

TARGET TAUPO

A Newsletter for Hunters and Anglers
in the Tongariro/Taupo Conservancy

MARCH 1998, ISSUE 27

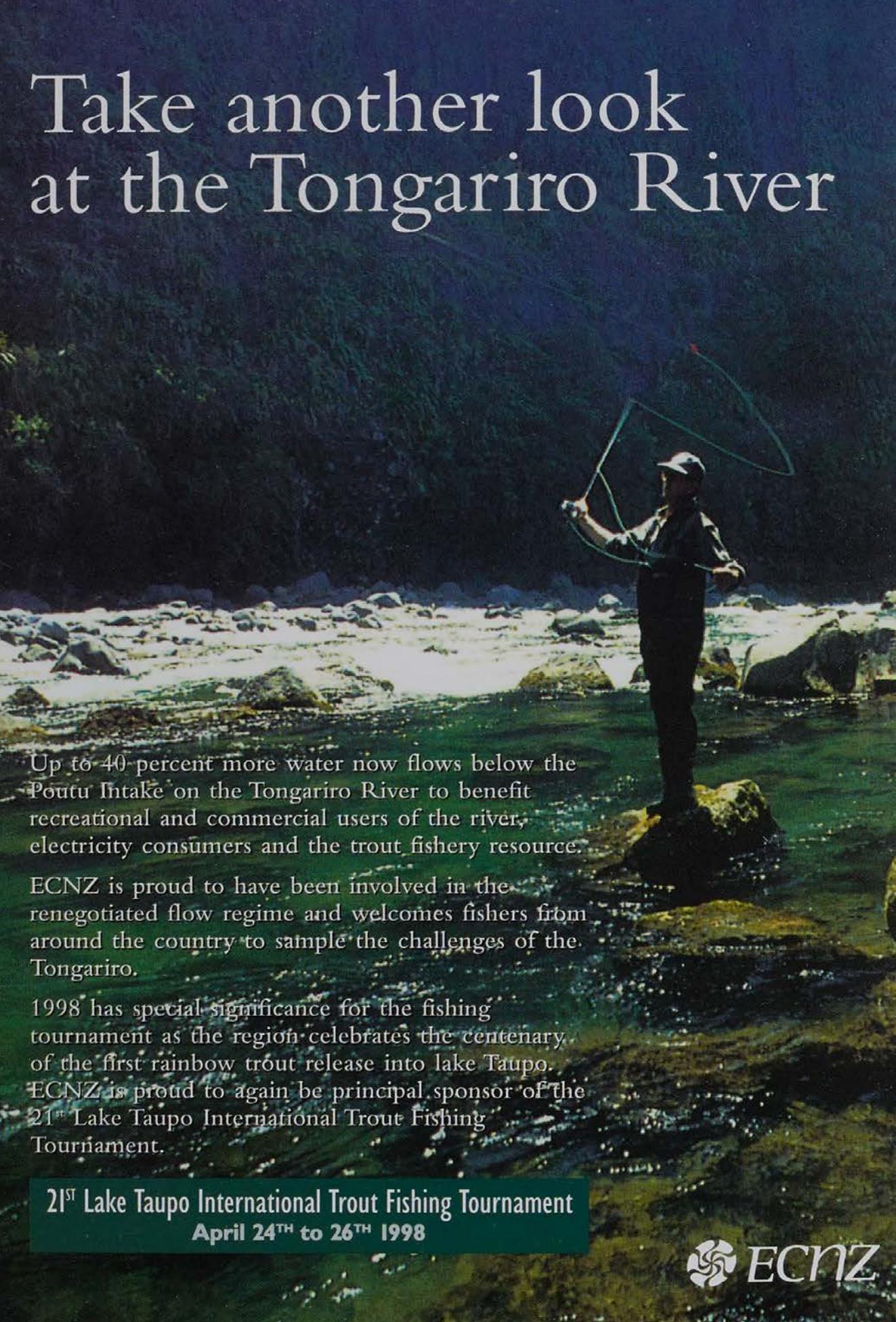


100 YEARS OF RAINBOW TROUT



Department of Conservation
Te Papa Atawhai

Take another look at the Tongariro River

A photograph of a man fly-fishing in a river. He is standing on a rocky bank, wearing a dark jacket and a white cap. His right arm is extended, holding a fly rod with a green line that curves back towards him. The river flows through the middle ground, with more rocks and water visible. The background is a dense forest of tall, dark trees.

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TARGET TAUPO

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in the Tongariro/Taupo Conservancy

MARCH 1998, ISSUE 27

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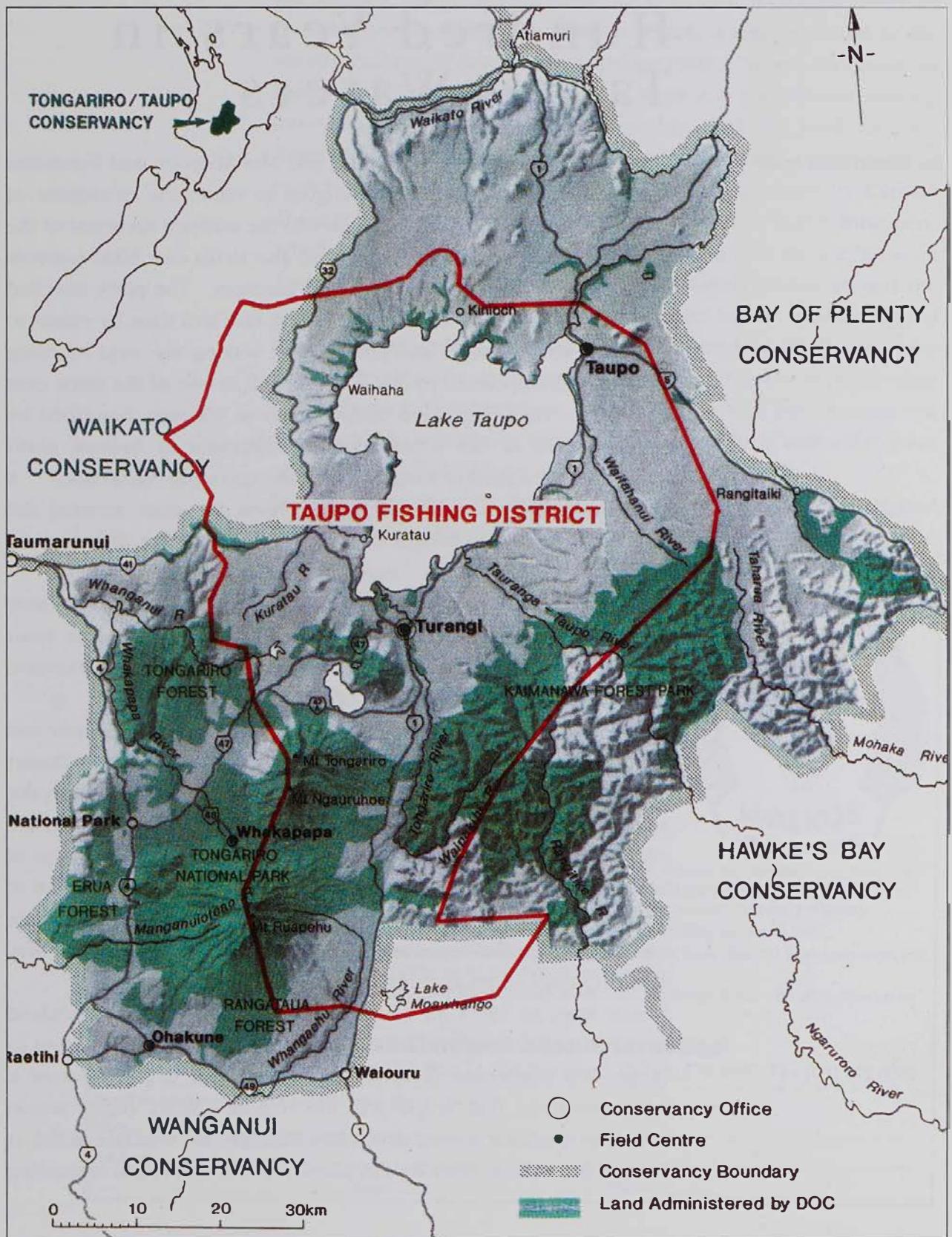
Cover photo:
24 February 1998 -
centenary
celebrations of the
introduction of
rainbow trout into
Taupo waters
Photographs by
DOC and Len Birch

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Tongariro/Taupo Conservancy



Rainbow Trout: One Hundred Years in Taupo Waters

by Glenn Maclean

On a day in late February 1898 Mr and Mrs Malcolm and Forrestina Ross and Mr A.R. Lowe left Wellington to climb the mountains of Tongariro National Park. Lowe, who was the assistant secretary of the Wellington Acclimatisation Society, had also in his care 5000 rainbow trout fry from the society's Masterton hatchery. The party travelled north to Mangaonoho on the main trunk line and then by coach to Ohingaiti where they overnighted. On waking the next morning they were disappointed to discover that fish in two of the three cans had died. They continued on by coach to Waiouru, described by Malcolm Ross as "*an outpost on a wilderness of tussock plain backed by the snows of Ruapehu and the steaming Ngauruhoe*". A combination of a rough road which shook the cans, aerating the water, and frequent changes of fresh water whenever they crossed small streams ensured the remaining fry survived.

On reaching Waiouru they liberated the first of the fry in a dam near the stables. It is likely that it is from this release that the trout population in the Waitangi stream, which flows west from Waiouru, was established.

The next morning, 24 February 1898, the party hired a wagonette and continued their journey north. Close to the summit of the Desert Road they came to the first of several streams which flow into the Tongariro River. Here at the ford on the upper Waikato stream the party conducted a small ceremony and Forrestina Ross, by virtue of being the only woman in the party, released the first pannikin-full of rainbow trout into Taupo waters. Later on the party also made releases into the Te Piripiri and Mangatoetoui streams on their way to successfully climb all three mountains in the national park.

A year later, in 1899, Mr Cecil Whitney approached the Auckland Acclimatisation Society to make further releases of rainbow trout in Taupo. The suggestion received little enthusiasm, in part because it was considered that Taupo was too remote. What angler would bother to travel for several days, often through bad weather, to fish at Taupo? In response Whitney circulated a petition at Taupo requesting

that the society stock Lake Taupo and its rivers with rainbow trout in the spring of 1900. In a paper he wrote in 1937 Whitney claimed all but one person signed the petition which, when presented to the society, had the desired result. In late 1900 a "liberal allocation" of trout was released into the Waikato River and the streams flowing into the lake. Further releases followed in 1901 and 1902. In 1903 Reverend Henry Fletcher arranged that the Auckland Acclimatisation Society send a further 5000 fry, which were received by Captain Thomas Ryan. Ryan was the master of the steamer "R.M.S. Tongariro" which provided a regular mail, passenger and goods service between Taupo and Tokaanu. The fish were immediately loaded aboard the steamer to be released into all the tributaries on the western side of the lake. Ryan undertook similar releases through to 1906, in the later years receiving the consignment as eyed ova which were then hatched under his supervision. The society allowed him as much ova as he could handle and in evidence given later Ryan claimed to have released about 220,000 fry in the years 1905 and 1906.

In April 1904 the first rainbow trout was caught which weighed 1.36kg. Yet by 1906 Count Fritz von Hochberg, who otherwise found



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very little to commend the North Island, wrote of being impressed by a rainbow trout caught by Robert Jones, landlord of the Tokaanu Hotel, which weighed 8kg. By 1907 rainbow trout were the dominant species in the lake, surpassing the brown trout which were introduced in 1887, in numbers although not in weight. Anglers were delighted; the whole impetus for the introduction of rainbow trout had arisen through disappointment with the difficulty of catching brown trout. Word quickly spread and anglers in New Zealand and from overseas were soon flocking to Taupo. In the beginning the fishing was confined to the Waikato River and the stream mouths around the lake. Gradually though, anglers tested the rivers, many developing a preference for this form of angling. One of the first to fish the Tongariro River was Major Rhys Wykeham Jones who with a party of friends moved upstream from the Delta to fish near the road bridge in 1909. Facilities quickly established to cater for the rush of anglers. Robert Jones built a camp at the mouth of the Tongariro River and another on the banks near the Hut Pool some 400 metres downstream of the road bridge. This camp was a favourite of anglers

and staying there brought certain privileges. Each angler was allowed a pool to themselves until midday when they changed with another angler. A few anglers chose to fish with a fly but most fished with Devon spinners, a metal minnow with two or three treble hooks. A typical catch was that of Charles C. Percival of England, who between 26 March and 25 May 1911 caught 354 fish weighing 1376kg, the largest 6.8kg.

Then in about 1912 the size and quality of the trout began to decline rapidly as the population of the native fish, the koaro, collapsed under the predatory pressure. The

The 1920s reflected the golden years of the Taupo fishery. Typical of this time is this photograph of Bob Floyd with rainbow trout of 19lb and 21-1/2lb, May 1924. Photograph: Mrs F Whittaker



authorities decided the trout population should be reduced and in 1912 the Tourist Department began buying trout from anglers. Anglers however were reluctant to sell their catch and so controlled netting was undertaken, the fish smoked and sent to markets in Auckland and Wellington to defray expenses. Between 1913 and 1920 103,000 trout were sold and many others unfit for eating were buried. In 1917 the average size had fallen to 1.45kg but by 1920 the population was making a remarkable recovery and netting ceased. By 1924 the size and condition of trout exceeded the peak of 1910, and the mid-1920s probably reflect the best years of the Taupo fishery. Pat Burstall, a former Conservator of Wildlife, lists a rainbow of 12.5kg caught at the mouth of the Waitahanui River in 1924 as the largest caught on a rod and line in this period while Ralph Ward, a Taupo historian, suggests a fish of 9.9kg caught by William Branson in the 1923/24 season was the largest ever caught on a fly. There is also a report of J.D.A. Painton of Taupo catching a 10.6kg rainbow at the Waitahanui stream mouth one night in 1925, a night in which he caught 11 fish, 10 of which were over 9kg. These fish all pale in comparison though to a fish described by Budge Hintz, a 17kg (37.5lb) rainbow caught in the Mangamutu stream prior to the First World War. He records Awhi Northcroft as saying "*Big fish! We had to cut it in two to weigh it*".

In 1926 Zane Grey, a noted Western author, made the first of his three visits to the Taupo area. Prior to this all the fishing on the Tongariro River essentially occurred in an area between the Hut camp up to the bluff above the road bridge. However Grey's party was taken by Hoka Downs, whose family owned a large area along the upper Tongariro, to the Dreadnought Pool just upstream of the Poutu confluence. Grey wrote of his outstanding success in *Tales of the Angler's Eldorado: New Zealand* and the government also took the opportunity to publicise his visit to the area. Suddenly the lower river was not the only area of the Tongariro. This was further emphasised when the Duchess of York expressed a wish to undertake some trout fishing. Following Grey's success a camp was erected at Kowhai flat beside what became known as the Duchess Pool. The 10-day visit by the Duke and Duchess of York in March 1927 along with Grey's visit the previous year promoted Lake Taupo around the world.

This period was to have an important influence on the future management of the fishery, a direction entwined in the developing

relationship between Ngati Tuwharetoa and the Crown. Through the first few years of the Taupo fishery it was, along with the Rotorua fishery, under the control of the Auckland Acclimatisation Society. This did not rest easily with Rotorua anglers who argued that they had little say in the management of Rotorua and they petitioned the government to set up a new society based on the local region. In 1906 the government, realising the tourism potential and the need to ensure the sustainability of the fisheries, instead took control, initially vesting the fisheries in the Department of Tourist and Health Resorts. The Department employed rangers and issued licences, which were accepted in Rotorua but only to a limited extent in Taupo. Trout were held to be the property of the Crown but in Taupo anglers' access to the waters and control of the rivers and streams was contested by the

Maori landowners, some of whom issued their own licences. As the number of anglers attracted by the fishing increased in the early 1920s so too did concern over landowners charging anglers to fish across their land and over the lease or purchase of land by wealthy visitors to obtain exclusive access to prime sections of the fishery. This was not in keeping with the desire that the fishery should be accessible to all New Zealanders, and so in 1924 the Crown entered into negotiation with Ngati Tuwharetoa reaching an agreement later enshrined in an Act of Parliament. That Act, the Maori Land Amendment and Maori Land Claims Adjustment Act 1926 (or "the special Act" as it is more commonly known) guarantees a licensed angler foot access to fish the streams and



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lake, and the general public access to the lake. The Tuwharetoa Maori Trust Board was paid £3,000 per annum plus a sum equivalent to half of the revenue from fishing licences, licensing of commercial boats, camp ground fees and fishing fines in excess of this. Not until 1938 did licence revenue exceed £3,000. Today the cost is borne by taxpayers and not anglers, in recognition of the benefits to all New Zealanders of this agreement. It is very easy to take the access for granted but it is one of the major attributes of the Act and therefore the Taupo fishery.

In addition to the access provisions, the 1926 Act required that the Taupo fishery was managed by the Crown. The responsibility for management was vested with the Department of Internal Affairs. Full-time rangers were appointed at Taupo and Turangi, and the Tongariro Trout Hatchery (now the National Trout Centre) was established to collect wild eggs and distribute them locally and for the maintenance of trout fisheries elsewhere.

New regulations issued under the 1926 act included different licence fees for local residents (Adult Season £1.10s), other New Zealanders (£3) and anyone else (£6). Without allowing for inflation over the last 62 years, these equate to \$3, \$6 and \$12 respectively. The season ran from 1 November to the 31 May and the daily bag limit was set at 25 fish with a minimum legal length of 300mm (12"). Fly fishing only waters were established on the Waitahanui River and tributary streams of the Tongariro but not on the mainstem, as Zane Grey would lament in his last visit in 1929.

The golden years were short lived and by the 1930s it was again apparent that the trout population had outgrown its food supply. Coincidentally a similar situation was also occurring in Lakes Tarawera and Okataina and smelt, which had been successfully released into Lake Rotorua in 1907, were in turn released into these lakes. Within two years a huge turnaround occurred in the size and condition of the trout and so not surprisingly the release of smelt from Lake Tarawera into Lake Taupo was trialed in 1934. Releases of smelt continued at intervals through to October 1939 and by 1940 smelt were clearly established in the lake. By 1942 smelt were a large part of the diet of Taupo trout, which has remained unchanged to today.

Despite the downturn in the fishery in the 1930s an issue arose over the number of anglers fishing on the Tongariro and on 20 June 1933

The Waiouru to Tokaanu track, April 1925. Despite its remoteness the quality of the Taupo fishery soon attracted anglers from all around the world.
Photograph: Mrs F Whittaker



the Upper Waikato and Tongariro Anglers' Club passed a remit "*That the Minister of Internal Affairs be asked to open up more fishing waters above the Dreadnought Pool, to relieve the congestion of rods on the river*". In a supporting article in the October issue of N.Z Fishing and Shooting Gazette, L. Hanlon, the president of the club wrote "*It is felt by all anglers who visit the Tongariro, that owing to the congestion of rods on the pools now available there is urgent need of more angling water being made accessible to them ... arrive to find the famous pools occupied by a dozen rods or more, to their profound astonishment and disgust, many of them finding it hard to find a place where they can get a fish as most of them are not inclined to take part in the unseemly rush to get there first, which has, of late years, become the common order of the day*". By 1934 fishing between the Delta and Kowhai Flat on the Tongariro was restricted to fly only which was extended to cover the whole river during the month of May.

Licence sales, which had numbered 4000 in the 1930/31 season, rose steadily to 8500 in the 1938/39 season before the Second World War caused a marked drop. However by 1948/49 licence sales had exceeded those of the 1938/39 season. Concern increased about maintaining the fishery in a satisfactory state in the face of this rapidly expanding angling pressure. Steps were taken to reduce the pressure including closing the Whitikau stream to angling in 1950, reduction of the daily bag limit from 12 to 10 fish in 1938 and from 10 to 6 fish in 1948, as well as shortening the season on both the lake and tributaries. In addition stricter enforcement of the regulations and protection of spawning fish was carried out and the Whitikau Falls

were blasted to improve access to the upper spawning grounds. The fall in angling pressure was not immediately reflected in the size and condition of the fish, but became apparent after the war. Many poorly conditioned fish were caught and the Department of Internal Affairs in association with scientists from the Marine Department saw an urgent need for a detailed study into the trout populations. In 1951 the first major study was undertaken, the results of which provided a significant advance in the understanding of how the Taupo trout fishery functioned. One of the most important discoveries was that poorly conditioned trout were not diseased as previously thought, but fish which had spawned and not recovered condition. Regulations of the time included an open season from 1 November to 31 May, a daily bag limit of six fish and a prohibition on trolling within 200 metres of the shore around the whole lake. In addition more than one million fry from the Tongariro trout hatchery were liberated into the lake annually. Data from angling surveys indicated anglers were returning 30% of their catch, inevitably rejecting the poorer conditioned fish which contributed to the high proportion of older fish in the population. Despite the large trout population the Department of Internal Affairs in a report on the situation commented "*The individual angler today catches less trout than formerly, largely because with the great increase in numbers of anglers, congested conditions make for competition among them*". From the results of the studies the scientist in charge, D.F Hobbs, commented in 1954 "*From evidence now becoming available it would appear that the cumulative effects of a series of happenings which tended to limit exploitation, outweighed the results of expanding angling pressure. There was probably inadequate allowance for the natural resiliency of a wild stock under increasing pressure, and for the extent to which additional angling effort tended to be competitive between anglers with the result that cropping of the stock did not increase proportionately to the enormously increased sales of licences*".

To improve the condition of the trout it was decided that greater harvesting of "unthrifty" old trout would divert the available food to the younger, stronger growing fish which should improve the average size. Therefore in 1954 and 1955, a special winter fishing season was permitted under strict controls. However to ensure sufficient fish were able to spawn angling was stopped on all the western and

northern streams around the lake and restricted to the lower reaches in the eastern tributaries. The bag limit was increased to eight fish and all fish caught were included in the bag, whether they were killed or not, to encourage anglers not to be selective.

By 1960 the quality of the fishery had still not improved very much and so fishing was permitted all year, the bag limit was removed and lead and wire lines allowed. This time the fishery responded and in 1963 a bag limit of 20 fish was reimposed. In the early 1960s an experiment began to test the effects of large-scale hatchery stocking of the lake. This involved releasing up to 100,000 marked rainbow trout per year and then looking at the proportion of stocked to wild fish in subsequent anglers' catches. This indicated the practice achieved very little in terms of putting more fish in anglers bags and so stocking of the lake ceased in 1965. Instead of the widespread netting practised early in the century to reduce trout numbers, the same effect had been achieved through adjustment of angling pressure and angling methods, the anglers maintaining the balance between trout numbers and the food supply.

The number of anglers using the fishery continued to grow steadily, reaching 69,105 in the 1980/81 season and peaking at 82,000 in the 1987/88 season. At this time it was considered that the fishery was so large that it was a long way from facing any problems as a result of the increasing angling harvest. D.J. Stack, the Conservator of Wildlife in charge of the Taupo fishery wrote in 1983 "*There is little concern that increasing tourist angling will over exploit our trout stocks. There is ample evidence that angling pressure is far from saturation point*".

In 1987 the Wildlife Service of the Department of Internal Affairs, which managed the Taupo fishery, was restructured into the new Department of Conservation. Under the Conservation Act acclimatisation societies and conservancy councils were abolished and replaced by regional fish and game councils. However the 1926 Act required that the Crown manage the Taupo fishery and the Conservation Act stipulated the Director General of Conservation undertake this role with all the powers of a fish and game council to do so. Prior to this, expenditure on management of the Taupo fishery bore little relationship to the revenue derived from fishing licence sales. Instead revenues were absorbed into the government's consolidated fund and an annual allocation of a much smaller sum

was made. However the Conservation Act required sports fish and game management to become totally user funded, the corollary being all the money derived from licence sales be spent on management. Therefore since 1987 all expenditure on the Taupo fishery has been equivalent to its level of use. Recognising that user input to the fishery was essential, the Taupo Fishery Advisory Committee was established in 1990. The committee is made up of representatives of local fishing clubs and groups, national fishing interests and the Tuwharetoa Maori Trust Board to advise the Minister of Conservation and the Department of Conservation on management policies and activities.

Coinciding with this change, the fishery entered a period of decline reflected in particular by very low catch rates amongst winter anglers on the rivers. The fishery managers began to suspect that overharvest could after all be having a major impact and undertook a three-year study to assess trout production in the lake. The fishery reached a low point in the 1990/91 season. In this same season an intensive year long survey estimated the angling harvest to be approximately 113,000 trout or 30% to 50% of the total estimated trout production in 1988 and 1989. It was clear overharvest was occurring in the lake, which was limiting the number of fish surviving to reach maturity and so run the rivers to spawn. The managers were confident sufficient fish were spawning to ensure the sustainability of the fishery but there were not enough fish in the runs to provide satisfactory winter angling.

The response was to reduce the daily bag limit from eight fish down to three from December 1990. Aided by several seasons of favourable conditions the fishery quickly responded, reaching a peak of 205,000 legal-sized trout in the lake in November 1994, three times more than the numbers measured in 1988 and 1989.

The 1926 Act had secured to the Crown title to the beds of Lake Taupo and certain parts of its tributaries. In 1993 title was returned to the Ngati Tuwharetoa people and is now administered by a Crown iwi structure called the Taupo-nui-a-Tia Management Board. This did not affect the public's access to Taupo waters but was another step in strengthening the relationship between Ngati Tuwharetoa and the Crown.

In September 1995 Mount Ruapehu erupted, depositing ash into the lake and rivers, and in the same month and again in December two

very large floods swept down the rivers. A research project in the mid-1980s had established that large floods in spring have a very detrimental effect on the survival of young trout fry. As a consequence the fishery managers expected the year class to be very weak and implemented an increase in the minimum legal size of trout from 35cm to 45cm. This had the effect of protecting the year class through the main period of lake angling, ensuring a greater proportion of fish reached maturity. The fishery has faced such adverse situations before and will continue to do so; it is all part of a wild fishery in such a rugged landscape. However the regulation changes reflect how the knowledge and management of the fishery have developed over the last 100 years.

It is fitting that 100 years on the rainbow trout fishery is in a golden year, the size and condition of the fish the equal of any year since the 1920s and unmatched elsewhere. With the advances in knowledge, in environmental care and awareness and with the ever-developing relationship between the Crown and Ngati Tuwharetoa there is every reason to look forward to another 100 years of great fishing.

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Kiwi - Under Threat

by Nina Rodsjo, Cam
Speedy and Harry Keys

Kiwi populations are declining nationwide. Older birds are dying at a rate of 6% to 8% every year, while few young birds are surviving in the wild. If this pattern cannot be stopped it is estimated that kiwi will be extinct in the North Island by 2015.

Within the Tongariro/Taupo Conservancy, there are three main parts to kiwi conservation. Firstly it is important to prevent further destruction of kiwi habitat, particularly on private land. The second aspect is the management of threats to kiwi. The greatest threat is from introduced predators (stoats, dogs, cats and ferrets) but possum traps and cars also kill or maim many kiwi. The third aspect involves increasing recruitment of juvenile birds, particularly protecting them from stoat predation.

On the issue of dogs and cats, educating people is a vital part of kiwi management in order to minimise these impacts on the kiwi. The possum trap and car issues also involve important education initiatives.

But it is the stoat problem that is the hardest nut to crack. Currently our ability to control stoat impacts on kiwi chicks is very limited. About 95% of kiwis hatched in the wild are killed by stoats within three weeks of hatching. Until such time as new skills and technological developments are obtained to significantly

*Radio-tagged male
kiwi lead staff to the
nest sites. Ross
Martin cradles "Andy"*



reduce stoat populations, kiwi will continue to decline. Research currently underway is providing some cause for optimism - it appears that it may be possible to limit impacts from stoats by poisoning campaigns which target their main prey, rats, which then transfer the poison to the stoats which prey on them. However one of the toxins used, brodifacoum (the active ingredient in Talon, a poison widely used by the general public) raises concerns because it is quite persistent in the environment.

The most active part of kiwi conservation has become the removal of kiwi eggs from wild nests to be hatched and raised in captivity. This buys time for researchers and managers to develop predator control skills and technologies.

Tongariro Forest contains the most important population of kiwi within the Tongariro/Taupo Conservancy, it being the largest of several remnant kiwi populations in the central North Island. In this forest area several adult male kiwi have been caught and fitted with radio transmitters.

This allows staff to monitor their breeding behaviour and so intercept

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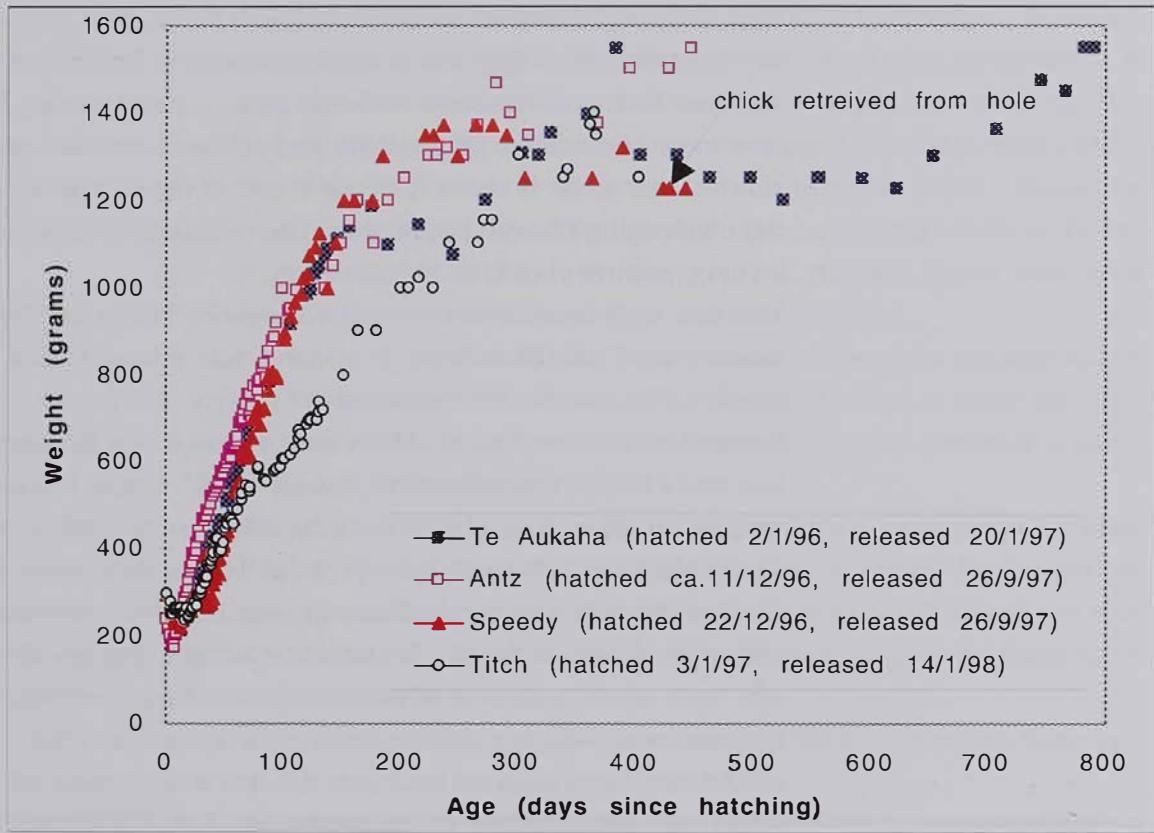
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eggs at the right time to successfully hatch them. The project is part of "Operation Nest Egg" and is also happening in Northland, Urewera National Park and Westland National Park. Nationwide, 26 chicks have now been raised in captivity and released into the wild. The survival rate so far is about 60% with most of the deaths occurring in the challenging Okarito population. The technique is developing into a vital component of kiwi conservation.

The first eggs were taken from the Tongariro Forest in 1995 and in January 1997 the first chick, Te Aukaha, was released back into the forest. Te Aukaha has managed to survive for over a year. In September 1997, two more chicks were released into the forest to join him and a fourth was released in January 1998. Graph 1 illustrates the weights of these four chicks from hatching to November 1997 and shows they lost 120 to 250gms or 9% to 16% of their body weight in the first three to four weeks following release. Such monitoring pre- and post-release is crucial. In particular weight changes after release may be a useful indicator of pre- and post-release "conditioning" and the ease with which a chick adjusts to its life in the wild. All these chicks have been released back into the area where stoats are trapped, which also reduces their risk of predation.

Six more kiwi eggs have been removed from the forest during the 1997/98 breeding season and three of these have successfully hatched. The resultant chicks are currently being raised in captivity and are due for release in the spring of 1998. Unfortunately, funding and resources limit the amount of work that can be done. Many hours of staff time are required and equipment costs are high (\$330 for each radio transmitter). Rearing costs are also high, up to \$1300 per chick to raise to release size!

Other management has been carried out in Tongariro Forest as well to protect kiwi. The first was support for a kiwi research project by Jonathon Miles and Dr Murray Potter from Massey University. Subsequently most staff resources and volunteer effort have gone into trapping stoats. But we have done a 1080 programme as part of a wider campaign carried out by the Animal Health Board and the regional council. We have also started to educate hunters about the need for dog control. Forest vegetation monitoring has shown that possum browse has reduced owing to the possum control and we are also getting higher rates of kiwi calls during our annual kiwi call monitoring. There is also direct evidence from nearby that there has



Graph 1: Growth rates of the first four kiwi chicks at Rainbow Springs and after release into Tongariro Forest.

been some kiwi recruitment as a result of reduced stoat predation. Our next major test of the efficacy of this will be release of captive reared chicks into their fathers' territories where there has been no stoat trapping.

Kiwi management nationally is co-ordinated by Dr Hugh Robertson with assistance from fellow Department of Conservation scientist Rogan Colbourne, through the Bank of New Zealand "Kiwi Recovery Plan". This special plan to protect kiwi involves several organisations. The Department of Conservation is responsible for administering the plan and protecting kiwi overall, while Bank of New Zealand is the principal sponsor. The Royal Forest & Bird Protection Society is an independent organisation which helps with the sponsorship funding allocation process.

Captive breeding institutions such as the Rainbow and Fairy Springs, Auckland Zoo and the Mount Bruce Wildlife Centre all look after kiwi chicks for the year that they spend in captivity until they get big

Cam Speedy marks the top of a retrieved kiwi egg to ensure it is kept in an upright position



enough to protect themselves. But numerous volunteer organisations (such as the Wilderness Trust, which has been involved with the Tongariro Forest Project) and individual volunteers are also involved. These volunteers who freely give their time and effort to help protect kiwi, are a vital part of saving our national bird.

However, ultimately it is support from all New Zealanders that will make the most difference for our kiwi. Care with dogs, cats, possum traps on our roads, and looking after our remaining kiwi habitat are things we can all do to help the plight of the kiwi. The alternative of losing kiwi from the mainland of New Zealand in our lifetime is absolutely unthinkable - so we must all do our bit!

Lake Levels and Angling Opportunities in Lake Otamangakau

by Michel Dedual

Radio tracking of trout in Lake Otamangakau (*Target Taupo*, issue 26) showed that lake level fluctuations were not influencing the habitat used by rainbow trout. However, as the lake level increased brown trout took the opportunity to venture into the newly formed swampy areas. Observations made from the bank indicate that brown trout work around and defend a patch of weed in a consistent manner. The same fish can be seen passing by (generally in the same direction) at regular intervals, feeding mainly on damselfly nymphs and snails or chasing intruders. Brown trout are most visible as they cruise through the weed-free zone existing between the edges of the weed bed and the beach. Therefore, these weed-free zones are the favourite fishing "possies" for anglers stalking brown trout from the shore. A second group of shore-based anglers prefer to wade out and cast to the outside of the weed beds, fishing the deep water for both brown trout and the more pelagic (open water) rainbow trout. If the lake level is too high they cannot wade close enough to the weed beds to be able to cast to the far side.

We undertook a study to explore how the Lake Otamangakau water level affects the availability of fishing possies, catch rate, and angler satisfaction and secondly to assess what lake level management would provide for optimal angler satisfaction.

We identified the stretches of the shore where most of the shore anglers were seen fishing. We then measured the length of these stretches and the water depth at the edge of the weed bed. Finally we assessed how the amount of suitable shoreline angling fluctuates with lake level.

To address the second aim of our study we carried out angling surveys between 1996 and 1997, including a satisfaction questionnaire. Shore anglers were approached as they were fishing and asked how long they had been fishing and the number of fish caught so as to calculate their individual catch rate. The average catch

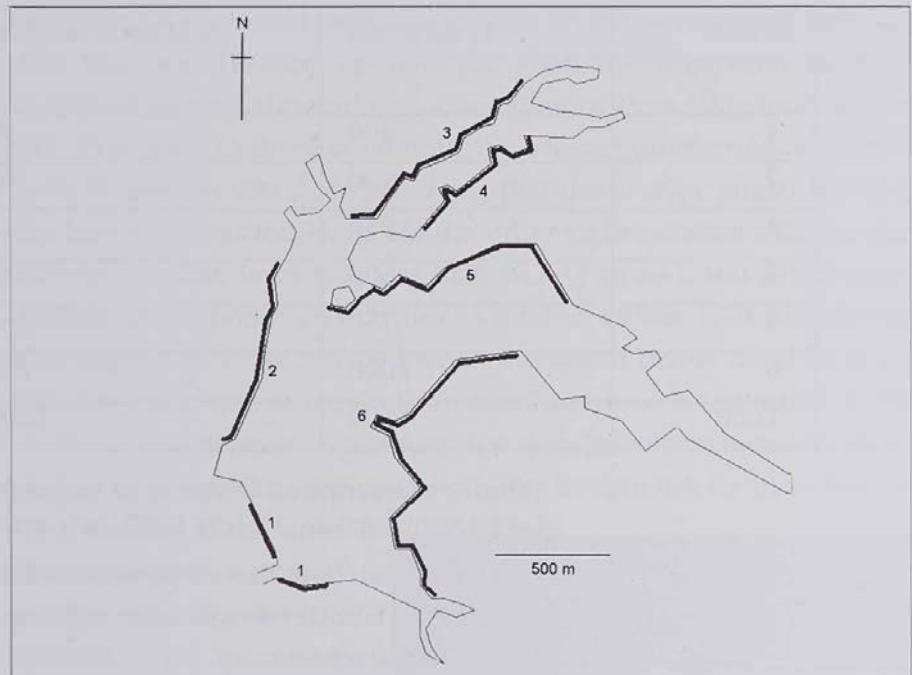


Figure 1: Locations of the favourite sections of Lake Otamangakau for shore angling.

rate for each survey was calculated by averaging all of these individual catch rates. As part of the satisfaction survey the anglers were also asked if the lake level on that day was too high, okay, or too low. They were considered to be satisfied if they reported the lake level to be okay. For the numerical analysis of satisfaction we used a rating system that consisted of 1 for too low, 2 for okay, and 3 for too high. The anglers were then asked what, if anything, they would change about the lake level, and why.

Surveys identified six stretches along the shore of the lake where angling is most popular (Figure 1). The northern and north-western shores (stretches 2, 3 and 5) are mainly composed of volcanic material deposited from an eruption of Mount Tongariro approximately 9700 years ago. The composition of this soil is not suitable to sustain any plant growth and it is likely that unless a substantial deposition of sediment occurs the lake bottom will remain free from weed. The eastern and southern shores (stretches 1, 6 and 4) which border the swamp are more muddy. Furthermore, the slope is generally less steep than where volcanic material is present. These geologic and morphologic variations of the shore create differences in the average water depth at the edge of the weed amongst stretches. Stretch 5 has the deepest water along the weed

Stretch	Length (m)	% of Total Length	Average Depth at the Weed Bed Edge (cm)
1	400	9	60
2	900	20	85
3	950	21	75
4	600	13	60
5	750	15	90
6	1000	22	0
Total	4600	100	

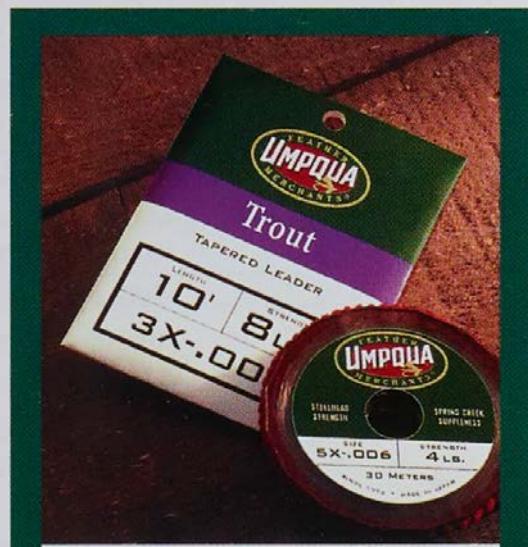
Table 1: Description of the most popular shore angling stretches, Lake Otamangakau, 17 July 1997, lake level = 610.78 m.a.s.l.

bed and stretch 6 the shallowest (Table 1). As a consequence changes in lake level will have varying effects depending on the stretch of shoreline.

Personal observations suggest that brown trout require a minimum depth of about 20cm to swim comfortably. It is assumed that as long as 20cm of water are present along the edge of the weed bed the angling opportunities will be preserved. The first stretch to be affected by changes in lake level is stretch 6 and the last one is stretch 5. The entire shore angling opportunities are preserved at a minimum lake level of 610.98 m.a.s.l. (metres above sea level). For a lake level lower than this the amount of suitable shore angling area starts to decrease and disappears completely when the level reaches 610.08 m.a.s.l. At this level the depth at the weed bed edge of stretch 5 is less than 20cm (Graph 1). Between October 1996 and March 1997, 12 angling satisfaction surveys were carried out on Lake Otamangakau, collecting data from 52 shore-based anglers. During the surveys the lake level averaged 611.13 m.a.s.l. and ranged from 610.58 to 611.65 m.a.s.l. The catch rate was not influenced by lake level and was highly variable but the lake level did influence angling satisfaction. The maximum angler satisfaction occurred when the lake level was at 611.08 m.a.s.l. (Graph 2).

As a second way of assessing the optimum level we adjusted the recorded level on the day by the amount of change desired by the angler. This suggested the most desired lake level was 611.13 m.a.s.l. The most common justifications for adjustment of the lake level were that it would provide better fishing (18 cases), easier access (nine cases), and more fishing opportunities (seven cases). Fishing

opportunities included more space, more shoreline, and more options. The lake was flooded up into the shoreline vegetation on four occasions during the surveys, coinciding with a lake level above 611.33 m.a.s.l. In these conditions the average satisfaction measured from 20 anglers was 2.56, indicating that the average angler felt that the lake level was too high. On the other eight occasions during the surveys the lake level was less than 611.33 m.a.s.l. and the average angling satisfaction assessed from 32 interviews was 1.79. This shows that anglers are more satisfied when the lake is below flood levels. The low catch rate of brown trout from the shore is indicative of the challenge that these fish constitute. It is this challenge which appeals to anglers as well as the exciting opportunity to sight-fish for those brown trout cruising in the weed-free zone. It was a pleasant surprise to see that the optimal level calculated from the regression model of 611.08 m.a.s.l. (Graph 2) was so close to the level of 611.13 that the anglers would choose. It is noteworthy that the preferred lake level desired by anglers was exactly the same as the average lake level (611.13 m.a.s.l.) recorded during the angling surveys. This strongly suggests that it is not unrealistic to provide the optimal lake level for shore angling. The consistency among anglers regarding their preferred lake level is a sure reflection of the special conditions required to achieve good shoreline fishing in this lake. When

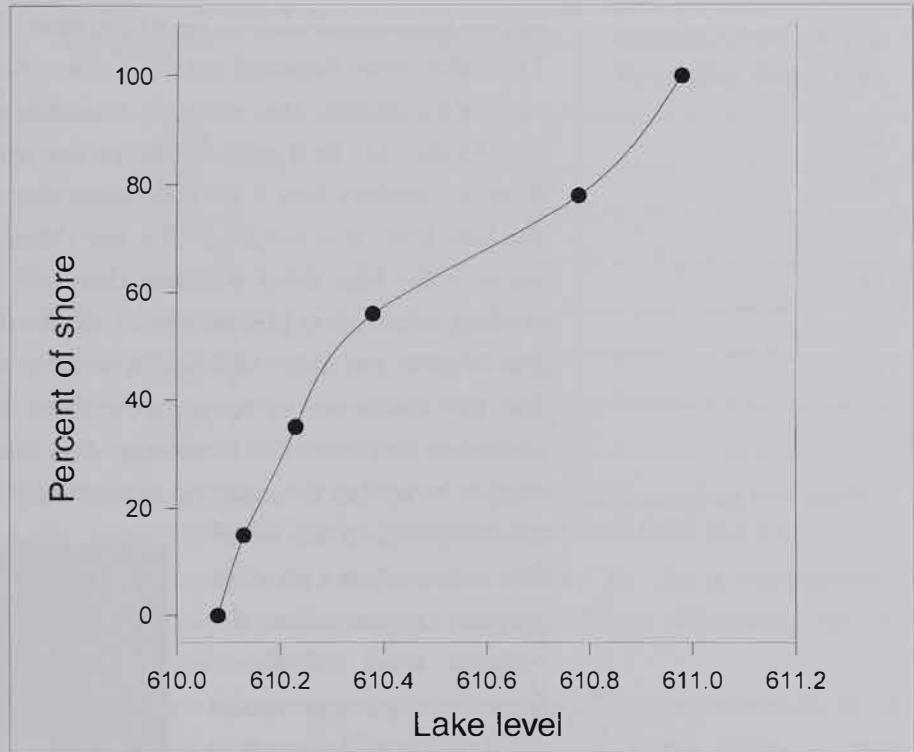


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Graph 2: Proportion of the total amount of favoured shore angling area in relation to Lake Otamangakau level

the level drops below 611 m.a.s.l. the weed-free zone starts to shrink, restricting angling options and space for those anglers targeting brown trout cruising inside the weed beds.

However, when the lake level rises above 611.13 m.a.s.l. the increased depth restricts the opportunity for those anglers wanting to wade out to cast into the open water channel. The lake level may also indirectly affect angling satisfaction through the presence or absence of rooted plants reaching the surface. In floating weed the fishing line gets tangled and the lure motion is impaired. Floating weed may rise to the surface either through constant lake level and growth of the plants or by a decrease in lake level.

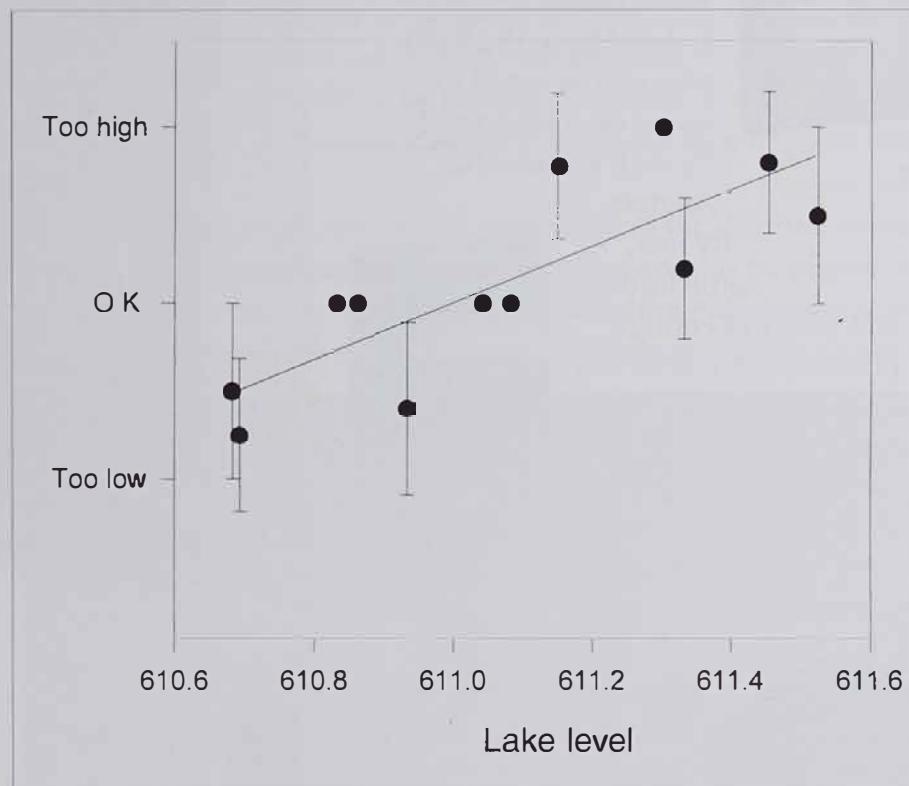
We recommend that the lake level should be kept as close as possible to 611.10 m.a.s.l. from October to May which is the legal fishing season in Lake Otamangakau.

From June to November the level could be kept slightly lower (level to be set). This would expose the weed to frosts which would knock it back, guaranteeing the existence of weed-free zones in the shallow margins especially along the eastern and southern shores. This lower winter level would also benefit ECNZ which would have a larger capacity

to absorb winter floods (up to a level of 611.96 m.a.s.l. when spilling over Te Whaiau dam occurs). The exposed weed beds would also provide valuable feeding areas for waterfowl over the winter period.

We would like to thank all the anglers who have kindly co-operated during the surveys. Without this information we would not have been in a position to recommend this lake level management regime which should benefit anglers in the future.

Another fine example of the value of the information that can be gathered from anglers was provided by the data recorded by a regular visitor to Lake Otamangakau. This angler meticulously recorded on a map the location and depth of all fish (158 brown and 173 rainbow trout) that he caught between January and February 1997. His records also included the contour of all weed beds present and the changes in fish behaviour that he noticed between day and night. The patterns of fish density, location and movements during the day fit extremely well with the radio-tracking results gleaned during the same period. Ralph's angling and observation records provided us with the ultimate verification that the results of our experiment were reliable. Many thanks Ralph.



Graph 3: Angling satisfaction in relation to the lake level, Lake Otamangakau, summer 1996-97

YOU SAW HIM TWICE LAST SEASON...

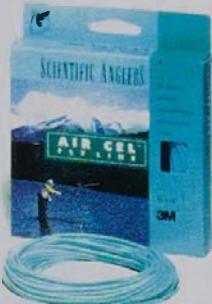
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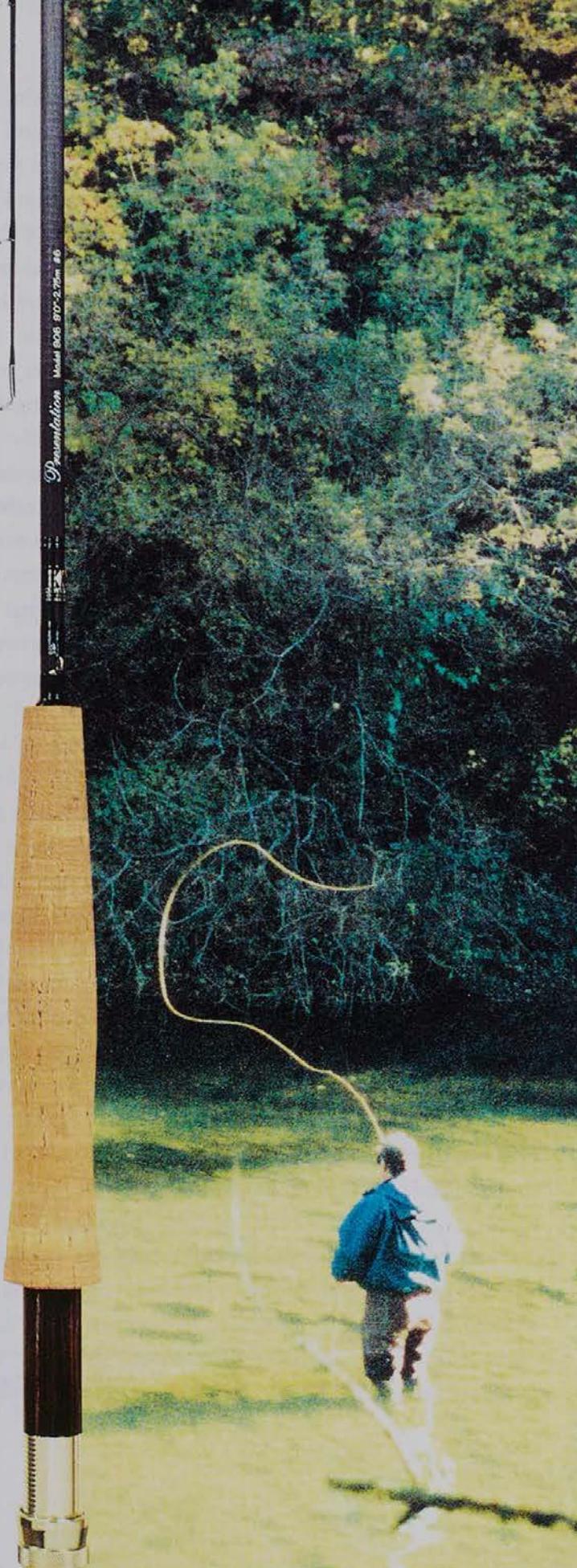
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Rangitikei Remote Experience Zone - Spring Helicopter Access

by Cam Speedy

The four helipads available in the Rangitikei Remote Experience Zone (REZ) of Kaimanawa Forest Park were again open from Labour Weekend to mid-December in 1997. A total of 25 parties made bookings for the four sites over the seven-week period. Of these, 22 parties actually made it into the hills, typically spending between four and seven nights in the area. The blustery spring winds and cooler temperatures seemed to delay the onset of spring yet again this year with "spring" hunting conditions not really apparent until early December. The wind in particular made hunting challenging for many hunters and was likely a key factor in keeping the deer off the tops.

Red deer numbers appear to be down this year both in terms of the number seen and killed and from various personal observations. Sika deer in comparison seem to be holding their own. Much of the sign evident in the heavily forested habitats of the catchment is sika deer sign.

The regrowth of bush lawyer kept well ahead of the deer last winter and strong mountain beech regeneration continues to be present in open gaps throughout most of the catchment. However, despite more younger deer than previous years in the jaw sample (Graph 4) and a

Upstream of the Ecology Junction camp site, 17 November 1997. With weather like this the spring flush was still several weeks off



Block	No. of Parties	No. of Hunters	Days Hunting Recorded	Sika Seen	Reds Seen	Sika Hind Kill	Sika Stag Kill	Red Hind Kill	Red Stag Kill	Jaws
Ecology Exclosure	5	16	60	27	5	4	-	2	1	4
Whakamarumaru Tops *	6	18	43	17	8	3	3	2	3	3
Ecology Junction *	7	28	108	17	37	3	2	8	2	12
Otamateanui Tops *	4	12	34	2	22	1	1	1	3	2
Totals 1997	22	74	245	63	72	11	6	13	9	21
1996	15	54	248	47	112	5	13	16	10	25
1995	15	45	151	53	115	9	3	22	21	19

* Information not received from one or more parties.

Table 2 summarises the 257 days of hunting recorded from the 18 returns received. Previous years' totals are shown at the bottom.

number of hinds obviously breeding in consecutive seasons, deer condition continues to suggest that deer numbers remain at greater density in the forested habitats of the REZ than this habitat can comfortably support. This is also supported by: observations of deer that had died during winter; a lack of palatable regeneration in understoreys accessible to deer; and one or two site localities favoured by deer (north-facing gully heads and windthrow with a north-easterly aspect) where beech seedlings are not regenerating in light gaps.

While the bush condition appears to be poorer than desirable from both a conservation and deer hunting perspective, the alpine environment continues to thrive under the low deer densities created by the current harvest regime.

Most parties seemed to enjoy their opportunity to visit the REZ this year and encouragingly the impact at campsites was lower than ever before. It seems (finally) that the message regarding human impact and rubbish is starting to get through - although the mess left by parties flown illegally into the "Whakamarumaru Tops" site during the "roar" suggests some parties still have about as much regard for the bush as they do for the law. This type of visitor continues to threaten the future of helicopter access for all users. Information on any such groups will be gladly accepted from the public and followed up by DOC staff.

An interesting aspect of the feedback this year was the differing perceptions of the size of deer population between parties. To help explain this, I have included a sample of the feedback received from four parties that visited this year:

"At the end of our seven day trip into the Rangitikei/Ecology Junction our opinion of the block is as follows: The fishing was extremely difficult. Many fish were seen but only two were landed, both in very good condition. Our landing site had been used recently and left tidy, however there had been a couple of small trees cut up, probably for firewood. Five untouched deer were found dead on the river flats and may have been there for a month or so. Four lots of deer guts were found on the tops with 3 x 20 litre containers of Jet A1 fuel. In the 30 years I have been hunting I have never seen so little deer sign over such a large area. Great for the bush I guess. Possum sign was also scarce. As far as deer numbers go it is my opinion that this area is being shot over."

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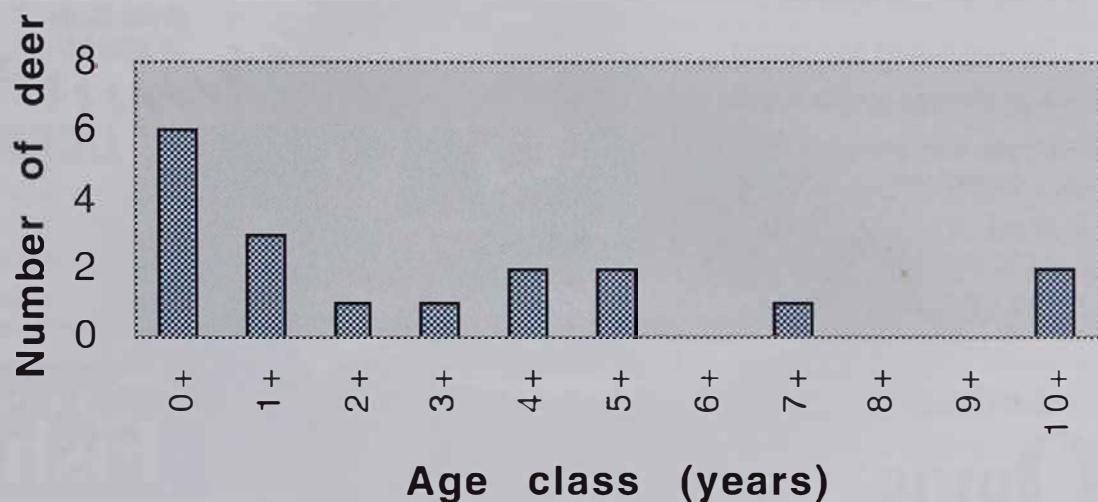
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from the air and that this is an extremely low deer population.
Kind regards
P.M."

"Once again thank you for the privilege of being able to fly into this site for a week. We all had an awesome week that seemed to go far too quickly. While we had a great week, the hunting was again disappointing. It was apparent that what promised to be a good spring earlier in the year did not eventuate in the Kaimanawas at the time we were in there. There was little growth on the flats both at Trick Creek and upstream of Ecology confluence, the deer were not using them extensively and probably hadn't for some time. We all hunted pretty hard for the week and were probably rewarded well for the challenging conditions. We ended up with three, a yearling sika hind from a tributary well upstream from camp, a mature red hind (in fawn) from a tributary downstream and a yearling red hind out of the main river. We had a couple of encounters that should have resulted in an animal but we seem to be a bit slow or they are getting faster! The weather was great for sunbathing over the week as we never had a drop of rain but the wind made the hunting very hard. We could never seem to get a consistent wind, every time we got into good country a wind shift had the deer running for cover. Speaking of cover, that's where we found all of the animals. They all seemed to be very high in the creek heads in



Graph 4: Age structure of a sample of deer harvested from the Rangitikei River catchment of Kaimanawa Forest Park - spring 1997 (all sexes and species combined)

tight cover (coprosma and lawyer). A couple of times in desperation I tried to hunt through the tight stuff, I found plenty of sign, all red hot, but the animals were about 100m ahead of me. Talking to Craig and Dave, that is where they shot all their deer; up high in the creek heads, right on dark. The country in between the tight cover is obviously being used, but I guess only as they move from one pocket to the next. We found the camp in great shape and left it as we found it, if not better. Thanks once again and I hope we might be able to book this or another block next year.

Yours sincerely

I.M."

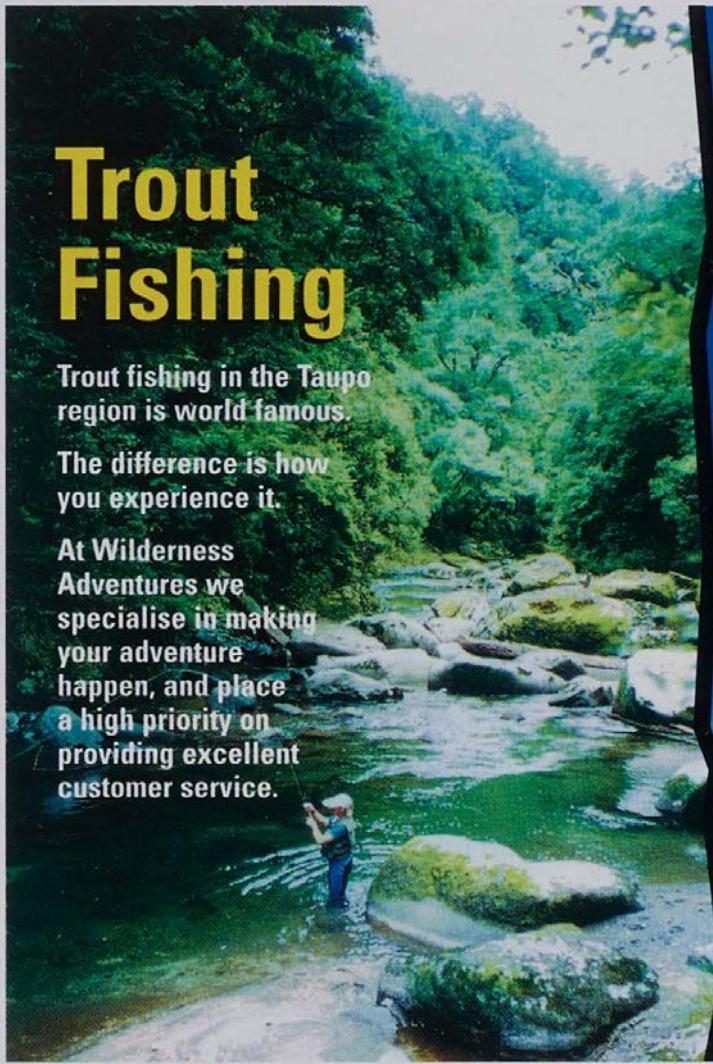
"Camp site was clean on our arrival. The sika deer were more educated than on my first trip to Ecology Creek in December 1988. Of

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the 16 seen (and a few shot) you can add another 13 encounters/whistles to that tally. Regrowth in guts was heavier than in 1988. I had three bad misses which would have improved our ratio. I guess that's hunting - looking forward to a return trip some time to even the score.

Regards

M.F."

"Enclosed are four jaw bones from the animals we shot in the Rangitikei this spring. The other animal (no jawbone) was a spiker (uneven length) taken 40 minutes upstream of Thunderbolt crossing - average condition. Not much animal sign within 45 minutes walk of camp for first few days, however, three animals were seen within 200 metres of camp (2 groups) on the last day. We had good weather, only drizzled, or should I say spitted, on two occasions and the wind was good for hunting. Campsite was clean - toilet sure does help to keep the place tidy.

Fish numbers were up on last time with most pools having three or more fish. Still doesn't make them any easier to catch! All three of us had a great time and are keen to go back next year. Not many places like this left where you can catch a trophy sized trout in the morning and head off and shoot a deer in the afternoon. Can you please let us know how old the jap stag was - our guess he was 10+ years.

Thanks a lot!

M.S."

These letters, typical of the feedback we get from hunters these days, show not only how different people perceive their blocks, but perhaps more importantly, how many of the hunters using the hills these days really do care about such places and want to look after them. One day, perhaps all "users" will have this attitude and the "abusers" with little regard for the bush or the law will cease to exist (don't hold your breath!). We are grateful to all the hunters who provided feedback and look forward to ongoing dialogue between managers and users in the interest of better management in the future.

Note: A prosecution is being followed for alleged illegal helicopter hunting activity in the area over Labour Weekend.

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Clements Road - A Model For the Future?

by Cam Speedy

Among New Zealand sika deer hunters, Clements Road is as well known as the Tongariro River is among anglers. It is the gateway to Kaimanawa Forest Park, easily accessible, and yet still wonderfully scenic. But it is also an excellent management model highlighting how recreational hunting can provide social, economic and ecological benefits to New Zealand.

Clements Road was opened up by loggers seeking red beech for fence battens just prior to and following the Second World War. Back then the area was remote, there were plenty of deer, and introduced predators had still not made a major dent on the local residents such as kiwi, bats and kaka. Indeed, these species appear to have still been relatively common. The road itself was a lifeline to the outside world for a bustling community based around the timber industry, but unfortunately it also let the outside world in, in the form of possums, rats, stoats and cats.

When the area was gazetted Forest Park in the early 1970s, the loggers moved out for good, while more and more visitors began to move in. In 1983, the area once known as State Forest 90 was gazetted a Recreational Hunting Area (RHA) under the Wild Animal Control Act in recognition of the area's accessibility and the value hunters placed on its sika deer as a hunting resource.

Since that time hunting pressure has remained intense. Currently over 1000 hours of hunting activity occur per square kilometre of forest bordering the road each year. This is almost 25 times greater than the national average for public conservation lands of 40 hours per square kilometre per annum. Under such an intense hunting regime deer numbers have continued to fall since the early 1980s with only skilled hunters now regularly successful. But there are those who know the secrets of what is for many a frustrating hunting block. A hard core of a dozen or more local, Rotorua, Bay of Plenty, Waikato and Auckland hunters consistently take deer. Their personal contributions to the hunting diary and deer jaw databases from this area over the years have been instrumental in helping build an understanding of the relationship between deer hunters, deer and forest values along Clements Road.

The deer jaw collection programme, which has operated since 1983 over the whole of the wider Kaimanawa RHA, has provided more deer jaws

from this herd than any other herd in New Zealand in recent times. Data from the Clements Road jaws shows that the herd in this most accessible of all the hunting blocks in the RHA is under intense pressure. Deer have a life expectancy of only 3.5 years for males and 4.4 years for females. Given that wild sika could easily live to 15 years or more if they had a chance, we can see how perilous life is for a Clements Road deer. But the heavy harvest pressure has many benefits. The deer themselves are large, in extremely good condition and most importantly from the hunters' perspective, they are very productive with most breeding hinds having fawns each spring. The stags grow outstanding antlers, the results of which have been on show each Queen's Birthday Weekend for the last five years at the annual Sika Trophy Competition measure-up day. Every year the top 10 heads are dominated, despite their young age, by Clements Road stags. Clearly these deer live in very favourable conditions. The low density achieved by intense hunting pressure allows the habitat to flourish and the majority of terrain is north-facing, warm and sheltered, providing good rearing habitat for fawns which reduces winter mortality. Nutrition is clearly not a limiting factor as it is in some areas - recreational hunting alone limits this population. As deer numbers have continued to fall under the severe hunting regime, regeneration has all but healed over the scars of the beech splitting era.

But having any deer at all still has an ecological cost. This is simply because the damage done when deer were first liberated into the pristine forest environments of the central North Island can easily be maintained by only a few deer. You will not see a prolific regeneration of fuschia, pate, broadleaf or five-finger - certainly not in the densities of pre-deer forests or those which develop inside deer exclosures. To eliminate deer impact, deer would need to be almost completely removed, a task that is neither feasible with current technology and resources, nor desirable for a large number of dedicated park users. Despite its deer, the forest around Clements Road still retains a richness and diversity not seen in other, less accessible areas where hunting pressure is lower. While there is some ecological cost to having deer in Clements Road forests, there are also major ecological benefits which result from a hunting regime that seriously limits deer density.

This hunting provides other benefits too. Hunting is a healthy, outdoor experience pursued by many thousands of New Zealanders. I would rather my son be in the hills learning about our natural world, how it fits together and how to be self-reliant within it, than hanging

around street corners and getting into trouble back in town. Deer provide many with the motivation to seek such experiences and to pass them on to younger generations. We cannot, and should not, overlook the role that hunting can play in teaching youngsters important life skills.

Hunting also plays an important role in the local business economy. Ask any of the local entrepreneurs who are involved in the business of providing goods or services to hunters. Hunting may not be as popular as trout fishing locally but expenditure on hunting is nevertheless significant. Helicopter and aircraft companies, sports shops, food and refreshment outlets, accommodation and transport providers, and specialist hunting and firearm retailers all benefit from thousands of hunters coming into the region to hunt deer.

While not every hunter takes venison home to share with the family, the Clements Road hunting challenge provides a sort of spiritual nourishment which is difficult to describe. I suspect for each and every hunter it is a little different but that is the nature of hunting - it is a very personal thing. Regardless of individual attitudes to hunting or to deer, it is hard to overlook Clements Road as a model for successful management of a New Zealand hunting destination in which the hunting experience can be demonstrated to provide many benefits. A model of all participants in over the years can be proud and, because of its success, one that might remain socially, ecologically and therefore politically sustainable into the future.

A typical Clements Road scene, the afternoon light filtering through ancient beech forest





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Proposal to Import Trout and Salmon for Sale in New Zealand

Ask any angler visiting the Taupo region why they chose to come here and they will undoubtedly mention the green image, the qualities of the lakes and rivers, and the stunning fish. If they are an overseas visitor they are also likely to tell you that the fishing quality in their country has deteriorated through degradation of the environment, overcrowding, privatisation of water bodies, exclusive access, and so on. New Zealanders should be proud of what we have and be committed to the preservation of those elements which combine to produce such fantastic fishing opportunities.

Currently the Ministry of Fisheries is undertaking an assessment of the risk of allowing imports of salmonid products from North America and Europe. The risk assessment considers the likelihood of these products bringing unwanted organisms into New Zealand as well as the nature and possible effects these organisms may have on people, the environment and the economy of the country.

As a member of the World Trade Organisation, New Zealand has an obligation to maintain sanitary measures only while supported by scientific evidence and based on international standards, guidelines and recommendations unless a risk assessment shows a higher level of protection is justified.

In our submission as managers of the Taupo fishery, we have argued strongly that the risk assessment does justify a continued ban on the importation of these products. It is estimated that the importation of salmonid products would represent a trade volume of approximately \$10 million per year. Counting against this is the fact that for many of the fish diseases present overseas very little is known about their biology, mode of transmission, concentrations necessary for infection and so on. This makes it impossible to be confident such diseases could not be introduced with imports of fish products into New Zealand. Once in New Zealand it is acknowledged that control of a disease outbreak will in most cases be impossible to achieve. Around the world fish disease costs hundreds of millions of dollars in lost

production and has major environmental and recreational impacts. Even if control is possible it raises the issue of who would pay. A further issue is that we are concerned over the impact a legal market for imported trout products could have. Currently the key barrier to increased poaching is the difficulty in marketing the poached fish without being detected. As the paua fishery has highlighted, once a legal market exists a black market can flourish under the cover of this.

New Zealand's trout fisheries are amongst the best in the world. The Taupo fishery alone generates over \$100 million annually to the local, regional and national economy. Why put such fisheries at risk for a few million dollars?

The Taupo Fishery Advisory Committee has also made a submission against allowing the importation of salmonid products. We now await the Ministry of Fisheries decision with interest.

Summer Angling Results

Comment amongst anglers this summer has centred around the excellent size and quality of the trout. Reports of anglers bags dominated by larger than usual, well-conditioned fish have been common this summer. The photographs in this article show the exceptional condition of some of these fish. The fishing wasn't necessarily easier than previous years, though some anglers reported exceptional fishing through late summer.

Eddie Beresford of Auckland shows his delight at the biggest trout he has ever caught. The smaller fish at 49cm is 4cm over the minimum legal length of 45cm but is dwarfed by the second at 63cm and 4.3kg (9.5lb)



The results of our summer angling survey confirm that this year has definitely been one to remember. Anglers surveyed caught a total of 395 fish, with an average length of 530mm and an average weight of just over 2.0kg. As usual the fish seen were nearly all rainbow trout and only two were brown trout, one weighing 4.1kg.

Table 3: Change in the mean length of trout caught by summer anglers 1985-1998

Lake Taupo summer survey	Mean length (mm) of fish caught
1985/86	487
1986/87	489
1987/88	489
1995/96	493
1996/97	491
1997/98	530

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As table 3 shows, the mean length of trout this year is substantially greater than previous years, with an increase of 39mm on last year, and 41mm compared to ten years ago. The corresponding increase in fish weight since 1987 of over 0.5kg (1lb) is also very impressive. As discussed in the following article on the results of our acoustic counts it appears the increased size and condition which is significantly different from the last ten years, reflects a change in the functioning of the lake ecosystem. Table 4 below highlights the rapid growth of fish in the lake this summer.

Table 4: Growth of trout in Lake Taupo over a four month period

Month	Mean length (mm) of fish caught
November	528
December	522
January	539
February	549

The catch rate for both the northern and southern ends of the lake was identical this year (0.20 or one fish for every five hours of effort for the "average" angler). The hotspots proved slightly different to last year, with Five Mile Bay in the north providing some good harling early on and Kuratua and Whareroa the places to be in the south.

The catch rates in table 5 show similar trends to previous summers. During November trout are distributed throughout the water column, and are therefore available to anglers fishing deep or shallow. As the summer progresses the lake surface temperature increases, as does the amount of boat activity, encouraging trout to greater depths.

This movement effectively puts the trout out of reach of anglers using lead lines, and is reflected in the low lead line catch rates in January and February. The catch rate for wire lines in February is lower than expected, and likely to be an anomaly due to the small sample size, especially when compared to the outstanding success anglers reported using downriggers.

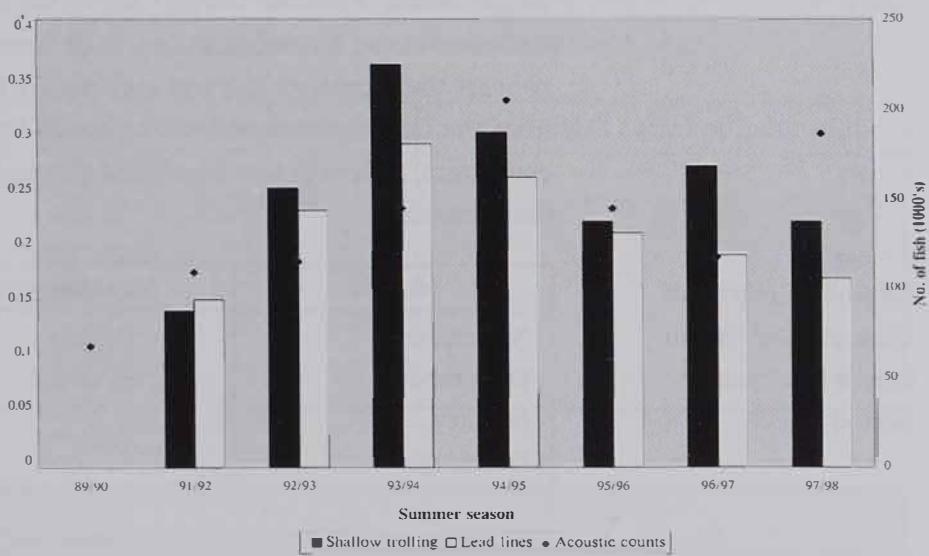
Table 5: Catch rates by method over the 1997/98 summer

	November	December	January	February
Shallow trolling	.28	.27	.12	.26
Lead lines	.27	.21	.09	.09
Wire lines	.28	.43	.39	.07
Downriggers	.19	.21	.18	.53

Graph 5 shows how trout production and catch rates have fluctuated over time. Although it appears that a relationship exists between the

two, it is interesting to note that when the November acoustic count is very high, the summer's catch rate is not necessarily so, and vice versa.

Graph 5: The fluctuation of shallow trolling and lead lining catch rates with trout production since 1989



As part of the summer survey the satisfaction of anglers was also measured. Anglers' perceptions of the size and quality of fish, their satisfaction with their success, and their angling enjoyment are recorded and can be compared with previous years.

Table 6: Average satisfaction scores measured over the past two summers

Measure	1996/97	1997/98
Size and quality	3.6	3.9
Angling success	3.5	3.3
Enjoyment	4.6	4.7

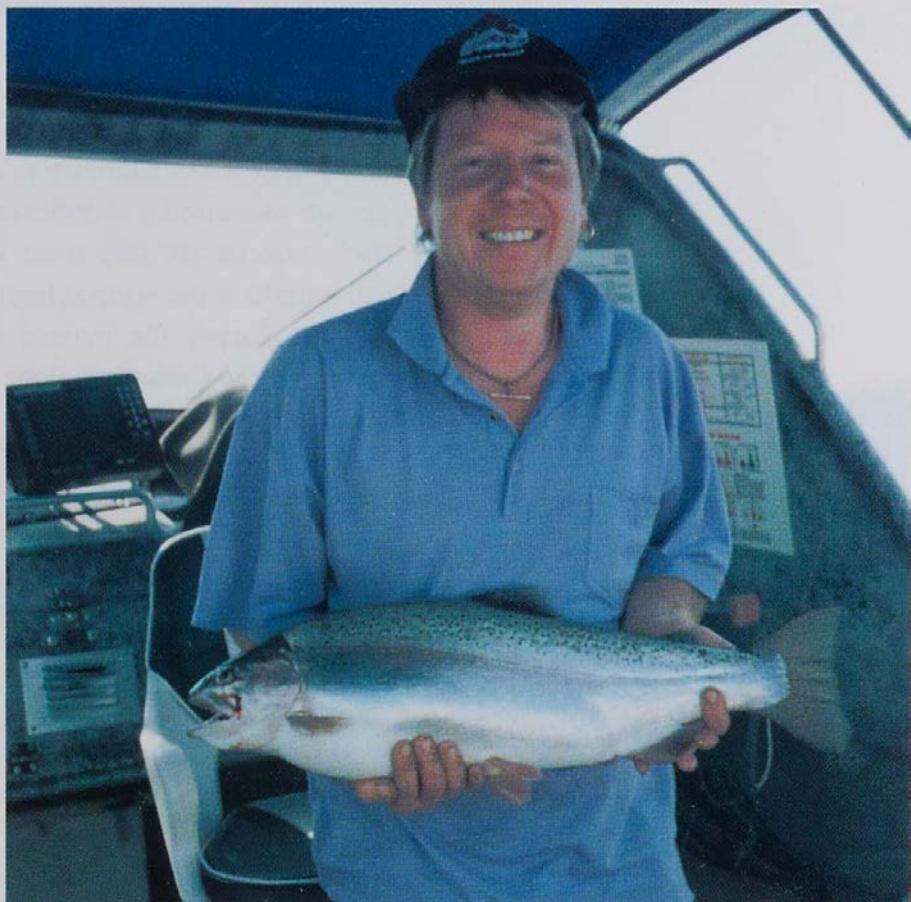
The results show that anglers are still enjoying their fishing (mean score of 4.7 where 5 is excellent), and rated the size and quality of the fish 3.9 even though they appear slightly less happy with their success (a further testimony to the condition of the trout caught this summer).

Overall the results of this summer's survey are very encouraging, especially in the face of the 1995 Mt Ruapehu eruptions and the increased minimum size limit. The average length of trout caught was 80mm over the required 450mm minimum length, and only 12% of trout caught had to be returned for being too small. Furthermore, only 0.2% (3) of the 1368 anglers surveyed this summer cited the new minimum size limit as a detraction from their angling enjoyment.

Given the size and condition of many of the rainbow trout in the lake they are going to be very large by winter when they run the Taupo

Local resident Steven Denton is typical of many anglers who were delighted at the size and condition of trout in Lake Taupo this summer. Steve's remarkable rainbow - his first trout ever - weighed 4.15kg (approx. 9.1lb), was 60.5cm long and had a condition factor of 67.7.

rivers to spawn. When hooked these fish will be a handful to hold on to but that's all part of the fun! All in all it is shaping up to be a very memorable winter season - befitting the centenary of the introduction of rainbow trout.



Acoustic Count Contrary to Predictions

As a consequence of the 1995 Ruapehu eruption and two very large spring floods in the same year we expected that the survival of young trout in the rivers at the time would be very poor. This was confirmed by surveys which indicated a lack of juveniles in the rivers in late summer. Either the young trout had died or migrated to the lake. Previous studies provided strong evidence that unless the trout were over 100mm in length their chances of survival in the lake were remote. As most fish had only hatched several months previously they would be nowhere near 100mm in length and so it was expected that they would not have survived in the lake.

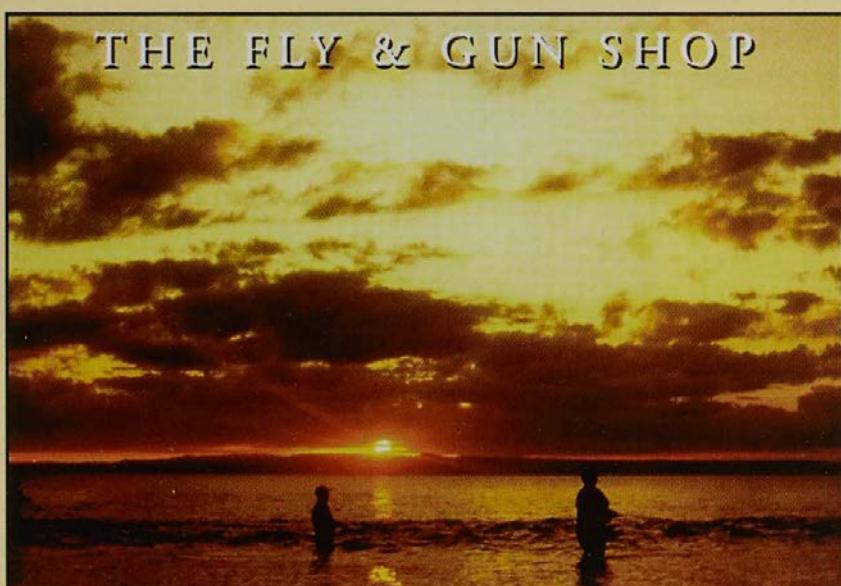
The fish hatched in 1995 were expected to reach catchable size last spring. To reduce the angling harvest of this group of fish so that

sufficient would survive to reach maturity and so run the rivers to spawn, we increased the minimum size limit from 35cm to 45cm. This had the effect of protecting these fish through most of the summer when normally the greatest harvest occurs.

The first indication that things were perhaps not as expected was that when the weather conditions allowed, surprisingly good fishing success was experienced in early spring. In November we repeated our annual acoustic survey of trout numbers in the lake which has been undertaken since 1988. Contrary to our predictions of a drop in trout numbers we measured a significant increase as highlighted in Graph The count of 187,000 trout longer than 35cm (the old minimum legal length) is the second highest on record. Interestingly, at the time of the survey the density of trout along the eastern shoreline was over three times that along the western shoreline.

Hard at work in Taupo . . .

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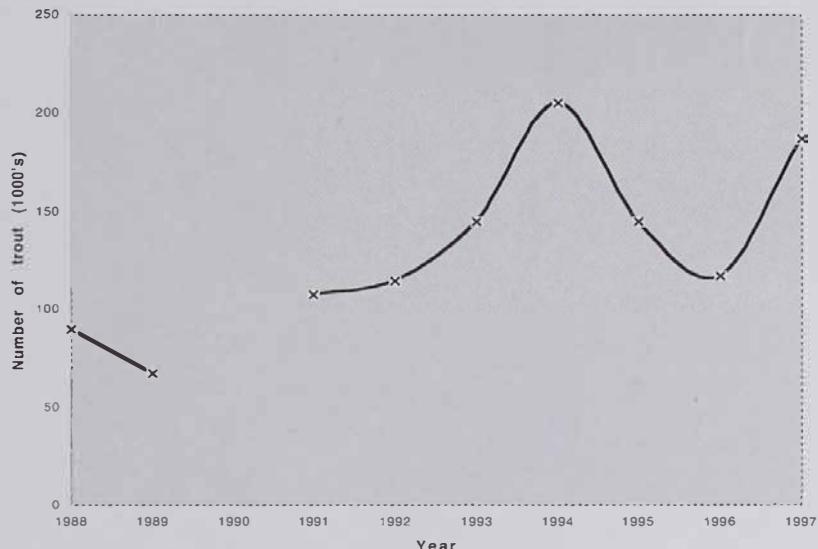
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Graph 6: November estimates of the number of trout (larger than 35cm) in Lake Taupo, 1988 to 1997



So how come there were so many more trout than predicted? We now know from recent research undertaken by the National Institute of Water and Atmospheric Research that the eruption had a second impact causing a change in the dominant zooplankton in the lake over summer. Whereas the normal zooplankton tended to sink into the depths the replacement species remained close to the surface throughout the summer. What effect this change might have is pure speculation but zooplankton are a key component of the food chain in Taupo. Certainly there are a lot of smelt although it appears no more than in some other years during the last decade. What we are certain of though is that the size and condition of the trout in the lake this summer exceptional, quite possibly as good as occurred in the fishery since the golden years of the 1920s. It would seem that the changes which have influenced trout growth and condition may also have increased the survival of the juvenile trout when they first entered the lake in late 1995.

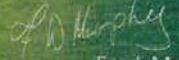
This is the second occasion in recent years when a trout fishery has boomed as a consequence of what appeared at the time to be disastrous events. In the early 1990s the introduction of waternet into Lake Aniwhenua was viewed with gloom yet within several years the fishery was producing unsurpassed numbers of trophy trout. This highlights just how complex and interwoven the different components of the natural ecosystem are and the difficulties in trying to predict how a fishery will respond to changes.

The increase in the minimum legal length to 45cm has proven to be timely, though not for the reason it was introduced. The harvest could be larger given the number of fish in the lake but they are growing so rapidly and to such a size that to harvest them at less than 45cm is



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simply a waste. A good example is to look at a 45cm fish lying amongst an average bag of fish as brought in by lake anglers over the last few weeks; it looks tiny.

River anglers this winter should reap the benefit, albeit that they will first have to land the fish, which is likely to be easier said than done.

DOC Participates in Inaugural Game Fair

Cam Speedy sits amidst part of the DOC display at the game fair, Waitangi weekend.



On Waitangi Weekend the Wildfowlers' Association of New Zealand hosted its inaugural game fair at the grounds of the Taupo Gun Club. More than 4000 people visited the fair over the two days viewing the numerous hunting and fishing related displays and taking part in four wheel drive and shotgun shooting activities.

The Department of Conservation had its own display promoting the Taupo fishery and the centenary of the introduction of rainbow trout into Taupo waters. Local fishing guide Ron Burgin generously loaned his 8.4kg rainbow from Lake Otamangakau, the largest rainbow from Taupo in recent years. A live display of brook, brown and rainbow trout also attracted a lot of interest. In addition Cam Speedy was present to talk about the public discussion paper *Issues and Options for Managing the Impacts of Deer on Native Forests and other Ecosystems* and how interested parties could make submissions.

We were very encouraged by the numbers of people attending and the quality of the exhibits in what is intended to be an annual event.

Fishery Staff complete Wader Safety Course

In late February fishery staff successfully completed a one-day wader safety course run by Garth Oakden of Tongariro River Rafting. The course comprised a theory session which covered identification of

Garth explains the next swim to fishery staff. Note the green wading belts worn by staff



Glenn Maclean demonstrates the correct technique. Feet up and pointing downstream, Glenn looks for a suitable place to get out of the water.



Many of the guests who gathered for the dawn ceremony (Photograph: Len Birch)

Trout Centenary Celebrations

As described in the feature article on the history of rainbow trout in Taupo waters, the first introductions occurred on 24 February 1898. One hundred years to the day the event was marked with two



commemorations. A dawn ceremony on the upper Waikato stream at the site of the original release was planned to commemorate the fishery and its importance as one of the cornerstones in the development of the relationship between the Crown and Ngati Tuwharetoa. A second, community celebration of the fishery was organised by Destination Lake Taupo and hosted by the Department of Conservation at the National Trout Centre in the afternoon.

Unfortunately after weeks of settled weather a violent storm hit the central North Island on 23 February. Staff erected a marquee amidst driving rain and wind beside the Upper Waikato stream but it was quickly apparent that with no improvement forecast a change in venue was necessary. Late in the afternoon the marquee was re-erected beside the children's fishing pond at the National Trout Centre.

As guests gathered in the dark the next morning a storm swept through with torrential rain and gale-force winds. It was appropriate for 24 February also marks the 40th anniversary of the infamous 1958 flood which reshaped the Tongariro River and caused major damage to the Turangi township and surrounds.

A large contingent from Ngati Tuwharetoa and Ngati Rangi iwi attended along with other invited guests including the Taupo District Council Mayor Joan Williamson, National MP Georgina Te Heuheu, the Director of Fish and Game New Zealand Bryce Johnson and members of the Taupo Fishery Advisory Committee.

Proceedings commenced in the very dim light of Pu-Ao-Te-Ata-Tu - the pre-dawn - with Matiu Mareikura of Ngati Rangi delivering karakia tawhito - ancient chants befitting the occasion. This was followed with karakia karaitiana - a christian service conducted by Bishop Takuira Mariu. The Director-General of Conservation, Hugh Logan, then spoke on behalf of the Minister of Conservation Nick Smith, who was unable to attend. As a preface to his speech Mr Logan spoke at some length on Forrestina and Malcolm Ross, and Mr A.R. Lowe, the people directly credited with having introduced rainbow trout to the Taupo waters. Within his speech Mr Logan also mentioned the good work of the Department in managing the Taupo fishery in partnership with Ngati Tuwharetoa, and other bodies such as the Taupo Fishery Advisory Committee.

In reply Mr Tumu Te Heuheu, Paramount Chief of Ngati Tuwharetoa, spoke about the relationships that had developed between his iwi and the Crown following negotiations over the Taupo fishery, and special legislation passed in 1926. He said significant benefits had accrued to both parties and he was unequivocal in his assertion that

The horse and wagonette arriving for the re-enactment
(Photograph:Len Birch)



Re-enactment of the release of rainbow trout
(Photograph:Len Birch)

In the afternoon guests once again gathered in the grounds of the National Trout Centre. Unfortunately the weather remained poor, a southerly change late in the afternoon bringing very cold temperatures and the first snow of the year on the mountains. The highlight was the arrival of a horse and wagonette which brought Forrestina and Malcolm Ross and A.R. Lowe (Katrina Thomas, Peter Henry and Norrie Ewing respectively) to the children's pond for a re-enactment of the original release.

Joan Williamson, Chairman of the Turangi-Tongariro Community Board Tim Hurley and Graeme Pyatt of the Taupo Fishery Advisory Committee spoke of the valuable contribution the fishery has brought to the area in terms of tourism, employment and recreation. John Gibbs, the Taupo Fishery Area Manager, then described a brief history of the management of the fishery. The re-enactment was followed by demonstrations of fly tying, fly casting, taxidermy, trout cooking and a display of the future development proposal for the Trout Centre. There were also contests in accurate fly casting and guessing the weight of a trout and the number of fish in a tank.

The Taupo District Council's Destination Lake Taupo has declared 1998 to be the "Year of the Trout". A number of groups and organisations have special events planned so keep

the Taupo fishery was the finest in the world bar none. During the ceremony the rain eased and following the formal proceedings guests mingled over a champagne breakfast beside the children's fishing pond. Despite, or perhaps because of, the inclement conditions, it was a memorable morning befitting of the occasion.



an eye out for these. The Department of Conservation for its part is involved in two initiatives. Firstly in conjunction with Chris Jolly Boats we are promoting a school project to highlight the different aspects of the fishery and its significance to the Taupo area. The package offered includes a visit to the National Trout Centre including a guided tour and opportunity to catch a fish from the children's pond, resource material, an opportunity for 10 lucky schools to win a charter on one of Chris's boats as well as the chance to win prizes for the best projects. Initially the package has been sent to all local schools but any other schools wishing to take part should in the first instance contact Shirley Oates at our Turangi Office on (07) 386 8607. Our second initiative involves the creation of a long-term development proposal for the National Trout Centre and implementation of the first stages this year. It is envisaged that the natural charm and qualities of the area will be retained with greater displays on the biology of the fishery, other aquatic species and historic aspects of the fishery and its management, as well as increased interpretation by DOC staff. It is planned to have the completed proposal by 30 June, although there is a lot of discussion to occur prior to this. Once completed the proposal will be presented in *Target Taupo*.

Competition to Guess Mystery Weight

As part of the centenary commemoration at the National Trout Centre we ran a competition to win a season fishing licence by guessing the

*80% of entrants
estimated this fish,
held by Taupo Fishery
Area Manager John
Gibbs, to be over the
magical 10lb. In fact it
weighed
approximately 9.1lb
(4.12kg)*



weight of a rainbow trout on display. The fish, which is shown in the photo, was caught by Taupo Fishery Area Manager John Gibbs several days previously, weighed and kept on ice. It proved an ideal fish for the competition, big and impressive but not quite 4.45kg (10lb). Very surprisingly B. Solomon guessed the weight exactly, 4.12kg (approx. 9.1lb) and so easily won a licence for next year. Much less surprising was that of the 26 people who entered the competition, only three including the winner did not over estimate the weight. Twenty-one of the remaining 23 entrants thought the fish was over the magical 4.55kg (10lb) mark and the average weight for all the entries was 5.85kg or almost one and a half times its actual size.

For those people who tried to guess the number of fish in the raceway, the actual number was 227. R. Edmunds with an estimate of 222 was closest and so also wins a licence for next season.

Delay in Replacing River Angling Signs

In the November 1997 issue of *Target Taupo* we advised that we planned to update our river information signs, the new signs to be in place by this April. However, as discussed on page 56, licence sales to date are less than we budgeted for. Management of the Taupo fishery is totally self-funded from licence sales and the reduction in expected revenue necessitates we delay some spending. The new signs were to replace signs erected in 1990 and so we have decided to retain these for an additional year.

Design of the new sign layout is continuing so that when the money is available it will be simply a matter of sending the template to a printing firm, which will print the computer generated graphics onto film which is then glued directly onto a metal backing board.

Catfish Abundant over Summer

A number of people have contacted us over recent weeks concerned at the number of catfish they have seen in the lake and whether they are having a serious impact. Full results of our monitoring of catfish numbers will appear in the next issue of *Target Taupo* but analysis of the results for December and January indicates numbers are on a par with last year.

An MSc thesis by Grant Barnes, sponsored by DOC and published in

1996, found that brown bullhead catfish in Lake Taupo fed largely upon freshwater invertebrates but that larger catfish also took koura. Very limited remains of small fish were also found in a few stomachs. He concluded that at present population levels catfish were unlikely to influence trout size or numbers.

Catfish can tolerate a wide range of temperatures but become more active in warm temperatures. As a consequence, catfish can be found lying in small crevices almost asleep over winter, and are easily caught by hand. However over summer they are much more active and feed vigorously. In summer Lake Taupo stratifies with a layer of up to 30 to 40 metres of warm water lying over and not mixing with the underlying cold water. The catfish actively seek out the warmer water, moving especially into the shallows where the highest temperatures are recorded. These areas are also the areas where people swim or launch their boats and so at this time of year people see a lot of catfish. However the numbers present are not indicative of the density over the whole lake.

An interesting behaviour which has been reported in previous years and which was very apparent this year was the schooling of catfish in midwater over shallow sandy areas. The fish in the schools were quite fearless and not afraid to approach divers. However beneath them on the sand were other fish which were much more elusive, taking fright as soon as they spied a diver. One of the unknown aspects of catfish in Taupo is their reproductive biology. Elsewhere catfish require a minimum temperature of 21°C before commencing spawning yet, apart from localised areas of shallow water around the margin, Lake Taupo does not reach this temperature. Yet catfish do spawn successfully and we wonder if this midwater shoaling behaviour is related to this. To answer this question we propose to undertake a small research programme next summer, the results of which will be reported in a future issue of this magazine.

Waipa Fish Trap

Trapping of this upper Tongariro River tributary commenced on 12 January with the intention to trap the whole year's rainbow and brown spawning run. Twenty-six rainbow trout passed upstream in January before we were hit with a flood, which overtopped the barrier and put the structure to its first test. A heavy leaf litter load and

branches dammed the upstream barrier causing the rail to bend, and turbulence around and below scoured out the pens and under the true left bank. The structure survived and heavy rocks carted from the

The Waipa trap in operation



main river coupled with the fitting of a steel girder to the upstream pen, have straightened the barrier and strengthened the whole trap. Further improvements are planned.

Eight upstream migrants were trapped in February and as at 7 March a further 12 rainbows, the heaviest to date being 3.8kg.

A flood in late January provided the first test for the Waipa trap and an opportunity to trial different methods of operation



The operator's hut is now liveable with the installation of a stove and construction of the verandah, all that is required to make the hut comfortable for winter operation.

Anglers see Results of New Structure

A number of anglers stopped on the lake this summer as part of creel and licence checks have asked DOC staff who have interviewed them if they are new as they haven't seen them before. In fact it is a reflection of the new Department structure and approach. Rather than staff being designated to work as rangers or in the hatchery or on willow clearance and tracks, staff now work across all the projects in the fishery. There are 15 full-time staff and any of them, including the Fishery Area Manager, may be the staff member interviewing you.

Deformed Trout

Sarah Good from Auckland with her catch



Not all trout caught in Lake Taupo this summer have been magnificent specimens. This 1.8kg (4lb) rainbow male was in a healthy condition, despite an obvious natural deformity.

Update on the Issue of Lead in Lake Taupo

In the last issue of *Target Taupo* we undertook a review of existing information on the possible impacts of lead in Lake Taupo. We concluded that the level of lead inputs was very unlikely to have any detrimental impacts on the aquatic ecosystem but, acknowledging

that lead is an environmental toxin, the most responsible action was to look to use alternatives where possible.

A student study to measure the amount of lead-based fishing material lost in popular fishing spots and the concentration of lead in the sediments was unfortunately not fully completed. However the data that was collected will be very useful and we are planning to complete the study ourselves next summer. As part of this we will also establish marked areas on the lake bed to monitor the future loss of fishing equipment.

We are encouraging local entrepreneurs to develop alternative non-lead-based downrigger weights, although not with a great deal of success at present. If we are unsuccessful we will pursue a couple of different strategies. Changing from the use of lead-based fishing equipment to more environmentally friendly products does not have to happen immediately but is a long-term goal. Success will depend on the ready availability of similar or cheaper priced alternatives and on increased environmental awareness and responsibility amongst anglers, tackle manufacturers and suppliers.

Fishing Licence Sales

As at 28 February, licence sales are down by 10% compared with the same period last year. The total licence sales for the 1997/98 season are shown below, with the previous year's sales in brackets:

Adult Season	10,934	(10,942)
Child Season	4198	(4993)
Adult Month	593	(609)
Adult Week	5533	(5414)
Adult Day	16,126	(19,859)
Child Day	4666	(4842)
Total	42,050	(46,659)

1998/99 Souvenir Fishing Licence

To commemorate the centenary of the introduction of rainbow trout to the Taupo fishery in 1898, we plan to have souvenir licences printed for the 1998/99 season. Don't miss out on this collector's item when it becomes available in late June.

Compliance and Law Enforcement Update

This summer there has been a notable reduction in fishing offences on the lake and rivers. Of the 1479 anglers checked during the summer survey period 1.31% were spoken to for infringements relating to licences. Fishing without a licence is still the most prevalent offence.

While the low level of offending is a good indicator of angler behaviour, our field staff still maintain a high level of patrolling, focusing on key areas vulnerable to poaching activities. This is reflected in the successful citing of six offenders for using nets to catch trout.

In a recent court case two offenders were ordered to undertake four months' periodic detention for offences involving disturbing spawning fish and the use of a net.

A vehicle was used in committing the offences and the offenders were also disqualified from driving for one month. In addition they had to pay court costs and fines totalling over \$1100.

Kia ora tatau katoa

Widespread Deaths of Smelt and Bullies Reported

We have also received numerous calls this summer from people concerned over the numbers of dead smelt and bullies washing up along the shoreline. Such deaths are a normal occurrence at this time of year and are simply fish dying from the rigours of spawning along the lake margins.

The very high surface water temperatures in the shallows this year may exacerbate the situation, particularly for bullies which are unable to readily move away from these areas, but the main impact of this summer's weather has been to make these deaths much more obvious than normal.

Under the usual summer weather patterns strong winds regularly stir up the shallow margins, sweeping the dead and dying fish up into the debris or into deep water out of sight. This summer however, the lake has been characterised by long calm periods. Under these conditions people are attracted to the lake in large numbers and the dead fish quietly lap on to the water's edge where they are readily seen.

Bitz 'n' Pieces

News Items from Around the Conservancy

Deer Discussion Paper

On 18 December 1997 the Minister of Conservation released the public discussion paper *Issues and Options for Managing the Impacts of Deer on Native Forests and Other Ecosystems*. The release followed a year of meetings and discussions by a working party made up of a number of groups and organisations with an interest in the deer issue, convened by the Department of Conservation in January 1997.

As part of the process conservancy staff attended three meetings convened in Taupo by various hunting groups during January and February 1998 to provide information on the discussion document and the submission process. Department of Conservation Principal Policy Analyst, Jenny Brash, who is leading the process, was also hosted for a field trip looking at local deer issues in February.

Submissions on the discussion paper closed initially on 2 March 1998. An extension to 11 March was given to allow a number of people who received the document late to complete their submissions. All submissions received are currently being independently analysed and will assist in the preparation of a draft deer management plan for New Zealand.

This draft is due to be with the Minister of Conservation by the end of July after which it will be released for a further round of public submissions. It is hoped the final plan will be adopted by the Minister later in the year.

Autumn Possum Control

1080 poison will be laid to kill possums at several locations around the conservancy through the autumn hunting period (February to May).

These include:

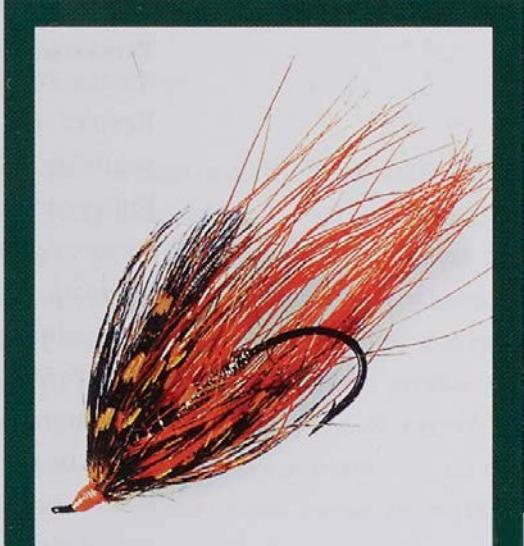
- 1 Along the northern boundary of Erua Forest in the upper Kaitieke Valley. This will involve aerially distributed 1080 baits, probably carrots, from late April to early May. The operation is part of Manawatu-Wanganui Regional Council's operations.

2 The following scenic reserves: Raurimu, Mangatepuhi and Raurimu Spiral will be treated by Manawatu-Wanganui Regional Council Staff with hand and/or 1080 bait stations distributed around reserve boundaries between National Park and Taumarunui.

3 Along the lakeshore reserves of the Western Bays of Lake Taupo from Karangahape through to Waihaha between February and April. This will involve 1080 baits distributed by hand and/or in bait stations as part of Environment Waikato's bovine Tb control maintenance operations.

Brodifacoum in the form of "Talon" or "Pest-Off" baits has been laid at numerous sites around the conservancy as a means of maintaining low pest (mostly rat and possum) densities where successful knockdown operations have occurred. This bait is laid in bait stations but pigs may get access to bait either directly out of bait stations or by consuming rat or possum carcasses that have died from eating bait. The Department recommends that hunters do not eat pork that has been taken in or near any of the following areas:

- In the vicinity of the Whakapapa Village and Ohakune Mountain Road within Tongariro National Park;
- Rangataua Forest around Rotokura and Dry Lake and



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on the lower lava flow east of the lakes;

- The upper Waione Valley of Tongariro Forest;
- Erua Forest south of Erua Road;
- Opepe Scenic Reserve;
- Tirohanga Scenic Reserve;
- Pakuri Scenic Reserve;
- Kaiapo Bay Scenic Reserve;
- Ohakune Lakes Scenic Reserve;
- Ohinetonga Scenic Reserve;
- Whakapapa Gorge Scenic Reserve and the adjoining north-western boundary of Tongariro Forest.

All poisoned areas are well signposted - please do not remove signs.

Possom Control Results From 1997

Results of the operations carried out in winter 1997 are now available. Possums were below the level of detection in both the Pukepoto and Rangataua Forest operational areas (i.e. no possums were caught during post-poisoning trap catch assessment). These are pleasing results which will give significant benefits to conservation values in these areas over the next few years.

Of interest to hunters will be the observation by local hunters at Rangataua that while some dead deer were found after the poison operation, deer numbers were not seriously affected in the operational area. A series of five minute bird count transects established in Rangataua Forest last February is also currently being re-surveyed and data from this monitoring should show up any changes in bird abundance in this area. The Rangataua operation had no negative impacts on the area's short-tailed bat population.

At Raetihi Hill near Ohakune, the post-poison trap catch assessment was not so good showing a residual possum population of 7.6% (76 possums caught in 1000 trap nights). This operation involved 800ha of aerial poisoning and 800ha of ground work. It appears that a 250 metre gap left between the aerial boundary and the bait station/trapping network has been at least partially responsible for the higher than desirable residual catch, although this was a second treatment following the initial knockdown in 1994 and bait shyness may also be a contributing factor. Extremely high possum densities on adjoining private land have not helped this situation. However a maintenance regime is now in place around 2400ha of forest in this

area and possum numbers should continue to slowly decline over the next 12 months, especially if on-farm possum control on adjoining properties begins as planned this winter.

In Tongariro Forest, maintenance trapping through the winter of 1997 following aerial 1080 carrot application in June 1995 has yielded 109 possums from 3350 trap nights, a residual trap catch of 3.2% (32 possums per 1000 trap nights) two years after treatment. This is an extremely encouraging result suggesting that the successful initial knockdown is holding. Forest monitoring plots and bird monitoring in Tongariro Forest have shown this forest is responding very well to pest control. Deer hunters are also starting to realise the benefits of healthy forest with plenty of healthy deer being seen and shot in the forest during this last spring/summer hunting period.

Spring/Summer Hunting Summary

The recent growing season was slow to start and dried out earlier than usual (around Christmas/New Year) but since mid-January regular light rain, high humidity and afternoon thunder storms have helped the growth to continue, ensuring a better than average season over most of the conservancy. Prolific flowering of Clematis, rata, pohutukawa, cabbage trees, kamahi and kanuka are all indicators of the productive season locally. Whether it is the El Nino weather pattern or a result of successful pest control over large parts of the conservancy in recent years is open to speculation but regardless of the cause all sorts of wildlife will benefit from the extra resources produced.

The western part of the conservancy missed the earlier dry spell owing to regular westerly patterns so will produce the most noticeable results for wildlife. Some of the velvet around in December and January suggests there will be some big red heads out west this autumn. To the east, the sika heads will more likely show problems in the brow tines and in their length owing to the early season drought conditions. A good sample of heads entered in this year's Sika Trophy Competition will help tease out any trends. Hunters interested in the competition should note the change of venue and format this year (see the advertisement in this issue of *Target Taupo*).

Hunter interest continues to be high in the conservancy with permit numbers this summer similar to previous years'. We have not had time to analyse any data yet but will provide details in the July issue.

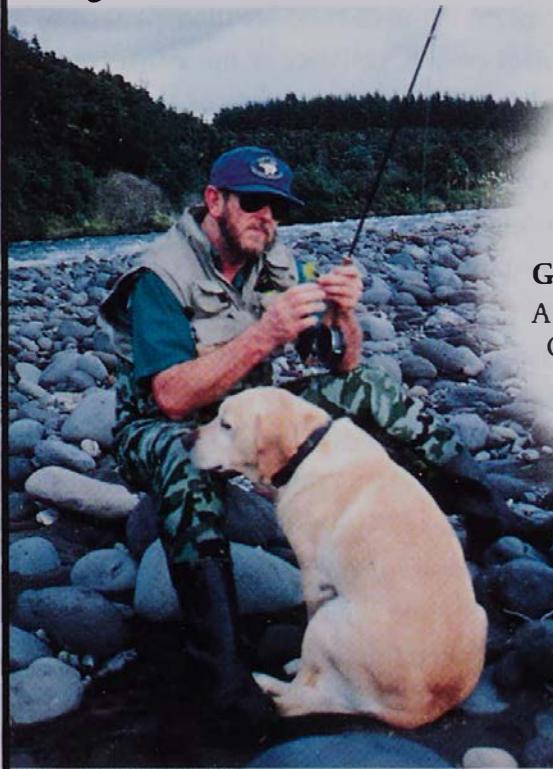
Please send in your spring/summer hunting diaries if you have not already done so.

Generally though, hunting was hard from mid-December until mid-January but has picked up with the damper conditions since then. Tongariro Forest produced well through November but slowed once hinds began fawning. Similarly, the Waipakihi Valley produced good numbers of deer for November/December hunters but the valley quietened down with the dry spell and the coinciding fawn drop.

Places to watch this autumn will be:

- The Kaimanawa front country in the Tiraki/Te Tiringa stream area;
- The Rangitikei will be as good as ever this year based on the low number of stags taken over spring and the high levels of stag sign from last rut evident in the catchment;
- The Mohaka/Ahimanawa manuka country still has high numbers of sika deer;
- and as always the Upper Oamaru, Jap Creek and Upper Kaipo areas within the Kaimanawa RHA will provide good stag

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Graham Whyman, Sporting Life, Turangi.

A life member of TALTAC, served on the Wildlife Conservancy Council and is currently angler representative on the Taupo Fishery Advisory Council. Graham has fished the Taupo district since the late 1940s and when he's not helping he enjoys the relaxation of wet line fishing where his favoured pattern is the Umpqua Olive Woolly Bugger, or the hot, new Laser Fly, Fluoro Yellow and Orange. Sage and Umpqua – the perfect combination.

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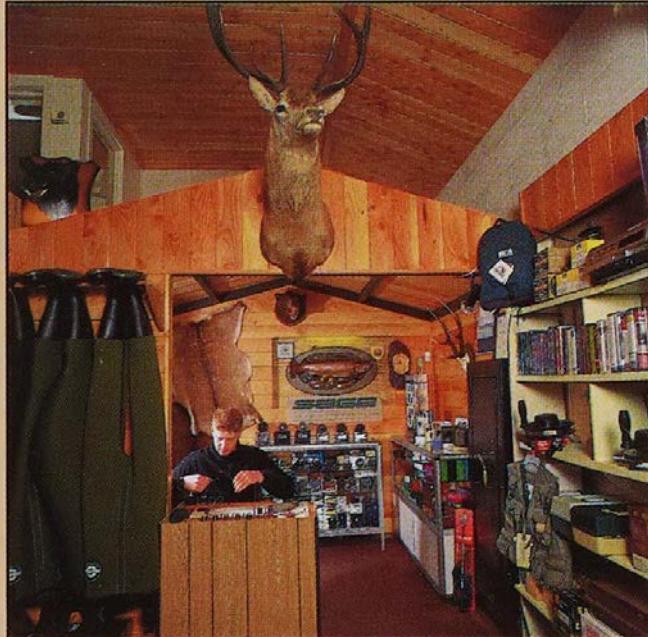
Please keep an eye out for the rubbish situation this autumn - messy hunters continue to threaten the future of both recreational hunting access and helicopter access to the high country. If you can carry it in full, please carry it out empty - there is no excuse.

Be careful, let's have a hunting accident-free autumn.

Umukarikari Tb Prevalence in Deer - Landcare Research Study

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F&G 163

A total of 34 deer was recovered from the Waimarino/Waiotaka/Whitikau catchments of Kaimanawa Forest Park during the spring/summer period as part of a Landcare Research study into the prevalence of bovine Tb in wild deer. These included 14 sika (10 females, four males) and 20 red deer (13 females, seven stags). Two deer with lesions typical of Tb infection (a red stag spiker and an old red hind) and four other deer with disease symptoms (not necessarily Tb) were included in the sample. This is still a much lower disease level in the deer than was recorded in the pre-possum control (August 1994) deer population, but the age of the diseased red stag (born since the poison operation) suggests that either diseased deer are still dispersing into the area, or that deer to deer contact may still be occurring within the treatment block.

Deer and possum density assessments were also undertaken in February to see if the disease is persisting in "pocket areas" where deer and possum density is higher owing to good localised food resources or more desirable habitat. Possum numbers appear to still be very low but deer, especially red deer, are starting to become more numerous.

A number of local hunters were not happy to see this operation go ahead and voiced strong opposition, but hunters need to appreciate that the sample area was over 15,000ha in size and the sample was a random one taken over that entire area. The impact of removing 34 deer (one deer per 400 hectares) is likely to be minor on their hunting outcomes. The operation required 25 hours of helicopter time which highlights the point that commercial venison recovery remains uneconomic in this part of the Kaimanawa Range.

A full report will appear in the July issue of *Target Taupo*.

Taurewa Goat Programme

by Norm Macdonald, Probunt New Zealand

(Probunt is one of New Zealand's foremost professional animal control teams, specialising in, among other things, goat control. It has recently become involved in an international initiative to remove goats from one of the major islands in the Galapagos group in the eastern Pacific - testimony to the high regard in which it is held in its specialist field.)

The Taurewa Ecological Area, located approximately 20 minutes south of Taumarunui, was first hunted by Prohunt New Zealand in late November 1996. In this sweep the professional hunters removed 143 goats, four pigs and eight deer from the control area.

Effort this year was timed to coincide with the finer weather in mid-January to maximise hunter productivity. A total of 90 hunter days was spent hunting the control area for 23 goat and seven deer kills (an 83% reduction on the total number of kills from Taurewa in 1996). Another 12 hunter days were spent in the Waipakihi River in the Kaimanawas, putting the team's hunting dogs through both a deer and kiwi aversion course, prior to hunting the control area. Prohunt also repeated the goat monitoring (done initially in 1996) at both the start and finish of the control programme, and the results have been passed on to Wayne Fraser and Manaaki Whenua (Landcare Research) at Lincoln.

To maximise hunter efficiency, we divided the control area into day-sized hunting units and systematically ground-hunted them utilising dogs. All the hunters were linked by radio and worked as a very effective team. The hunters completed two sweeps of the block and spent the balance of the time "hot spotting" areas where remnant goats were thought to remain.

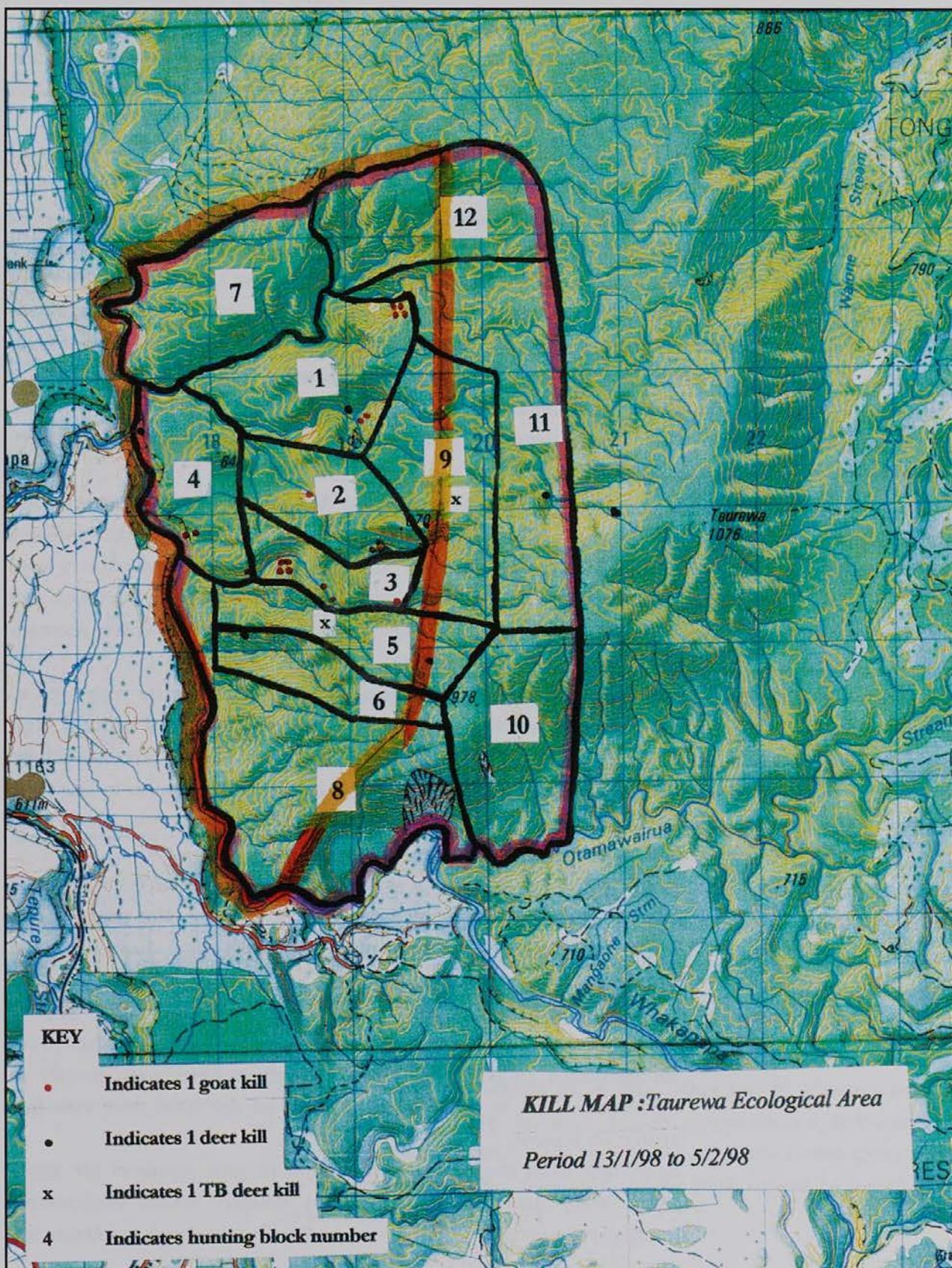
The feral goat population in Taurewa was found to be restricted to areas of prime habitat. Goats were generally found around bluff systems, or living in steep open slip areas around creeks. These remnant goats generally were living in the same areas as in the 1996 operation. Large areas of flat country on the centre of the block were goat free.

The method of hunting was ideal for this type of country. The hunters put in 82 effective hunter days, effort in the control area for 23 goat kills. Ninety percent of these kills came during the first sweep of the control area.

No pig sign was noted in the control area during the contract period. The hunters found moderate numbers of deer in the more rolling/flatter areas of the block, elsewhere deer were patchy in distribution and in low numbers. Two of the nine deer kills had visible Tb lesions.

Benefiting from the dramatic reduction in goat numbers are those steep bluffy areas around the front country where recreational hunting pressure from people camped in Quartz Creek maintains the

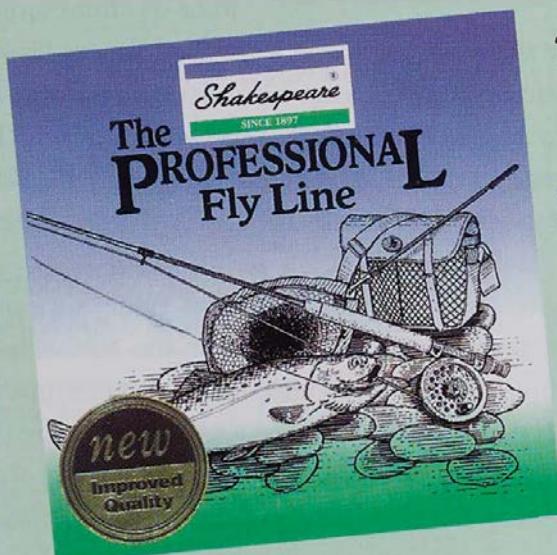
Initial sweep boundary
Second sweep boundary



resident deer population at low numbers. These areas have had an immediate vegetation response. An abundance of especially pate and konono (to 25cm height on the forest floor) has appeared since last year's initial control effort.

The results from this year's effort in Taurewa indicate that there has been a significant reduction in feral goat numbers in the control area over the last two years. Even though the programme was timed over the drier months, weather was still unpredictable, and two days were lost owing to heavy rain. Other than that the programme ran on schedule and the control area received two very thorough sweeps, and additional effort in previous high density areas.

Comments from the hunters also confirm that they are very confident few goats remain in the contract area.



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Team Profile

Rob Marshall



Rob (known as Bert to distinguish him from Rob McLay, not that there is any physical similarity) is the most recent addition to the fishery team, filling the vacant position of Fisheries Ecologist in January of this year. His main role is the co-ordination of the many fishery monitoring programmes undertaken by the Department. Rob joins us after completing

a Bachelor of Science degree at Auckland University, where he studied freshwater and marine ecology. During his university vacations, Rob regularly came down and worked as a fishery volunteer which gave him experience in many aspects of the job. Obviously he made an impression and we were delighted to employ him when the opportunity arose.

Although Rob is a born and bred Aucklander, he avidly supports the North Harbour rugby team in its struggle to win the NPC title (or to at least stay in the first division). In addition to a keen interest in rugby, Rob has travelled to the Taupo region regularly over the past 14 years to pursue a passion for fly fishing. Since his arrival Rob has spent many hours fishing, not that this has yet posed much threat to the trout population.

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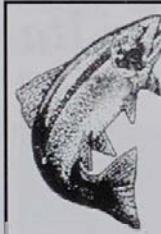
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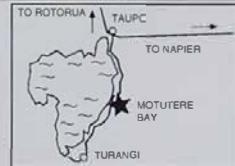
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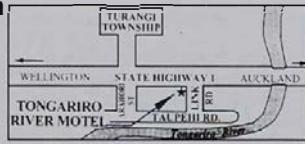
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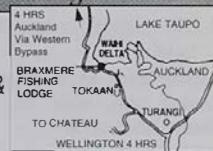
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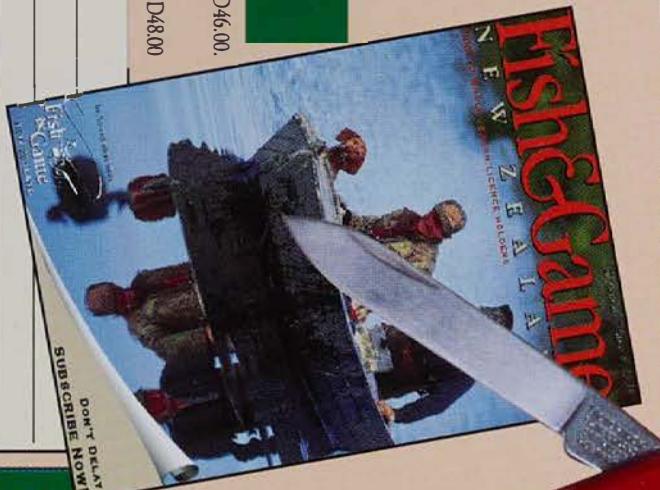
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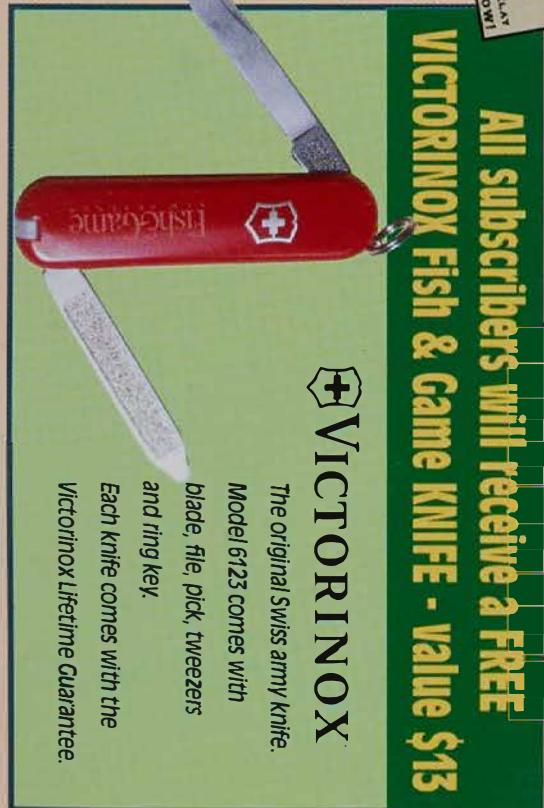
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