H₂S) from Crater Lake Te Wai ā-Moe. Volcanic tremor was also present. GNS issued three Volcanic Alert Bulletins in November and December noting the behaviour was not unusual.

The temperature peaks reached through the last 12 months have not been

as large as the previous 24 months, particularly in 2016 when measured gas emission was also higher than in 2017. The GNS bulletins noted that this behaviour of Ruapehu - higher than usual temperatures and high gas fluxes (emission) - is common when the vent system is regarded as being "open". This has been observed in the past outside of eruptive periods and following them (e.g. 2008). Conversely lower temperatures are normally accompanied by lower gas flux but the relationship between lake temperature and gas is not simple (Figure 5). There are many periods when the vent is regarded as open but gas emission is low.

DOC has a responsibility for visitor safety in TNP which we take very seriously. Ruapehu has a history of hazardous-sized eruptions many of which have not been able to be warned about beforehand (e.g. 1969, 1975, 1988, 2007). Some records suggest that most hazardous eruptions are preceded by some signs of unrest (seismic activity, distinctive water chemistry) and occur when the lake temperature is hot (e.g. > 40 °C) and warmer than the average at the time. Some however occur when the lake is colder than average with no indications an eruption may be about to occur. As part of this we see that it is important in a cooling cycle to learn better how to tell the difference between two mechanisms: a) lake cooling most commonly due to

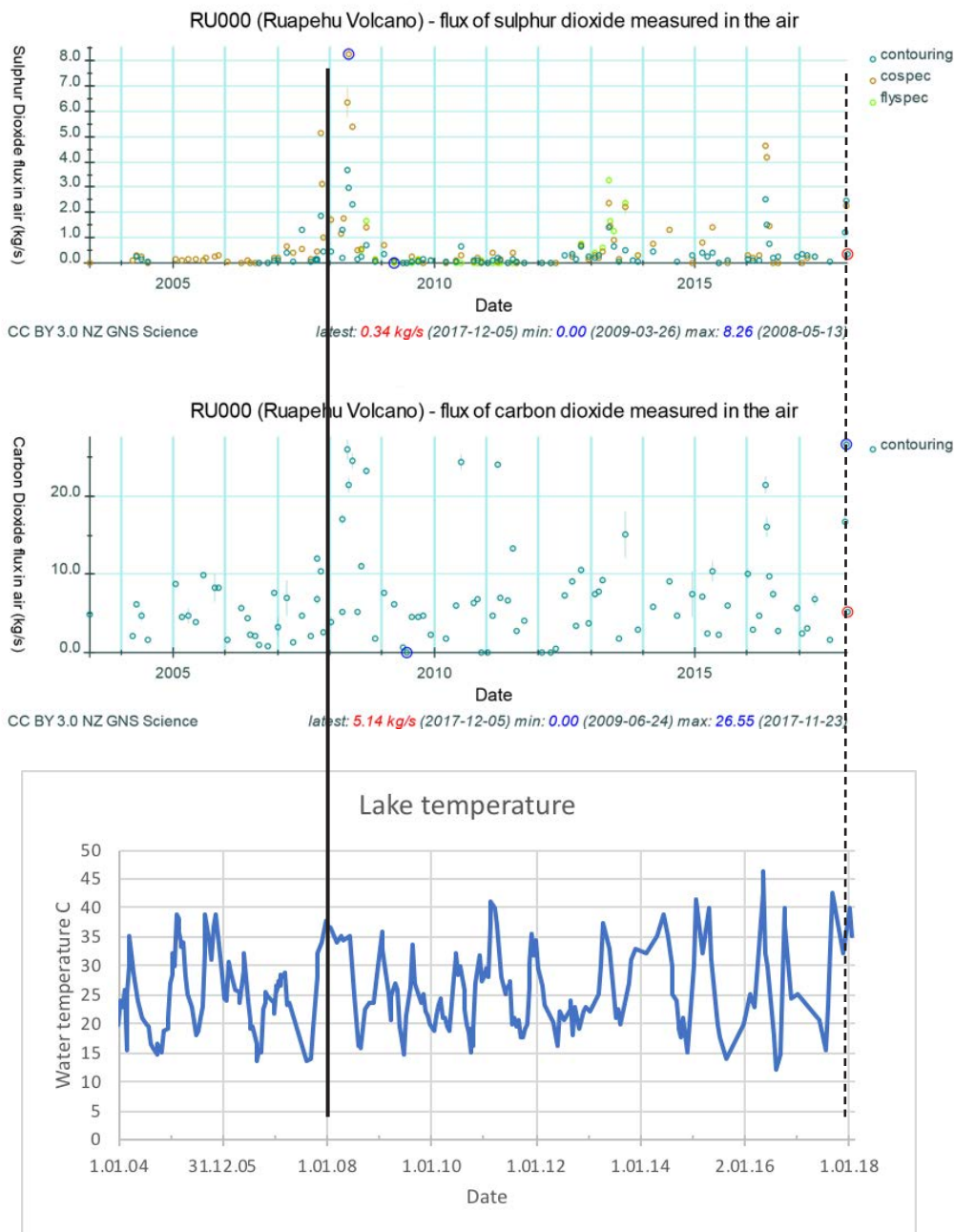


Figure 5: Gas emission and water temperature at Crater Lake/Te Wai ā-Moe from 2004 courtesy of GNS/GeoNet. Major peaks of gas and water temperature in 2008 (vertical line on 1 Jan 08) were associated with 'open vent' conditions following the September 2007 eruption. Other peaks in 2016 (minor 'hydrothermal' activity noted), 2013 and 2017 were not related to volcanic activity. Small eruptive events in 2006 and 2009 are not associated with recorded elevated gas emission then. Gas levels were not able to be measured frequently enough before the 2007 eruption so the situation before the eruption is equivocal.

cooling at depth in the vent (e.g. 2016, 2017); and
b) cooling sometimes due to a vent blockage -in the latter situation if gas pressure starts to build up, visitor safety can be compromised by sudden eruptions (most recently 25 September 2007). These latter situations do not have signs of unrest which means at present it is very difficult to warn people reliably. Cool temperatures are one guide, albeit an inadequate one.

Following the 2016 heating cycles the lake cooled and by mid-June 2017

reached 20°C. This is the DOC-Tongariro volcano team's initial "cool mode watch temperature" in the present lake temperature regime as outlined in last year's Tongariro. Our internal procedures were invoked again, but this time we also requested Mountain Air to try to look for signs of sulphur slicks on Crater Lake/Te Wai ā-Moe. These indicate that hot fluids (brines, steam, other gases) are upwelling into the lake and therefore the assumption follows that the vent is not blocked. The pilots detected slicks through June but in July no slicks were seen on several flights as the temperature

continued to cool (partly due to rain/snow events) to 15.3°C. Images from the Ngāti Rangi-Horizons cam at Dome was also utilised and we hope that with some refinements such a camera will become an important tool for detecting upwelling when other methods are not available due to weather etc.

When the temperature cools to 15°C we need to make decisions about whether to restrict access into the Summit Hazard Zone, working with Whakapapa Ski Area as well as GNS. Weather prevented GNS from gas and lake sampling or close observations during this crucial period. When the temperature started to rise in late July, from our inadequately-informed perspective, we were in a period indicating a resumption of heating at depth potentially accompanied by a pressure increase coinciding with a vent blockage (mechanism b). On the other-hand GNS had no data suggesting unrest was imminent in an absence of positive data that would have been relevant (e.g. seismicity was very low). This dichotomy was resolved on the eve of us flying up for a last check, when Nico Fournier (GNS Volcanology head) visited the lake. He saw clear upwelling implying there was no blockage and there was no evidence of anomalous, throat-burning gas like on our visit in early September 2007. The lesson for us is that while Mountain Air can provide useful aerial observations during their commercial operations, we cannot expect their observations to be as reliable as closer observations on foot or via a helicopter or a high resolution, well focused cam with images available to staff. In this case the evidence eventually showed the cool lake temperatures were due to an absence of heating due to cooler temperatures and less heat flow deep in the vent (mechanism a), rather than a blockage.

Better methods of measuring gas more frequently would help us understand this behaviour and potentially allow hazardous situations to be heralded better. Real time monitoring of multiple gases in alpine environments close to source is becoming

possible. DOC resources have not yet been able to be mustered to help GNS work with the US Geological Survey to bring the technology here.

Work was begun in 2015 by Stefan Cook and his supervisors at Canterbury University after our invitation to examine the stability and strength of the rocks in the crater rim underlying the outlet of Crater Lake/Te Wai ā-Moe. Lauren Schaefer has continued the work and confirmed that about 14 metres of quite weak rock underlie the armoured lava layers currently forming the bed of the lake outlet stream. This confirms there is a potential for a release of about 2.6 million cubic metres of water. If this amount of water was released suddenly a lahar larger than the December 1953 or March 2007 lahars could occur. We need to know more about potential mechanisms for such a rim failure such as a large earthquake, eruption or weathering by the acidic waters, and how large the resulting lahar might be.

The Eruption Detection System needed considerable work this year. A new emphasis by Ruapehu Alpine Lifts on the Turtle trail being family friendly and the new Delta Quad Chair running up the same line as the old Waterfall T-bar indicated the Eruption Detection System needed to be enhanced there. Subsequent changes to the supervisory software and some upgraded hardware are expected to make the system run more smoothly. Theo is rapidly coming up to speed with the other lahar systems as well as further developing the lahar response in Whakapapa Village.

The equipment shed on Dome, formerly known as Dome Shelter was removed as required by the TNP Management Plan. It was the last building located in the summit area of Mt Ruapehu. Following the partial failure of its volcano monitoring function during the 2007 eruption, planning started to find a better location for monitoring equipment. Dome was poorly located, vulnerable to volcanic eruptions, and did not provide an effective

shelter. It was also time to restore the values of a pristine and sacred summit plateau.

The current building was erected in 1984 but then damaged in the 1995, 1996 and 2007 eruptions and needed repairs after each. It replaced a shelter housing volcano monitoring equipment built near the current site in the mid 1960s but destroyed in the 1969 eruption. The building has been a landmark and reference point for backcountry adventures for decades. Unfortunately, it has also been associated with tragedy. In 1990 army personnel were drawn to Dome Shelter in a blizzard thinking that it would provide better shelter than their snow caves in a blizzard. Six of them lost their lives. Twenty-eight years later the accident is still alive in memories of survivors, and the families that lost their loved ones. William Pike and James Christie almost lost their lives there in the 2007 eruption. The army are working with us to remove the building in February. *(See demolition photos on page 23)*

Skier fatality in Japanese eruption

A soldier on a snow training programme was killed on Kusatsu Kokusa ski area on Mt Kusasutu-Shirane volcano (2171m) in Honshu on 23 January. He was one of 8 soldiers hit by flying rocks (ballistics, 10-20cm in diameter according to one report). Four other skiers were also injured, some seriously. There are reports of gondola cabins and buildings also damaged, and possibly flying glass contributed to some of the injuries. A snow avalanche also occurred possibly triggered during the eruption and one skier was caught in it. The massif consists of overlapping pyroclastic cones and several craters and crater lakes. Since 1805 it has erupted at least 17 times, mostly phreatic eruptions which can be hard to predict, like at Ruapehu. The previous confirmed event was in 1983 while in 1932 an eruption caused a lahar which killed two people. One of the craters of the volcanic massif had been

the epicentre of minor volcanic unrest of the last few years and access to it had been restricted. But the eruption was centred at another vent Kagamiike 2km away which hadn't erupted for thousands of years. The restriction was extended to 2km from the vent so the upper part of the ski resort has had to close for some time.

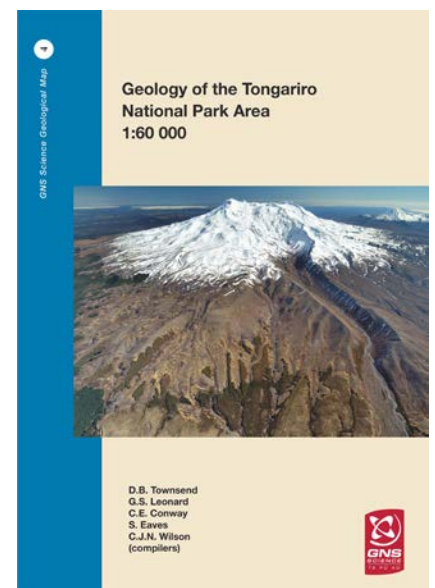
The new geological map of Tongariro National Park

The new map and accompanying bulletin are currently in the final publication phase and will be available probably by May 2018 from GNS and the DOC Visitor Centre at Whakapapa (price around \$50). Many scientists and students have contributed to this major multiyear-multiagency effort in a wide range of projects mentioned here and in previous Tongariros. We now have a much better understanding of the volcanic and glacial history of TNP. The major role of glacier ice and lava-ice interaction in the development of these volcanic landforms has finally been proven. It has finally proven that South Crater on Tongariro should be called South Cirque! Some of this and other information will appear on future editions by Geoff Aitken of New Topo's Tongariro Alpine Crossing, Tongariro Northern Circuit, and Mount Ruapehu maps www.newtopo.co.nz.

Acknowledgments

We are grateful to Blake McDavitt and Julian Tovey who have moved on from DOC for their dedicated and hard work on volcanic risk management and public safety over the years. Bubs Smith and others from Ngāti Hikairo and Ngāti Rangi are stepping into important roles in volcanic management. Nico Fournier, Graham Leonard, Dougal Townsend, Ben Kennedy and other scientists from GNS, Canterbury, Massey and Victoria universities and their students have also made huge contributions and we thank them. We're also grateful to Mark Blair (Doppelmayr NZ) and Dan Jolly (RAL) for ongoing work on the EDS.

Figure 6: Cover of the new TNP geological map by GNS showing Ruapehu and the valley formed by the Wahianoa Glacier which flowed off to the southeast (lee to NW winds) during the last glacial maxima. *Photo: Dougal Townsend*



Based on an article on the Department of Conservation website - www.doc.govt.nz

A change for good

The evolution of the Tongariro Natural History Society is one of many stories that illustrate the connection between the growing success of community initiatives and DOC's changing role to enable others.

What started as a memorial fund 37 years ago, today provides a collective value of work in the order of \$500,000 per annum to conservation if volunteer effort is included.

Project Tongariro is one of many stories of the transformation of a community conservation initiative. It's also a tangible example of how our community engagement role has shifted away from mainly leading to enabling and supporting others.



Former DOC conservator for Tongariro Taupō and DOC representative on the society's committee since 1986, Paul Green has seen the society's evolution both inside and outside of DOC. These days he is president of Project Tongariro and *"delighted to have the opportunity to work from the community perspective."*

Project Tongariro (legal name Tongariro Natural History Society) was originally formed after four National Park rangers were killed in helicopter crash in December 1984. The society was started from a memorial fund from two family bequests and a Memorandum of Understanding signed with the former Lands and Survey department. *"It's been maintained in good faith to this day and probably one of the oldest such agreements DOC has had."*

Initially the organisation focussed on producing publications like a Park Handbook and assisting on summer programmes.

A change for good

In the 1990s DOC Conservator, Paul approached the Society to be an active conservation group raising money and undertaking projects in Tongariro National Park and its environment.

Project Tongariro "accepted this challenge" and undertook projects like restoring Waihohonu Hut, located on the Tongariro Northern Circuit Great Walk.

DOC provided office space for one part-time coordinator which has now grown to four. The Conservancy provided a grant that funded Project Tongariro's administration. By DOC funding \$20,000, Project Tongariro was able to provide \$100,000 -200,000 for conservation work.

As Project Tongariro's experience and confidence grew they reached out for broader community support *"We are also able to assist with DOC projects where additional help is needed –like heather control and dactylanthus surveys."*

Paul adds that they've needed "more proactive management as the work range has grown. *"We have had to develop policies and plans such as health and safety, strategic plan and a marketing plan."*

The most significant change in the Society's evolution is the amount of volunteer days spent on tasks like predator control, wetland restoration and planting.

"Project Tongariro has initiated additional conservation in the community through programmes like Greening Taupō, Kids Greening Taupō, and Predator Free Taupō. In monetary terms the collective value of work is likely to be in the order of \$500,000 per annum if volunteer effort is included."

Whio update 2017

**Rebecca O'Sullivan,
Community Ranger
DOC Central Plateau**

2017 was a very successful year for the Whio Hardening Facility at the Tongariro National Trout Centre with 43 of these nationally-vulnerable birds passing through the creche before being released on rivers throughout the central North Island.

Thirty-nine juvenile whio and two retiring breeding pairs were released into nine protected sites around the North Island where predator control is undertaken. The whio came from all over New Zealand, some travelling by plane all the way from Christchurch thanks to Air New Zealand.

With mammalian pest species such as stoats and rats kept at low levels, wild whio populations bolstered by the captive breeding programme can start to grow in numbers.

This was the third season for the facility - and the most successful yet for the whio - as a result of the dedicated work of DOC staff, volunteers, iwi and community conservation groups such as the Central North Island Blue Duck Trust, Ngāti Hikairo ki Tongariro and Blue Duck Lodge.

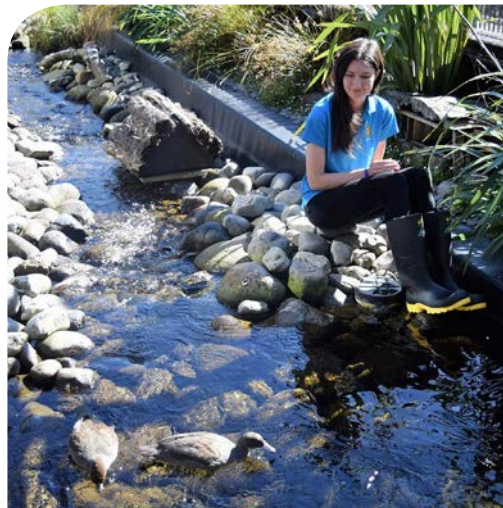
Genesis Energy and DOC have partnered to secure the future of this unique vulnerable native bird. Operating under the name of Whio Forever, this partnership is fast-tracking implementation of the national Whio Recovery Plan to protect whio and increase public awareness.

The support of Genesis Energy is enabling DOC to double the number of fully-secure whio breeding sites throughout the country, boost pest control efforts and enhance productivity and survival for these rare native ducks.

Public awareness was also given a boost this year with the return of the Whio Family Day.

Volunteer Support

Volunteer Kayla spent four months living at the Tongariro National Trout Centre looking after the whio every day – from cleaning the enclosure, to whio observations, health checks



Left: Volunteer Kayla Wilde inside the aviary.
Photo Stephanie Kerrisk

and releases. Volunteer contribution not only gives the whio full-time care, but provides an excellent learning opportunity and hands-on experience for the volunteers – who often come from a tertiary education background in a relevant field.

Return of the Whio Family Day

The event, held at the Tongariro National Trout Centre in March, was hosted by the Whio Forever partnership between Genesis Energy and the Department of Conservation as part of national Whio Awareness month celebrations. More than 70 children explored the site throughout the day on a nature



Above: Conservation dog Beau showing off his concentration skills for the crowd as part of his display.

Photo DOC

Below: Learning the skills of a conservation dog handler.

Photo: Sarah O'Sullivan

scavenger hunt, and tested their balance, observation and other skills in the Whio Ranger Obstacle Course.

Neo and Beau the whio conservation dogs were a big hit! Captive bred whio awaiting release to the wild were a big drawcard in the whio enclosure.

The event will be back again next year for those who missed out this time.

Background information on whio

- The whio is a threatened species of native duck that is only found in New Zealand's fast flowing waters. Featured on New Zealand's \$10 note and with an estimated nationwide

population of fewer than 2500 birds, who are rarer than kiwi.

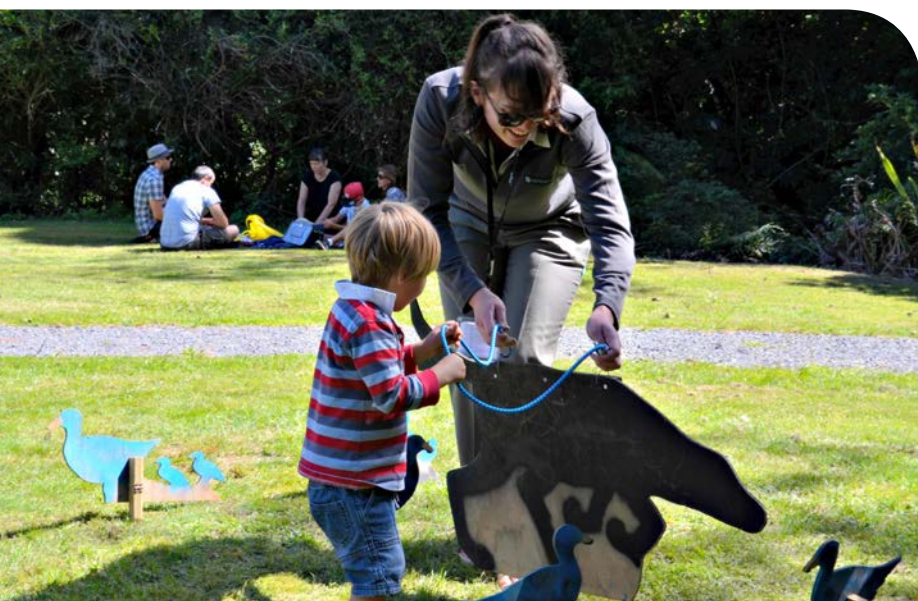
- Whio are adapted to live on fast-flowing rivers so finding whio means you will also find clean, fast-flowing water with a good supply of underwater insects.
- This makes whio important indicators of ecosystem health – they only exist where there are high-quality clean and healthy waterways.

Whio Forever

- Genesis Energy has a strong historic association with whio through the Tongariro Power Scheme and in 2010 this association grew through the establishment of Whio Awareness Month (March).
- Today, Genesis Energy and the Department of Conservation (DOC) continue their partnership through the Whio Forever Programme, which aims to secure the future of whio in the wild and ensure New Zealanders understand and value of whio in our rivers.
- The support of Genesis Energy and the work of DOC has enabled the Whio Recovery Plan to be implemented.

Conservation issue

- The whio are eaten by stoats, ferrets and cats, with the largest impact during nesting time when eggs, young and females are vulnerable, and also when females are in moult and can't fly.
- Extensive trapping can manage these predators and work in key whio habitats by DOC and Genesis Energy on the Whio Forever Project has already seen an increase in whio numbers.
- Whio cannot be moved to predator-free islands like other species because of their reliance on large fast-flowing rivers.
- Pairs occupy approximately 1km of water – so they need a lot of river to sustain a large population and





Left: Becky O'Sullivan and Andrew Glaser with conservation dog Neo
Photo: Sarah O'Sullivan

they fiercely defend their territories, which makes it difficult to put them with other ducks in captivity.

- They are susceptible to flood events which destroy nests, fragment broods and wash away their valued food source.

NB: The first whio for the 2017/18 summer season arrived at the hardening facility in the Tongariro National Trout Centre 14 November 2017. The facility will open through to March 2018.

Below: Staff and volunteers get the opportunity to release a new batch of whio into the facility.

Photo Kayla Wilde



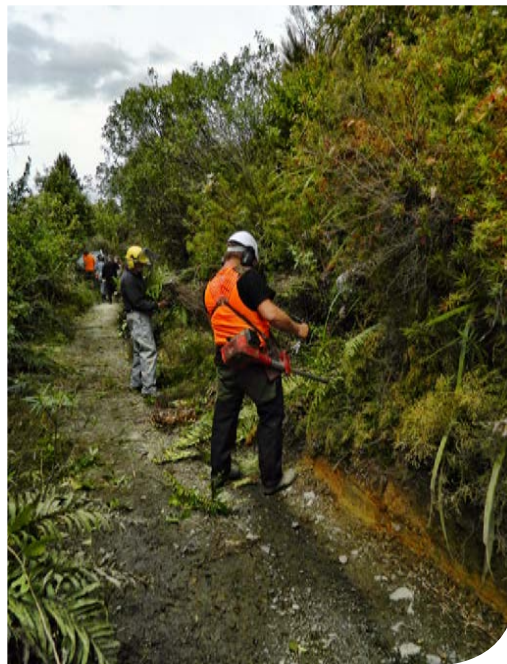
Friends of 42 Traverse – Conservation Yakka!



Stacey Faire
Community Ranger
Whakapapa

There is a new crew on the ground who are willing to get grubby and do some hard yakka to help maintain tracks within the Tongariro Forest Conservation Area.

A new community group called the Friends of 42 Traverse, is a collective of 4WD club members, hunters and other recreational users of Tongariro Forest. Already they have delivered over 1000 man-hours clearing vegetation and weeds from tracks.



Right: Friends of the 42 volunteers carry out vegetation clearance and weed control at their pre-summer working bee.
Photo: Peter Vahry

One of their members, Peter Vahry, has been instrumental in keeping momentum with the group. Lobbying of the Tongariro Taupō Conservation Board about the popular 42 Traverse hike, 4WD and mountain biking track has started. The 48km, Grade 3 ride is the last wild ride of its kind in New Zealand, it traverses from the end of Kapoor's Road and starts at 910m ASL, dropping down to 395m in Owhango.



The community interest in Tongariro Forest is exciting for the Department, but Senior Recreational Ranger Toby O'Hara is keen to manage expectations. There are only three DOC recognised tracks, in Tongariro Forest (42 Traverse, Top Track, Waione/Cokers) that are all designated backcountry status which means they can be rough and uneven and are meant for visitor seeking some adventure, not an easy walk along a gravelled track. Recreational vehicle use is permitted only along the 42 Traverse itself. The main focus has been on just maintaining access the old forestry track, so Biodiversity Rangers can safely track kiwis and who within the native bush.

Tracks across the highway in the Tongariro National Park are experiencing a much larger growth in visitor numbers and our resources are often diverted to address the pressures of increasing tourism to the area.

"Working with the Friends of the 42 is an exciting opportunity for us to work with the community to ensure these opportunities are available into the future and facilities



meet the expectations of the wide and diverse groups of people that use the Tongariro Forest” said Toby O’Hara who is looking forward to sitting down and developing a working plan with the new group.

DOC is pleased to work with the Friends, as they can also reach out to 4WD drivers to help them understand how important the winter closure to 4WD vehicles is. With softer soils, winter track damage can set back track maintenance.

The Friends have established a Memorandum of Understanding with the Department that outlines the working relationships and expectations. *“These agreements are essential to good working relationships and both parties need to have a shared vision to ensure a sustainable future for a variety of recreations within the Tongariro Forest.”* said Peter Vahry founding member of the Friends of the 42.

Click here to join up and help The Friends of the 42

<http://www.friendsof42traverse.nz/>

Above: Friends of the 42 volunteers gather to get their working instructions for the day.
Photo: Peter Vahry

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OUR PLAYGROUND, OUR RESPONSIBILITY

Kids Conservation Events in Taupō



**Rebecca O'Sullivan,
Community Ranger
Central Plateau**

Providing fun activities to teach children about conservation, which are easy to replicate in your backyard, is the aim of the new Kids Greening Taupō Event Series for young families.

The series – a partnership between DOC and Kids Greening Taupō – was launched on 12 March at the Waipahihi Botanical Gardens, focusing on nature sensory activities ideal for the young.

Four further events were held throughout the year, with the most recent “Stamping out Pests” which showcased making tracking tunnels, held at the Taupō Parent and Child Expo in November.

Kids Greening Taupō, a school-based conservation education programme, has been a pilot project with five local education centres participating over the past three years. This event series responded to the keen community requests from other schools and families eager to get involved.

Co-ordinator for Kids Greening Taupō Thea DePetris has enjoyed the events. *“Getting youth outdoors in nature is the best way to build eco-literate adults. I am passionate about what this series offers our community, to not only enrich our local*

biodiversity, but to install the love of nature in our young”.

Kids Greening Taupō builds on the Greening Taupō community days and initiatives to plant trees in our own backyards.

DOC is keen to support the vision of Greening Taupō and the family series says Community Ranger Anna Elwarth *“because protecting our nature is a job much bigger than DOC alone, nature lies in the hands of all New Zealanders, and this series engages the hearts, hands and minds of our young to become involved.”*

May:

“Warm homes for Invertebrates” let kids and parents alike explore the leaf litter for insects, learn about weta and how to make an “Insect hotel” at home

Graeme Robinson of the Botanical Gardens Society said it was great to have Kids Greening Taupō visit the gardens. *“The Society is keen to see the garden used for educational purposes such as this. To see the delight on these youngsters faces at finding all sorts of creepy critters is a great reward for the hours our volunteers spend maintaining these gardens.”*

Below: Ranger Becky hunting the leaf litter with Kerry and Celia, **Right:** Graeme Robinson from the Society with Kids Greening Taupō student leaders.
Photos: DOC





June:

"Birds with full tummies" was the most popular event, with kids coming to the botanic gardens to count and identify birds and make a bird feeder to take home.

September:

"All things Green" focused on planting and weed busting – with a great turn out of helpers from the Waipahihi Botanical Garden Society to show us all how it's done. Kids took home a newspaper potted kowhai seed.

November:

"Stamping out Pests" held at the Taupō Parent and Child Expo highlighted predators in the backyard with families taking home, and learning how to use a simple tracking tunnel.

The series will be evaluated over the summer – look out for more events next year!



Above left: Bird feeders were a hit! **Above right:** Kids Greening Taupō Student leaders.

Photo: Kids Greening Taupō

Left: Kids Greening Taupō Student leader from Tauhara College,

Left below: Thea with volunteers Jenny, Laura and Jan. *Photo: DOC*

Below: Robyn, Predator Free Taupō; Jane from Forest and Bird, Thea from KGT and Amelia from DOC at the expo. *Photo: DOC*



Kids Greening Taupō - Learning through nature set for expansion



Thea DePetris,
Education Coordinator

Through Kids Greening Taupō, kindergartens and schools are working together with their community to increase biodiversity and bring more birds back into town.

real-life opportunities for project planning, conservation work, problem solving and collaboration. Critical to the programme's student-led approach, the students are poised as active leaders, decision-makers and contributors in their local community, making real difference today.



Jack McNeill, a Year 12 student at Tauhara College and Kids Greening participant, says Kids Greening Taupō has provided him with experiences and learning that him or his parents never dreamed possible. *"Through my involvement, I have had the opportunity to address the Prime Minister, Governor-General and our local MP, alongside developing my journalism skills and expertise for our blog. Kids Greening Taupō has certainly enriched and 'greened' my school journey. It's certainly environment-focussed, but there are so many other opportunities that you wouldn't expect."*

Above: The 'bug man' Ruud Kleinpaste gets everyone up close to a weta.

Photo: Thea DePetris

Based on the Collaborative Community Education Model, the power behind Kids Greening Taupō is providing opportunities for engaging young people in real and local restoration projects and supporting teachers to use these authentic learning contexts. Founded on the goals of local restoration group Greening Taupō to 'retro-fit' ecological corridors throughout town, the students are at the 'heart' of this conservation education programme, working together and with community partners towards achieving a shared environmental and educational vision.

On the ground, participating kindergartens and schools establish restoration projects within their school grounds or at nearby green spaces, enabling them to grow and apply their knowledge, skills and values to these

One of the key endeavours of Kids Greening Taupō seeks to ensure a continuous learning journey for the town's children and young people, such that students have the opportunity to participate in the programme as they move from kindergarten through to secondary school. Since its inception as a pilot in 2015, the programme has involved five educational organisations. As Kerry Penny, National Outreach and Education Coordinator, puts it, *"it was important to take a pilot approach and ensure the programme was well tested before expanding into the community at large. Conservation education programmes through a collaborative community approach are not prescribed and therefore, every programme is unique due to the local taonga and conservation education opportunities found in the local environment."*

Night Time Adventures - trail running in Tongariro National Park

Stacey Faire
Community Ranger
Whakapapa

Everyone has their go to training runs, ones that you don't have to think too hard about. My go to trail run is the Whakapapanui Track.

It is in Whakapapa Village, it's a 6km loop track that can be extended to include the Silica Rapids walk (about 10-15km), and it is mostly under cover, so it suits all weather conditions, which is handy if you wish to avoid either the sun or the rain. However, snow can still be afoot in the shoulder winter seasons! My friend convinced me to go for evening run, due to commitments i.e. excuses I hadn't been running for a while so we thought a short run on the Whakapapanui Track would help me reconnect with nature and reignite my passion for trail running.

My running buddy who has lived in the Tongariro Park community for 15 years advised me to carry a torch because when the sun goes down we will be in utter darkness. As an ex-Aucklander who grew up in the city with constant lights everywhere, this mini-night-time adventure sounded like fun. Also, being slightly afraid of the dark I thought a night run could keep me moving a bit faster than normal.



So, we set off onto the familiar Whakapapanui Track that I had run so many times before, but every time I run here the native bush catches my breath. I enjoy seeing native mistletoe in bloom (*Peraxilla tetrapetala*) and the contrast between the beech forest and the smaller lower alpine vegetation around the board walk area.



Above: Bridge over the Whakapapanui Stream.
Left: Start of the Whakapapanui Track.
Photos: Stacey Faire

We started the run at the lower end of the track, running up towards the Whakapapa Village. This orientation has the Whakapapanui Stream on the left-hand side, which is the home of the native blue duck, whio. The beauty of this track is the Whakapapanui Stream adjacent the whole time, so if you can't see the river you can hear it. There is a wonderful sense of life or movement, when you hear the roar of river running.





Above: A lovely setting to either run or walk through.

Photo: Stacey Faire

With our torches in our hands we ran up the track, scooting past the mistletoe and weaving around beech trees. My running buddy has a great affinity with nature and it is always a pleasure to run with her as the energy levels are always high. We made it to the turn off point (right to Silica Rapids or left to Whakapapa Village) and decided not to go any further as it was later than we anticipated and the sun had set.

Well normally, in the day time, I like to soar down the track fast, swooping around trees like a kererū. However, in the dark, everything was unfamiliar and I was more like half blind kiwi scuttling on the forest walk, trying not to trip up on a tree root. I noticed that running in the dark, the noises are different, senses are enhanced. The only the calming factor was the river running alongside us, keeping us company.

As we crossed the bridge, at the end of the run, I said to my friend 'Let's turn our torches off and see how dark it is' I could tell she thought it was a strange request but obliged.

Well, well well... it was pitch black, so of course I let out a high-pitched scream! To our delight and surprise a blue duck, a whio called back. We laughed, and I called out again and our friendly local whio responded. What a bonus hearing a blue duck and running in World Heritage Park at night! It was well worth the effort squeezing in this mini-night adventure as it did ignite my love of running surrounded by nature, no more excuses!

<http://www.doc.govt.nz/whakapapatracks>

<http://www.doc.govt.nz/nature/native-plants/mistletoe/>

<http://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/blue-duck-whio/>

Predator Free 2050

– Look at what we can achieve!

Stacey Faire
Community Ranger
Whakakapa



Gotcha! Says
Dan Dan the
Trap Man!



Below: The community at work! " ... engaged with people to protect New Zealand's unique fauna and flora"

Photos: DOC

2017 was a busy year for Biodiversity Ranger Danial Van der Lubbe, who I call - Dan Dan the Trap Man. At the start of year Dan was asked to be the regional coordinator for Predator Free in the Central Northland Island region.

This is large task and Dan approaches it with energy and since he is a man of action, not a school or community group in the district could avoid his enthusiastic story about Predator Free 2050.

"It's a great opportunity for doc to get engaged with people to protect New Zealand's unique fauna and flora" said Dan on the Predator Free Tongariro

Dan is helping communities start a Community Trap Library.

A Community trap library is a place where the public can borrow a trap at a small rental price for up to three months to test them out and then either buy the trap or return it. The persons operating the trap library provide safety information and advice on setting the trap. – Find your trap library in Ohakune, Owahango, Taupō, Kahaora.

<https://predatorfreeTaupo.nz/news/18-trap-library>





Left: Schools have embraced Predator Free 2050.
Photos: DOC

To find out more contact your local predator free ranger

<http://www.doc.govt.nz/nature/pests-and-threats/predator-free-2050/predator-free-rangers/>

Read more about PF2050 on the links below

<http://www.doc.govt.nz/predator-free-2050>

<https://predatorfreenz.org/>

Predator free cartoon video

<https://youtu.be/vUhSVViFSEc>



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Wairakei - a golf course for kiwi



Renee Potae
Ranger - Biodiversity
Wairakei Golf + Sanctuary

One of New Zealand's top golf courses, Wairakei International, also known as Wairakei Golf + Sanctuary, has become a haven for a wide range of flora and fauna including nationally vulnerable species, brown kiwi, South Island takahē and the New Zealand falcon.

Since the 1960's, when the course was developed by government-owned Tourist Hotel Corporation, golfing enthusiasts from around the world have flocked to Wairakei, New Zealand's first internationally recognised Golf Course. However, since the development of the sanctuary on the property which opened in 2011, flocks of a different kind have been arriving and many have adopted Wairakei as their new home. Golf course owner, Gary Lane, had a vision to create a unique environment where golf and the natural habitat could work in harmony.

There is an intertwining of international commerce and ecological restoration, golfers and conservation enthusiasts.



Right: Renee with one of the 54 kiwi that have been released into Wairakei Golf Course + Sanctuary.

Photo: Renee Potae



WAIRAKEI

Wairakei Golf & Sanctuary is an example of how relationships between people give momentum to the restoration of our threatened species. Wairakei works in partnership with the Department of Conservation (DOC) who maintains relationships with relevant Iwi as kaitiaki of protected species. Wairakei has been instrumental in the formation of local community group, Greening Taupō and has been supportive of Predator Free Taupō. Fund raising initiatives support conservation on a national scale via national charity, Kiwis for kiwi. Kiwis for Kiwi supports the many community and Māori-led kiwi conservation projects across New Zealand.

Ecological restoration began in 2009 and has included extensive native planting, a pest eradication programme and the installation of a five kilometre "Xcluder" © pest exclusion perimeter fence. In the absence of predators such as rats and mustelids, an eclectic mix of endemic, native and exotic species have made the fields, bush blocks, water ways and fairways home. Bird species at the Sanctuary include brown kiwi, South Island takahē, New Zealand falcon, North Island robin, whiteheads, tomtits and many others, including a range of waterfowl. Exotic species include pheasants, guinea fowl, quail and fallow deer.

Wairakei Golf + Sanctuary plays a significant role in the Operation Nest Egg © (O.N.E) programme for kiwi conservation as a "kiwi creche". Kiwi eggs are lifted from nests in the wild, hatched in captivity at facilities such as Kiwi Encounter, Rainbow Springs Nature Park, Rotorua. The young kiwi chicks are then released temporarily to a predator-free creche facility such as Wairakei.

When they are a healthy weight where they have a better chance of defending themselves against predators, they are released to re-join wild populations. Between 2012 and 2017, 54 kiwi chicks had made Wairakei their place to “find their feet” and grow. For each one of these special taonga, there are a great many people involved behind the scenes including volunteers and stakeholders in support of the programme. Kiwi have come to Wairakei from Ngāti Rangī at Rangataua Forest on the southern flanks of Mt. Ruapehu, Ngāti Hikairo at Tongariro Forest, Rimutaka Forest Park Trust and Te Ati Awa, Taranaki Kiwi Trust and associated Taranaki Iwi.

Once inside the fence, kiwi chicks are monitored by resident kiwi ranger, Renee Potae and gamekeeper, Jeff Willis, with assistance from the DOC Tongariro Kiwi Team, DOC Taupō and volunteers. The habitat is varied but ideal. The low native scrub under the tall exotic trees beside the fairways is a favourite, as are the large blackberry thickets! There is a weed management programme underway, but where there is blackberry, there will also be kiwi.

Growth rates each year have been excellent. Kiwi stay at Wairakei for six to eight months or until they are 1200g in weight and there are an average of 12 kiwi at the Sanctuary at one time. For more information about all things kiwi visit www.kiwisforkiwi.org

Due to the nature of Operation Nest Egg, kiwi are coming and going from the sanctuary. Opportunities arise for the initiation of kiwi advocacy activities.

In the absence of cats and mustelids, the resident falcons are thriving as the apex predators of the ecosystem, closely followed by the Australasian Harriers. The adult pair of falcon had nested in the Craters of the Moon mountain bike park adjacent to Wairakei in the 2012 and 2013 seasons. As described by local DOC Ranger, Anna Elwarth, the falcons “feasted on the gamebird offspring



from the sanctuary”. Community group, Bike Taupō provided extra protection by setting DOC 200 traps near their nest. In 2014 the pair nested at the Huka Honey Hives but by 2015 they had moved into their food larder. If you played a round of golf at Wairakei during the summer of 2016 – 2017, there was an extra hazard on the 9th hole as the falcon pair had decided to build their nest on a mound beside the 9th tee.

In 2016, Wingspan photographer, Betty Shepherd, began bravely keeping a close eye on the falcon nests at Wairakei. The photograph provided is one of many acquired via hours of quiet patience in ducking from protective adult falcon.

Top: “Kiwi Contact” schools program. Wairakei Primary School students meet a kiwi up close.

Photo: Matt Alcock

Above: Falcon on nest with a falcon chick.

Photo: Betty Shepherd



Above: Sammy the first takahē chick to be hatched inside the Wairakei Sanctuary enjoys a feed.

Photo: Wairakei Sanctuary

A more recent addition to Wairakei's unique landscape are the bright and endearing takahē. In March 2015 a pair of these rare birds, "Grant & Flotsom" arrived and later that year they were joined by Matariki and Hauhungatahi from Maungatautari Eco-sanctuary.

These takahē are "retired" breeding pairs who have previously been part of the captive breeding program aimed at increasing the national population of these birds which, as at October 2017, stood at 347 individuals. Usually found in the Murchison mountains of Fiordland, it is a special experience to see them taking their daily walks around the golf course. At Wairakei, takahē who have slowed or ceased breeding are provided a safe-haven at which to live out the remainder of their lives in a predator free environment and spread the word about the plight of their species.

However, in March 2016, Matariki and Hauhungatahi proved that a change of scene can sometimes make all the difference. They successfully hatched and reared a takahē chick who was named, "Sammy". Sammy has joined the takahē population in the South Island. In January 2018, another chick was successfully hatched at Wairakei. He or she, will also be re-located to the South Island population.

The golf course

The golf course itself was officially opened in 1970. It was designed by leading English golf course architect, the late Commander John Harris, English professional golfer, Michael Wolveridge and Australian golfer, Peter Thomson, a five times British open winner.

The property was purchased by overseas owners in 1989 but returned to New Zealand ownership in 1997 when it was taken over by three Auckland businessmen, one of whom is the current owner, Gary Lane. Wairakei underwent an extensive upgrade to bring the golf course and facilities back up to international standards. This included the re-contouring of some of the course, a new lake and water hazards, redesign and addition of bunkers, new cart paths and golf course irrigation.

In October 2010 the golf course was voted number one course in New Zealand in an industry survey that took account of ratings from golf professionals and people in the golf travel industry. It was rated number one course by readers of New Zealand Golf magazine and in 2005 the course was rated by the prestigious US Golf Digest magazine to be in the top 100 courses in the world outside of the USA.

Gary Lane took full ownership in December 2008 and began development of the sanctuary aspect of the property. Thus, bringing together international commerce, tourism and conservation. Visitors to Wairakei who come for the golf are introduced to New Zealand's passion and challenges for ecological restoration. Wairakei Golf + Sanctuary's value lies not only in measurable increases in native flora and fauna but also in raising awareness amongst those who may not otherwise engage with New Zealand's special wildlife. Wairakei has become an inspiration to individuals, community groups and businesses alike.

The Mallowpuffs project continued

Harry Keys
Science Advisor-Volcanology
Department of Conservation

Breaking news, believe it or not.

On 4 October 2017 Deidre Ewart selflessly carried a packet of MallowPuffs biscuits up to 2600m and down without a single one cracking open across the chocolate puff cap. This is in stark contrast to an exhaustive study published in 2006 in Tongariro.

In 2006 I had found that not one mallowpuff out of a carton of packets survived a trip to that altitude. This was during repeat trips up to the Crater Lake tephra dam at 2537m. The explanation then was that the cracking was caused by the air inside the mallowpuff expanding and cracking the chocolate as the atmospheric pressure outside reduced with increasing altitude. The theory was that pressure imbalance developed into an overpressure that was fatal for the integrity that is, or was, the perfect mallowpuff.



So what is the difference? Poor research in 2006, the woman's touch or a change in chocolate recipe? The consensus seems to be the latter.

I'm wondering if I should ask Griffins for another carton of MallowPuffs to address the question, because further investigation in 2017 was hampered by lack of samples.



Above: Mallowpuffs at altitude! Mallowpuffs in 2017 seemed better able to cope with high altitudes but not with onslaught by chocaholics.
Photo: Harry Keys

Left: Harry Keys in the true spirit of scientific research carefully testing some samples
Photo: Deidre Ewart



Greening Taupō and Predator Free Taupō



Robyn Ellis
Greening Taupō Co-ordinator

Predator Free Taupō

It has been only seven months since Greening Taupō held a public meeting at Wairakei Golf & Sanctuary to gauge the interest from the community in

The first 'run on the board' for Predator Free Taupō was acquiring funds from KiwiBank enabling Acacia Bay Residents to join the 'Kiwibank Predator free communities'. This has been going well with over 70 traps going into backyards of Acacia Bay residence protecting and enhancing their native biodiversity.

In October PFT was successful with a funding application from the Waikato Regional Council Environmental initiative fund to support a Predator Free Taupō Community coordinator with awarded funds of \$20 000.00 over two years, and to finish the year off nicely we received the news of being successful in our funding application to the Department of Conservation Community Fund to also support a "Predator Free Taupō Community Coordinator" with awarded funds of \$45,000 over the next three years.

The funds will support a dedicated coordinator that will be able to actively promote Predator Free Taupō. PFT will be the vehicle to link sites and people together within the Taupō region to coordinate trapping efforts across multiple sites, establish community trapping effort particularly at sites with high ecological importance, support Kids Greening Taupō to promote Predator Free Taupō within local schools and encourage individuals to undertake trapping in their backyard.

Predator Free Taupō has created a steering group to help support the coordinator with advice, industry knowledge and assistance.

A Facebook page and website Predator Free Taupō has been created and there has been a lot of interest from the



Above: A selection of trapping equipment supplied to the Acacia Bay community for them to undertake predator trapping in their area.

Photo: Predator Free Taupō

regards to predator control in Taupō, the meeting demonstrated there was a strong interest in the community for predator control. There are advantages in predator control being community led and Greening Taupō is best placed to facilitate these efforts - and as such, Predator Free Taupō (PFT) is now underway!

The establishment of Predator Free Taupō is the next step towards the goal to replicate the intensive conservation work occurring within the Wairakei Golf + Sanctuary into the surrounding community.



Left: Greening Taupō and hundreds of volunteers have planted areas such as Waiariki Drive, the Waikato River and Whakaipo Bay (shown here).
Photo: DOC

community to become actively involved.

Greening Taupō

Along with initiating Predator Free Taupō Greening Taupō and the Vegetator Vennel Team got the community involved boots and all along Waiariki Drive this year, we had four successful planting days involving 350 volunteers planting 5500 plants just along the drive, GT held another six planting events in partnership with Local and Regional Council, Department of Conservation and Contact Energy planting many native plants and trees with the help of the community all within the Taupō area .

Cathy from Quality Print created the best certificates to be given out to all the kids that came along and helped out. At each of the planting day that the kids attended throughout the year they got a native bird sticker to stick onto their certificate. Greening Taupō is into year three of restoration along the Waikato River with awarded funds from the Waikato Catchment Ecological Enhancement Trust [WCEET] funding weed control, land preparation and plants.

Our community partners Bike Taupō continue controlling wilding pines alongside the river and are now heading

down towards Aratiatia. Greening Taupō has secured additional funds from the

Waikato River Clean up Trust to enable this work to be continued and to restore another large area alongside the river for the community to assist planting this year.

Greening Taupō has a great collection of planting day events planned for 2018, a calendar of these events with dates will be sent out to all our members and also posted on the Greening Taupō Facebook and website in the next few weeks so keep a look out and mark the dates in your diary. It's going to be a great year!

Prepare for the future

a study of Mt. Tongariro's largest volcanic eruptions in the past

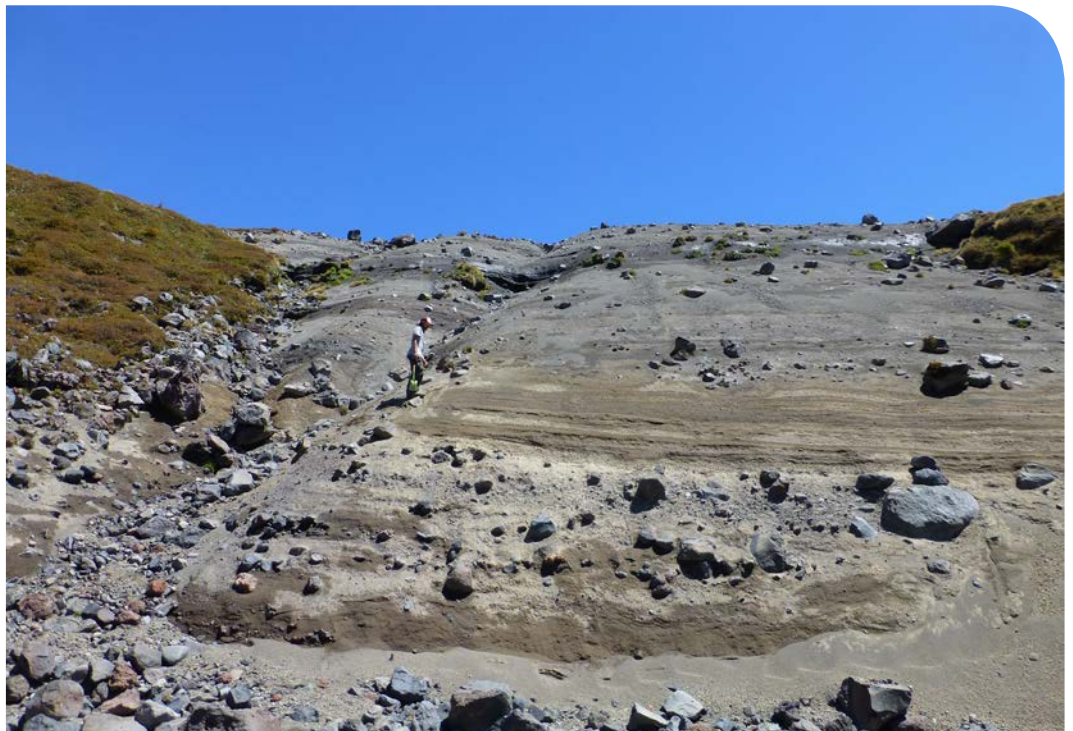


**Mirja Heinrich - PhD Student
Project Tongariro 2017 Memorial Award Winner**

The main geological focus within the Tongariro National Park during the last 30 years has been its largest volcano, Mt. Ruapehu. This changed drastically after the Te Maari eruptions in 2012. Mt. Tongariro poses an exceptional threat to the land and people around it. Multiple vents have been active in the last 15,000 years and have produced frequent and

This gives important information about different magma feeding systems beneath different parts of the volcano and the extent of hazard zones.

The most active period of Mt. Tongariro took place about 11,000 years ago and lasted for 200-400 years. Over this time span Mt. Tongariro produced five



Right: Coarse proximal deposits erupted from the saddle area between Mt. Tongariro and Mt. Ruapehu with my field assistant for scale.
Photo: Mirja Heinrich

hazardous eruptions. Because of this complexity it is hard to pinpoint future precursory signals to a certain location. Even simultaneously erupting vents cannot be excluded.

My PhD project, supervised by Shane Cronin, traces back the largest explosive eruptions of Mt. Tongariro to possible vent areas to help understand the source of the eruptions, how big they were and where they were mainly distributed.

plinian eruptions, which are defined by extremely high eruption columns of volcanic debris and hot gasses ejected into the atmosphere that eventually settle as deposits.

In two summer field seasons I completed more than 20 field trips, each lasting three to five days. With the help of my supervisor, his former student Natalia Pardo and multiple field assistants, we worked our way in from the roads towards the summit area. We hiked



Left: Mirja on the eastern side of Mt. Tongariro.
Photo: Natalia Pardo

on and off the tracks, always with the invaluable support concerning access, safety and cultural value of Bubs Smith and Harry Keys. About 150 sites were described and measured in detail in and around the National Park. Samples for further investigation were taken from 25 locations discussed and granted permission for by Bubs Smith.

Interpretations about the origin of these explosive Mt. Tongariro deposits can be made through careful mapping, sampling and investigating. We found out that all five main eruption deposits contain multiple coarse grained layers. This is understood to be a stop-and-go mechanism for each of the individual large-scale eruptions. The most active vent at that time must have been located in the saddle area between Mt. Ruapehu and Mt. Tongariro, with distinct distributions to the southwest. More complex distribution patterns with multiple lobes reach Lake Rotoaira in the north and blanket the northwest of the National Park. Here it is more complicated to identify the eruptive vent area which could have been where Mt. Ngauruhoe is located today. It is likely that the activity changed between major eruptions, and that multiple vents were active at a given time.

Currently, I am half way through my PhD.

Preliminary results show that the most active phase of Mt. Tongariro was a time where magma ascended in pulses, stopping and starting from shifting vent locations. For several hundred years, one plinian eruption phase followed the next with little recovery time for the natural systems around the volcano. Where State Highway 1, 47 and 46 encompass the National Park today, with a 15km radius from the volcanic vents, the deposits of Mt. Tongariro's largest eruptions reach up to 4m in thickness. This study shows the scale of eruptive activity Mt. Tongariro was capable of in the past.

But as with all research; every question that gets answered brings with it new questions.

What was the trigger and the driving mechanism of these eruptions and could it potentially happen again?

Conservation in action

Photos that never quite made the articles

When editing the Journal there are always so many great photos and only so much space! Here is a selection, from Taranaki Falls to things in the rear view mirror, deer and a Morepork chick at Wairakei Golf + Sanctuary, Whakapapanui Stream, fire bucket and an old Hapūawhenua Viaduct bolts, left over rail tunnels on The Old Coach Road, Dome demolition, tramping the Tongario Alpine Crossing, a Morepork chick at Wairakei Golf + Sanctuary and winter in Tongariro National Park.

