TARGET TAUPO

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

JULY 2000, ISSUE 34

Department of Conservation
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Photo by Mark Kitteridge

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JULY 2000, ISSUE 34

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Front cover: Early morning at the Cattle Rustlers' Pool, Tongariro River, July 2000

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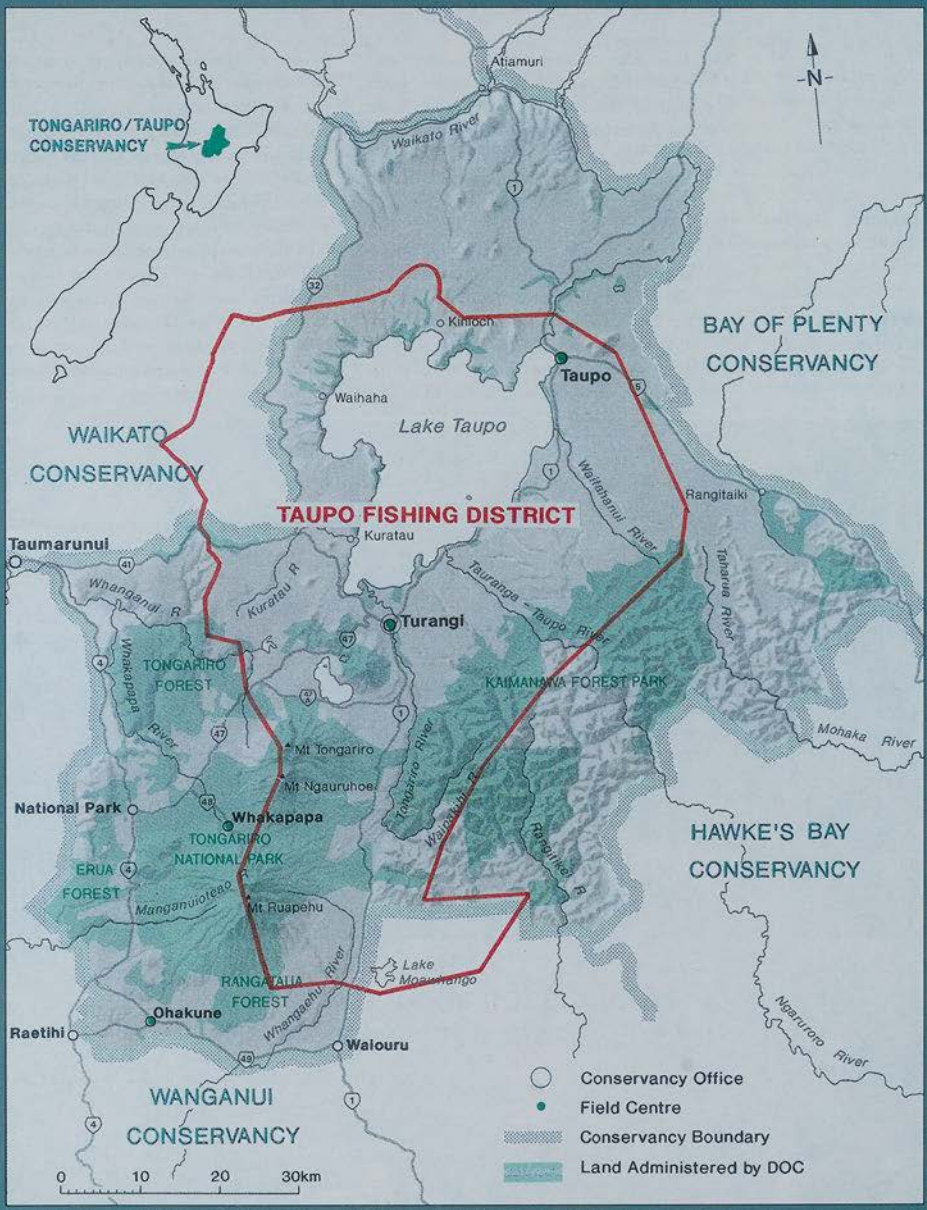
Tongariro/Taupo Conservancy



River Angling Signs Finally in Place

After what became a lengthy design and production process, the Tongariro River angling information signs have been completed and installed. The last of the eight signs was erected on the banks of the Tongariro River in April this year. To date, comment from anglers has been very positive.

We have recently received aerial photographs of the other eastern tributaries, which allows us to commence production of signs for the Waitahanui, Hinemaiaia, Tauranga-Taupo, Waimarino and Waiotaka rivers. These signs will be based on the same design as the Tongariro signs, but will contain maps and photographs unique to each river. These will be completed and installed by the start of next winter's fishing season.

The maps incorporated in the new Tongariro signs have sparked interest amongst anglers who would like their own copy. We recognise the potential worth of such a reference, especially for newcomers to the area, so once the maps of the other rivers have been completed, we will explore the idea of producing some form of access map for anglers. Exactly what form this will take, and how it will be distributed, has yet to be decided, so if you are interested please contact us with suggestions.

We have received a lot of favourable comment over the new angling signs

Information about illegal activities is only of use when it is passed on immediately

If you see such an activity, whatever the time, please contact compliance staff

Telephone: (07) 386 8607

After hours, an answerphone message will provide you with the number of the Conservancy Duty Officer. He/she will take your call and pass on your information to the appropriate person

Note this contact number is also printed on your Taupo District fishing licence

The Tongariro Power Scheme and the Taupo Fishery

by John Gibbs and Glenn Maclean

John is the Manager of the Taupo Fishery Area. He has fished Lake Taupo since the 1950s and his working involvement with the fishery management goes back to 1964.

Glenn is the Manager of the research and monitoring programme in the Area. He is also responsible for fishery advocacy and is the editor of Target Taupo.

The Tongariro River in its natural state at Waipakihi Road end

The early stages

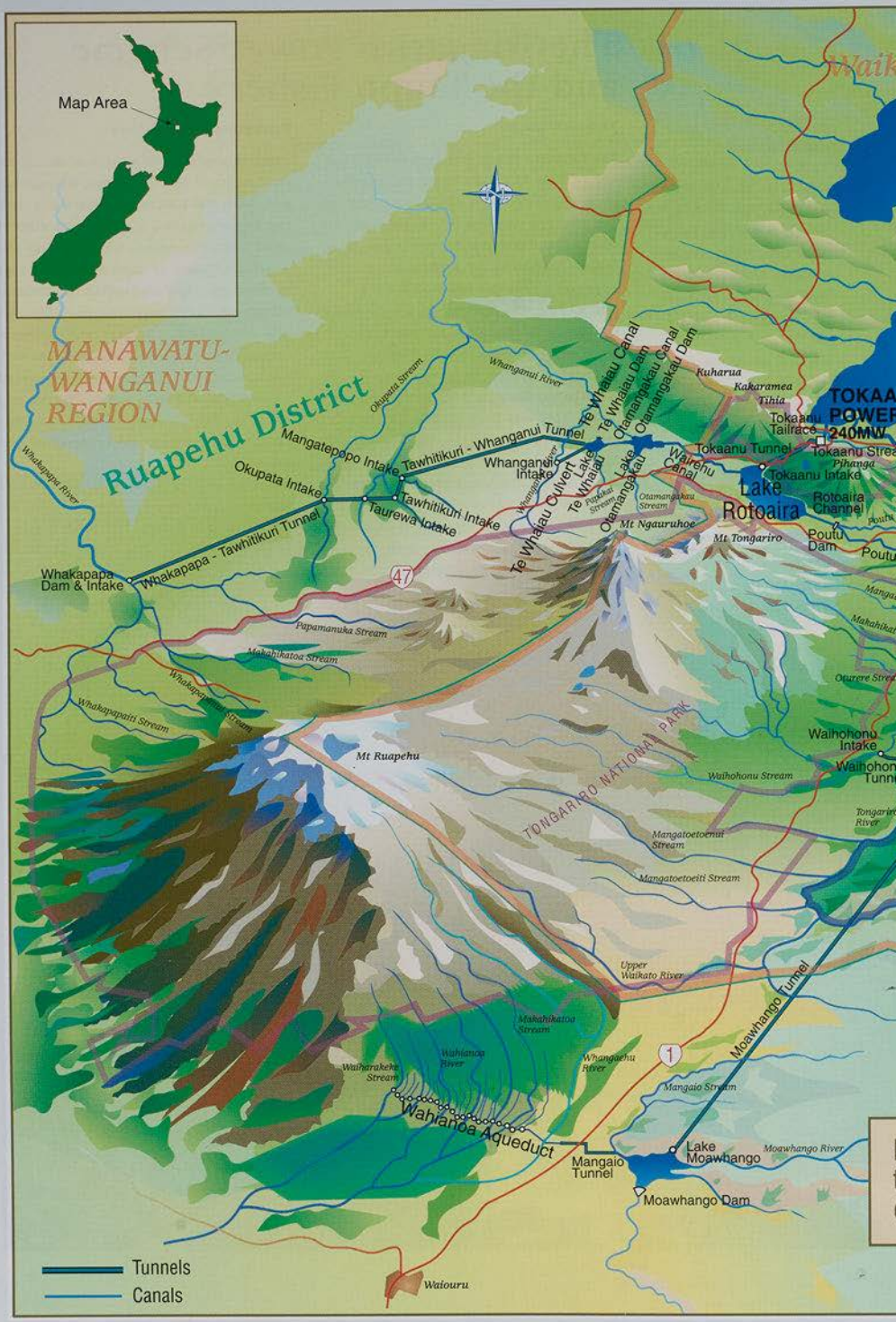
The Tongariro Power Development (TPD) is one of New Zealand's larger and certainly more complex hydro electricity schemes. The concept was first developed some 50 years ago and design and investigations were initially authorised by Parliament in 1958. Approval in principle followed in 1964.

The scheme was designed in several stages and significant changes were made even well after initial construction had begun. For example there were to be two dams on the Moawhango River and two on the Tongariro River. This was later modified to one on each. Approval for the final stage, the Rangipo power station, did not come until after the first diversions from the Tongariro and Whanganui Rivers were built. Except for the Rangipo stage, all approvals predated the 1967 Water and Soil Conservation Act and so did not receive the scrutiny of formal environmental impact assessments that is expected today.

Protection of the fishery

Bringing together the waters of the upper catchments of the Whanganui, Whangaehu, Rangitikei and Tongariro Rivers was a difficult engineering task and involves a maze of dams, reservoirs, intakes, tunnels, canals and aqueducts (Figure 1). Even in the early days of engineering investigations the potential to impact on several important trout fisheries was recognised. Anglers and fisheries management agencies (acclimatisation societies and the NZ Wildlife Service) pressed government and the Marine, Works and Electricity Departments for assurances that suitable safeguards would be designed into the scheme.

Concerns centred around the risk to trout fisheries if river flows were interrupted, the loss of habitat from de-watering streams, barriers to migration, introduction of new species when naturally separated catchments were linked, diversion of volcanically-polluted toxic waters into adjacent catchments, straying of spawning trout


Map Area
MANAWATU-WANGANUI REGION
Ruapehu District
Whanganui River
Okupata Stream
Whakapapa River
Mangatepopo Intake
Tawhitikuri - Whanganui Tunnel
Okupata Intake
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Papamanuka Stream
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Kuharua
Kakaramea
Tihia
Tokaanu Tailrace
Tokaanu Tunnel
Waihohonu Intake
Waihohonu Stream
Mangatoetoenui Stream
Mangatoetoeiti Stream
Upper Waikato River
Moawhango Tunnel
Wahianoa River
Whangaehu River
Waiharakeke Stream
Wahianoa Aqueduct
Mangaio Stream
Mangaio Tunnel
Lake Moawhango
Moawhango River
Moawhango Dam
Waiouru
Tunnels
Canals

e 1.1: Location and features of
ongariro Power Development
inset North Island location).

Genesis

through mixing of waters and loss of angling opportunities through reduced flows. Naturally the focus of much of this concern was on the Tongariro River which not only supported a world-famous trout fishery in its own right, but was the principal spawning and rearing tributary for the whole Lake Taupo fishery.

Several investigations were undertaken in the late 1950s and 1960s to try and get some baseline data on both trout and native fish to assess the likely impacts of the scheme. While simple inventories of whether species were present or absent were feasible, there were, at this time, few effective techniques to evaluate fish population sizes and more complex ecological and behavioural relationships. Similar difficulties met attempts to determine the impacts of the scheme on angling opportunities and success.

Despite this uncertainty several measures were proposed to try and limit the negative impacts of the scheme as it was then conceived. Many were based on educated guesses rather than hard facts. The list of key fishery protection measures agreed included:

- Provision of a minimum flow for the lower Tongariro River;
- Exclusion of the toxic volcanic water from the Whangaehu River;
- Placing screens across the Tokaanu tailrace to prevent spawning trout being attracted into it as they sought the diverted Tongariro River water;
- Construction of an aqueduct to carry the Tokaanu Stream spawning waters over the tailrace;
- Screening of the water from the Whanganui River catchment to exclude brown trout from Lake Rotoaira and lampreys and eels from both Rotoaira and Lake Taupo;
- Adoption of the principle of providing "artificial freshes" to create the recommended pattern of flow that would provide the best possible fishing conditions in the Tongariro River;
- Ongoing collaboration between fishery managers and power scheme operators and modification of operating procedures in the light of experience;

Map of Tongariro Power Development showing dams, reservoirs, intakes, tunnels, canals and power stations. (courtesy Genesis Power Limited)

- Managing diversions of the Whanganui and Whakapapa Rivers in dry weather to ensure fish were not endangered by low flows.

Construction

Site preparation and some construction work began in 1964. Initially this focussed on building the town of Turangi, necessary to house the many hundreds of workers involved in the TPD.

While early fishery protection measures were aimed at the effects of the completed scheme, construction posed its own set of problems. The various dams, canals, tunnels and buildings were largely made of concrete which consumed huge amounts of gravel aggregate. The handiest places to find this were the nearest river beds but first the water had to be removed! A large stretch of the Tongariro River below the highway bridge was diverted to allow extraction of many hundreds of thousands of cubic metres of gravel. This meant that trout were cut off from the flow and had to be salvaged and transferred to the new river channel. Several other extraction sites were scattered around the scheme.

Other diversions were necessary to build the intake structures and dams and these affected every river and stream in the scheme as well as their fish populations.

Perhaps the worst effects came from the construction of diversion tunnels. These were usually drilled in hard rock, often intercepting large groundwater inflows, then lined with concrete. The Tongariro River was badly affected with water polluted by rock flour and toxic concrete leachate from the Moawhango and Rangipo tunnels. Attempts were made to separate out the sediment particles before discharge into the river, but the gorge-enclosed construction sites had insufficient space to build effective settling ponds for the volumes needing treatment.

By the mid-1960s it was apparent to the Wildlife Service that a more thorough understanding of the spawning runs of trout in the Tongariro River was necessary if appropriate safeguards were to be negotiated. The size of the river and its frequent floods made conventional trapping of fish impossible. An ingenious device was designed to stop trout on their upstream migration, using an elec-

Construction of the coffer dam to divert the Tongariro River while the Poutu Intake is built - April 1969

I Said...

being somewhat of a

fly fishing nut I get to fish in many different and special locations both in New Zealand and overseas. Whether it be casting a dry fly at a rising trout on a river, stalking a cruising brown around a lake edge or drift fishing over a weed bed, there is nothing I like more than to fish one of the Taupo river mouths after dark.

For this type of fishing there is only one rod for me and that is the Sage 896SP. I have fished with many top quality fly rods over the years but keep coming back to my trusty 896SP. I like the medium fast action of this rod. It has power to burn but it is forgiving enough when my casting arm tires later in the evening and my cast is prone to turn to custard. The 9'6" length has its advantages when wading deep and allows me to fish a lighter tip due to the softer tip action.

For greater control over longer periods of time and taming big fish after dark I can't go past my Sage 896SP.

Mike Stent

Owner Fly & Gun Shop Taupo and Professional Guide.

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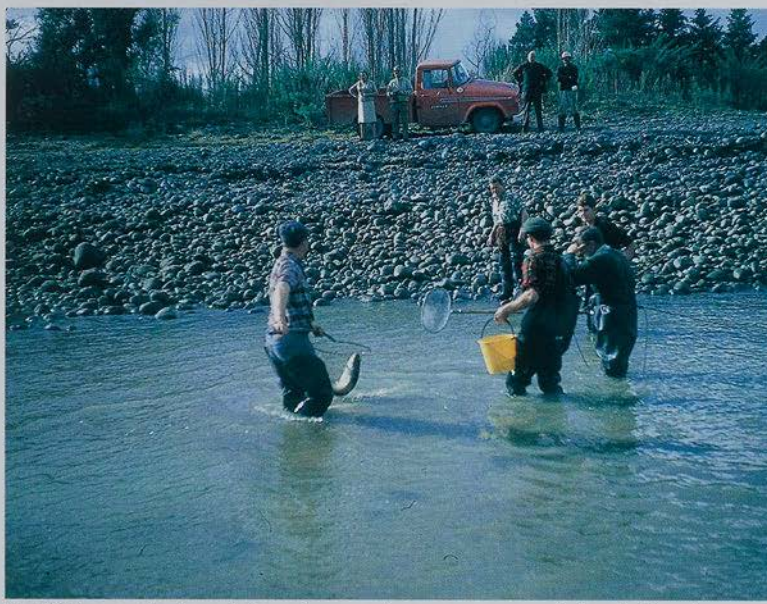
Heavy machinery completes the stopbank which diverted the lower Tongariro River for gravel extraction - July 1968



Wildlife Service fishery staff salvage stranded trout from the cutoff channel of the Tongariro River, using an electric fishing machine. Standing beside the truck is well-known Tongariro angler and tackle shop owner Geoff Sanderson and Mrs Sanderson - July 1968

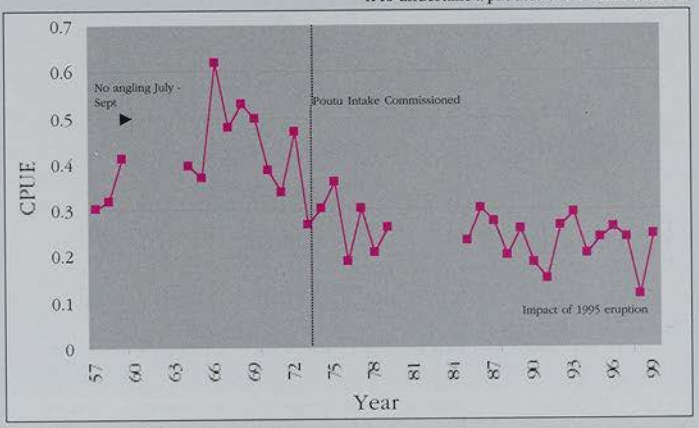
trical field across the river, and divert them into a chamber excavated on the bank. In passing through the entry and exit culverts the trout activated an electronic counter which, in theory, would record every spawning fish moving up the river. Unfortunately this pioneering attempt met insurmountable difficulties. Although it diverted and counted thousands of fish, others were seen to swim barely affected through the field and bypass the chamber. The uncertainty this created meant that no reliability could be placed on the data gathered and the experiment was abandoned after several years trial.

Finally TPD was completed

The key features of the scheme were phased

in over several years. The western diversions were finished first along with lakes Otamangakau and Te Whaiau in 1972. The Tokaanu tunnel fed the powerhouse and tailrace which began operations in 1973 along with the Poutu Intake diverting water from the Tongariro River to Lake Rotoaira and the Poutu dam. After Lake Moawhango was completed it was fed by the Wahianoa diversions and in turn ran to the Tongariro River through the Moawhango tunnel. The Rangipo tunnel, underground powerhouse and tailrace tunnel were commissioned in 1983.

Graph 1: Average catch rate or CPUE (fish per hour) measured on the Tongariro River 1957–1999



The Resource Management Act requires new consents

Various stages of TPD had been authorised, in some cases retrospectively, by a range of statutes and legislative measures. The implementation of the Resource Management Act in 1990 requires TPD and other schemes like it to undertake a process of resource consent renewal by 2001. These consents, unlike the previous approvals, require much greater consideration of the effects of the scheme on the environment. This has led the scheme's owner, Genesis Power and its predecessors, into an extensive consultation and information gathering exercise.

The Department of Conservation has taken a very active role in this consultation and refined its understanding of the issues and effects of the scheme on the trout fisheries it manages. One of the greatest difficulties in assessing these effects and proposing remedial measures has been the lack of comprehensive data on the state of the fishery prior to TPD. We have made a major effort to gather fishery information over the last 20 years but much of this describes the situation as it currently is, rather than as it was before the scheme.

The process thus far has culminated in the production of an Assessment of Environmental Effects document and the lodging of consent applications by Genesis Power. Submissions by

The Tongariro River flows from Tongariro National Park, a World Heritage Area for its natural and cultural values

affected parties must be made to the two regional councils concerned - Environment Waikato and horizons.mw, by 10 August 2000. Decisions on the applications, including any conditions that may be imposed on consents, will be made by a joint hearing of the two councils. There is provision for appeal to higher courts for eligible parties if they are not satisfied with the outcomes of the hearing.

So what do we seek from the TPD consents process?

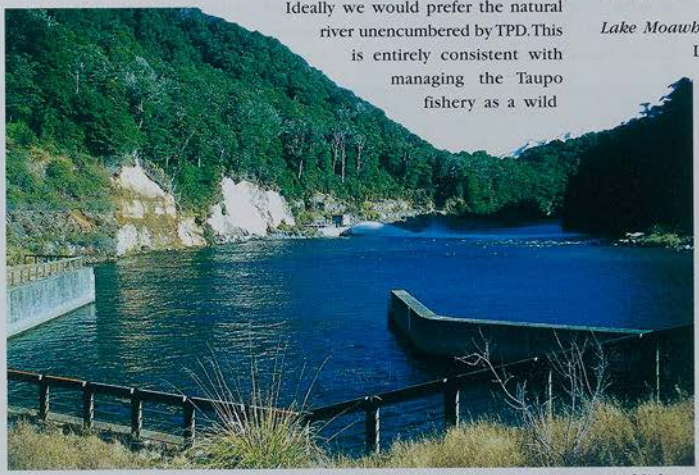
Historically the Tongariro fishery was significantly better than it is now. For example the average catchrates for most years between 1957 and 1999 are presented in graph 1. Clearly anglers had greater success prior to the construction of TPD than after. The argument is whether the decline is as a consequence of TPD or other changes in the fishery. We believe that the major influence is the operation of the power scheme.

We agree with Genesis that the Tongariro fishery is still very good. However we strongly dispute that anglers should not expect any better. The fishery was much better, all things considered quite possibly the best in the world. The Tongariro is not just another trout fishing river and we do not accept the argument that anglers must accept some decline. Simply because the scheme has operated in a particular way to date is no justification for the operation to continue in this way. After all the operating rules were set under quite different legislation which took much less consideration of the environment and the fishery. In our opinion if the TPD scheme was proposed

Lake Moawhango is set amidst the unique landscape of the Army Training Ground

now it is extremely unlikely that it would receive the necessary operating consents under the Resource Management Act to be financially viable. It certainly would be a much different beast anyway.

Ideally we would prefer the natural river unencumbered by TPD. This is entirely consistent with managing the Taupo fishery as a wild fishery as prescribed by the Taupo Sport Fishery Management Plan. We would take whatever fishery nature deals us which, as we saw in the past, was something very special. Any deviation from this is a major concession by the fishery. However we acknowledge that the structures are in place and that the scheme is important to New Zealand. It is not realistic to pursue the removal of the TPD structures so the challenge is to optimise the flow regimes to best meet the needs of the fishery.



Looking upstream from the intake to Rangipo power station. Water from Lake Moawhango is diverted 19.2km underground entering the Tongariro River above the intake

Lets work our way around the scheme

Lake Moawhango - Starting in the south, Lake Moawhango was created as a storage reservoir. The level of the lake fluctuates through a range of 14 metres and as a consequence the fishery is not great. Originally it was considered that the establishment of a fishery in the lake would help balance some of the other adverse effects of the scheme. However the restricted access through the army land bordering the lake and the poor quality of the fishery means that this has not eventuated. Short of significantly reducing the lake level fluctuations to allow the establishment of aquatic weed beds there will be little improvement in the fishery. The lake is very important to Genesis and a major shift in the operating regime would be a severe constraint for them. At this stage we believe it is appropriate that Genesis continue to operate this lake however they choose. However in recognition of this

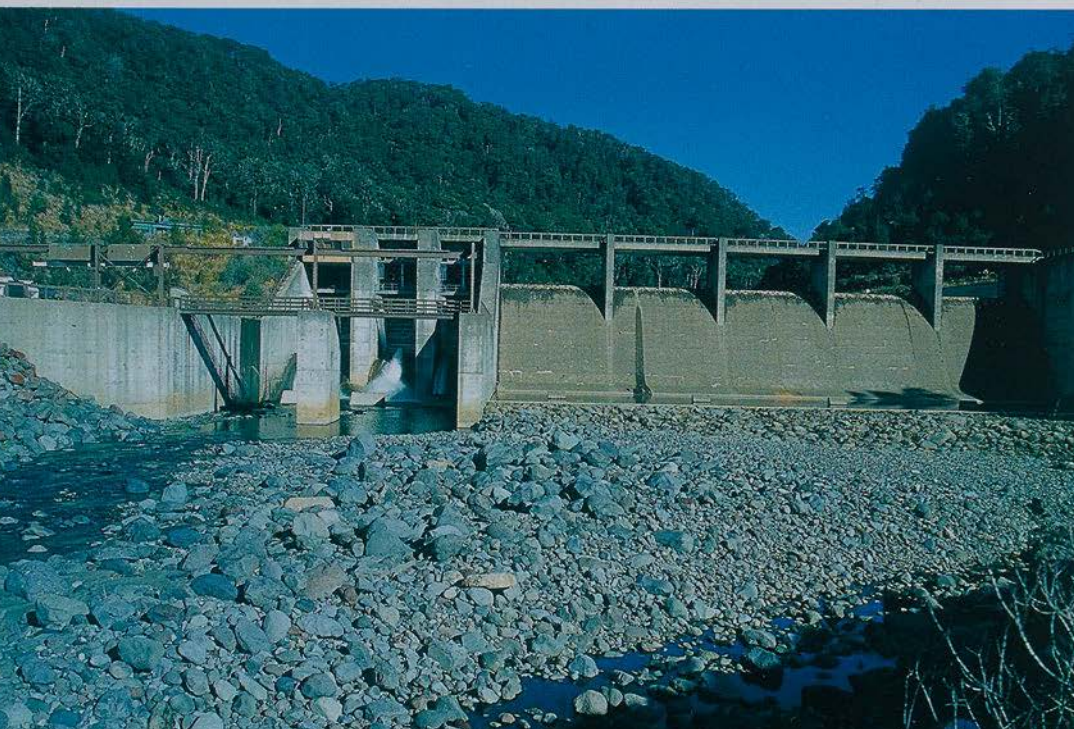
opportunity we seek a concession to the fishery in terms of operating regimes in the lower Tongariro River.

Upper Tongariro River - Historically Taupo trout migrating up the Tongariro River to spawn were unable to get past Waikato Falls which are immediately upstream of Poutu Intake. Upstream of the falls there was a resident population of rainbow trout which supported some angling albeit limited due to the lack of access. In the early days of the TPD scheme anglers fished for large rainbow trout around Waipakihi road end with some success. Indeed in the early 1980's while on a hunting trip in the Waipakihi valley one of us caught a rainbow male of approximately 45cm in the first pool we fished which we promptly killed and ate not realising the significance of the capture. In the mid 1990's we electrofished many of the small side tributaries all the way up the valley and in almost all of them there were large populations of stunted mature rainbow trout. Some of the progeny of these fish must migrate down into the main river but despite numerous drift dives and hours spent walking along the river it is many years since we have seen any large fish above the Waipakihi Road end. It is likely that the stretch of river between Rangipo dam downstream to Waikato Falls which is much more constrained in a gorge was essential for fish to survive in the main river and grow to large size. With the building of Rangipo dam this stretch is now inaccessible and as a consequence the fishery in the upper river is no more.

Below Rangipo dam a residual flow of 0.6 cubic metres per second (cumecs) is released from the dam, the remainder of the flow being diverted through Rangipo powerhouse. The low flow in this stretch of river does not support a fishery of any value but the changes have also had a very detrimental impact on the whole ecosystem including the blue duck population. So long as flows remain low and Rangipo dam precludes fish access between this stretch of river and the upper river the fishery is unlikely to improve. Given the other serious issues and the barrier presented by the dam we agree that doing the best for blue duck is the priority in this part of the river.

Another key issue associated with Rangipo dam is how the build up of sediment behind the dam is handled. Previously ECNZ opened the radial sluice gates at intervals to allow the sediment to be scoured downstream. This would occur during a flood when the flow past the dam reached 100 m3/s and was expected to rise further. Once the sediment was scoured they would close the gates.

Less than 1 cumec of water is released downstream of Rangipo Dam



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During a flood it is also necessary to shut Poutu canal which causes the full flood flow to pass down the Tongariro River. The two dams have only a tiny storage capacity and flows quickly overtop the dams as if they were not there. These two reasons are why TPD does not affect the magnitude or effects of large floods in the Tongariro River.

However in the past as soon as the flow at Poutu intake fell below the capacity of Poutu canal (~75 m^3/s) ECNZ would reopen the canal and begin generating again. This sudden diversion of the majority of the flow reduced the flow in the lower Tongariro to less than 20 m^3/s. It is a physical fact that a larger flow can carry a much larger sediment load than a smaller flow. Prior to the canal opening the river was transporting a great deal of sediment particularly after scouring and so when the flow was cut the river simply dumped this load onto the riverbed. That the river cleared more quickly was of benefit to anglers but the sediment left was very detrimental to the fish and the organisms they feed upon.

1 m^3/s = 1 cumec or the equivalent of a cube of water 1 x 1 x 1 metres which takes 1 second to pass a point on the riverbank.

In the aftermath of the 1995 and 1996 Mt Ruapehu eruptions and the huge inputs of ash into the river, Genesis in addressing public concerns and practical considerations of their own agreed to adopt a new regime. Now when they scour Rangipo dam they do not reopen Poutu canal until the turbidity (clarity) falls to an agreed level. This has the effect of keeping the scheme closed for much longer, often in the order of 5 to 7 days. You notice this change as a higher flow for longer in the river, a longer time for the river to clear but also by the much improved appearance of the river above the main road bridge.

Genesis propose to adopt this rule for future scouring and we support this approach.

Lower Tongariro River - Currently Genesis release a constant 16 m^3/s below Poutu Intake. By the time the river reaches Turangi the flow has almost doubled due to input from the intervening tributaries like the Whitikau Stream. This regime was an interim

Flows in the lower river are controlled by Poutu Intake

Waikato Falls just above Poutu Intake was a natural barrier to the spawning migration of trout from Lake Taupo

measure agreed to in 1993. Prior to this ECNZ released the minimum flow allowed of 11.3 m^3/s below Poutu Intake so as to maximise the amount of water they could divert through Rangipo power station. However to meet the required 28.2 m^3/s minimum at the Major Jones pool at Turangi they then had to divert large flows from Poutu canal down the Poutu Stream. The flow below Poutu Intake was not sufficient for rafting and the high Poutu Stream flows were not appropriate for the naturally low flowing stream. A compromise was sought between the commercial rafters, DOC and ECNZ who offered a constant release of 16 m^3/s if the Major Jones minimum was reduced and the requirement to ensure the flow over Waikato falls was equal to that below Poutu Intake was removed. The new flow suited the commercial rafters and the removal of the operating constraints made day to day operation of Poutu intake much more straightforward for ECNZ. From our perspective the lower flows in the Poutu were desirable and the lack of any need to adjust the intake removed the opportunity for errors in the flow setting and the consequential negative flow surges which had occurred in the past. A constant release when supplemented by tributary inflows gave some semblance of a natural flow regime downstream albeit that it was still a pale shadow of the natural pattern. The regime was never intended to be the long term answer, that would come out of the TPD consents process but at least it was better than what we had.

As part of the TPD consents process ECNZ commissioned a study by Ian Jowett, Dr David Rowe and Dave West of NIWA to look at how the flow in the river affected different aspects of the trout life history, their food and angling opportunity. They suggested a regime based on a flow which dropped rapidly to a low level over spring and summer to maximise the amount of habitat for juvenile trout and then rose slightly in autumn to suit food production with higher flows during winter. This regime which varies from 10 m3/s in summer to 16 m3/s in winter at Poutu Intake is similar to that proposed by Dr Theo Stephens who undertook a study for the Wildlife Service ten years previously. Stephens regime varied from 13 to 18 m^3/s but both are similar in shape to what occurs naturally. We strongly support this idea of a seasonally varying flow, both because the science is sound and because the regime closely mirrors the natural situation. The more difficult issue is at just what level to set the flows.

Obviously in some years catastrophic events like large floods have the major impact on the number of fish produced. However at other times several years of ideal conditions come together to produce wonderful fishing as is occurring in the Taupo fishery this winter. Such fluctuations are all part of a wild fishery and as the historic data shows, was a feature of the Tongariro. The challenge in a managed regime is to create suitable conditions in the river so that when the climate allows the trout population is able to take advantage like it once did. In simple terms more than enough fish hatch from the gravels each year to fill all of the suitable areas in the river and the surplus die over the following months. If more were to survive then ultimately there would be more fish returning to spawn in three years time. So how can survival be

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NOTICE TO ANGLERS:

WAIHAHA LAKE TAUPO

As from 1 July 2000 anglers wanting access through Waihaha 3B2 block to the Waihaha foreshore and river mouth are required to have first obtained a permit in writing from the Trustee administration.

APPLY IN WRITING TO:
WAIHAHA MAORI LANDS TRUST
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improved?

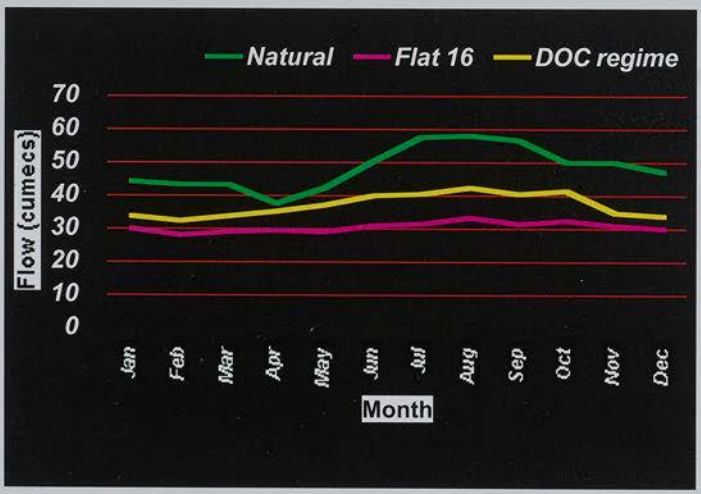
In our view the key factors which limit the size of the trout population are the amount of suitable habitat and the amount of available food for the young trout. These two factors are closely linked. The data is inconclusive as to whether one factor is more important than the other so our approach is to seek a flow which as much as possible maximises both. The biggest influence on the amount of suitable juvenile habitat is a flow which drops 5 to 7 m³/s (a drop of 0.1 metres in water level) in spring. Fry seek areas of coarse stones and gravel in the quiet shallow margins of the river. Under a constant flow these quiet areas are where the fine sediment which the fry dislike settles out. By dropping the level the areas where the sediment settled out over winter are left high and dry and ideal habitat for the newly hatched fry is created in areas free of sediment.

The actual size of the flow appears to have relatively little effect on the amount of fry habitat but the models suggest a flow of 20 m3/s released from Poutu Intake will maximise the amount of food available. The quantity of food is most critical over summer and autumn so if we set the flow at this time at 20 m³/s we come up with the following regime.

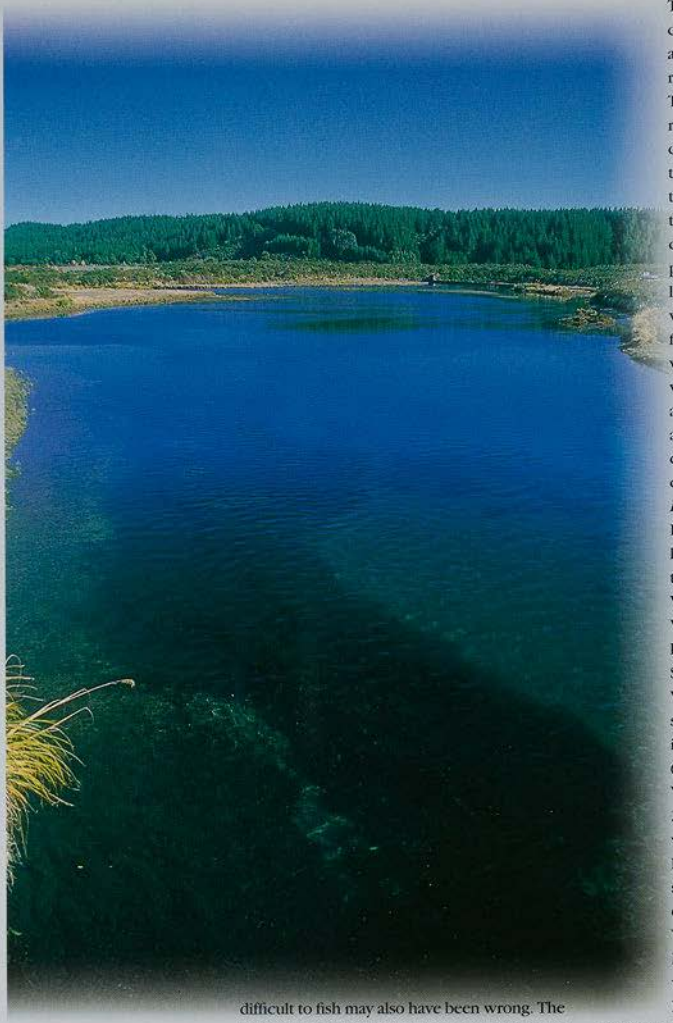
Jowett and his colleagues also looked at the effect of different flows on the ease and success of angling and concluded that flows of 15 to 20 m³/s were preferable. At the time of the study we shared this assessment but more recent information has changed our views. As graph 1 highlights anglers pre TPD caught twice as many fish per hour of effort than they do now. Whether the river was easier to fish or there were more fish as a consequence of the flow regime, the bottom line was anglers were more successful even with the relatively unsophisticated equipment they had. In our view the natural flow regime produced more fish but our perceptions that the river was more

Table 1: Monthly flows at Poutu Intake and at Turangi based on a 20 m³/s minimum release. Tributary inflows are those presented in Jowett et al 1996

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Poutu Intake	20	20	21	22	24	25	25	25	25	25	20	20
Tributaries	13.9	12.2	12.9	13.3	13.2	14.8	15.4	17.2	15.4	16.2	14.8	13.8
Turangi	33.9	32.2	33.9	35.3	37.2	39.8	40.4	42.2	40.4	41.2	34.8	33.8



Graph 2: Calculated flows at Turangi using a constant release of 16m³/s and our proposed regime at Poutu Intake. Note that the natural flow is the mean monthly flow.



Under normal conditions water flows through Lake TeWhaiau into Lake Otamangakau. However when the Wairehu canal is closed inflows flow over the spillway at the top right back into the Whanganui River

difficult to fish may also have been wrong. The radio tracking of fish migrating up the river as referred to in A Blessing or a Curse on page 30 rovides some clues. Under lower flows anglers are able to wade much more of the river and the continual disturbance forces the fish across into areas where they are out of reach. Jowett and co. identified that there are optimal water velocities and depths which the trout prefer to lie in. Under low flows these areas are often out of reach of anglers but it may well be that with the full flow in the river these areas were too deep or quick and the preferred areas were much more along the edges. Therefore the fish lay where anglers could cast to them and because anglers couldn't wade as far the fish remained less disturbed.

The higher the flow the more the river regains that ethereal quality called natural character. In simple terms this is those qualities special to the Tongariro River, the big boisterous flows, the wild untamed character of the big river. We would prefer the full flow back in the lower river but obviously this would not be a desirable outcome for Genesis. Acknowledging this we believe our suggested regime with it's pattern of seasonal fluctuation will improve the returns to anglers and capture some of the character of the old river which is currently missing.

Lake Otamangakau - Inflows to Lake Otamangakau are derived largely from water diverted from the headwater streams of the Whanganui River as part of the Western Diversion and to a much lesser extent from Te Whaiau Stream. As a consequence of the Whanganui Minimum Flows decision Genesis must maintain a flow in the Whanganui river at Te Maire (58 km downstream of the Whakapapa intake) of at least 29 m^3/s or the natural flow, whichever is least between 1 December and 31 May. This decision means that for a few weeks each summer all of the water in the Whakapapa, Okupata, Tawhitikuri, Mangatepopo and Taurewa Streams which is normally diverted into Lake Otamangakau, must be returned to the Whanganui river. Currently Genesis achieve this by closing the Whakapapa intake but continuing to divert the minor tributaries into Lake Otamanagakau. An amount of water equal to that flowing in is then released from the valve in the Otamangakau dam back into the Whanganui catchment. The advantage of this approach is that a limited inflow of cold well oxygenated water is maintained rather than the lake becoming totally stagnant. The water released from the valve is drawn from the deepest part of the lake and tends to contain

Our thanks:
Despite historical difficulties, in recent years we have had a very good relationship with the staff of ECNZ and Genesis. We appreciate their efforts in working with us to try and minimise the effects of the day to day operation of the TPD scheme

much less oxygen. Over summer Genesis maintains the lake at a relatively high level of 611.1 metres above sea level both to assist angling and to maximise the available habitat for trout when the inflows are limited. Studies in the mid 1990s indicate that oxygen levels in some parts of the lake do occasionally fall to critical levels under conditions of low inflow but that the fishery was not affected. The only concern we have is that the summers studied were not particularly extreme and over a very hot still period there is the potential for excessive surface temperatures and low oxygen levels close to the bottom. For this reason we do not favour any proposal which would significantly reduce inflows into the lake.

Genesis are proposing a continuation of the status quo and we are supportive of this approach. The Lake Otamangakau fishery when established in the early 1970s was characterised by very high catch rates of small fish but soon became known for producing trophy-sized rainbows. Currently the fishery is in very good health with large numbers of both rainbow and brown trout. However there is a marked absence of the trophy fish for which the lake is famous. These trophy fish do not grow exceptionally quick but instead live to an old age continuing to grow throughout their life. In this way they are able to reach a very large size. Evidence suggests that the current lack of trophy fish is a consequence of extensive losses of adult trout in 1997 and 1998. This occurred when unusually serious flooding in the lower Waikato caused Genesis to close the Western Diversion so that the flooding was not exacerbated by additional water from the Whanganui catchment. Wairehu canal at the outlet of the lake was closed but the intakes were left open so that water continued to be diverted into Lake Otamangakau and spilled over Te Whaiau spillway. Unfortunately the spillway is immediately downstream of Te Whaiau stream which is used by nearly all Lake Otamagakau trout for spawning. The flooding coincided with spawning and the spent fish returning to the lake. These fish drop passively downstream carried along by the current. As the only current was over the spillway they went over as well and were lost.

Genesis recognise the problem and are comfortable with suggested changes to how they might operate the lake under such conditions to minimise any spill. The nuts and bolts are yet to be decided but we are in general agreement over the operation of this lake.

Where to from here?

Our desired regime requires that much more of the natural flow remains in the lower Tongariro River. This is water that will not be available to Genesis to use through Tokaanu Power Station and represents a significant loss to them. Given our different objectives it is perhaps not surprising that we have not reached any agreement in our discussions to date. As already mentioned the next step is to now present our case at the Regional Council hearing.

Over the years anglers and fishery managers have had to fight very hard for every small concession by TPD to the fishery. For the most part these debates have occurred in an unfriendly environment and with no support from the legislation. That the river is still a good fishery is a testament to their efforts but what wouldn't they have given for this opportunity. It will not be an easy process but the Tongariro River was one of the great rivers and demands no less.

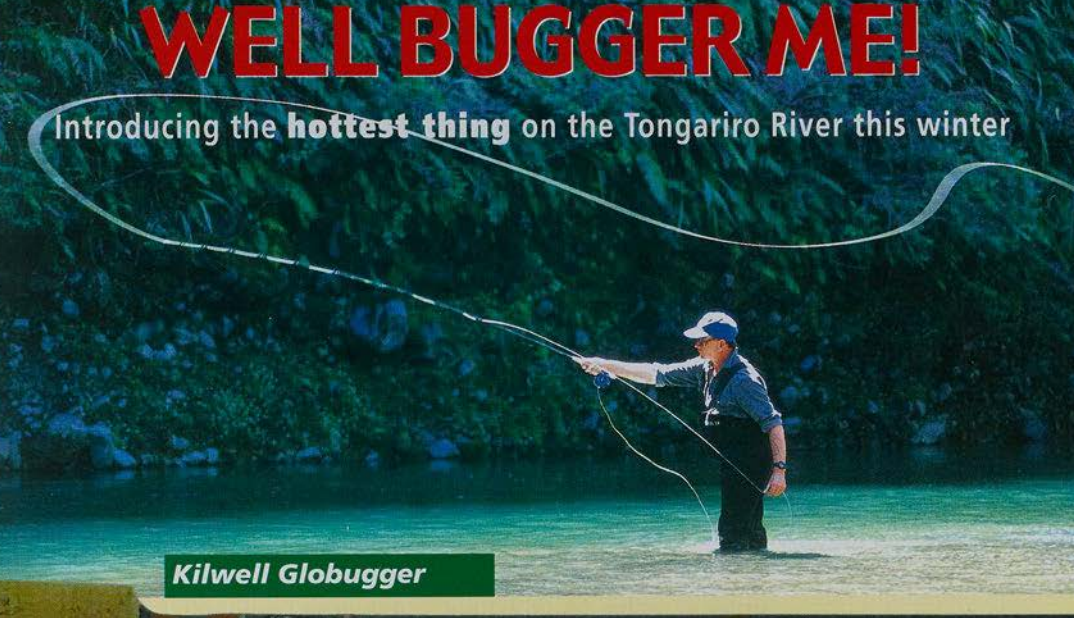
Momentous Occasion

Long-time readers of our magazine might recall a photo in the July 1992 issue of editor Glenn Maclean's wedding. Glenn and Sue married on the banks of the Tongariro River in the beautiful setting of the National Trout Centre in February of that year.

Well it's a long time between drinks, but on 18 July the Macleans became the very proud parents of twins. Although arriving very early, perhaps in anticipation of the evening rise, Campbell and Simone are thriving and should be close to coming home by the time you read this. We are sure you will share our delight and congratulations for Glenn and Sue. Now: you were wondering why this issue of *Target* is late....?

WELL BUGGER ME!

Introducing the **hottest thing** on the Tongariro River this winter



Kilwell Globugger

- 9'3" 3 piece for 8/9 line (That 3" makes all the difference when big lead is whistling around your ears!)
- Impact resistant epoxy coated tip section. (Heavy glo bugs and nymphs often hit the tip section causing damage to the thin wall blanks.)
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How Satisfied are Lake Otamangakau Anglers?

Every year we conduct a creel survey on Lake Otamangakau. The survey methodology is very similar to that we use on Lake Taupo during summer and the eastern Lake Taupo rivers in winter. Part of the survey involves assessing anglers' satisfaction with various aspects of the fishing by asking them to rate their satisfaction on a scale of 1 (terrible) to 5 (excellent).

This method of monitoring angler satisfaction works very well on Lake Taupo and the tributaries where the number of anglers is very high, but has proven less successful on Lake Otamangakau. Here the angling pressure is much less and the angler demographics are also very different, with most anglers only visiting once or twice a season.

Rather than asking the same anglers again and again to rate their satisfaction, we have designed a new method of assessing what anglers think about the fishery.

Those anglers who fish Lake Otamangakau regularly, and who have done so for many years, have accumulated a vast amount of experience and knowledge of the lake and its trout. The new survey is designed to record some of these anglers' observations at the end of each season.

Seven such anglers have initially been invited to take part in the survey, all of whom are more than happy to contribute to the management of the fishery in this way. The combined experience of the seven anglers on Lake Otamangakau is 114 years. Several months ago each angler was contacted and asked a series of 12 questions. They were asked to rate their satisfaction with aspects of the fishing, ranging from the number of trophy trout caught to the number of young fish in the lake. The preliminary results were very interesting with most anglers detecting similar features of the season's fishing and rating them accordingly. The universal feeling was that fishing overall was good, but that there was a distinct lack of trophy trout in the lake. This lack of trophy trout is consistent with our trap results last winter and is currently being looked at. The results of an in-depth study will be published in the November 2000 issue of Target Taupo.

The results of the new satisfaction survey will provide a very good source of information with which to compare Lake Otamangakau fishing seasons, and will increase in value as the number of seasons surveyed increases. We look forward to next year with interest.

Not the usual form of boat used on Lake Otamangakau, but effective all the same

Attaching Weight to Fishing Lines

Recently we have had a number of enquiries from anglers seeking clarification on the legality of attaching a weight to a line to help sink a lure when trolling or jigging.

Regulation 16 of the Taupo Fishing Regulations 1984 describes the provisions for weight on lines and these are summarised as follows:

- In fly fishing only areas, you are not allowed to attach anything made from lead, glass, plastic or other materials that makes casting easier or increases the sinking or buoyancy of the line. This does not prohibit the use of weighted flies so long as these fall within the size definition in regulation 2.
- In any part of Lake Taupo where trolling is permitted you may use wire or lead lines (so long as these are not used in conjunction with downriggers). There is no restriction on attaching a weight to a line to help it sink. Similarly, there is no weight limit on the lures themselves, remembering that a maximum of two lures or flies on the line applies.
- Exactly the same legal provisions apply to jigging. Therefore, within areas where trolling is permitted you can jig with a lure of any weight or use a sinker as a weight in conjunction with a fly or lure. However you may not use more than two flies and/or lures.
- When using downriggers you must not attach any weight to the line and the line itself must be unweighted (e.g. nylon or dacron). As above, there is no weight restriction on lures and up to two lures may be used.

Mice, Mice & More

by Cam Speedy

Cam co-ordinates animal pest and threatened species management for the Tongariro-Taupo Conservancy. Cam and his team also oversee weed management and habitat monitoring

Those of you who hunt or fish the central North Island high country will have noticed the large numbers of mice this year. Scores of mice were caught nightly around spring hunting and angling camps and anglers reported back country trout full of mice - up to a dozen in the gut of a single fish.

Mouse irruptions are an irregular but significant part of the life cycles in our modern high country. Boom and bust cycles have been enjoyed and suffered by New Zealand's wildlife for hundreds of thousands of years and 1999 was a classic example. While the species composition has changed significantly in our high country ecosystems over recent times, these natural cycles have not.

Many plant species including Coprosma fruited heavily in 1999

In margin: Irruption: an abrupt increase in population numbers or density

It all started with the prolific seeding of the beech forest during the summer of 1998/99. As anyone who has a garden knows, every growing season is different. The "crop" is never the same from one year to the next - sometimes good, sometimes abysmal, generally just average. But every now and then the right conditions conspire to produce that once-a-decade sort of crop we wish we could enjoy every year. This is called "masting". Almost every tree species will, every so often, produce en masse due to a combination of favourable environmental conditions. While we don't fully understand what actually triggers these "mast" years we do know they are very important to wildlife. Population density or breeding success in many species of wildlife often hits a periodic peak immediately following such events. An excellent example of this from New Zealand's own conservation biology is the link between rimu fruiting and kakapo breeding. Our long lived "parrot of the night" only breeds successfully only every now and then - most often following a rimu mast year.

The interesting thing about 1999 in the central North Island was that it wasn't just the beech that seeded heavily - many other plant species also produced extremely well. Numerous species of Coprosma, Astellias, miro, hinau, tawa, kahikatea and in the alpine tussock grasslands, several species of tussock, all produced huge "crops" during the autumn of 1999. Throughout the central North Island high country, all sorts of wildlife enjoyed a bountiful harvest. Then La Nina took control. A dry winter with little snow or rain saw our skifields barren while the surrounding forests stayed dry. Dry winter conditions greatly enhance the survival of most wildlife. An animal can handle freezing temperatures far better if it is well fed and dry. By October the results of this "great" season (biologically at least) were becoming apparent. In the low country fat pigs were plentiful, and rats had already reached higher than normal densities. In the high country, while thousands of tiny new beech seedlings were popping up out of the leaf litter, true to ecological theory the beech mast had also produced a mouse population irruption. They seemed to be everywhere!

Beech seedlings in their thousands popped up out of the leaf litter this summer

Mice!!

The standard ecological understanding of this phenomenon is that when beech mast occurs in any given autumn, mice irrupt the following spring due to increased winter survival (and even winter breeding in a really good year). However, The Handbook of New Zealand Mammals suggests *"....mice have not yet been shown to eat beech seed in the wild...."* which is puzzling. There is obviously some more complex relationship between the mice and the beech seed perhaps involving an intermediate organism. Life expectancy for wild mice in New Zealand forests is less than 18 months and winter is the critical time when food is short and environmental conditions harsh. Conditions that allow for increased winter survival can therefore have a huge effect from one growing season to the next.

On the back of the "mast" year rodent numbers exploded

This is certainly what happened last winter. By spring, the stories of mice in the bush, mice in the tussock, mice on the ski fields, early season trout full of mice, and huts, camps and even helicopter hangars full of mice were too numerous to be total exaggeration. This was no localised event either - it was widespread in the central North Island throughout a wide range of habitats.

Then in December 1999, another well documented part of the ecological understanding associated with beech mast kicked in. Stoats appeared en masse. Rising on one of their preferred prey items, stoat breeding peaks following the mouse irruption associated with beech mast. The stoat population this last summer seemed almost as spectacular as the mouse "plague" supporting it, with people complaining about losing chickens and ducklings and seeing stoats in their gardens or while hunting.

The higher than normal stoat density this summer will have undoubtedly done serious damage to our native wildlife, but they also took a heavy toll on the mice. By March the mice were all but gone, although every dry north-facing bank was still riddled with their holes. Rats seem to have hung on far better, perhaps at the expense of the mice!

So whose "sector" of the ecosystem did best this last quarter? The deer were certainly fat this autumn, no doubt after grazing thousands upon thousands of newly sprouted seedlings. Those seedlings that managed to escape hungry deer and a fierce late summer drought have grown three to five centimetres since spring. The mice? - recycled I guess, in a way that only nature can. Perhaps by a stoat or a rat, preferably by a falcon or morepork. In the chronology of events over the past two years lies a pattern that will repeat itself at some undetermined time in the future - just like it has for hundreds of thousands of years. It is hard to say when the next mast might come, or even where the benefits of the last one may ultimately fall. Certainly there was a domino-like response from a wide variety of wildlife in our interesting modern amalgam of the "natural" and the "exotic". Not like the days of old, sure, but no less interesting. While kakapo have now been made redundant in our high country ecosystems by introduced possums, rodents and stoats, I have no doubt that 1999 would have been one of those years the kakapo bred around here.

The tragedy is that what should have been a year of the kakapo, was in fact a "year of the mice".

The upstream limit on the Waimarino River is now the pool situated beneath the first major bluff above the previous limit marker.

Waimarino Winter Limit Moves Upstream

The winter fishing limit on the Waimarino River is defined as the point known as Korohe crossing. Recently kaumatua from Korohe approached us suggesting that the current crossing, which is where the limit sign was, is not in fact, Korohe Crossing. After visiting the area with them we agree that the site identified in the Taupo Fishing Regulations is approximately two kilometres upstream beneath a large bluff. Coincidentally, in 1999 we had undertaken an assessment of the distribution of trout spawning in the river and decided an appropriate point for the winter limit was this same bluff. As a consequence we have shifted the limit marker to this point.

FISHING TRACKS CLEARED

Anglers' access tracks, roads and car parks were mowed and cleared between 3 April and 4 May this year. The firm Adstar BOP from Tauranga won both the tractor mowing and track clearing contracts from eight other tenderers and they did a pretty good job.

Dennis and Steven of Adstar did all of the 45-odd kilometres of walking tracks and were relieved to put their scrub bars down at the finish. After seeing lots of large trout along the way, they reckoned they would be back to do some fishing. Sorry we didn't get around to those casting lessons boys...!

TAUPO FISHERY ADVISORY COMMITTEE

THE TONGARIRO RIVER NEEDS YOUR HELP

Genesis Power believes anglers should be happy with current Tongariro River fishing! Are you?

Reports and studies we have show the Tongariro River is not the great river fishery it was prior to the power scheme

Refer to TPD resource consents article in this issue of Target Taupo

The TFAC asks anglers who have fished the Tongariro River to comment urgently to the committee - at PO Box 149, Turangi

Comment:

Signed: _____ Date: _____

Address: _____

Taupo Fishery Scientific Expertise Exported to Fiordland

Last March Taupo fishery scientist Dr Michel Dedual was asked by the Southland Fish and Game Council and Meridian Energy for advice regarding a study in the Waiau River catchment. The Waiau River was originally the outlet of Lake Manapouri but since the construction of the Manapouri Power Scheme and particularly the erection of the Mararoa weir, the water of the Waiau River upstream of the weir can reverse its direction of flow. The water can flow either out of or into Lake Manapouri, depending on the prevailing climatic conditions.

Generally fish swim against the current and the inconsistent direction of the flow has the potential to confuse them about where to go next. Reversal of flow direction is a phenomenon also known in Europe. For example Dutch fishery managers trying to re-establish Atlantic salmon and to enhance sea trout runs in the Rhine River are facing this situation. When the dykes on the North Sea are shut during high tide the rivers run "backward" before the flow direction reverses at low tide when the dykes are open. This has been shown to upset the migration of the sea trout.

Southland Fish and Game invited Michel to visit to assess the potential of using radio-tracking techniques to follow where the fish are going to spawn and how they cope with the changing flow direction upstream of the weir. This is particularly important since the Waiau River is heavily used by brown trout (resident and sea running) and rainbow trout and quinnat salmon that migrate upstream of the weir to spawn.

We would like to thank Southland Fish and Game staff for their warm hospitality and wish them good luck for their experiment. We have no doubt that they will gather some very valuable and interesting results.

CATFISH STUDY UPDATE

The acoustic tracking study of catfish in Lake Taupo is now completed. A total of more than 60,000 data records on fish distribution and swimming depth in the lake have been recorded covering an entire year from November 1998 to December 1999. Preliminary analysis of this impressive amount of data indicates that catfish make large migrations in the lake especially in early summer. The return of tagged catfish marked in Motuoapa and recovered in Waihi Bay (more than 10km away) also supports this hypothesis. During winter 1999 catfish were more resident roaming inside Motuoapa Bay using water from the surface down to 17 metres deep. A complete summary of the study will be presented in future issues of *Target Taupo*; don't miss it.

A Blessing or a Curse?

by Glenn Maclean

Recently several anglers have written asking whether kayakers and rafters paddling on the Tongariro River affect the trout fishing. The short answer is yes but depending on the paddlers' behaviour and where the fish are lying at the time, the effect on an angler's chances of success may be either beneficial or detrimental.

I have a photo on my desk from the late 1960s of an electric fish counter set up across the Lower Birch Pool adjacent to the hatchery. Dominating the photo is a heavy wire rope stretched across the river from which hang a series of two-metre long electrodes. These solid steel bars are spaced a metre apart and each hangs in the water to form a continuous electric field with the battleship chain earth strap lying across the bed of the river. It is an impressive image but equally striking is that it is impossible to navigate past this structure. Clearly the use of the river by rafters or kayakers was not considered an issue and as it turned out it wasn't. I can imagine the uproar if we tried to do it now but the example highlights how much the use of the river has changed in the last 30 years. From a time when the river was the sole domain of anglers, they now have to share it with a large number of boat-borne thrill seekers.

Commercial rafters were aware of the anglers' dismay and generally tried hard to minimise their disturbance of the pools

The boom in commercial rafting on the Tongariro River, part of a nationwide upsurge in the late 1970s was facilitated by the establishment of the access road into Waikato Falls as a consequence of the Tongariro Power Development. This road was necessary to service Poutu Intake, which was commissioned in late 1973 and opened up the stretch of river from Waikato Falls to Turangi. Once in the river, the first place rafters could leave the river was below the hatchery (now the Tongariro National Trout Centre) though many chose to raft through to Turangi. This took them through a large number of the more popular fishing pools and past a lot of unhappy anglers. To be fair though, the commercial rafters were aware of the anglers' dismay and generally tried hard to minimise their disturbance of the pools. In an attempt to alleviate the growing discontent amongst anglers the then Wildlife Service explored the possibility of establishing a new exit point on the river above where the majority of angling occurred. This would enable the rafters to raft down from Poutu intake through the best white water section and leave the river before they encountered very many anglers. The commercial rafting companies were supportive of this idea and so the Wildlife Service approached the Justice Department over whether rafters could exit the river at the Blue Pool using the locked access track. The Justice Department while supportive of the idea, was concerned that once it issued keys to the gate these would inevitably be copied or lent and misused to access other parts of the property with associated security and fire risks. Instead it offered to remove the gate so that all river users, not just the rafting companies, had vehicle access to the Blue Pool area. The gate was removed from the access road in 1983 and the solution went a long way to resolving the conflict though not all anglers were happy with it. Those who had previously made the effort to walk into the upper river now had to compete with many other anglers to fish what were some of the best pools on the river.

Through the 1980s boating on the river continued to increase. In particular kayaking became popular and once again the conflicts began to build. On 8 November 1990 a meeting was held between commercial rafting companies, the New Zealand Canoe Association, angling interests and the harbourmaster. The commercial rafters and canoeists agreed to voluntarily restrict their activities on the river below the Blue Pool between June and August to the hours of 10 a.m. to 3 p.m., Monday to Friday. The agreement didn't apply to private users though their numbers tended to be low during winter. Most companies continued to exit the river at the Blue Pool but this agreement reduced the interaction between anglers and

other users downstream and all in all worked well.

Then in July 1998 the second and third largest floods recorded since 1952 wreaked havoc all along the river. Amidst the carnage was the loss of the Blue Pool access from past the Breakaway Pool. A new track was cut to allow rafts to be retrieved instead from above the Breakaway Pool, but carrying the rafts up past anglers' cars inconsiderately parked along the track is not always easy. As a consequence some users are choosing to raft further down the river and exit at places like the Tongariro National Trout Centre and at the Admiral's Reserve. In this case anglers have not helped themselves with their insistence on parking past the signs at the road end, although it is noticeable that this winter anglers are making more of an effort not to block the access track. This is appreciated by the commercial rafting companies, but particularly on busy weekends inconsiderate parking is still causing unnecessary difficulties. The increased usage of the lower river coincides with a boom in the use of "rodeo" kayaks, those blunt-nosed pieces of plastic which have replaced surfboards on the top of cars. These kayaks have opened up all sorts of new opportunities with their propensity to make fun out of the smallest feature in the river and their ability to bounce their way down the most boulder-infested runs. With this increased activity it appears some of the old tensions are resurfacing.

A separate underlying tension has been the development over the years of a proprietary ownership of the Tongariro River amongst the rafters and kayakers, to which some anglers take affront. They argue that the quality of the river is solely as a consequence of the determined efforts of anglers and fishery managers fighting for the river during the building of the Tongariro Power Development. To have another group now intimate it has an equal right to the river and seek concessions in terms of flow regimes suitable for rafting rather than angling definitely antagonises these anglers.

Damn - here comes a raft!

One very well known and successful Taupo fishing guide swore by disturbing the fish, often to the chagrin of those fishing beside him. A raft drifting quietly through the pool was mild; much more his style where it was possible was to drive his boat at high speed in a tight circle for several minutes and then throw a great length of anchor chain grating over the side. Certainly unorthodox, but it

Anglers are no longer the only users of the Tongariro River (Photograph Helen Mitchell)

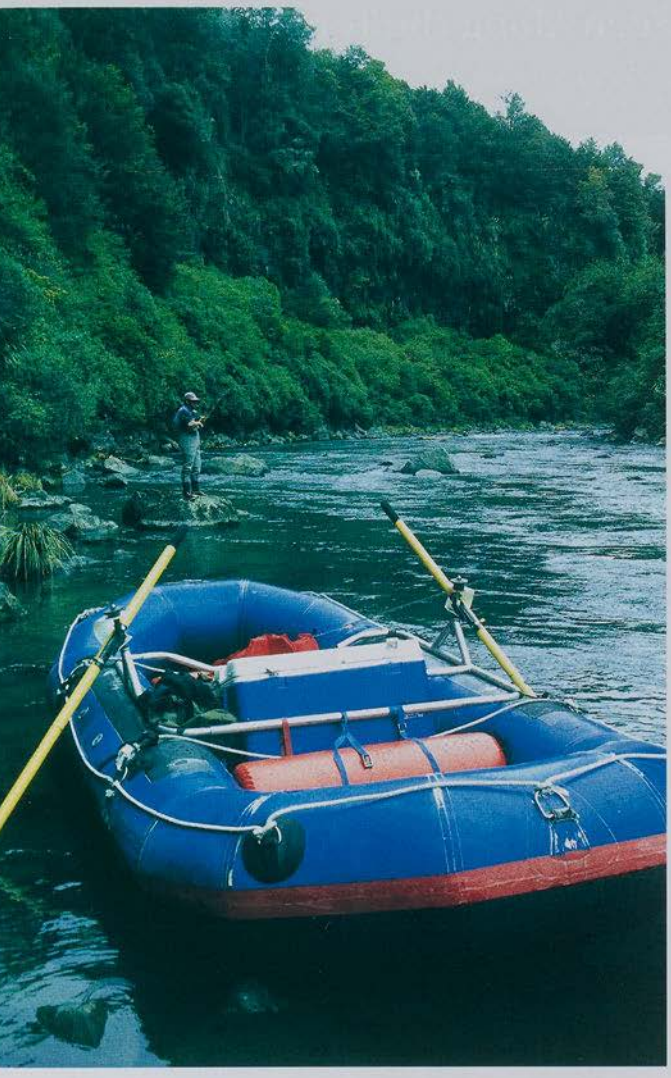
was very hard to argue with his results. We are not advocating such extreme behaviour but it does highlight that there are occasions when an angler fishing after a pool has been disturbed will suddenly have success. On the other hand I once watched a couple of anglers throw boulders into a pool in an effort to liven things up. Up to that point they had caught only two fish for a whole morning spent fishing. When they left an hour later they still had caught only two fish and proven that throwing rocks into the water doesn't work.

Our radio tracking of spawning trout migrating up the Tongariro River provides clues about the likely effect of a raft passing overhead. Under the cover of darkness or following a period of movement upstream, the fish lie out in the shallows or at the tail of the pool where they are vulnerable to the next anglers to come along. However over the next few days as they are continually subject to a barrage of gaudy flies and disturbed by wading anglers they move into the deeper holes and under the far bank out of reach. We have written before about how at the time of the tracking experiment the Reed Pool was one of the hot spots on the river. During settled periods we would walk along the true left bank tracking our tagged fish, which would be lying under our feet along with 50 or 100 other visible fish. The downstream anglers would be casting across toward us, their flies falling several metres short and quickly being swept around. By the time their flies were close to the bottom they were five or more metres away from the bank and the fish.

The true left bank is the left hand bank as you face downstream

When the fish are lying out in the shallow margins they are feeling very vulnerable; especially those which are not long out of the lake and still unsettled by their new environment. A natural response for a trout to a shadow passing overhead is to slide away into the depths, no doubt in part a protective behaviour, which has evolved to counter the threat of bird predators. One only has to sit on a raft to see the agitation amongst the fish as the raft passes through the pool. If the fish are lying out and taking the fly readily then obviously such behaviour in response to a raft floating past doesn't help. However it is also important to remember that trout in the Tongariro are not fickle resident fish which have spent their whole lives in a single pool, to be easily upset by the slightest change to life, as they know it. They do feed but in a very passive manner, which is why they will not move very far at all, especially up off the bottom to take a fly. Much more their response is as a reaction to something passing close to their nose, even an aggressive reaction against the bright object dancing close to their head. Even when they are disturbed it is often possible to elicit this reaction whereas a resident fish might sulk for several days.

Sometimes a disturbance may even help. If the fish are not playing the game, then being spooked around the pool may be sufficient to cause them to swipe at a provocative fly. Similarly if they are lying out



The use of rafts has opened up the fishing opportunities in the upper river

of reach, a raft may push them across into lies where they are now vulnerable to the angler. Examples of this occur all the time on the river. You may remember yourself experiencing a quiet spell in a pool when another angler has appeared on the far bank. This angler may well have had immediate success as they struck fish pushed across by you. As they hooked fish and disturbed the area close to them suddenly you started to hook up again as the fish move back into reach.

Perhaps most critical is the sort of disturbance to which the trout are subjected. Key to this is that sound generated out of water is only poorly transferred through water whereas sound generated within the river is amplified across the pool. For example, when we are drift diving we can hear only faintly what is going on above the water but hear every scrunch of gravel as someone walks along the edge of the water. There is nothing that rings out like two boulders being clacked together, whether they are dislodged by a raft or an angler wading the pool. Laughing and yelling by a raft party which shatters the harmony of the river may well be inappropriate to an angler seeking to get away on their own but at least the effect on the fish will be minimal.

The bottom line is raft fishing in the upper river is a very successful way to fish. Sure the boatmen handle the raft expertly and minimise the disturbance of the pool, but in many cases it is still necessary to raft into the pool before the angler can get out to fish. That some very spectacular catches are made is evidence, how little impact a passing raft may have on the fishing.

By and large commercial rafters go to some effort to either float quietly down the far side of the pool or pass behind a line of anglers, whichever is more appropriate. Anglers need to recognise that the impact of this is unlikely to be significant and that the rafters and canoeists are doing their best. Similarly there is an onus on the boaties not to play in pools or runs where anglers are fishing or are likely to fish and to acknowledge that the hype and noise may not be appropriate in the company of other users. By all means say "hi" but asking how the fishing is soon wears a bit thin if you are not the first raft that has asked the question of the angler.

Both groups of users have a right to be on the river. However the Tongariro is one of the great angling rivers of the world, not just another rafting river. In this particular case it is perhaps not unreasonable to ask for special consideration of the angling values.

Pigs Seen Along the Tongariro River

No not wild pigs, but anglers with no respect for the river, that provides them with their sport. The litter lying along the banks of the river this winter is disgusting. Chip packets, drink bottles, muesli bar wrappers, empty nylon spools, fish guts, the list is endless. All a very sorry reflection on anglers. We struggle to understand how people can be so uncaring. The river provides them with a great experience, so in return anglers treat it like a rubbish dump. They will happily carry a 2.5kg fish for 20 minutes back to the car but it seems an empty drink bottle is too much. Well if you are one of these people, how about a change of heart, either that or go somewhere else (to use polite terminology).

To those people who do appreciate the river, picking up just one piece of rubbish each time you go fishing will make a big difference. It is no fun cleaning up after other people and it should be unnecessary, but unfortunately it seems there will always be pigs to be seen along the river.

KIDS' BLUE LIGHT GONE FISHIN'

On 25 March 2000 the police programme "Blue Light" organised a kids' fishing competition on Lake Taupo in collaboration with Graham Sinclair, presenter of the "Gone Fishing" TV show. Forty-two kids were selected from the Taupo area. They were issued with complimentary fishing licences and embarked on 10 fishing boats graciously offered by local fishing guides. This armada of keen young people braved the cold during the morning with good success. The competition ended at lunchtime and kids enjoyed a well deserved barbeque. DOC staff weighed a total of 31 fish, the largest a rainbow male 610mm long and 2.8kg in weight. Good effort kids! And thanks to the organisers and local sponsors who made this event possible.

A Great Winter Unfolding on Taupo Rivers

We do not use superlatives like "great" or "exceptional" lightly. The fact that there are a number of superlatives in the following article reflects the fact that this is shaping up to be one of those memorable years that come along just occasionally.
(EDITOR)

As expected, the fishing this winter is proving to be excellent as large numbers of well conditioned fish make their way up all the tributaries. In most years one river outfishes the rest but a feature this year has been the great fishing in all the rivers. The runs started early, beginning in mid April, and the Hinemaiaia was outstanding over the last two months before it closed. A number of the regulars claim it was the best the river had fished for many years. Other anglers were reporting big catches on the Waitahanui, Tauranga-Taupo, Waimarino and Tongariro rivers. Interestingly, despite all the comment about the fishing on the Tongariro our data shows that the average catch rates on this river are not very high (Table 1).

Table 1: Mean catch rates (average of all anglers' individual catch rates) to 30 June 2000

River	Individual CPUE	Average fish weight (kg)	No. of interviews
Tongariro	0.20	2.07	484
Tauranga-Taupo	0.33	1.73	110
Waitahanui/Hinemaiaia	0.35	2.23	246

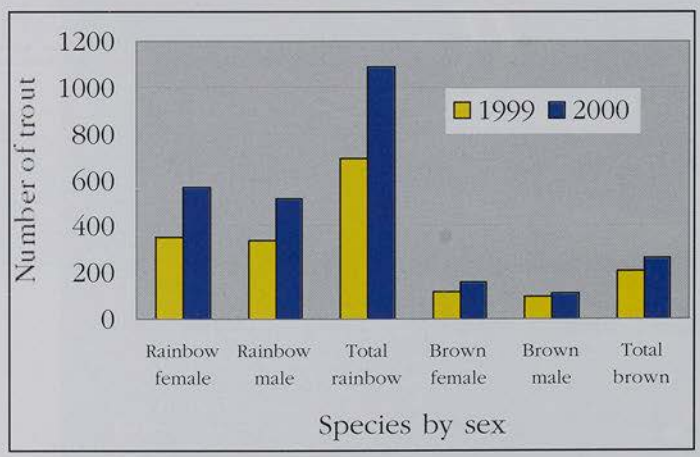
The excellent angling is consistent with our monitoring of trout numbers in the spawning streams. In the March 2000 issue of Target Taupo we presented the full results of last year's trapping season on the Waipa stream. Six months of trapping have been completed this year and the results compare very favourably. Overall the number of trout trapped is 50% greater compared to the same period last year (table 2). It will be interesting to see how the later part of this spawning season compares, as last year the number of trout trapped in September, October and November was very high.

The same increase is evident in our counts of spawning fish along selected stretches of the other eastern tributaries (table 3).

The Hinemaiaia count is not up as much as we might have expected given the quality of the fishing this year. However it was evident from our survey data that much of the best fishing actually occurred just above the highway bridge rather than closer to the upstream limit as is typical at this time of year. Our counting stretch is just below the HB dam and it is likely that the majority of fish have yet to reach this part of the river. The results next month will confirm whether this is correct or not.

The other feature this winter has been the slightly larger average size of the fish, which are in excellent condition. The data for fish through the Waipa trap in 1999 and 2000 highlights this (table 4).

All in all it is shaping up to be the best winter's fishing for perhaps 20 years or more. It is a



Graph 1: The number of trout by species and sex through the Waipa trap to 30 June for 1999 and 2000

characteristic of a wild fishery like Taupo that the fishery does fluctuate through extremes, but when conditions all come together they produce some memorable moments. The only thing is that when the fishery reaches a peak like at present there is only one way for it to go. In late 1999 two significant floods are likely to have affected the survival of the young trout and it's not hard to imagine that this will be reflected in the fishery in a year or two.

The boom in the Taupo fishery is mirrored in the Lake Otamangakau fishery. It has been a very busy winter for our trap operators on the Te Whaiau Stream, the major spawning tributary of the lake. Table 5 shows that the number of fish through the trap this year is nearly three times the total at the same time last year.

As occurs in many fisheries in New Zealand, the brown trout migrate several months earlier than the rainbow trout. Whereas the peak of the brown trout spawning run is likely to have occurred, we expect many more rainbow trout to pass through the trap yet. Clearly the conditions which favoured trout survival and growth in Lake Taupo have also benefited fish here. Make sure you get out and make the most of this winter!

Table 2: The number of trout by species and sex through the Waipa trap to 30 June for 1999 and 2000

	1999	2000
Rainbow female	354	569
Rainbow male	339	520
Total rainbow	**693**	**1089**
Brown female	115	157
Brown male	94	110
Total brown	**209**	**267**

Table 3: Counts of spawning fish in selected stretches of five Taupo tributaries, June 1999 and 2000

Year	Tauranga-Taupo	Whitikau	Waimarino	Waiotaka	Hinemaiaia
1999	356	339	475	965*	408
2000	1053	902	821	1154	480

**Count was affected by a blockage upstream which prevented trout getting through the Waiotaka gorge until later in the year*

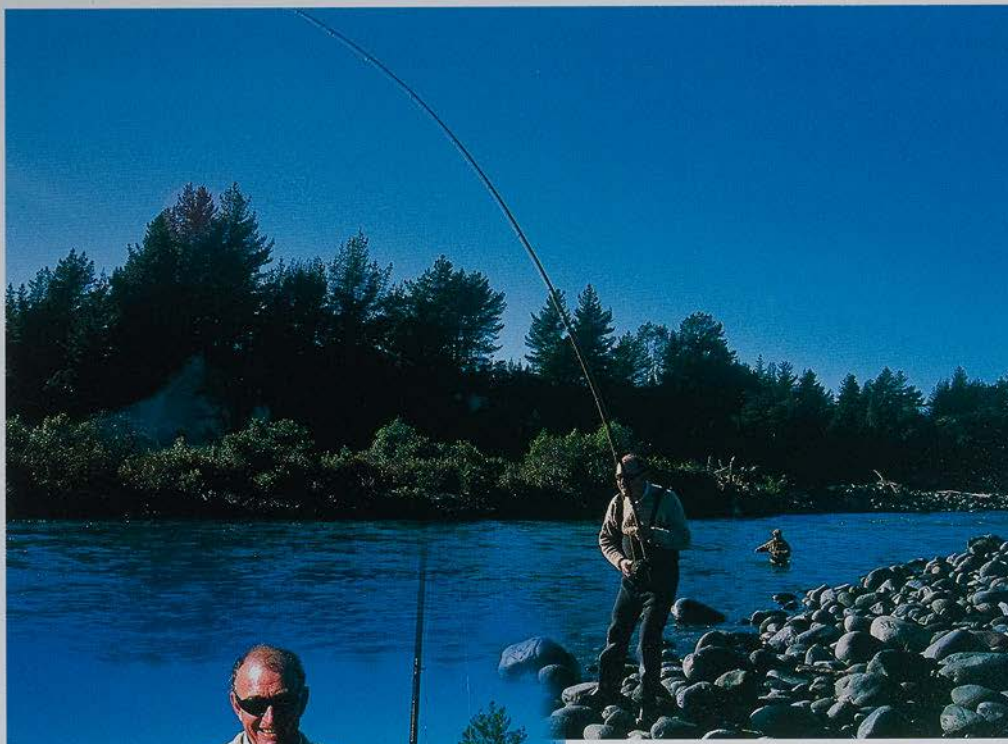
Table 4: The average length and weight of fish through the Waipa trap to 30 June for 1999 and 2000

	1999	2000
Rainbow female	530mm, 1.77kg	541mm, 1.98kg
Rainbow male	530mm, 1.70kg	540mm, 1.85kg
Brown female	591mm, 2.66kg	600mm, 2.85kg
Brown male	598mm, 2.67kg	626mm, 2.98kg

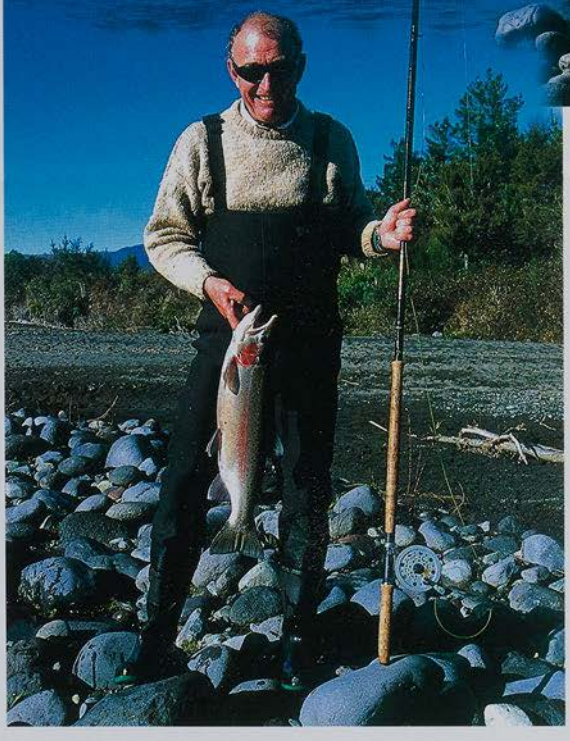
Table 5: The number of fish through the Te Whaiau trap to 30 June for 1999 and 2000

	1999	2000
Rainbow female	126	403
Rainbow male	176	489
Total rainbow	**302**	**892**
Brown female	258	633
Brown male	164	452
Total brown	**422**	**1085**

Hooking fish is only part of the challenge in the Hinemaiaia River



W R Scott of Christchurch enjoys the moment on the upper Tongariro River



The prize - a typical Taupo trout in 2000

Tongariro National Trout Centre Society Several Steps Closer

Formation of the Tongariro National Trout Centre Society is almost complete and the society should be in place shortly. The society is intended as an opportunity for people to support or even get involved with the development of the educational and advocacy roles of the Tongariro National Trout Centre in association with the Department of Conservation.

The necessary signatures for incorporation have been gathered and the rules for the society agreed. These have been kindly reviewed by Strato Cotsilinis to ensure the society qualifies for charitable status. Strato is the New Zealand angling representative on the Taupo Fishery Advisory Committee and a chartered accountant. This is a good example of how it is hoped that the society will function, able to draw upon the vast range of skills within its membership to achieve particular tasks.

Currently the Department is producing a pamphlet to guide visitors around the centre. This pamphlet will be available at the entry gate and includes a form for people wishing to know more about the society or to become a member. The pamphlet is at the printers and should be in use shortly.

An article on the society and its objectives will be published in the November issue of *Target Taupo*, by which time it should be up and running and in a position to welcome new members.

"Had Any Luck?"

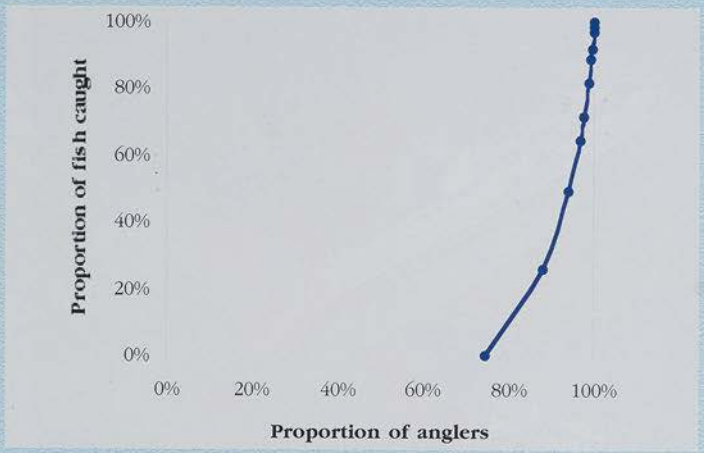
by Michel Dedual

Dr Michel Dedual is the Fishery Area Scientist. Hailing originally from Switzerland, Michel is also a very enthusiastic and "lucky" angler.

Among anglers there is a saying that 90% of fish are caught by 10% of the anglers. The saying suggests that while a few individuals have real skill or knowledge about fish and fishing, most of us are just out drowning our flies and soaking up the sunshine.

The suggestion has some basis in fact but is not strictly true for fishing at Taupo. Data collected in 1999 during angling surveys on local rivers reveal that 12% of anglers caught 75% of the fish (graph 1). Nevertheless a small proportion of anglers catch a large proportion of the fish. But does this necessarily imply that the successful anglers are skilful? Might it not be that they were just lucky?

How can we approach questions of this general nature? The inequity in fishing success is similar to other social or economic inequities and some statisticians and mathematicians have tried to extract and weigh the "luck" factor to determine if it is more important than skill.



Graph 1: Proportion of total catch accounted for by proportion of anglers on Taupo rivers in 1999

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

Let's look at some aspects of angling success

Most of us believe that fish are easier to catch when there are a lot of them about. This is true to some extent but unfortunately the relationship between fishing success and trout abundance is not this simple. Just because a lot of fish are present doesn't necessarily mean that they are easier to catch. Catchability can be divided into a component that depends on the behaviour of the trout, such as how vulnerable or accessible they are and a component related to the angler's efficiency. Trout may be out of reach sitting deep in the pool or they may be very spooky in shallow and clear water. A typical example is in the Tauranga-Taupo River in autumn when large shoals of trout can be seen in the shallow, clear lower reaches of the river. A poor cast or the use of too heavy gear will see them bolt away. In such situations it is difficult to pretend that we didn't catch fish because there was none around!

Interestingly the catchability of fish plays a big role when we try to relate fish abundance to catch rate. Studies on Pacific salmon in North America indicate that the catchability of individual fish tends to increase when salmon numbers decrease. This also holds true for a wide range of migratory salmonid populations in England and Ireland and for rainbow trout in some lakes. In simple terms, relatively large changes in population density may be reflected by only small changes in angler catch rates.

Does fishing success favour women anglers?

It is commonly reported that women are better anglers and catch bigger and more trout than men. The 1999 angling survey on Taupo rivers provided some interesting results. Overall female anglers were as successful as their male counterparts, as 20% of both sexes had caught fish at the time of the interview. However the above statement that women catch more trout than men was not supported. The catch rates for male and female anglers were 0.24 and 0.11 fish per hour respectively, indicating that successful men were catching more fish than successful women. Why? Are men more persistent, skilled, or luckier than women? Maybe women are satisfied with catching fewer fish?

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

"Fisherman's luck"

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

Henry Van Dyke in his highly recommended book Fisherman's Luck is a strong believer that chance is the key ingredient to fishing success. He says *"One side of our nature, no*

doubt, finds its satisfaction in the regular, the proper, the conventional. But there is another side of our nature, underneath, that takes delight in the strange, the free, the spontaneous. We like to discover what we call a law of Nature, and make our calculations about it, and harness the force which lies behind it for our own purposes. But we taste a different kind of joy when an event occurs which nobody has foreseen or counted upon. It seems like an evidence that there is something in the world which is alive and mysterious and untrammelled."

Even though luck is unpredictable, many of us are certain that we can boost good luck and reduce bad luck. We are casting our lines in the Superstition Pool!

Superstitious beliefs are found around the world in every culture. They all have the function of providing comfort in uncertain times. Superstitious beliefs fill in the gap when knowledge falls short. You see this happening with many things, for example people might be more likely to turn to alternative medicines when orthodox medicine can't give them the answers that they seek. Research shows that it is quite normal to be superstitious. Goethe reckoned that "Superstition is the poetry of life, and that's why it's not bad for a poet to be superstitious." Fishing by its unpredictable nature provides a fertile ground for superstitious beliefs. Some of these superstitions are easy to understand but some are much more obscure.

Angling superstitions: some swear by them, others just swear!!

Anglers should not wash their hands with soap before going to sea or else they will wash their luck away.

Touching chives before going fishing brings bad luck.

Many anglers believe that one's luck for the day depends on the person you first see when you awake. If that person is industrious you will be lucky catching fish that day. If the person is lazy then your luck will not be good.

One of the worst pieces of bad luck is for a person to go fishing with their clothes on inside out.

A good time to go fishing is when you see a chicken oiling its feathers.

A rabbit crossing your path when you are going fishing is a sign of bad luck that day.

If a person goes fishing every Sunday, someday he will catch the devil on his hook and be snatched off the bank into the water and may drown.

If on your way to fish, you see a pin, pick it up for luck; failing to pick it up will bring you bad luck.

If the end of your rod touches the water, you will not be successful.

It is unlucky to take a dog on a fishing trip.

It is unlucky to bait your hook with a worm by using your left hand.

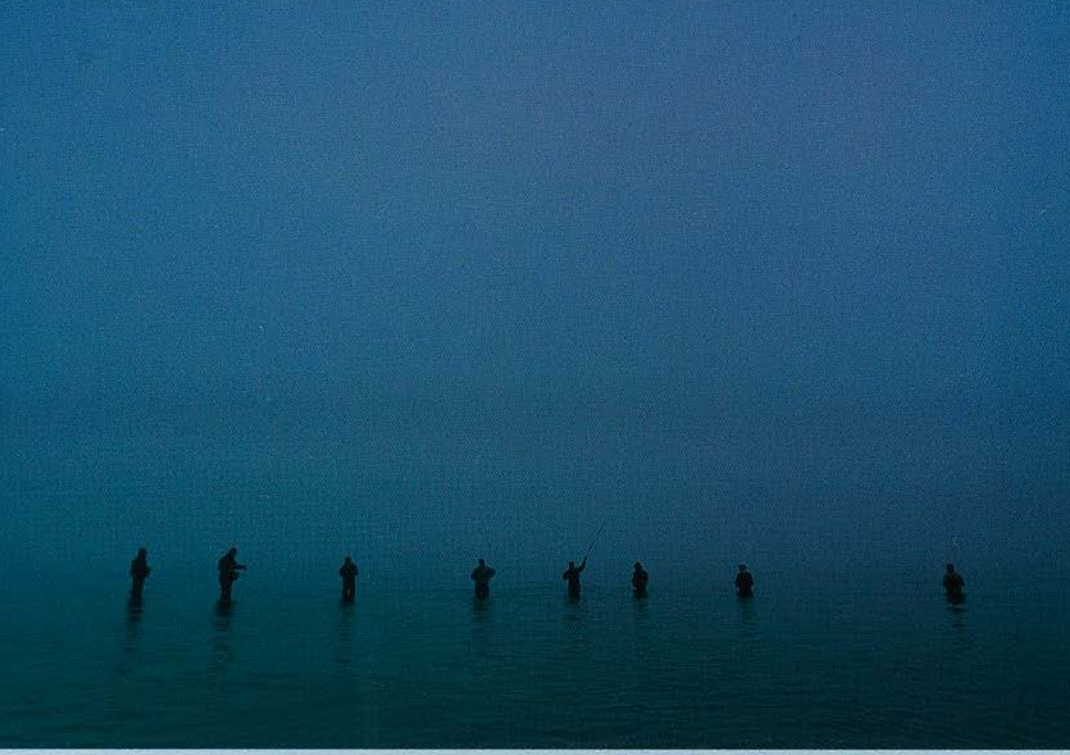
Turn your pocket inside out and you will catch catfish.

A fish should always be eaten from the head toward the tail.

If you count the number of fish you have caught, you will catch no more that day.

It is bad luck to close a pocket knife unless you were the one who opened it.

"But in fact, all these superstitions about fortunate days are idle and presumptuous. If there



Casting into the unknown at the Waimarino River mouth. Why will some of these anglers catch many more fish than the others? (Photograph courtesy of Kennedy Warne)

were such days in the calendar, a kind and firm Providence would never permit the race of man to discover them. It would rob life of one of its principal attractions, and make fishing altogether too easy to be interesting" (Henry Van Dyke). If we don't trust superstition to help us catch fish but still believe that luck is a key ingredient in success then we may try to measure the odds. To quantify the chance of catching a fish before we cast a line we have to explore the domain of probabilities.

The odds of catching a fish

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

We use the idea of probability only for events about which we have incomplete knowledge, usually because they lie in the future. If we knew the exact details of everything that has ever happened or ever will happen, probabilities would become redundant. Any value we quote for the probability of an event is relative to some knowledge that we have about that event, or that we choose to hypothesise about it, and will change as that knowledge changes.

The probability of catching a fish assigned by an angler depends totally on that angler's knowledge. If you are wearing polaroid glasses and scan the pool for trout but discover none, then for you the probability of hooking a fish on a cast is 0. For the angler who can't see through the water the probability will remain at half. Neither of these values is wrong; each is a correct evaluation based upon the angler's knowledge of the situation.

A simple error known as the "gambler's fallacy" illustrates the importance of specifying carefully what knowledge we are taking into account when calculating probabilities. If a hookup has occurred on 10 successive casts, many anglers wrongly believe that the likelihood of success on the 11th cast is then less than half, because of what they call the "law of averages". Such

anglers are confusing two questions. If a line is cast 11 times and we know none of the results, the probability of all 11 casts resulting in a hookup is less than 1 in 2000. But if we know that the first 10 casts did result in a hookup, then the probability of the 11th also resulting in a hookup is half as always.

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

Aristotle: "Probable impossibilities are to be preferred to improbable possibilities."

"Probable impossibilities are to be preferred to improbable possibilities."

What is fishing skill?

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

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

At river mouths you know that the chance of having the fish around is high. Skill will help you to scan all depths and current until you reach them. Trout may be stacked close to the bottom, actively feeding in mid-water or cruising the lip of the drop-off. Skill will help you to visualise what your fly is doing and at what depth it is swimming. These parameters are perceived by feeling the tension and watching the angle of the line. Skill becomes sensorial. Sometimes you feel confident that the delicate balance is swinging your way. Maybe skill is the ability to recognise when everything is working well or to identify when and why something doesn't feel right. Now that's a weird definition of skill: the ability of sensing when everything is fine. But that is only the angler's side of the story. The fish has its own mind; if it's unlucky it will fall in the trap set by the lucky angler and if it's lucky it will avoid the lure of the unlucky angler. So even though skill is important, luck seems to be more relevant to the unknown question of what the fish will do.

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

Conclusion

But all this, you must remember, depends upon something secret and incalculable, something that we can neither command nor predict. It is an affair of gift, not of wages. Fish (and the other good things which are like sauce to the catching of them) cast no shadow before. Water is the emblem of instability. No amount of preparation in the matter of rods and lines and hooks and lures and nets and creels can change the fishing essential character. No excellence of skill in casting the delusive fly or adjusting the tempting bait upon the hook can make the result secure. You may reduce the chances, but you cannot eliminate them. There is no combination of stars in the firmament by which you can forecast the piscatorial future. When you go a-fishing, you just take your chances; you offer yourself as a candidate for anything that may be going; you try your luck." (Henry Van Dyke)

River Angling Seminars Prove Successful

On 20 May and 8 July, Department of Conservation fishery staff held free river angling seminars at the Tongariro National Trout Centre in Turangi. These were the first fly fishing seminars to be held for several years and the response was very pleasing. Approximately 150 anglers attended the first seminar and more than 200 anglers ranging in age from five to over 60 years came along to the second session. Men dominated the audience though it was nice to see a few lady anglers there as well. Further seminars developing on the ideas we have picked up this year are planned for next year.

The seminars covered many aspects of fly fishing Taupo rivers. Technical Services Programme Manager Glenn Maclean and Fisheries Ecologist Rob Marshall discussed the life cycle and movement of Taupo trout, the techniques and equipment used by wet fly and nymph anglers, angling etiquette, fishing regulations, playing and landing fish and catch and release techniques.

The sessions concluded with Rob giving a practical casting demonstration and display of swimming in waders in the Tongariro River.

The aim of the seminars is to give newcomers to fly fishing at Taupo a better chance of catching fish. The aim is for everyone present to take at least one piece of information away that helps them to be more successful. Judging by the response so far, the aim was achieved and people had an enjoyable morning by the river.

Rob Marshall gives a practical demonstration on the Tongariro River

The nets are set in shallow water close to the weeds and rushes favoured by catfish

Monitoring the Catfish in Lake Taupo

by
Bryan Taylor

Bryan is one of our fisbery rangers. He undertakes a lot of our field work and quite likely is the person who stops to check your fishing licence sometime

The brown bullhead catfish (Ameiurus nebulosus) was discovered in Lake Taupo 15 years ago and today the population is widespread. Although catfish numbers are highest in weedy, silty areas, they are also found over sandy shingle areas during summer. The Department of Conservation initiated a monitoring programme studying the catfish population in December 1996.

Sampling is carried out every two months. The same areas are used each time: Waihi Bay and Motuoapa Bay in the south and Whakaipo Bay in the north.

At each site, three fyke nets are set overnight. These nets are a series of hoops attached to an extended wing. Catfish, on encountering the wing, swim along this barrier into the hooped part of the net from which they can't escape. Over a time, each of us has developed our own techniques for setting these nets to account for fluctuations in water depth, wind strength and direction, rain and the nature of the lake bed. There are times when it is easier to get out of the boat and work on foot in the water. This is especially so when working alone and the wind is blowing in the wrong direction.

It is usual that the fyke nets are set during late afternoon or early evening in water depths of about 700mm close to rushes and other cover. The three nets are set between 20 and 40 metres apart.

The nets are recovered before 8 a.m. the next morning. Waihi, with its muddy, slushy bottom and Motuoapa with its weeds, produce the largest catches. With a good catch of 200 plus fish, two people are needed to manhandle the nets and fish into the boat. On one occasion one net was so full of fish it had to be dragged ashore before it could be hauled over the side of the boat.

Before leaving the catch area the contents of

all nets are counted and the total from each net recorded. Fish with coloured floy tags, which are part of a study to estimate the size of the catfish population, are returned to the water after the number on the tag is recorded.

Back at the laboratory an overdose of benzocaine is added to the water in the fish bins, which quickly kills the fish in a humane way. The length of each fish is recorded. A sample of 25 randomly selected large fish (larger than 250mm) and 25 randomly selected small fish (250mm or less) is also taken and lengths, weights and sex recorded for these fish.

To establish the sex of a catfish it is necessary to first dissect it by cutting from the anal vent to the gills. By moving the gut aside the gonads are revealed lying against the fish's backbone. The male gonads are long, thin, white strands, which look like fatty tissue. The female gonads are pale orange and wider. Each extends the length of the gut cavity.

A diet analysis is carried out on the same 50 fish. The stomach is cut away from the gut and the contents squeezed into a petri dish. What do catfish eat? Mostly snails, vegetation and worms. Some larger fish eat koura and smelt as well. Oh yes, must remember to record the results! Bon appetit! This happens to be my favourite job, though others in the fishery team struggle to cope with the odours associated with this task.

The results of this monitoring are reported regularly in *Target Taupo*, the next report in the March 2001 issue.

Next time you see three orange marker buoys 20 to 40 metres apart in a somewhat triangular setting in a quiet bay on the lake edge, they are probably working catfish nets. Please do not disturb them!

Autumn Hunting Summary

by Cam Speedy

Warm wet weather through much of late March/early April broke the fierce late summer drought and tended to wash the red deer roar out this year. Nevertheless, those hunters who persevered were treated to some sporadic success, particularly in the Ahimanawas and other eastern parts of the conservancy. These areas seemed to provide more consistent results than western parts such as Tongariro and Erua Forests. A good number of young representative heads showing strong potential were taken from the higher quality western red deer herds but nothing outstanding was reported. I am aware of a few stories of the "one that got away", suggesting perhaps a few bigger boys were out there somewhere but I am not aware of any such heads being shot.

These superb trophies are typical of the quality available in the last 10 years

The sika roar by comparison was better than average this year but as usual, reports from hunters suggest the hunting varied from "outstanding" to "abysmal", depending on when and where one hunted. The Easter break corresponded well with the peak of the rut where I was - Monday 24 April seeing the sika stags squealing from all points on the compass during what was my most exciting morning's stag hunting ever. The stag jaws deposited in jaw boxes around the place during this period certainly support an Easter peak for the rut this year, but rutting sika stags were still being heard and shot through May and well into June.

A feature of the roar this year, for both sika and red deer, was the great condition of the animals, even in some of the more stressed high country habitats. This is likely to be a reflection of the abnormally productive environmental conditions experienced through 1999. Perhaps it is global warming or the La Nina weather pattern, but 1999 was a standout year for our local native forests in terms of fruit/seed and subsequent seedling production. This extra production has certainly been reflected in the condition of the deer.

The aircraft companies that specialise in transporting hunters to the backcountry reported similar levels of client interest to previous years during April 2000 and this fits with our permit issuing statistics, which show this autumn period to have been a very average year. Just over 3000 hunters took out permits to hunt public conservation land in the Tongariro/Taupo conservancy.

A great selection of representative trophies was displayed at the eighth annual Hunters and Habitats' Sika Hunting Competition, held at Great Lake Centre in Taupo, on 2 July 2000. This year's event was held in association with the NZ Deerstalkers' National Conference, and unlike last year the "Trade" really got behind the event making for a wonderful weekend celebration of the hunting on offer in the central North Island. Thousands of visitors took advantage of the show and over 120 heads, including sika deer, red deer, fallow deer and pig tusks, were presented for measuring. Hunting-related photos, videos and artwork all added to the family atmosphere of a very successful day. Over $15,000 worth of prizes provided by sponsors were given away on the day, including the big prize, a Chamois Hunt valued at over $1750 provided by Amuri Helicopters, taken away by Malcolm Hogg of Te Puke.

As mentioned, the quality of the heads this year was impressive with no fewer than 14 sika heads, with Douglas Scores over 170 points, making the record books. The winning sika head was shot by Stephen Anderson of Whitianga scoring 195 points. This spectacular 9.5 year old nine-pointer came from, you guessed it, Clements Road in the northern Kaimanawa. Taupo's Brian Elworth, with a 3.5 year old eight-point head scoring 162 3/8 Douglas Score points, took out the coveted "Judges' Choice" prize, now recognised annually with the Jim Marshall

Memorial Trophy.

Following the rut, seven helicopter operators were given permission to recover deer carcasses from selected parts of the public conservation land within the conservancy. These areas included that part of Kaimanawa Forest Park outside the Recreational Hunting Area; the Hauhangatahi Wilderness Area and northern slopes of Mount Tongariro in Tongariro National Park; and Rangataiki Forest. As at the end of June 2000, some 100 deer carcasses, mostly red deer, had been recovered and recovery rates had started to drop, despite the high prices being paid for venison. Helicopter operations are due to cease for the year at the end of October as recreational hunter interest and use in our local forest and high country begin to increase again with the warmer weather. While many hunters will see helicopter recovery in a negative light, hunters will notice increased breeding success and deer quality over coming years as a result of reduced numbers in the stressed habitats of the high country. The heavily forested nature of much of the front country will mean the helicopter harvest has negligible impact here.

There is much debate among hunters as to the pros and cons of helicopter harvest, poison and intensive recreational hunting pressure which all influence the central North Island sika herd. However, as deer density has come down in the past 10 years as a result of some of these influences, there can be no doubt that the quality of the deer has improved. The heads on display at this year's competition highlight this point very well.

At the end of the day, the sustainability of hunting depends on the sustainability of the habitats within which the deer live. Unless the natural habitats of the central North Island remain healthy and productive, there is no future for the wildlife that depend on them. Worth thinking about!!

2000 Sika Competition Results (Sika Heads)

Hunter	No.Points	Douglas Score*	Age	Location
Stephen Anderson	9	195	9.5	Clements Road
Greg Duley	12	193	?	Kaweka Main Range
Mark Vowles	8	190.7	6.5	Clements Road
Roger Halliwell	8	189.7	7.5	Puketitiri
J Konlecher	9	188.3	6.5	Tararakina
David Blayney	8	187.7	?	Waiouru
L Polglase	8	187	5.5	Waiouru
Dawson Bliss	8	184.6	5.5	Ngamatea
Craig Spence	9	178.7	?	Otupua
Malcolm Hogg	8	176.7	8.5	Tiraki
James Elliot	8	176.1	8.5	Oamuru
Rick Dodson	8	174.2	7.5	Ahimanawa
Howard Norton	8	172.3	7.5	Clements Road
Greg Duley	8	170.3	?	Kaweka Main Range
Roger Halliwell	8	166.7	3.5	Puketitiri
Adrian Livesey	8	166.6	11.5	Oamaru
Clayton Robinson	8	166.4	4.5	Upper Mohaka
Winstone McNae	8	165.7	?	Kaweka Main Range
Winstone McNae	8	165.6	?	Manson
Kevin Meredity	8	165.4	7.5	Kiko Road
Jim Pottinger	8	164	9.5	Rangitikei
Stephen Philpott	8	163	5.5	Poronui
Brian Elworth	8	162.3	3.5	Waiouru
Bruce Howard	8	161.5	6.5	Rangataiki
James Flight	8	160.1	4.5	Tauranga-Taupo
Robert Pol	8	158.6	3.5	Clements Road
David Barraclough	8	157.4	5.5	Ahimanawa
James Flight	8	157.2	4.5	Tauranga-Taupo
Matt Cutler	8	154.5	6.5	Golden Hills
Dion Patterson	8	154.4	6.5	Rangitikei
Tom Loughlan	8	153.4	3.5	Clements Road
Andrew Philpott	8	153.3	6.5	Otupua
Andrew Williams	9	151.2	8.5	Tauranga-Taupo
Alan Jackson	8	149.4	7.5	Tiraki
Graham Vowles	7	149.2	8.5	Ahimanawa
Graham Reichardt	8	144.7	3.5	Motumatai
Roger Halliwell	8	142	3.5	Puketitiri
Stephen Anderson	8	139.5	4.5	Clements Road
Ross Pyper	6	136.1	8.5	Wainui
Mark Hoare	9	135.4	3.5	Oamaru
Dion Patterson	8	135	4.5	Rangitikei
Peter Budd	8	134.1	4.5	Clements Road
Neil Philpott	8	131.1	3.5	Waiouru
Dion Patterson	8	127.7	3.5	Rangitikei
A J Allcock	8	124	6.5	Lower Ripia
John Crossland	8	123.7	3.5	Poronui
Alan Ladd	5	123	9.5	Clements Road
Bruce Bailey	6	115.7	?	Waiouru
Chris Philpott	6	106.5	3.5	Otupua

- decimal point denotes 8ths Douglas Score (e.g. 0.7 = 7/8ths)

For details of prize winners and other data records, check out the website (www.nzsika.co.nz)

Harvest Survey 2000/01

How many trout are caught from Lake Taupo and the rivers over a season? When we last measured the harvest in 1995/96 an estimated 129,600 trout were caught and kept, or 217 tonnes of fish. Five years on we need to update this figure so we can be confident the harvest remains at a sustainable level.

As a consequence, during the 2000/01 fishing season, we will be repeating the harvest survey. The information gathered in the survey provides accurate information about the level of angler effort, catch and harvest from Lake Taupo and its tributaries throughout the fishing season.

We will be using a methodology very similar to the previous surveys undertaken in 1990/91 and 1995/96. It is a very comprehensive study, which places a lot of pressure on our financial and staff resources. Such is the value we put on this information. The survey involves estimating the harvest from four distinct parts of the Taupo fishery:

* the lake (trolling and harling)
* the Tongariro River
* the Tauranga-Taupo River
* the lake edge and at river mouths.

Estimating the harvest from the river mouth and lake edge and from the Tauranga-Taupo River is a new addition to the survey and will improve the accuracy of the final harvest estimate. The harvest in each of the areas is established by dividing the fishing season into groups of similar days and then sampling a certain number of days in each of these groups. For example, "Christmas and New Year holidays", which have a very high angling effort, are grouped together and sampled separately from "early winter weekdays". There are 11 such groups or strata and from each of these we have randomly selected four days to sample. By sampling in this manner, we are able to calculate a final harvest estimate which has much tighter confidence limits than if we just picked a

Fishery staff Rob McLay (pilot) and Rob Hood discuss the course for the next flight

Above: Its slow speed and manoeuvrability make the Piper Super Cub ideal for counting anglers fishing the rivers this winter

Below: Interviewer Rowena Cudby (right) records the day's catch while local fishing guide Peter Church (left) looks on. The red sticker on the back of Peter's boat allows us to identify fishing guides from the air

number of days at random during the year. During the 96 days to be sampled, our staff and contractors will be interviewing anglers at boat ramps, rivers and at river mouths. These interviews will provide an estimate of the daily catch rate. While the interviews are occurring, an aerial count of the number of anglers on the lake and rivers will also be done to establish the amount of angling effort. By multiplying the amount of angling effort by the average catch rate, we are able to establish the total number of fish caught during the day.

The survey runs from 1 July 2000 to 30 June 2001. If you are approached during the survey, we hope you will take the opportunity to participate and spare a few minutes of your time to talk to the interviewer. Part of the survey also involves calculating the catch of guided anglers and regular contact with local boat fishing guides. These guides have been briefed recently and their response has been very positive and all are more than willing to assist us in any way possible. The co-operation of all fishery users is important if we are to complete the survey successfully and gain the information so essential to managing the fishery in a sustainable way.

Access to the Tongariro River through the Tongariro National Trout Centre

Part of the plan to re-jig the Tongariro National Trout Centre included re-routing the anglers' access from the service entrance (the southern entrance) to the northern end of the public car park (see issues 30 and 31 of *Target Taupo*).

The aim was to continue to provide angling access to the river outside of open hours but to avoid anglers walking around the staff living quarters and work area.

Removal of two of the three houses fronting State Highway One earlier this year provided the opportunity and the location. We opened up an old access track into the grounds from the back of the northernmost house, put in a crossing at the downstream end of the fish trap and steps up the bank to the Tongariro National Trout Centre river walk. Anglers now have easy access to the Tongariro River pools from the Cattle Rustlers up along the bank to the Silly Pool.

The house site provides a good car park, visible to passing traffic, and it is signposted at the roadside. We will seal this area as soon as temperatures warm up. In the meantime we have put wooden bollards around the park to discourage parking on the grassy areas which were quickly becoming muddy.

A Very Good Summer on Lake Taupo

In the last issue of *Target Taupo* we presented the interim results of the lake fishing survey over summer. Since then the survey has been completed. In summary, last summer was very good, in terms of both the number and size of trout caught. The month of March continued the trend reported in the previous article. The catch rate was 0.27 fish per hour (one fish every three and a half hours) and the average weight of those trout caught was the highest all summer at 1.99kg. Table 1 shows the average size of trout between October and March, while table 2 presents the average catch rate over the same period. The growth of trout over summer is obvious from the results shown in table 1. The average weight of 1.53kg in October increased to 1.99kg in March. The main reason for this is that the majority of trout caught early in the season (September/October) are either young small fish or older recovering fish that have returned to the lake after spawning. From October onwards, growing conditions in the lake improve and the trout are able to grow and gain condition very rapidly. The trout caught in March therefore represent a population that has been feeding all summer and are in prime condition, ready to spawn.

The catch rates shown in table 2 highlight the success of anglers on the lake over summer. The lowest catch rate recorded was 0.27 fish per hour in March, which is an excellent catch rate at this time of year when typically the fishing gets hard as the fish move deeper out of reach. The catch rates in the other months, such as November and February, were very good indeed. No wonder winter anglers are having such a good time on the rivers this year.

Table 1: Average length and weight of trout kept by anglers - October 1999 to March 2000

	October	November	December	January	February	March
Weight (kg)	1.53	1.41	1.52	1.66	1.73	1.99
Length (mm)	507	502	506	514	508	533

Table 2: The average catch rate (catch per unit of effort, CPUE) of lake anglers from November 1999 to March 2000

	November	December	January	February	March	Overall
CPUE	0.46	0.32	0.22	0.40	0.27	0.32

Fishing on Lake Taupo was fun this summer

Taupo Field & Stream Directory

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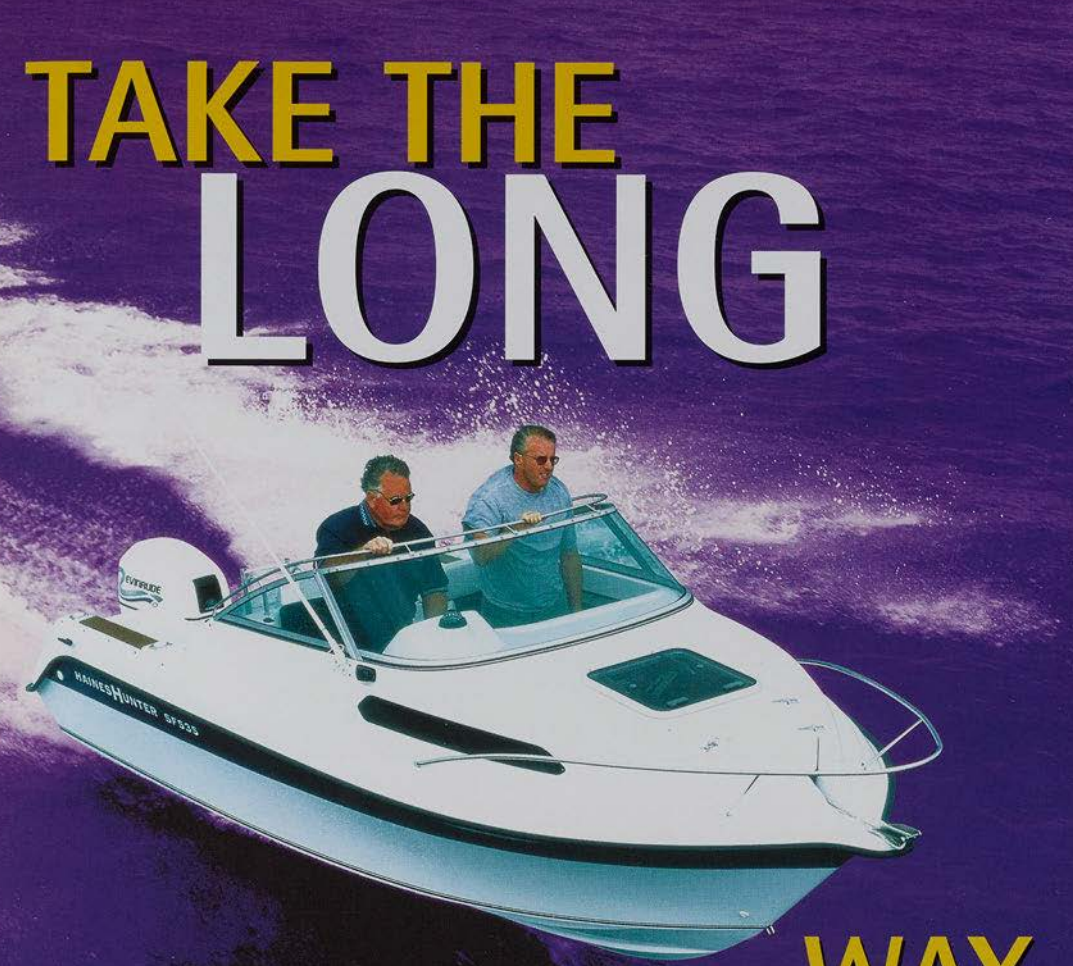

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