Tongariro

the Annual

APRIL 2006 VOL 14

Department of Conservation
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TONGARIRO

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Cover photo: Blue Duck
Above: A Tongariro Natural History Society volunteer atop Mt Pihanga with Lake Rotopounamu in the background. Photo: TNHS
Back cover:

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Above: New Zealand flax (Phormium tenax) Photo: DOC

Left: Delicate fungi in the forest. Photo: DOC

Below: Ferns Photo: DOC

Background: Crater Lake, Mt Ruapehu. Photo: Dave Wakelin

For more information on all matters relating ot conservation check out the Department of Conservation's website www.doc.govt.nz

Dave Wakelin
Editor

… and stuff

Recently my grandson, Connor, aged 6½, commented to his mum, *"I love being with Grandad because he knows so much about everything and you know you can talk to him about everything … and stuff!"*

How important it is to be knowledgable about stuff! After all knowledge is really an ordered collection of relevent stuff.

I was eleven when the microscope arrived, a gift from a great uncle. Tall, elegantly turned from brass, the microscope was a relic from a bygone age.

The companion oaken box was full of *stuff* with which the Victorians would have both intrigued and bored to death guests who dared ask, *"I say, just what sort of stuff can you look at with this magnificent instrument?"*.

Oh the slides! Hair of a bat, skin of dogfish, wing of a Monarch butterfly, cockchafer's antennae, lining of a lung and ash from Krakatoa's 1883 eruption. My life changed with that microscope.

Four hundred and eighty years before, in 1665, Robert Hooke gazed through his primitive microscope at the cellular structure of a piece of cork. This closer look at nature was to change the concept and understanding of our world forever. Blood and tissue, plants and rocks revealed their structures and secrets to the microscope. Diseases were isolated as collections of bacterial rods, tubes and blobs.

Over the next few years I was to discover lots of *stuff*. I became increasingly more curious about the interrelationship of things. Why were leaves green in the summer yet turned brown and 'died' in the Winter? Why does compost compost? This led to an interest in geology, botany and other natural history *stuff*.

All this was nearly 50 years ago. The microscope now sits on a shelf, an attractive ornament to be admired. But, despite that, it played a part in opening my eyes to the natural world and in no small way influencing my career direction. National Parks and conservation became my career. I have seen so many marvellous things on this planet with its bountiful variety of life There is so much I haven't seen but I know it's there and that it is important.

"Yes, I have a pair of eyes, and that's just it. If they wos a pair o' patent double million magnifyin'gas microscopes of hextrapower, p'raps I might be able to see through a flight o 'stairs and deal door; but bein' only eyes, you see my wision's limited."

Charles Dicken's Sam Weller

We may not have super high vision eyes but with our eyes we can perform a myriad of functions. We can see, focus, discern, examine and select, compare, inspect, distinguish, and contrast. Taking time to take a closer look has led to creation of national parks, and conservation of wildlife and plants. A closer look has led to the discovery of new medicines, many based on what nature can provide. Next time you venture out into the outdoors try using your eyes like a microscope, excite your curiosity and take a closer look at the other world around you. We are not alone. Our world is full of wondrous things … and *stuff*.

Tongariro Taupo Conservator, Paul Green
Photo: Dave Wakelin

From the Conservator

Right: Ruapehu Area Manager, Nicola Patrick and Conservator Paul Green assist with the survey and monitoring of Blue Duck.
Photo: Bubs Smith

The Tongariro Journal is a great opportunity for the Conservancy to report on its work and to inform the public of achievements, issues and challenges. I particularly value the opportunity to be able to communicate our work with key stakeholders like members of the Tongariro Natural History Society.

We have had many staff changes over the past 12 months. It is always difficult to lose staff who have made a significant contribution to our work. At the same time it is an opportunity to introduce new ideas and enthusiasm. I particularly want to thank Mark Davies for almost 10 years as Area Manager at Ruapehu. Mark will be remembered for his lateral thinking and enthusiasm in continually improving conservation in the Area. Mark achieved much in projects like working with Ngati Rangi on the Karioi Rahui Restoration Project, driving the Whakapapa Village and Skifield Sewage Scheme and upgrading the 42 Traverse in the Tongariro Forest. Mark is now Community Relations Technical Support Manager for the Bay of Plenty Conservancy. I also note the departure of Sean Goddard our Community Relations and Technical Support Manager to Auckland where he has been appointed Conservator and Greg Dyer our Business Services Manager who has been promoted to Principal Business Analyst for the Northern Region. Other significant departures include our Business Services Supervisor Maureen Smith who was one of our longest serving staff members, Peter Morton and Petrina Francis. Maureen was committed to participating in all our work and was the mainstay for our waiata singing! Peter had worked at Ruapehu where he will be remembered for managing the Kiwi Project and as Biodiversity Supervisor in the Conservancy Office. Petrina will be remembered for making a real difference as Community Relations Manager in the Taupo Fishery.

I look forward to working with all the new staff. In the current employment market recruitment has been more difficult than usual but I am pleased to have been able to appoint Nic Etheridge, Nicola Patrick and Geoff Bell into the three Management vacancies. All have quickly come up to speed.

The Tongariro Natural History Society has continued to grow and evolve in its role. It is now difficult to imagine how we would manage without access to their strong support, volunteer co-ordination and additional resources. Volunteer efforts at sites like Rotopounamu-Pihanga, South Taupo Wetlands and on projects like the Summer Programme and mistletoe propagation is immense.

The Tongariro National Trout Centre Society and Genesis Energy continue to contribute to the development of facilities and education of visitors at the National Trout Centre. The opening of a new education classroom and education programme for schools is a major initiative. The support of Taupo District Council for this project is also acknowledged.

The Conservation Awards in December illustrated the massive community contribution towards conservation. It is pleasing to acknowledge that conservation is more 'mainstream' than when the Department was established in 1987. Conservation is not about ownership of resources but about protection of our heritage and encouraging sustainable usage of it. Recreation is now better valued in our society for its social benefits. Conservation is now seen as having economic value. Much of our tourism industry is based on New Zealand's conservation assets and the Community Value of resources like clean water widely understood.

Biodiversity prioritisation continues to be a major issue. Unfortunately the task of halting biodiversity decline increases each year. It is only in recent years that we are starting to understand the devastating impact of introduced animals like rats, stoats, mice. Integrated pest management is extremely costly and the department is only able to effectively do this work at selected sties. The impact of this was highlighted to me over the summer programme when I spent several days in the Kaimanawa Forest Park. The Kaimanawa's has not been prioritised as an ecological site and there is a marked decline in the last 20 years of species like whio, kiwi, kaka, robins. The same decline is apparent with plants like mistletoe. More often than not remaining birds are older and it is highly likely many formerly common species will disappear over the next 20 years. Until recently I don't believe we fully understood the impact of these pests.

Below: Paul Green with Norrie Ewing, a long time member of staff as a member of the Fishery Area team on the occasion of Norrie's retirement. Photo: Dave Wakelin

The mobile nature of our world today continues to encourage biodiversity incursions. Surveillance for organisms like Didymo has become a top priority for us.

Finally I would like to thank everyone who has contributed to conservation in the past 12 months – conservation board members, staff, volunteers, stakeholders and sponsors.

A Year of World Heritage

Above: Tumu te Heuheu, New Zealand's World Heritage Committee delegate examines a fine piece of artwork presented to him by aboriginal delegates of the Uluru /Kadadu visit to New Zealand.
Photo: Dave Wakelin

By Paul Green

Tongariro Taupo Conservator

We have continued to be busy hosting international visits to Tongariro, assisting the New Zealand delegation on the World Heritage Committee and contributing to international exchanges and forums. I am often asked what is the advantages of World Heritage to the management of Tongariro National Park. I wrote the following extract for a World Heritage pamphlet.

"New Zealand's natural areas are well protected by the National Parks and Conservation Acts. World Heritage status adds an additional layer of responsibility for protection, not only for the Department of Conservation, but for other authorities too such as regional and local councils.

"I think the fact that Mt Ruapehu is within a World Heritage area has helped people understand the decision not to intervene at the Crater Lake to prevent a lahar (volcanic) mud slide) flowing down the Whangaehu River.

"And when the Department needed to raise $4 million to upgrade the Whakapapa Sewerage system in Tongariro National Park, the small community of concessionaires and ski clubs joined together to help fund the project – without the World Heritage tag this may not have happened.

"I believe World Heritage has caused people to have a greater awareness of the natural and cultural values at stake. We're already conscious of the need to protect special places in New Zealand and World Heritage status raises the bar just a little bit higher".

Tumu Te Heuheu and his delegation have been busy representing New Zealand and the Pacific countries on the World Heritage Committee. They have a demanding two years in prospect as New Zealand is to take over the Chair in 2006 and host the Committee meeting in 2007. This is a huge commitment for New Zealand and Tumu in particular.

Al Gillespie has accepted the role of rappateur at World Heritage Committee meetings. This is an extremely challenging role as the rappateur has the task of drafting resolutions and amendments to the satisfaction of state parties who often have conflicting issues. Al is virtually working 24 hours during Committee meetings.

Pacific 2009 Action Plan

The Pacific Workshop in 2005 prepared a 5 year Action Plan for World Heritage. As a representative on the World Heritage Committee New Zealand is keen to see the

Above: The Kazan Kremlin at night.
Photo: Jim Miotke
www.betterphoto.com

Plan advance. The World Heritage fund has allocated resources for assistance with tentative list preparation in the Marshall Islands, Samoa and Fiji. They have also provided assistance for site nomination at Vanuatu.

A regional workshop was held in Port Villa, Vanuatu from 5-8 September 2005 on the topic of 'Potential themes for serial and transboundary cultural World Heritage Sites in the Pacific'. Funding was provided by the Nordic World Heritage Foundation and Kevin Jones from the Department of Conservation acted as a Facilitator.

2007 World Heritage Committee Meeting

Preparing for the 2007 Conference that will held in Christchurch, will be a major logistical exercise in the coming year. Tongariro and Te Wahipounamu are like to receive visits from delegate's pre and poste conference.

It is planned the meeting will have a Pacific theme and it is likely that the Pacific region will have a workshop prior to the meeting. The meeting will to be attended by more than 500 delegates with many being accompanied by spouses.

New Zealand Tentative List

Before a world heritage site can be nominated for inscription it is necessary for a country to have a tentative list of sites. The Department released a discussion document identifying a number of possible sites and seeking comment including suggestions for other potential sites in January 2005. Submissions closed on 31st March 2005, with a total of 292 submissions. The submissions have been analysed. The next step will be to finalise the tentative list. This will require consultation with a wide range of parties.

Visits to Tongariro

Our official visits have included delegates from Malaysia, the Solomon Islands and Uluru and Kakadu in Australia.

The Australian group included traditional owners and officials from Environment Australia. We have been fortunate that Tumu and Ngati Tuwharetoa have supported each visit.

Kazan – Russia Workshop

In April 05 I represented New Zealand at a workshop in Kazan, Russia. Representatives from 25 countries were brought together to clarify the concept of Outstanding Universal Value (O.U.V) that is the key test for the inscription of natural and cultural properties on the World Heritage List. The meeting was structured into four themes:

- Understanding the concept of outstanding universal value under the World Heritage Con-

vention.

- Better identification of properties of potential outstanding universal value and preparation of tentative lists.
- Improvement of nomination of properties of potential outstanding universal value.
- Sustainable conservation of World Heritage properties.

The workshop agreed with the definition established in the Operational Guidelines ie 'Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such the permanent protection of this heritage is of the highest importance to the international community as a whole'.

It was recognised that the concept has evolved over time. Experience has shown that the evaluation of natural sites can be based on science whereas the evaluation of cultural sites is more judgemental. Natural site evaluation has probably been based on the 'best of the best' whereas cultural site evaluation might have been based on 'representative of the best'?

Consideration was given as to how members could be best assisted to prepare tentative lists and to nominate sites. It was agreed that most help was required for regions like the Pacific where there was under representation of sites. I did find it interesting that New Zealand was one of a small number of countries without a tentative list! The others in this category were countries with undeveloped protected area or site management. The discussion confirmed my view that New Zealand was rather unique in having a 'laisez faire' attitude towards World Heritage. I believe this is a consequence of us having a strong protected areas system with no obvious financial or protective benefit for World Heritage status. This is in contrast to many countries where funding for management is only available for World Heritage sites.

Altogether the workshop provided 25 recommendations to the World Heritage Centre. It was a busy workshop and great to work and compare experience with others from a wide perspective of experiences. At the same time we were well looked after by our hosts. Kazan is populated by the Tatars who travelled through from Turkey and Asia. Many locals did not regard themselves as Russian. Kazan City was striking because of the Kremlin – a walled historic city with many temples and a Presidential Palace. Restoration was going on at a frantic pace. The tatar culture was fascinating. The people were very knowledgeable and proud of their heritage. 'Ivan the Terrible' had destroyed much of the city

Right: The brightest architectural jewel, standing out from the whole ensemble , is the Suyumbika Tower, the spiritual symbol and pride of Kazan. There are many legends and hypotheses connected with this tower, whose architecture has a pronounced oriental flavour. It takes its name from the last queen of Kazan, Suyumbika, who, legend has it, threw herself from the top after Kazan had been taken by the Muscovite troops. The official version of the origin of the tower is that it was raised in the seventeenth century by Russian builders as a watch-tower for military purposes. The Tatar version attributes its origin to Bolgar builders and traces the source of its architectural perfection to the brick structures of the pre-Russian period of Kazan's history.

Background: The Wall of the Kazan Kremlin with the minarets of the Kul Sharif Mosque. Four centuries ago the legendary many-minaret Kul Sharif Mosque decorated the capital of Kazan Khanate. It was named in honor of its last Imam Seid Kul Sharif - one of Kazan defence leaders. When Ivan the Terrible captured the city the mosque was burnt down and ruined as well as other Moslem buildings of the Kazan Kremlin. In 1995, the President of the Republic of Tatarstan signed the Decree in accordance with which work at Kul Sharif Mosque's reconstruction started. The mosque's complex includes a building of the mosque itself, a library, a publishing centre, Imam's Administration.
Photos: Paul Green

and the churches when he ruled. The locals were proud that Kazan was a place where East met West and different religions and cultures were living in harmony.

Visit to New Caledonia, French Polynesia, Rapa Nui

Andrew Bignell visited these sites as part of New Zealand's role of encouraging World Heritage in the Pacific.

Mt Fuji Seminar

We were asked by the Waseda University in Japan to make a presentation at a seminar.

Together with the Fujisan Club they are committed to improved management at Mt Fuji and recognising the natural and cultural values of the mountain. Dave Lumley was scheduled to make the presentation but was unable to attend at the last minute due to a medical emergency in his family. I was most appreciative when Mark Davies our former Area Manager at Whakapapa agreed to substitute with 36 hours notice. Mark was able to make a major contribution to the seminar at short notice given his previous two visits to Mt Fuji and his high level of understanding as to the management challenges being faced at Mt Fuji.

Visit to Kakadu & Uluru.

Environment Australia and the traditional owners of Kakadu and Uluru invited DOC to send staff to continue discussions of the relationship between traditional owners and park managers. Our delegation consisted of Greg Martin Conservator Waikato, John Gardiner Area Manager Whangarei, Joe Harawira Kaupapa Atawhai Manager Waikato and Jim Maniapoto our Kaupapa Atawhai Manager. Jim Maniapoto was also invited to attend a special ceremony at Uluru to celebrate 20 years of joint management.

Visit to Suva – Fiji

In early November 05 I accompanied Tumu Te Heuheu and Martin Wikaira (Ministry for Culture & Heritage) to Suva to discuss how NZ and Fiji can best work together to implement the Pacific Action Plan 2009. We were impressed by progress being made by Fiji in preparing a tentative list. A number of sites had been identified including a rainforest in the Sove Basin, an historic town, a marine area and the Sigatoka Sand dunes.

Tumu and I visited the Suve Basin where the Fiji National Trust has formed a partnership with Conservation International to protect 20,000 hectares of rainforest. The land is owned by 13 tribal groups who have all expressed a wish to see it protected. A lease is in the process of negotiation together with the preparation of a Management Plan.

Fiji is a useful conduit between New Zealand and the rest of the Pacific for World Heritage activity. An example of Fiji's role is the establishment of a protected area training course at the University of South Pacific in Suva. This concept had been explored at the Tongariro Workshop in 2004.

Fiji was keen to assist in providing a programme for the 2007 World Heritage meeting in New Zealand.

Who Uses the Park?

In the well-stuffed filing cabinets of DOC there are probably accurate estimates of the numbers of people who use the park each year and clear indications of what they come to do. Many of the people seen in the park actually work there. DOC staff are one of the biggest groups including scientists, both geologists and botanists, planners, conservation workers, track builders, bus drivers, safety services, hut wardens, maintenance workers and many more. Staff associated with Ruapehu Alpine Lifts are a sizable group too, including ski and snowboard instructors, lift operators, car parkers, avalanche bombers, snow clearance workers, groomer drivers, ticket sellers, shop workers, caterers ambulance drivers and ski patrollers. Then there are the independent bus drivers, shuttle bus operators, helicopter pilots, coffee vendors and tour leaders.

Above: Thanks to generous corporate sponsorship the Tongariro Natural History Society now has a vehicle to enable the Executive Director, Sarah Gibb and her team of volunteers to carry out work in Tongariro National Park. Photo: Sarah Gibb

Another significant park group are the volunteers who contribute time and energy to a vast array of park projects. Many come as part of organisations in New Zealand but many are international volunteers who come from Europe and elsewhere to experience the park on a daily basis. Deirdre Husted-Andersen from Denmark writes (2001):

"Most of us come over from Europe to stay over the summer to assist technical support staff doing fieldwork. And many end up staying longer than initially planned. Some of us even come back several times. It is now my third time here, but hopefully not the last one."

If DOC's statistics are unraveled they would indicate that several hundred thousand come annually to ski or snowboard. Some return several times as regular practitioners or as members of ski clubs with lodges on the mountain. Others come on the annual work weekend or ski only a few days each year. Thousands more join in summer programme activities (organised annually by DOC) and many more come to tramp the various tracks, use the DOC huts or to hone their mountaineering skills before taking on the challenge of South Island mountains.

Tourists from New Zealand and all over the world come to enjoy the scenic beauty of the park. They may indulge themselves in gentle walks or take a chair lift to the Knoll Ridge café to heighten their pleasure and enhance their views of the spectacular landscape. A few may even play golf on the idiosyncratic golf course in front of The Chateau. Tony Pearson, a visitor from Nelson commented (2005):

"For the passing tourist Tongariro

offers access to its far reaching views and stunning topography without the need for specialist skills or gear. Whether you wish to tramp, ski or just simply ride the lift to the top of Ruapehu, they are all on offer in this world class national park."

There are many visitors who would readily agree with Tony and they come from Germany, Poland, Britain, Japan and other Asian countries, Australia, Canada and America. They experience the park in multifarious ways each one of them deriving the personal pleasure and satisfaction, which can only be found in outdoor settings of unique beauty and wonder.

Schools bring thousands of class groups each year for a variety of reasons. Some for scientific field work in geology or earth science or botany: some for leadership training and outdoor recreational skills. Some schools regularly volunteer their time to assist DOC with conservation work in the park. Other classes may come to paint or make music or to relax in this unique environment. University groups also use the park for fieldwork in a bewildering array of scientific endeavours leading to advanced thesis work. Often the university groups link with practicing scientists to collaborate on research projects ranging from the study of vulcanology, to the inspection and recording of rare plants and animals. Other scientists may be tracking the weather patterns while others will be engaged in monitoring early volcanic warning systems.

Organised recreational groups such as tramping clubs (from all over the North Island) botanical societies, forest and bird clubs, women's' walking groups, kayakers, mountain bikers, photography clubs, solitary artists attempting to capture the on-going allure of this special landscape. Bruce Jefferies, a former Chief Park Ranger, reflecting on park users while eating his lunch in the Crater Lake region remarked (1985)

"Paretetaitonga and Tahurangi revealed small groups of people enjoying the unique qualities of the Summit area: a couple of climbers tackling the ice flutings under the small peak of Tukino, a lone skier on Paretetaitonga "eating up" the perfect windpack conditions and people on the Dome at the same time as us. All these people had different reasons for "going to the top" but they were experiencing the blend of rare qualities that make up Ruapehu."

For Maori people the park has special significance. It is a place of awe and majesty and is the origin of fascinating stories of the gods and of great acts of heroism and love. Ngati Tuwharetoa in fact gave the park to the people of New Zealand in 1887 and in so doing created one of the first national parks in the world. Such is the international significance now, of Tongariro National Park, that it holds dual UNESCO recognition as a World Heritage site. The cultural significance and the natural importance make Tongariro one of a small number of World Heritage sites with dual recognition. All New Zealanders are the beneficiaries of Ngati Tuwharetoa's vision in gifting the park to the people of Aotearoa/New Zealand.

Ski patrollers are now all professionals, contracted to Ruapehu Alpine Lifts. From the early 1950's

until 2000, however, the patrollers were predominantly volunteers who gave up their time to assist others in difficulties. They were a mix of farmers, teachers, carpenters, university lecturers, mechanics, doctors nurses, public servants, architects and others. In fact, they were a cross section of New Zealand society. Some members served five years in the patrol and ten years service was not uncommon but a special few contributed 30 years of volunteer time to honing their skiing, first aid and mountaineering skills so that they could help other skiers when they got into difficulties. Arnold Heine for example, served thirty seasons and was honoured by his peers. It was said of him (1985):

"You are a quiet man and some would say you are typical of those who love the outdoors. You are kind, deliberate, caring, good company, vastly experienced

persevering and just being with you is richly rewarding. You have provided comfort and kindness to the thousands who flock to this winter environment season after season and you have made an immense contribution to the respect in which the patrol is held by the general public."

There is another special group of park users who contribute to the park in particular ways. The Tongariro Natural History Society operates like a "friends of the park" organisation and contributes finance, volunteers and enthusiasm to the park, year after year. The organisation is modelled on similar groups in American national parks and was formed as a living, dynamic memorial to people who lost their lives in a tragic helicopter crash in 1984. Over the intervening years hundreds of thousands of dollars have been contributed to the park to assist with park interpretation. The society has published books about key aspects of the park and these have sold well. In addition members have contributed their time and skills in a variety of ways: leading Summer Programme trips, pulling weeds, painting huts, potting plants, pro-

viding money for visitor centre improvements, contributing money to the park handbook, assisting in the eradication of predators around Rotopouamu and much more.

So what in particular makes the Tongariro Natural History Society special? A formal, memorandum of understanding (MoU) has been signed by DOC and the Society, which specifies the roles and responsibilities of both parties. In fact, the District Conservator is a member of the Executive Committee of the society. In this way priorities for projects and funding programmes can be agreed upon. In terms of contributions of time and money, members of the Society have provided DOC with several hundred thousand dollars for ongoing park projects. Recent partnerships (time and money) include the current park handbook, the audio visuals shown regularly in the Visitor Centre, the up-grading of the Ohakune Visitor Centre, the signage for the Mounds Walk, the eradication of pests in the Rotopaunamu area, restoration work on the old Waihohonu Hut and much more. The work is on going and the need for funding ever present.

The society is always open for new members: the only requirement is enthusiasm for the park and an ongoing desire to contribute to its preservation. Who uses the park? It's there for all New Zealanders to enjoy and for visitors to appreciate and admire.

Looking back … preserving our heritage

By Glen Hazelton

Technical Support Officer
Historic

It is not only natural heritage that the Department of Conservation is charged with protecting. It is also DOC's role to protect historic heritage and within the Tongariro-Taupo conservancy there are a vast range of historical resources the Department manages. Amongst these many resources, two in particular have assumed a greater significance in the Department's work over recent years harking back to a time when very different forms of transport moved people around the region.

Above: A reminder of a bygone era - the Tokaanu wharf.
Photo: Glen Hazelton

Reaching out 260m into Lake Taupo near the mouth of the Tokaanu Stream, the Tokaanu wharf stands as a reminder of a time when steamships plying the lake's waters were the most important link to between the southern end of the lake and the settlement of Taupo. Isolated, with only the barest of roads linking it to other settlements settlements like Tokaanu came to rely heavily on transport across the lake for their economic survival.

From the 1870s a regular transport service had commenced on the lake and sometime between 1874 and 1883 the first jetty or wharf was constructed at Tokaanu. For at least the next four decades the Tokaanu wharf was the terminus for lake steamers and mail coaches and a vital economic link to the outside world. The annual wool clip of the pioneering sheep farmers was shipped across the lake, and the Waihi Dairy Factory and local flax mills also provided regular shipments of cargo for the steamers, in addition to importing supplies.

The wharf also played an integral role in Tokaanu's association with the earliest days of tourism in New Zealand. Well before the turn of the century the thermal village was part of the grand tour of the central North Island that also took in the Whanganui River, the central plateau, and after 1903 included a night at the Waihohonu Hut, the oldest building in Tongariro National Park, another historical asset managed by the Department. Here at Tokaanu as well as the hospitality of the hotel visitors could bathe in the thermal hot pools, which are still open today. After the release of Brown trout in 1887 and Rainbow trout in 1898 steamers brought increasing numbers of anglers hoping to snare some of the trophy fish in the lake.

In 1901-2 a major extension of the wharf was undertaken to allow the new steamship SS Tongariro to go alongside at all times. This ship was the ply the waters of the lake for the next 20 years. The early decades of the 20th century, however, brought improvements to the road along the eastern shores of the lake, bringing an end to isolation and reducing the need for the steamer operation. The opening of the main trunk rail

line in 1909 further directed freight away from the Lake.

When regular lake transport services came to an end in the mid-1920s it was also the end of an era for the Tokaanu Wharf. Yet it remained a popular place for fishing, picnicking or simply admiring the impressive views of the lake and surrounding mountains for both locals and tourists alike. It was also an important local landmark, with a strong physical presence on the lake.

In 1995 the Taupo Harbour Master became concerned about unsafe nature of the old wharf. After failing to establish clear ownership, the Lake Taupo User Forum pulled up the first 18.2m of planking, a length of handrail, and erected a keep out sign in the name of public safety. The Department of Conservation and members of the community became increasingly concerned with the wharf's future, seeing the necessity of protecting the wharf because of its strong national historical importance. The Tokaanu wharf is the largest and oldest timber wharf remaining on any of the lakes where commercial steamers operated (Rotorua, Te Anau, Wakatipu). Even in the 1990s it remained in close to original condition because little maintenance had been done after the steamers stopped in the 1920s. Many earlier repairs had used mostly native timbers and although tanalised pine decking had been used after the 1960s, some of that had been pulled up in 1996 and the majority of the wharf remained either totara or beech. The wharf was also seen to have great cultural and social significance, being bound up with the fortunes of the Tokaanu and Waihi communities, and standing a relic of early farming and industrial endeavours at the remote southern end of the lake.

Inspections by DOC and works consultancy in 1996, including divers, indicated that while much of the wharf had a good "bill of health" some urgent remedial work was identified that had to be completed before the structure deteriorated further. Further comprehensive assessments in 1999 by connsulting engineers Frame Group detailed work specifications for necessary tasks to ensure the safety of the structure and ongoing maintenance. Work has continued progressively since this time as funds and materials allow. To begin with, one hundred and twenty years of lichen, moss and algae growth were water blasted from the piles, bearers and decking. Pinus radiata decking was removed and replaced with Totara and Red Beech planks to preserve the original integrity of the structure. Overgrown exotic vegetation overhanging the wharf was also removed, helping to increase light and air flow as well as giving better views of the wharf from the shore.

Below: The relaid first section of the wharf. Photo: Glen Hazelton

The outer reaches of the wharf's decking and rails were removed until work on unsafe piles and superstructure could be completed. Timber from here that was not rotten was recycled to areas closer to the shore, replacing planks removed earlier and radiata decking. Timber from the dismantled old Taupo wharf was also earmarked for use in restoration, ensuring "new" materials were in fitting with original components and locally-sourced.

Work to restore the entire wharf to its former glory re-

Right: Although currently shortened the wharf still dominates Tokaanu Bay. Photo: Glen Hazelton

mains ongoing, a task not helped by the occasional theft of materials off the structure. Certainly, the priority remains conservation, maintenance, repair and the stabilisation of the wharf, but there is scope in future for further reconstruction to increase the understanding of the wharf's original purpose. The wharf is incorporated with other historical sites in a local Tokaanu Heritage Walking Trail, as it again takes its commanding position in the lake. It will take those walking it back to a time when it was the gateway to an otherwise remote and isolated part of the central North Island.

Further south, another important heritage site whose working life was effectively brought to an end by the modernisation of transport in the North Island is also being actively managed by the Department.

The Ohakune Old Coach Road is the only remaining cobbled coach road in New Zealand. Its history is strongly connected to one of New Zealand's greatest construction feats—the North Island main trunk rail. This project was a key component of the massive public works programme inaugurated in 1870 by the government of William Fox and led by the visionary treasurer Julius Vogel. Like other great railway projects around the world, the challenging construction of the main trunk rail line like certainly played a part in the early stages of nation building. By April 1885 work had begun on the central stage of main trunk rail, a section that would prove the most complex and difficult and take some 20 years to complete. This section would ultimately provide some of the most impressive and innovative structures in New Zealand's engineering history. The Old Coach Road itself was built along the alignment of an old Bridle Track first surveyed by John Rochfort in 1886. After progressive upgrades a decision was made in 1905 to construct a more permanent, all-weather coaching road, when work on upgrading the Raurimu-Makatote Road demonstrated that the soft volcanic soil would make the road unusable in winter.

The back-breaking work continued between 1905 and 1906. Work gangs built the road by hand, shaping and laying the cobbles (setts) and in-

terlocking blocks along the road edges, all the while working and living through winters in the heavy New Zealand bush. At up to 3000 feet above sea-level, conditions were often cold and miserable. Still, many men had their families with them, living in simple whares with canvas roofs and wooden sides. They lived on only basic rations – either corned beef or occasionally bacon, supplemented by any vegetables they could grow on site during the summer months. Native birds provided the only fresh meat.

In spite of the isolated, inhospitable conditions and arduous, often tedious work, the first coach to travel the "Matapuna-Ohakune Coach Road" ran on November 11th 1906. The new cobbled road allowed passengers (and freight) to be transported by coaches between the northern and southern railheads of the uncompleted main trunk railway, in a trip taking an average of four hours. The road also continued to play an important role in supporting the construction of the railway and associated infrastructure. Although the going was still hardly smooth, for travellers taking the journey at this time the trip offered views an impressive trip through awe-inspiring virgin forest traversing the unique volcanic landscape.

The road's useful life was coming to an end in 1909, however, when the last section of the Main Trunk Rail line was fully opened to traffic. Parts of the road were subsequently brought into the national roads system, while the remainder were simply abandoned. In 1964 the Ohakune District Council blocked parts of the road with logs to prevent vehicular use of the road. In 1987 the main trunk deviation saw the road cut in two. Still, much of the road remained simply abandoned its finished state, being slowly reclaimed by an accumulating mass of leaf litter and regenerating native vegetation.

Below: The past is revealed to DOC staff and archaeologists during the excavation of the Old Coach Road. Photo: Derek Thompson

The road, however, was never forgotten by locals, and hunters and trampers familiar with the area. In the early 2000s, local businessmen and enthusiasts, led by Errol Vincent began to promote the tourist potential of the road. They convinced DOC of the significance of the road and the viability of restoring it to a usable condition as a walking track. With increasing research, it became apparent that the road had significance for a number of reasons, including its human history, cultural significance and its archaeological value. The fact that it hisitroic use of setts makes it the most superb example of a hand laid road in the country. With these factors in mind, as well as the superb potential visitor and recreational opportunities on Ohakune's doorstep, a decision was made to restore some of the road and make the remainder walkable, with links to the old Hapuawhenua and Taonui viaducts. Designed by the brilliant Public Works Department engineer Peter Seton Hay, these viaducts themselves are significant historical assets and stunning examples of the engineering excellence required to complete the main trunk rail. At 932 feet (284m) long, 150 feet (45m) high at its highest point, with a 10 chain radius curve, the Hapuawhenua viaduct remains im-

pressive and surely has to rank as one of the most beautiful viaducts in the country. Like the road itself, it is recognised as a Category I site, a 'place of outstanding or special historical or cultural heritage significance or value' under section 23(2) of the Historic Places Act 1993. As a result, it will be actively managed by the Department, restored to its 1987 condition, maintained to a high standard and eventually integrated as part of the walk with the track traversing its span. The smaller Taonui will be passively managed, though access to view the viaduct will ensure it too can be appreciated by visitors to the Old Coach Road.

Combined, the Old Coach Road and the viaducts also speak of a significance broader than their construction and technological ingenuity. The construction of the main trunk rail, with which both are connected, transformed the way in which people travelled and moved freight and mail. At a local level, the line opened up an area of the country previously under Maori control to growing European settlement, with major subsequent impacts for the Maori population. Areas previously seen as too remote to develop economically were now more easily accessible, and this access resulted in significant social and environmental changes for the Central North Island. Towns like Ohakune grew up as products of the railway, and sawmillers moved in to exploit the vast resources of native timber within easy reach of the main trunk rail, often permanently altering the region's landscape. From its very inception this has been a locally-driven project, and this partnership between DOC and the local community is set to continue throughout the life of the project. A partnership agreement for the restoration of the Ohakune Old Coach Road has now been signed between major community groups and the Department. The majority of the physical work on the road is expected to be undertaken by volunteers and a significant degree of raising funding for the project itself lies with the community. The Department will provide continual, ongoing support and technological expertise along with bodies like the New Zealand Historic Places Trust to ensure the track not only meets visitor safety and recreation standards, but also that all work done protects the strong heritage

Right: DOC staff and archaeologists take a rest during the clearance and excavation of part of the Old Coach Road. Photo: Derek Thompson

Right: Straddling the forest the Hapuawhenua viaduct is an impressive structure. Photo:Glen Hazelton

values of the road.

While the fact the road has been virtually abandoned since it ceased use has helped protect its heritage values, restoring it to a walkable state is obviously a considerable undertaking. As a result, work has been broken down into stages in an operations plan developed for the community by the Department. Over time this work will include investigations and archaeological surveys of the road to ascertain the extent of setts, its route and the location of drains and culverts, removing the layer of decomposition that has settled over time and the vegetation, reinstating the width and road structure, fixing slips, identifying and reinstating old drains and culverts in as traditional a manner as possible, preserving old fences and gates, and working to protect, restore or reinstate other special features like bridges, the quarry, dock and setts, and linking the two sections of road divided by the New Hapuawhenua viaduct diversion. An archaeological excavation in May 2005 gave archaeologists and DOC staff a better understanding of how the road was constructed and assisted in the development of a restoration and conservation plan.

With an enthusiastic community commencing initial work shortly, it is hoped that Stage One from Marshalls Road to the old Hapuawhenua Viaduct will be opened by November 2006, the 100th Anniversary of the opening of the road. In time, when the entire track is completed there will be on-site interpretation to convey the stories of this special road. Guided tours will offer concessionaire opportunities and local employment. Ultimately, visitors and locals alike will be able to re-trace the steps of pioneering New Zealanders. Walking along the Old Coach Road and under the Hapuawhenua viaduct it will be hard not to marvel at not only the incredible scenery of the dual World Heritage National Park, but also at some incredible feats of frontier engineering that have stood the test of time and still inspire awe at the fortitude, skill and ingenuity of their builders. The track will not only stand as a locally and nationally recognised testament to their achievements, but also to the determination of a local community and their partnership with the Department of Conservation to make their initial dream of bringing the past alive a reality.

Recreation and Facility Work

By Peter Devlin

Technical Support
Supervisor, Recreation

The provision of recreation facilities, whether it is a bridge, track or a simple marker pole, enables park visitors to have a recreational opportunity that is unique in the world. As a country, we can be proud that the Department is at the forefront internationally when it comes to Recreation Planning and the provision of visitor facilities.

The Department's Visitor Strategy has a number of inter-related goals that we are working towards. One of these goals relates to the protection of the places visited by members of the public. Many of the intrinsic and historic values of an area can be compromised by the number of visitors a place receives. A good example of this was evident on the Tongariro Crossing within Tongariro National Park.

With approximately 70,000 visitors annually using the Mangatepopo Valley, environmental impacts of some sort are inevitable. Consequently, some form of management intervention is required to minimise these impacts. Of particular concern was a section in the Mangatepopo Valley. Visitors were unable to follow a fixed track as this changed according to the season with numerous braided water courses. As a result, a network of tracks evolved with impacts extending over a large area. The decision was made to construct a boardwalk, it was determined this was the best option to overcome both the changing nature of the landscape through and would greatly assist in confining visitors to a defined area.

Recovery of the site will take some considerable time given the harsh alpine environment the plants are expected to survive. Stabilisation and re establishment of vegetation is already evident and the outlook in the longer term for recovery at this site looks positive.

A number of tracks within the Tongariro/ Taupo Conservancy will be upgraded over the next three to five years. Parts of the Tongariro Crossing, Spa-Huka, Waihohonu and Lake Rotopounamu trackswill all receive an upgrade. New tracks will be established up Mt Tihia and the Tuaranga/Taupo Waterfall.

Upgrade work is currently taking place near Ketetahi hot springs on the Tongariro Crossing. Extreme weather conditions associated with a high number of visitors makes this a challenging site to manage.

Erosion and the loss of material is a major challenge for management. In recent year, Ritter mats have been used to help retain material. Each mat has honeycomb cells that holds the material and prevents further

erosion. The mats are placed under the walking surface and will stop the loss of material once the walking surface has worn away.

The Taupo Fishery Area has been the recipient of a number of assets relocated from other sites within the Conservancy. A toilet block was removed from the Mangatepopo Roadend and the Mangawhero Lodge moved from Ohakune. The lodge is being used as a classroom for school children as part of the 'Taupo for tomorrow ' education programme.

Paul Green QSM

By Lianne Fraser
Programme Manager
Community Relations

Colleagues, friends and staff were delighted when Paul Green's dedication to conservation and outdoor recreation was recognised with the Queen's Service Medal for public services in the 2006 New Year Honours list.

Paul started his career in conservation as a ranger in Tongariro National Park at Ohakune in 1974. But his passion for the outdoors began as a teenager with weekends spent tramping in the rugged Tararua Ranges, often with the Wellington tramping club. In 1968 he and friends spent four months exploring and climbing in the Peruvian Andes, an adventure which remains a highlight in his life.

His work with the Department of Conservation and its parent organisations, Lands and Survey, Forest Service and Wildlife Service has taken him to a range of locations within New Zealand and overseas. He's worked in Fiordland National Park, the Hauraki Gulf, and was an exchange ranger at Australia's Kosiosko National Park. Paul has been the conservator for the Tongariro Taupo Conservancy since 1987.

More recently he represented New Zealand at the World Parks Congress in South Africa and the Pacific at a World Heritage workshop in Kazan in Russia. He helped draft the terms of reference review of the Argentinean National Park system and is a member of the International Organising Commission of National Parks and Protected Areas. Through the United Nations environment programme, Paul is actively involved in international conservation efforts.

The complexity of work has deepened over the years but Paul says one of the more satisfying aspects is a growing recognition for the importance of conservation, especially its cultural and economic value.

"One of the things I'm proud of is being able to manage Tongariro National Park World Heritage Area against increasing visi-

Above right: Paul Green, Tongariro Taupo Conservator who recived the Queen's Service Medal for Civil Service in the 2006 New Year's Honours List. Photo: John Shorland
Right: Conservancy staff put on a celebration function for Paul at the Turangi offices to which past and present staff who had worked with Paul were invited. He was presented with a finely carved Waka Huia in which were rocks and feathers from each of the areas he has worked, Hauraki, Kosiosko (Australia), Fiordland and Tongariro. Photo: Dave Wakelin

Above right: Paul has a passion for the outdoors and has always believed in and supported the summer programmes run by the department. He leads a number of trips including this one to the top of Mt Tihia from which there are magnificent views of the national park and Lake Taupo.
Below: While it is quite a joke among staff that Paul is something of a technophobe he has embraced cellphones to the extent that even in the middle of the Kaimanawa Forest Park on a summer programme trip to Tauranga Taupo Falls he was answering calls!
Photos: John Shorland

*tor numbers, and being able to manage many of the natural and cultural values we're trying to protect without turning the place into a t*heme *park,*" he says.

Working with tangata whenua, and Ngati Tuwharetoa in particular, is a rewarding part of his job and Paul has enjoyed his role in developing and strengthening their relationship. He actively supports Ngati Tuwharetoa Paramount Chief Tumu te Heuheu as New Zealand's Head of Delegation to the World Heritage Committee and was integral in Tongariro National Park becoming the first World Heritage Area in the world to gain Associative Cultural Heritage status.

Paul is held in high esteem by colleagues and friends alike. After the tragedy at Cave Creek in 1995 it was members of the West Coast staff that asked for Paul to be appointed to help guide them though their difficult times.

His quiet wisdom and encouragement have helped many people develop and further their careers and his advice and support are valued by many. Never one to blow his own trumpet, he works behind the scenes, uses humour a great deal and manages to bring out the best in people.

As well as his work with DOC, Paul is a member of the Central North Island Blue Duck Charitable Trust, the Waikato River Enhancement Trust and the Tongariro Natural History Society. He has been a trustee of the Sir Edmund Hillary Outdoor Pursuits Centre for 15 years and works with the Turangi Whanau Support.

The MallowPuff Project

By Dr Harry Keys
Conservancy Advisory Scientist

During work at the crater (2545m) During work at the crater (2545 m) on 24 October digging a 2.5 metre deep hole to change the batteries at ERLAWS site 1, we discovered that our reward for the hard labour, pineapple MallowPuff chocolate biscuits had all cracked open. Speculation was rife on whether it was the altitude, damage in my pack or some other cause. Griffins who manufacture MallowPuffs agreed to us doing some more product testing and provided samples.

Subsequently we found that 30 % of biscuits tested had the chocolate coating cracked open by 1630 m (Iwakau), 60 % by 1750 m (Hut Flat), 86 % by 2000 m (Knoll Ridge), 96 % by 2250 m and 100 % by 2600 m. Only two biscuits made it intact to the crater rim (on the day with the highest air pressure) but they cracked shortly thereafter. The speed of ascent (by helicopter, car or foot) appeared to make no difference and neither did various combinations of holes melted through the chocolate coating in attempts to vent expanding air inside the puffs.

We concluded that the cracking is caused by the air trapped inside the marshmallow expanding as the external air pressure reduces with increasing altitude. The marshmallow in MallowPuffs is manufactured at low elevations and deposited onto the biscuit base probably at a slightly elevated pressure. Marshmallow is elastic, so when external air pressure reduces the whole mass of marshmallow will expand. The chocolate coating is relatively brittle and can not accommodate this expansion so it cracks. Fortunately this has no effect on their taste. We thank Griffins Foods Ltd for their support.

Saving the Central North Island Blue Duck

By Jonathon Miles
Technical Support Officer
Biodiversity.

Approximately ten years ago, ECNZ (the predecessor to Genesis) began the process to renew the resource consents to continue to operate the Tongariro Power Development scheme. ECNZ began a process of consultation with the Department of Conservation (DoC) and the Royal Forest and Bird Protection Society (Forest and Bird).

Representatives from DoC and Forest and Bird were at the core of a working group of many interested parties that investigated and worked through many complex issues surrounding the renewal of these consents. Central to those concerns for DoC and forest and Bird were blue ducks and trout. Two of the more conspicuous inhabitants of these rivers. After much consultation, Do, Forest and Bird and Genesis established a mitigation package consisting of the release of minimum flows below the Mangatepopo and Whanganui intakes on the Western Diversion of the TPD and the establishment of a blue duck trust. The trust would provide for ongoing initiatives to enhance, protect and promote blue duck populations, habitat and natural character.

A formal agreement was entered into on 2 November 2000 and the Central North Island Blue Duck Conservation Charitable Trust (CNIBDCT) was launched in Tokannau on 16 August 2002. The trust is chaired by former Forest and Bird president Keith Chappell. The new trust will seek to assist the establishment of new blue duck populations, especially locally, the protection of existing ones and the promotion of blue duck river conservation awareness from a chest of 1.5 million to be provided by Genesis Power over the life of the water right (15 years).

The primary objective of the trust is to:

Create new self-sustaining populations of blue duck in appropriate locations (not limited to the TPD region).

The ancillary objectives are to:

- Enhance existing populations of blue duck within catchments affected by the TPD as a first priority but not limited to these catchments;
- Enhance priority aquatic indigenous ecosystems within the catchments affected by the TPD.
- Enhance priority threatened species conservation work within the catchments affected by the TPD.

The trust has approved three projects one of these projects is to secure whio in the Western Central North Island.

Our project aim is to secure a combined minimum population of 40 interrelating pairs of blue duck on key rivers in the central North Island,

namely the Whakapapa, upper Whanganui, Mangatepopo, and Manganui o te Ao (Wanganui Conservancy).

The project will test whether the implementation of predator control regimes will secure self sustaining blue duck populations on these rivers. It will run for 5 years from 2004/05 onwards. On a section of each river blue duck productivity and survival will be monitored without predator trapping for three seasons, how ever one of these seasons 2006/07 we will be monitoring productivity and survival during and after an aerial 1080 operation. Trapping will target stoats mainly.

Project Plan:

We need to monitor these rivers prior to any type of control so we are

	2004/05	2005/06	2006/07	2007/08	2008/09
WHAKAPAPA	No trapping monitor productivity & survival	No trapping monitor productivity & survival	Aerial 1080 Monitor productivity & survival	Trapping monitor productivity & survival	Trapping monitor productivity & survival
UPPER WHANGANUI	No trapping monitor productivity & survival	No trapping monitor productivity & survival	Aerial 1080 Monitor productivity & survival	Trapping monitor productivity & survival	Trapping monitor productivity & survival
MANGATEPOPO	No trapping monitor productivity & survival	No trapping monitor productivity & survival	Aerial 1080 Monitor productivity & survival	Trapping monitor productivity & survival	Trapping monitor productivity & survival

able then to measure the effectiveness of either the aerial 1080 operation occurring in 2006/07 season. Effectiveness 1080 results in a higher overall survival territorial pairs, chicks and juveniles for that particular season. The same is the case for when we start to trap for stoats along these three rivers we will also be measuring the same things.

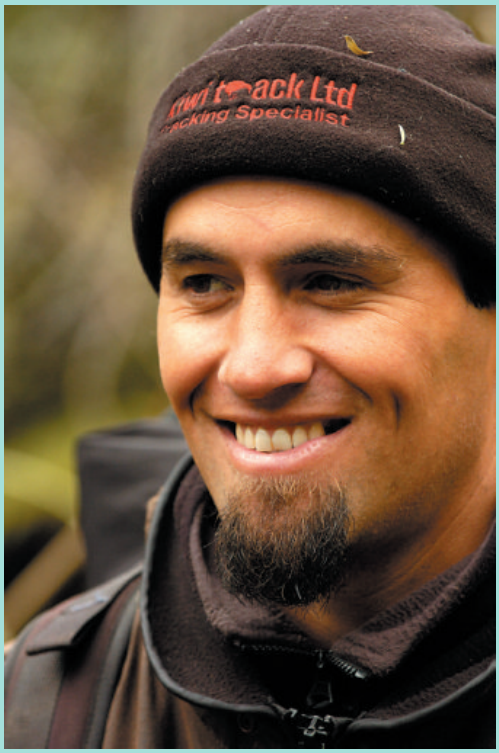
We need to do monitor for a number of reasons, then main one has been stated above, but others are we want to be able to provide figures before and after so we are able to model the population, if these management techniques work they can be adopted else where in New Zealand where whio are declining as well, and maybe most importantly we are able to show results that provide the Central North Island Blue Duck Conservation Charitable Trust one of our funding sources, and the Department itself that the money each has put into this programme is delivering on what it was intended to deliver on, and is therefore achieving what it set out to achieve to secure a minimum population of 40 interrelating pairs on key rivers in the central North Island.

We are still in the monitoring phase of this programme, and the rest of the article is dedicated to those who are actually doing the monitoring, the people who are on the rivers from August through to the end of February, or if you like from when there is snow on the ground through to when the snow from the volcanoes has all melted away and when these peaks are ready for there next frosting, and of course the ducks themselves.

Rising out of bed at 5am to jump into a freezing cold river is not every-

Right: Whio Ranger Bubs Smith tracks a Blue Duck which has been fitted with a radio transmitter.
Below: Gavin Thompson, who with Bubs spends his days in the rivers of the Central North Island tracking Whio.
Photos: Bubs Smith

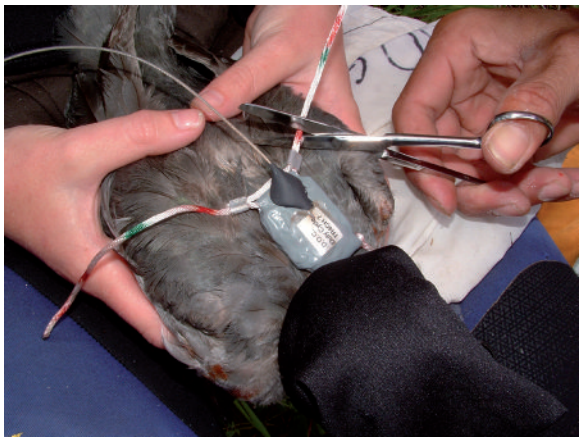
one's idea of a good time, but this is a typical day for one of the Ruapehu Whio Programme team members. For Whio Rangers Bubs Smith & Gavin Thompson, early starts are just part of the job, particularly as the old adage of the early bird catching the worm (or whio so to speak) definitely holds true for whio workers. Whio are most active early morning and late evening, often hiding in caves during the heat of the mid-day sun, thus if you want to be part of the action, then early to bed and early to rise it is. Once underway, Bubs and Gavin travel in the aptly named "Duck Truck" to one of three rivers within Tongariro Forest which form the Ruapehu Whio Programme's study site. These are the Mangatepopo, Whanganui or Whakapapa Rivers, all of which are interconnected. The study site stretches for a total of almost 30km between the three rivers, so the team has a busy schedule. Upon reaching the river, Bubs & Gavin climb into half-dry (or half-wet if you're a pessimist) wetsuits, there they walk the river reach, covering many kilometres of river in a day. Walking on slippery, algae-covered rocks all day is no mean feat, and the team have the bruises to prove it!



Whilst monitoring the river reach Bubs and Gavin are recording what ducks they see, and what they're up to. This data translates into valuable information such as population trends, adult survival, adult mortality, number of nests, causes of nest failure, chick productivity, juvenile survival, recruitment data and dispersal data. Daily work not only includes monitoring, but also catching whio as well. Almost all of the 60 or so whio in the study areas are now banded with unique colour bands on their legs so that the team can individually identify the ducks. Catching and banding occurs in December and January. One of the main focuses of these banding operations is to catch and band the young chicks, ideally just prior to fledging from their parents. The brood, of typically between two and six

chicks, stay with their parents for almost three months, before fledging off into the big unknown to hopefully find a mate and territory of their own. Banding days call upon the help of other Whio Team Members such as Alison Beath, Petra Specht and Jonathan Miles. Many other DOC staff and members of the community also come along to help out. A banding day generally kicks off at the leisurely hour of 7:30am, (as it's important that volunteers aren't too tired for a day on the river). Once on the river, it's usually fairly easy to find the target birds, as whio occupy the same territory all year round. Once the birds are located, the team sets a large mistnet across the river, using a system of ropes and poles. Then, most of the team hides in the scrub around the net, so that they cannot be seen by the ducks. Whilst they do this, one member of the team heads upstream of the birds, and herds them downstream into the net, aiming to have them float slowly downstream and into the waiting net. Once the birds are removed from the net they are weighed and bands fitted to their legs.

A selection of females also have transmitters attached. This is a vital part of the project, as it allows the team to locate nest sites. In the days before transmitters, , locating nests required hours of patient observation, hoping to catch a glimpse of a female leaving or returning to her nest site and giving herself away. Whio nest in caves or vegetation close to the river's edge, and are vulnerable to both predators (mainly introduced stoats) and floods. Now there are 15 females with lightweight transmitters attached, they wear these on their backs like miniature backpacks. This makes locating nest a comparative breeze. Locating nests is so vital as one of the biggest limitations to the population appears to be from nest failure (through predation or flooding). By pin-pointing the nests we can find out what caused the nest failure, giving us the relative importance of floods vs predation as a threat to the nests, and also what predators exactly are posing the greatest threats to the ducks. Mustelids (stoats, ferrets, weasels), cats, dogs, possums, and rats are all likely candidates. Importantly, having females transmittered means that dead females can be located and the cause of death can be established. Females are more vulnerable than males to predation, as females are attacked and killed on the nest. This means that most whio populations are now characterised by a few pairs, and a surplus of single males, desperately seeking a mate. This male bias in populations is an indicator of the impact predators are having on whio. Just a few months ago, a dead transmittered female was found on the Whakapapa River. Only her skeletal remains were left, cached inside a stoat den, obviously having supplied a meal for a litter of young stoats. This sort of tragedy unfortunately is also part of the job for the Whio Team.



In order to prevent these sort of occurrences, the Ruapehu Whio Programme is investigating the impact of predation on the whio populations. This is achieved by monitoring prior to and after predator control on the rivers. Trapping will be instigated along the study area rivers in 2007. We are also investigating the outcomes of a 1080 drop in Tongar-

iro Forest in September 2006. If predation is a key driver in the decline of our populations then we should see positive results in key performance areas such as higher adult survival, more pairs on our rivers, more successful nests, higher productivity, higher chick survival, and possibly higher recruitment levels. The understanding gained in this project of threats to whio, and the methods to manage those threats will also contribute to whio conservation nationally.

Despite the challenges of the job and the river environment, for the Ruapehu Whio team, working with whio is a particularly rewarding job. They are stunning, mysterious birds, an icon of our wild rivers. They are considered so special by New Zealanders that they are even on our $10 bill. They are highly unique, and many aspects of their biology directly relate to the difficult river environment which they spend all year round on. For example, they have a thick fleshy lip on their upper bill, which acts as a shock absorber when feeding for stream invertebrates amongst rocks. They have big, comic-looking webbed feet, meaning they can negotiate the toughest rapid with ease, making us humans look clumsy and well out of our element. Whio are also incredibly camouflaged- their blue-grey colouring means they look remarkably like a rock, even to experienced observers. The river is a difficult environment to live on, as fluctuating river flows can affect food supply and nests. Thus, whio occupy the same territory year-round, so as to avoid the high energetic costs associated with moving between widely spaced feeding areas. Aspects of their social behaviour are also related to the river environment, for example, males and females live in year-round pair bonds with each other. This appears to be an adaptation to the river, as two adults are required to keep the young chicks together so they don't get swept away. All of the other three species of ducks worldwide that live year-round on the river also have year-round pair bonds.

This season 2004/2005 we have monitored 27 pairs, 19 nesting attempts of these only 7 have been successful getting 26 chicks to the water. Of these 26 chicks 11 have been lost (flooding, predation), 15 have fledged and are now juveniles.

Just pay a thought in August, if you are up at 6:30 in the morning of Bubs Smith and Gavin Thompson, as they will be on/in one of the three rivers we monitor ..... I certainly will.

Taupo - one stop tourist destination

New Zealand is one country that can lay claim to having a heart. 30,000 New Zealanders live literally within a stone's throw of that heart - Taupo Moana - Lake Taupo. Look at a map of New Zealand and Lake Taupo, with it's distinctive heart shape, dominates the centre of the North Island.

It is no coincidence that Taupo Moana plays such a significant part in New Zealand's heritage, cultural and geological.

The legends of the creation of the islands of New Zealand are well known. Stowaway demi god Maui whilst on his brothers waka (canoe) cast into the depths of the ocean and hauled up a gigantic fish which became Te Ika a Maui (the fish of Maui), the North Island of New Zealand. The skyfather Ranginui placed the venerable mountain Ruapehu on the centre of the heaving fish to bring calm. Ruapehu, later joined by Tongariro and Ngauruhoe, looks out over Taupo Moana the heart of the North Island.

Today that heart beats strongly, drawing almost a million visitors a years into the area, whether to sightsee, ski, relax or push themselves to the limit on one of the many many multisports events the area is known for.

Naming a lake

Historian John Grace of Ngati Tuwharetoa records the naming of Lake Taupo in his seminal work "Tuwharetoa". He describes two possible origins of the lake's full name Taupo Nui a Tia. Both involve the explorer Tia who travelled inland from the Bay of Plenty looking for land for his people. Finding a tribe, Ngati Hotu, already settled at the northern end of the lake he travelled aound the shore to find land near Titiraupenga and settled with his people in the shadow of the mountain.

While Tia was at Paka on the eastern side of the lake, he noticed standing some distance away a high, rocky cliff which faced the lake. He observed the peculiar formation and colouring of the laval rock. It appeared to him to resemble the cloak that he wore about his shoulders. The cloak was called a taupo (a word that is now obsolete) and was made of closely woven material with an outer covering of flax leaves, coloured yellow and black. It was used as an outer garment to shed the rain. Tia went toward the cliff and under it made a post of sacrifices that he named Hikurangi. There he recited the incantations considered needful to propitiate the local deities. Rising up he removed his cloak and fastened it to the post and named the great cliffs Tauponui a Tia (the great cloak of Tia)

The name Tauponui a Tia, during the occupation of the tribes that followed, was given to the lake itself and then to the vast tract of land surrounding it.

FACTS & FIGURES ON THE DISTRICT - AREA	
Total area	6,970 km2
Total land area	6,354 km2
Lake Taupo area	616 km2
Planted plantation forests	189,000 ha
Other forestry land (unplanted)	44,800 ha
Farming	187,861 ha
Residential	1,720 ha
Commercial/ industrial	548 ha
Mining/mineral	53 ha
Reserves, Parks	153,315 ha
Other	58,101 ha
FACTS & FIGURES ON THE DISTRICT - ALTITUDE	
Lake Taupo	370m
Lake Taupo (depth)	164m
Mt Ruapehu	2,797m
Mt Ngaruahoe	2,290m
Mt Tongariro	1,968m
FACTS & FIGURES ON THE DISTRICT - POPULATION (2001 census - usually resident population)	
Taupo Town	20,310
Turangi Town	3441
Mangakino Village	1281
Other (Rural)	6489
Total District	31521
FACTS & FIGURES ON THE DISTRICT - LAKE TAUPO	
Length	46 km (25 nautical miles)
Width	33 km (18 nautical miles)
Perimeter	193km (104 nautical miles)
Area	600 sq km (60,000ha, 150,000 acres)
Volume	59 cubic kilometres
Height above sea level	Minimum (chart datum) 355.85m
Depth Maximum	186.84m (102.2 fathms) below chart datum. Average 110m (60.1 fathoms)
Surface temperature	Coldest winter 10.6oC Summer average 18.0oC (up to 25oC in shallows in summer)

Destination Lake Taupo, the marketing wing of Taupo District Council, has divided the many activities in the area into six themes that best characterise what the area has to offer.

Fire and Ice

Tongariro World Heritage National Park contains three magnificent volcanoes - Mt Ruapehu, Mt Tongariro and Mt Ngauruhoe. Drive right around the lot on the famous Volcanic Loop Highway. Scenic flights can take you over Lake Taupo and the volcanoes. During the summer months ride a chairlift up the slopes of Ruapehu to the highest restaurant in New Zealand, on the Whakapapa Skifield. The 17km Tongariro Crossing for those with reasonable fitness traverses the Tongariro volcano massif. Regular transport operates to and from the crossing.

Together the Turoa and Whakapapa ski areas make up the largest ski area in New Zealand with 1,800 hectares of groomed snow. Being in volcano country, the region is also famous for its many geothermal attractions. Both the Taupo and Tokaanu townships offer weary travellers the ultimate health spa experience - the chance to luxuriate in bubbling, hot natural mineral waters with nothing above you except the stars. Just

minutes north of Taupo near the village of Wairakei is Craters of the Moon, a spectacular 45 minute walk around a thermal area.

Adventure Plus

Mountains, forests, rivers, lakes and uncrowded skies ensure that just about every adrenalin pumping outdoor taste is catered for. Options include jetboating, 4x4 motorbiking, white water rafting, kayaking jet skiing, tandem skydiving, bungy jumping, horse trekking, parasailing, replica racecar driving, mountain biking, abseiling, rock climbing, skiing and snowboarding.

Not everyone comes to Taupo and the region for the high thrill 'man-made' adventures. Each year thousands marvel in the countless waterfalls, streams, mountain trails, forest glades and lake views. The Tongariro Crossing is just one of dozens of long and short walks available in the central North Island, some connected by a series of well maintained huts. Visitor centres and DOC offices have walks brochures available.

Turangi at the southern end of Lake Taupo is known as "Adventure Central". On its doorstep are the Tongariro River, Tongariro National Park, Kaimanawa Ranges, Lake Taupo and the Whakapapa and Turoa Ski Areas.

Indulgence

Not everyone who comes into the Taupo area is into the adventure stuff! For many enjoying the magnificent scenery from the comfort of a bus or car or even the deck of a tourist launch is ideal. The region boasts a tremendous range of accommodation from basic backpacker (this is one of the most popular backpacker destinations in New Zealand) through to the exquisite and exclusive such as Huka Lodge, consistently ranked as one of the top 10 lodges in the world. New motels, lodges and apartments are being built each year to cater for the increased demand. Indulge in a little TLC (trout, luxury and champagne) at either end of the lake. The view of sunset on the mountains of Tongariro National Park across Lake Taupo is only equalled by that at Whakapapa of the setting sun turning a massive, snow-covered volcano pink.

The region has six excellent golf courses, fine lakeside paved walks and award winning restaurants. Relax over a fine cappuccino at one of the many outdoor cafes and before or after dinner soak in a natural mineral spa at either end

Want to know more about the Taupo district?

One of the most comprehensive tourism websites in the country is that of Destination Lake Taupo www.laketaupo.com. A little further south log onto www.ruapehunz.com for what to do in and around Ruapehu. For conservation information don't forget www.doc.govt.nz

of the lake.

Heritage and Culture

The central North Island has large tracts of New Zealand's untouched, unspoilt, uncrowded country. The volcanoes of Tongariro National Park, New Zealand's first national park and a World Heritage Area dominate the view south from Taupo Township. The park was created in 1887 when it's sacred peaks (Ruapehu, Tongariro and Ngauruhoe) were gifted to New Zealand by the Ngati Tuwharetoa people. The Park Visitor Centre at Whakapapa on the slopes of Mt Ruapehu has fine displays and audiovisuals on the parks cultural and natural history. For a further fascinating insight into the customs and history of the Tuwharetoa people, visit Wairakei Terraces where you can see a replica Maori village, treasured Maori carvings, indigenous cultural performances and enjoy a traditional hangi feast.

On the western side of the Lake is the Pureora Forest Park where you can walk through ancient rainforest so untouched, some of New Zealand's rarest flora and fauna still thrive here. To the east of the Lake, the Kaimanawa Forest Park contains vast ancient beech forests.

In the beautiful Whirinaki rainforest, local Maori offer a fascinating and illuminating eco-cultural experience with fully escorted walks, treks and wonderful manaakitanga (hospitality).

Family Fun

The Taupo region is a great place for families. Besides those everyday essential kids stuff like hamburgers, crotch-dragging jeans and skate ramps, there is a huge range of healthy outdoor attractions you won't find in any city mall. Take the kids trout fishing, cruising or sailing on the Lake, go eco-exploring secret beaches in a kayak or float down the Tongariro River on a white water raft. Cycling is big in the area with specially built mountain biking trails and a brochure dedicated to this activity. Over the Christmas/New year period DOC runs its popular summer programme of walks and activities.

In winter there's every snowsport from tubing to snow scooters and the beginner facilities on Mt Ruapehu are brilliant. Hire a mountain bike and zoom along some of the many beautiful forest trails. Take them horse trekking, 4 wheel

A few travel tips

- Book ahead. The Taupo region is extremely popular all year round.
- Pack some walking shoes. You'll be surprised at the range of walks, from short 20 minute stroll to more energetic full day efforts.
- Don't forget sunscreen. We are 355 metres asl and closer to the sun!
- Dont leave valuables in your car. Sadly, here as in most tourist spots opportunistic thieves feel they have more right to your possessions than you do.
- Bring plenty of film or a spare memory card for your digital camera. This area is a photographer's heaven.

Above: Walkers on the Tongariro Crossing stop to admire the view of Blue Lake and distant Lake Taupo.
Photo: Peter Blaxter

quad biking or mini-golfing or to the thermal water parks, indoor climbing walls and the hole-in-one golf. Not everything costs – check out Aratiatia Rapids, Huka Falls, Botanical reserve, Craters of the Moon, Native plant Nursery, Rose Gardens, Tokaanu Thermal Walk, Tongariro National Trout Centre, Opepe Reserve and heaps of walking tracks.

Trout Paradise

In a country world famous for trout fishing, the Lake Taupo region is the best of the best. Writer Zane Grey introduced the rest of the world to the legendary trout fishing in the rivers flowing into Lake Taupo and anglers have been flocking to the area ever since. A real New Zealand adventure is to hire a guide and explore some of the gin-clear streams and rivers of the region. The Tongariro River at the Southern end of Lake Taupo is one of the best trout rivers in the world - a 'temple of the sport' as one overseas magazine raved.

At the National Trout Centre (www.troutcentre.org.nz) beside the Tongariro, an under river viewing room lets you get a trout's-eye view of the action. On special days throughout the year volunteers organise children's fishing days at the centre.

The chances of catching a decent sized trout during your stay are very good, even if you are new to the sport. Some of the local guides who operate charter boats on the Lake actually guarantee you'll catch a trout. Fresh manuka-smoked Rainbow-on-rye with a glass of wine has to be the perfect way to end a day in the Taupo region.

A Fine Balance

The protection of vast areas of the central North Island is clearly part of the key to a very successful tourist industry, a finely tuned balance. Tongariro National Park, New Zealand's first, was set aside as the National Park in 1887. Other areas around Lake Taupo were es-

tablished as reserves and the vast Kaimanawa Forest protected as a Forest Park.

Trout fishing as a major recreation and tourist industry has not only brought dollars to the area but the realisation that our rivers and lakes must be cared for if we are to continue to maintain the reputation as the world's greatest trout fishing area. Central to all this is the Department of Conservation. The department is responsible for administering and managing vast areas of natural and historic resources in the central North Island. A network of tracks is maintained by DOC staff along with accommodation that ranges from four bunk bivvies through to 24 bunk huts, well used in the summer months. Staff maintain viewing tracks and look out points at most of the key scenic spots in the area. Often DOC works very closely with local authorities such as the Taupo District Council and the Ruapehu District Council and volunteer organisations such as the Tongariro Natural History Society, Tongariro National Trout Centre Society and Ohakune 2000 on specific community projects that enhance tourist attractions.

Piwakawaka

By Sascha Brocks
Volunteer
Tongariro Natural History Society

Flying halfway round the globe to the "other site" to look after a little bird called Piwakawaka "Fantail" is something not everyone would consider useful. But being an ecology student from Germany and having the chance to volunteer with the Tongariro Natural History Society puts it into context.

I come from a country not having the problem of pests like rat, stoat and possum being a thread to the native birds and plants. Therefore I was keen to learn more about this specific field of conservation and playing a little role towards the restoration of the mauri or life force of the Karioi Rahui.

Above: New Zealand Fantail, Piwakawaka, returns to the nest. Photo: Sascha Brocks

The Karioi Rahui is located on the southern flanks of Mt Ruapehu, just east of Ohakune, and is from cultural and historic significance to the Ngati Rangi and to the park. Covered by a rich reds-silver beech/podocarp forest it contains half of Tongariro/Taupo Conservancy's priority

species such as North Island brown kiwi, kaka, short-tailed bat and a diverse mistletoe population, being the largest in the North Island.

One tool to determine the success of pest control methods is to monitor the breeding success of the Fantail, because it's one of the most common birds, easy to follow and at risk of predation. I did this to gather baseline data prior to rodent control in spring 2006 which will be compared with the results of a second monitoring the same summer.

The aim is to have more than 50% successful clutches combined with tracking tunnel indices less than 10%. This would mean that the current methods to protect the native bird life are working.

This year's results show already an improvement in the breeding success due to the stoat traps, which are in place in some parts since Feb. 2004, but away from these it's a mere 25%.

Above right: Sascha with a kiwi.
Below: Fantail chicks on the nest.
Photo: Sascha Brocks

Besides spending most of my time looking after my little friends and providing DOC with necessary data for the future management of the Karioi Rahui Restoration Project I had the chance and time to experience the Park and New Zealand in a way a normal tourists might not. I went on the TNHS trip to Mokau, joined the AGM, helped on the Kite Day and Tussock Traverse, accompanied DOC staff on summer program trips, spent Christmas in Waihohonu Hut, killed willows in the wetlands, baited at Rotopounamu and enjoyed the hospitality and company of the other volunteers, members and Sarah.

After four and a half months in Turangi and six months away from home it is finally time to leave. University exams and another summer are waiting in Germany. But I hope to be back next October to continue the project and with the support of the TNHS and DOC writing my master thesis here.

Conservation Awards for 2005

By Dave Wakelin
Senior Community
Relations Officer

The thirteenth Tongariro Taupo Conservancy Conservation Awards were announced at The Lakeland Resort in December, before a large gathering, which included the Tongariro Taupo Conservation Board. In all five awards were made. The Bernard Stretch Memorial trophy was also presented and this year was awarded to Wairakei Primary School by Elliot Ashton-Stretch, Bernard's son.

Conservancy Landscape Architect, Herwi Scheltus, in presenting the first conservation award of the evening to Russell and Trevor Le Quesne, trading as TPP Contracting. Herwi said Russell and Trevor were, "Local earthworks contractors who have completed work in a very sensitive and effective manner on Mt Ruapehu over the last 5 years. Their first job in Tongariro National Park was the restoration of areas such as 'Orc Road' disturbed during the filming of parts of 'Lord of the Rings'."

What has always impressed said Herwi has been the way they have undertaken difficult terrain projects such as the installation of snow making pipelines for RAL and the Iwikau-Whakapapa Village sewage scheme where they went to places where tracked machines had never been before and are most unlikely to ever go again! Connecting 50 plus club lodges and RAL buildings to the new sewer line which they also installed was no mean feat and Russell's operator skills came to the fore. Both Russell and Trevor committed themselves to getting it right with the minimum amount of environmental damage by doing it once and doing it properly.

Turangi Taupo Area Manager Dave Lumley spoke of the Waipahihi Botanical Reserve, a 34 ha Scenic Reserve owned by the Crown which has been managed on a day to day basis by the Waipahihi Botanical Society since 1968.The reserve is a valuable conservation gem almost surrounded by urban development and has become increasingly valued by locals and visitors for its quiet walks among native and exotic gardens.

"The society," said Dave, "with its membership of approximately 400 thoroughly deserved to receive this award. Every week up to 30 volunteers spend two or three hours tending the ex-

Above right: Laura Dawson (centre) with Elliot Ashton-Stretch with staff from Wairakei School, recipients of the Bernard Stretch Memorial Award.
Above: Landscape Architect Herwi Scheltus presents Russell and Trevor Le Quesne with their award.
Right: Bette Davis accepts the award on behalf of the Waipahihi Botanical Society from Turangi Taupo Area Manager Dave Lumley.
Photos: Dave Wakelin

Above: Conservation Award Winners 2005 with their awards. From left to right - Trevor, xx and Russel Le Quesne, Margaret Jefferies (TNHS),Peter Otway, Bob Norling and Errol Vincent (MTRO) and Bette Davis (Waipahihi Botanical Society).
Below: Peter Otway with his award presented by Conservator Paul Green. Photos: Dave Wakelin

tensive gardens and maintaining the walking tracks within the reserve." Conservation with Communities' is a key mandate for the DOC and the efforts of the Waipahihi Botanical Society demonstrate how effectively community organisations can deliver conservation achievements. Notably last year a member of the Society, Larry Stent, received a Conservation Award for his years of work at Waipahihi Botanical Reserve as well as at Pukawa.

Conservator Paul Green in presenting a Conservation Award to Peter Otway on behalf of Conservancy Advisory Scientist (at present in Antarctica) Dr Harry Keys acknowledged the enormous role Peter had played over the years in the understanding and hazard management of one of New Zealand's foremost volcanoes. "His work surveying at Ruapehu is legendary and his 'office' at Dome Shelter must have one of the best views of any regular workplace in New Zealand." said Paul.

One of the great services Peter made was to provide ideas, critiques and be a sounding board for all manner of aspects of Crater Lake and lahars. This has been very comforting as DOC grappled with some very significant volcanic processes with major implications.

Peter, like all surveyors, knows the value and techniques of measuring distances, heights, and volumes and so has provided us with, or helped us obtain, a wide range of data. He has been meticulous in his analysis of data and was always reliable. The study Peter led on Whakapapa lahars remains a benchmark for lahar risk mitigation and the effects of global warming on the crater glaciers as well. His measurements of lahar velocity in 1995 (up to 90 kilometres per hour) were another first.

Ruapehu Area Programme Manager Community Relations, Bhrent Guy, spoke of parts of our history which in the modern pace of

Above: Bob Norling and Errol Vincent with the award presented to the Main Trunk Railway Organisation.
Below right: Sarah Gibb, Executive Director of the Tongariro Natural History Society and DOC's Senior community Relations Officer, Dave Wakelin. Photos: Dave Wakelin

life could easily be overlooked and allowed to rust or rot away. The award made to the Main Trunk Railway Ohakune (MTRO) recognises that in Ohakune there is a group dedicated to preserving our railway past and with it the influence early rail construction had on the town. Bhrent said, "MTRO became pro-active in pursuing access to the to the historic Hapuawhenua Rail Viaduct via the Ohakune Old Coach Road, an old cobbled coaching road, running through Tongariro National Park from the end of Marshalls Road, Ohakune, to Horopito."

The research work, submissions and lobbying by Robert Norling and Errol Vincent and other members of MTRO Inc. to bring about two extremely important decisions ie the inclusion in Tongariro National Park Draft Management Plan and Historic Places Listing, for the protection of this nationally important historic heritage site was of monumental proportion. The Old Coach Road preserves major aspects of New Zealands pioneering history and reflects the technology used and the hardship endured in opening up the central North Island for further development. Their continued passion to ensure that the road becomes a piece of New Zealand's history which all can enjoy and learn about.

Conservator Paul Green made no secret of how much pleasure it gave him to present an award to the Tongariro Natural History Society. Paul said the society was, "Born out of a helicopter tragedy on Mt Ruapehu in 1982 when five people died. Formed from a bequest made by the families of those who died the society had long been a stable support group for the national park and latterly for the conservancy in general." He went on to say that initially the society supported the park on a number of key interpretation projects through sales of its well researched and illustrated publications. In recent years a change of focus of the society, which now has a paid Director and a membership of more than 250, has changed to accept the challenge of organising and running a number of conservation projects by volunteers such as the Mt Pihanga/Rotopounamu restoration project and encourages people from all walks of life to become involved.

Roy Dench - QSM

By Dave Wakelin
Senior Community
Relations Officer

Roy Dench is one of those quiet achievers who has worked tirelessly, giving up hundreds of hours of volunteer service and expecting little in return. To him it is his way of furthering his passionate interest in the outdoors, in national parks and conservation. We applaud the awarding of a well deserved Queen's Service Medal.

Those of us who have worked with him in DOC know of the efforts both he and Annette have made as regular leaders of Summer Programme trips in Tongariro National Park. Much of his association with Tongariro has been through the Tongariro Natural History Society where he has given outstanding voluntary support over two decades. He also served a term as President of the organization.

Above: Roy and Annette Dench with Conservator Paul Green who also received a QSM in the New Years honour's list. Roy's QSM was for Community Service and Paul's for Public Service
Photo: Herwi Scheltus

The great strength of Roy's contribution to conservation has been his ability to advocate for indigenous fauna and flora. He has years of knowledge and experience that he is happy to share on many levels - as a conservationist, as an advocate and educator, as a volunteer and as a tireless worker.

Roy has been a member of the Otorohanga Zoological Society, Inc for more than 30 years and beside two long periods as chairman, for which he received a life membership, his achievements have included:

- Completion of the Barry Rowe Aviary, a large dome aviary.
- Kiwi Rescue missions in Northland and Taranaki.
- Establishment of the Tangiteroria Kiwi Reserve in Northland.
- New pens constructed to house Little Spotted Kiwi and Tuatara translocated to the Kiwi House.
- A captive managed and captive breeding programme for Tuatara established.
- Upgrade of kea and kaka enclosures and bird of prey aviaries built to display NZ Falcon, Harrier Hawks and Barn Owls.
- Great Spotted Kiwi and Little Spotted Kiwi chicks successfully hatched.
- Saddlebacks translocated and released into Barry Rowe aviary.
- Establishment of the Deer Park.
- Construction of a new kitchen for bird food preparation and a hospital for injured fauna.
- A special needs building that included an incubation room and housed brooders, the library and provided office space.

An Illustrated Guide to Lahars

By Dave Wakelin
Senior Community
Relations Officer

Mt Ruapehu is a volcano with a relatively unusual feature. The vent of the volcano is filled with a 10 million cubic metre lake, Crater Lake. Any eruption of Ruapehu has to occur through the lake. Large eruptions blast vast volumes of water out onto the slopes of the mountain giving rise to lahars as rivers of water carry snow, ash and debris down into the valleys.

In 1995 and again in 1996 Mt Ruapehu erupted, throwing ash and debris in all directions onto the slopes of the volcano and blanketing much of the central North Island in varying thicknesses of ash. Mt Ruapehu is one of the world's most active volcanoes and had previous erupted with similar magnitude in 1945. Many other eruptions have occurred in the intervening years, and several produced lahars.

A consequence of the 1995/1996 eruptions was the depositing of about seven metres of volcanic debris (called tephra by scientists) over the lake outlet of Crater Lake creating a barrier. The barrier becomes a dam when the lake level exceeds that of the old lake outlet

A lahar will occur at sometime in the future once the lake level behind the barrier reaches a level above the old lake outlet such that water percolation through the loosely consolidated material causes the dam to collapse.

Below right: This view of Casita Volcano shows the pathway of the landslide and lahar that swept from volcano's south flank. The large boulders in the foreground originated from the upper flanks of the volcano; the largest boulders are about 3 m in diameter. The fast-moving lahar probably rolled or bounced the huge boulders along the base of the flow to their current location. Note that the lahar spread across the valley floor as it swept from the mouth of the canyon; trees in the center of the valley were left standing. (Photo: K.M. Scott)

What is a Lahar?

Lahar is an Indonesian term that describes a hot or cold mixture of water and rock fragments flowing down the slopes of a volcano or river valleys draining one. When moving, a lahar looks like a mass of wet concrete that carries rock debris ranging in size from clay to boulders

A Catastrophic Lahar

The side of Casita Volcano in Nicaragua collapsed on October 30, 1998, the day of peak rainfall as Hurricane Mitch moved across Central America. As the sliding debris eroded older deposits from the volcano and incorporated additional water and wet sediment from along its path, it increased in size (bulked up) about nine times. By the time it reached the base of the volcano, the thick slurry of rocks and water had also diluted to a watery flow (hyperconcentrated flow, 40-80% sediment by weight). The fast-moving mixture then eroded additional sediment to transform into a debris flow containing more than 80 percent sediment by weight.

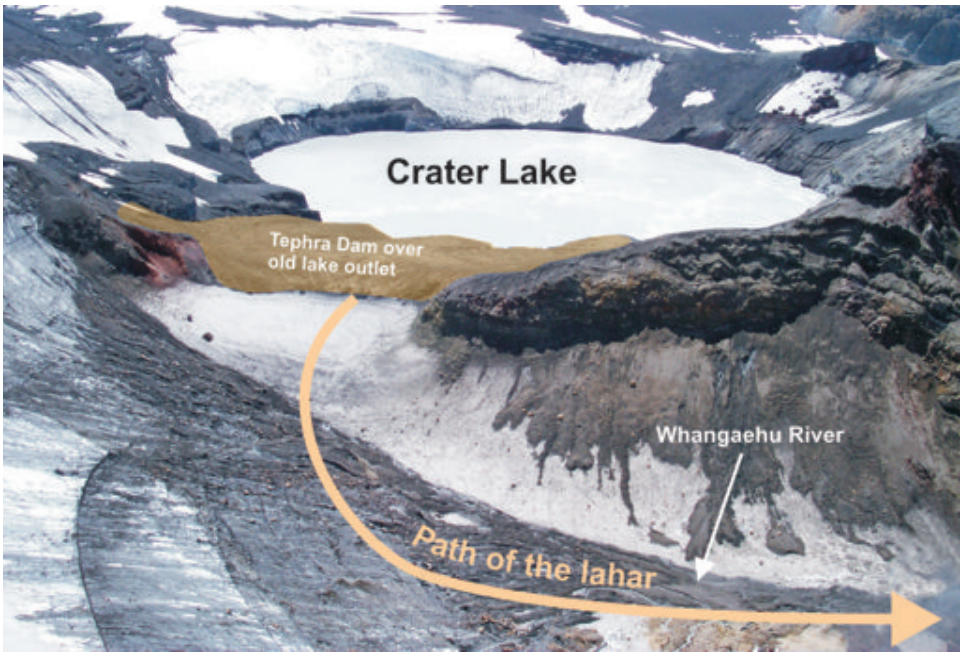
The lahar killed more than 2,000 people as it swept over the towns of El Porvenir and Rolando Rodriguez. The only warning of the approaching lahar was a noise like helicopters or thunder, and ground tremor that caused some residents to think an earthquake was occurring. Within 2.5 to 3 minutes, the lahar overran the towns, killing almost everybody.

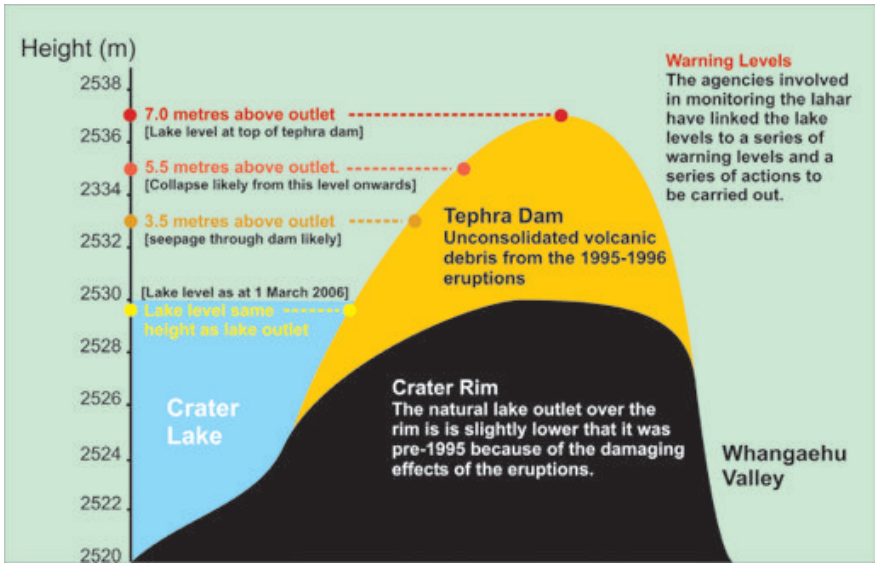
The two towns destroyed below Casita (El Porvenir and Rolando Rodriquez) were "new towns" that were, unbeknownst to planners, placed in a prehistorically active lahar pathway.

Above: Graphic showing the location of the ERLAWS sensors (DOC and Genesis), the bund and the likely path of the lahar from Crater Lake.
Below right: Crater Lake, Mt Ruapehu showing the location of the tephra dam and the path of the lahar.

more than 10 m in diameter. Lahars vary in size and speed. Small lahars less than a few metres wide and several centimeters deep may flow a few metres per second. Large lahars hundreds of metres wide and tens of metres deep can flow several tens of metres per second - much too fast for people to outrun.

As a lahar rushes downstream its size, speed, and the amount of water and rock debris it carries constantly change. The beginning surge of water and rock debris often erodes rocks and vegetation from the side of a volcano and along the river valley it enters. This initial flow can also incorporate water from melting snow and ice (if present) and the river





Above: Profile of Crater Lake rim showing the tephra dam and warning levels related to significant lake levels. Various agencies have prescribed actions once each warning level is reached.

it overruns. By eroding rock debris and incorporating additional water, lahars can easily grow to more than ten times their initial size. But as a lahar moves farther away from a volcano, it will eventually begin to lose its heavy load of sediment and decrease in size.

Numerous terms are used by scientists to describe the properties of lahars (for example, mudflows, debris flows, hyperconcentrated flows, and cohesive and non-cohesive flows).

What triggers a lahar?

Eruptions may trigger one or more lahars directly by quickly melting snow and ice on a volcano or ejecting water from a crater lake. More often, lahars are formed by intense rainfall during or after an eruption--rainwater can easily erode loose volcanic rock and soil on hillsides and in river valleys. Some of the largest lahars begin as landslides of saturated and hydrothermally altered rock on the flank of a volcano or adjacent hillslopes. Landslides are triggered by eruptions, earthquakes, precipitation, or the unceasing pull of gravity on the volcano.

Volcanoes are susceptible to landslides for several reasons. Their cones are steep and often rise thousands of metres above the surrounding land. They are built layer upon layer of weakly consolidated and brittle rock debris. Because of the frequent intrusion of magma into their cones and the shear mass of lava that form their cones, internal faults or shear zones commonly develop. Finally, hot, acid-rich water or steam commonly circulate throughout the cone to forming hydrothermal systems. Over time, this hot water changes hard volcanic rocks to weak material. A volcano with a hydrothermal system is like a house infested with termites--the house gradually weakens to the point that it may collapse. The collapse of a volcano, and the resulting lahar, are natural, expectable events during its life history and long after it stops erupting.

The collapse or "flank failure" of a volcano will often generate a fast-moving landslide that usually transforms into a lahar after traveling a few kilometres. Depending on the size of the landslide, its water content, and extent to which the volcano's rocks have been weakened and turned into clay by a hydrothermal system, the resulting lahar may travel more than 100 km downstream. Approximately 4500 years ago we think a hydrothemrally altered part of the old crater rim of Ruapehu (between the summit ridge and Cathedral Rocks) collapsed and produced a large destructive depositi in the Whangaehu valley. A report of sich an event today would cause cause serious economic and environmental damage.

Right: The Tangiwai road bridge on State Highway 47 was raised by two metres to lift it above any damaging affects of the predicted lahar from Mt Ruapehu's Crater Lake and subsequent lahars.
Photo: Dave Wakelin

Planning for a managed response to the predicted lahar from Crater Lake

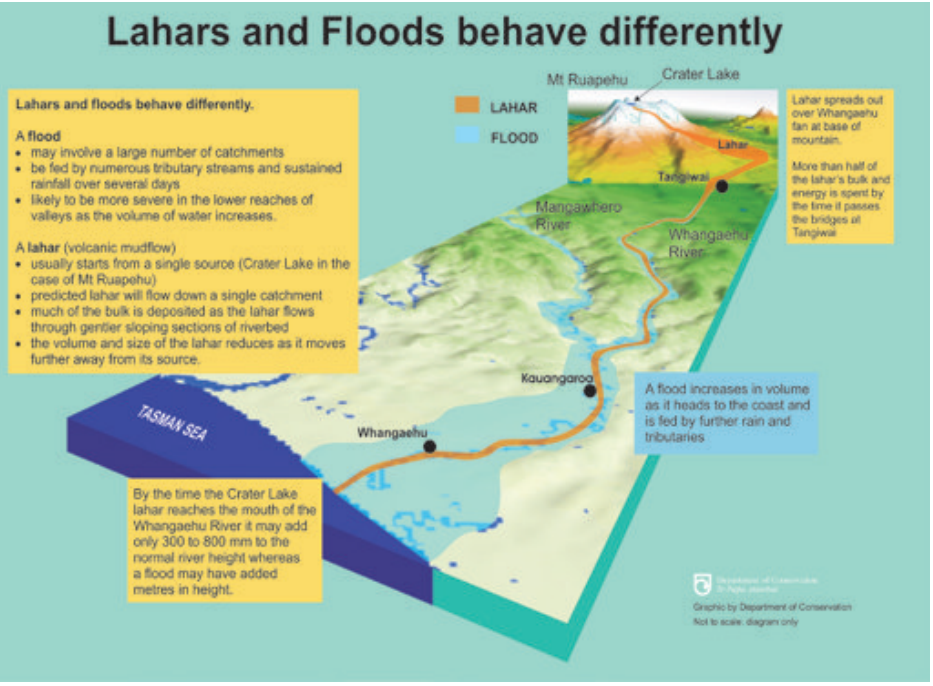
Planning for the expected lahar down the Whangaehu Valley on East Mount Ruapehu is well advanced. The Department of Conservation has carried out an objective environmental and risk assessment and the Minister of Conservation. Actions undertaken to mitigate the effects of the lahar include:

- The Department of Conservation has put in place the ERLAWS warning system and the bund.
- Emergency response systems have been established with warning lights and gates on State Highways 1 and 49.
- The rail authorities have upgraded their warning systems in place to stop any rail traffic and are confident that the bridge and rail structures can withstand the lahar.
- The Tangiwai Road bridge on SH49 has been lifted by two metres and strengthened to ensure that the bridge infrastructure is clear of the expected maximum lahar wave height.
- Emergency response plans have been written, tested and refined.

Can the size and destructiveness of the lahar be predicted?

The likely size and destructiveness of a lahar cannot be predicted accurately because of the complexity of the dam failure process, and of lahars themselves.There are several possible scenarios:

- The lake water could percolate through the loosely compacted tephra, creating a tunnelling effect that empties the overfill as a dribbling outflow, of no threat to anything and anyone.
- The lake could erode through when the levels have reached only half the maximum height of 7 m and create a moderate lahar.

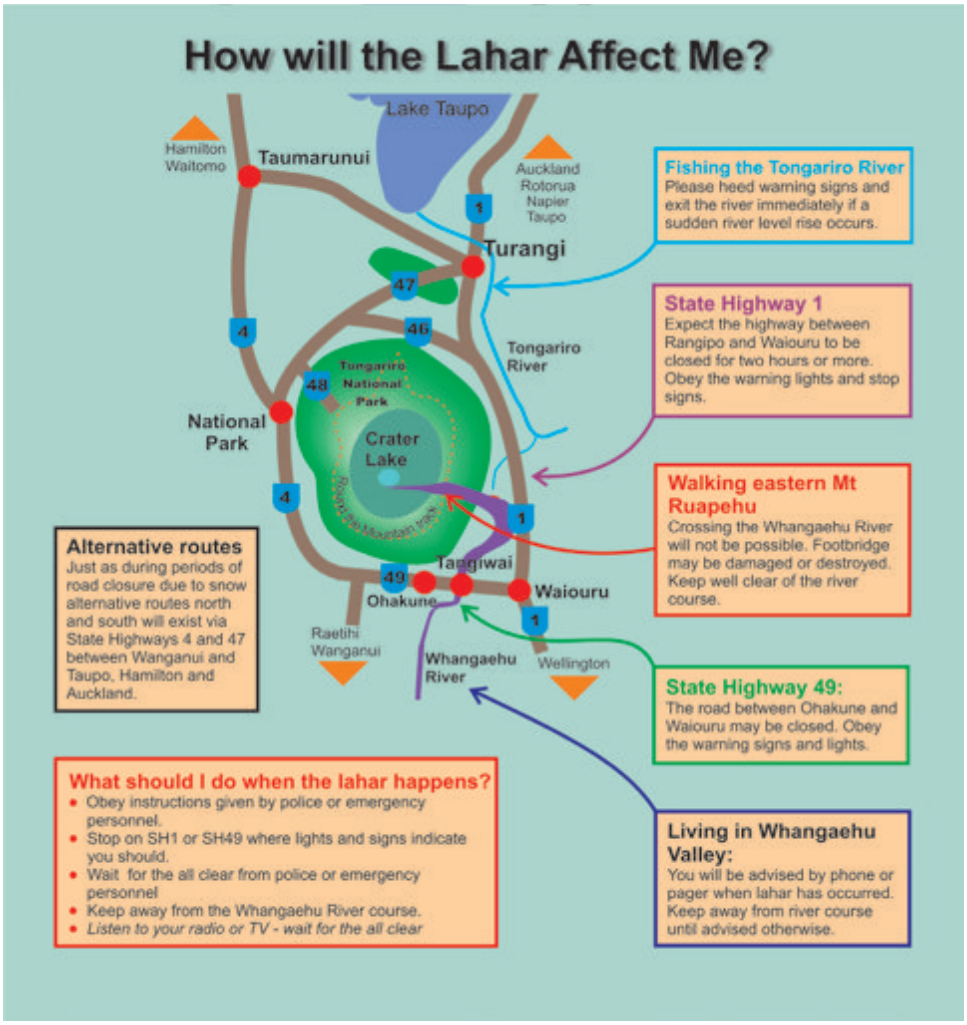


Above: Graphic to show the different in behaviour and effects of lahars and floods.

Below right: Graphic to show the affects of the lahar on different users.

- The worst case would be if the tephra dam were to collapse suddenly when the water level reaches its top, and the full volume of overfill (approximately 1.6 million cubic metres) was released into the Whangaehu. Planning for the consequences of a lahar has been based on this eventuality. The most likely sized lahar will be up to 90% larger than the 1953 event.

This lahar would take about 20 minutes to reach the top of the Whangaehu outwash fan at 1200 m. The flow would begin to wane soon after and, within an hour, the flow would have decreased by about 80%. The wave travelling at an average speed of 21 km/h would reach Tangiwai in about two hours.



How does the East Ruapehu Lahar Alarm Warning System work?

Sophisticated ground sensors have been installed at three sites on Mt Ruapehu. The sensors detect vibration caused by the movement of a lahar. In addition, a trip-wire has been placed in the tephra dam and water level sensors in Crater Lake itself will detect the dam breaking and the dropping water level. The triggering of the lake outlet sensors alerts authorities via a radio, phone and computer networks. A lahar passing down the Whangaehu River past the Alpine Club sensor site creates a second opportunity for an alert or reinforces the first alert. The timing between the two reports gives a further indication that a lahar is underway and how fast it is moving. This information is further confirmed if the Tukino sensors also respond. Authorities involved in the emergency response, such as DOC, Police, Ruapehu District Council, Transit and Ontrack will be immediately notified by pager alarms, and predetermined actions will be initiated. These include notifying other stakeholders such as Transpower, and other local and regional authorities, plus confirming the initial alarm has been received and actioned. The system will give up to two hours advance warning at the Tangiwai Bridge, and up to one hour's warning at the Desert Road.

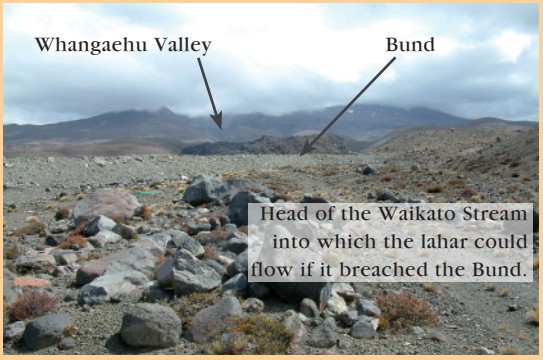
What is the likelihood of the alarm system failing?

Failure is considered very unlikely. The alarm system is the best available in the world, and has been adapted to meet conditions on Mt Ruapehu. It has three types of lahar sensors at three sites, supported by dual radio telemetry paths. The base station has a automatic backup computer system ready at all times and a 24/7 website for information support and system operation.. A similar system in operation on Mt St Helens in Washington has worked without failing for the past 10 years. In May 2003 the sensors picked up a small rain flood in the Whangaehu Valley.

Below right: The bund constructed to reduce the possibility of the lahar flowing into the Waikato Stream.

Bund facts

Where is the bund located?



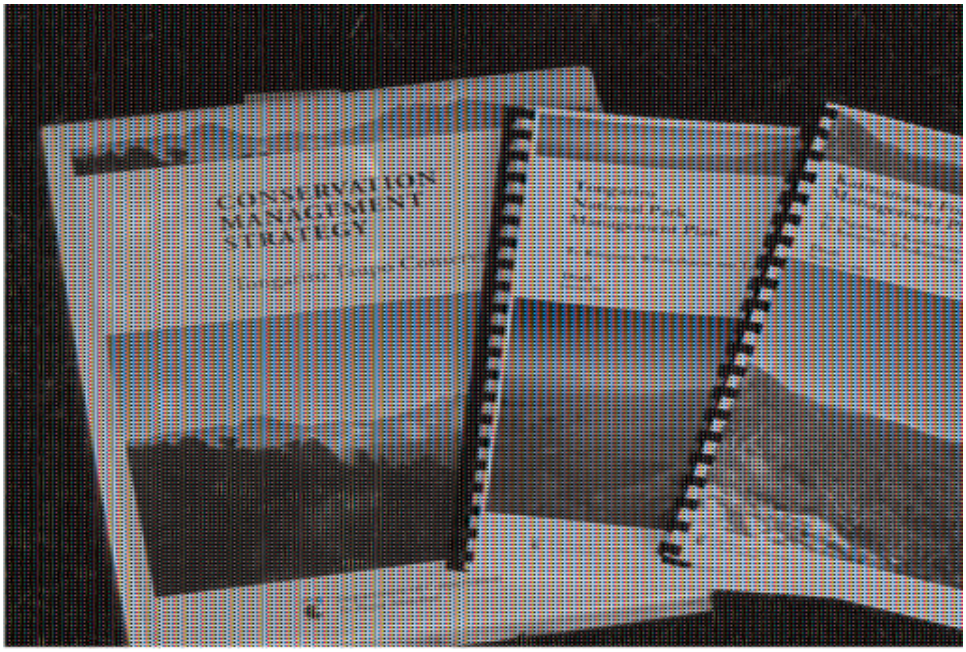
The bund (stopbank) is located at the end of a massive ridge on the true left-hand side of the Whangaehu River close to the national park boundary. It is constructed in the location most suitable for preventing a lahar spilling from the Whangaehu into the Waikato Stream and ultimately into the Tongariro River.

The bund is built from material recovered from the Whangaehu riverbed. The bund is appoximately 285 m long, 20 m wide and a maximum of 4.6 m high.

Will deflecting the worst case lahar down the Whangaehu river create additional risks to infrastructure and people?

The increased risk is negligible. It is projected that flows down the Whangaehu would increase between about zero and seven per cent, or looked at another way, would increase the water level at Tangiwai by about 2.5 cm, or 0.5 %

Why does the department do statutory planning?



By Ro Cudby
Conservancy Planner

"Conservation" means the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public and safeguarding the options for future generations.

Conservation Act 1987

Conservation is a state of harmony between men and land.

Aldo Leopold (1949) A Sand Country Almanac

The Department of Conservation's statutory planning function is part of a range of tools employed to fulfil the main aim of the Conservation Act 1987 – to conserve New Zealand's natural and historic resources.

The department is involved in two types of statutory planning: management planning, for protection of natural and historic resources on land the department administers; and advocacy planning, for protection of natural and historic resources off public conservation land..

When it comes to the aim of management planning, Aldo Leopold really hit the nail on the head. Along with conservation of natural and historic resources, the Conservation Act directs the department to foster recreation and allow tourism. The department's statutory management strategies and plans seek to integrate these different, and at times conflicting, goals by finding an acceptable balance between conservation of the natural environment and human interests. Conservation management strategies and plans must do this within the legislative and policy framework illustrated in figure 1.

Tongariro/Taupo Conservancy prepares two types of statutory management planning documents. The Tongariro/Taupo Conservation Management Strategy 2002 (CMS) implements general policies and establishes objectives for the integrated management of natural and historic resources on all public conservation land in the conservancy. The Tongariro National Park and Kaimanawa Forest Park management plans implement the CMS and establishes detailed objectives for the integrated management of those places. Both the Tongariro National Park and Kaimanawa Forest Park management plans are currently under review.

The second type of statutory planning the department carries out is its advocacy work. Section 6(b) of the Conservation Act directs the department to "advocate the conservation of natural and historic resources generally". This function is generally achieved through participation in processes such as the preparation of district and regional plans and policy statements by local authorities and involvement in resource consent applications processed under the Resource Management Act (RMA).

Examples of advocacy planning undertaken by the conservancy in recent years include making submissions to the Proposed Taupo District Plan, submissions to proposed variations to Environment Waikato's regional plan relating to Lake Taupo water quality and sustainable management of geothermal resources, and involvement in numerous resource consent applications for subdivision of land around the lake.

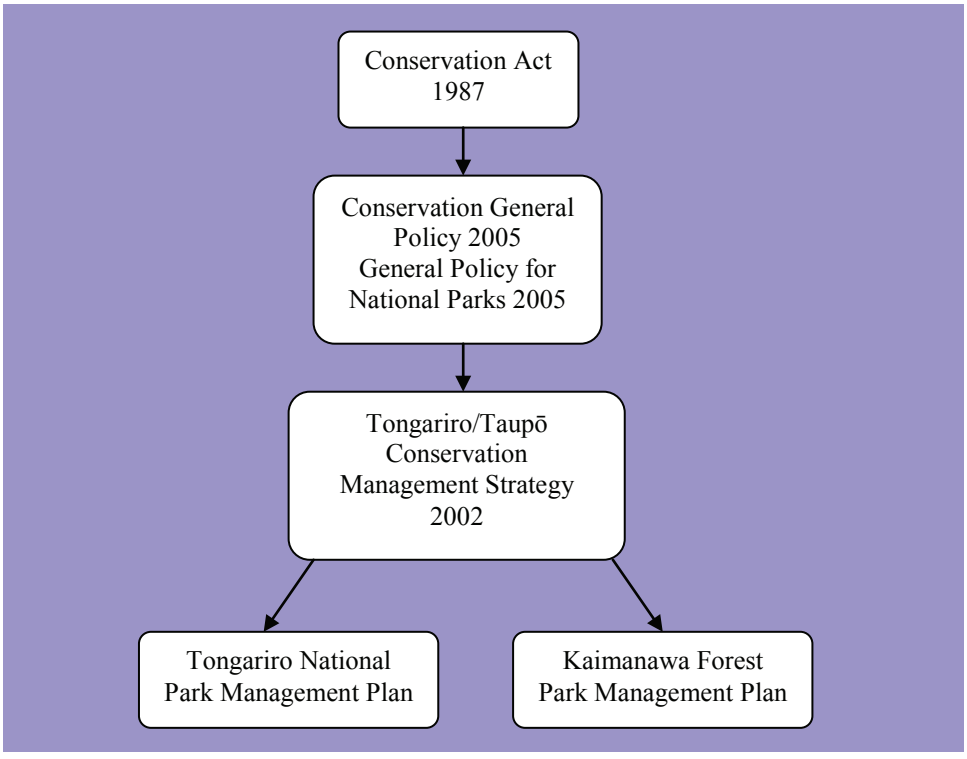


Figure 1: The legislative and policy framework that applies to conservation planning.

1. The Tongariro National Park Management Plan has been through two public consultation processes and is currently with the New Zealand Conservation Authority for its consideration and approval. The Draft Kaimanawa Forest Park Management Plan was released for public consultation in December 2005 and public submissions were invited by 10 March. Following consideration of submissions, this plan will be redrafted and handed to the Tongariro/Taup Conservation Board for approval.

Volcano Watch 2005

Ruapehu

By Dr Harry Keys
Conservancy Scientist

The most active events of the year were steam bursts (aka "hydrothermal eruptions") during a strong geothermal heating episode in late winter-spring. Heads of steam rising moderately rapidly were seen from north and south of the mountain on the morning of 13 September 2005. Most of the other reports of "eruptions" were only steam rising passively from the heated lake or cloud effects. The heating episode started in late July accompanied by minor but significant seismicity (Brad Scott and others personal communication). Maximum temperatures of 39°C were measured on 3 September and 15 November similar to the maximum in the previous heating episode which peaked on 9 February 2005. A further heating episode commenced in early-mid February 2006 with minor seismicity in the form of moderate volcanic tremor beginning later in the month.

The 2005 winter heating episode improved our understanding of the complex Crater Lake/vent system. It provided a very clear demonstration of the tendency for the lake to rise during these episodes (Figure 1, Table 1). Most recent geothermal heating episodes have occurred during the spring-summer melt season when melt- and rain water flowing into the lake obscure any change accompanying the heating itself. But in winter there is little melt. Precipitation and snow drifting were minimal from July to August 2005. Evaporation can be significant in windy conditions and warm lake temperatures but wind speeds were generally relatively low during July-November. Therefore, apart from some precipitation inputs from October onwards and evaporative losses, most of the changes in lake level from July to 5 December 2005 (Table 1) are thought to have been due to thermal expansion (about 0.3 m at the temperatures involved, Tony Hurst personal communication) and fluids welling up from the vent system beneath the lake during heating or drawing back down into the vent during cooling. Such fluid transfer is believed to occur as a result of thermal instabilities between single phase (gas or brine) and two phase (gas and brine) regions of geothermal and magmatic fluids in the vent system (e.g. Vandemeulebrouck, Hurst and others, Analogue

TABLE 1. CHANGES IN CRATER LAKE LEVEL AND TEMPERATURE DURING WINTER-SPRING 2005

DATE	LAKE LEVEL (M ASL)	LAKE TMPERATURE (^{0}C)	STAGE IN LAKE LEVEL CYCLE	NETT VOLUME ADDED OR LOST (CUBIC METRES)	VOLUME/DAY (M^3/D)
27 June	2527.7	18	Minimum level of winter		
31 August	2528.5	38	1st peak in level	+149,000	+2300
6 October	2527.5	Ca 30	Minimum level between heating pulses	-187,000	-5200
27 October	2528.1	37	2nd peak in level	+116,000	+5500
5 December	2527.2	Ca 30	minimum level before summer rise	-173,000	-4400

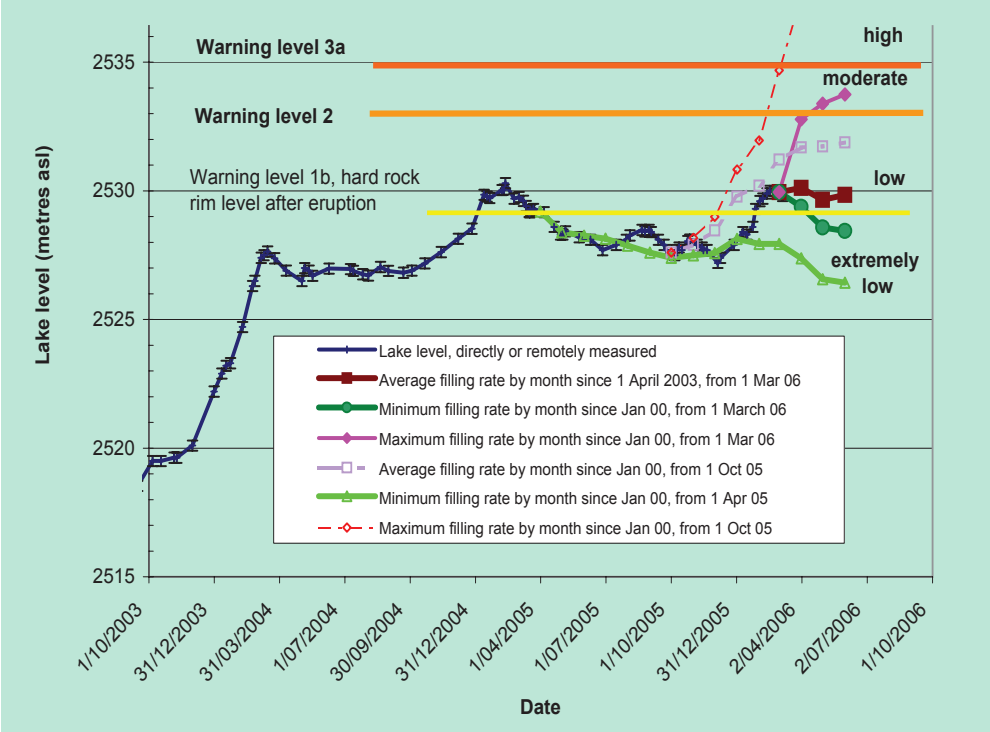


Figure 1. Crater Lake level since 1 October 2003 with six scenarios of previously projected or future lake levels. The draw down in lake level in November 2005 had a major influence on projected levels for the 05/06 melt season. Warning levels 1b to 3a are also shown (horizontal coloured lines) with expert judgments on the likelihood of dam break at these levels.

modelling of instabilities in crater lake hydrothermal systems, Journal of Geophysical Research vol 110, 2005). These volume changes may be better quantified in future but in the meantime are estimated to be range of -4000 to +4000 cubic metres per day. They represent considerable perturbations to the lake level and when they are identified will be taken into account in future lake level projections.

Ongoing filling of Crater Lake

Crater Lake has continued to fill but the filling rate appears to have slowed. Figure 1 shows the rise in lake level (blue line) that has occurred since 1 October 2003 (see Tongariro 2005 page 44, for filling before then). For much of 2005 the filling rate was relatively low, similar or less than the minimum rate (light green line/triangle symbol) that has occurred in any month since April 2003, except during the heating episode. The rises in lake level in the spring-summer melt seasons are still clear but the falls in autumn have become more pronounced in the last two years. Each year the lake level at the start of the melt season (taken as 1 October) has been higher than on 1 October the preceding year (Figure 2). Up to April 2005, the level reached in the melt season (Oct –April) has also always been higher than in the preceding year. But so far this melt season the peak level has not reached the peak of 04/05.

The apparent reduction in lake level increase (i.e. filling rate) is clearly shown by the levelling (flattening) off in the volume of the lake, measured at 1 October (Figure 2). The flattening off in lake level is also due to the inverted cone shape of the crater basin, which means that the same volume of water occupies a thinner layer as the lake rises. The 2005/06 melt season may represent a significant change in the trend of ongoing filling, although it was clearly influenced by the lake level decrease between late October and 5 December (Figure 1).

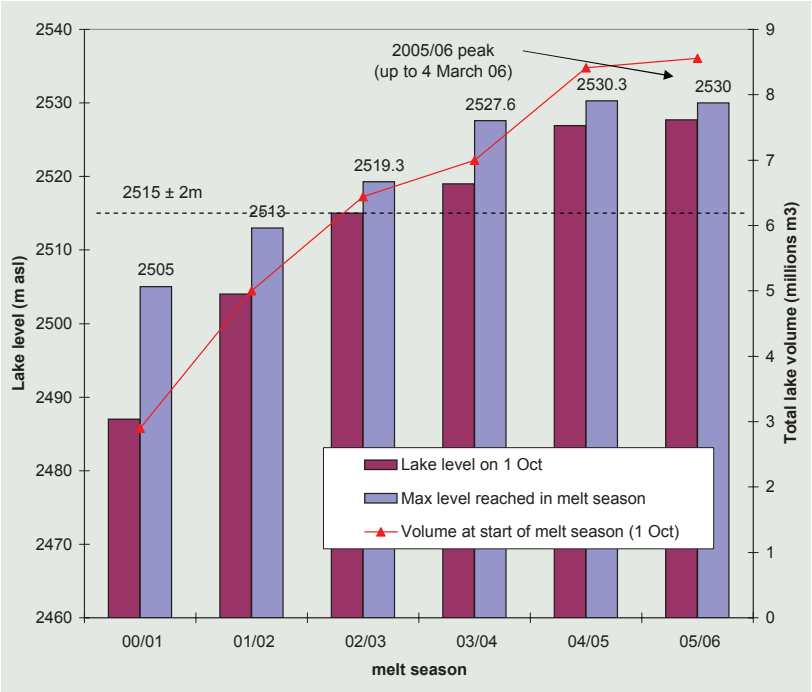


Figure 2. Crater Lake levels at the normal start (1 October) and peak of each melt season since 2000, with the recent slowing in filling rate indicated by the flattening off of the data series for lake volume (red line) at the start of the melt season.

The amount the lake fills each melt season is quite variable for several reasons. Many different processes affect the water balance (i.e. inputs include snow and glacier melting, precipitation, snow drift, ice calving and snow avalanches, upwelling from the vent, thermal expansion, crater floor uplift, rock fall; while outputs include evaporation, potentially seepage well below the hard rock rim level in the crater basin and/or at shallow depths, drawdown into the vent, thermal contraction, crater floor subsidence). Some of these processes are subject to day to day climatic variability or year to year volcanic variations and few can be quantified easily, especially given the relatively short period of time since volcanic activity quietened after the 1995-1998 eruption sequence and since accurate measurements have been possible. To date the lake has filled the most in the 2000/01 season (Figure 3), when the nett increase was two million cubic metres, and least in the 2002/03 season when 0.63 million cubic metres were added. So far in 2005/06 the nett addition is even less than that, only 0.54 million cubic metres, from 5 December 05 (but it is only 0.44 million m^3 nett when calculated from 1 October 05).

This variability has a major effect on the probability that a critical lake level will be reached in any given melt season. This probability depends mainly on the volume of infilling required to raise the lake from its level at the start of the melt season to a level high enough to make the tephra dam unstable. The critical level is considered to be approaching or above 2536 m (Warning level 3b, Fell report 2003) but the stability seems likely to start to decrease above 2535 m (Warning level 3a): so WL 3a is regarded as the critical planning level.

It is important to note that despite the variability, the volume (amount of infilling) required to raise the lake to Warning levels 2 and 3a has steadily reduced (Figure 3) as the lake has filled, that is until this season. The 04/05 season was the first that the critical planning level would have been reached if the lake had filled by the maximum amount experienced in either the 2000/01 or 2003/04 seasons (Figure 3). 1.5 million m^3 were needed to fill the lake from its level on 1 October 2005 to the critical planning level.. At the start of the 05/06 season there was roughly a 2 in 6 chance of that level being reached in 05/06. So far only a third of the required volume has been recorded so the critical level is now unlikely to be reached this season. The flattening off in 05/06 of the red curves for the amount of infilling required (Figure 3) is another illustration of a change in the filling trend.

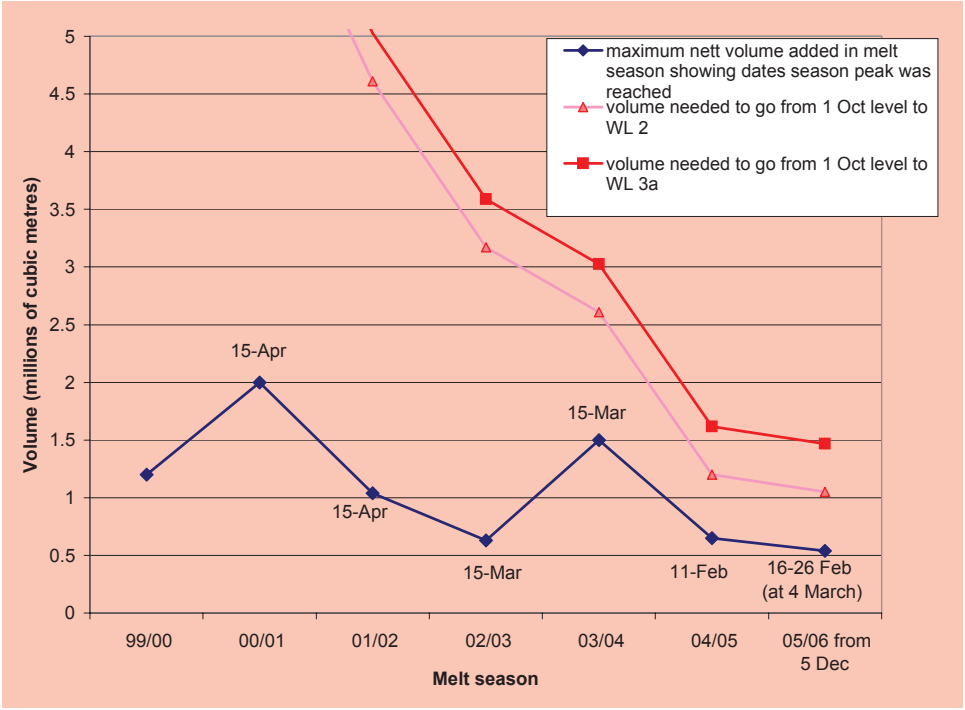


Figure 3. Graph representing the maximum nett volume added by Crater Lake each melt season showing the large year-to-year variation. The decreasing volume needed to fill the lake from its level on 1 October to either Warning Level 2 or 3a is also shown.

Previous years' filling rates averaged by month and grouped into maximum, average and minimum scenarios have been used to make projections of future levels for lahar management (Figure 1). Projections are regularly refined to take account of variability for use in the Crater Lake status reports that are issued every 2-4 weeks. Together, the variability in filling data and the short observation period (6 years) mean that the reduction in overall filling rate with time is probably not yet significant statistically, but the calculations of the amount of infilling required to reach higher warning levels seem more robust. If the apparent slowing of filling rate continues, the flattening of the level at the start of the melt season (Figure 2) will have implications for filling projections and lahar management.

It is tempting to speculate on why the infilling rate has reduced with time. Climatic variability and evaporation seem likely to be contributors. As the lake surface has risen it has become more exposed to the evaporating potential of wind, especially as the surface area has also increased. We are attempting to collect wind data from an experimental climate station at Dome Shelter in conjunction with Andrew McIntosh and colleagues from Victoria University of Wellington to quantify the wind effect during summer. Lake water balance in autumn-winter may also provide insights partly because the confounding effects of inflow and inflow variability are less in winter. Changes in autumn-winter are small compared to those in the melt season (e.g. 0.44 million cubic metres added in April-October 2002 and 0.31 million lost in April-October 2005) so cause and effect may be more subtle.

After the 2002/03 melt season the lake level has dropped during April-October. Since 1999/2000 the net amount of water added in this part of the year has reduced. Trends with lake surface elevation and area are weaker than with time (trends are not shown here - probably none are significant statistically) but suggest an inflexion point around 2515 m. Water

chemistry and geophysical surveys indicate that seepage has not yet occurred through the tephra dam (i.e. above 2529.3 m) and no lake water signature has been found (Bruce Christienson personal communication) in water samples from the upper Whangaehu Stream down to the first exposed waterfall (approx 2500 m asl). Nevertheless an increasing water loss due to deeper seepage through the crater basin wall below an elevation about 2515 ± 2 metres (Figure 2) might explain some of the reduced infilling rate. A more detailed water sampling investigation in the upper Whangaehu Valley below 2500 m might have some chance of testing this idea. It is interesting that White Island's crater lake has stabilised for now a metre below the lowest point of the crater rim, apparently due largely to seepage outflows (Brad Scott personal communication).

Ngauruhoe and Tongariro

On Ngauruhoe's northern flanks the steam heated ground continues to change. Bare ground was visible from the National Park BP petrol station again in the 2005 winter. On 10 September Colin Lawrence, Nick Singers and I measured ground temperatures (at 10 cm depth) up to 69.8°C at NZMG E2737469, N6224458 about 90 m below the northwest rim of the 1954 crater. Areas of moss are growing on lava outcrops warmed by the steam. Temperatures inside the crater have continued to cool (to 78°C, down from 86°C nine years ago). Kim Martelli and Shane Cronin from Massey University have surveyed some of the 1975 pyroclastic flow deposits on the northwest slopes and determined that the new Titan2D computer model can simulate them successfully.

Ruth Basher from Waikato University completed a Masters thesis in 2005 on the volcanology and volcanic risk from the Te Maari crater system which has been active for at least the last 14,000 years (since the last Ice Age) making it one of the longest lived vent areas on Tongariro volcano. The Te Maari Upper Crater was the source of the most recent eruption of Tongariro (1896) and a very young lava flow (1500 AD). A repeat of the ashfall experienced during the 1896 eruption could have significant adverse affects on agriculture, forestry, transport, electricity generation and transmission networks, tourism (including the Tongariro Crossing) and human health and employment. A lava flow on the scale of the 1500 AD flow could initiate forest fires and affect Highway 46. The distinctive low frequency earthquakes (tornillos) have been detected again at Te Maari Upper Crater but no surface changes have been recorded.

Education at the trout centre takes off

Tragically, we live in a world that often plunders the very resources that support life on earth, with little regard to sustainable management or the needs of future populations. Changing this behaviour in the next generation is becoming increasingly important, and a new education programme now being delivered to schools at the Tongariro National Trout Centre aims to do just that.

The concept of a programme promoting sustainablity and using the natural qualities of the trout centre as a backdrop first sprouted several years ago. But only in 2004, when a teacher was employed through funding from Genesis Energy, did this concept become reality.

The progamme is called Taupo for Tomorrow and uses the wild Taupo trout fishery, as well as the beautiful Taupo environment, as case studies to help young people understand what resources are and how vital it is that these are managed in a sustainable way.

Thea DePetris, a registered secondary teacher, has developed a comprehensive programme and has now begun delivering this to schools that visit. The trout centre makes a perfect location for a programme about sustainability, and Thea has incorporated outdoor activities using the Tongariro River, Waihukahuka Stream and the wild trout fishery. However, it made sense to provide the programme and teacher with a classroom as well, that would compliment the rest of the centre and provide a base for visiting groups.

The search for a classroom was not easy, and with limited funding available, it was quite a relief to be offered a building from Ohakune by the Ruapehu Area of the Department of Conservation. The building was lockwood style and had previously been used as accommodation by the Girl Guides Association. Known as "Mangawhero Lodge" due to its location near the Mangawhero River, it was ideally suited as a classroom, both in size and facilities. The potential was there, and it was agreed to relocate it to the Tongariro National Trout Centre in Turangi.

However, moving such a large building, approximately 17 metres long and 8 metres wide, into a bush surrounding would never be simple, and in the end it had to be cut in half and transported in two pieces. Once on site, it was then joined together, set on new piles and located facing outward over the children's fishing pond. Throughout the relocation,

special care was taken to ensure the least damage to native vegetation and to areas that the public enjoy. Thought was put into the exact positioning of the building, so some large native trees would be untouched. These now soften the new building visually, helping it to nestle into the bush.

Since relocation the classroom has undergone a complete refurbishment, with new windows, lighting, ranchsliders, carpet, floor insulation, curtains and air conditioning. The Tongariro National Trout Centre Society, a volunteer group who encourage children into trout fishing as a recreational sport and who have been instrumental over the years in sourcing funding to develop the centre, got in behind the project, finding the much needed money for a new roof and deck. Along with trees planted by students from a visiting Wellington college, and volunteers from the Society and Taupo Fishery Area team of DOC repainting the outside, "Mangawhero Lodge" has now had a complete facelift and been transformed into a very pleasant and effective classroom.

Just prior to the first school groups using the new classroom in 2006, it was blessed by local tangatawhenua, and as a result renamed the Whakapumaunga Learning Centre, in recognition of Whakapumaunga Downs, (known locally as Darkie). Darkie passed away recently but he, along with his family, were the original hapu of the area and was a very strong advocate for protecting the lake and surrounding rivers.

Taupo District Council also came on board and provided funding for stormwater education to be incorporated into the programme. This means every child in Year 5 & 6 at a Taupo District School will have the opportunity over 2006 visit the centre, and enjoy a specialist programme that teaches them the value of Lake Taupo, good clear water and the life it supports.

Perhaps this new initiative will go some way to ensuring the sustainability of the beautiful Taupo environment and the trout fishery for years to come. And the new classroom will be home to hundreds of children learning how they too can be a part of a sustainable future. Taupo for Tomorrow has found lift-off!

Tracking Trout

Right: Dr Michel Dedual implants a transmitter into a trout. The fish was then allowed to recover and released back into the lake. From the moment its movements were transmitted and recorded by data loggers on the lake bed.
Photo: Glenn MacLean

By Michel Dedual
Fishery Area Scientist

Dr Michel Dedual is our Fishery Area scientist. Hailing originally from Switzerland he is also a very enthusiastic angler and hunter

While more than 30 years of research has greatly advanced our understanding of many aspects of the river dwelling phase of rainbow trout in the Taupo catchment, the behaviour of individual trout in the lake remains poorly understood. What do rainbow trout do in Lake Taupo during the course of a day, a season, or a year? How do they respond to physical factors such as temperature and current? What is their home range and does this vary with season or in response to other variables? This information on trout movement and habitat preferences is vital when designing monitoring programmes, making management decisions, particularly in regard to the impact of angling, and when considering the potential impact of changes in lake water quality on the fishery.

A range of techniques have been used to attempt to describe the vertical distribution and movement of fish in oceans or in the open water zone of lakes, amongst which radio and ultrasonic tracking are the most common.

In 2003 we collaborated with a transmitter manufacturer in Canada to develop a "silver bullet". This hi-tech tag sends a signal relaying the temperature and depth where the fish is swimming every minute or so day and night, for a year to any remote data loggers within range. We used this tag to discover rainbow trout behaviour in Lake Taupo and these acoustic transmitters are now demanded by scientists world-wide.

How was it done?

Thirty six fish were caught between November and December 2003 at different locations around Lake Taupo

Each fish was anaesthetised in a solution of clove oil and a transmitter implanted in its body cavity. The incision was stitched and the fish was released after several hours recovery. From that moment on it was transmitting the depth in which it was swimming and its body temperature.

We installed 16 "listening stations" or data loggers at strategic locations around the lake bed that automatically recorded any tagged fish swim-

This is a merely a summary of this ground (or lake!) breaking research. A fuller account can be found in the Conservancy's Target Taupo November 2005, Issue 50

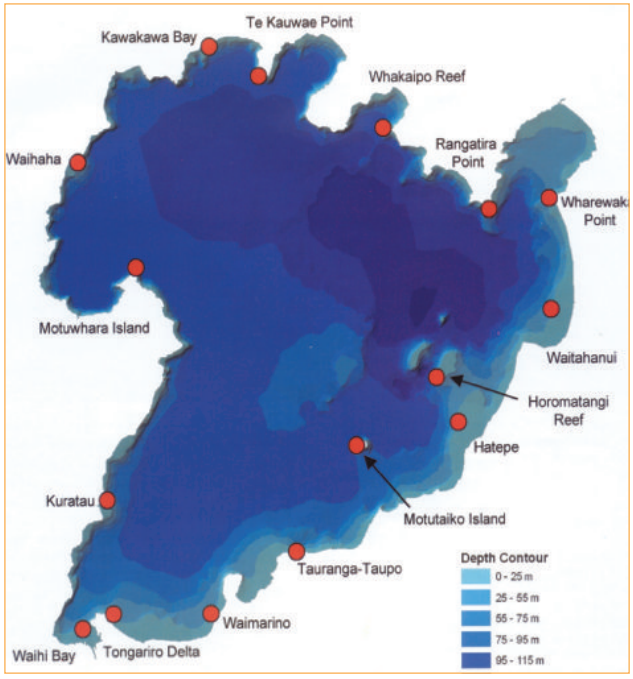


Figure 1: Location of the data loggers around Lake Taupo.

ming within 800m to 1km from the station. (See figure 1)

A year later, at the end of the trial in December 2004, we recovered the data loggers, downloaded the data and started to explore it. In total more than 2 million records were downloaded.

Do trout favour any spots in the lake more than others?

It appears that the area withni a perimeter running between Waihaha, Karangahape Cliffs, Wharewaka Point and Tauranga-Taupo River mouth were the most attractive part of the lake. (Figure 2)

Trout move around Lake Taupo, but how often and why?

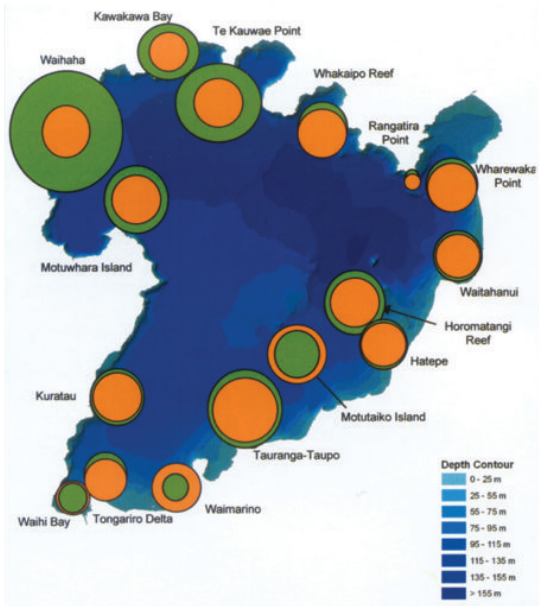
With the exception of Rangatira Point, most tagged fish visited most locations at some time during the year.

Comparing the number of locations each trout visited and the number of visits made by each fish shows that individual trout in Lake Taupo do their own thing rather than following a similar pattern of movement.

By knowing where and when each fish changed location it is possible to determine the swimming path each one followed.

Taupo rainbows can be classified into several types according to their patterns of travelling. The large majority are "wanderers" that travel anywhere around the lake and frequently crisscross the middle of the lake just like goldfish would travel in a fish bowl. Another type of fish roams widely but avoids some parts of the lake. In particular these "partial roamers" seem to avoid the southern end. A third type could be called "eastenders" as they travel backwards and forwards along the eastern shore and rarely cross the lake.

Figure 2: The number of signals received by each data logger (green circle) and the number of different fish visiting each site (orange circle).



Yet another pattern of movement is to go along the entire edge of the lake without crossing it ("sideliners"). Finally some fish didn't move much at all remaining most of the time in the area where they were caught and tagged.

The pattern followed was independent of the size, sex, or maturity of the fish, or the methods and location of capture.

How far do trout swim in Lake Taupo?

From the swimming paths it is possible to measure the total distance that each fish travelled by adding the distances from one location to the next where the fish was recorded. It is however important to realise that this calculation provides the absolute minimum estima-

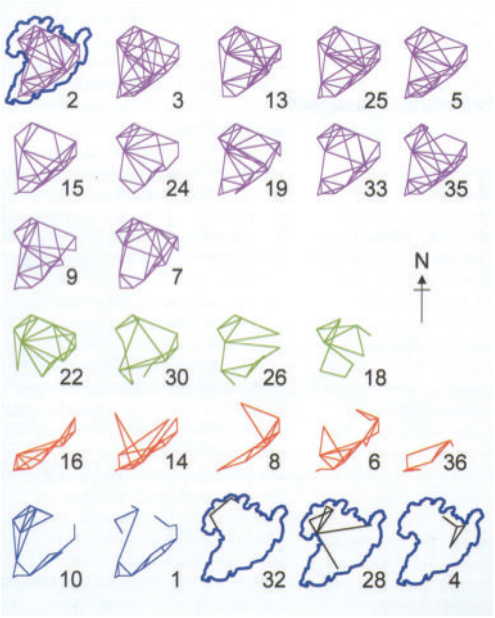


Figure 3: The travelliing route of individual fish around Lake Taupo

tion as the distance is measured in a straight line between stations and doesn't allow for the vertical movements or any wandering that the fish may have done on its way. One trout swam at least 5752 km between 16 December 2003 and 23 August 2004 (or an average of 22.9 km per day)!

Notably, the distance and the rate of travel in the lake is much higher than in the Tongariro River. During the Tongariro tracking experiment we estimated that the fastest fish travelled from the Tongariro Delta to the Waipa trap (26 km away) in 16 days. This equated to a maximum average daily movement of only 1.6 km.

Why do they travel so much?

It is well established that trout in Lake Taupo rely on smelt for food. Smelt spend most of their lives in the open waters of the lake before returning to spawn along the sandy beaches and river mouths in late spring and summer. The abundance of smelt is a key factor to explain trout distribution in Lake Taupo.

Surveys indicate that smelt are not evenly distributed across the lake: This patchiness in their distribution forces trout to travel and they have to travel far because the distances between smelt concentrations may be large, not helped by the fact that the smelt also move around a fair bit too. This search for food is likely to be the main driving force of trout movement in the lake.

Just like the trout, every predator in the food chain has to follow its prey and in Lake Taupo smelt follow zooplankton that follow phytoplankton. All these organisms can swim except phytoplankton which are microscopic floating plants and not equipped with any active locomotion system. However this doesn't mean that phytoplankton don't move around the lake, as they are at the mercy of its currents.

Is there a particular time of the year when trout movement increases?

Trout movement is more intense during autumn and winter than during spring. Again, smelt may be the key to explaining this pattern. Smelt concentrate near the shore and spawn from November to March. During this period trout can focus on this area and as a result don't have to travel much. However, when smelt spawning is over, trout have to fund and follow them in the pelagic zone of the lake, inducing some large movements. This is where the position, directions and strength of the currents will provide some clues as to where the rainbows will be.

Do trout travel more at night or during the day?

Trout arrive at new locations at all times of the day. The frequency of arrival and departure at new locations is usually the highest between 07:00 and 08:00 in the morning and lowest between 16:00 and 17:00

in the afternoon. In general however trout are less active at night.

Another plausible explanation for Taupo is that rainbow trout are visual feeders and are therefore more efficient during daylight hours. Trout feeding opportunities are especially good at dawn and dusk when enough light is present and the smelt are still close to the surface of the lake.

How long do trout stay in the same location?

During this study the majority of trout stayed at the same location for only very short periods of time. Indeed, 54.8 % of all visits lasted for less than 10 minutes and only 6.8 % lasted more than 2 hours. This reiterates that rainbow trout are highly mobile in Lake Taupo and that they are on the move most of the time.

It does appear that the locations where the proportion of very short visits (less than 10 minutes) is low are also those where the duration of long visits (greater than 2 hours) are high. The locations fitting this pattern are Waihaha, Tauranga-Taupo, Tongariro Delta, and Waitahanui. Interestingly these are all river mouths. The opposite trend where the proportion of short visits is above average and the proportion of longer visits is lower, exists at Waimarino, Motutaiko Island, Te Kauwae Point and Motuwhara Island.

Ecologists talk about the "edge effect" to describe these areas that are more attractive and productive in ecological systems. In Lake Taupo the "edge effect" can be created by a rapid change of depth such as at the drop-off or a change of temperature and also current velocity at the "rip" where cold river water runs into the slow, warm water of the lake.

Immediate implications

This study has clearly shown that rainbow trout in Lake Taupo move much more extensively than previously thought and are not territorial.

This lack of territorial behaviour in rainbow trout in Lake Taupo is positive from a management perspective. It means that the effects of a concentration of fishing effort and therefore harvest in one particular area will not create a "hole", but rather reduce the total abundance across the whole lake. Furthermore, because most trout move throughout the entire lake, catching a fish in a particular location in the lake will not affect the number of fish running in a particular river but the impact will be shared by all the spawning tributaries. In other words the population can be managed as a whole rather than a series of distinct groups.

The extent of fish travel also means that just because fishing is good in one spot on one day, there is no certainty that it will be good the next. So next time you catch Taupo trout, spend a moment to appreciate what great athletic wanderers they are and treat them with all the respect they deserve.

Rotopounamu

Right: The 'A' team of volunteers who worked on the Lake Rotopounamu project: Tanya Greaves, Margaret Jefferies , Linda Dyck, Sascha Brocks. Below: Chris Bell fixes a marker to one of the bait stations around Lake Rotopounamu. Photos: Chris Bell

By Chris Bell
Volunteer
Tongariro Natural History Society

There exists a shared vision of turning the clock back for Rotopounamu and Pihanga, part of the Tongariro National Park; restoring the immense variety of wildlife that once existed here, including birds, insects and flora that have been driven out by recent invaders, rat, stoat and opossum. To this end a crack team of volunteers from the Tongariro Natural History Society (TNHS) and the Department of Conservation (DOC) have worked through the summer to establish a network of 450 bait stations over a 250ha area to reduce the rat population, an important first step in the ecological restoration of the area.

The ecological and cultural importance of Pihanga and Rotopounamu is well recognised by those who live and work around it. This mixed beech and podocarp forest unique to New Zealand has never been subjected to degradation from logging, and Pihanga has great importance in the rich Maori history and legends of the island.

Since 2003 the Tongariro Natural History Society with the assistance of DOC has been collecting baseline information on the introduced pests and native fauna of the ancient forest around Lake Rotopounamu. Now, in the summer of 2005/06 action is being taken. The use of bait stations filled with poison has greatly reduced the number of rats in the control area, and anecdotal reports from those who know Rotopounamu say that the bird life around the lake has never sounded so vibrant. Of course, Rotopounamu is not an island and rats from the surrounding land will reinvade in time - it will require a year round effort to control not only rats, but stoats and possums as well.

International volunteers for TNHS have spent this season closely monitoring the native birds, especially Robins and Fantails to look at how their breeding success has fared in response to rodent control. So far around Rotopounamu over 20 Fantail nests have been found, and though many have been predated, others have

successfully raised broods of young.

Special wooden boxes designed to be a weta 'des res' were installed last year and it has taken everyone by surprise how quickly cave and bush weta's have taken residence. These weta boxes will be another valuable tool in observing the effect of pest control on native fauna

The initial inspiration for action to be taken against invasive species came in response to the declining fortunes of the North Island Robin. The song of this bold and charismatic bird is familiar to visitors of Rotopounamu, but studies have shown that there is a strong male bias in the population, with very few actual breeding pairs to maintain their numbers into the near future. However, this year a Robin trained to respond to a signal for tasty mealworms, and school-group favourite, 'Eddie', found a mate after years of bachelorhood. After their first nesting attempt failed the pair had a second, successful attempt and fledged at least one chick.

Keeping Rotopounamu rodent free is an ongoing battle, and its supporters are committed to this long term goal. It is hoped that the native wildlife will go from strength to strength as a rat free environment is maintained, and the protected area is gradually expanded to completely envelop Pihanga.

The Great Relay Challenge

Bay of Plenty Conservancy issued a challenge to Tongariro/Taupo to compete in Great Lake Relay held on Saturday the 18th of February.

Tongariro accepted the challenge and rapidly scanned the conservancy for keen walkers and runners. The team comprised 16 members who had the choice of either a run or walk leg of various distances from 5km to 14km.

Tongariro crossed the finish line in 15:01 hours, 2 hours and 10 minutes ahead of BOP who came in at 17:11 hours. Within the 190 composite teams Bay of Plenty finished 80th and Tongariro/Taupo 10th great achievements for both teams.

Below: Some members of the Tongariro/Taupo Team aka Greenies Team; from left to right, Back row; - Colin Lawrence, Jonathon Miles, Ross Martin, Middle Row; - Hari Smith, Maureen Smith, Petra Specht, Nic Etheridge, Nina Manning, Ro Cudby, Front row;- Mike Fawcett, Bubs Smiths, Glen Hazelton

The Tongariro Taupo team had John Luff, who was our ultra super performer. Luffy had walked for 3 days in the Kaimanawa's, arrived in Turangi at 4pm, only to go to Ohakune to get gear, to come back to run 14.1km at 1am (without sleep) in Taupo. Then after his run, which he did in record time, carried onto the DOC shoot in Wanganui for 9am Saturday morning. He came 4th overall as an individual at the shoot and it was noted by the organisers, that he was the first person ever to fall asleep during the shoot!

Ascending Ruapehu

By Dave Wakelin
Senior Community
Relations Officer

Early Maori avoided the mountains of the central North Island. These were the haunts of the gods, sacred, tapu, places. Even when venturing across the Rangipo Desert eyes were shielded from a glimpse of the peaks, such was their power and mana.

J.H. Kerry-Nichols, Victorian explorer who wrote of his travels through the King Country of the North Island in 1883.

As European settlement increased through the 1800s so did the desire of some Pakeha to explore the interior of the North Island. One such explorer was J.H. Kerry-Nichols, a professional explorer. In 1883 Kerry-Nichols travelled from Tauranga through forbidding King Country, covering in excess of 600 miles (1000 kilometres) and recording in detail meetings with chiefs, Maori legend and story, plants and geology seen and impressions of one of the wildest parts of New Zealand. His party bathed in the Pink and White Terraces, and visited Huka Falls and Tokaanu. They also climbed Tongariro and Ruapehu (twice) despite warnings that no man climbed the peaks and returned.

After travelling from Tauranga and visiting the Huka Falls and the Wairakei thermal area Kerry-Nichols and party made their way to Tokaanu with the intention to explore and climb Tongariro and Ruapehu. The explorer described the Rangipo plateau, *"as one of the most remarkable regions in the world" in the very centre of which, towers the "...magnificent cone of Tongariro [Ngauruhoe], situated in the midst of a cluster of lower mountains, whilst close to it and separated only by a narrow valley, stands the colossal form of Ruapehu, peak rising above peak to the region of eternal snow*
The desert tract .... is about eight miles across, covered for the most part with a luxuriant growth of native grasses; while it is intersected from one extent to the other by a perfect network of streams and rivers, which flow generally in an easterly direction and form tributaries of the Upper Waikato."

As they travelled they were mindful that their presence was not entirely welcome, *"... we kept out to the east along the Waikato River, to avoid, if possible, being seen by the natives of Rotoaira, who keep watch and ward over the tapued mountain."*

As the party made their way towards Tongariro they, as countless visitors have since noted, saw *"... embedded in their steep pumice sides ... the charred remains of enormous trees, which must have lived ages ago, when some volcanic eruption swept over them."*

Despite the weather and storms Kerry-Nichols and his party succeeded in climbing Mt. Ngauruhoe, which to them was known as Tongariro. They made the ascent from the Waihohonu Valley and climbed to the summit of Ngauruhoe via the eastern flanks. Ngauruhoe is described as having active sulfatara, large deposits of sulphur, hot springs of boiling water, steam and vapour. Following the ascent of Tongariro Kerry-Nichols planned to find the sources of the two major rivers that rise from the slopes of Mt. Ruapehu, the Wangaehu (sic) and the Waikato.

Ruapehu wrote Kerry-Nichols,

A fuller version of this article appeared in the 1995 Tongariro Journal. Illustrations in this article are from "The King country" by J.H. Kerry-Nichols, a facsimile reprint by Capper Press.

Right: Mt Ruapehu as seen by Kerry-Nichols and his party in October, 1883. The party's first ascent was to the top of the foreground peak. Te Heuheu, which Kerry-Nichols named Point Victoria.

"which ranks among the largest extinct volcanoes in the world, assumes the form of an enormous truncated cone, with a far-reaching base of oblong form, and which gradually narrows towards the summit, at which point the mountain is nearly a mile in length from its northern to its southern peak. ... In fact, it is the succession of magnificent scenery thus produced which forms one of the grandest features of this marvellous monument of volcanic forces."

From the Mangatoetoenui Stream the party began an assault of Ruapehu, intending to climb the northern Te Heuheu Peak. They rode their horses as far up the slopes as possible before tethering them and continuing on foot, realising that it was going to take them two days and they would have to overnight on the mountain.

As they climbed they saw below them, *"... a party of mounted natives riding along the track below, and whilst we hid our horses in a gully, we crawled to the top of a ridge and watched carefully, to see whether they would pick up our tracks. Fortunately, however, they passed on, riding hard along the track which passes through the Tongariro Plains into the heart of the King Country."*

Before nightfall they reached a height of 6200 feet (1800 metres) where they camped under the lee of a large boulder, clearing an area on the steep ground just large enough to hold them in place.

That night a storm struck them. *"At midnight the terrible climax came; with a noise like the howling of a thousand fiends, a terrific gale of wind swept over the mountain. In an instant our tent was carried away from over us... blinding showers of sand and scoria filled the air... which got into the hair and filled the eyes, caused a choking sensation in the throat and permeated every article of clothing."* The rest of the night was spent huddled together, waiting for sunrise.

After a light breakfast the party continued upward, considering themselves well clad for the severe conditions. *"Our boots were stout, and capable of withstanding snow and ice; we wore thick overcoats belted round the waist, thick comforters round the neck, fur caps with flaps to protect the*

Above: Waiting for sunrise after a fierce storm blew their tent away.

ears, while alpenstocks with flag-staff and tomahawks to cut our way to the top, completed out ac-coutrements."

With a final effort to conquer a steep icebound pinnacle they made the top, twenty hours after leaving the base of the mountain to reach *"... a world where there was no sound but the sigh of the wind, where there was no sign of life; a world placed high in the sky, made up of golden sunshine, azure blue, and glittering snow and ice, but encircled as it were, by a broad expanse of green, bordered by the blue waves of the distant sea."*

From this vantage point Crater Lake cannot be seen, hidden behind the southern rim of the Summit Plateau. However Kerry-Nichols was able to see many other distinctive peaks as he gazed around - Pirongia, Karioi, Maungatautari, Te Aroha, Ngongotaha, Hapurangi, Horohoro, Tarawera (which was not to erupt for another 3 years), Patauaki and Tauhara, Hikurangi and to the west Taranaki.

Before descending Kerry-Nichols and party built a cairn and erected a flag, named the peak Point Victoria, believing it to be the highest point in the North Island.

Kerry-Nichols was determined to find the source of the Whangaehu and Waikato rivers, both of which began on the slopes of Ruapehu.

They began their second ascent by heading for the distinctive southern lava bluffs of the Whangaehu.

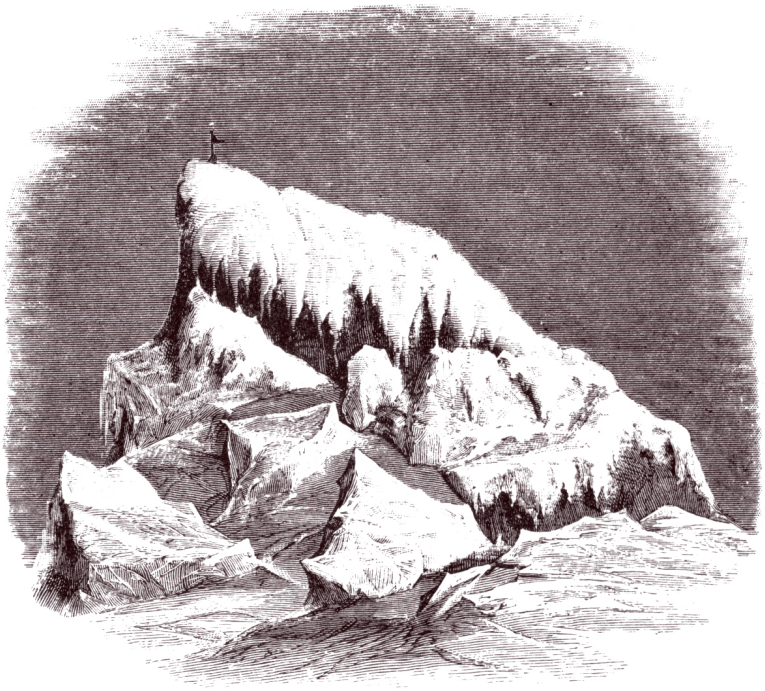
Did Kerry Nichols Influence the Creation of Tongariro National Park?

There is no evidence to suggest that J.H. Kerry-Nichols and Lawrence Grace knew each other. Both how-ever came from Tauranga where Grace was a Member of Parliament so it is likely, for Tauranga in the 1880s was not a big place, that they would have met socially at least. It is most likely that Grace would have read Kerry-Nichol's passionate ac-count of his travels, having very strong family connections with the area, being married to a daughter of Te Heuheu Tukino IV paramount chief of Ngati Tuwharetoa..

Several years later Lawrence Grace was approached by his father-in-law, over the vexing issue of demands being made on the mountains of Tongariro by rival tribes, loggers and runholders. What could be done? Grace, certainly aware of the recent creation of Yellowstone National Park in the United States, suggested "Why not make them a tapu place of the Crown, a sacred place under the mana of the Queen. The only possible way to preserve them forever is to give them to the Government as a reserve and a park, to be the property of all of the people of New Zealand, in memory of Te Heuheu and his tribe".

Te Heuheu Tukino IV,, on 23 September 1887, did precisely that. He gave to the Crown the sacred peaks as a nucleus of what was to become Tongariro National Park, now a dual World Heritage Area for its landscape and cultural values.

Was Grace aware of Kerry-Nichol's proposal for a central North Island park area? Did this, along with his knowledge of the new National Park concept influence his thinking and advice? Who knows?



Above: Point Victoria, the highest point on Mt. Ruapehu climbed by Kerry -Nichols and his party, showing the cairn and flag placed after the ascent.

Following the Whangaehu gorge for some distance they soon found that continuation was impossible due to the vertical nature of the gorge and had to retreat out of it. They did note *"... the milky waters of the Whangaehu..."* They named a water-fall in the Whangaehu, Horseshoe Falls because of their shape. These are possibly the falls visited by Summer Programme participants during the Rangipo Desert guided walk.

The climb got steeper and more impressive. *"Here, around on every side, rose steep precipices, great but-tresses of black lava mounted up in the form of stupendous bluffs that supported, as it were, the rampart like heights above, while right in front of us ..."*

Above this they came across huge ice caves from which the Whangaehu flowed. Here was *"... the true source of the remarkable [Whangaehu] river"*.

Kerry-Nichols noted that, *"Wherever the water flowed over the rocks it left a white deposit, and when we tasted it, it produced a marked astringent feeling on the tongue ..."*. The party did not continue onto the summit. Kerry-Nichols knew of the presence of the Crater Lake. He was aware that the lake was formed by an extinct crater, and in saying that the lake was filled by subterranean springs, postulates that it could have some connection with the Whangaehu. He notes that, *"... there must be strong subterranean springs in this portion of the mountain, to account for the large volume of water forming the source of this river [Whangaehu], as likewise extensive deposits of alum, of some form or other, to cause the complete* discoloration of the waters by that mineral".

Towards the end of Kerry-Nichol's journey the party camped at Te Pakaru Plain, west of Lake Rotoaira. From here the view to the mountains was spectacular. *"... the variety of scenery to be obtained within the radius of ten miles ... no view could equal it"*. This was a region where in the future, *"... countless generations of men might assemble to marvel at some of the grandest works of the creation"*.

A National Park?

Kerry-Nichols proposed that, *"... with the Te Pakaru Plain proclaimed as a public domain, New Zealand would possess the finest and most unique park in the world. For healthfulness of climate, variety of scenery, and volcanic and thermal wonders, there would be no place to equal it in the northern or southern hemisphere, no spot where within so small a radius could be seen natural phenomena so caried and so remarkable. It would embrace within its boundaries the hot springs of Tongariro and those of Tokanu (sic), and would stretch from the waters of Lake Taupo to the shores of Rotoaira."*

Clean it or lose it!

The invasive alga Didymosphenia geminata or didymo has recently been confirmed in the Waitaki and Ahuriri Rivers by Biosecurity New Zealand. This brings the number of rivers known to be infected by didymo to 10, spread between Southland, Otago, Nelson and now Canterbury.

In December Biosecurity New Zealand strengthened control efforts with the implementation of a South Island-wide Controlled Area, enhanced public awareness and a one million dollar research programme to investigate potential control tools. It is now a legal requirement to clean any items that have been in contact with lakes and rivers when leaving the South Island or before using them in another waterway.

A number of agencies and organisations including DOC, Fish and Game New Zealand, power companies and Regional Councils have assisted Biosecurity New Zealand to spread the message that it is up to every one of us to take responsibility to ensure we do not inadvertently spread didymo to a new catchment. Information packs and posters have been spread far and wide including to fishing licence holders, DOC concessionaires, multi sport athletes and others. In addition, new river signage, radio advertisements and personal contact with river users has occurred.

In the Taupo and Rotorua areas we are taking the campaign further. If didymo arrives and forms big blooms then you will simply not be able to fish rivers like the Tongariro. You certainly would not want to swim in them, kayaking and rafting would be much less appealing and the ecology of the rivers will be seriously affected. The bottom line is the pleasure many New Zealanders derive from this area and the local economy would take a very big hit. Think about what it would mean to you personally if didymo arrived - many of us have an awful lot to lose. However it's not all doom and gloom. We are lucky, as didymo hasn't been detected here and it is still business as usual. But we must do our level best to ensure it does not arrive.

Below: Cleaning your gear with detergent is essential and simple to do. (Photo: Glenn Maclean)

It's not an impossible battle, there are very practical ways to clean our gear to avoid transporting the cells but each of us need to be proactive to ensure we, and the people around us clean their gear. For example, moteliers must provide a detergent bath and insist that guests decontaminate their gear in it, local sports shop staff must show every licence buyer how simple it is to wash their gear and why it is essential, anglers must quiz their fellow anglers and so on. To assist with this, local stakeholders recently met to identify the various pathways that didymo might

enter the central North Island and practical measures to address each of the threats. The group is in the middle of putting together packages to highlight the threat, identifying and organising practical solutions and ensuring personal contact is made with the hundreds of fishing guides, accommodation providers, rafting and kayaking companies, sports shops, outdoor educators, air transport operators – the list seems endless. However if we are serious about keeping didymo out, then all these people have key roles to play.

This approach recognises that ultimately all freshwater users must do the right thing. People need to clean between waterways anywhere in New Zealand – everyone, everywhere, everytime. Simply because didymo has not been detected in the North Island does not guarantee that it has not crossed Cook Strait. It is essential trout anglers and other river users adopt CHECK, CLEAN and DRY as a matter of routine, much as saltwater anglers wash down their equipment at the end of the day to protect it from the ravages of salt. Didymo is likely to be a long term threat and cleaning our gear whenever we move from one river to another must become an integral part of any trip.

It's not hard. Saturate your rod and reel, felt soles of your wading boots and the mesh of your landing net with a 5% solution of dishwashing detergent (50ml and 950 ml of water) from a squeegee bottle. Open your fly box up and allow this and other gear to dry completely (at least 2 days). Why not keep the squeegee bottle in the boot of your car so it is always on hand.

If you are kayaking or rafting wash down your clothing, spray skirts and the like in a bin with 750 ml of detergent and 14 litres of water. Throw a litre of this solution into the bottom of your kayak and leave to slop around. That's a single refill of detergent at $3.50 - cheap to protect the environment you treasure.

If you are planning a duck shooting trip this May then make sure your gear is clean or dry before you go to another location. Don't forget about your dog, as damp fur is a perfect vector to transport didymo. Similarly don't give your dog a swim to cool down in some stream you cross on the way home, in case he is still damp.

Its simple stuff, just think about what you are doing and take the appropriate action. Keeping didymo out will require conscientious effort from all of us but it's well worth it!

If you coming fishing at Taupo this winter, pull out your gear a week before and give it a good clean as above. Not only are you being responsible but it will help build the anticipation for your upcoming trip, much as touching up your decoys and replacing their strings prior to opening day of the duck shooting season.

Who remembers Springheel Jack?

By Dave Wakelin
Senior Community
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Who remembers Springheel Jack? If you lived in the Bay of Plenty in New Zealand during the 1950s and early 60s then maybe you do. The hermit of the bay. A slight, shuffling figure with a scraggly salt and pepper beard, threadbare grubby jacket and trousers, once white sandshoes with a toe or two poking through and grimy hands with long slender fingers. Long stringy black and silver hair that occasionally swung down over his thin ascetic face and a voice, soft and gentle, with a strong trace of his English origins. That's how I remember him.

He had a dog, from memory an English sheepdog or variant that took after his master, scruffy, dirty and smelly but with the same gentle eyes and warm nature.

Springheel Jack was his nickname, but call him that and both dog and master would give chase, filling the air with barks, spindly arms and language that was then still relatively new to nine or ten year old children!

His real name was Michael Hogkins and the stories about him said that he had been a professor at a university but the death of his mother tilted the already fine balance of a brilliant mind and he took to the roads. The Auckland Museum, it was said, called him back now and then to identify shells. Maybe there is truth in this because his name does appear in the acknowledgements for a book on New Zealand shells.

Springheel lived in some packing crates near the Tauranga railway line and walked a regular beat throughout the bay. About every fortnight he and his dog arrived at the Tauranga South bus shelter where he held audience with whoever would gather and listen. I still remember the rush home from school, and peddling furiously down the road to the bus shelter where the hunched figure would already have a scattering of children around him.

Not everyone was tolerant of this eccentric. He received abuse and derision from those who chose not to understand. Some would not let their children go near him, either out of fear that he would molest them or at least give them fleas or some other affliction. I was told that someone deliberately ran over his first dog. Others threw stones at him from time to time. Most, however, treated him for what he was, a kindly somewhat scruffy eccentric.

Springheel Jack was an interpreter. To a small horde of young children, and some adults, huddled around him in a very ordinary bus shelter, Springheel expounded on all the glories of nature. Ask a question and

after a moment's reflection he would, in his quiet earnest way, begin to speak. I don't believe poor old Michael had ever been married but he loved children. I can't remember the colour of his eyes but I know that they twinkled whenever he began to answer a child's question. We were spellbound. How could one person know so much? My interest in nature, and things natural, grew with each visit of this kindly hermit.

From his scruffy bag he would draw out an old school exercise book or grocery docket book, probably scavenged from a rubbish bin or dump. Remember that back then we used to write in exercise books in pencil, so with the aid of a rubber he was able to recycle the pages of some child's efforts or use the backs of the docket books' carbon pages to produce pure magic. He was using recycled paper long before it became fashionable to do so. With a stubby pencil gripped in grimy fingers he worked pencil lead into whatever you cared to ask for. Dogs, plants, shells, faces, insects replaced repetitive primary school alphabets and simple sums on smudgy blue-lined paper. He was the first artist I had ever seen at work.

I remember once asking him about dogs, how many different types of dogs were there? *"Come back in a fortnight",* he said. I did and from that magical bag he produced pages of handwritten notes on dogs, their origins, types and breeds as well as page after page of sketches of the major breeds. My drawers began to fill with words and pictures of dogs, shells, trees, insects, my own personalised encyclopedia of nature.

I am certain this kind gentle hermit influenced and developed my love of nature, my curiosity for the sciences and eventual embracing of park interpretation. He would have been pleased that at least one of his regular bus shelter band grew up with an expanded view of the natural world and a desire to pass it on to others. I would like to think so.

I was about fourteen when I heard that Springheel Jack had died. He had been found dead in his simple dwellings. What happened to that scruffy smelly dog I do not know. Maybe, like the TV dog in the adverts, he is still wandering the highways searching for his master. I hope he finds him.









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Tongariro Natural History Society