TARGET TAUPO

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

MARCH 1996, ISSUE 21

Department of Conservation
Te Papa Atawhai

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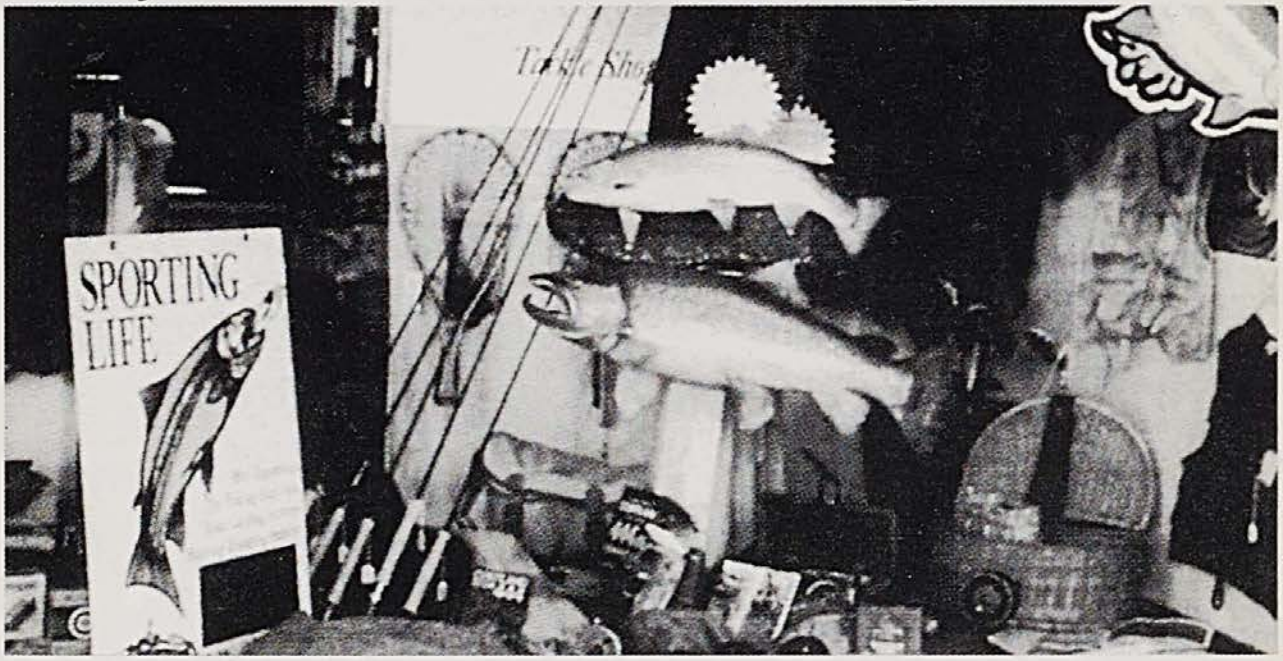

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MARCH 1996, ISSUE 21

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Cover photo:
A classic shot of a rutting sika stag from NZ Forest Service files

A New Direction for *Target Taupo*

Target Taupo has come a long way from the 28 page black and white first issue in July 1989. From uncertain beginnings it has become an integral part of our fishery and conservancy advocacy, providing managers with an opportunity to share information with many anglers and hunters we would otherwise have no contact with. These days it is distributed to over 1,000 subscribers twice a year as well as to more than 10,000 adult whole season fishing licence holders each July. This involves a large amount of work not only in writing and editing the magazine but in organising advertising to offset costs, entering all the addresses from used licence books, labelling and inserting the magazine into envelopes.

Obviously to send 10,000 copies rather than 1,000 involves additional printing costs and effort to mail but the actual effort involved in writing, editing and layout is exactly the same.

We believe *Target Taupo* is a very effective way of informing the users about what is going on in the management of their resource, the issues, developments, changes and trends. Judging from the feedback the magazine is appreciated by many of you. Our greatest challenge is to actually get the magazine in front of everyone. Our greatest problem is that we are resource managers and while quite able to present the information, we do not have the specialised printing, distribution and advertising skills which become more and more necessary as the magazine becomes larger, nor the time to pursue these.

From the next issue, *Target Taupo* will take a further step forward.

Complimentary copies of the July, November and March is-

sues will all be mailed to 1995/96 whole season fishing licence holders. We believe the additional cost will more than be outweighed by the benefits which accrue from being able to put information in front of a large proportion of our users on a regular basis. So as to remain resource managers and not publishers we have negotiated with a major publisher to produce the magazine, sell the advertising and mail it out on our behalf. We will still write all the articles and the format will be little different to this issue. A number of competitive quotes were received and the final cost will be similar to the cost for last July's issue.

The names and addresses of 1995/96 adult whole season licence holders are taken from the licence duplicates returned by licence agents. Shirley Oates puts a lot of effort into trying to decipher some names and addresses, filling in missing suburbs, checking street names and so on, to ensure the correct address. However, there are some that are so incomplete or unreadable they are not able to be used. It is to your advantage to make sure when you buy a licence in the future that your address is complete. At the end of each season the database will be used to mail out the following three issues of *Target Taupo*. So the benefit of purchasing an adult whole season licence rather than a short term licence is that you will receive three issues of *Target Taupo* over the following season.

For those of you who don't wish to purchase a whole season licence or are interested from a hunting point of view we will continue to run subscriptions through this office.

Many current subscribers are also whole season licence holders and will in future receive a complimentary copy. These people will receive refunds for extra issues.

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HELI·SIKA SIKA HUNT

CO-ORDINATED BY CUSTOM CARTRIDGES IN ASSOCIATION WITH DEPARTMENT OF CONSERVATION

The Movement and Habitat of Radio Tagged Rainbow Trout in the Tongariro River

by Michel Dedual

In issue 19 of *Target Taupo* we explained how last winter we captured 92 rainbow trout, surgically inserted a radio transmitter into each of them and then followed their progress during their spawning migration up the Tongariro River. We were able to follow 74 of them before ceasing tracking on 17 November 1995. Fourteen transmitters were returned by anglers, seven of these coming from fish caught in the river, two from fish caught in the lake, and 5 were recovered from fish found dead (one following spawning and four following the Ruapehu eruption). The names of the people who have won a free season licence for 1996-97 have been drawn from those who returned a radio tag and these people will be notified shortly.

During the study period which was ultimately ended by the eruption, about 1000 fish locations were determined. In this article we will present the key results using a series of commonly asked questions. The answers may help winter anglers to improve their success on the Tongariro River.

Where in the river do trout spawn?

The Tongariro River was split into four different reaches:

- from Poutu intake to the Fence Pool (top) - 10.5km
- from the Fence Pool to the Breakaway Pool (upper) - 2.25km
- from the Breakaway Pool to the Highway Bridge (middle) - 7.75km
- from the Highway Bridge to De Latours Pool (lower) - 3.45km

Trout were assumed to be spawning when they remained in one location for more than three weeks. In all, the spawning locations of 40 fish were determined in the Tongariro. The figures below represent the density spawning of radio tagged trout per kilometre of river in the different reaches.

Between June and November:
11 fish spawned in the top river = 1.05 fish/km
10 fish spawned in the upper river = 4.44 fish/km
8 fish spawned in the middle river = 1.03 fish/km
11 fish spawned in the lower river = 3.18 fish/km

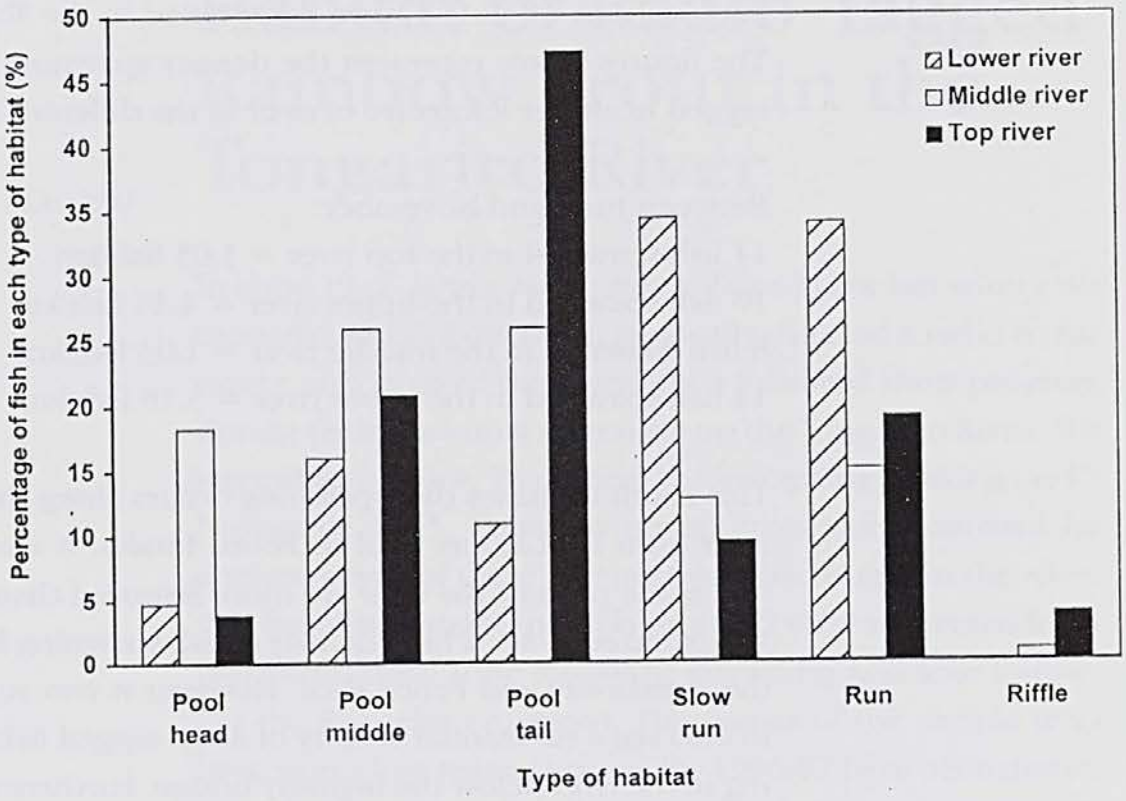
This result indicates that spawning occurs along the whole river from De Latours Pool to Poutu Intake. It also shows that some parts of the river are more favoured than others. We expected to see a high density of fish spawning between the Breakaway and Fence Pool. However it was surprising to also see a substantial density of radio tagged fish spawning in the river below the highway bridge. Furthermore, the river above the Fence Pool did not attract a very high fish density. The middle river had, for no obvious reason, the lowest density of spawning radio tagged fish in the river. Twelve fish were caught passing through the Whitikau trap (23% of all spawning radio tagged fish) indicating the importance of this stream.

Where do trout lie within the river?

For this analysis the river was split into three slightly different sections from those used in the previous question. These sections reflect changes in the character of the river along its length:

- from the Cherry Pool to the Island Pool (lower)
- from the Island Pool to the Fence Pool (middle)
- from the Fence Pool to Poutu Intake (top)

Graph 1 : Habitat use by radio tagged trout in the different sections of the Tongariro River.

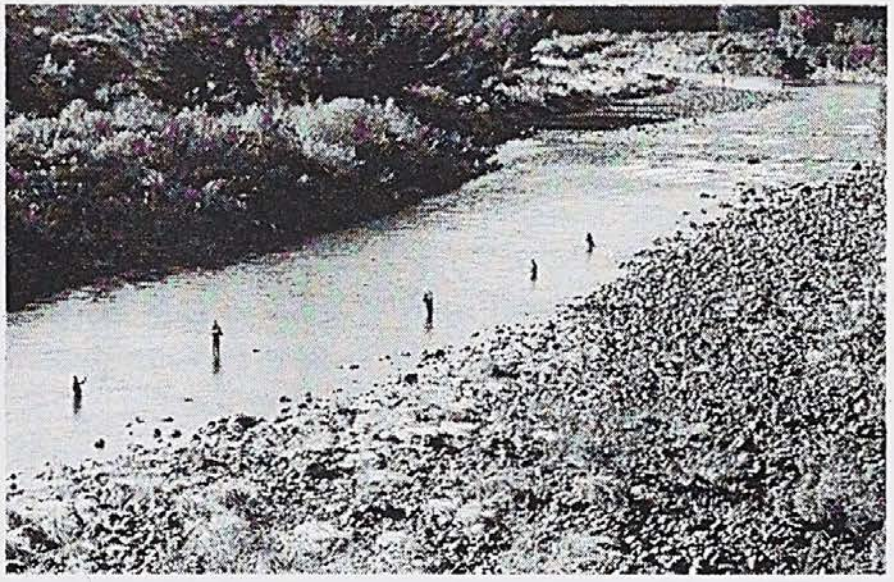


This graph shows that in the lower river, every type of available habitat is used but especially the slow runs. In the middle river the primary habitat used is in the pools. In the top section the fish use the tail of the pools extensively which is where you typically find spawning gravels. The tail of runs are also used more frequently than in the other sections of the river.

The top section was closed to fishing during the tracking period and we believe that the habitat use in this part of the river represents the preferred habitat of spawning trout in the absence of anglers. In the middle river where the fishing pressure is the greatest the habitat use may reflect the effects of disturbance by anglers. Tracking done at night showed that fish move from deep water to shallow water at the tail of the pools or closer to the banks.

Many anglers know that if they are the first to fish a pool in

the morning it generally pays to start at the tail. Later during the day trout will seek shelter further up at the head of the pool or in the middle under a steep bank where they are less accessible. This shift in habitat is especially true when the water is clear and did not occur to the same extent under cloudy water conditions. From these results we can see that fishing success in a pool is as much dictated by its "fishability" as by the number of fish present. If a pool contains many sheltered deep areas difficult to reach with a fly, it will be a very good pool for fish but a frustrating one for the angler.



Disturbance by anglers does affect where the fish lie in the pool

How quickly do trout move through the river?

In 1995 the quickest tagged fish ran from the lower river to the Whitikau trap in 12 days and the slowest in 80 days. Typically it took about 30 days which is an average rate of 600 metres per day (the Whitikau trap is about 18.5km upstream of the lower Tongariro trap). This travel time for the radio tagged trout was similar to other trout marked with plastic floy tags, which indicates that carrying a transmitter did not affect the speed at which migrating trout swim.
As a comparison, in 1993/94 a tagging experiment showed

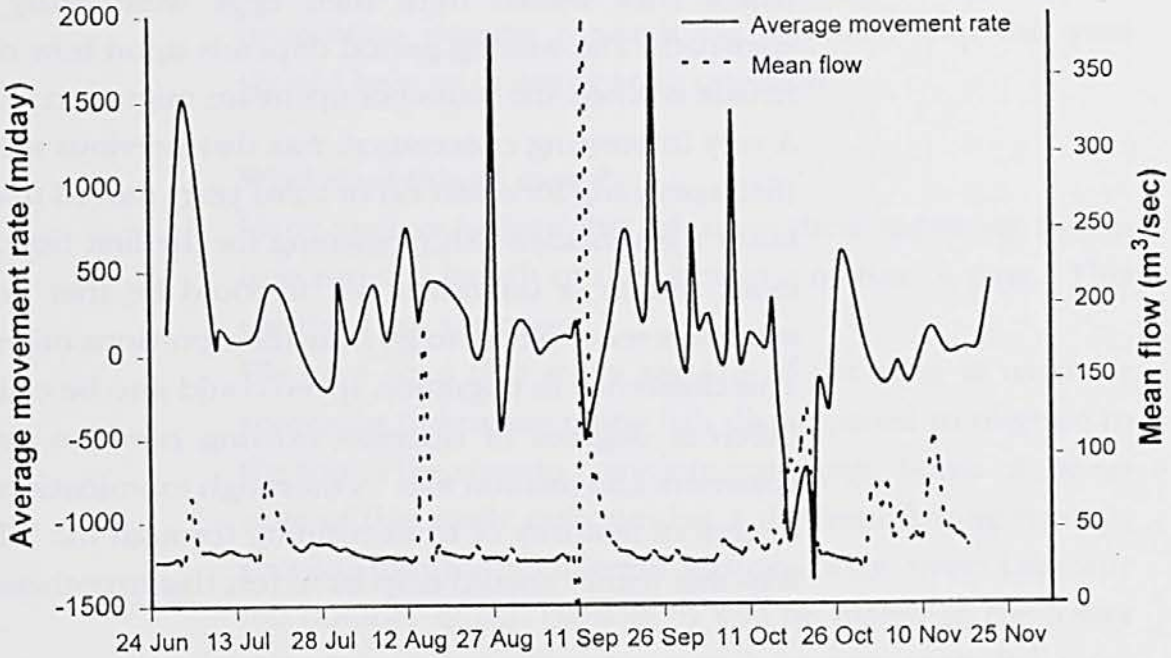
that the average running time for floy tagged fish was 23 days. This daily movement rate is much lower than for salmon. For example it has been found that in the Waimakariri River in the South Island, chinook salmon can travel 70km in less than 15 days (4600 metres per day). We believe that the migration speeds depends, to some extent, on how far up the river it is necessary to travel to find suitable spawning grounds. The final maturation of the eggs occurs as the trout migrates upstream. Once the eggs are ready to be spawned, fish have the potential to retain them only for a limited time. The lower Waimakariri River is totally unsuitable for spawning so the salmon move quickly upstream until they start to encounter suitable spawning grounds. However, in the Tongariro River where the spawning grounds are very close to the lake, such rapid travel does not occur.

Individual daily movement rates are highly variable and on any one day some fish are moving downstream, some resting in the same area, and others moving upstream. This means that the fish are not moving all together in a wave like fashion.

What affects the movement rate?

Looking at Graph 2 we can see that every fresh (small flood) induced an increase in average daily movement rates (values above zero on the graph). Both when the river was rising and then receding the fish ran upstream at similar speeds. We also noted that if the floods exceeded about 100 cumecs then fish had a tendency to stop moving upstream (a zero value on the graph) and to seek shelter along the margins, or even move downstream (values less than zero). However, after the peak of such floods upstream movement resumed. The greatest change in movement rate during the study took place following the major ashfall from the

Graph 2 : The average daily movement rates compared to levels throughout the study period.



Ruapehu eruption in October. This severe event which consisted of a reasonable flood and ash contaminated water over several days, made the fish halt upstream movement, then pushed most of them downstream, some even going back to the lake. Four of them died. However after a couple of weeks some fish resumed their travel upstream. These results strongly suggest that the eruption did not kill all the adult fish present in the river.

In general when the flow is low the average daily movement rate is slightly lower than during a fresh.

When the fish are moving upstream there is no difference in the average speed between male and female rainbow trout. However, the males have a more irregular pattern of movement, often spending time at the same spot then moving up or down to spend another period before moving again in search of more spawning females. The males can do this because they can deliver their milt repeatedly and mate with more than one female. Females on the other hand

have shown a more consistent pattern of movement, moving upstream until they found the right spawning ground where they waited until their eggs were ready to be spawned. The waiting period depends upon how ripe the female is when she starts her upstream migration.

A very interesting observation was that previous spawners (fish spawning for a second or third year) moved upstream faster than maiden fish (spawning for the first time). The exact reason is unknown but it could be that previous spawners recall where to go from their previous migrations. This difference in migration speed could also be caused by different degrees of ripeness existing between previous spawners and maiden fish. A thorough examination of the degree of maturity of trout running through the Whitikau trap this winter should help us to test this hypothesis.

Is it easier to catch a trout when it's moving or when it's resting?

Analysis of the migration pattern of radio tagged fish which have been taken in the Tongariro by anglers shows differences between males and females. Our results suggest that females were generally caught as they were moving upstream but males were caught when holding in one spot. This indicates that females may have a greater tendency for occasional prey capture, whereas males are taking lures as part of an aggressive response to defend their patch rather than by the need to feed. This means that if you are fishing on a spawning ground you will be more likely to catch males, most showing the coloration typical of a fish which has been in the river for a while. Females, however, are more likely to be taken while travelling or resting on their way to the spawning grounds.

The largest proportion of trout tagged were previous spawners but the largest proportion of the fish caught were maiden fish which generally move slower. At this stage we

don't know if previous spawners are more difficult to catch than maiden fish. A comparison between the proportions of previous spawners present in the anglers' bags and the proportion passing through the Whitikau trap this year should help us to answer this question.

What does this all mean?

Many anglers believe that trout on their spawning migration run the length of the river in a matter of days. This clearly is not the case.

We have seen that every section of the river is used for spawning indicating many fish do not need to migrate to the top of the river to complete spawning. Some of the results of this study indicate that a different fishing strategy should apply to the different sections of the river. Logically the number of fish passing by will be higher in the lower river than in any other part, simply because every fish moving up has to pass through there. Unfortunately this doesn't mean that the lower river will be more productive because there are a lot of areas such as under the willows and along the steep banks where the fish lie out of reach of anglers. This explains the low catch rate measured last winter in the lower river during our angling survey despite the large numbers of fish seen holding there. The study suggests that the best angling in the lower river can be expected when the fish are moving, particularly during changes of flow around a flood peak (providing the flood is not excessive).

In the middle river angling prospects do not look so favourable because of a smaller density of spawning fish present and a reduced number of fish passing by. However, some features of the river in this section act to counter this situation. There is proportionally less water where the fish are out of reach than in the lower river so good angling could

be achieved especially during low flow conditions when fish are not moving.

In the upper river where the highest density of spawning fish exists the best fishing is to be expected about two weeks after good fishing in the lower river has been reported. These two weeks representing the average time for the fish to run from the lower to the upper river. But high fishing pressure and disturbance by previous anglers will push the fish into their refuges in the deepest parts of the pools making capture more difficult.

If the river is in flood then it pays to fish closer to the banks where the water is shallow and where the current is not too strong in all sections.

In a future issue of *Target Taupo* we will be presenting more details about the reactions of individual fish tracked through big floods and the Ruapehu eruption.

What is the Formula for Big Sika Stags?

by Cam Speedy

Over the past three years, data on trophy quality has been collected from the central North Island sika herd through an annual autumn hunting competition. The data set now totals over 300 stags, aged and scored, most with location and habitat information. The data set provides a useful insight into the production of trophy animals among New Zealand sika, and helps to answer some of the questions about what contributes to a good trophy. This article discusses some of the more important elements of trophy production in this herd and explains why the focus of this year's competition will be slightly different.

Trophy quality is a reflection of three key elements in a stag's environment; the genetic makeup of the herd to which he belongs; his physical maturity (a reflection of his age); and the quality of nutrition he is able to obtain from the habitat in which he lives.

The genes of all New Zealand sika are derived from the handful of deer released near Poronui in 1905. While there has been some hybridisation with red deer since that time, in theory the herd should still have the potential to grow heads as good as those shot in places like Poronui in the 1940s. However, clearly there are very few stags (if any) of that quality shot each roar these days. Has the gene base declined and how could this occur in just twenty or so generations?

Theoretically, the genes passed on to a stag fawn from his father should be some of the best genes available, because in deer society, to control mating rights over groups of females, a stag needs to be able to fight off other rivals. In natural populations, over time, this situation selects for powerful, large antlered stags and it is these traits that

dominate the gene flow from generation to generation. Unfortunately, when man is involved things start to change a little. Most New Zealand deer harvest regimes are generally exploitative, resulting in a small proportion of stags reaching maturity. This is because young stags make up the majority of the harvest (silly spiker syndrome). Also, large harvests of young stags result in herd sex ratios that favour females, because the behaviour of young females, and to a lesser extent hunter selection, makes them less vulnerable than their male counterparts. Sex ratios that favour females reduce competition for mates among stags at mating time. In such a situation young stags which are potentially poor trophies often get to pass on their genes by default rather than because they are the most worthy. Obviously some young stags will possess the genes for trophy antlers but poor quality stags will also get the opportunity to pass on their genes. Add to this, selective harvesting of the best heads by trophy hunters for the taxidermist, and we may well have a situation that has or is resulting in a decline in the genetic base of the herd.

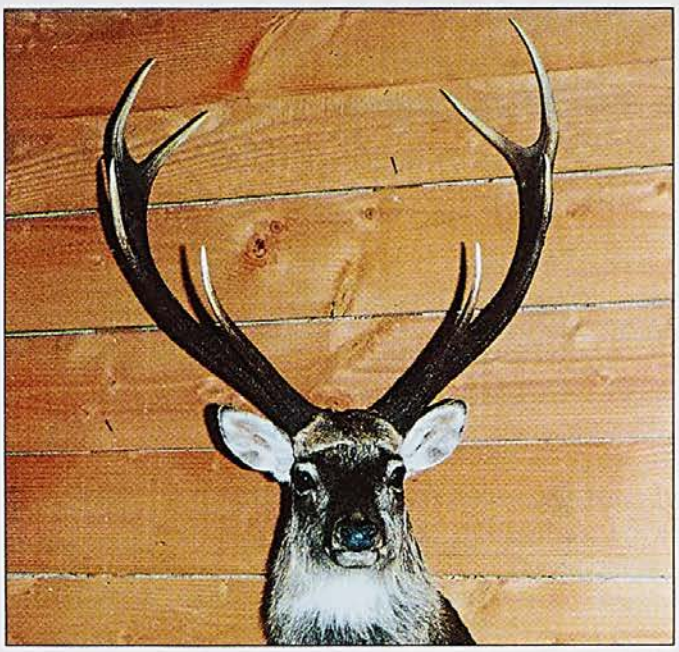
However, each year or two a real cracker head does turn up so perhaps the gene base is not the major problem. The data set from the last three sika competitions suggests that age has a significant bearing on trophy production. The three winning heads of 1993, 1994 and 1995 have all been seven or eight years and the top three heads each year have always been older than six years.

The average age of the whole sample to date gives an interesting insight into the age structure of the mature stag component of the herd. Average is 4.5 years and confirms that the harvest regimes many sika are under prevents most stags reaching peak physical maturity. If New Zealand sika hunters want a significant increase in trophy quality to occur, some consideration must be given to allowing young stags to survive the early silly years.

Despite the young average age of stags over the past three years though, many older stags of six, seven, eights and even nine years have also been entered into the competition with heads that can only be described as poor specimens. Why do these stags not have better antlers? The answer is sometimes genetic, but often the location gives the real clue. Populations which have a higher proportion of older animals, tend to survive in areas where hunting pressure is lower or where, for some reason the hunting pressure is less effective. For example, very dense and/or difficult vegetation, windfall, manuka etc. Because harvest is difficult in such areas, populations are generally higher and the available nutrition must be shared by many animals. Often in the high country too, the energy demands of winter are extreme. Animal condition is compromised in many areas where density is higher, by short growing seasons, strong competition for the available food and harsh winters. This is reflected in smaller animals, lower body weights, reduced reproductive success and poor antler development. Without adequate nutrition, no animal will reach its true genetic

potential and the simple fact is that much of the habitat in the sika range is very depleted by animal density that is just too high.

In summary, the formula for trophy sika stags is a combination of factors. Genetics is one but it is my personal opinion that New Zealand sika generally have an adequate gene base. Age and nutrition, I believe, are far more important. Hunters looking for that trophy of a lifetime therefore need to find an area where habitat quality is high, and hunting pressure is either low enough to allow an increased proportion of stags to attain six or seven years, or where the harvest is carefully managed to allow young stags to survive the younger years. This means the lower altitude, modified country in the east Taupo, western Hawkes Bay and southern Kaimanawa areas, especially where private land offers protection to reasonably good densities of sika, offer the best prospects for consistently good quality trophy stags. The high country herds are generally too undernourished, and the publicly accessible herds in the low country are too exploited, to produce top trophies on any more than just an occasional basis.



The combination of good genes, good habitat and age, can still result in high quality wild sika trophies in the central North Island

Because over-harvest of young stags is a major contributing factor to the general lack of big sika stags taken in the central North Island today, some could justifiably criticise the Sika Trophy Competition over the past three years for encouraging the wholesale harvest of any stag, regardless of age or trophy potential. However, New Zealand's central North Island sika herd is extremely robust at a population level (herd estimate >15,000 animals on 8,000 sq.km) and initially it was important to get a relatively large sample of the whole stag population to provide a "snapshot" of the situation.

Now that we have a better idea of what is going on, more informed comment on harvest strategies that will improve trophy production can be made. Voluntary restraint in the harvesting of young stags, particularly in the spring/summer season when spikers (at around two years of age) are dispersing into unfamiliar territory, and/or when stags are targeting open country for velvet production, will help allow stag population age structures to shift more towards trophy age classes. If this restraint is combined with continued heavy hunting pressure on hind populations, sex ratios will become more balanced and the base population (which provides the annual harvest) can be kept at levels that allow for healthy habitat. This in turn will not only allow our native forests and their native inhabitants to flourish, but will ensure adequate nutrition for their resident deer populations, keeping production high. With better age structure in the stag population the genetic base of the herd will also be maintained as the stronger stags will control most of the breeding.

To encourage these basic game management principles, the organisers of the 1996 Sika Trophy Competition have restricted entry into the competition to stags with six antler points or more. This will mean stags less than three years

old will generally not be eligible. Hunters are also encouraged to harvest a hind for each stag taken, however this will not be compulsory for entry into the competition, this year at least.

The management of our mountain lands and the deer that occupy them is a controversial issue. There are many who say the deer should not be there. Perhaps there is some philosophical validity to this perspective. However the reality is that they are here and we have limited ability to eliminate them. In the central North Island at least, there are many land owners who would not want to, even if we could. Given that deer are now a part of the ecology of this land, careful management of the habitat as well as the deer is important if deer hunting is to occur in a manner compatible with sustainable land management. Your involvement in the 1996 Sika Trophy Competition will help to provide information that will guide such management in the future. Please support it and the generous sponsors who are involved this year. The prizes this year are better and more numerous than ever before and for many of them, you don't even have to go for a hunt!!! Check out the advertisements in this autumn's hunting magazines and be in to win.

Diving in Lake Taupo

by Errol Cudby

It's just a big puddle of fresh water and there are no snapper or sharks, or scallops or ockies, but there are some fascinating dives to be had in "the great lake".

Summer is the best time. The water temperature gets up to around 20 degrees Celsius and visibility is usually 5-6 metres. There are more fish around and plants are blooming; there are more anglers too, if recovering the gear they leave on the bottom is your mission.

Fish Life - There are eight species of fish in the lake but two of these, koaro and goldfish, are secretive and unlikely to be seen by divers. While all species can be seen diving during the day, many are resting up and tucked away in the weeds or crevices whereas at night they are out in the open feeding. Most commonly seen are the slender, almost transparent smelt which swim around in large shoals. They are natives of New Zealand but not Lake Taupo and were introduced to the lake in the 1930s for trout to feed on.

The brown and rainbow trout give the lake its international reputation as a top recreational fishery and they are frequently seen if you are observant. The rainbows are a midwater fish which swim around on the edge of your vision while the browns are often found resting on the bottom alongside rocks or logs. At night both species are more approachable.

Bullies are one of the original inhabitants, they are bottom living and widespread. In summer look for their egg patches on plants, stones and branches. There will be a brave little blackish coloured male guarding each patch with his life.

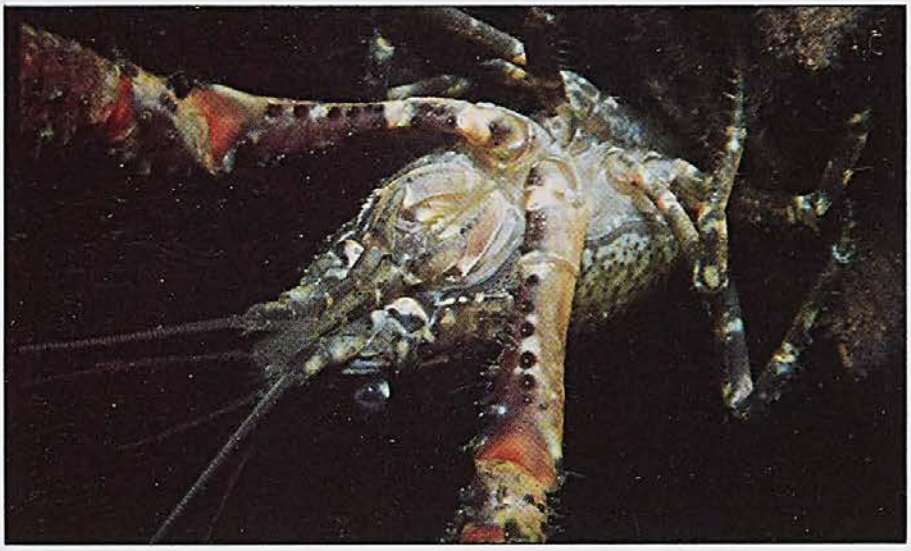
Catfish are unloved and unlovely except to their mothers. They have spread throughout the lake since being illegally introduced eleven years ago, although they are more nu-

merous in weedy areas. At night they seem to be everywhere and you would swear you can hear them purring.

In winter when the lake waters cool they get so dozey that they can be caught by hand, especially at night with the aid of a bright light.

Koura or freshwater crayfish are the only other denizen of the deep you are likely to see underwater. They will be parading around on the open bottom 20-30 metres deep, rearing up with their pincers clicking as divers approach, but at shallower depths they hide during the day.

Come in if you're good looking



The occupant, a freshwater crayfish

Getting There - There is no vehicle access to large stretches of the lake edge and the best spots are often only accessible by boat. Generally the bottom is quite clean with just odd branches, rocks and freshwater mussels scattered over it. Weedbeds exist in the sheltered shallow areas around the lake but generally the visibility is not so good there. The cliff faces, reefs and islands are impressive with steep drop-offs and rock formations. The water is clearest in the middle to western areas and there are wrecks near Kuratau and Waihaha to be found. North of Hatepe, standing and fallen trees in 3-15 metres of water indicate past upheavals and moa footprints in mudstone have been photographed near Pukawa but not yet located. So much to see and do!!

Bully laying eggs

Taking Care - Take care though, if you are coming from the sea, as fresh water is less buoyant and you will need to take some lead off your weightbelt. Along the cliff faces, particularly when the water is clear you can free fall to dangerous depths before you realise. People seem more susceptible to to the narks in lakes (Nitrogen narcoses "rapture of the deep", a feeling similar to drunkenness with similar effects on on performance - caused by the effect of nitrogen gas at high pressure, i.e. depth, on the central nervous system).

The lake is 357 metres above sea level so allow an extra safety margin if you are using decompression tables and ensure your topside practice is the best. Use a well marked boat and dive flag, and a well informed boatman as it's hard to run on the surface wearing SCUBA to get out of the way of another vessel that has not seen you.

As is typical within deep lakes, there is a thermocline. Depending on the time of year, somewhere between 25 and 40 metres, divers will notice a rapid change in temperature, the warmer upper layers giving way to the depths where the temperature stays at the winter minimum of around 11 degrees celsius. It can be a bit of a shock if you are not dressed for it. Currents need to be considered where the water flows into and out of the lake and there are often gentle water movements around points and headlands. Unlike the sea, if diving in the inlet currents you can't throw a diver over the side and have a look after lunch to see how far he or she has drifted. Being cooler and more turbid than the lake surface, streams follow the bottom contour into the depths. They can make the ticker flicker quicker when you realise you are in one inadvertently, but ascending a few metres will clear it.

Clubs, Contacts - Find out more about where and when and how, from the two local clubs - Turangi at the upstream end (President: J Truebridge, RD1, Turangi) and Taupo (PO Box 80, Taupo). Dive Inn, Spa Road, Taupo supplies all the bubbles, they know the best places to go and there are a few Department of Conservation staff who are easily bribed - some have been known to offer themselves in sacrifice at the mere mention of words like "Poor Knights", "Barrier" or "Mercs".

Spring/Summer Hunting Summary

by Cam Speedy

An early start to spring set up by a very mild September was followed by consistently mild, moist, northerly weather patterns which has allowed for another outstanding growing season in the central North Island during 1995/96. Most forest habitats are at their best this year, especially where possums have been reduced by successful control operations in recent years, and this has had a positive influence on game, as well as native species in the conservancy. Despite the generally good conditions however, the good news for hunters has been negated by two factors in the eastern ranges.

Firstly, sustained high deer density in parts of the eastern high country over the past decade meant deer condition prior to the growing season was poor following a harsher than average winter. Secondly, significant deposits of ash from Mount Ruapehu fell right at the onset of the growing season. This resulted in major stress for deer, particularly in the Tongariro, Waipakihi, Tauranga-Taupo, Hinemaiaia and, to a lesser degree, in the upper Mohaka catchments.

Dead deer were widely reported by hunters from these areas throughout late October, November and December, indicating that the ash did indeed have some lethal effect. The timing, in early spring, was unfortunate, given the already poor condition of some animals. A further, perhaps secondary effect, occurred at fawning with reports of dead slinkies and fawns in some areas.

Given that 1000 lambing ewes died on one large farm property in the district as a result of the ash, and assuming local feral deer had a poorer average nutritional status than local farmed sheep at the time, it is perhaps not unrealistic that 5% or more of the deer herd in the path of the ash shower

may have died. This would mean some 350-500 deer deaths over an estimated 200,000ha. The number of dead deer reported on hunting diaries certainly suggest there were plenty lying around to be found.

Hunting statistics from the Waipakihi Valley, one of the worst hit areas for which we have significant data from previous years, show no change to the average kill rate this year. Hunting effort was about half of what is usually reported, presumably because hunters were put off by the presence of the ash, and as a consequence harvest was well down. The best case scenario from a hunter's perspective is that the deer that died from the ash accounted for the fewer deer harvested, with no nett loss or gain in the population compared to a growing season without an eruption and normal hunting pressure. The worst case scenario for hunters is that the deer that did not die from the ash were under such nutritional stress that they were forced to feed harder and longer than they otherwise would and were therefore more vulnerable to harvest. Such a scenario would see a reduction in deer density in the valley, which from a forest conservation perspective is a very positive outcome.

The condition of breeding hinds and younger animals has generally remained poor through summer in the Waipakihi, despite the river flats having strong grass growth right through January. Stags appear to be reasonably fat, which is not unexpected considering the amount of good grass available to them. Poor hind and young deer condition may well have longer term impacts in terms of the intensity of this year's rut, subsequent reproductive success, fawn survival or even breeding hind survival, should the snows again be heavy and prolonged at lower altitudes this winter.

In most other areas where the ash impact was less severe, the good growing season has allowed deer to put on good condition through the season and the effects of the ash should not last too long.

The observation of nutritionally stressed deer around the eastern parts of the conservancy is consistent with the 86 deer harvested by helicopter in the upper Mohaka/ Kaimanawa RHA area in November which underwent full autopsy by Ministry of Agriculture vets looking for bovine Tb (see *Bitz 'n' Pieces* for more details of this operation). No Tb was detected, but some of those deer autopsied were in very poor condition, the proportion of yearlings was low (10%), and the proportion of breeding aged hinds carrying fawns was only 50%. In a normal farmed situation and/or in good habitat conditions, in the vicinity of 70 % of breeding sika hinds would be expected to be carrying fawns.

On a more positive note though, the early and strong growing season, away from the influence of the ash, has produced some great velvet and things look good for a few better than average heads this year. Amongst 44 red deer harvested from Tongariro Forest for autopsy no Tb was found,

and again the quality of the deer and the size of some of the stags seen suggest there will be some good heads around in autumn. A total of 48 deer jaws provided from the Ohakune area during 1995 showed a general increase in size which provides a good indication that possum control has allowed for an improvement in forest health in that part of Tongariro National Park.

The notification of the Department's intention to allow a limited Wild Animal Recovery permit for the Hauhangatahi Wilderness Area of the Tongariro National Park in May this year has seen increased hunter interest and effort in the area this season. This area seems to have soaked up some of the hunting pressure from hunters displaced by the ash in western Kaimanawa Forest Park.

A total of 2539 hunters obtained permits to hunt in the Conservancy during the 1 October to 31 January period. This is 10% up on the average (2300) over the past five years, despite the ash. Just on 300 hunters had returned diaries by 23 February 1996 documenting 1000 days of hunting on public conservation lands. This response is a little disappointing, however, a summary of the limited data provided is presented in Table I. Overall, this spring and summer was more productive than any of the last five years at the same time of year, with one kill for every three days hunted, well up on last years average kill rate of one kill for every four days hunted.

Winners of the diary prize draw were as follows:

Air transport with Lakeland Helicopters : Des Monohan, Thames Coast

Air transport with Air Charter Taupo : J Ratima, Raetihi

Sika Safari video from Neil Philpott : D Brown, Auckland

Sporting goods from The Fly & Gun Shop, Taupo : Richard Curtis, Auckland

Table 1
Tongariro/Taupo Conservancy Recreational Hunting Statistical Summary
October 1995 to January 1996

Area	Block	Days Hunted	Encounters				Kills				Kills/ Day
			Sika	Red	Pig	Goat	Sika	Red	Pig	Goat	
Kaimanawa Recreational Hunting Area	All	236	169	10	-	-	49	1	-	-	0.212
- Tb Disease Survey (Aerial) Harvest	All	22 hrs	-	-	-	-	48	6	-	-	2.453
Kaimanawa Forest Park (Excluding RHA)	All	436	227	184	3	-	75	71	-	-	0.335
Tongariro National Park	All	110	12	98	5	-	1	55	3	-	0.536
Tongariro Forest	All	105	-	61	-	30	-	26	-	7	0.314
- Tb Disease Survey (Aerial) Harvest	All	23 hrs	-	-	-	-	-	44	-	-	1.913
Erua Forest	All	26	-	12	-	35	-	11	-	14	1.000
Rangitaiki Forest	All	10	3	3	-	-	-	-	-	-	-
Lakeshore Reserves	All	14	-	1	-	-	-	-	-	-	-
Unspecified Returns	Whole conservancy	44	-	-	-	-	-	5	-	-	0.114
Totals Oct-Jan 96		990	-	-	-	-	127	169	3	21	0.323
Totals Oct-Jan 95		1816	-	-	-	-	165	265	-	30	0.253

100 rounds of ammo from NZ Ammunition Co. Ltd : Jon Lynch, Taupo

Outdoor clothing from Stoney Creek : Patrick Krippner, Linton

We trust your autumn hunting is safe and successful and look forward to reviewing your contribution to forest conservation in the central North Island in June when you return your hunting diaries, deer jaws and wildlife sightings.

Remember, be prepared and above all else, IDENTIFY YOUR TARGET !

Something Fishy

Future Angling Prospects

The immediate future - There has been much speculation about the consequences to the Taupo fishery of the September eruption of Mount Ruapehu. Sensational reports that the fishery was wiped out were unfounded and inaccurate. As discussed in the second part of this article there are impacts which will become obvious in several years' time, but angling prospects for this winter are excellent.

At the time of the eruption there were at least two age classes of trout happily doing their thing in Lake Taupo, unaware of the fury of the mountain. As in recent years, these fish which were spawned in 1993 and 1994, are very numerous. From the November acoustic survey we estimated that there were 145,000 legal sized trout present in the lake. While less than last year this count is similar to 1993 and much higher than earlier years (see Table 2).

Table 2 : November acoustic count of legal size trout (1000s) in Lake Taupo

YEAR	NO. OF TROUT
1988	90
1989	69
1990	N/A
1991	108
1992	115
1993	145
1994	205
1995	145

These larger counts since 1992 have preceded excellent summer trolling on the lake (Table 3) and winter river angling.

Table 3 : Average catch rates (fish per hour) on Lake Taupo over recent summers

	YEAR				
METHOD	1991/92	1992/93	1993/94	1994/95	1995/96
Shallow trolling	0.14	0.25	0.29	0.30	0.22
Leadlines	0.15	0.23	0.34	0.26	0.23
Wirelines	0.42	0.41	0.36	0.42	0.41
Downriggers				0.30	0.32

Catch rates given are the average of every angler's catch rate, not the total numbers of fish divided by the total number of hours of effort as usually used. Calculating the catch rate in this way is perhaps a better measure of the average angler's degree of success.

From Table 3 it appears shallow trolling techniques were less successful than last year over the December-January period. However, those anglers fishing deeper continued to have very good success. Overall it was again a good summer on the lake and come next winter, the fish will once again pour into the rivers.

Since the eruption the Tongariro River has turned a concrete grey every time it has rained, as a consequence of ash washed in from the Mangatoetoenui Stream which flows off the eastern flanks of Mount Ruapehu. With time, the effect is becoming less, but even under low flow conditions the river has some colour, much like a South Island glacial river. However, the ash doesn't appear to deter the adult fish or affect angling. Even in the days immediately following the main eruption some very good fishing was experienced in the lower river. Numbers of spawning fish through the Whitikau trap in January and February are very similar to the runs at the same time last year.

Many anglers visiting their favourite pool for the first time this winter may, however, get a shock to find it bears little

resemblance to how they remember it. Two large floods in September and December, one the largest for ten years, have dramatically re-shaped the river.

So get out and make the most of what will be another good winter's angling. As we will discuss, prospects in a couple of year's time are less promising.

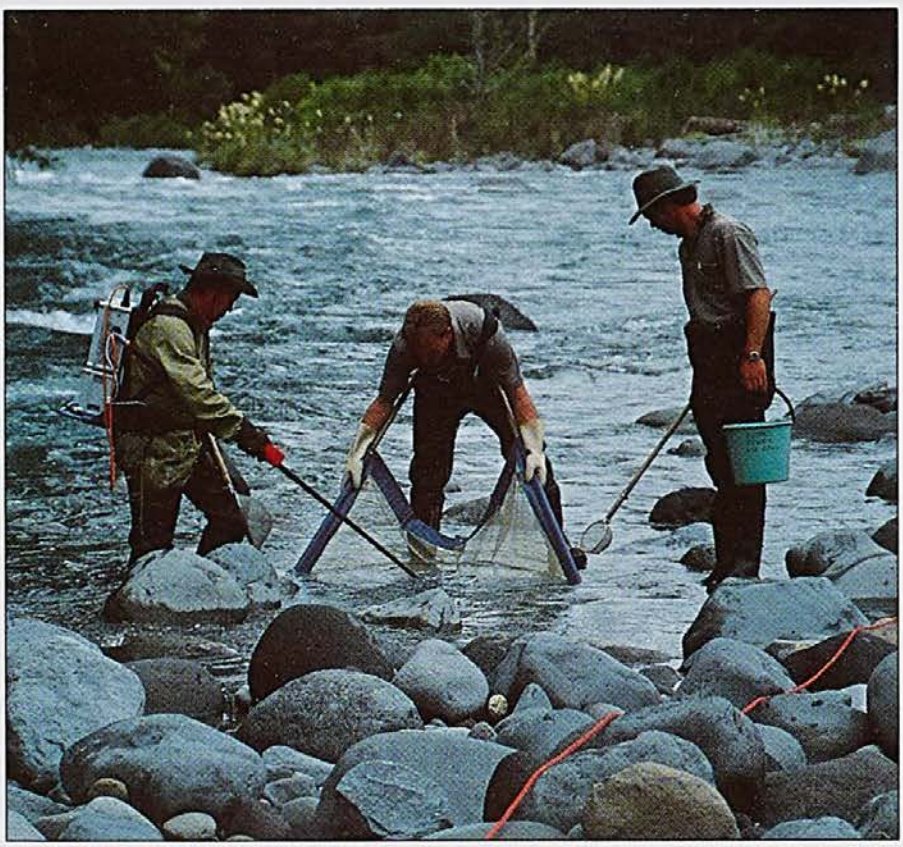
The Longer Term Effects - The Taupo fishery is sustained by natural spawning. When conditions are favourable, as they usually are, a large proportion of the millions of fry which hatch from the gravels each spring are able to survive and grow. These fish reach legal size (35cm) in their third year (age 2+) and form the basis of the fishery for the next two years. However, occasionally nature conspires to throw additional challenges at these young fish and far fewer survive to be available to anglers.

The eruptions in September and October deposited huge amounts of ash into the river and onto the surrounding catchment. This is continually washing into the river and the Tongariro is carrying a huge sediment load. Fine sediment is the bane of many forms of freshwater life. On top of this two very large floods in September and December were both dramatic enough to re-shape large areas of the river. Nature has delivered a very severe test and the outcome is that the river has taken a hiding. In the Whitikau Stream, which, apart from the eruption on 11 October, was not affected by ash, electric fishing surveys indicate fewer fry than in recent years, almost certainly as a consequence of the floods. In the Tongariro though, the situation is even worse, with very low numbers of fry and the aquatic insects they depend on for food.

Fortunately numbers of fry and fingerlings in the other eastern tributaries are higher which may, to some extent, mask the low recruitment from the Tongariro system. However, almost certainly the numbers of adult fish returning to spawn in 1998 and 1999 will be depressed.

The Long Term Prospects - Since the establishment of trout fisheries in the district around the turn of the century, there have been four eruptive periods from Ruapehu before this current activity. The effects of these eruptions have at times been much more severe than anything we experienced this time. Yet the impacts on fisheries have only ever been short term. For example, the Whakapapa fishery appeared to have been completely annihilated in both 1969 and 1976 eruptions, but quickly bounced back after both events.

Large numbers of trout will spawn in the Tongariro this winter. As the condition of the river improves, and if there are no unseasonal floods, there is every chance that this year's trout production will be very good. As events early in this decade showed, it takes only a couple of years of favourable conditions for the fishery to bounce right back.



Electric fishing the Tongariro River to assess juvenile trout numbers From left to right: Errol Cudby, Iain Maxwell and Michel Dedual

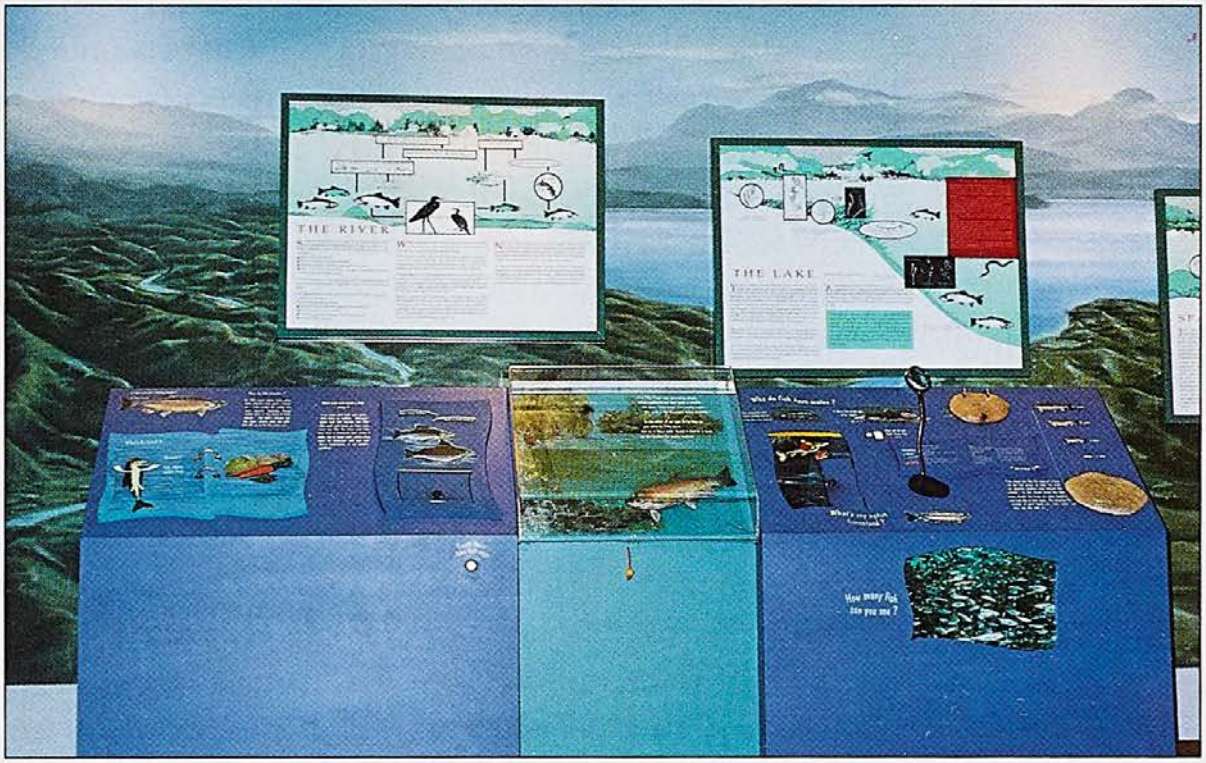
National Trout Centre Displays

The viewing chamber was extensively damaged in the September flood, but with some help from a Turangi Lions' Club member, was back in service just in time for Santa on Christmas Eve.

The roof was not quite finished as the contractor ran out of materials. Also we could not get a contractor to re-lay the carpet in December and have decided to wait until visitor numbers ease. However, the place was operating in time for the holiday visitors, complete with the installation of a new interactive children's display which has proven very popular.

It nearly wasn't though - the flood on the 23 December again washed out the river walk.

The interactive display set up in the viewing chamber



Lake Otamangakau Update

In the November 1995 issue of Target Taupo we predicted some very good fish would be taken from Lake Otamangakau this summer, and so it has proved. Amongst a number of fish taken over 4.45kg (10lb) have been trout of 6.4kg (14lb), two of 6.8kg (15lb) and a beauty of 8kg (17.5lb). This latter rainbow, a male, was caught by an American client of local guide Graham Deans and after weighing, and the all important photograph, it was carefully released: a marvellous gesture.

Catch and release is very important to sustaining the trophy fishery in Lake Otamangakau. Nevertheless if you catch what you regard as your trophy of a lifetime and would like to put it on the wall then don't feel uncomfortable about doing so. By the time a fish has reached 5 to 6kg it is likely to be five or six years old, and to have spawned several times. It has therefore passed on its genes and is beginning to battle old age. If, when mounted it will be admired and treasured as the culmination of many years of angling, then perhaps that is a fitting end! This is quite different to killing every large fish you catch. Unless the fish is something special to you then why not put it back.

Most important are those fish between 3.5 and 4.5kg, which in Lake Otamangakau are usually in superb condition, and if only given another year or two stand a real chance of becoming a special trophy for someone.

Note that these comments are specific to Lake Otamangakau which has the ability to sustain the removal of a handful of trophy fish each season, something many headwater river fisheries for example, may not have.

The downside this season was that as also predicted, catchrates have generally been low. The capture of trophy fish is usually the culmination of many hours of effort and learning.

Another feature of the fishing this summer has been the confirmed capture of two 5.7kg (12.5lb) brown trout, the largest brown trout ever taken from the lake. Most of the large fish, particularly the rainbows, have been reported as not having any fin clips, indicating they did not pass through the trap on the Te Whaiau Stream last winter. It is difficult to know whether these are fish which spawned elsewhere, avoided the trap in times of high flow or are, in fact, clipped and the clip has regrown and it is not apparent to anglers.

Many anglers believe that spawning occurs in the lake or the Te Whaiau Canal though these areas do not provide good spawning habitat. Spawning usually occurs in clean gravel in running water, most often found in the tributary streams and at some lake outlets. Where spawning occurs in lakes it is usually when inflowing streams are absent or unsuitable and the trout then spawn on stony, wave washed shores. Such conditions do not occur in lakes Te Whaiau and Otamangakau.

We do know, from recapture of kelts migrating downstream after spawning, that approximately 30 percent of the run did avoid the trap in times of high flow last winter. However, it would be unusual that a much greater proportion of the large fish have apparently avoided the trap We also know from inspecting anglers' bags that the trap clips are easily overlooked by most anglers. This is not that surprising, for despite the clips being readily apparent once someone knows what to look for, they are not always obvious otherwise. Generally Lake Otamangakau fish very quickly regain condition after spawning and by mid-summer the fin has completely re-grown. All that is then apparent is a faint scar line across the middle of the fin.

Trapping of the run this winter will provide further information about this.

Also conspicuous by their absence has been any of the juveniles we released into the lake in December 1994, all clipped by removing a whole fin. When the whole fin is removed it never re-grows leaving a very obvious stub. A feature though of the fishing at Lake Otamangakau in recent years is that young fish make up only a very small proportion of anglers' bags. Schools of fish 250-350mm long are occasionally seen in the outlet canal and around the lake margins but the year class typically first appears in anglers' bags in significant numbers later in the year when the new season opens on 1 October. By then they are well conditioned fish of approximately 1kg.

Their occurrence in the catch early next season will prove very interesting. A general comment amongst Lake Otamangakau regulars this summer has been that they have seen more young fish than in recent years which, if in fact is the case, is a positive trend.

It was a very poor year for cicadas with many fewer around the lake edge than last year. Weather conditions were more conducive to blowing them into the water but there just weren't enough present to instigate a widespread rise. Perhaps next year?

In early January ECNZ began work to remove accumulated sediment from Lake Te Whaiau and the Te Whaiau and Otamangakau canals, as part of maintenance of the Tongariro Power Scheme. This does not affect the main body of Lake Otamangakau other than the delta.

The corporation holds resource consents to undertake this work, the conditions of which were agreed upon after extensive liaison between ECNZ, the Manawatu-Wanganui Regional Council and DOC. These conditions control the timing of dredging and place very tough constraints on the downstream turbidity effects from the dredging and settling pond discharges. The work is being carried out by Heron Construction who also undertook the dredging of

the upper Hinemaiaia dam in 1994. Using a cutter suction dredge and pumping the material removed into large settling ponds they were able to successfully complete excavating the HA dam without exceeding some very tight environmental constraints. The same technology is being used at Lake Otamangakau. Work will continue through into the spring.

The cutter suction dredge in operation in Lake Te Whaiau just upstream of the road bridge

Once again this winter we will operate the Te Whaiau trap which provides valuable information on the size and structure of the Lake Otamangakau trout population. Now that we have two years data we are able to determine additional information such as the number of repeat spawners in the population and also to detect any changes which may be occurring in the size or structure of the fishery.

Angling Seminars

Following on from a successful trial seminar last year fisheries staff conducted a further three angling seminars at Kuratau, Motutere and Kinloch over the Christmas period. Each session covered the basics of trolling on Lake Taupo including discussion on the different methods and rigs and how to fish them, where and when to go, and the use of echosounders to improve success. In all, more than 200 people attended. Comment received back suggests that many anglers found them worthwhile and that some of the tips passed on proved successful in subsequent days.

For people who only get to visit Lake Taupo a few days a year or are just starting out, trolling on the lake can seem to be a mystery and singularly unsuccessful. However, with some fairly simple explanations of where the fish are likely to be and how to target them, success can often become much easier.

These seminars are likely to be repeated next summer, though perhaps at different venues. Once details are finalised these will be widely advertised.

1995/96 Trapping Operations

Yes, we're back into it. Late January saw us re-installing the Whitikau trap for another year. Despite the two very large floods in September and December, a week of repair work and general maintenance was all that was needed to get the trap operational again.

The 7 September flood down the Tongariro was the largest for 10 years. However, on Christmas Eve 100mm of rain in 24 hours saw the biggest flood in the Whitikau since we have been trapping. The damage sustained to the trap area was not serious but has created new challenges to the operation by changing the flow over the trap. To give an idea

of the magnitude of the flood, a beech tree (estimated to be over 25 years old) just upstream of the trap, was washed away.

Last season was particularly successful in terms of achieving our aim to trap as much of the run into the Whitikau Stream as possible. Refinements to the trap and the operating procedure, along with plenty of snow instead of rain during the winter, resulted in the trap being effective over much greater periods than in 1994. Coupled with this we were able to refine our estimate of how many fish we missed during floods (by assessing the number of kelts returning to the trap missing a current year's trap clip), and so estimate the total annual run in the stream. Last year 11,140 rainbow trout and 1,338 brown trout migrated up the stream to spawn. The estimated monthly totals are given in Table 4.

Table 4 : 1995 Whitikau trap run

	RAINBOW	BROWN
January	172	0
February	364	11
March	949	5
April	1563	101
May	1703	476
June	1332	582
July	1440	122
August	1217	35
September	1475	5
October	506	1
November	304	0
December	115	0
TOTALS	11140	1338

On 1 April we will install the Te Whaiau trap at Lake Otamangakau. This season will be its third in succession and the trap is proving to be very successful. The results

from last year were discussed in the November 1995 issue of *Target Taupo*.

This season the trap is to be modified slightly to allow a more efficient recapturing of kelts and to improve the entrance to the upstream pen.

Kids' Fishing Days 1996

The fishing pond at the Tongariro National Trout Centre will be open on the following days in 1996, for children aged six to 14 years (inclusive). They will be assisted at poolside to catch a trout which will be weighed, measured and presented to them with a certificate to take home. The pond will be open on these days between the hours of 9 a.m. and 3 p.m.

Sunday, 5 May
Sunday, 2 June
Sunday, 7 July
Sunday, 18 August
Sunday, 22 September

There is no charge for the event, as local anglers provide voluntary assistance. To participate children must have a Taupo fishing licence, which costs $2.00 for a day or $6.00 for a season.

Parking is available adjacent to SH 1. There are picnic areas near the pond and along the Tongariro River and there will be barbequed foods and fishing licences for sale on these days.

Anglers Obey Fishing Regulations

This summer 1222 anglers have been checked as part of routine compliance and survey activities on lakes Taupo and Otamangakau. Fishery managers are pleased with the level of compliance and only 14 anglers (1.1%) face action

for fishing without a current licence. A further eight offences involving either fishing with more than one rod or continuing to fish after keeping the daily bag limit (three fish) were also detected.

The results suggest that few anglers are prepared to fish at Taupo without a current licence. This indicates that people accept the fishing regulations and that our current compliance effort towards ensuring anglers are licensed is sufficient. No doubt the major deterrent is that they don't want to go to court, but ultimately it means each angler is paying their share towards the management of the fishery.

Harvest Survey Update

The 1995-96 season's harvest survey is well past the halfway mark now with the major part of the lake work section completed. Over 2000 lake anglers have been interviewed by staff since the beginning of December and 45 aerial counts completed. Preliminary analysis indicates that the total angling effort (total angler hours) over the Christmas/New Year period this season was slightly higher than that measured in the 1990-91 survey. Over three days sampled over Christmas a total of 2868 anglers were counted fishing compared to 2457 seen in the 1990 Christmas period. This is a 16% increase over the earlier survey.

The catch from this period was found to make up one tenth of all the fish caught from Lake Taupo over the 1990-91 season. However, other times of the year have shown very little differences from the 1990-91 survey. It could well be a reflection of more holidaymakers being in Taupo for Christmas than was seen five years ago. Certainly anglers fishing along the eastern shores of the lake between Motuoapa and White Cliffs experienced "traffic jams" which were a rather daunting sight from the air for any staff counting anglers who didn't have a good flying stomach.

Surveys on the Tongariro River start again in early April and it will be interesting to see if last year's eruption has had any effect on angler numbers. There have been quite a few changes in the river since last winter so some exploring will be necessary to find where the fish are hiding. If you are approached by a DOC interviewer we will only take three minutes of your fishing time and your answers will give us an important insight to the trends of the fishery. A big thank you to all those approached over the summer who happily answered our questions.

Smelt Harvest Trial

Smelt, while native to New Zealand, did not naturally occur in Lake Taupo. They were introduced in the 1930s to provide food for trout and have become the dominant prey of rainbows.

When Ngati Tuwharetoa iwi accepted a Crown proposal to allow legal public access to and use of Lake Taupo in 1926, the rights to indigenous fish in the lake were reserved to the iwi. One of the main species was koaro, an entirely freshwater-dwelling member of the whitebait family.

After trout were introduced about the turn of the century they fed heavily on koaro and apparently depleted their numbers significantly. Later it became apparent also that the introduction of smelt had a greater impact, virtually extinguishing the traditional koaro fishery. As a result, Ngati Tuwharetoa sought the right to harvest smelt.

However, because of their importance as trout food, human harvesting of smelt has been prohibited since the fish was first introduced.

Research by DOC fishery scientists in the 1980s gave us a much better understanding of smelt and trout population dynamics. It seemed that the lake produced more smelt than that needed by trout and it appeared therefore that a

small surplus of smelt might be available for harvest.

Our knowledge was not sufficient though to give a clear understanding of how, where and when smelt could be harvested, without affecting either the viability of the population or the growth of trout.

Over recent years, the Tuwharetoa Maori Trust Board has consistently made the point that they had lost a traditional fishery reserved to them by law. It was clear that if a sustainable surplus of smelt could be harvested, it should be made available to the board's beneficiaries.

In response to this advocacy the Trust Board and the Department jointly developed a proposal to allow a carefully controlled and monitored trial harvest on a research-by-management basis to be evaluated after three years.

This action was consistent with the Department's statutory obligations under the Conservation Act to give effect to the principles of the Treaty of Waitangi.

Initially three sites were selected around the lake shores between Waitahanui and Kuratau. A maximum harvest of 200 litres from each site was agreed, to be taken between the months of November and February. Each permit holder was restricted to taking two litres of smelt per permit and a maximum of 25 permits per month for each site were issued. The Tuwharetoa Maori Trust Board verifies applicants' eligibility as board beneficiaries and DOC issues permits to take up to two litres of smelt from a specified site, on a specified day.

The first harvest began in November 1994 and the second season commenced in November last year, finishing at the end of February. Permit holders returns and our own compliance monitoring show that approximately 150 litres of the possible 600 litres of smelt were taken in the first year.

Prior to the start of harvest and throughout the year since, smelt are sampled at regular intervals both in and adjacent to the three harvest sites. This will reveal the seasonal abun-

dances of smelt along the beaches and any impact on numbers from the trial. A sample of smelt is also examined for length and state of maturity, which will show the seasonal ratio of spawning versus juvenile smelt. A record is also kept of the by-catch of other species, mainly bullies, juvenile trout and some koaro.

Monitoring to date has shown no significant difference in smelt densities between harvested and unharvested sites, indicating that current harvest levels are not affecting smelt numbers.

Staff monitor the smelt population at the trial sites each month
Left to right: Michel Dedual and Grant Sim (Bart)

The trial will be evaluated after the next season and a decision will be made whether a permanently managed harvest can be sustained. There is strong agreement between DOC and the Trust Board that harmful impacts on the trout fishery must be avoided. As an over-arching objective, this dictates that a conservative approach be taken until knowledge becomes more substantive.

Bitz 'n' Pieces

News from Ohakune

Work begins within the next two weeks on construction of the bridge across the Makotuku Stream on the Horopito access road. It is hoped that the bridge will be completed by the beginning of the roar but no promises there.

The Rangataua Forest access road has recently had some work carried out on it by Winstone Pulp International Ltd. Two-wheel drive access up through the forest is now available for the first seven kilometres of road.

During the week of 4-8 March 1996 a Hughes 500 helicopter was working the open country between the Ohakune mountain road and the top of Karioi Forest. The machine looked as though it was is in hunting mode, and it was, but hunting for Pinus contorta (lodgepole pine) not any deer species!

News from Whakapapa

Annual Goat Hunting Competition - Taumarunui Rod & Rifle Club

A small but enthusiastic group of 14 hunters participated in this year's goat hunt on Sunday, 25 February, in the Tongariro Forest area. The event had been postponed from November due to bad weather. Conditions were ideal on the day with a cool night temperature, a heavy dew and fine weather.

Most hunters went out in pairs with younger hunters accompanied by an adult. This was a great learning opportunity for younger hunters. All groups shot goats, in all 35, along with one deer.

Each group won a prize, donated by the Department of Conservation. The trophy for the largest head went to Barry Dodd. The party with the largest tally was Darryl Brown, Terrance Brown and Norm Bennett.

The annual goat shoot is sponsored by DOC as part of the goat control programme for Tongariro Forest. The goat control operation also involves a contract hunter with dogs, staff ground hunting and an annual helicopter shoot. Goat numbers are steadily decreasing with reports from hunters of significant regeneration on slips and steeper country. The absence of goats also enhances deer hunting as deer tend to avoid areas where goats are present. However one consequence of the success in reducing goat numbers is that the competition will continue for many more years.

Spring Helicopter Access into the Rangitikei for Recreational Hunters

For the third year in a row, between late October and Christmas 1995, recreational hunters had access to four helicopter landing sites in the Rangitikei Remote Experience Zone of Kaimanawa Forest Park. A total of 15 parties involving 45 hunters took this opportunity. These hunters harvested a total of 65 deer (22 sika & 43 red) from which 40 jawbones were supplied.

Helicopter access is restricted in this part of the park in recognition of the special wilderness character of the Rangitikei catchment. However, its remoteness also restricts hunting access and therefore the ability of recreational hunting alone to keep deer numbers at a level where they are not causing serious habitat depletion.

The seven week helicopter access period allows hunters a productive window in which to enjoy the catchment and contribute to its ecological welfare each year. Spring was

chosen over other times of year because it is at this time that breeding females are most vulnerable to harvest as they are under a high physiological demand in the late stages of pregnancy, there are no trophy animals to influence hunter game selection because stags have already cast their antlers, and the most effective control of the population can be achieved. Hunters are able to hunt the catchment during the rut. While they must walk in at this time of year, better conditioned stags with larger antlers as a result of improved habitat conditions, and more intense rutting due to a more balanced sex ratio make the walk very worthwhile.

The data collected from the parties this year is presented in the table below. The movement of the Trick Creek landing site used in previous years, to the Whakamarumaru tops on the Makorako Range resulted in an increased harvest this year and relieved the pressure on the Rangitikei trophy trout fishery. The other three sites remained largely unchanged from previous years and produced similar numbers of deer for a similar hunting effort.

Table 5 : Spring hunting data from the helicopter sites in the Rangitikei Remote Experience Zone

Landing Site	No. of parties	No. of hunters	Days hunted	Sika seen	Red seen	Sika Kills		Red Kills	
						Stag	Hind	Stag	Hind
Ecology Stream	1	3	10	2	3	2	-	-	-
Eco/Rangitikei Junction	7	23	68	24	29	3	3	6	8
Whakamaru tops	5	15	63	19	72	8	6	8	14
Otamateanui	2	4	10	-	11	-	-	7	-
Totals	15	45	151	53	115	13	9	21	22

A significant increase in the proportion of hinds reported to be in fawn, and in the number of young deer suggests an improvement in available nutrition. The effect of changes in habitat condition will be studied in more detail in March 1996.

The visible human impact at landing sites suggest hunters visiting the area have an increasing awareness of environmental care, however some parties still have room for improvement. Our thanks to the parties who participated for their feedback.

Tongariro Forest Tb Deer Survey

During late November/early December 1995, the Manawatu-Wanganui Regional Council, on behalf of the Animal Health Board undertook an aerial recovery operation of feral red deer in Tongariro Forest Conservation Area to assess the levels of bovine Tb infection in the herd. The work is part of livestock disease management in the region. Data on disease levels in feral deer was required to assist in planning Tb control operations in Tongariro Forest.

A total of 44 red deer were recovered in 23 hours flying time, for autopsy by Ministry of Agriculture vets as part of the operation. No Tb was found in the sample which came from an area of approximately 12,000 ha in the north and west of the forest. This result indicates that red deer are not a major reservoir of the disease in Tongariro Forest which may well influence the selection of bait types used for this coming winters Tb management operations. Deer disease sampling surveys undertaken in other Tb endemic areas in the central North Island, at similar times of the year, have resulted in disease levels as high as 41% of deer autopsied in recent years.

Kaimanawa Feral Deer Tb Survey - Preliminary Report

by Keith Paterson, MAF Quality Management, Rotorua

As part of ongoing surveillance of the spread of bovine Tb in feral animals in the East Taupo area, the Ministry of Agriculture (MAF) has been surveying feral deer. In 1994, 55 deer (40 Sika and 15 Red) were shot in an area in the north western Kaimanawa State Forest Park between the Waimarino River and Clements Mill Road. All deer were subjected to a post mortem by MAF staff and bovine tuberculosis was detected in 3 sika hinds (6% of deer sampled). These deer

were located in the headwaters of the Tauranga-Taupo River, the headwaters of the Tiraki Stream and the lower reaches of the Te Aratea Stream. Although there has been unconfirmed reports of Tb in this area, the latter two are the first confirmed cases of feral Tb north of the Tauranga-Taupo River.

In 1995, approval was given to extend the survey into the north eastern part of the Kaimanawa Forest Park west of Poronui and extending into private land in the vicinity of the Mohaka River. A total of 86 deer were helicopter shot in early December 1995 and were subjected to the same post mortem routine. No evidence of Tb was detected in these animals indicating that if it is present, then it exists at a very low prevalence. This suggests that Tb is still confined to the Taupo catchment of the park rather than the Hawkes Bay catchment. However, MAF is interested in talking to hunters about any suspect lesions that are found in deer from anywhere in the park or adjoining country.

Of interest to hunters is some additional information collected during the 1995 survey. Of the 86 deer sampled, 74 were sika and 12 were red. Hinds outnumbered stags nearly three to one. Forty eight percent were aged two years and over, 42% 1-2 years and 10% were less than one year. Only 50% of breeding age sika hinds were pregnant. A total of 51 animals were weighed as they arrived off the helicopter (entire bodies). Sika hinds aged 1-2 years averaged 42kg and hinds older than two years averaged 44kg.

Manager Profile

Nadine Gibbs

Many of you may recognise Nadine as the person who interviewed you for the harvest survey this summer.

Nadine has worked for the fisheries team for the past two years during her university vacations. She completed her Bachelor of Science degree in 1995 and this year is returning to Massey to her first year of her M.Sc. Her thesis will be based on marine mammals, in line with her future plans to become a marine mammal scientist.

While working for fisheries she is regularly landed with a range of tasks, such as sorting invertebrates from benthos and drift samples, entering and manipulating data on the computer or assisting our scientist Dr Michel Dedual with smelt research, otolith (inner ear bones) removal and mounting on histological slides.

Nadine also covers our licence administration when Shirley is away as well as doing harvest survey interviews.

Nadine is a qualified open water diver and whenever she gets the chance is out scuba diving.

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Back cover photo : The main mouth of the Tongariro River on the morning of 13 October following overnight ash fall from the Mt Ruapehu eruption