



# TONGARIRO

## the Annual

DECEMBER 2000 VOL. 9



Department of Conservation  
*Te Papa Atawhai*



THINK FRESH

CALL  
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# Tongariro

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**Cover photo:** The peaks of Tongariro National Park from above Crater Lake. (Photo: Nicola Topping)

**Above:** The banner from the LEARNZ 2K Internet site, [www.learnz.org.nz/2k](http://www.learnz.org.nz/2k), depicts the three sections of the Nga Taonga o Tongariro project; volcanoes, kiwi and mistletoe.

**Back cover:** Hokoi Ngataierua Tinirau, of Tamahaki iwi blesses three kiwi chicks about to be released into the Karioi Rahui. Hokoi said that establishing a viable and self-supporting kiwi population was a joint effort and was "not done as a department, not as an iwi, but as a people". (Photo: Bruce Mercer)

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# Millennium Blues

I'm not really sure whether I like this new millennium or not. It seems much faster than the old model. It's hard to believe that this time a year ago we were so concerned about the Millennium Bug, about planes falling out of the sky, computers refusing to work and so on. Who talks about the Millennium Bug now? How quickly what once grabbed headlines is pushed into the background of our memory to make way for the current issue or fad.

Some things from the past remind us of how little the really important things change. Two stories that illustrate this. Both take place during the biggest conflicts of the 20th Century, one during the First World War and the other during the Second by men too young to go to war. Both show that love of the outdoors and appreciation of the wonders of Tongariro National Park, felt by many today has not changed.

The pace of life has gone into overdrive since Cranleigh Barton and companion Brodie walked the coach road from Waiouru to Waihohonu Hut in 1915 and Ashley Cunningham guided parties up to Crater Lake from Ohakune in the 1940s. Access to the park is easy - no 19 mile walks across the desert any more. The park is ringed with highways and staff devote considerable time maintaining tracks huts and bridges to modern standards. Walking on volcanoes still provides the same thrill Barton and Cunningham felt years ago. Access to information has never been easier - by early 2001 the Whakapapa Visitor Centre's new make-over will be complete; brochures and books abound on the walks and nature of Tongariro and a key press or two brings park information into your home via the Internet.

Sadly a century's worth of changing pace has not been good for the original inhabitants of Aotearoa. Many of our native species, plant and animal are severely threatened. They, too, are part of this new millennium but unless we can make the recently released Biodiversity Strategy work they may not be around to see the next. At the current rate of decline, about 6% per annum, the North Island Brown Kiwi may not be found on the mainland within 20 years. Loss of habitat from logging, intensive farming and plantation forestry and also introduced animals such as dogs, cats, possums and more particularly stoats overbalance one side of the life scales for kiwi and other species. Mistletoe, Dactylanthus and our lizards need active management to survive in the central North Island and elsewhere.

There is hope. Information reaching the right quarters may galvanise communities and politicians into action to spearhead drives to protect our native species. The Biodiversity Strategy is a welcome step in the right direction as are the Biodiversity and Conservation Awareness funding packages received this year. Innovative Internet education projects like LEARNZ2K are empowering children and others to appreciate and act responsibly towards the outdoors and our unique biodiversity. Volunteer organisations such as the Tongariro Natural History Society are actively propagating Mistletoe by hand placing seeds in Beech trees. Technology also has a vital role to play. News that the heather beetle has made small but significant inroads into Heather is encouraging and time will tell if there is a biological solution at hand to combat stoats.

With so much challenging conservation work stretching way out into the distance before us maybe the pace of the 21st century is what's needed to take us on the journey ahead.



Helen McCormick of Rainbow Springs Kiwi House about to release a kiwi into the Karioi Rahui.  
(Photo: Bruce Mercer)

Dave Wakelin  
*Editor*



Tongariro Taupo  
Conservator, Paul Green.  
(Photo: Herwi Scheltus)

## Conservator's Comment

Celebrations passed quietly for the Conservancy as we entered a rather wet and cool millennium with few visitors braving the elements to camp in the park. There were no public safety issues during this period and no fires.

We are sorry to lose our Regional General Manager Grant Baker to a position leading the Business Management Division at Head Office. Grant has been very supportive of us and was a regular visitor to the Conservancy. We are optimistic that he will be able to bring a strong customer focus to his new position which is a vital one for the Department.

Signing the Conservation Management Strategy out to the Conservation Board was a major milestone. The draft was completed following agreement with Ngati Tuwharetoa over the Treaty of Waitangi sections. The Conservation Board now considers the draft and will forward it to the New Zealand Conservation Authority, hopefully in late February 2001.

In mid December we are hosting a visit by Greg Moore Executive Director of the Golden Gate National Park Association. Greg will meet with staff and members of the Tongariro Natural History Society to discuss the involvement of volunteers and community groups in Conservation and the relationship between departments and these groups. His Golden Gate group is very active with providing significant volunteer assistance and fundraising towards conservation.

The Tongariro Natural History Society is continuing to evolve as a co-ordinator of volunteer work as well as supporting education initiatives and fundraising. The Society has agreed to fund a part time co-ordinator for education and sponsorship as from January 2001. The Conservancy now has an annual volunteer calendar.

The LEARNZ2K programme in the Tongariro National Park has been a marvellous success. Staff have worked hard to provide support to Pete Sommerville and Jeff Gunn from Heurisko on their virtual field trips with school children. We congratulate Heurisko on their achievements and numerous awards they have won.

In April Mark Burton our local MP and Minister of Tourism opened the Huka Falls toilets/visitor kiosk. It is great to now have sewage removed from the site and to have clean toilets. We are thankful for the efforts of the Craters of the Moon Trust in continuing to manage this site. On the negative side our ability to fund the ongoing servicing requirements especially the payment of the capital charges and depreciation is proving to be very difficult.

The Whakapapa Visitor Centre upgrade will be largely complete in late November, with new displays, enlarged reception and display areas and relocation of the volcanics audiovisual. Visitor circulation has improved. It is 14 years since the last display upgrade. Although the displays were generally in a tidy condition they were lacking information on World Heritage Status, 1995-96 Ruapehu eruptions and recent biodiversity work in and adjacent to the national park.

As I write we have discovered a promising result in one of the sites being monitored following the introduction of the heather beetle five years ago. There is strong evidence of heather mortality following a prolonged attack from the heather beetles while native vegetation remains in healthy condition. We will monitor progress with great interest over the next five years.

Increased biodiversity funding has enabled the Minister of Conservation to declare



Conservator Paul Green and members of the Tongariro Taupo Conservation Board outside the recently opened Huka Falls toilets and Visitor Kiosk. (Photo: Dave Wakelin)

a kiwi sanctuary in Tongariro Forest. This is a five-year project over 16000 ha of forest. The long term aim is to sustain a minimum of 100 breeding pairs of kiwi in Tongariro Forest and to better understand management requirements for kiwi survival. Up to 60 eggs will be removed in specific years and hatched at Rainbow Springs before being released back into the wild at 1000-1200 gm. Birds will be radio tagged and monitored. The impact of 1080 aerial operations will also be monitored to assess benefits along with stoat and rodent research and monitoring. This same funding initiative has also benefited additional possum control work in the Karioi Rahui where ecological improvements continue to be made.

In late October we hosted a World Heritage Site Managers' Workshop which proved a great success. It was an ideal opportunity to share examples of best practice with managers from 16 countries in our region of the West Pacific, South East Asia and Australasia and some strong friendships were forged. It must have been a culture shock for managers from Asia to be welcomed at Waihi marae following a quick car ride from Auckland Airport and up to 20 hours air travel. The Powhiri was followed by dinner, entertainment and sleeping over at the marae.

The workshop focused on

- Performance monitoring and evaluation
- Tourism sustainability
- Risk management
- The involvement indigenous people in park management
- Information availability and dispersal of information

It was particularly interesting for us to learn of cultural management issues throughout the Pacific and Australia. Thanks to staff and iwi representatives who helped ensure everyone had a great time.

The Minister of Conservation has approved the installation of an Eruption Detection System to mitigate the Crater Lake hazard. Design of this system and design of this system is underway in conjunction with GNS and overseas agencies. It is expected installation will occur in 2002. The Crater Lake is not projected to fill until 2005 so risk of a collapse of the ash bank at the Crater Lake outlet will not occur until that time. The construction of a bund in the Rangipo Desert to prevent spill over into the Tongariro Catchment is being investigated.

This year we enjoyed a better ski season although it is probably true to say we were always one snowfall away from a good season. The Commerce Commission's approval of RAL's request to purchase Turoa Ski Resort will help remove a great deal of uncertainty that has existed at Turoa and in Ohakune in recent years.

The Conservancy is currently preparing a three to five year Strategic Directions Plan. These will help enable a more strategic approach to conservation over a longer time frame. Our Strategic Directions must still be flexible enough to be consistent with any directions from the Minister. They must also be consistent with the Conservancy's Conservation Management Strategy and any other planning documents. The strategy will be completed early in 2001 but must keep evolving as new information or policies come to hand.

Finally, I would like to thank staff for their commitment and effort and everyone else we work with, for their support, to enable another year of good progress.

Paul Green  
*Conservator*

This is an edited version of a diary kept by Cranleigh Harper Barton (1890-1975) of a trip to Tongariro National Park at Christmas - New Year 1915/16. It is illustrated with watercolour sketches he made as he tramped along. Collections of his later paintings are in the Turnbull and Hocken Libraries, the Whanganui Regional Museum and Canterbury Museum. The original paintings were given by Cranleigh to his friend Arthur Bates because of their shared enthusiasm for Mt. Ruapehu. After Cranleigh's death in 1975 the graphic description of the trip was found in his papers and Arthur put the two sources together to make this comprehensive account of a trip in the days before colour films.

*"Here we had to turn off the road and take a track, which led for another four and half miles to the hut, which nestles in between the mountains of Ruapehu and Ngauruboe."*  
(Painting by C H Barton)

# A Trip to Mount Ruapehu National Reserve of New Zealand

C H Barton

## Wednesday 29 December 1915

It was a showery morning and I set forth from Feilding by the mid-day train and reached Marton an hour later, where I met my companion of the trail, Brodie, a fellow solicitor of Wanganui. Very imposing we looked in our mountaineering kit of breeches, putties, ice axe and climbing pole. Like snails we carried all our belongings in our ruc-sacks on our backs. The belongings consisted of a change of underwear, toilet accessories, a blanket a piece and enough food to last us for a week. We finally reached our destination - Waiouru - at 7.20 p.m. Waiouru consists



of a vast plain, a station and two houses. We walked across to the nearer house and arranged with the coachman to take our provisions on the coach next morning and drop them for us at the 19 mile peg in order to save us carrying them that distance. We walked half a mile to the other house, Peter's Accommodation House, had a cold supper, arranged our packs for the morning and retired to bed early. It was a very cold night.

## Thursday 30th December 1915

We were aroused at 4.30 and breakfast was served at 5 a.m. Three quarters of an hour later we were on the road, which is merely a metalless track across the plain. We walked steadily on at the rate of four miles an hour. At times the heavy soft sand made travelling difficult, especially through the bleak region known as the



Onetapu Desert. Often the road was perfectly straight and monotonous for miles and miles. We could have easily raced the coach which left Waiouru at 9.15 a.m. to the 19 mile peg, but about half a mile before we reached the peg, we had to ford a swift mountain stream. It was so refreshing wading in the water and the spot was so pretty that we decided to halt there for lunch instead of at the peg. A little before twelve the coach came by and later when we resumed our journey we found our "swag" at the mile post lying by the side of the road.



*"The hut (Waibobonu Historic Hut) is unpretentious, being built of a double thickness of corrugated iron with pumice packed between the walls to keep out the cold."*  
(Painting by C H Barton)

Here we had to turn off the road and take a track, which led for another four and half miles to the hut, which nestles in between the Mountains of Ruapehu and Ngauruhoe.

Finally we made our weary way to the hut which we were not sorry to reach about 5.30 p.m. The hut (*Waibobonu Historic Hut*) is unpretentious, being built of a double thickness of corrugated iron with pumice packed between the walls to keep out the cold. The plain oblong hut is divided into two compartments, the large for men and the smaller for ladies and at the end of the men's is a large open fireplace backed with blocks of pumice stone.

Each room has a small window which does not open and the floor is mother earth. In our men's quarters is a small rough wooden table and five built-in wooden bunks. A number of kerosene tins for buckets and soap boxes for chairs complete the furniture. The hut was empty but we discovered a note saying that two men had been there and would be returning the following evening. We soon had a cheerful fire blazing, unpacked our things, boiled our "billies" and had a nice hot meal. We retired for the night on our beds of dried fern and straw. At that altitude the nights are always cold, especially towards morning.

### **Friday 31 December 1915**

We were awake about 4 a.m. - very cold. We rose at seven and lit the fire for breakfast and then set out for the morning. We decide to follow down the bank of the Waihohonu Stream to see some rapids that Brodie had seen before.

Next we crossed the plain of tussock until we came to another swiftly running stream, the "Ohinepango" (Dusky Maori Maiden), which we followed to its source. *Barton and Brodie set off after lunch and followed the Waibobonu Stream up onto the slopes of Ngauruhoe from where they got views lower Tama Lake and reached the shores of upper Tama Lakes before returning to Waibobonu Hut.*

On reaching the hut we found two travellers, Mr. Brockett, a Wairarapa schoolmaster, and his friend Mr. Graham of Wellington. They stay until Sunday and tomorrow we four are going to try the ascent of Mt. Ruapehu together. A cold night and huge fire. Here one feels so far from civilisation. The last night of memorable sad 1915.

### **Saturday 1 January 1916 New Year's Day**

We were on the track through the beech trees a little before 7 o'clock. After the bush came a well marked track for three or four miles along an easy low spur of the mountain. It was bitterly cold. The signs of the track were either a stake stuck in the ground or else a stone placed on top of another. Some of the Mt. Tongariro tracks are marked with smears of red paint on the stones. Soon after nine we were

*"But for the deliciously cool western breeze I do not think I should have ever reached the top, but I did not give in and finally a little after one o'clock I and the others scrambled up the last steep ridge and lay exhausted on the very summit."*

(Painting by C H Barton)

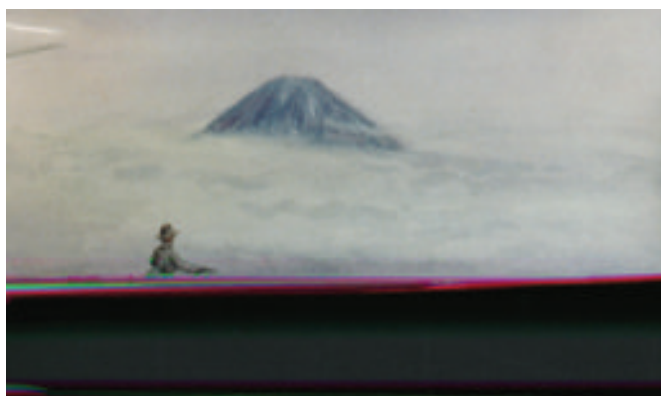


delighted to catch a glimpse of the mountain up through the mist and in another half hour it was quite clear and towered before us. Looking backward we could see Ngauruhoe's head rising above the clouds and mist. But for the deliciously cool western breeze I do not think I should have ever reached the top, but I did not give in and finally a little after one o'clock I and the others scrambled up the last steep ridge and lay exhausted on the very summit. The view was stupendous in every direction and although it was cloudy, at one time or another we saw every part of the landscape stretching beneath us. We piled a few more stones (*to a cairn*) to increase our shelter and lit a fire with some wood and kerosene we had taken up, boiled the billy and boiled some coffee we had brought. Then a little whiskey each, most reviving. It was bitterly cold and the wind increased in violence until a regular

blizzard was raging.

About 3.30 we decided to descend into the Crater and found we could hardly stand up in the cold. We were all, except Graham, wearing dark glasses for protection against the dazzling glare of the snow and as he was afraid of snow blindness we made him a mask of brown paper with eyelet holes and I also blackened his face below the eyes to keep the reflection off. He looked a regular bushranger. Brodie and I took the plunge and scampered down a snow slope beside a rocky ridge, hardly able to breathe against the force of the wind, which tore up huge lumps of snow and flung it in our faces.

*Their two companions became unsettled by the steep conditions and approaching weather so Brodie made the decision to turn back and head back to Waibonnu Hut rather than descend to the crater lake.*



*"Looking backward we could see Ngauruhoe's head rising above the clouds."*

(Painting by C H Barton)

## **Sunday 2 January 1916**

A cold showery morning. Graham and Brockett had to leave for Waiouru and said

good-bye and departed on their 25 mile walk about 10 a.m. I did not envy them their walk with all their gear. After lunch we wandered through the beech forest to the Ohinepango Spring. We saw the footmarks of wild horses.

### Monday 3 January 1916

*Barton and Brodie set off on a fine morning walking to Oturere and up to Emerald Lakes and Red Crater and on to Blue Lake, following much the same route as today. They noted that, "Far away we could see a perpendicular moving column of dust showing the whereabouts of the coach between Waiouru and Tokaanu."*

Stretching far beneath us was a broad green and brown plain, then Lake Roto Aira nestling prettily in a charming shape under the Pihanga chain of mountains and over their tops Lake Taupo stretching far into the blue haze, with faint blue distant rows of hills.

About a mile or more before we reached the hut we came to the Ketetahi Spring or Blowhole, a huge one with boiling springs on the hillside. We explored it but had to be cautious as we could put our sticks right through the crust in places. The

rocks form the spring into a series of pools and cascades and we chose a pool each of the temperature we liked. We had a lovely bathe.

The hut is not nearly such a nice one as the Waihohonu one with one fireplace, but a cooking galley some yards away. We found a young red-haired drover and two mates, a curious little man with spectacles and a Maori in possession of the sole three bunks. The Maori had come up to bathe in the spring as he had strained his leg. After tea we had to rake some straw into one of the corners and slept there together for warmth, as it was a bitterly cold night.



*"The hut (Ketetahi) is not nearly such a nice one as the Waihohonu one with one fireplace, but a cooking galley some yards away."*

(Painting by C H Barton)

### Tuesday 4 January 1916

We had to be content with a smaller breakfast than we had anticipated, as our sausages and some cheese disappeared, evidently stolen by one of the drover's hungry-looking dogs. We started soon after 7 a.m. and steadily climbed the winding track up the mountain, past the hot spring. It had been snowing heavily in the night and we were soon up to the snow line. We diverged to the left and climbed a rocky slope until we looked down on the large Blue Lake, which lies in a cup in the mountain. Further behind is the other active Crater - Te Mari.

We arrived back at the Waihohonu Hut at dusk. It was just as we had left it. It was not long before we had our supper boiling over a cheerful blaze.

### Wednesday 5 January 1916

Raining when we got up and kept on intermittently all the morning. Climbing Ngauruhoe as we had discussed was out of the question as the mountain was not visible all day. We explored the lower course of the Waihohonu and found the most beautiful deep and narrow mountain gorge, down which the water rushed. It evidently extended for some miles. Our evening was spent arranging for our final farewell in the morning. We packed and left behind a small quantity of food we did

not require addressed to the First Comers with the compliments of the last Goers.

### Thursday 6 January 1916

When we awoke early there was a solid black mass of clouds over the saddle between the mountains. We set out with all our possessions on our backs soon after 7 a.m. and followed the bank of the Waihohonu to its source. It began to rain with a driving rain in our faces and we were soon very damp. There was no track and we had to rely on our judgement and compass.

After leaving the saddle it was down hill most of the way and the rain cleared. We surprised a drove of wild horses, seven mares and two foals. They were poor looking animals and not nearly as fine as the stallion we saw the other day. We struck the Makahikatoa Stream at some pretty rapids, in negotiating which I fell into the water up to my waist. Then came the Whakapapanui Stream, which we forded, then boggy country with some curious round knolls rising in the mist and finally on turning round we found we had come too far as the Haunted Whare, our destination, was some distance behind us on our left, prettily situated on a rise on the edge of some bush.

We made our way to it and found it evidently occupied but no one was about. We lit a fire, changed and dried our wet clothes and made tea. The Haunted Whare is so called because a great many years ago a lonely shepherd lived there and he is said to have murdered a Maori girl who visited him there. It is a wooden lined hut and iron outside, the iron having been recently added by the Government. The inside is picturesque as all the boards and beams are hewn by axe and there is the usual big open iron fireplace, a rough table and a large bed of dried fern on the floor. A fishing party of four put in an appearance at dusk. They were all Wellington men and were very pleasant. We discovered we had mutual friends. They had a string of mountain trout freshly caught and we were invited to supper, and had one each, grilled to a turn. It was delicious. We turned into bed at 10 p.m. and slept well with no interruptions from the ghost.

### Friday 7 January 1916

We said goodbye after an early breakfast as we wanted to walk the 10 miles to Waimarino in order to catch a train for home at 10.40 a.m. There was a track or road all the way. We came on two new substantial bridges nearing completion. The road after that was straight and uninteresting and owing to the faulty map again we approached some houses, which we thought were half way and instead found they

were the township of Waimarino itself. It consists of about six houses, all of the same pattern, in two rows, and on the edge of the bush was a summer evangelical camp. We spent an hour at the station before the train in trying to spruce up. The train was frightfully slow, stopping for ages at every little station but the bush scenery was very fine and the mountains were nice and clear. I arrived back at Feilding safely shortly before eight and my trip was finished. Supper, a hot bath, the luxury of a bed with sheets again, and a welcome budget of New Year letters completed the day.

*"It (Haunted Whare) is a wooden lined hut and iron outside, the iron having been recently added by the Government. The inside is picturesque as all the boards and beams are hewn by axe and there is the usual big open iron fireplace, a rough table and a large bed of dried fern on the floor."*

(Painting by C H Barton)



# Volcano Watch 2000

## Mt. Ruapehu

Ruapehu has continued to quieten down after the 1995-96 eruptions. Seismicity has been generally low relative to pre-1995 behaviour with only two notable bursts of tremor in mid April and mid July recorded at both the Dome and Far West seismometers (Brad Scott and Brent Alloway, GNS, personal communications). Temperatures have continued to decrease in Crater Lake and in the fumaroles that were formed near the eastern crater rim during the eruptions (Figure 1). The lake temperature was 39°C on 4 September, which is the lowest temperature measured since the eruptions. Steam puffs observed in June and early September were due to atmospheric conditions, not to increased activity at the Lake or eruptions. There have been no confirmed eruptions since the hydrothermal (steam) eruptions of September-October 1999. This is the first time there have been no eruptions in a 12-month period since 1993. Such non-eruptive periods are rare on Ruapehu. It is interesting that the last three such periods were followed by significant volcanic activity within four years (i.e. in 1968, 1988, 1995) but this is not a good basis for predicting eruptions on an unpredictable volcano like Ruapehu. Most likely Ruapehu is still adjusting from the 1995-96 eruptions. Comparison with post-1945 activity still suggests we might see steam eruptions in the next year or so, irrespective of other processes.

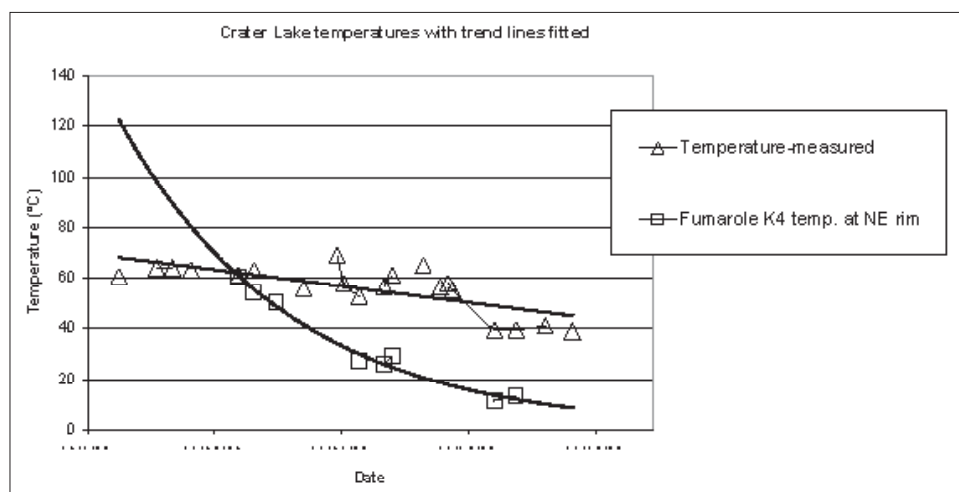


Figure 1: Crater Lake temperatures with trend lines fitted

## Whakapapa Visitor Centre displays

New displays for the Whakapapa Visitor Centre have occupied consultants and several staff this year. Volcanoes and volcanic processes are a feature of these displays and it has been interesting to see ideas take shape over the months. The essence of the volcanoes of Tongariro National Park has had to be identified and a wide variety of information presented in suitable and practical ways.

In the last 20 or so years the understanding of what causes volcanoes has progressed significantly so interpretative material has had to change. We used to think subduction of the Pacific Plate beneath the North Island produced magma by frictional heating and that volcanoes formed above crustal cracks through which the

Northwest corner of Crater Lake on 26 June 2000. During winter cliffs of snow develop above the lake shore making access to the water edge more difficult.

(Photo: Harry Keys)



magma rose to the surface. It is now believed that magma is formed by water in subducted sediment being released and reacting with convecting mantle material. This magma ascends to create volcanoes and eruptions because it is buoyant (driven by differential densities due to gas content and other compositional characteristics), not because of the presence of cracks. John Gamble of Victoria University who helped convene the international State of the Arc conference at Whakapapa in February 2000 has been involved in research on these processes at Ruapehu.

### Large Tongariro National Park eruptions

One interesting aspect of the displays exercise highlighted the importance of work that scientists like Ian Nairn, Barbara Hobden, Sue Donoghue and Bruce Houghton have been doing. They have studied the products of eruptions from the volcanoes focussing on those about 11,000 years ago. This period produced the largest eruptions in the last 26,000 years from the park's volcanoes (Table 1). Several vents between the source of the huge Rangataua lava flow on Ruapehu and Te Maari on Tongariro may have been active at once during some eruptions, unlike now when only one vent is active at a time. Some of these vents have only just been recognised such as a major vent in the south-western head of Oturere Valley called Half Cone by Ian Nairn because erosion has destroyed much of it. Other vents were buried by subsequent eruptions of Ngauruhoe and Saddle Cone. Deposits from these eruptions, particularly those from the Tongariro massif and Tama Saddle area produced ash deposits up to 125 cm thick along the route of Desert Road. These layers dominate almost all the road cuttings there and give us some indication of volcanic hazards during the most severe eruptions. The recent eruptions from the volcanoes were so small in comparison that deposits from them are not even visible along the Desert Road.

Table 1. Volumes of ash produced in the most recent eruptions of the TNP volcanoes, compared to volumes erupted by the largest eruptions in the last 26,000 years summarised from recent studies by Ian Nairn, Sue Donoghue and others.

Volcano	Actual or approximate year of eruption	Volume of tephra (cubic kilometres)
Ruapehu	1995-96	0.07
Ngauruhoe	1974-75	0.001
Tongariro (Te Maari)	1896	0.001
Ngauruhoe (“Mangatawai tephra”-birth of modern cone)	2,500 years ago	Approx. 0.1-0.2
Saddle?-Tama-Tongariro vents (“Poutu lapilli” eruption)	11,000 years ago (but younger than O-W eruption deposits)	1.2
Saddle vents-Half Cone (“Ohinepango-Waihohonu tephra” eruption)	11,000 years ago	1.7
Ruapehu (“Taurewa eruptive episode”)	Between 11,200 and 14,000 years ago	0.2-0.3 or more

Ski Patroller, Mark Sneddon, checks snow stability before a ski descent to sample Crater Lake water on 4 September 2000  
(Photo: Harry Keys)



### Volcanic activity at other skifield volcanoes

Elsewhere in the world active volcanoes with skifields have continued to erupt and disrupt skiing on or near them. The following information on volcanic or

seismic events has been obtained from the Global Volcanism Network ([gvn@volcano.si.edu](mailto:gvn@volcano.si.edu)), the Volcano List at Arizona State University ([volcano@asu.edu](mailto:volcano@asu.edu)) and other web sources. The long running explosive and effusive eruption of Etna Volcano (3315 m) on Sicily has covered the skifields there with scoria and ash. Skiing has probably been affected for most of a second (or more) winter in succession.

Copahue Volcano (2965 m) on the Argentina/Chile border had significant ash explosions, acidic mudflows and probable ice avalanches from 1 July. This eruption is particularly interesting because like Ruapehu, Copahue is andesitic and one of the very few volcanoes in the world with an active crater lake surrounded by glacial ice and snow. During what appears to be its most vigorous activity in the past century, tephra up to 8 cm in diameter landed 12 km from the crater on at least one occasion. The ski town of Caviahue experienced ash fallout up to 3-5 cm thick during one eruptive episode and ash falls have repeatedly covered ski slopes. Skiing has apparently been disrupted to a similar extent to

Harry Keys  
*Conservancy Advisory  
Scientist*

that on Ruapehu in 1996 and only 400 people were reported in the town at one stage where normally there would be up to 10,000 people during the ski season. Japanese volcanoes have been in the news a lot this year. Usu volcano (732 m) on Hokkaido Island erupted in late March producing spectacular scenes of buildings and roads damaged by large airfall blocks and ground uplift of up to 60 metres! The nearby ski resort of Toyako on the shore of Lake Toya caldera had to be evacuated and ashfall may have disrupted skifields nearby during June and July. Elevated seismicity has continued at Iwate, Honshu with an expansion of its fumarolic area and temperature but no eruption has occurred yet. Unusual seismic activity also occurred at Bandai (August) and Asama (September) volcanoes on Honshu Island.

## Bridges, boardwalks and bits and bobs

Frequent users of the Tongariro National Park may have noticed changes to many of the tracks. This is the result of a new mantra, "QCM Structures", being chanted by recreation staff throughout the conservancy and indeed New Zealand. Those in the know will understand Quality Conservation Management (QCM) is about developing and improving the department's systems and services. The area of visitor structures was first to be considered.

What are visitor structures? Think anything built for visitors to use. Bridges, boardwalks, platforms, safety fences, wharves, stairways, gantries, ladders, handrails and the list continues.

Recreation staff in Area offices are now reaching the end of a very busy four years starting in 1996. Structures reaching the end of their useful life were upgraded

or replaced. Work ranged from adding handrails, replacing decking, strengthening beams, replacing netting, adding gabion baskets through to the larger job of actual replacements. Emergency replacement of structures occurred when severe storm cycles demolished a number of bridges.

During last season, the programme began to look beyond upgrading or replacement of structures. Finally there was a chance to examine non-bridged areas and to assess them for access. In all cases, sites were examined carefully for safety issues or developing environmental damage. The 1999/2000 season saw six new bridges on the Round the Mountain Track and what is often fondly called 'the Ditch' Track between Whakapapa Village and Mangatepopo Valley.

As to the future? All structures will be formally inspected at least bi-annually and any required maintenance work undertaken. There will continue to be ongoing replacements as everything reaches the end of its useful life. Recreation staff will respond to any events causing sudden damage. With this large pulse of work now settling down we are looking forward to catching up with other work on facilities that has been deferred.

Looking forward to seeing you out there and enjoying it all.



Barbara Curtis makes some adjustments to one of the bridges built in Tongariro National Park during the year.  
(Photo: Warren Furner)

Barbara Curtis  
Programme Manager  
Whakapapa



# Had any luck?

There is a saying among anglers that 90% of fish are caught by 10% of the anglers. This suggests that while a few individuals have real skill or knowledge about fish and fishing, most of us are just out drowning our flies and soaking up the sunshine. The suggestion has some basis in fact but is not strictly true for fishing at Taupo. Data collected in 1999 during angling surveys on local rivers reveal that 12% of anglers caught 75% of the fish. Nevertheless a small proportion of anglers catch a large proportion of the fish. But does this necessarily imply that the successful anglers are skilful? Might it not be that they were just lucky?



"Had any luck?"

Some researchers believe that the chances of angling success relates to a series of outcomes. The odds of catching a fish depend on when and where the fish are, the chance that an individual will attack a fly or a lure, as well as the probability that an attack results in a catch. The effects of these unpredictable events on fishing success are, as you might expect, poorly understood.

**Some aspects of angling success.** Most of us believe that fish are easier to catch when there are a lot of them about. While this is true to some extent just because a lot of fish are present doesn't necessarily mean that they are easier to catch. Catchability can be divided into a component that depends on the behaviour of the trout, such as how vulnerable or accessible they are and a component related to the angler's efficiency. A typical example is in the Tauranga-Taupo River in Autumn when large shoals of trout can be seen in the shallow, clear lower reaches of the rivers. A poor cast or the use of too heavy gear will see them bolt away. In such situations it is difficult to pretend that we didn't catch fish because there were none around!

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## **Does fishing success favour women anglers?**

Women are better anglers and catch bigger and more trout than men? The 1999 angling survey on Taupo rivers provided some interesting results as 20% of both sexes had caught fish at the time of the interview. The catch rates for male and female anglers were 0.24 and 0.11 fish per hour respectively, indicating that successful men were catching more fish than successful women. Why? Are men more persistent, skilled, or luckier than women? Maybe women are satisfied with catching fewer fish?

## **"Fisherman's luck"**

When two anglers meet on a pool they will invariably start the conversation with "Any luck?" as a way of introducing each other. The angler who doesn't believe in luck will probably answer "yes" if they have caught fish but will try to demonstrate, at least verbally, that in fact luck was a minor ingredient in their success. Another angler may reply "no" and not elaborate any further or try to blame bad luck for their lack of success. Luck can be good or bad.

## **Many of us cast our lines in the Superstition Pool!**

Superstitious beliefs are found around the world in every culture. They all have the function of providing comfort in uncertain times. Superstitious beliefs fill in the gap when knowledge falls short. Research shows that it is quite normal to be superstitious. Fishing by its unpredictable nature provides a fertile ground for superstitious beliefs. Some of these superstitions are easy to understand but some are much more obscure.

- Touching chives before going fishing brings bad luck.
- A good time to go fishing is when you see a chicken oiling its feathers.
- If a person goes fishing every Sunday, someday he will catch the devil on his hook and be snatched off the bank into the water and may drown.
- If on your way to fish, you see a pin, pick it up for luck; failing to pick it up will bring you bad luck.
- If the end of your rod touches the water, you will not be successful.
- If you count the number of fish you have caught, you will catch no more that day.

If we don't trust superstition to help us catch fish but still believe that luck is a key ingredient in success then we may try to measure the odds. To quantify the chance of catching a fish before we cast a line we have to explore the domain of probabilities.

### **The odds of catching a fish**

The concept of probability is much more difficult to define than most people imagine. At first glance, there seems no difficulty in understanding that the outcome of a cast will either be hooking a fish or nothing. The probability of catching a fish before a cast is made is therefore half, yet it proves very difficult to give a perfect definition of the likelihood of catching a fish.

We use the idea of probability only for events about which we have incomplete knowledge, usually because they lie in the future. If we knew the exact details of everything that has ever happened or ever will happen, probabilities would

become redundant. Any value we quote for the probability of an event is relative to some knowledge that we have about that event, or that we choose to hypothesise about it, and will change as that knowledge changes.

The probability of catching a fish assigned by an angler depends totally on that angler's knowledge. If you are wearing Polaroid glasses and scan the pool for trout but discover none, then for you the probability of hooking a fish on a cast is zero. For the angler who can't see through the water the probability will remain at half. Neither of these values is wrong; each is a correct evaluation based upon the angler's knowledge of the situation.

Probabilities are valid for processes that are repeatable like throwing dice. Fishing is by its nature unique because no two casts are identical and so theories of probabilities are likely to be inappropriate to fishing.



"Don't let them see the frying pan!"



Anglers at the Picket Fence,  
Waitahanui River Mouth.  
(Photo: Destination Lake Taupo)

### **What is fishing skill?**

Fishing success is a combination of several factors but luck is immeasurable, superstition can't be proved and probabilities do not apply to the unique nature of fishing. We are left with fishing skill. But again fishing skill is hard to measure. There is a big difference between luck and skill though. Luck is either on or off with no in-between but skill is more like a good wine, there is no short cut and it improves with time. Nothing can beat personal experience and practice.

With practice we improve our casting distance and accuracy but this is meaningless if there are no fish present. Skill resides in small things that take time to recognise, like being able to read the water to know where the fish are most likely to lie, the importance of good line mending or the ideal length of leader that makes touch detection and striking easier.

At river mouths the chance of having the fish around is high. Skill will help you to scan all depths and current until you reach them. Trout may be stacked close to the bottom, actively feeding in mid-water or cruising the lip of the drop-off. Skill will help you to visualise what your fly is doing and at what depth it is swimming. These parameters are perceived by feeling the tension and watching the angle of the line. Skill becomes sensorial. Sometimes you feel confident that the delicate balance is swinging your way. Maybe skill is the ability to recognise when everything is working well or to identify when and why something doesn't feel right.

The fish has its own mind; if it's unlucky it will fall in the trap set by the lucky angler and if it's lucky it will avoid the lure of the unlucky angler. So even though skill is important, luck seems to be more relevant to the unknown question of what the fish will do.

Regardless of how we look at the issue of fishing success it seems that there is an "immeasurable" factor involved. Some take it as it comes and call it luck. Others try to limit the importance of this slippery factor by refining their equipment, enlarging their knowledge and as a result improving their skill.

You may be a most skilful and knowledgeable angler but if your car blows a head gasket 25 km away from an amazing fishing spot then you are just unlucky. Similarly if the battery of your cellphone runs flat and you are unable to receive the call from your partner trying to tell you that you have to cancel your fishing expedition because the mother-in-law just turned up you are lucky!

Michel Dedual  
*Taupo Fishery Area*  
Scientist

# More Haunted Whare Stories

The old hut called the Haunted Whare has a place in local folklore dating back to before Tongariro National Park was established in 1887. A beautiful young Maori woman who perished in the vicinity in tragic circumstances was said to haunt the hut. One story says she died in a blizzard while others state variously that she ended her own life in the Whakapapanui Stream after her lover was murdered, or that she herself was murdered.

Rumours of a ghost or patupaiarehe (fairies) were rekindled in the 1880s after a shepherd was found dead, minus one eye, in the isolated slab but on the Grace's sheep station at the north-west foot of Tongariro. The whare may have been burned down after that and a new but built. In any case, the ghost continued to appear at the window of the hut, now and then, terrifying its occupants and was also credited with being able to walk across snow without leaving footprints.



A watercolour painting by Cranleigh Barton in 1929 shows detail of the Haunted Whare. See the article on page 6.

This building was still standing when the Chateau Tongariro became the home for 200 psychiatric patients from 1943 to 1945. In 1943, the Porirua Mental Hospital had to be evacuated after it suffered earthquake damage and about 800 patients were transferred to other hospitals, and also to Rotorua Island, Wairakei Hotel and the Chateau.

One young nurse who cared for the patients at the Chateau recalls the night when the Haunted Whare burned down in 1943 in a book called 'Out of Mind Out of Sight - the story of Porirua Hospital':

*"We were all young and sprightly creatures and we didn't ever see any men. One time a crowd of airforce fellows came from Waiouru and we had a party at the haunted whare about a mile down the road from the Chateau. It was just an old tin shed really and we lit a fire and sat around. Afterwards the fire wasn't put out properly and the whare got burnt. Nobody knew until the truck went down to National Park the next morning and there was what the driver called "this charred bloody ruin." All the members of the National Park Board came and interviewed us and I've never been so terrified. There is a little plaque there now which says it was burnt down in 1943 but you'd have thought it was Cleopatra's Needle or some such, the fuss there was."*

And so ends this story of the Haunted Whare. today there is no sign of the plaque nor of any remains of the old building which was once located about 400 metres to the southwest of the Tawhai Falls carpark on the road to Whakapapa Village.

Karen Williams  
Taupo



Loaded packhorse outside  
Ketetahi Hut in February 1924.  
Photo by Ralph H Ward, courtesy  
of Gerard Ward, from the Taupo  
Heritage 2000 Collection.

This is just one of dozens of interesting photos which came to light during the year 2000. Researcher Karen Williams has scanned hundreds of historic photos on a wide range of topics from around the Taupo district this year. These have generously been made available to the project from the collections of numerous private individuals. Karen has also interviewed many people from the area on tape. The photos and oral archives are held at the Taupo Library and will be available for future researchers. The Taupo Heritage 2000 Project is a special project funded by the Government's Millennium Fund.

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A visitor browses through the  
new retail section of the redeveloped  
Whakapapa Visitor Centre.  
The corridor leads to the new  
displays and the auditorium  
where new versions of *The  
Sacred Gift* and *Ring of Fire* are  
shown.  
(Photo: Warren Furner)

# Heather biocontrol programme starts to show results

## **News flash!**

The first dieback of the most widespread weed in Tongariro National Park has occurred. This is due to an outbreak of a small beetle released as a biological control agent. It is the first successful result of the heather biocontrol programme the Department of Conservation started back in 1990.

Last year, during annual monitoring of all the beetle release sites scientists Dr. Simon Fowler and Paul Peterson from Manaaki Whenua Landcare Research found five beetles at one of the original release sites. This is a site up the Te Piripiri Stream on the eastern side of the Park containing a patch of dense heather about 20 by 15 metres in extent. This was the first confirmation that the beetle had established after its deliberate release.

In mid November 2000 Simon and Paul visited this site again in conjunction with scientists from DOC and Massey University. They found all the heather plants in the dense patch were grey and dead or dying. In addition, isolated heather bushes up to 10 metres away were also showing the effects of browsing by the beetle and its larvae.

The Landcare scientists estimate there are presently about 14,000 beetles in the heather patch. Last year there were only about 500 beetles but these produced large numbers of larvae which fed on the heather severely damaging it. These larvae led to about 30 times more adult beetles this year.

Native plants in and around the release site were examined for signs of beetles or browsing damage. No beetles or damage were found. Healthy specimens of *Pentachondra pumila* were found under and near dying heather plants (see photo). This species is an important indicator plant for monitoring because it was the only native plant that failed the first "no choice" tests in quarantine of whether the beetle would eat such plants. These early laboratory tests showed that confined and starving beetles browsed it. This led to more elaborate and realistic tests to determine that in the real field situation the beetle would not eat *P. pumila* but instead would leave it in search of heather plants. At the Te Piripiri site there were no signs of browsing or other damage on *P. pumila*.

## **Background**

Heather was introduced into Tongariro National Park from 1912 to establish habitat for grouse. It is now widespread in the Park and still spreading. It can out-compete the native vegetation it invades, leading to loss of indigenous plants and insects. Its invasion is a particular concern in grassland sites above the bush line and more recently in wetlands. It also has the potential to cause major problems in other parts of the country. To date it is only a serious ecological concern in the central North Island where it has been spreading at rates possibly as high as 7 km/yr along roads due to seeds being spread by road machinery, bee keepers trucks and possibly by people picking the much-admired blooms. This spread could only be partly controlled by repeated use of herbicides. Other than biocontrol,

there is no cost-effective tool available to control heather. Because of this, heather has been an especially difficult weed for DOC, the Army and others to manage.

Heather beetles were released at various sites in and around the Park between 1996 and 1999. This followed several years of careful host plant testing by Manaaki Whenua Landcare Research and other research by Massey and Victoria universities leading to an environmental impact assessment process led by the Department of Conservation. This public assessment process concluded that the beetle would be safe to release and would not affect indigenous plants or the wider New Zealand environment.



Simon Fowler of Manaaki Landcare examines *Pentacodon pumila*. Healthy *P. pumila* under or near heather is a good sign that the heather beetle is directly affecting the target species, Heather, and not vulnerable natives.

(Photo: Harry Keys)

### **Some recent overseas experience**

Heather in Europe is a highly valued and protected species while heather beetles are regarded as pests. Simon Fowler recently examined an outbreak of heather beetle in the UK. He collected samples of the beetle and examined heather die-back patterns. Studying such outbreaks overseas helps us recognise why outbreaks commence and end, promotes general understanding of their impact on heather and other potential lessons. Conversely New Zealand experience and understanding can be useful to European colleagues.

During a recent visit to Holland I spent a very interesting day cycling through extensive protected native heathlands near Arnhem escorted by Hans Kampf, a Senior Policy Advisor with the Dutch National Reference Centre for Nature Management, Ministry for Agriculture Nature Management and Fisheries. Heather density in these heathlands on the low fertility sandy Ice Age moraines (altitude approximately 150 m asl) is greater than at many places in Tongariro National Park but plants are only half as high and less woody.

The Dutch heathlands like others in Europe are being managed by a variety of methods. Light grazing by cattle and horses is used to counter invasion of both grass (due to eutrophication from fallout of nitrogen-based pollutants from industry and motor vehicles) and trees (natural succession). Various forms of turf cutting also reduce fertility and induce disturbance, both of which promote heather. Mowing older heather plus invading scrub and tree seedlings and use of fire also induce disturbance and reset the heather succession. All of these methods aim to sustain the dynamic heathland and protect its heathland ecosystem including reducing the incidence, severity and extent of heather beetle outbreaks. These have been additionally managed by mowing heather and removing the cuttings. One aim is to reduce the accumulation of the litter layer as this provides better habitat for the beetle.

We did find two small relatively old outbreaks of heather beetle damage each ap-

This cattle species (close relative of the extinct European aurochs) and wild horses have been introduced some Dutch national parks. The aim is to re-establish ecological processes which promote Heather by removing competing grasses and tree saplings.

(Photo: Harry Keys)



proximately 40 by 40 m in extent. The belief is that extensive browsing by the insects leads to plant death by excessive evapotranspiration. The dead and dying plants were 20–60 cm tall and probably mature or degenerate specimens while younger plants were growing vigorously between these. Generally however the Dutch heathlands appeared to be in good condition. Hans showed me areas of healthy heathland that were mostly grassland several years ago testifying to the success of the ecological restoration and management.

My conclusion from this visit is that the heather beetle and plant succession will provide ecological constraints on our heather problem as we hoped but are unlikely to eliminate heather. Litter buildup in ageing heather populations should enhance the beetle habitat both below and above treeline. Beetle numbers should increase to cause significant browsing pressure. But there is a substantial heather seedbank in Tongariro National Park soils which may result in killed plants being replaced by young plants for many years yet. What happens to these young plants may be crucial but Simon Fowler does not know of any fundamental biological reason why they will not be browsed here. In the absence of fire, grazing and disturbance are low in most of our “heathlands”. Therefore as native woody shrubs and tree species continue their succession and grow below the natural treeline, heather is likely to become less dominant there. Above the treeline, deer and hare density and grazing pressure is probably an order of magnitude less than that in the Dutch heathlands (Cam Speedy personal communication). Probably, grazing is insufficient to selectively remove more palatable native species that compete with heather and so enhanced control of grazers would be unlikely to assist heather control. But in Army country the wild horses have probably assisted the spread of heather.

### **Future work**

The Te Piripiri site will continue to be monitored to determine the ultimate fate of heather there and what replaces it, as well as the health of native plants. At this stage the time taken to see localised effects and the nature of those effects are as predicted back in 1995.





The Heather Beetle, introduced to selected and monitored areas in Tongariro National Park in a bid to effectively control heather. (Photo: Manaaki Whenua Landcare Research)

**Harry Keys**  
*Conservancy Advisory Scientist*

About 400 beetles initially were collected during the November visits and released at further roadside sites between Whakapapaiti Stream and Taurewa, along Highway 46 and the Desert Road. Many of these beetles were females at the egg laying stage. It is hoped that these beetles have adapted to the seasonal cycle and climate in Tongariro National Park and that these release sites will also be successful (look for grey patches of heather in a few years time). These and the other as-yet unsuccessful sites will continue to be monitored scientifically but further releases may be made it becomes clear that previous releases have failed.

Landcare have some Public Good Science funding for heather work which complements funding from DOC and the New Zealand Army. With Massey University they will begin looking more closely at possible invertebrate predators and competitors which might limit the heather beetle in New Zealand. This will build on preliminary work funded by DOC and carried out in the early 1990s by Vaughan Keesing who concluded the beetle would probably not be constrained significantly

by invertebrates here.

If the heather beetle continues to multiply and spread, it is hoped that it will become a very effective tool for helping DOC, the Army and possibly Regional Councils to control heather in future.

#### **Acknowledgments.**

We thank staff of Manaaki Whenua Landcare Research for their great assistance with the heather biocontrol programme over the years. Thanks are also due to many other people in various organisations who have assisted us, including the New Zealand Army and the Public Good Science Fund for recent funding. I also thank Hans Kampf for showing me around the Dutch heathlands.

The Ohakune 2000 group is creating a walkway following the course of the Mangawhero River from the park boundary down through the townshop. Thanks to the sponsorship of trees from Genesis Power Ltd. and the support of the Department of Conservation, Ohakune Primary School pupils and teachers, the police and community the group recently planted 150 trees on part of the walkway. Genesis have promised further support in the future. (Photo: Ohakune 2000)



# World Heritage Site managers' workshop



Clockwise from top left: Delegates are led onto the Waihi Marae for a powhiri; Delegates hongis outside Tapeka Whareniui; Pupils from Hirangi Primary School's Kapa Haka group entertain the workshop; The obligatory group photo outside Tapeka Whareniui on Waihi Marae. (Photos: Dave Wakelin, Herwi Scheltus)

They arrived from everywhere. Australia, Thailand, Vietnam, Cambodia, Korea, Laos, Malaysia, Indonesia, Japan and the Philippines and across the Western Pacific from Papua New Guinea, Kiribati, Solomons, Fiji and Samoa.

The Third Site Managers' Workshop for the World Heritage Areas of South East Asia and the Western Pacific was held in the Tongariro Taupo Conservancy at the end of October using as venues Waihi Marae, Sir Edmund Hillary Outdoor Pursuits Centre and Whakapapa Visitor Centre.

Many delegates arrived at Turangi after about 20 hours of travelling including four hours by car or van from Auckland International Airport. The workshop began with a powhiri at Waihi Marae, a unique experience for all hearing the shrill cry of the karanga and being led onto the marae to hongis with tangata whenua which on this occasion included local DOC staff. Daryl King from Australia spoke eloquently on behalf of the group followed by Paramount Chief Newman Tegheta from East Rennell in the Solomon Islands. Each of the tangata whenua who spoke in reply including Ngati Tuwharetoa paramount chief Tumu Te Heuheu acknowledged the presence of Chief Newman and the honour of hosting this special gathering.

For the group the dinner entertainment was special. Hirangi School's Kapa Haka group delighted everyone with their skill, poise and style as they performed a



Clockwise from top left: Gary Pappin from Willandra Lakes, Australia teaches the world to sing; Hemi Kingi, Kaipapa Atawhai Manager, teaches the Australians to sing!; Delegates bed down in Tapeka Wharenuui on Waihi Marae ; Harry Keys draws in the Tangiwai ash to explain the 1953 disaster which claimed 151 lives after a lahar from Ruapehu swept away the rail bridge; Truong Lan Tam from Vietnam watches Harry intently; Cam Speedy explains the creation of Kaimanawa Forest Park; Ben Devi explains the creation of the Solomon Islands using material at hand.  
(Photos: Dave Wakelin, Herwi Scheltus)

range of waiata and haka.

Most of the gathering slept on the marae in the Tapeka Wharenuui though the 'musical' accompaniment during the night ensured that some slept less than others!

The five day workshop focused on

- Performance monitoring and evaluation
- Tourism sustainability
- Risk management
- Indigenous peoples' involvement in Park management
- Information availability and dispersal of information

As an introduction to the Park and the surrounding area the first full day of the workshop was a field trip. The delegates were able to appreciate that the Park and other areas for which we have management responsibility mean different things to different users. For the skier, trumper, botanist, scientist, photographer or sight-seer the Park's values can be different and the same. During the course of the day



Above: Members of Ngati Rangi hongi with the delegates before leading the group up to Rotokura Lakes.

Right: Richard Pirere, Ngati Rangi kaumatua and Tongariro Taupo Conservation Board member gazes out over Rotokura, a sacred lake for his people. (Photos: Dave Wakelin)



they were introduced to some of the major management issues, including:

- Ruapehu Crater Lake Risk Assessment
- weed and pest management
- roading projects in a world heritage area
- visitor centre redevelopment
- recreational facility development
- the Karioi Rahui restoration project
- village and skifield development in national park.

During the course of the workshop which used the facilities of the Sir Edmund Hillary Outdoor Pursuits Centre and those of the Whakapapa Visitor Centre many delegates had the opportunity to present case studies on their own country's World Heritage areas. The presentations left vivid memories of stunning, evocative landscapes. The eerie nature of Angkor Wat with its huge temples and statues reclaimed from the Cambodian jungle and the surreal islands of Ha Long Bay in Vietnam, 1700 pedestal like limestone blocks rising from the sea.

The workshop also offered some delegates a chance to give presentations on areas within their country which were being considered for World Heritage status. For example the Malaysian delegate, Sapuan Haji Ahmad, gave an excellent Powerpoint presentation on Gunung Mulu Conservation Area in Sarawak, an area that from the strength of the presentation appears to deserve World Heritage status.

A common thread was that when the delegates got up to speak, they spoke from the heart about the areas in which they worked.

A key part of any international gathering is the plenary session where delegates can discuss and make decisions and recommendations on key issues relating to the workshop and their respective responsibilities.

No decision has yet been made on where the fourth workshop will be held in 2002 but Cambodia, Indonesia, Vietnam, Papua New Guinea or Guam were suggested as possible venues.

From the floor came suggestions for themes or topic for the next workshop to follow on from this workshop.

- Indigenous people's management of World Heritage properties



Above left: A chairlift ride to Knoll Ridge on the Whakapapa Skifield was a new experience for nearly all the delegates. Above right: Warren Furner from DOC explains issues related to the removal of sewage from a major skifield and including club lodges.

Below right: A highlight of the workshop dinner at the Grand Chateau was an 'impromptu' rendition of *The Man From Snowy River* by Willandra Lakes Executive Officer Doug Williams. (Photos: Dave Wakelin)

- Community-based projects
- Management to protect World Heritage values
- Communities living in World Heritage Areas
- World Heritage in the context of regional and district planning
- Economic return to communities from World Heritage inscription
- Managing use and carrying capacity

The proposed Asia Pacific Focal Point was discussed at length and a number of points brought up for clarification by UNESCO.

The delegates felt that good progress had been made in working with indigenous people on approaches to cooperative management. Despite some points of tension there were successes at the operational level, reliant very much on hard work and building trust and respect.

A draft Training Needs Analysis document presented at the workshop was discussed and the conclusions reached were that work is needed at site level so staff and local communities get a better understanding of World Heritage. Even though the World Heritage Committee gives top priority to training needs there is a need to work with ASEAN countries. Now that the document had been produced it now needs to be turned into actual training and training partners identified.

The overall feeling from all delegates was that the workshop had been well organised and the relaxed atmosphere contributed enormously to the weekend's success.

Workshops like this are vital if we are to play a role in the conservation of cultural and natural areas in our part of the world. Five days with delegates from 16 countries made several things very clear. We possess the same passion for conservation. We share common problems relating to World Heritage and other protected areas and by meeting together we can all recognise the problems and together look for solutions.



Dave Wakelin  
Senior Community  
Relations Officer

# LEARNZ2K education project

An internet-based project focussing on Tongariro National Park World Heritage Area has been a feature of activity in 2000. Nga Taonga o Tongariro was this year's subject of LEARNZ, an online educational programme for New Zealand schools. It has been created and developed by teachers for teachers via Christchurch company Heurisko Ltd with funding from the New Zealand Ministry of Education and support from the Department of Conservation.



One of the empowerment techniques used by LEARNZ2K is the Ambassador programme where classes send Jeff their 'ambassador'. These stuffed toys, each with a name travel with Jeff and feature in the broadcasts and on the web site, increasing the student's involvement.  
(Photo: Jeff Gunn)

The key idea behind LEARNZ is to take students in schools throughout New Zealand on a Virtual Field Trip. Students stay in their classrooms but travel virtually by the use of information and communication technologies. Students communicated with the LEARNZ teacher Jeff Gunn, who was on location with DOC staff in the field. From the field Jeff usually ran two audioconferences (via cellular speakerphone) a day, where he and the DOC staff downed tools for 30 minutes and answered students questions. After returning from a day in the field Jeff then wrote a diary and picked out his best 10 digital images for the day. These were added to the web site for students to enjoy the following day. There is also a web board where students asked more questions, made comments and took part in

the 'Tongariro Treasure Hunt'.

Nga Taonga o Tongariro or LEARNZ2K targets the science, social studies and technology curricula of years 4 to 10 and has three themes:

- Tongariro World Heritage including volcanoes
- Kiwi and Operation Nest Egg (ONE)
- Karioi Rahui (co-operative management and mistletoe)

The site (see [www.learnz.org.nz/2k](http://www.learnz.org.nz/2k)) is an excellent school-reference for mistletoe, ONE and specific world heritage topics and for exploring the secrets and stories behind conservation. Jeff compiled theme and curriculum information on the site and did the logistic organisation. He developed a system to give Ngati Rangi and DOC initial access to draft information on the Rahui pages via a secure site which enabled drafts to be reviewed and checked before public access was allowed. The site now contains 96 background pages of information, 63 class activities and over 1200 individual images.

160 schools had registered for the programme by October. This is more than for 1999. Once most schools join they return the following year showing they are satisfied with the programme. It is estimated that approximately 15,000 New Zealand students were involved in LEARNZ2K. During the virtual field trips held in May and October/November DOC staff talked by phone conference to about 3000 primary students from schools all over New Zealand. Questions and field trip summaries prepared by the children and posted on the website provide a means of assessing the effectiveness of information transfer and uptake by the children. Site statistics are very impressive and showed it reached the target audience.

- The number of user sessions varied from a low of 3841 in April to a peak of 8998 in May with October second at 7618.
- The average length of user sessions was a maximum of 23 minutes in April and 16 minutes in both July and October.
- The most popular visit times have been during school hours on weekdays.

The LEARNZ2K project went to great heights to bring Tongariro National Park to the school children of New Zealand, including a trip to the Crater Lake of Mt. Ruapehu. Jeff Gunn and Harry Keys above the lake.  
(Photo: Harry Keys)



- The most popular pages (after the front page) have been Tongariro, ONE kiwi, followed by the teacher's then kid's homepage. (The learnz99 homepage has remained quite popular too showing how use of the site will continue into the future.)
- By far the most visitors reach the site via the Learnz page (rather than via search engines) showing they have book marked the site for future reference.

*LEARNZ would like to thank all the staff involved in the programme at both the Turangi and Whakapapa DOC offices, as well as the Rainbow Springs Kiwi House. Harry Keys, Nick Singers, Jo Heath, Pete Morton, Jo Heath, Barbara Curtis and Helen McCormick are the key personnel that brought about this most successful programme with Jo being the key Whakapapa contact and Harry in Turangi. Thanks also to Paul Green and Mark Davies for their vision in seeing the potential of this programme.*

The success of LEARNZ2K and last years Learnz99 led to Heurisko becoming involved in Conservation Week 2000 with a special audio conference related to the week's theme of *Enjoy Your Parks*.

In summary we conclude that this has been a useful educational and awareness raising project. It made useful and relevant information widely accessible and reached the target audience. This can be attributed to dedicated work by Jeff Gunn, Heurisko, DOC staff and Ngati Rangi. Jeff noted that if it were not for the partnership with the Department of Conservation, this programme would not have taken place. DOC gets direct contact with students through audioconferences and the web board which increase student knowledge of the work DOC staff do. Students

identify DOC staff with their profiles on the web site and can enquire as to how they became skilled in their profession.

It is probably no coincidence that Heurisko Ltd won two significant prizes for the LEARNZ99 and LEARNZ2k programmes in 2000. They won top honours in *Excellence in the Use of IT in Education* at the Computerworld Excellence Awards 2000. They also got first place and an A+ for outstanding achievement in *The Education Award for Telecommunications* created by the Telecommunication Users Association of New Zealand.

Harry Keys  
Conservancy Advisory  
Scientist

# Taupo District - event capital of New Zealand

If you want to find out all the events happening in the Taupo District look for the *Lake Taupo Events Calendar Summer 2000/2001* from visitor centres. Alternatively go online and check the most up to date information on Destination Lake Taupo's website, [www.laketaupo.nz](http://www.laketaupo.nz)



Above right: Greg Carlyon in the early morning light as another Tongariro Mountain Classic gets under way from Turangi.  
 Above: The loneliness of a long distance runner - a runner pushes on, up to the top of Red Crater, the highest part of the Tongariro Crossing.  
 Right: The most welcome site of any multisport event - the finishing line. Another competitor reaches the line on the Genesis Tongariro Mountain Classic.  
 (Photos: Helen Mitchell)

The Conservancy Planner is a hard man to pin down. A common cry in the Conservancy Office is "Anyone seen Greg?" Usually he's in some part of the conservancy either inspecting a project or attending and presenting evidence at a hearing or consent meeting. Or he might be quietly planning the next **Genesis Tongariro Mountain Classic**.

Greg, 33, came to DOC eight years ago from Palmerston North after completing a planning degree at Massey. The entrepreneurial streak was evident even at university where he bought old houses, renovated and sold them.

He and partner Maree Gurney had been here only

a few years when they took over the running of the ailing Tongariro Mountain Classic and in the process turned it into one of the country's premier multisport events.

The Tongariro Mountain classic typifies the level of multisports interest in the central North Island. Each year competitors from throughout New Zealand and around the world are prepared to run, kayak, ski, cycle, swim and waterski through and over some of the country's best scenery, competing in at least eight events.

The Tongariro Mountain Classic starts and finishes in Turangi township, next to Lake Taupo and the Tongariro River. An early morning wake-up road cycle over the daunting Te Ponanga Saddle leads to the Mangatepopo Road end 45 minutes away. A 'stroll in the Park' over the famous Tongariro Crossing in Ton-





gariro National Park is undoubtedly the most scenic and spectacular section of the whole event and the most punishing with an 800 metre climb to Red Crater. Pain is just a four letter word to some competitors who have made the 26 km section in under two hours and still had time to smile when they reach the changeover section for the next cycle ride to the Tongariro River. A 17 km kayak cruise through some good grade II rapids leads out onto Lake Taupo and up the Tokaanu canal. Run or crawl the 5 km back into Turangi and its all over. For some reason TMC competitors are an incredibly friendly happy lot so small wonder the event picked up four sports awards this year.



For several other events the punishment goes even further!

The Tongariro National Park provides the backdrop, the scenery and the challenges for the **Crater to Lake Multisport Challenge** - the original winter multi-sport event for the Ruapehu and Taupo districts. The event was established in 1992 and provides a unique blend of action, excitement and at times drama, as teams and individuals race at great pace from high on Mt. Ruapehu to the finish line at Taupo town.

The uniqueness of the event comes from the six activities, with a snow ski and water ski added to the traditional triathlon disciplines of cycling, running and kayaking. The course is regarded as one of the most challenging for multi-sporters in New Zealand, covering 142 kilometres. The Crater to Lake multi-sport challenge is held in the last weekend of August each year.

A relative newcomer to the event calendar is the **Lakes Express Multisports Adventure**. The course crosses mountain snows, mountain tracks, forestry tracks, "goat" tracks, a wee bit of tar-seal and expanses of fresh water. Competitors use a wide range of equipment including snow skis, snow boards, running shoes and boots, mountain bikes, road bikes, drag skis, helmets, life jackets, assorted cloth-

Above right: The Crater to Lake Multisport Challenge starts high on the slopes of Mt. Ruapehu with an exhilarating race down the slopes an adrenalin rush on bikes down the highway.

(Photo: Chris Birt)

Below: The quickest way to work! Karl Sloan from Team Punch's Place rockets across Lake Taupo, towed at speeds of up to 140 km/hr by helicopter during the Lakes Express Multisport Adventure.

(Photo: Tony Jensen)



A concern for the department is the potential damage that can occur to tracks and facilities through the running of multisport events on conservation land. Before a concession to run the event is granted the course is carefully inspected and monitoring of the area is carried out before and after. Limits on the number of entries and other conditions may be set.

Runners appear out of the mist on a downward section of the run down Mt. Ruapehu on the Lakes Express Multisport Adventure.  
(Photo: Tony Jensen)

ing and inflatable bananas! The event moves from the slopes of Mount Ruapehu across various terrains to Lake Taupo, across the lake and finishes close to Taupo at Wharewaka Point. As well as catering for the social multisport junkie, Lakes Express also has major appeal to corporate, secondary school and individual entrants.

The event hit the TV headlines this year when one of the competitors literally screamed up Lake Taupo on skis, towed at 140 km/hr by a helicopter.

From an event that grew from an idea by local identity Walter de Bont 24 years ago the **Lake Taupo Cycle Challenge** is now very well-established on the event calendar. The initial event on the 5th of November 1977 attracted 26 cyclists with the purpose of cycling around the lake to raise money for a charitable institution, the IHC. In perfect weather the first cyclists arrived back in Taupo in six hours 40 minutes.

Today, the event is a national institution, attracting cyclists from throughout the country and overseas. Last year the event broke the 5000 entrants barrier and this year in the vicinity of 6000 cyclists will set off on the 160 km journey around the lake. The event consists of four different challenges; the solo 160 km challenge; 160 km relay with 2,3 or 4 riders, a 320 km twice around the lake Enduro and the 500 km super Enduro. The challenge begins from North Domain in Taupo (357 m) travelling anticlockwise around the lake. The highest point on the course is 650 m. The greatest growth in the challenge has been in the relay. Teams of two, three or four make the relay changeover every 40 kms. This year 700 teams have entered, 100 more than last year.

The exciting thing about the cycle event is that the most do the ride as a personal challenge, entering for the first time as a solo or more likely as part of a relay team. For many it is a chance to better their previous times. Many have entered five or six times but there is a small band of enthusiasts who have completed more than ten



Below: Each year hundreds of bykes have to be transported to relay changeover stations during the Lake Taupo Cycle Challenge.  
(Photo: LTCC)



finishes (26), several have made more than 15 (3) and one cyclist if he completes this year, will hit the magic 20 Lake Taupo Cycle Challenges.

The Cycle Challenge is organised by the Lake Taupo Cycle Challenge Trust, made up of members of Taupo-Nui-a Tia College, The Rotary Club of Taupo Moana and The Lake Taupo District Sports Advisory Council (SAC). The Trust relies on hundreds of volunteers to ensure the event is fun-filled, exciting and safe.

The **sport of trout fishing** brings millions of dollars into the Taupo district each year. Anglers from

throughout New Zealand and overseas come to fish the streams and rivers that flow into Lake Taupo. Rainbow Trout have been in the Taupo area since 1898 when 5000 fry were released in the headquarters of Waikato River that flows off the slopes of Mt. Ruapehu. After a shaky start the trout have become very well established.

The day's take home catch is limited to three trout a day but you may catch and released as many fish as you like. All fish taken must be above the 45 cm in length. Typical trout fishing methods include trolling or down rigging by boat or fly fishing in the rivers and streams.

#### The **Mighty River Power International Trout Fishing Competition**

has been running for 24 years. For many years ECNZ was a major sponsor but with the energy split-up several years ago Mighty River Power agreed to take on the sponsorship role. The Department of Conservation limit the tournament to 500 anglers only and have increased the catchable size to 46 cm to try and prevent overkill. Typically 600 to 800 fish are weighed in with sizes up to four kilograms.

The competition is seen as a fun activity for both family and individual anglers and brings many people to Taupo. Every year brings new stories and the largest fish on display are always a centre of attraction.

There is a special section for the fast-growing sport of women's fly fishing and the children's section makes it a real family tournament. Like any event there are excellent prizes from a variety of sponsors.

The Conservancy's Taupo Fishery Area is involved in the organisation and running of the competition and sees it as a great means of encouraging new enthusiasts to the sport.

One of the fun events of the year has to be the **adidas Great Lake Relay**. Teams from all walks of life, ages and levels of fitness set out to walk run and hobble around the 160 km of Lake



Right: Thousands start on their own personal and physical challenges around the 160 km Lake Taupo Cycle Challenge circuit.  
(Photo: LTCC)



Right: Another potential prize winner on the line during the Mighty River Power International Fishing Tournament.  
(Photo: Destination Lake Taupo)



Above: Tumu Te Heuheu passes the next leg of the relay over to Maree Gurney at the Tauranga Taupo changeover point during the *adidas* Great Lake Relay. (Photo: Maureen Smith)

Dave Wakelin  
Senior Community  
Relations Officer

Taupo. Groups number from 10 to 12 people and each undertakes either a 16 km section or two 8 km sections in relay around the lake. Part of the event takes place during the night and finishes on a Saturday afternoon in Taupo where up to \$90,000 in spot prizes, including international travel, are given away. The conservancy has had several teams in over the last three years and at the end of the event they are already talking about the next years effort.

For the fitness enthusiast there is also the **Levene Half Marathon** held on the first Sunday in August each year, attracting up to 2000 entrants.

For the serious fitness fanatic there's always the **Air New Zealand Ironman**, probably one of the biggest sporting events on the Taupo calendar and regarded as the ultimate in New Zealand triathlons. It involves a 3.8 km swim, 180 kilometres cycle before completing with a full 42.2 km marathon. If mountain biking is your thing then join 2000 other enthusiasts on the **Taupo Cycleworld Day-Night Thriller**, the largest mountain bike event in Australasia.

If fishing is your sport don't forget the **Kinloch Fishing Contest**, two days of fantastic trout fishing, based around the small lakeside settlement of Kinloch.

If it all sounds too exhausting try a couple of the other events which require the minimum of effort but promise maximum enjoyment. The Taupo area has secured an **International One-day Cricket Match** in January each year followed in February by the **Lake Taupo Arts Festival**.

Of course from DOC's point of view one of the most important events of the year is our **DOC Summer Programme**. The series of guided activities is designed to take people high and low, in and out, over and under the exciting forest, mountain and river scenery of Tongariro National Park, Kaimanawa Forest Park, Tongariro Forest and Lake Taupo reserves. The programme runs from 27 December 2000 through to 27 January 2001. Get a programme brochure or further details by phoning 07 892 3729.

Whatever your inclination there is an event or activity for you in the Taupo District.

### Want more Information?

Details on the entire Taupo events calendar, summer and winter along with everything else to do and see in the region can be obtained from the Destination Lake Taupo website -- [www.laketauponz.com](http://www.laketauponz.com)

**Tongariro Taupo Summer Programme** [www.laketauponz.com](http://www.laketauponz.com) [www.doc.govt.nz](http://www.doc.govt.nz) Ph: 07 892 3729

**Genesis Tongariro Mountain Classic** [www.sportzhub.co.nz](http://www.sportzhub.co.nz) email: [cbros@xtra.co.nz](mailto:cbros@xtra.co.nz)

**Levenes Half Marathon** [www.taupohalfmarathon.org.nz](http://www.taupohalfmarathon.org.nz) Ph: 07 378 3118

**Lake Taupo Cycle Challenge** [www.cyclechallenge.org.nz](http://www.cyclechallenge.org.nz) email: [ray@cyclechallenge.org.nz](mailto:ray@cyclechallenge.org.nz) 07 378 1546

**Taupo Ironman** [www.ironman.co.nz](http://www.ironman.co.nz)

**adidas Great Lake Relay** [www.relay.co.nz](http://www.relay.co.nz) email: [ingrid@relay.co.nz](mailto:ingrid@relay.co.nz) Ph: 07 378 0455

**Might River Power International Fishing Tournament** [www.reap.org.nz/~fishcomp](http://www.reap.org.nz/~fishcomp)

**Taupo Cycleworld Day-Night Thriller** [www.eventpromotions.co.nz](http://www.eventpromotions.co.nz) email: [murray@eventpromotions.co.nz](mailto:murray@eventpromotions.co.nz)

**Crater to Lake Multisport Challenge** [www.sportzhub.co.nz](http://www.sportzhub.co.nz) Ph: 0800 TO CRATER (0800 862 728)

**One Day International Cricket** [www.nzc.cricket.org.nz](http://www.nzc.cricket.org.nz)

**Kinloch Fishing Contest** Ph: 07 377 0078

**Lakes Express Multisport Adventure Event** Ph: 07 378 9200

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Photo: Nicola Topping  
courtesy Mountain Air



Top left: Dramatic evidence of the effect of the heather beetle. The original beetle release site at Te Piripiri Stream near the Desert Road in January 1996.

Top right: The same site in November 2000 showing the heather dieback. Landcare scientists are netting heather beetles for release elsewhere in Tongariro National Park.

(Photos: Harry Keys)

Above: Tongariro Taupo Conservation Board members, June Baker and Laurie Burdett examine the new Wairakei Tourist Park map at the Huka Falls facility opened in April.

(Photo: Dave Wakelin)

Above right: Helen McCormick of Rainbow Springs Kiwi House releases one of three kiwi into the Karoi Rahui.

(Photo: Bruce Mercer)

Middle right: The Waihanoa Bridge erected in December 1999, was toppled by high winds that created havoc through the North Island in September. It was re-erected in October.

(Photo: Tom May)

Right: DOC Kaupapa Wahine staff mixing concrete for one of the new walls at the Tongariro National Trout Centre.

(Photo: Maureen Smith)





# Lord of the Rings

I started working in Fiordland National Park about the same time as the books of Lord of the Rings were printed as one volume for the first time. My copy has been read four or five times and is now dog-eared, held together with plenty of Sello-tape and treasured. Lord of the Rings is an incredibly diverse, exciting, humorous and uplifting work that explores the relationship between good and evil and the value of fellowship. Little wonder it has been described by some as the greatest literary work of the 20th century. It has sold more than 50 million copies worldwide in 25 different languages. To keep faith with J.R.R. Tolkein, the Tolkein family trust would not let just any production company put the trilogy into film. Recognition of the esteem with which New Zealander Peter Jackson is held as a director culminated in the announcement that he was to direct the Lord of the Rings trilogy. New Zealand has been chosen as the location for this magnificent fantasy work. A number of the key locations for the filming were within Tongariro National Park.

Jackson said, *“My team and I poured our hearts into this project for past three years, so it’s a great thrill to begin actual photography. Filming three films at once has never been done before, in addition to which the project features state-of-the-art special effects, so it was essential to plan everything down to the last detail. We owe Prof Tolkein and his legion of fans worldwide our very best efforts to make these films with the integrity they deserve.”*



Right: Lord of the Rings Director, Peter Jackson enjoying a reflective moment among the lava flows of Mt. Ruapehu. Jackson's films include the cult *Bad Taste*, *Meet the Feebles* and *Braindead* followed by *Heavenly Creatures* and *The Frighteners*. (Photo: Pierre Vinet)

Peter Jackson and his wide ranging and talented crew and cast are filming over several years all the three parts of the trilogy concurrently, almost as though they were making one giant motion picture. The logistics of tackling such an undertaking are enormous.

## Application for a Film Concession

A major film doesn't just happen and a lot of effort goes into finding the right locations before any film is run through a camera. Peter Jackson and crew visited Tongariro National Park several times before filming got underway this year. (See box section above for a story on the arrival of Peter Jackson at Waihohonu Hut).

The Lord of the Rings production company is called Three Foot Six Ltd because Hobbits, the main characters of the trilogy are between three and four feet in height. The company gave the conservancy very short notice when they submitted their application for a film concession, placing considerable pressure on staff. The application took about two months to process while staff spent a considerable amount of time in the field with Lord of the Rings location scouts and production crew assessing sites where filming might take place. The application itself related to sites within the Whakapapa, Turoa and Tukino skifield “amenities area”, as well as two other sites. The magnitude of the film project was starting to be appreciated. We were told that there would be two film crews filming simultaneously accompanied by support staff, actors and extras. Close to a thousand people per

### **Waihohonu Hut logbook entry Friday 26<sup>th</sup> April 1998 by Bruce Ferguson.**

Any Peter Jackson fans out there? I'm talking about NZ's own splatter-fest film director, the guy who did "Bad Taste" and "Heavenly Creatures".... anyway, him and 5 of his American buddies came traipsing through Waihohonu yesterday, puffing up a sweat and sucking hard on cigarettes. They had come from the village and were going to press on to Oturere. But that wasn't the last I saw of them in my day. Three hours later I passed them on the way to Oturere. The six of them were sitting on a rock just this side of the big canyon half an hour before Oturere.

I didn't know but I suspect they were actually:

- Discussing plans for a new Disco-splatter film with a scene involving a group of geologists crushed in an avalanche of disco balls in the big canyon.
- Injecting each other with caffeine in order to battle the other side of the canyon.
- Having second thoughts about the whole trip and considering turning around and heading for their car.

Well whatever it was they never made it to Oturere. I got a little worried and headed back earlier than planned thinking something terrible had happened. But they were gone! It seems they headed for the car, a fact confirmed by a Dutch woman who said she saw a bunch of hairy guys with big butts move through Waihohonu.

Oh Pete, oh Pete, I hope this sad tale is just a botched great outdoors NZ experience for your Yankee pals and not the story of your career! Keep those bright Hollywood lights burning square in your eyes, for over that great climb is your goal, the relief to all your pains.

*Bruce of course didn't know how prophetic his last statement was because in 1998 no announcement had been made that Jackson was to direct Lord of the Rings.*

day were involved in the project, the largest film crew ever assembled for a motion picture in the Southern Hemisphere.

In preparing a response to the application the department consulted with Ngati Tuwharetoa and Ngati Rangī, the Tongariro Taupo Conservation Board and appropriate staff.

A number of issues had to be carefully considered as they were at odds with the Management Plan for the park. Essentially these related to the use of helicopters, horses and vehicles operating off-road within the park. During this period considerable pressure was brought to bear on the conservancy by the local community and businesses as declining the company's application to film would have huge economic implications.

The application for filming within the national park was approved in part. One proposed filming site "Mangaturuturu" was rejected outright because of its pristine nature and because it could only be accessed by helicopter. The use of horses and helicopters was declined as these were considered to be inconsistent with the management plans for the Park. In addition, restrictions were placed on the use of vehicles off formed roads. The film company asked for reconsideration of the application because it considered these particular aspects were integral to its filming proposal. The Minister of Conservation upheld the Conservancy's decision.

### **Monitoring**

A key factor in the whole filming project was monitoring. Filming was to occur in sub-alpine areas and even though these were within the skifield amenities area there was the potential for damage to occur. Conditions in the concession document required the film company to abide by the department requirements for monitoring.

The monitoring requirements over the months of filming were considerable and as



Filming among the lava flows of Mead's Wall, Whakapapa Ski Field, Mt. Ruapehu. (Photo: Pierre Vinet)

the department did not have spare staff it contracted an outside expert to carry out monitoring. Three staff members also acted as backup. The magnitude of the work proved to be such that an additional monitoring person was contracted. The film company provided funding for the monitoring staff. They also agreed to reimburse the department for vehicle running costs and cover reasonable time spent by staff assisting with the monitoring.

A precise structure was set up for the monitoring of effects on the filming sites. This consisted of:

- **Site Management Plan**, which dealt with among other things the location of photo points and what had been agreed with crew and actors involved at each location during each filming sequence.
- **Special Effects Management Documents**, dealt with the sites used, materials to be used in the special effects, and any mitigation measures that might be required.
- **Daily Reports** on the previous day's activities, dealing with any issues that might have arisen during the filming. In addition regularly weekly meetings were held to discuss the previous week's filming as well as what might be coming up in the next week. This proved the essential in minimising any potential impact that might occur, possibly through oversight.

The Conservancy had to consider in its monitoring program a whole range of possible impacts, which included:

- Special effects such as smoke, fake snow and ice, blood, fires, and 'rock casting' (fibreglass rocks were cast from some of the volcanic rocks in the area so they could be placed in the 'right' location for filming).
- The effects of hundreds of pairs of feet during combat scenes.
- The use of vehicles within the area such as quads, trucks, buses etc.
- The film company's adherence to the permit conditions.

Innovation was the name of the game. In order to mitigate damage to the ground and surrounding environments a number of techniques were used:

- Access tracks were clearly marked with standards and tape.
- Fenced off staging areas were established.
- Vegetation was dug and stored in temporary nurseries to be replanted after the filming.
- Scaffolding and boardwalks were erected to protect sensitive areas and sandbags used as steps.
- Truck loads of old carpet arrived literally overnight to be 'laid' over gathering areas to protect the vegetation cover.
- Rubbish bins were placed everywhere to catch cigarette butts etc.

During the course of the filming the film company requested variations to the original concession. These often arose out of conditions such as weather, location



Above: Methods used to try and protect the vegetation from hundreds of feet included sand-bagged steps (left foreground), "No go" tape, rubbish bins, hundreds of square metres of carpet and monitoring staff.  
 Below: Sandbags were filled with ash collected on Mt. Ruapehu and used to create steps in the steeper gullies.  
 (Photos: Herwi Scheltus)

and the whim of the director who suddenly saw greater potential at a slightly different site. Because of good communication these posed little problem and were dealt with quickly and efficiently. There was a need for a number of variation documents to cover major changes while minor changes were catered for in the site management documents.

### Restoration

Sub-alpine areas are very fragile and the department realised right from the start that while there might be a need for some restoration work this was always considered a last resort. Three Foot Six Ltd was required to do its utmost to ensure that the filming activities did not result damage to the natural environment. However special additional conditions in the Conservancy's concession document covered the likelihood or possibility of restoration work being required. When filming had concluded at each site the monitors surveyed the area and made recommendations as to what was required (if anything) to restore it to its original condition. The Conservancy's Landscape Architect prepared a total restoration plan including costings which clearly defined areas where it was considered damage had occurred and also the estimated cost to repair those areas. The film company accepted that in such a pristine area restoration work was part of the cost of filmmaking.



### Media and Security

Naturally there was high media interest at the start of the filming in April although it tapered off very quickly. Any media enquiries were handled either through the Conservator or the Conservancy's Public Awareness Officer. Three Foot Six were very conscious of the need for tight security around the filming. Clearly they want the three movies when they are released to be major blockbusters.

## Lessons Learnt

This was the largest filming concession the Conservancy's has processed and managed. While it is unlikely larger projects of this type will come out of the park a number of valuable lessons learnt.

- Our management tools for the park (draft Conservation Management Strategy and Tongariro National Park Management Plan) were robust enough to deal with large-scale applications such as this, as well as intense legal and technical scrutiny.
- Our concession application process was also robust enough to handle close examination.
- The park cannot sustain filming of this magnitude where there might be 500 plus crew and actors and extras on-site. In the future a maximum of 50 crew and actors might be an upper limit.
- Locals and local staff in most instances were the most suitable for carrying out the monitoring work because of their knowledge of both the area and the way the department operates.
- In future, filming applications of a similar size and with the potential for adverse effects should, in most cases, be publicly advertised
- Staff have to be prepared to handle and respond to a director's request to move to a new (unapproved) site.
- There was need to brief film crews, actors, extras and others on environmental concerns when filming in the national park or protected area. It is probably something that we very much take for granted but to many the park is just an area of rock and tussock.
- Clearly, before any filming takes place an area needs to be thoroughly examined so that ground base is established for any further monitoring that may take place.
- Most importantly, regardless of the size of the application and economic implications for an area, the department has to be prepared to say "No" if it is considered the effects on the national park or protected area are just too great to sustain.

Anthony Birks  
*Concessions Supervisor*  
Herwi Scheltus  
*Landscape Architect*  
Dave Wakelin  
*Senior Community  
Relations Officer*

The first of the three movies, *The Fellowship of the Ring*, will be released in December 2001 with the second, *The Two Towers* in December 2002 and the final, *The Return of the King* in December 2003.

Actors in the trilogy include Sir Ian McKellen, Elijah Wood, Sean Astin, Cate Blanchett, Sir Ian Holm, Liv Tyler, Sean Bean, Viggo Mortensen, John Rhys-Davies, Billy Boyd and Christopher Lee. With extras the film cast could reach 15,000. Peter Jackson, Fran Walsh, Phillipa Boyens and Stephen Sinclair wrote the screenplay. Jackson, Barrie Osborne (*The Matrix, Face/Off*) and Tim Sanders (*The Frighteners*) are the Producers. The Director of Photography, Andrew Lesnie was responsible for *Babe* and *Babe: Pig in the City* while Production Designer, Grant Major (*The Frighteners, Heavenly Creatures*) will work his magic on the amazing costumes, including 2000 suits of armour. Weta Workshop in Wellington is making incredible armour, miniatures, creatures and special effects while Weta Digital will create stunning visual effects under the direction of Mark Stetson (*The Fifth Element*).

I've been on set and know that the final product will have movie-goers coming back again and again to pick up on the incredible attention to even the smallest bit of detail. The ugly Orcs in the background of battle scenes are as carefully made up as those hacking and scything at the front.

Roll on December 2001!

# New plans for the Tongariro National Trout Centre

When did you last visit the Tongariro National Trout Centre? If its been a while you will notice some major changes - the result of a lot of discussion and production of a Master Plan. The master plan has been designed to guide the development of the Tongariro National Trout Centre (NTC) into the new millennium. The National Trout Centre Trust has endorsed the plan and work on the first projects is well

underway. The plan covers the next decade and it is intended that new projects will be undertaken each year so that the facility continues to expand.

## The Master Plan

The Taupo fishery is essential to the local community for many reasons. Should the wild Taupo fishery suffer a catastrophic event the hatchery could be used to rear large numbers of young trout to kick-start the fishery again. As a hatchery, NTC needs to be in a state of readiness should the unexpected occur. So whatever development occurs on the site it must be such that it does not restrict the use of the facility as a hatchery.

However the NTC's location beside the Tongariro River, is an ideal place to visit to learn about the Taupo fishery and its management. This advocacy role is considered to be an integral part of the day-to-day operation of the facility. Currently 50,000 visitors

a year visit the NTC and the master plan concentrates on developing the site, in terms of both the facilities and the operational procedures so as to maximise this role.

The objectives of the plan are to develop a facility to provide:

- information of interest and practical value to anglers and the public about the Taupo fishery including its ecology, history, and use
- a picture of the DOC's fishery management and research activity
- an educational role to inform young New Zealanders about the freshwater environment and trout fishing.

Within these objectives four basic principles to guide future development have been identified. These principles are:

- 1 To keep the development of the site in scale with the intimate setting and where possible let the natural qualities of the site dictate the style of the displays.
- 2 That there should be no commercial development below the escarpment but there is the opportunity for sponsorship.
- 3 That an entry fee be charged and that the department provide a quality experience in return.



The new Tongariro National Trout Centre location sign that greets visitors at the State Highway 1 carpark. The map shows the new extension of the river walks to the confluence of the Waihukahuka Stream and Tongariro River.

- 4 That there is an opportunity to provide interpretation on wider conservation issues.

In keeping with these objectives and guiding principles, the following operational plan has been adopted.

### **Operational Changes**

**Entry fees and opening hours** - The NTC now opens between 10 am and 3 pm each day. During this time all of the facilities will be open, staff will be on site and available to the public. As well no activities, such as lawn mowing will be undertaken, which are inappropriate to the overall visitor experience. Outside of this period the gates may be open and no fee will be charged.

**Roving ranger** - A staff member, based in the building beside the children's pond, will be readily available within the grounds to answer visitors' questions.

**Teacher** - An application has been made to employ a suitably qualified teacher under the Learning Experiences Outside the Classroom (LEOTC) programme administered by the Ministry of Education. This person will be based at the NTC and undertake three roles. They will interpret and instruct visiting school groups. They will develop information packages on the freshwater environment, trout and fishing which can be distributed to schools, and will assist with the development of educational facilities around the grounds.

**Vehicles** - Cars and trucks within the grounds are not in keeping with the tranquil setting. Instead, staff will use an electric cart to move around.

### **Changes to the Grounds and Facilities**

- **Car park and entrance** – We have applied to Transit New Zealand to erect a large sign on State Highway 1 indicating the entry to the NTC car park. At the start of the walking track down the escarpment an entry sign will inform visitors about the walkways and activities, picnic areas and the need to pay an entry fee. The sign will include a brochure rack so that visitors can take a brochure outlining the path to follow. Low level lighting will be erected along the pathway for use when the facility is open for special functions at night.
- **Entry gate over the Waihukahuka (hatchery) Stream** - An automated gate will require the insertion of coins to open between the hours of 10 am and 3 pm. Outside this period entry will be free.
- **Stripping pens** - These pens are used to hold mature trout in the Waihukahuka Stream prior to stripping them to obtain fertilised eggs for the hatchery. These pens will be reconstructed to improve their effectiveness and redesigned so that upstream migrating fish can be trapped in the slot between the pens. Fish suitable for stripping can then be transferred across into the holding pens rather than having to transport fish from one of our other fish traps.
- **The hatchery building** - This building will be maintained as a hatchery in an immediate state of readiness. All of the incubation trays, rearing pens and associated equipment will remain in case the fishery ever needs to be re-stocked. However, because in the course of a normal year we rear only a few thousand fish for the children's pond there will not be a lot of activity to see. Displays will explain this and how trout are reared in a hatchery.
- **Aquarium** - This is intended to be one of the highlights. One of the advantages of this site is a constant supply of clear, cold water and a natural setting amongst



Hatchery Manager, Errol Cudby,  
and Landscape Architect, Herwi  
Scheltus, at the new viewing  
chamber.  
(Photo: Herwi Scheltus)

the ferns and streamside bush. The plan is to create an encompassing experience where the visitor walks within and under the tank, which nestles amongst the vegetation complete with the sound and smell of the stream. It will require a lot of planning and design to achieve the desired result and this will come at a considerable cost. The tank or tanks will display fish and aquatic plants, which occur in the central North Island rather than species from elsewhere.

- **Fish ladder and pond** - One of the criticisms of the NTC has been that depending on the time of the year people visit, they have not seen any trout. Such is the nature of a wild fishery where the fish are free to come and go. To try and ensure some fish are present

year-round we are re-installing the dam that used to exist on the Waihukahuka Stream. The pond created makes an ideal picnic site and regular feeding of the fish will ensure that there are always fish to see. If approached quietly these fish will take food thrown to them.

- A fish ladder has been installed at the dam wall to provide trout passage to the spawning areas upstream. A viewing platform has been built.
- **Workshop** - This building is being stripped and relined to become a “dry display” area to include an angling museum, auditorium, teaching room and an area for management-related and other displays.
- **Smokehouse** - This is close to the site of the original smokehouse which was used by people staying in the anglers’ camp many years ago. Half of the smokehouse will be built so that visitors can see inside and see how it functions. The other half will be a real smokehouse complete with the smell of burning manuka sawdust and smoking trout.
- **Riverside tracks** - The July 1998 floods washed away large areas of the river bank and ,with it, most of the walking track along the river. People want to walk along the river so we are reinstating the track close to the river accepting that occasionally it will flood and be damaged.
- **Historic anglers' hut** - This is a link back to the anglers’ camp, which used to exist on the site. A 1930s period hut will be constructed and fitted out complete with anglers’ tackle of the time. The room will be viewed through a front window with no internal access to the display. It will be built on high ground above the level of the July 1998 floods.
- **Extension to the Tongariro River walk** – The river walk has been extended to the confluence of the Waihukahuka Stream and the Tongariro River before looping back past the children’s pond.
- **Electric fish barrier and counting chamber** - In the late 1960s an electric fish barrier was constructed across the Tongariro River to divert migrating trout into a concrete chamber situated in the hatchery grounds. The chamber contained



Conservancy staff from Kaupapa Wahine building a stone wall as part of the redevelopment of the Tongariro National Trout Centre.  
(Photo: Maureen Smith)



an electronic fish counter and the intention was to obtain an annual estimate of the number of trout migrating through the river so that any effects from the construction of the Tongariro Power Development (TPD) could be measured. It is planned to re-create in part the barrier and counter as a display.

- **Hatchery trap** - The hatchery fish trap was installed in 1963 and operated until 1995. It was used to monitor the run of spawning trout in the Waihukahuka Stream and also to trap fish from which eggs were obtained for the hatchery. By re-installing this trap we can demonstrate a working trap in operation.
- **Children's fishing pond** - This pond was originally built to act as a settling pond into which water from all of the hatchery raceways and ponds flowed prior to being discharged back into the Waihukahuka Stream. Built by members of the Corrective Training Institution it was also an ideal facility around which to base the children's fishing days. These have become an integral part of the NTC operation. They are great fun for children but also provide a valuable opportunity to pass on important messages about trout fishing. To improve the experience for every child we will limit the number of children so that sufficient time can be spent with each.
- **Underwater viewing chamber** - The underwater viewing chamber built by the Turangi Lions Club in 1983 has proved to be one of the highlights for visitors to the NTC. However, recent major floods, damaged the chamber and displays to the extent where it was decided to completely resign the chamber. We dismantled the building above the chamber and re-assembled it amongst the trees beside the children's pond as the kiosk. A simple roof has been constructed over the chamber, and a viewing deck built out over part of the stream.

All in all these are exciting developments for what is a very special place. Next time you are passing, call in and experience the Tongariro National Trout Centre.

Glenn Maclean  
*Taupo Fishery Area*  
*Programme Manager*  
Herwi Scheltus  
*Landscape Architect*

# Tongariro from the Air



Right: Looking northwards with Ruapehu's highest peak, Tahurangi (2797 m) in the foreground, Crater Lake and Pyramid Peak in the centre of photo, and the Summit Plateau beyond. Mt. Ngauruhoe lies in the distance.

Below: Mt. Ruapehu, surrounded by a ring plain comprised of airfall deposits, debris avalanches, mudflows and glacial material.

(Photos: Mountain Air)

Unless you're flying down the centre of the North Island the usual view of Tongariro National Park is from the highway. However, from the air the Park takes on a totally different dimension and interesting features can be seen that are hidden from the eyes of the car-borne traveller.

Take a trip around Tongariro National Park with Mountain Air, a scenic flight and air charter company based just outside the border of the national park not far from Whakapapa Village, and see for yourself.

An aerial tour usually begins over Mt. Ruapehu the largest mountain in the Park. Maori legend tells of Ruapehu being placed as a calming influence in the centre of the large fish, *Te Ika a Maui*, hauled from the ocean by young Maui. Evidence

suggests that the first mountain building eruptions may have begun as far back as a million years ago. Certainly, over the past 250,000 years there have been many periods of activity punctuated by the major re-shaping effects of glaciation, massive slope failure, lava flows and lahars.

That first glimpse of Ruapehu's Crater Lake is a breathtaking sight. This lake fills the volcano's active vent and views of Ruapehu erupting flashed around the world in 1995 and 1996 when the mountain sprang into life in spectacular fashion. At that time, the Crater Lake containing about 7 million cubic metres of water, was, in a series of violent eruptions, blasted out onto the slopes





Above: Looking up hill from above the Whakapapa Village towards the area of the Iwikau Ski Village and the Whakapapa Skifield. The lateral moraine walls of the Whakapapanui Valley are easy to see as are the effects of river erosion.

Below right: A Mountain Air Cessna flies past Mt. Tongariro (1967 m) with snow-clad Mt. Ngauruhoe (2287 m) in the background and the head of the Mangatepopo Valley in between. (Photos: Mountain Air)

of the mountain. Volcanic mudflows (lahars) of water, lake silt and volcanic debris rumbled down the Whangaehu Stream while other lahars created black ribbons over the western and southern slopes of Ruapehu.

Tephra layer studies show the Whakapapa lava flows, which may have originated from a vent on the Summit Plateau, were deposited between 5000 and 9700 years ago and form the base for the present Iwikau Ski Village and Whakapapa Skifield. Even to the untrained eye these massive lava flows are striking when seen from the air.

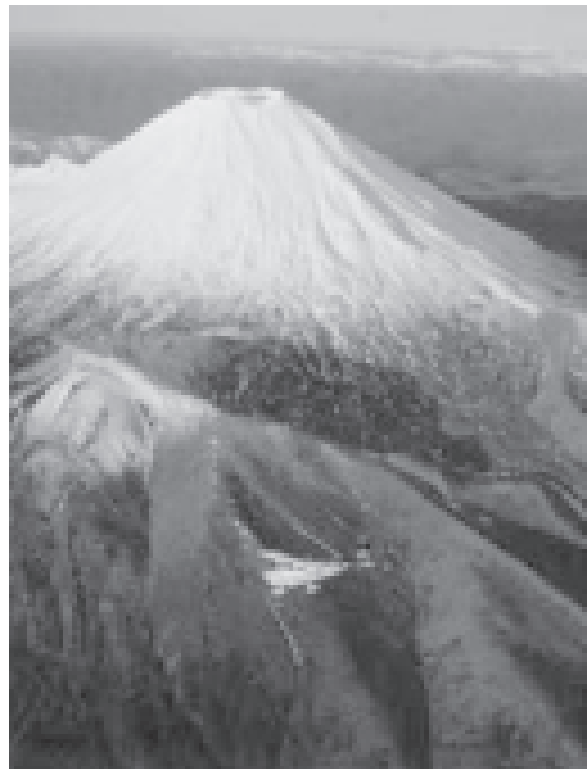
Evident too, is the influence of the last Ice Age which ended about 14,000 years ago. The paths of the ancient glaciers which carved deep valleys and left walls of debris called lateral moraines can be seen clearly. Often the huge scale of such features can best be recognised from the air, especially when the sun is low and casts strong shadows.

The most distinctive peak in Tongariro National Park is without doubt Mt. Ngauruhoe. Its conical shape bears comparison with Taranaki and also Mount Fuji in Japan. This magnificent peak is only about 2500 years old, rising from the eroded base of a previous larger volcano. Ngauruhoe, like Tongariro and Ruapehu is a composite volcano composed of interleaved layers of ash and lava. But, unlike them it is very young, little eroded and has only one central vent, so it has

an almost perfect shape.

In summer, dark lines down the western flanks of the volcano are the trails of numerous lava flows which occurred in 1949 and 1954. The last eruptions from Ngauruhoe in 1974-75 were highly explosive ash eruptions. These generated a number of avalanches of hot volcanic material including ash, bombs and blocks which like the lava flows are very clearly seen from the air.

Volcanoes are dynamic and historical records show that the crater of Ngauruhoe has changed considerably since it was first viewed by Europeans in 1839. Evident too on the flanks of Ngauruhoe are signs of early erosion and narrow channels run from the summit right down to the base of the peak in places. If you fly over the top of Ngauruhoe and look down into the vent you

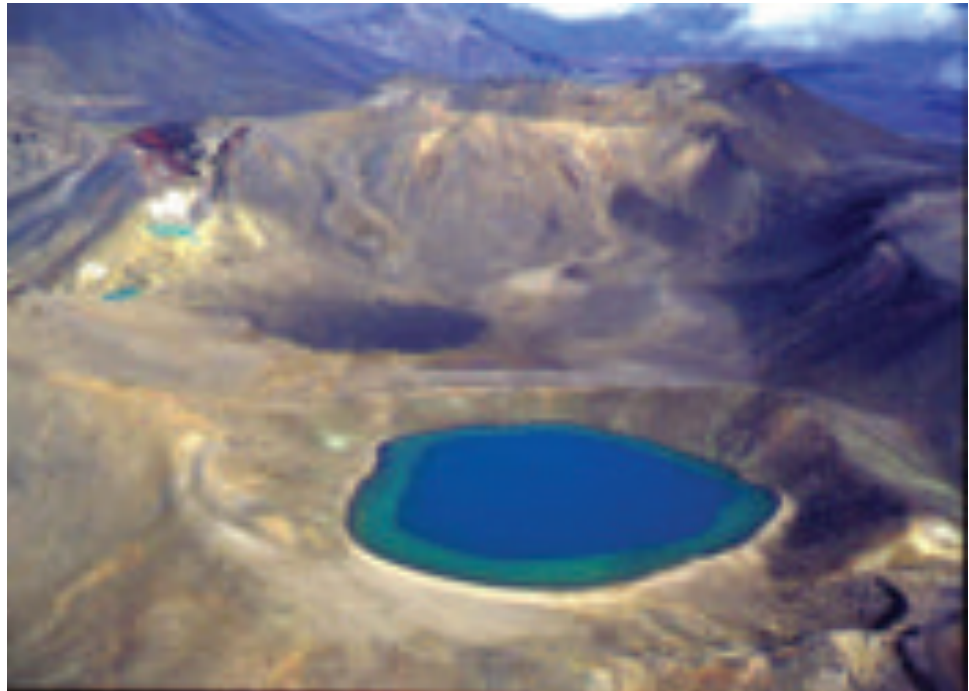


Left: The middle section of the famous one-day walk in the Park called the 'Tongariro Crossing' viewed from the air. Beautiful Blue Lake lies in the foreground with Red Crater and the Emerald Lakes above and to the left and the summit of Mt. Tongariro is in the upper right of the photo.

Below: The vivid volcanic colours of Red Crater contrast with the three water-filled explosion craters known as Emerald Lakes.

To the right the steep head wall of the Oturere Valley with its 'lunar' landscape created from lava flows from Red Crater.

(Photos: Mountain Air)



can see a younger cone has developed inside the main crater. Much of this cone was built from splatter material during the 1954 eruption.

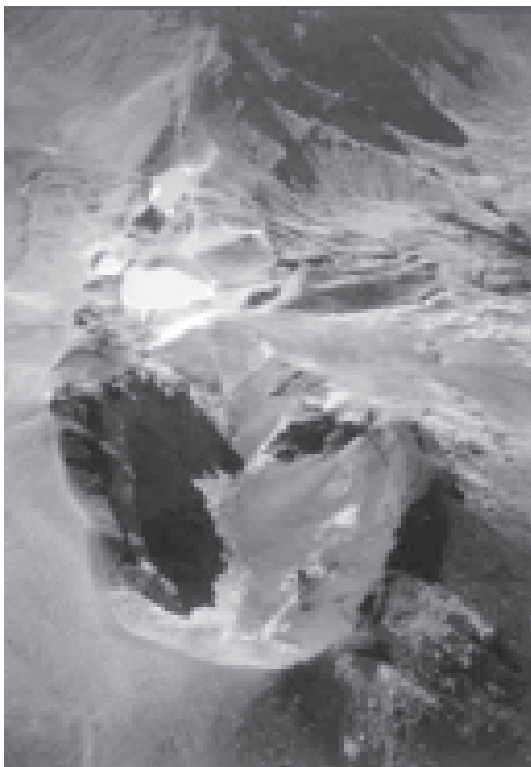
Mt. Tongariro from which the Park derives its name, is really a large complex of volcanic vents that date back about one million years. Seen from the air it all starts to make sense. Ngauruhoe is, strictly speaking, a parasitic cone of Tongariro but its size and prominence have earned it its own name. South Crater, between Ngauruhoe and Tongariro is not an ancient crater but a glacial cirque infilled with eroded and volcanic material. The same applies to Central Crater between Red and

North Craters.

The Tongariro massif has been heavily glaciated and otherwise eroded and this has destroyed many earlier vents. What we see today are younger vents, explosion craters and lava flows atop an older landscape.

Looking down into Red Crater from the air is an impressive sight. Its dark red and black brown basaltic scoria walls look angry and raw like a huge gaping wound on the mountain. Since the Taupo eruption (AD 186) there have been five lava flows from the crater, three into the Oturere Valley and one each into Central and South Craters. Ash eruptions were reported from Red Crater in 1855 and in 1897.

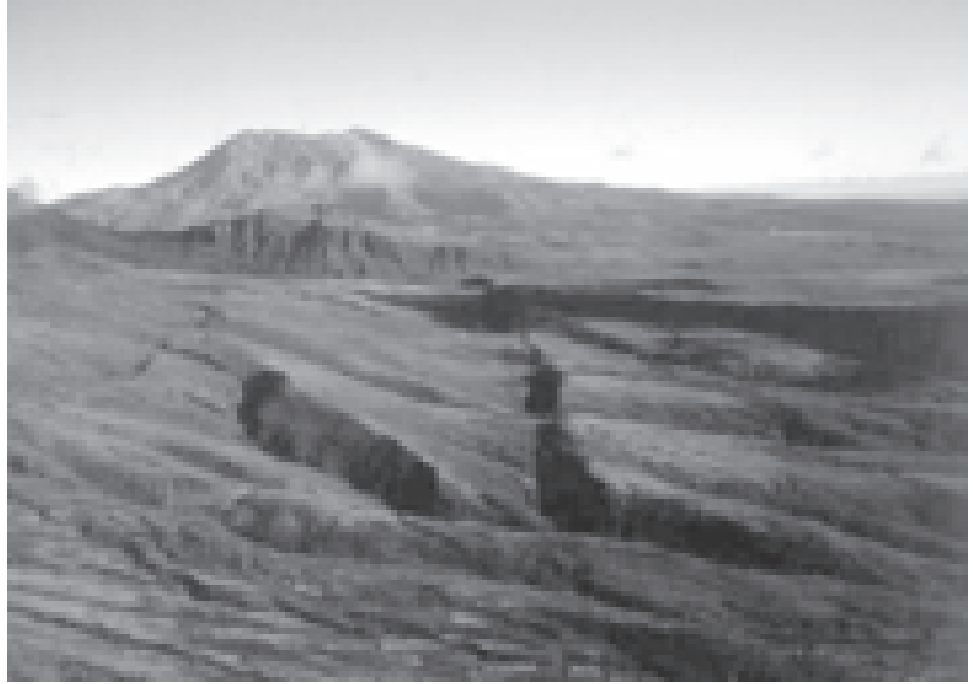
Below Red Crater are three water-filled explosion craters known as Emerald Lakes formed from contact between surface water and underground hot magma. The lakes' distinctive colour derives from light refraction caused by small particles suspended in the water and minerals leached from the rocks. Despite the steam vents around the lakes the waters are cold. The smooth, flat-top of North Crater is readily identifiable in this otherwise rugged setting. It was once filled by a molten lake of lava which cooled and solidified to give it its distinctive



Right: Two parallel faultlines slice through the western slopes of Tongariro. The age of the faults is not known but there has been movement along them in the past 1800 years.

Below: A line up of lakes. From the bottom to top: Emerald Lakes at the base of Red Crater, Blue Lake, Lake Rotoaira fills a down-faulted depression in the landscape between Tongariro and Mt. Pihanga. Lake Taupo, New Zealand's largest lake lies beyond to the north.

(Photos: Mountain Air)



appearance. Nearby, is Blue Lake, an old crater which erupted fountains of red-hot lava about 10,000 years ago. Infact, volcano-lovers would have enjoyed being around then because according to scientists there was major volcanic action occurring from multiple vents on Tongariro at that time.

Two north-east to south-west faultlines create distinctive lines across the flanks of the lower western slopes of North Crater. They aren't visible from the road but are obvious from the air. Evidence points to movement along these faults since the Taupo eruption.

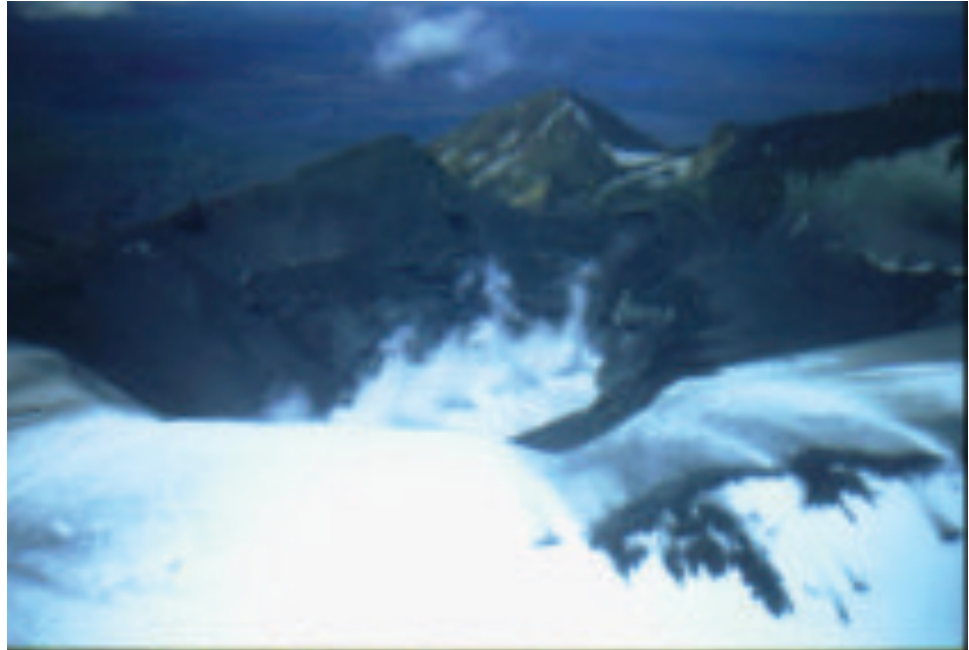
Dave Wakelin  
Senior Community  
Relations Officer



No flight over Tongariro National Park would be complete without a glance northwards at New Zealand's largest lake, Taupo. Lake Taupo occupies a large caldera formed by at least 18 eruptions. In AD 186, in a series of eruptions, the Taupo volcano spewed vast quantities of ash into the atmosphere blanketing the much of the North Island. Subsequently water entered the magma chamber to set off an eruption that sent debris 50 km into the atmosphere before a huge wave of glowing ignimbrite wiped almost everything from the landscape for 80 km in every direction. The forests we see today in Tongariro National Park including Tongariro Forest and Kaimanawa Forest Park have re-established in the last 1800 years. The forests in the south of the Park were sheltered from the blast.

Enjoy a flight over Tongariro National Park sometime and gain a whole new appreciation of the volcanic landscape of this dual World Heritage national park. You will get new insights into how it formed and how it has changed.

# Crater Lake Issue



Crater Lake, Mt. Ruapehu  
(Photo: Mountain Air)

## Background

The 1995-96 eruptions of Ruapehu emptied Crater Lake and modified the crater rim. Sudden failure of a mantle of volcanic ash over the former lake outlet when the lake rises against it represents the main risk from Crater Lake in the 2005-2010 time frame. This collapse lahar would travel down the Whangaehu Valley and could pose a very high risk to power pylons near the Wahianoa aqueduct, major bridges at Tangiwai and smaller road and footbridges. It could be large enough to spill into the Tongariro catchment where it would pose medium risks on State Highway 1 (Desert Road) and to anglers standing in deep water fishing in the Tongariro River. Mitigation of risks to public safety is essential.

This matter has become known as the Crater Lake issue. The Crater Lake is the most distinctive part of Tongariro National Park with important natural, cultural and scientific values that help give the park World Heritage status. Engineering solutions at the crater rim would seriously conflict with these important conservation values.

Comprehensive investigation and consultation began on the issue in April 1996 (see also Tongariro annuals 1997-1999). Scientific reports were commissioned on the stability of the crater rim and associated hazards using funds donated by locally relevant State Owned Enterprises (including ECNZ), local and regional government agencies, the Army and Winstones Pulp International. A public environmental and risk assessment process was then requested by the Minister of Conservation to examine the best mitigation options. The final report was produced by DOC early in 1999 and this was later subjected to an Independent Scientific Review by Professor Vince Neall of Massey University.

### The Minister's decision

Following that review, the Minister of Conservation, Hon. Sandra Lee has decided that an acoustic alarm system developed by the US Geological Survey is the most preferred way to reduce the main risks. An alarm will warn authorities in sufficient time to secure the main bridges, roads and power supplies. Further mitigation will be done in conjunction with regional authorities. This may include a bund (stop bank) on the Whangaehu outwash fan to prevent spillover from any future lahars into the Tongariro. We have support in principle for joint-oversight and funding of the alarm-warning system from the Manawatu Wanganui Regional Council (Horizons.mw) More detailed scoping has commenced to design the technical aspects of the alarm and required telecommunication links. This will involve a visit from US lahar specialists in February 2001 following the Cities on Volcanoes conference in Auckland. We are now in the final phase of the strategy to manage the issue that was mapped out in 1996/97, that is, implementation of the Minister's decision and monitoring.

Crater Lake is still rising more slowly than it did after the 1945 eruption. It was only one-third full on 4 September. Significantly the lake continued to rise throughout 1999, unlike the previous years, which saw evaporation lower the lake after the autumn freeze-up.

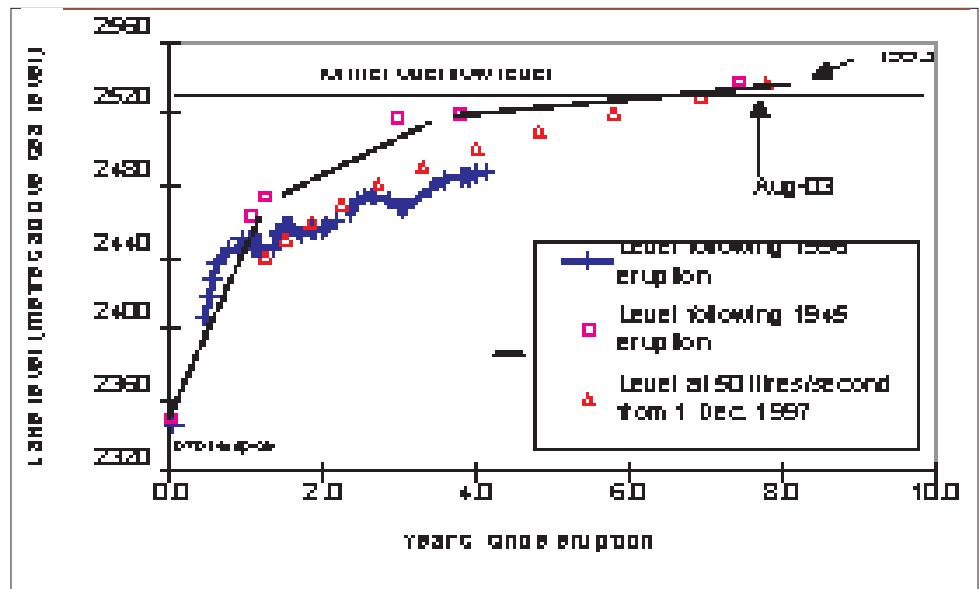


Figure 1: Crater Lake level rise following eruptions. Data from DOC and Peter Otway

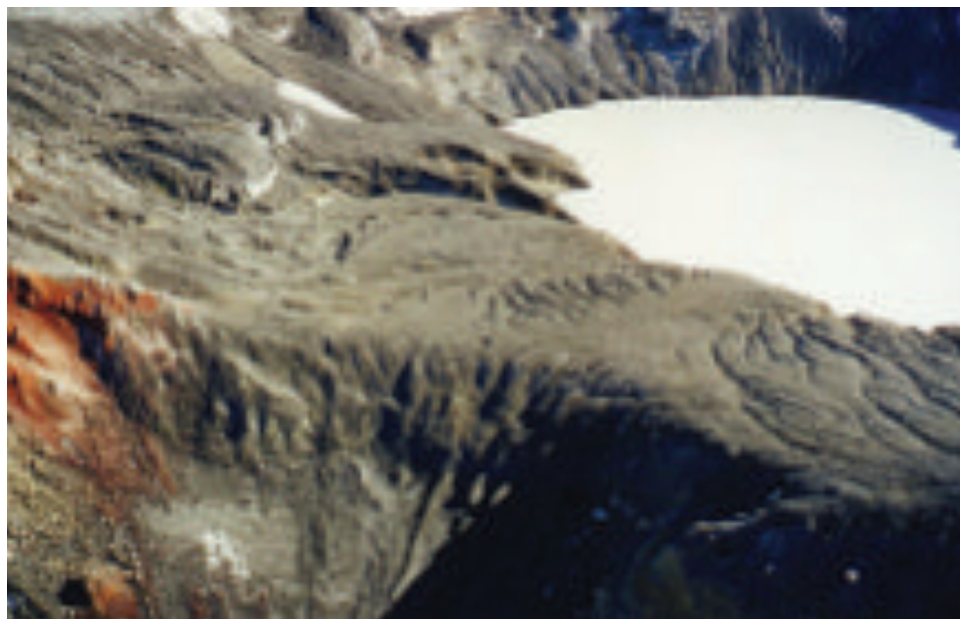
(Figure 1). Evaporation from the lake surface has reduced now that the lake temperature has cooled significantly, and we expect the filling rate to increase. However the lake is not expected to fill to the old 2530 metre level and above it until 2003 at the earliest and possibly not until 2006/2007 or later. This gives us sufficient time to properly design and construct a reliable alarm and warning system.

### Warning of other Whangaehu lahars

The new warning system will be the first public lahar warning system for the Whangaehu and Tongariro rivers. It will allow warnings to be given about lahars in these rivers caused by other mechanisms such as eruptions, collapses elsewhere on the rim and landslides in the upper Whangaehu Valley. In addition to the well known eruption lahars, research by scientists from Massey University has shown

Aerial view on 28 March 2000 of the mantle of volcanic tephra (ash and rocks) covering the former outlook of Crater Lake. The deep gully formed by glacial meltwater can be seen in the middle background up from the Lake.

(Photo: Harry Keys)



that several lahars much larger than any in historic time have affected these valleys over the last 2000 years. While the causes of the lahars remain speculative the warning system will provide the first substantial mitigation of risks posed by them. In the meantime research continues to better understand their causes.

An exciting step forward was made this year when Tristram Hales from Canterbury University, assisted by Andy Hoyle and funding from DOC and the Tongariro Natural History Society, made the first systematic examination of the geology of the rock formations in the active crater rim. He concluded that the crater might have had a more dynamic history than previously recognised and that the eastern rim in particular may be relatively young. If so it tends to confirm the eastern rim as a source of past large lahars and therefore a potential future source as well. We have already identified significant changes in the rim as a result of the 1995-1996 eruption. One task now is to link rocks in the crater rim formation with those found in lahar deposits downstream to learn more about the timing of construction and collapse of the crater rim.

#### **The future of the ash deposit at the former lake outlet**

We will continue to monitor the condition of the ash mantle blocking the lake outlet and how natural processes act on it in order to help predict the timing and severity of the collapse lahar hazard. So far the action of wind and water has caused very minor erosion (less than 20 centimetres lowering) of the crest of the deposit above the former overflow point. However, wave action from the rising lake might be critical. Dr Ian Nairn first outlined in 1997 how wave action would occur but noted that rocky material in the ash deposit might accumulate at the rising shoreline and armour it against further wave attack. Then, in April 1999 he showed that melt water from Crater Basin Glacier had incised a deep and widening trench in the ash deposit 200 metres north-west of the crest of the deposit. Turbulent stream action is clearly an effective agent for eroding this material. Wave action at the current lake shoreline tends to form cliffs there in the young ash deposits and older unconsolidated material. Therefore, it may also be effective at eroding the ash deposit blocking the outlet.

Harry Keys  
*Conservancy Advisory  
Scientist*



# Propagating parasitic threatened plants

Many different types of plants within our forests are fully or partially parasitic and obtain their food or water from other plants. Some plants even obtain their food from fungi, and incredibly these fungi may also themselves be parasitic or saprophytic (feed on dead leaves and wood) on other plants. The potato orchids (*Gastrodia cunninghamii* and other species) obtain their nourishment via a fungus that is parasitic on tree roots.

Several of the highest priority threatened plants for conservation management within the Tongariro-Taupo Conservancy are parasitic. The most well known of these are the leafy mistletoe species which grow attached to the branches of trees and dactylanthus which is a root parasitic.

All of the five large leafy mistletoe species in New Zealand occur within this Conservancy. They are all threatened and are now significantly less common than they once were. Possums have been attributed as the main reasons for their decline



A four year old Mistletoe plant, grown from a seed placed on the branch of a Mountain Beech.  
(Photo: Nick Singers)

because they eat the plant leaves and fruit and tend to severely damage them in the process. This results in fewer mistletoe flowering and producing fruit and often the severe browsing can kill the mistletoes. In addition, because in today's forests there are fewer native birds such as Tui and bellbird that are required to pollinate flowers and disperse their fruit mistletoe may also be less common.

Dactylanthus is a warty plant that grows beneath soil attached to the roots of its host. The flowers are cream, yellow, brown or red and are a surprising sight to see as they appear on the forest floor. They also have a very interesting scent, which is a sweet musky smell and attracts its natural pollinator, the short

tailed bat. These flowers can also produce up to 1 teaspoon of sugar-laden nectar and were used by Maori as a sweetener. Unfortunately very few people have ever seen these interesting and beautiful flowers because possums and rats quickly devour any that they can find. This has resulted in very few plants producing seed so that no new plants grow. It is thought to have once been very abundant throughout New Zealand prior to man arriving here as its distinctive pollen is commonly found in peat deposits greater than 1000 or so years ago.

Through intensive possum control both dactylanthus and mistletoe are able to flower and set seed. However, as yet we still don't know if this protection is resulting in new plants being produced. The number of plants at a particular site could now be naturally too low to be a viable population, and the population could die out despite being protected with possum control. The Conservancies and probably the North Island's largest yellow mistletoe population is known to consist of 90 odd plants. Many months have been spent searching for them in the last five years. Very few of these plants are young, the majority are old and several have died in the last five years. Propagating this species and others like them is a quick way to help address the problem of a lack of new plants being produced.

Mistletoe attach themselves to host trees via a modified root (haustoria) which

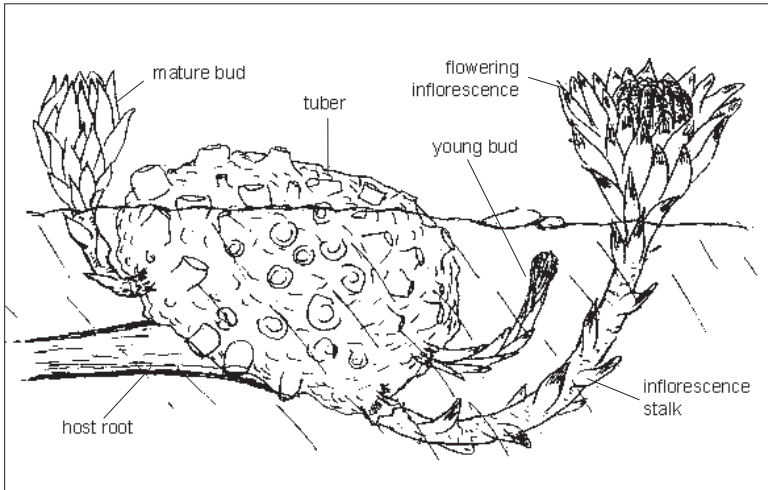
Still so tiny that you could easily miss it, but just in front of the forefinger is a seedling mistletoe, which grew from a deliberately placed seed. (Photo: Nick Singers)



grows into the host tree from the mistletoe seed (see photo). They cannot be grown in normal house-hold potting mix from seed and require a tree to attach to. When attached they obtain water from the host's xylem cells or water carrying tubes, however they produce their own food from their leaves. Some very large mistletoes can produce up to a thousand or more fruit in a particularly good year, however very few of these seeds are likely to grow into new plants. They can also live for many decades and some species such as the red and scarlet mistletoes (*Peraxilla* species) have survived on beech trees for over a century.

Mistletoe seed arrives on a host branch by being deposited there by a bird. All of the fruit skin and flesh must be removed before it will germinate. Thus it is an act with a small probability to be deposited in the right place in order to grow into a new plant. To complicate matters mistletoe are sometimes specific and will only grow on certain hosts and, as well, seeds can only penetrate through a certain sized bark thickness. The yellow mistletoe will only grow on very small branches no bigger than 1 cm diameter and as such they are commonly found growing on the outer branches of their host beech trees. One asset mistletoe have in their favour is that around their seed is a “super glue” like substance that sticks and quickly fastens to the host branch. When a seed does land on a branch it is likely to stay there. We have modelled our management to propagate mistletoe by simulating what occurs in nature. We collect mistletoe fruit at the right time of year when they are fully ripe. Then we then find a suitable host tree by looking for a healthy specimen with few pests and diseases and located in a good sheltered sunny site. The fruit skin and flesh is clean off the seed and the seed is then wiped onto the right sized branch where it firmly attaches being held by its own “super glue”. One gets very sticky fingers when doing this for several hours! The branches are then tagged so that we can monitor if new mistletoe are produced and how quickly they grow. Propagation has occurred with the white (*Tupeia antarctica*), yellow (*Alepis flavida*), green (*Ileostylus micranthus*), red (*Peraxilla tetrapetala*) and scarlet (*Peraxilla colensoi*) mistletoes. Success has occurred but as yet only the white and yellow propagation attempts have been monitored. After two years about 12% of the white mistletoe seed produced new mistletoe plants, the rest died of natural causes. Some of the branches of these new mistletoe plants are now up to 20 cm

long and may flower within a year or two. The yellow mistletoes were propagated on the forest line of Mt. Ruapehu and as such have grown more slowly because the growing season is much shorter. However, more seeds produced mistletoe and 18% have established. From the very first propagation attempts there are now more small mistletoe than the 90 known naturally propagated plants. As a result of these successes more propagation work is occurring and volunteers will be helping DOC staff to do this with the yellow mistletoe this autumn on Mt. Ruapehu.



*Dactylanthus taylorii*, Pua reinga,  
New Zealand's only parasitic  
flowering plant, lives on about  
30 species of native trees and  
shrubs.  
(Drawing by Avi Holzapfel)

We expect and aim to have thousands of new mistletoe plants within five years, resulting in a revival of the brilliant display of yellow flowers in summer in our protected beech forests if all goes to plan. *Dactylanthus* starts its life in a similar way to mistletoe, attaching to its host from a germinating seed. The seed will only germinate when it is near a small root hair, which are the fine roots that absorb water. It is thought that it only starts germinating because it senses chemicals that are produced by root hairs and these chemicals breaks its dormancy. The seed is known to live for 10 years and probably lives for many decades though this is not known for sure. *Dactylanthus* grows on hardwood shrubs and trees and is not host specific occurring on over 30 different species. These hosts are often dense in young regenerating forests that have arisen from disturbance such as logging, fires, slips and storms.

Seed production is uncommon and the very best protection with pest control and/or caging to prevent pests eating the flowers is required. This necessity has meant that until recent times little seed has been produced and when it is, it is a valuable resource. As such it is best to find optimum sites for regeneration. *Dactylanthus* seed is collected when fully ripe and then sown beneath suitable young and healthy plants. The same type of host species as the parent plant grew on is generally chosen to place the seed beneath. The soil is excavated to where the fine root hairs are located and then the seed is scattered on top and covered with humus and leaves to keep them moist and dark.

The first propagated *dactylanthus* plants produced flowers first in 1998, eight years after the seed was sown. In order to get obvious signs of success from seed sowing a fairly long wait is necessary and accurate recording is essential. Some successes have been seen at one site in Tongariro National Park after a very successful possum control operation. New small plants only the size of a marble have been seen attached to fine roots that were excavated in a heavy downpour. We hope to get the same or better results from our direct propagation attempts and help to protect this fascinating and interesting parasitic plant. One day our children may witness the sight that was described in 1926 by Hill at Opepe "*opening out, along the dry floor of the valley for a chain or more, appeared hundreds of flowers in clumps... the perfume was overpowering*" In time, it may even become an important energy-rich food source that it once was to our short-tailed bat and other forest creatures.

Nick Singers  
Conservancy Botanist

# Ohakune Track Memories

*I was searching our Conservancy library for history books to prepare an article for the journal. In among the many papers and documents that we have on the shelves I found one I had never seen before. It was entitled "Memories of the Ohakune Track in the 1940s" by Ashley Cunningham. These memories were put together in 1988 after he'd returned the area after a 38 year absence. It makes fascinating reading. This article is, in the main, as Ashley wrote it. (Ed.)*

## The Move to Ohakune

My stepfather's name was Owen Buckingham, known to everyone as "Buck". In 1941 he was posted to Karioi, as Officer in Charge of the State Forest. In 1942 Buck was transferred to Ohakune, and we lived in a house in Goldfinch Street. There was an unobstructed view of Ruapehu from the dining room window and the mountain took on a magnetic fascination.

## Introduction to the Mountain

Buck had in 1928 been taken up the mountain by "Joey" Blyth, so he knew the way. I pestered him to take me up, and one day in January 1943 he said we would go up in a couple of days time. I couldn't wait. He had told me where the track started and the following afternoon I took off alone on a "dummy run", intending to go just to the hut, believing it to be only five miles up the track. The miles passed, and the rich bush was enjoyable, but at the 7-mile peg I gave up and returned home.

Buck laughed and explained that the hut was nine miles up, not five!

The following morning was cloudy and unpromising, but we set off at 6.30 am. I wore sandals, as my boots had given me blisters the day before. It was drizzling when we reached Blyth Hut at 10 a.m. Three men were there: Jack Blyth, Reeve Williams and one other. Buck looked at the big frying pan and told how Joey Blyth had placed it in his pack in 1928. Joey said nothing. Later, after the summit



Blyth Hut

*"It was an 'L' shaped building of three rooms with a verandah in the shelter of the angle. There were 22 bunks, and the two larger rooms each had an open fireplace. It was well constructed, with sound flooring and walls lined with dressed T&G rimu. Roof and exterior walls were of corrugated iron. Cutlery, crockery, and cooking utensils were provided, and the hut was unlocked and freely available to the public."*

(Photos: Ashley Cunningham)



was reached and the party re-assembled at the top of "*Gliding Gladys*" ready to do the traditional slide down the snow on their gunny-sacks, Joey produced the frying pan, and sitting on it with the handle between his legs, he shot off down the slope ahead of everyone else.

Meantime my anxious forays to the verandah, peering into the cloud, were finally rewarded by the sudden glimpse of a sunlit peak of rock and snow, Girdlestone, looking very close. Jack Blyth had told us that the weather would clear, and his quiet confidence was most impressive. He also lent us an ice axe, saying "*You'll need this to cut steps across the razor-back, especially as the boy has sandals.*" The march up the mountain was a fascinating revelation. The distant yellow turned out to be tussock, the purples were plants and moss and rock, the browns were rock, often twisted into a fantasy of shape. Higher up, it became clear that the blue lines on Mangaehuehu Glacier were indeed crevasses. Using the ice axe to cut steps with one hand, and holding my hand with the other, Buck led the way along the razor-back to the summit. I was glad of his helping hand, as the snow felt slippery under my sandals. At last, the summit - the Crater Lake, that indescribable blue set in its vast basin of snow. What an impact to see it for the first time! Mountains subsequently became a dominating interest in my life.

### **The Husseys**

I met Ken Hussey on this first trip to Blyth Hut. He was then about 16, and had brought a packhorse up from their farm to carry out gear for Jack Blyth and his party. Ken's father, W F (Bill) Hussey, farmed the clearings up the Mangawhero Stream, but the living was not lucrative and the family earned a little extra money by maintaining Blyth Hut and track and occasionally packing stores up to the hut. Ken had acquired a rope and ice axe and by the mid 1940s was acting as the local guide for parties wishing to climb the mountain. Often these were servicemen from Waiouru Military Camp or Ohakea Air Force Base. Sometimes Ken invited me to assist with these tours, and, on other occasions, he and I alone made exploratory trips to different places on the southern side of the mountain. We did some elementary skiing from Blyth Hut on occasions. Ken, superior as usual, had real skis (solid wood of course) and bindings; I had made my own skis from mangao timber, attached to the boots by leather straps. We had no special boots for skiing, just leather workboots with hobnailed soles.

In the early 1960's the Hussey farm became part of Tongariro National Park and Ohakune Park Ranger Bill Hislop used the house for many years, until it was removed or dismantled about 1980.

### **The Ohakune Track**

Although the remaining section is now called Blyth Track, in the 1940s it was more commonly called Ohakune track.

The track had been initially cut about 1908, and during the following few years was opened up by members of the "Ohakune Ruapehu Alpine Club", one of whom was Thomas Arthur Blyth, affectionately known as 'Joey'. When his wife died in 1915, Joey took solace in working on the track, steadily developing and improving it until 1940, helped by his son Jack.

In the 1940s the first mile or so of the track lay up the narrow metal (and heavily pot-holed) road leading to Hussey's farm. From here it was only a few yards walk



Bergesen's Hut

*"... we delighted in the workmanship of it. It was built of kaikawaka, broadaxed so perfectly that the timbers and woodwork seemed almost to be sawn. It had a single room, large open fireplace, bed, bookcase, table, chair, and food cupboards."*

Above: Bergesen's Hut in 1949

Inset: The remains of Bergesen's hut in 1987.

(Photos: Ashley Cunningham)

to Bennett & Punch's logging tramway which one followed for a further mile before it too turned westward to cross the Mangawhero. After that one entered the podocarp forest on the track proper.

The next two or three miles lay through dense podocarp/beech forest, and the track has here been mostly replaced by the Ohakune Mountain Road.

Shortly after leaving the tramway, the track briefly worked its way along steep hillsides above the Mangawhero River, where it was benched and well drained, with little bridges over small side streams. Further on it rose up gently sloping flats, and here it was wider (about 2 m) with some muddy patches. After the 5-mile peg, which was about 700 m beyond where the sealed road now parts from Blyth Track, the podocarps were left behind and one entered a more stunted beech/totara/kaikawaka forest. There were many muddy sections here, and the track was often corduroyed, some of which remains today. The marker pegs indicating each mile of the track were of great interest to travellers, as it was a long walk to Blyth Hut. There was no 6-mile peg; we always judged the stream crossing (at 1030 m elevation) to be about that distance. Of course, there was no footbridge here in the 1940s. Up to this point today's forest has encroached on the track, so that it presently seems rather narrower than 40 years ago. Beyond

the stream, however, the forest growth is sluggish, and the track today is very much as it was in the 1940s. Even the 7-mile peg was still present in 1987, though the figure is almost illegible. Much of the corduroy that still exists on this section of the track probably dates back to the 1920s and 1930s, because very little of such work was done in the 1940s.

Beyond the 7 mile peg the benched track rose around the hill at a steady grade. Small log bridges spanned the streams, but these have collapsed and are now replaced by more modern structures. The predominately mountain beech forest has changed little in the intervening years.

In the 1940s there was no track going past Roto Kawa tarn, which because of the swampy ground, was not often visited. The track passed to the west of this small plateau, through open and eroded alpine scrubland, and then crossed a mountain beech slope, which had been slashed by a debris avalanche during the heavy rain-falls of 1941, carrying away about 50 metres of the track. Forty years later, there are still no plants growing on the main surface of this slip.

Beyond this patch of forest, and its slip, the track emerged onto tussock and scrub, and at this point we sometimes left our packs and walked across to Waitonga Stream and down to the falls. There was no track, but the travelling was easy.

The section of the track from the 1941 slip to the hut site is now disused, and slowly becoming overgrown with snow totara. The final steep and gullied section was always the worst part of the track. At the top of the hill, just before arriving at the hut, was the horse paddock. In the 1940s there was a makeshift fence here, with posts of local wood, and one or two strands of wire. Horses were seldom used on the track at that time, and the paddock was a remnant of the 1920s and 1930s when both pack and riding horses were more commonly used.

### Bergesen's Hut

During the later stages of the war, married men were conscripted into the armed forces. Some refused. Such a one was Les Bergesen of Ohakune who disappeared into the bush. However he had a few supporters who from time to time left him supplies at a prearranged place. I believe he built, and used, two huts; one of which was not very far from the present Ohakune Ranger Station. The other was beside the stream west of the 5-mile peg on the Ohakune Track. It was here that Les Bergesen was captured in 1944.

Ken Hussey showed me this hut a few months later, and we delighted in the workmanship of it. It was built of kaikawaka, broadaxed so perfectly that the timbers and woodwork seemed almost to be sawn. It had a single room, large open fireplace, bed, bookcase, table, chair, and food cupboards. Outside the door was a woodshed. Under a loose floorboard was his broadaxe, but that had disappeared by 1949, when I last used the hut.

I revisited the site in May 1987, and there had been so many changes in the forest and the stream that it took many hours to find the site. The hut is now reduced to scraps of decaying wood and some old corrugated iron.

### Blyth Hut

The hut was then called either Blyth Hut or Ohakune Mountain Hut, but in earlier days it had variously been called Mangawhero Hut, or Ohakune Mountain Cottage. William Salt assisted by Bill Mead and



*"The view from the former Blyth Hut verandah was well photographed, and show this view in May 1949 (above) and May 1987 (right) respectively. There seems no change to the tussock land in this area but the individual mountain beech trees seem to have grown much taller. One is drawn to speculate that this is a response to the warming climate, but human influence should not be discounted. For some 50 years the hut was fuelled by firewood, and although most of this was drawn from the forest to the west of the hut, the small groups of trees in the foreground of the photos would be vulnerable. Nevertheless, my view would favour an increase in the growth of these trees being related to the warmer climate of recent decades."*

(Photos: Ashley Cunningham)

Joey Blyth had built it in 1921. It was an 'L' shaped building of three

rooms with a verandah in the shelter of the angle. There were 22 bunks, and the two larger rooms each had an open fireplace. It was well constructed, with sound flooring and walls lined with dressed tongue and groove rimu. Roof and exterior walls were of corrugated iron. Cutlery, crockery, and cooking utensils were provided, and the hut was unlocked and freely available to the public.

### The 1945 Eruptions

I climbed several times to view the 1945 Ruapehu Eruption.

My first view of the phenomenon was in January 1945, and my diary notes that there was "a layer of mud over the snows to the north of the Crater Lake, and the lake itself was brown instead of its light blue colour."

On Easter Saturday 1945, Bill and Ken Hussey, a man called George, and I, reached the summit rocks at 12.15 pm. Very soon after we arrived there was an eruption.





Mt. Ruapehu erupting on 31 March 1945, as seen and later painted by Ashley Cunningham.

Although painted 50 years earlier it clearly resembles the stunning images of the 1995 eruptions.

(Painting: Ashley Cunningham)

My diary describes the event: - *“We were greeted by an entirely new scene.... the basin of the crater was covered in mud and rocks. There were large crevasses encircling the crater lake, which was dirty muddy brown surging, perhaps boiling water, with much steam rising off it. As we watched we saw a great bubble of water rise up from the eastern side of the lake. Although it burst within a second or two we had time to see that it was several hundred feet across and rose instantly to perhaps a couple of hundred feet before bursting. As it burst clouds of smoke and steam covered the lake. Then above the smoke shot rocks like meteors, leaving dense black trails of smoke behind them. The smoke surged up quickly, rolling out and filling up the crater, coming quite close to us and pushing up far above our heads certainly for hundreds, and possibly for thousands of feet. This whole display must have happened in less than a couple of minutes. I remember noticing that the ground we were on did not seem to tremor. Then we started to hear ominous thuds down in the smoke-filled crater, presumably stones falling back. Fortunately none landed where we were, although previous large eruptions had thrown many stones and blocks onto the outer snowfields.”* At that time the mountain was erupting every few days. The experience was impressive, and as we were not quick enough to photograph it, I later tried to paint it.



# Fiery Adventures

Ashley Cunningham refers to the exploits of two climbers who camped in the Ruapehu Crater during the 1945 eruptions and were fortunate to escape with their lives. Below is an account of their adventure compiled from two unnamed newspaper accounts in Cunningham's memoirs.

Two young Wellington men, who were subsequently injured when hot rocks exploded over a tent to which they were camping for the night in the crater, were Robin L. Oliver a member of the Geological Survey, and J. Witten Hannah, both of Wellington. This week, Oliver, one burnt hand still bandaged, told how he and Hannah late on Sunday July 1, examined the tholoid, the geological term for the huge island.

"We descended the ice slopes above the lake close under the main Ruapehu peak by cutting a few steps and belaying ourselves with a rope," he said. "A hundred and fifty feet down we reached the level of what had once been the Crater Lake. Only a small amount of water remained and about half the circumference of the island was in contact with the side of the crater. Where we landed the tholoid was close to the edge and very definitely alive, particularly on the outside.

*The surface was composed of scoriaceous rocks averaging a foot in diameter and piled 15 feet high. The mass was shaking and unstable and powerful jets of sulphurous steam were bursting out between the rocks. The boulders were hot and as they continually heaved and tumbled about a red glow came from underneath. Periods of comparative quiet would without warning be broken by a deafening report and red hot rocks would hurtle out of the centre of the tholoid, shoot 400 feet into the air, then fall back onto the island. These staccato outbursts would last for two or three minutes at a time and conversation was then impossible. While they lasted the whole of the centre glowed like an immense brazier."*

Oliver said he tried to make a closer examination by endeavouring to scale the shaking 15-foot face of the tholoid wall. He did not manage this, however, as the constantly moving boulders were too hot to negotiate.

*"About 5 p.m. we climbed back up the ash covered slopes and pitched our alpine tent in a shallow crevasse about three feet deep. The activity was now becoming more violent and at more frequent intervals. About 8 o'clock, when we were both in our sleeping bags brewing tea with meta fuel the big explosion came. Immediately a pretty concentrated deluge of hot rocks showered on to the tent, which collapsed. We could smell our clothing and gear burning. Most of our burns came from rock that seared through our clothes. I was struck on the head and for a short while lost consciousness. The whole outburst lasted only about half a minute and when I came to Hannah assisted me to a position 100 yards further up the slope, where he left me in my sleeping bag and went for help. While I lay there two subsequent explosions showered me with warm ash, but I curled up and hoped that nothing would hit me."*

Hannah succeeded in hauling his companion some distance from the scene, but was too weak to carry him further. He left Oliver and went in search of assistance. Hannah, though suffering from shock and a badly cut, knee, had reached the Ohakune Hut at 1 am after an exhausting trek off the mountain in the dark.

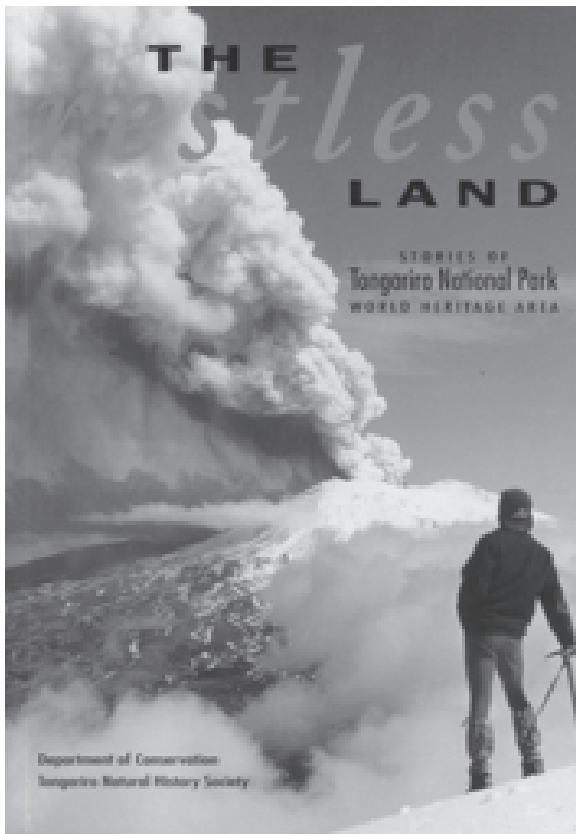
When he was located, Oliver was suffering from burns to the left hand, and the left leg and a moderately severe injury to the left shoulder. On receiving attention he was able to walk down the mountain and was admitted to the Raetihi Public Hospital. Fortunately his condition was not serious.

# Become a Friend of Tongariro National Park

The Tongariro Natural History Society is a group of volunteers from throughout New Zealand with a love for Tongariro National Park and a commitment to conservation. The Society was established in 1984 and has since contributed to the Park in many ways. Various books, displays and other information have been published, annual grants made to students researching aspects of the park and members have volunteered their time and skills and donated money to numerous projects.

The annual *Tongariro Natural History Society Memorial Award* was presented this year to two students. One of these, Ross Martin, is studying the activities and behaviours of stoat – the kiwi's most dangerous and elusive predator. The results of Ross' studies could provide the key to improving stoat control methods in the future. The second recipient, Tristram Hayles, is studying the geology of the summit of Mt Ruapehu. The water level of the Crater Lake is still low enough to enable Tristram to investigate the composition of rocks around the crater rim. His study will allow a glimpse of the eruption history of the lake to provide a greater understanding of future volcanic activities, including lahars, lava flows and ash fallout.

Exciting new changes are planned this coming summer. A part-time paid officer will be appointed to strengthen the educational potential of the Society and arrange appropriate sponsorship. The appointee will initially focus on Society membership with an enterprising campaign. In the long term he or she will plan programmes with widespread public appeal to visitors, especially children. The goal of the Society is to increase knowledge and understanding about the Park and leading scientists, photographers and park specialists will be engaged to run programmes, lectures and summer workshops such as 'Photography In The Park', 'Volcanoes of the South Wind' and 'What Animals



The society publishes a number of books on Tongariro National Park. It is a joint publisher, with the Department of Conservation, of *The Restless Land - stories of Tongariro National Park*.

## Live Here?'

For the first time, the Society has published its own Volunteer Calendar. It contains several new projects like 'Adopt a Mistletoe' - a weekend activity at the south side of Mount Ruapehu. The aim is to spread seeds of the yellow mistletoe *Alepis flavida* of which there are only five known populations in the North Island. The plant is fast disappearing because it is so palatable to possums. Because most of the traditional seed dispensers, like bellbirds, have also disappeared to a large extent, members of the Society are going to adopt this population of mistletoe and help it spread by individually placing seeds on new host trees. Another new project is the provision of interpreters in the Whakapapa Visitor Centre over busy holiday weekends. By sharing personal knowledge, interpreting displays or answering questions, volunteers from the Society will enhance the visitor's experience and assist staff at the centre. There are a number of other attractive projects for members to participate in this coming summer. And this is only the start!

Other opportunities have arisen for the Society to be involved with the upgrade of the Whakapapa Visitor Centre. A new donation box featuring Ruaumoko, the Maori god of the volcanoes, has been placed in the visitor centre. All donations will now be received by the Society and then doubled before the money goes to a chosen project in Tongariro National Park. Another display at the centre will feature the biological diversity of New Zealand with many plants and animals shown on a large mural. An information and activity sheet designed for children will be based on this mural. Visiting children and school groups will receive this sheet free of charge to learn about the Park and its inhabitants. The production of both the mural and the activity sheet is being funded by the Society because it recognises the importance of educating the younger generation about Tongariro National Park.

Anja Hambach  
*TNHS Secretary*

Become a 'Friend of the Park' and contribute any way you can! New members are always welcome. Please contact the Secretary of the Tongariro Natural History Society, PO Box 238, Turangi or email [runz@actrix.co.nz](mailto:runz@actrix.co.nz) for more information, the list of books published by the Society, a copy of the 2000/2001 volunteer calendar or an application for membership.

## The New Whakapapa Visitor Centre

Last November a government grant enabled the Conservancy to go ahead with the planned redevelopment of the visitor centre. The concept was to improve visitor traffic flow through the complex and enlarge the reception, retail and display areas.

The most obvious change when you enter the visitor centre is the feeling of

spaciousness. With the relocation of the volcanics audiovisual into the auditorium and the extension of an outer wall the display area is much larger. The new displays will interpret some obvious gaps in the old displays such as the Park's World Heritage

status, the 1995-96 eruptions and biodiversity issues.

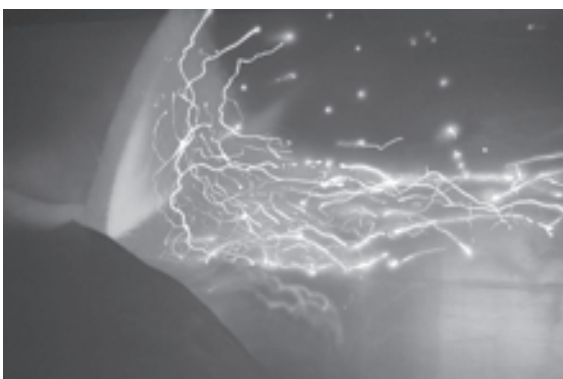
Staff have commented on the ease with which visitors can now move through the building. The auditorium which will screen the two audiovisuals, Ring of Fire and The Sacred Gift is now easily accessed from both reception and the display area.

Reception staff coped with the rigours of construction remarkably well, though one was seen behind the counter wearing ear muffs! The redevelopment will be completed in February 2001.



Right: The bust of Te Heuheu Tukino IV Horonuku greets visitors to the Whakapapa Visitor Centre.

Below: One of the exciting new graphics depicting the fiery nature of the 1995 eruptions (Photos: Warren Furner)



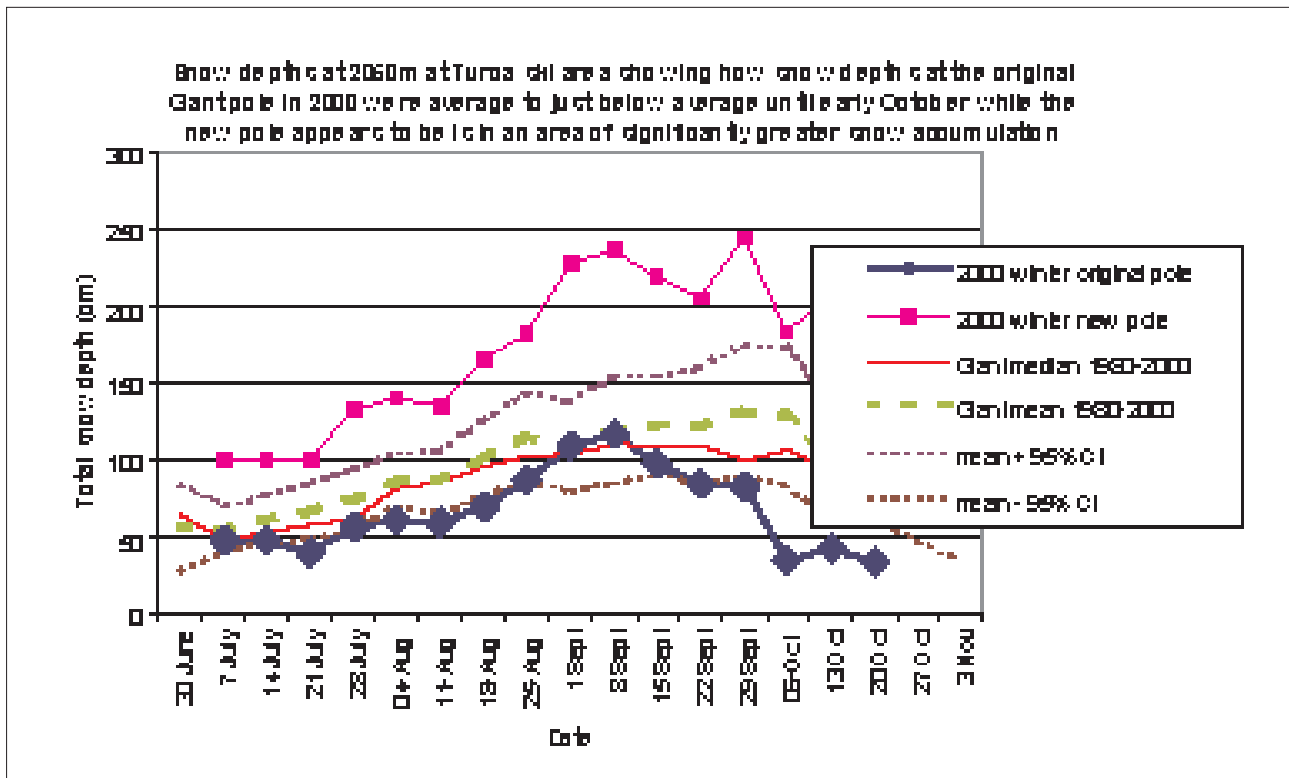
# Winter Snow

## The 2000 winter

An early start in June had hopes soaring of a great ski season. Coronet Peak opened on 4 June apparently the first time it has opened before Mt. Hutt which opened the next day (Evan Bloomfield [www.kiwinewz.com](http://www.kiwinewz.com)). Whakapapa (both Happy Valley and the Upper Mountain) opened earlier than average on 23 June. It closed on 29 October so at four months long the season was of average duration. Turoa closed on 23 October. Snow quality was excellent well into September with many days of dry snow and even some low-density powder days.

At the 2000 metre level the winter snow pack was of average depth at Whakapapa until mid September and generally just below average at Turoa until early October (see graph). Calculating mean snow depths at each measurement date for all years of record (i.e. 1980-2000 at Turoa, 1983-2000 at Whakapapa) provides an objective method of constructing a mean snow depth profile for rating any snow season for comparative purposes. Median snow depths are a slightly better way of representing the average snow depth as they are less influenced by the very heavy snow years of 1990 to 1994. But as the median profile lies well within the mean profile range (see graph) the latter is used here as it is simpler to calculate.

There are too few snow poles on Ruapehu to reliably record snow depth, especially at different altitudes. This year Turoa added a new pole which recorded snow depths much greater than the original pole or long term average depths there (see graph). Clearly, it is in a site of greater snow accumulation but the relationship with snow depths given by the original pole is not sufficiently defined after only one season. It is important that measurements continue to be made at this original pole in future seasons so we can track year to year snow depth changes and better



Good snow conditions meant that thousands took advantage of the special \$199.00 season passes on offer by both ski fields during April.

(Photo: Ruapehu Alpine Lifts)



account for site to site differences each year.

However it is clear that the snow line was generally higher than average this year. Skiing below 1900 metres and to the Top o' the Bruce was possible for about three weeks in total from 19 August while it was possible to ski to the road at Turoa for about a month. Tukino was skiable from 12 August to 21 September but had marginal snow cover for much of this time, similar to 1999, better than 1998 but worse than 1997. On the John Mazey scale Whakapapa had a poor snow year although not as poor as some earlier "poor" seasons. Whakapapa Skifield was much more crowded than usual (peak queues up to at least 45 minutes) because only the upper part of the mountain was open for most of the season.

### **The weather**

The 2000 winter was the third warmest on record at Whakapapa after 1971 and 1998. The daily mean air temperature was 0.9 degrees above the 1961-1990 average of 3.1° C. Precipitation was about average in the central North Island although insufficient rainfall data were collected at Whakapapa to calculate winter rainfall at our climate station. (We now have an automatic weather station which should rectify this problem.) The rest of New Zealand also had a warm winter with records showing it to be the second warmest on record since reliable measurements began in the 1850s (NIWA National Climate Summary–winter 2000, [www.niwa.cri.nz/clim\\_sum](http://www.niwa.cri.nz/clim_sum)). Taumarunui had its third sunniest winter on record.

The winter conditions were caused by more frequent high pressure systems east of New Zealand and sea temperatures around the country being 0.5-1 degrees warmer than average ([www.bom.gov.au/climate/current/anomsst.shtml](http://www.bom.gov.au/climate/current/anomsst.shtml)). Apart from the dump caused by a deep low pressure system in mid June most snow fell during the passage of fast moving fronts. The atmospheric conditions in the 2000 winter were more or less consistent with the La Nina weather and ocean patterns which persisted well into a third calendar year in succession. This was counter to most predictions by climate models made at November 1999. Therefore, the snow forecast also made in November 1999 (see Tongariro 1999, page 64) was not very accurate.

Harry Keys  
*Conservancy Advisory  
Scientist*

# A decade of kiwi protection in Tongariro Forest

Many Journal readers will already be aware that the Tongariro Taupo Conservancy staff, in partnership with a host of friends and associates, have been working hard to protect kiwi in Tongariro Forest for about a decade. The project has steadily grown in size over the years, matching the growing national concern about the decline of kiwi in the wild. Several notable milestones have been passed along the way, including the completion of Jonathon Mile's MSc thesis in 1995, which described the density, territory size, sex ratio and threats faced by kiwi in Tongariro Forest, and estimated the total population as about 200 birds. This valuable baseline work led to a four year trapping and predator monitoring operation in the Waione valley which gave us an insight into the stoat, weasel, ferret and rat populations in the area. This work was only possible through the dedicated efforts of several staff member, notably the volunteer work of Trevor Coker. Also adding to our understanding of predators is Ross Martin's MSc thesis on stoat behaviour in the forest. After several years of fieldwork trapping and radio tracking stoats, Ross is now completing the data analysis and write up of his valuable research. The outcome of our predator control work so far



MSc student, Ross Martin, checks out one of the monitored kiwi in Tongariro Forest. Ross was a recipient of a Tongariro Natural History Society Memorial Award . (Photo: Harry Keys)

has been to show that we do not currently have the resources to efficiently control stoats over a large enough area to cause a significant benefit to kiwi or other threatened species. Stoats breed rapidly and disperse quickly over large distances. Consequently control work has to cover thousands of hectares to prevent rapid reinvasion of a core protected area. Compounding this problem, Tongariro Forest is a difficult place to defend, with no natural stoat barriers (eg. water) to slow down reinvasion. The ineffectiveness of our attempts to protect kiwi by controlling stoats mirrors a national problem. This was recognised with the announcement in May 1999 of an extra \$6.6 million being invested in stoat control research over the next five years.

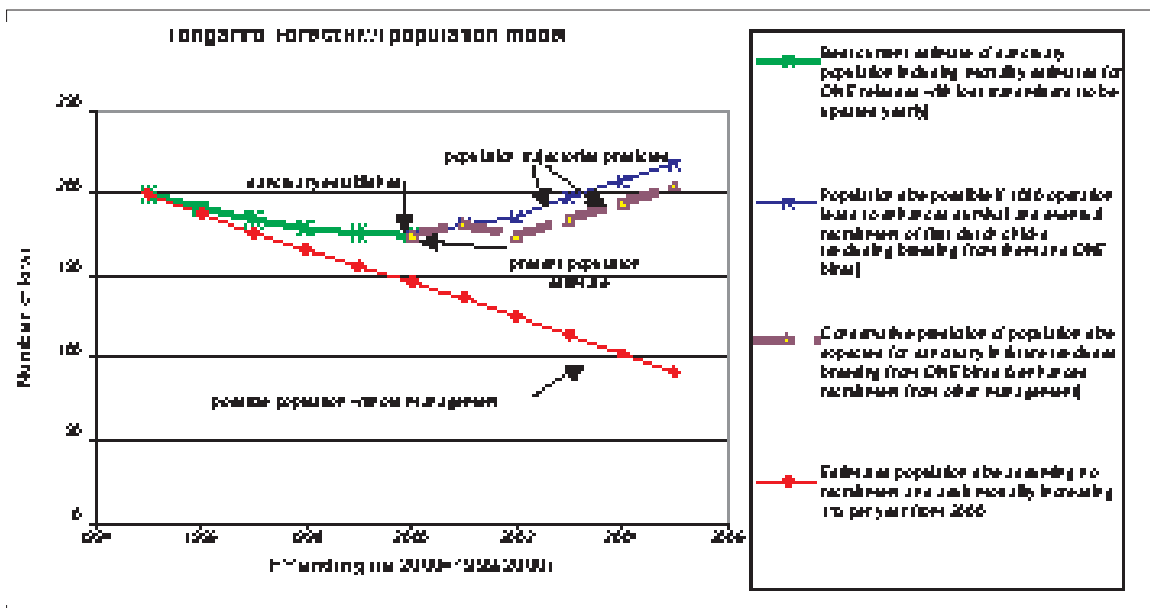
## Operation Nest Egg

Also consistent across New Zealand is the realisation that we have an aging kiwi population, who are failing to replace themselves as year after year they lose 95% of their chicks to stoats. As the years pass we are becoming increasingly concerned that our wild kiwi are on the brink of the abyss. Since 1997 "Operation Nest Egg" has been carried out in several sites, including Tongariro Forest, as a short to medium term tactic to prop up the wild kiwi population. The intention is to buy time until our stoat control ability improves. Operation Nest Egg (ONE) involves kiwi eggs being removed from the wild to be hatched and raised in safety at Rainbow

Springs in Rotorua. When the juvenile kiwi raised there get big enough to defend themselves from stoats, at about 1000 g, they are returned to the wild. In this way 21 kiwi juveniles raised by the dedicated staff at Rainbow Springs have now been returned to Tongariro Forest, five released in Rangataua Forest, and a further three returned to Whirinaki Forest. The outstanding efforts of Rainbow Springs in successfully raising so many juvenile kiwi at their own expense was recognised at the 1999 Tongariro Taupo Conservation Awards. Also crucial to the success of the work were the generous donations made by the Jack and Emma Griffin Charitable Trust, which allowed the construction of new kiwi chick rearing facilities at Rainbow Springs.

**Buying time**

The fate of all the ONE juvenile kiwi released to the wild has been monitored. We now know that about 20-25% of the released birds die through predation, accidents or sickness before reaching adulthood at 3-4 years of age. It appears that the annual mortality rate then drops to the same 6-8% as seen in wild adults. ONE kiwi have now bred successfully in the wild both in Northland and Okarito. As individual kiwi live and breed for 20-25 years in the wild, this work has shown that ONE is an effective tool to prevent the collapse of aging kiwi populations. We also now have a clear understanding of how many birds need to be put into a population to sustain it. However, ONE is not a long term answer, as any chicks hatched in the wild by successfully recruited ONE kiwi still have a 95% probability of being killed by stoats.



**Public support produces results**

Another function of ONE has been to act as a rallying point to focus public attention on the plight of our national icon. The return of each young kiwi to the wild is an inspiring event that many members of the local community have been able to attend. Public pressure led to both major political parties making an increased effort to protect kiwi as one of their campaign promises at the last election. This



Painting of a kiwi in Tongariro Forest by a pupil from National Park School.

year the newly elected Labour government announced the creation of five kiwi sanctuaries around the country, at a total cost of \$5 million over five years. The sites chosen for the new kiwi sanctuaries are in Northland, Coromandel, Okarito, Haast, and at Tongariro. The intention of the sanctuaries is to ensure the long term survival of each distinct form of kiwi at least within the sanctuary areas. They will also serve as research hothouses where techniques to protect kiwi will be developed and improved for use in other areas.

### **The Tongariro Forest Kiwi Sanctuary**

The Tongariro Forest Kiwi Sanctuary is charged with maintaining a viable population of the western form of North Island brown kiwi. Over the next five years the sanctuary has three objectives; **1 To grow the Tongariro Forest kiwi population by at least 12% by 2004, primarily through ONE.** From the original estimate of 200 birds in 1993 we now believe 120 aging adults remain. The ONE work already done has shown that an increase in radio tagged males from the current six to 12-16 will allow sufficient ONE juveniles to be produced to achieve this objective.

The hard part will be the capture of up to 10 new males over the next 12 months.

**2 To assess what effect aerial 1080 has in improving the survival of wild kiwi chicks.**

Radio tracking of both kiwi and stoats has already shown that kiwi are unaffected by aerial 1080 operations, while stoats are decimated through secondary poisoning. It is hoped that the window of low stoat density created by an aerial 1080 operation will last long enough to allow some wild kiwi chicks to reach a stoat proof size (4 to 8 months). The next aerial 1080 operation in Tongariro Forest will be timed to coincide with the first round of kiwi eggs hatching in the forest. Chicks will then be monitored in the wild to determine the level of stoat predation that they face.

**3 To support the concurrent Manaaki Whenua Landcare research on stoat and rat population dynamics in Tongariro Forest.**

Landcare will run an experiment in the Western side of Tongariro Forest over the next two to three years to determine the recovery of stoat and rat populations after the aerial 1080 operation. This will include areas where stoats and rats are controlled on an ongoing basis. The intention is to find the most effective way to achieve and maintain low stoat and rat densities. In addition Landcare staff will radio tag and track juvenile stoats to assess survival and dispersal.

The selection of Tongariro Forest as one of the five new national kiwi sanctuaries is the result of the hard work put in by both DOC staff and a wide section of the community, only some of whom are mentioned above. The credibility built up through a decade of sustained, focused and effective work has earned us a huge boost to the kiwi protection work we can do in Tongariro Forest. Three new permanent jobs will be created in the Ruapehu Area Office to work on the sanctuary. Staff are proud to have this opportunity and excited by the challenges that lie ahead.

Peter Morton  
Conservation Officer - Biodiversity



# Kiwi Management Risks

Our six species of kiwi that make up the genus *Apteryx* are in trouble. Loss of habitat to farm, forestry and urban development; stray dogs; predators like cats and ferrets; cars; and possum traps all kill large numbers of adult kiwi each year. However, the real bottle-neck in the kiwi life style is the vulnerability of chicks to predation by the stoat. Kiwi chicks hatch fully developed and leave the nest within days. Tragically, more than 95% of kiwi chicks that hatch are dead within a few months as a result of stoat predation. Kiwi populations are declining at around 6% per annum - that is halving every 10 years.

At Tongariro Forest adjoining Tongariro National Park World Heritage Site, the Department of Conservation is managing a 16,000 ha “Kiwi Sanctuary” as part of a network of five such sanctuaries around the country.

## The Management Approach

*In many ways kiwi are more like a mammal than a bird, with fur-like feathers, whiskers, a highly developed sense of smell, bones filled with marrow instead of air sacks and twin ovaries that produce huge eggs - each one constituting almost 20% of the female's bodyweight. They live in heavy bush or scrub habitat as monogamous pairs on exclusive territories of 30 to 70 ha where they feed on a range of soil invertebrates and which they vigorously defend from other kiwi. Kiwi can live for up to 30 years. Breeding starts at around three years of age and they mate for life. The larger (3 kg) female lays up to three clutches of two eggs between July and March which are incubated for up to 84 days by the smaller (2 kg) male. It is a life style that has served the kiwi well for some 70 million years.*

A lack of breeding success due to predation is the major problem. The mobility of most predators and their generally cautious behaviour means control to a level that allows adequate kiwi recruitment has been difficult to achieve in many areas. Standard trapping techniques employed at Tongariro are not particularly effective, very labour intensive and difficult to sustain with limited resources. A major research and development programme is underway to try and fill these management capacity gaps, particularly in relation to stoat control techniques. In the meantime more intensive, hands-on protection measures are required to at least hold the line while the technology catches up.

Operation Nest Egg (ONE) is a method which means a new generation of young kiwi can be recruited into areas where effective integrated pest control can later be implemented once new technologies have been refined into cost effective management tools. Until this happens having kiwi on 'safe' offshore islands remains

an important insurance policy for the future security of our kiwi.

## Risks

There are a number of risks in the kiwi management approach outlined above. These can be categorised as follows:

- 1 Biological** - There are a number of aspects to the biological risk for effective kiwi conservation. Many of our surviving adult kiwi are likely to be very old as a result of an ongoing lack of recruitment over many decades. Sudden population crashes before management has a chance to reverse the decline are a real possibility. With increased intensive hands-on management activity there is also an increased risk of spreading disease. Wildlife hygiene protocols have become an important part of kiwi conservation field practice to help reduce this risk but it remains a real threat. Finally, the “safety” of off-shore island populations remains vulnerable to sudden catastrophic events. Having kiwi on a number of geographically separate safe islands and ensuring strict security at these loca-



Too many kiwi are still falling victim to poorly set possum traps, feral cats and uncontrolled dogs in our forests. (Photo: DOC)

tions is very important in maintaining these 'insurance policies'.

**2 Technological** - The long term chances of success in maintaining populations of kiwi on mainland New Zealand will rely heavily on new stoat control technology which significantly reduces or eliminates stoat predation on kiwi chicks. There is no guarantee that this technology will be successfully developed, despite a five year funding of \$6.6 million towards this outcome. Both toxic and biological control options carry other social risks.

**3 Public Perception** - the public's expectation is that their national icon will survive on mainland New Zealand. The sheer scale of the task, limited resources and technology mean DOC can currently only protect

representative kiwi populations at a limited number of sites (kiwi sanctuaries of which Tongariro Forest is one). In other areas kiwi will continue to decline unless community initiatives can be developed and resourced. Despite hot public debate use of toxins and biological control agents are likely to be a key part of the integrated pest management regimes required to protect kiwi and kiwi habitat. There are also risks associated with public attitudes towards controls on their pet dogs and cats, hunting dogs and recreational activity that may impact on kiwi.

- 4 **Iwi** - Maori have a special interest in kiwi as a taonga or treasure. At a local level we have tried to involve the local tribe (Ngati Hikairo, a hapu of Ngati Tuwharetoa) at a range of levels from seeking their support to active hands-on involvement with egg removal and especially with the return of sub-adults from captivity. Consultation, negotiation and involvement with iwi is an important part of the project. To ignore their perspective on a range of issues is to risk major operational failure. Maori protocols for doing things within their rohe (ancestral domain) must be acknowledged and accommodated by the department.
- 5 **Financial** - the cost of the integrated management approach described above is significant - in excess of \$1 million over the next five years. In Tongariro Forest alone there is no guarantee that the programme will be successful.
- 6 **Political** - Because government have committed significant resources into the Kiwi Sanctuaries as part of their Biodiversity Management Strategy, they want to be assured of outcomes that result in the ongoing survival of kiwi on mainland New Zealand. If we fail to save the kiwi at at least some mainland locations, funding for further initiatives may be more difficult to acquire.

## Conclusions

Successful kiwi conservation involves a multidisciplinary approach including specific public and statutory advocacy; research and development; extensive integrated pest management; and intensive hand-on management at an individual species level. At all levels there are risks because the issues are complex, technology to deal with many of these issues is limited or expensive, and there is high expectation and intense public interest in the outcome. Identifying and attempting to actively manage these risks is a vital part of securing the future of our national icon.

Cam Speedy  
*Technical Support  
 Supervisor  
 - Biodiversity*



