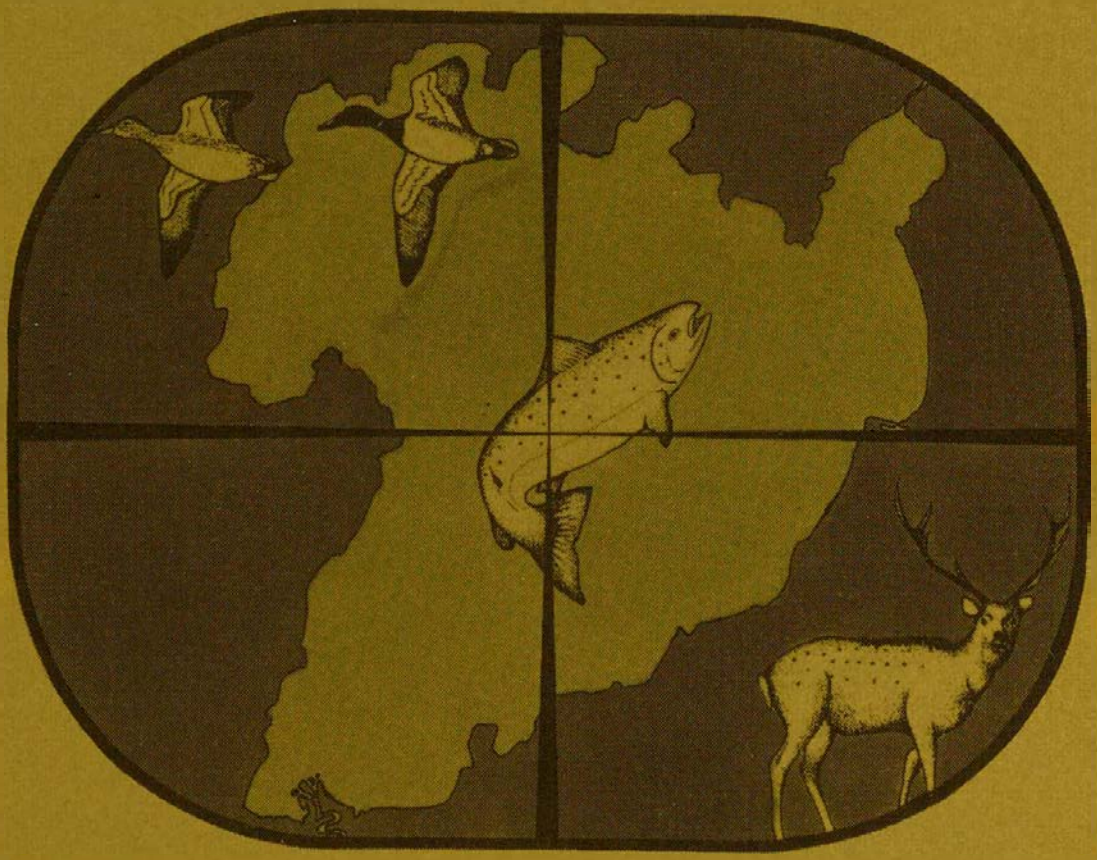
NOVEMBER 1994
ISSUE 17

TARGET TAUPO

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



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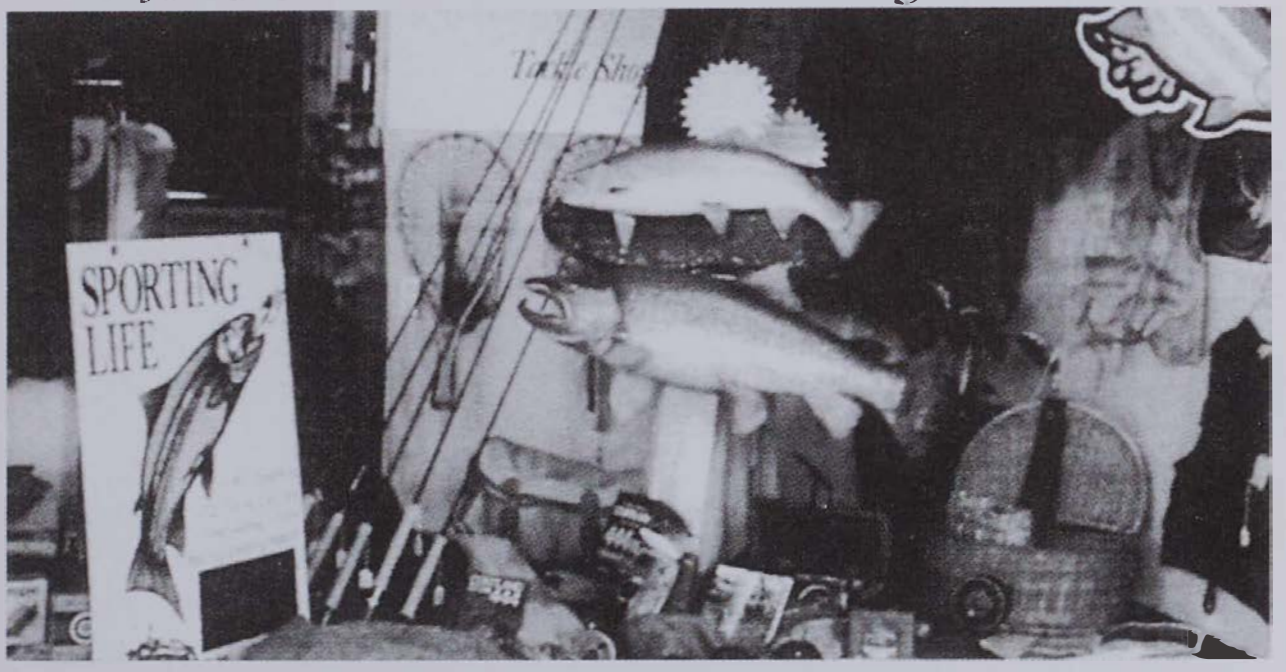

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TARGET TAUPO

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

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

Please contact compliance staff
ANYTIME

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or Conservancy Duty Officer *Phone* 386 8607 after hours.

LAKE OTAMANGAKAU UPDATE

Lake Otamangakau is under increasing pressure from growing numbers of anglers. In order to manage the lake as a trophy fishery in the face of this pressure, several different studies are being undertaken to determine key features that influence the trout populations. Featured later in this issue is a summary of the first winter's trapping of the spawning run. This ongoing project will not only provide valuable information on the size of the trout population in future years but also on changes in its structure. Changes might reflect the impact of overharvest - for example, fewer and fewer large fish in the run - but can also be used to assess the effectiveness of regulation changes.

As part of the trapping several large brown and rainbow trout were stripped and their eggs raised in the hatchery. These offspring are growing quickly and when they are approximately 50 to 60 mm long next autumn 500 of each will be finclipped and released back into the lake. Recapture of these fish in subsequent years by anglers and when they pass through the Te Whaiau trap will provide valuable information on growth rates and survival. If you catch a fish missing a whole left pelvic fin please drop us details of its length and when and where you caught it. Comparison of clipped and unmarked fish of similar ages will also provide an estimate of the level of recruitment into the fishery.

All of the fish which passed through the trap were finclipped by removing half the right pectoral fin. This fin will quickly regrow over the next few months but will leave a distinct scar line where it was cut. It will be interesting to see what proportion of the angler's catch these fish make up. If virtually all of the large mature fish which have spawned this winter are marked we can be confident that the run through the trap is a good measure of the adult population in the lake. From a monitoring perspective such a situation would be ideal.

This summer our staff will spend a lot of time on the lake inspecting anglers' catches. Often they will ask if they can take scale samples and the head of any trout you have kept. If it is a trophy fish you want to put on the wall don't feel bad about refusing. This is part of a study investigating ways of aging trout. In the past scales have been used but there is some doubt over just what the scales were telling us. In the head of the trout, however, is a tiny bone called the otolith. When this is looked at in cross-section it consists of a series of daily growth rings, much like the rings of a tree. This is a very

accurate way of aging the fish but the process is extremely time-consuming. It may be possible, however, to relate what the otoliths are telling us with particular patterns on the scales and so to have more confidence in our scale readings. Recent work in the South Island also suggests that by looking at differences in the spacing of the otolith rings it is possible to work out when the trout entered the lake and what size it was. This could provide important clues as to what the sources of recruitment are for Lake Otamangakau.

Another aspect we are looking at this summer is the harvest taken by anglers. This involves estimating the number of anglers using the fishery along with measuring their angling success. As part of inspecting your catch it is likely our officers may ask a few questions about how long you have been fishing.

On a weekly basis over summer we will continue to measure water temperature and dissolved oxygen levels through the water column at five different sites around the lake to gain an appreciation of how different lake levels and flow regimes impact on the water quality.

Anglers arriving at either of the boat ramps this season will notice new information and direction signs. The information signs provide basic information about the fishery, how to release trout correctly and such things as fires and access. There are also details about what information to record for a tagged or clipped fish and how to contact the Department. The signs are aimed primarily at the first time visitor but it would pay everyone to read them.

DOC Landscape Architect Herwi Scheltus puts the finishing touches to a Lake Otamangakau interpretation sign. Looking on, from right, are Fisheries staff David Howarth, Gordon McKenzie and Adrian (Bonzo) Ngamotu.

In association with these signs are new marker poles on either side of each ramp. It is deliberately very hard to miss seeing these and their message that boat speeds are restricted to not more than 5 knots within 200 metres of the shore. There is only a very small area in the middle of the lake that falls outside this restriction. The restriction is nothing new but what is new is that we will be actively enforcing it. As discussed in issue 16 of Target Taupo, excessive boat speeds on such a small lake have a serious impact both on the fishing and on angler safety. If you are up on the plane you are moving too fast! ■

WINTER HUNTING SUMMARY

Wet! is perhaps the only way to describe the hunting conditions experienced in the central North Island this winter. Weather records show an average 20 rain days a month for the whole of the June to September period.

Just on 1 300 hunters obtained permits for the period, down a bit on average. Of 350 returns received by 27 October, 32% were returned *"No hunting done"*, an indication of how persistent rain can influence hunting patterns. A total of 80 hunters (25% of returns) reported killing at least one animal (deer, pig or goat), seven red deer and two pigs from the Rangataua/Ohakune area being the best single effort for the winter. Five sika from the Waipakihi Valley in September was the best single recorded effort in the Kaimanawas.

As is often the case in winter, roadend areas received the bulk of the hunting effort. Kiko Road, Clements Road and Rangataua Forest were some of the more popular destinations. Regular hunters who know their blocks well took the majority of the winter harvest.

The data received from the winter period is summarised in table 1, overleaf. This data shows the lowest number of recorded hunting days for the winter period in five years. The totals corrected per 1 000 hunting days show the average return for sika hunters this winter was the worst recorded over the last five years. Both of these figures are likely to be related to the weather. Goat hunting continues to be comparatively slow as a result of control operations that have drastically reduced numbers in many areas since the early 1990s, although staff are starting to see a few returning in some areas.

TABLE 1 *Tongariro/Taupo Conservancy Recreational Hunting Summary June - September 1994*

Area	Block	Days Hunted	Encounters				Kills				Kills/ Day
			Sika	Red	Pig	Goat	Sika	Red	Pig	Goat	
Kaimanawa Recreational Hunting Area	All	297.0	170	6			35	4			
Kaimanawa Forest Park (excluding RHA)	All	202.0	114	34			23	12			
Tongariro National Park	All	99.5	6	47	3			20	2		
Tongariro Forest	All	37.0		27		15		11		5	
Erua Forest	All	33.0		3		27		3	2	11	
Rangitaiki Forest	All	18.0	7	1				5	1		
Lakeshore reserves*	All										
Unspecified returns	Whole conservancy	47.0					2	3		1	
Totals	Whole conservancy										
	1994	756.0					69	57	2	17	
	1993	1006.0					101	74	15	52	
	1992	887.0					93	59	6	18	
	1991	1458.0					158	127	16	156	
	1990	1650.0					169	175	14	229	
Hunting period totals corrected per 1000 days hunted 1990-1994	1994	1000					90	78	3	23	
	1993	1000					100	74	15	51	
	1992	1000					105	67	7	21	
	1991	1000					109	88	11	107	
	1990	1000					102	106	9	139	

*No data received

Winners of the diary prize draw for the winter period were:

AIR TRANSPORT WITH LAKELAND HELICOPTERS: *P M Strange, Taihape*

AIR TRANSPORT WITH AIR CHARTER TAUPO: *R J Harrison, Waiouru*

AMMO FROM NZ AMMUNITION CO LTD: *Brad Russell, Taupo*

SPORTS GOODS FROM THE FLY AND GUN , TAUPO: *Ross Tindale, Glenfield*

ACCOMMODATION/CAR SECURITY FROM SIKA LODGE: *Dave Mingins, Rotorua.*

Ten hunters also receive a complimentary copy of this issue of Target Taupo.

For those hunters awaiting results of jaw analysis, apologies. Please bear with us. ■

THE HUMBLE SPIKER:
Meat for the Freezer or Trophy of the Future?

A "knobby" stares inquisitively from the manuka: meat for the freezer or trophy of the future? [Photo courtesy of Rifleman Publications]

Some 2 000 diaries from hunters who utilise land administered by the Department of Conservation in the central North Island are received and processed each year. These hunting diaries document some 5 000 to 8 000 days of hunting annually. Many of the hunters who provide this information struggle to shoot a deer, while a small percentage do very well. Some, out of genuine concern for their hunting resources, practise a stag-only harvest philosophy, selectively harvesting the deer they encounter in the hills. Often they will pass up a fat mature hind in one gullyhead only to flatten a lanky, lean, adolescent spiker for the freezer in the next. This article discusses the subject of such self-imposed hunting ethics and their implications for the management of deer on conservation lands in New Zealand.

While stag-only harvesting is a herd management philosophy that can provide benefits where deer numbers are very low, the reality is that it is a very dangerous management strategy to employ for many of our deer herds, and one that is unlikely to see the return of the world-class trophies many hunters only read and dream about today.

Many of the natural forest habitats occupied by deer in New Zealand have been drastically modified over the past 100 years by heavy browsing pressure. Most of the highly palatable and nutritious plants are now only a minor component of these forests, replaced in the browse range by plants that have become more competitive because they are less palatable or better able to cope with deer browse. For this reason, the number of deer these forests can support is considerably lower than the numbers that could be supported by the forests that existed at the turn of the century. This situation is further compounded by the fact that it does not take large numbers of deer to maintain these changes indefinitely. This concept, often called *carrying capacity*, is an important one to understand in the context of deer management and, more importantly, in the context of habitat management.

For a deer population that is at a level near to the carrying capacity of its habitat, the greater the ratio of females to males in the population, the greater the tendency for the population to move towards a situation where its numbers exceed the carrying capacity of the habitat. This is because the more females there are, the greater the reproductive potential of the herd. If, with this strong reproductive potential, harvests are insufficient, the population will increase to a point where the abundance of quality nutrition becomes a limiting factor, with a resultant reduction in herd quality and damage to the habitat. In extreme cases disease or severe climatic conditions can cause a sudden die-off in a herd in this situation.

From both an ecological and deer management perspective, this scenario is a very undesirable situation which could take many decades to repair. It may be irreparable. Some would call this the result of unsustainable land use.

If, in this situation, the harvests that are taken focus on males, the chances of a stag surviving to full maturity also decline. This results in a shift in the age structure of the male population towards younger animals. The few stags that are lucky or cunning enough to survive for seven or eight years find it hard to get the quality nutrition required for trophy antler production and trophy quality crashes.

A greater hind to stag ratio also reduces competition between males for mates during the rut which in turn results in poorer rutting activity. This may affect conception rates although the availability of good quality nutrition has a major

influence on a hind's potential to come into season so conception rates will decline naturally in overpopulated areas anyway.

These scenarios take the philosophy of stag-only harvesting to the extreme but they serve as a useful illustration of the potentially dangerous road this herd management strategy follows if populations are allowed to expand too much in already depleted habitat.

The natural habitats in which deer live in New Zealand are considered by many to be very special. There is little doubt that browsing pressure by deer over many decades now has changed most of these dramatically. It is not intended here to debate the pros and cons of these changes; whether they have been detrimental or beneficial appears to be a matter of personal opinion. Nevertheless, the political implications of these changes are significant because New Zealand is a signatory to the International Convention on Biodiversity. This means the Government has an international obligation to protect the diversity of life in our natural environment, including the floristic diversity of our forests. It is this obligation that currently drives the official attitudes towards deer and other "wild animals". The legislation, therefore,

considers such animals as largely undesirable. Clearly this goes against the wishes of those who utilise this nation's deer resources for recreation, as a source of income, as a means of supplementing the modern supermarket diet or just as the prime reason for going into and enjoying the country's forests. Hence the current conflict between hunting interests and conservation groups.

Those who wish to see deer have improved "status", however, need to recognise the negative impacts that deer can have on our natural habitats, just as those who find the thought of introduced mammals in our forests intolerable need to recognise the benefits that these animals provide socially and economically to a great many New Zealanders. The pragmatists will realise that very few, if any, of our introduced mammals will ever be completely eradicated so common ground must be found between these opposing views if progress is to be made.

Back to the humble spiker. He is the key to this most complex and polarised issue.

There are those hunters who selectively harvest the deer they encounter for a variety of reasons, some of which include the protection of the hunting resource. There are others who have a more ad hoc exploitative attitude towards deer. They will shoot anything that will stand around long enough. The combined result of these hunting attitudes is that the most vulnerable sector of the herd provides the bulk of the harvest. More often than not this leaves the unfortunate spiker in the firing line - literally !

Herd monitoring in the central North Island over the past ten years has clearly shown that young stags (two years or less) make up a significant proportion (27%) of the harvest each year. In comparison, young hinds two years or less make up 16% of the harvest - a situation that leads towards the scenarios described earlier, especially in areas where the population is tending towards the carrying capacity of the habitat.

If harvest was consciously targeted towards the female sector instead of (both consciously and unconsciously) towards the young male sector of the herd, not only would more stags reach maturity, but populations could be more easily controlled, for it is the number of breeding hinds that determine a herd's reproductive potential and hence its ability to sustain harvest or to expand. To control the breeding potential of a deer herd is to control that deer herd. Not until a herd is controlled can it be manipulated to achieve some management objective, whether that be deer production, trophy production or improvements in habitat condition. Neither "deer haters" nor "deer lovers" can argue against this point.

If young stags were afforded some protection (whether it be achieved legislatively or ethically) until such time as they were beginning to show their potential as trophy animals - usually about three years old - a significant proportion of all male deer would reach a stage where they were fully mature before they were harvested. This would greatly improve the potential for trophy production in any herd. If harvest continued to focus on the female sector, herd numbers could be more easily adjusted to achieve desirable habitat outcomes (e.g., improved forest and hence better herd condition) while maintaining a quality herd which is dominated by males, many of them mature. The bulk of the feed available to the herd in the particular forest it occupies would then go into the production of trophy stags rather than the production of deer per se. After a few years under such a management regime a sizeable autumn harvest of quality mature stags would be available. These stags would rut intensely due to a higher stag to hind ratio which would create fierce competition for mates. Very few hinds would miss servicing under such a scenario and, if habitat quality was maintained, production could be maximised. This production would also be dominated by the strongest of many males, enhancing the gene pool of the herd.

This is the management strategy that is now becoming widely accepted in the United States. They call it simply "Quality Deer Management".

The mechanics of such a management regime in New Zealand could operate in exactly the same way; a deer is a deer regardless of which country it lives in or how it got there. However, it is difficult to predict how it might be initiated and implemented or even if it is possible in the current eco-political climate. Certainly a change in attitude towards the harvesting of young stags (and breeding hinds for that matter) would require hunters as a group to exercise considerable judgement, just as the active management of deer would require conservation groups to exercise a certain degree of open-mindedness and tolerance.

But there are longer-term benefits for both hunting and forest conservation in achieving herd sex ratios that favour males. These may include smaller herds, but these herds would be of high quality and would provide good numbers of trophy stags in healthier habitat.

The present situation where herd sex ratios invariably favour females has, in many parts of the central North Island, resulted in herds which have strong reproductive capabilities and in which trophy stags occur in relatively low numbers. When harvest does not keep on top of high production, animal quality declines as the habitat comes under severe browse pressure. This situation, rightly or wrongly, provides part of the justification for current eco-

political attitudes which are reflected in the legislative provisions that focus on the elimination of deer.

Protecting the hunting resource in many parts of New Zealand, particularly in the central North Island, is not about trying to increase the reproductive potential of the herds. They are doing more than well enough! If you struggle to shoot a deer you need to sharpen your hunting skills or try going a little further afield. There are plenty of deer out there.

The New Zealand hunting resource does, however, require intensive management to enhance trophy potential and to maintain herd quality. Herd quality is a reflection of habitat quality and there lies the common ground between the "deer lovers" and the "deer haters".

The development of high quality, trophy deer herds requires the nurturing of quality habitat and a change in hunter attitudes is a key element in achieving this. A change that will not only see the harvesting of breeding hinds become an integral part of herd (and habitat) management, but one that will also allow the humble spiker to survive the extra five or six years needed to become the world class trophy of tomorrow. Food for thought!..... ■

WINTER 1994
Big Fish and Big Flows

"Another front will move over the central North Island tonight bringing heavy rain and snow to low levels." Such forecasts have been the norm this winter and we have lost count of how many freshes have resulted. In one recent spell, six different freshes occurred in the Whitikau stream over a seven-day period. Every one is another long night for the trap operators.

Such a winter has really tested the operation of the Whitikau trap. In high flows the barrier must be cleared of debris continually and in floods the barrier must be let down to avoid destruction. In terms of this year's results it has been down too often to be confident in our estimate of the total run. We know from the numbers of unmarked fish above the trap that we missed many fish in a spell of several weeks in late August when a succession of freshes damaged the trap and continuing high flows prevented repairs.

In the long term, however, this winter has been of great benefit. Problems with trap operation have only become evident when the trap has been subject to long periods of constantly fluctuating river levels. Under more normal winter flows these problems are unlikely to have showed up. It is obviously preferable to sort them out in the beginning than to lose a year's data several years on in the middle of our research and monitoring programmes. Regular freshes every few days have allowed us to make changes, test them and then make more changes so that finally we are able to hold the trap through most freshes and are confident of trapping perhaps 80 to 90% of the total run. That part of the run missed during major floods can be estimated by retrapping the kelts as they return downstream and comparing the proportion of marked and unmarked fish. For example, if in August we trap and clip 2 000 upstream migrants which, when they return as kelts, occur in a ratio of 2:1 with unclipped fish, we can estimate that the total August run was 3 000 fish. Despite the weather problems this season, however, staff still put through 5 000 fish to the end of September.

In the Tongariro flows two or three times greater than normal have made operation of the lower Tongariro trap impossible. But all was not lost. For a period of five days during settled weather in mid-July we installed and operated the trap, tagging 50 fish. This success was pleasing given that, at the same time, an estimated 1 000 fish lay below the Whitikau trap showing no

desire to move at all. We waited in anticipation of the very high barometer finally falling and hopefully sending another run into the river. Finally, on a Sunday afternoon as a small front arrived, the barometer fell. All of a sudden the fish in the Whitikau started to pour through the trap in their hundreds before the rapidly rising water level pushed the barrier down. In the lower Tongariro the decision was reluctantly made to pull the screens out at 9 p.m. despite clearing skies. Shortly afterwards the river started to rise and by midnight was flowing around the hut. As many of you are aware, the river has rarely dropped back to anywhere near its normal level since.

Kelt drives involve herding fish which have spawned down to the trap barrier where they are netted, clipped and lifted over.

All of the tagged fish subsequently recovered from this small pulse through the Whitikau trap took at least 30 to 40 days to cover the distance. Although it would have been preferable to operate the trap throughout the winter as planned we are at least confident that under normal flow conditions we can trap fish in the lower river. Next year we will follow fish through the river using radio tagging equipment provided by NIWA for their research project. As part of this we will tag additional fish to answer our questions. The advantage of using radio tags is that far fewer fish need to be tagged to provide the same amount of information. We are already able to trap more than enough trout for this approach. The very high capital cost of the equipment initially precluded its use but has now been overcome by this joint approach.

The unusually high flows in the Tongariro are a consequence of the very wet winter. Everywhere from the lower Waikato in the north to Lake Moawhango in the south has run at very high levels for long periods. On the Tongariro this has been exaggerated by maintenance occurring at the Tokaanu power

station which prevented a full draw-off of water from Lake Rotoaira. As a consequence Lake Rotoaira has remained full for extended periods, restricting the amount of water ECNZ can divert from the Tongariro.

The high flows in the Tongariro evoked some interesting responses from anglers. Since late July the river has flowed for long periods much as it would if no hydro scheme existed. For many anglers this was the first opportunity to fish the river in these sort of flows and not everyone enjoyed it. The Tongariro is a very different river under these conditions and those anglers who adapted their methods enjoyed some wonderful fishing. Fish were able to hold in water where previously they had been too exposed. Anglers who targeted these areas had very good fishing while others plugged away trying to pull fish from old hot spots where they now struggled to get their gear near the bottom. The reluctance of some anglers to change their approach was well demonstrated by a recent incident at the Whitikau pool where an angler persisted in trying to wade out to where people stood in previous years. When it was suggested that he fish at his feet he replied that he had been fishing the pool for 20 years and knew how to do it. With double the flow, though, the Whitikau isn't the same pool he has fished all those years. He caught no fish and risked a dunking for his trouble.

Conservation Officer Bonzo Ngamotu clears log debris off the lower Tongariro trap following floods in July.

Early in the season, particularly in late June and early July when more normal flow conditions prevailed, the fishing was excellent. A feature was the unusually large average size of the fish. In past years fish kept by anglers have averaged between 1.8 and 1.95 kg and 520 and 545 mm in length. This year fish through the Whitikau trap averaged 550 mm and over 2 kg in weight. This average is for all the fish through the trap including those smaller fish many anglers would not usually keep. We received numerous comments from anglers about how difficult it was to land some of the fish hooked and the frequent occurrence of fish passing through the trap with flies in their mouths bore testimony to this. It certainly didn't get any easier to land these fish later in the season when there was more water in the river..

Of the other tributaries, the upper Hinemaiaia had its best season for many years, the Waitahanui fished well and the Tauranga-Taupo had yet another good season. The Waimarino and Waiotaka streams proved more difficult to fish but regular anglers familiar with each river also did well.

The excellent spawning runs were reflected in our regular counts of fish in several tributaries during the winter.

These counts are undertaken monthly during the winter on selected stretches of the Whitikau, Hinemaiaia, Waimarino and Waiotaka streams. Numbers usually peak in August and counts for this month over recent years are summarised below:

Year	Whitikau	Waimarino	Waiotaka(1)	Hinemaiaia
1990				567
1991	977	615		239
1992	1426			564
1993	1230(2)	758	534	485
1994	2120	684	839	755

1 These counts are undertaken for us by members of the local chapter of Trout Unlimited.

2 In this instance numbers peaked in September 1993 at 2 287. The September 1994 total was still 2 047 which compares favourably given that all the freshes this year pushed out hundreds of kelts which would normally have been counted.

Perhaps not surprising given several good fishing years and an improving economy is that the numbers of anglers on the Taupo rivers are once again increasing. For the first time since the late 1980s crowding and angler behaviour were the key issues for many of the anglers using the fishery this winter. At present our approach is to leave this issue up to you, the anglers, to resolve amongst yourselves. We can provide guidance on behaviour and etiquette which, when followed in a friendly, relaxed manner, work well. There are also, however, those ignorant anglers who work on the theory that whoever makes the biggest threats will carry the day. Unfortunately there is nothing the average angler seeking relaxation on the river can do about such people except move on elsewhere. The other option is to limit numbers on the river. Logistically this is very difficult to do in a fair way. It also makes for an interesting philosophical debate.

The large number of freshes may or may not have affected spawning success this year. Only a few floods have been large enough to move the riverbed and the bulk of spawning occurred subsequent to these freshes. Fry numbers in the shallows in late November and December will provide a good indication of any impact. One advantage this fishery has is that a number of spawning streams such as the Waitahanui, Tokaanu and many of the smaller streams are spring fed and so recruitment from these will be less affected.

Licence sales are significantly higher (up 20% to date) which is in line with our own observations of angler numbers this winter. Perhaps we are once again looking at the first hints of a potential problem caused by an ever increasing harvest coinciding with a year or two of poor production. Unlike the late 1980s, though, we know what to look for this time.

Prospects on the lake this summer appear excellent. A very strong young year class is appearing in anglers' bags along with large numbers of older fish. These numbers will increase further given that a lot of the spawning population is likely to be still up the rivers. One advantage of all the freshes is that these should have washed many of the kelts back into the lake a lot earlier than in recent years and, with several months to put on condition, these fish will contribute to some entertaining harling this spring. ■

LAKE OTAMANGAKAU
Winter Trapping 1994

The Otamangakau fishery was established in 1971 following the creation of the lake as part of the western diversion of the Tongariro Power Development Scheme. It receives diverted water from the headwaters of the Whanganui and Whakapapa rivers by a system of intakes and tunnels. The lake also receives natural inflows from several small tributaries, including the Te Whaiau Stream, which is recognised as the most important spawning tributary. The lake waters are mixed in the main body and then diverted via the Wairehu Canal to Lake Rotoaira. Lake levels are able to be altered by settings of the Wairehu Canal gates.

When Lake Otamangakau was formed trout populations already existed in the Whanganui and Whakapapa rivers. These fish and subsequent production in the headwaters of juveniles that were able to enter the lake via the diversion structures formed the basis of the fishery. The population was further augmented by releases (200-500 annually) of tagged fish from the Tongariro hatchery (National Trout Centre) as a means of monitoring growth and harvest rates in the new fishery.

In its early days, the Otamangakau fishery contained large numbers of relatively small brown and rainbow trout and supported high catch rates. As weed beds and associated aquatic insect populations became established, trout growth increased. During the last 10 years the capture of fish in excess of 4.5kg (10lb) has occurred regularly. The lake currently enjoys worldwide fame as a wild trophy fishery and anglers from around the world as well as New Zealand visit it to try their luck.

This fame has come at a price. The reputation of the fishery has attracted increased numbers of anglers. This increased pressure has caused the fishery managers to initiate a programme of research to establish basic data about the status of the fishery. One facet of the research was the establishment of a permanent trapping facility in the main spawning tributary, the Te Whaiau Stream.

The trap is a conventional design and incorporates an upstream migrants' pen and a downstream (or kelt) migrant pen. The trap was operated for the first time this year, beginning on 20 April and finishing on 16 August.

Table 2, below, describes all the trout trapped at Lake Otamangakau in 1994.

Month	R/Bow Female	R/Bow Male	Brown Female	Brown Male	Total
20-30 April	4	2	25	17	48
May	43	29	254	131	457
June	100	50	102	15	267
July	104	49	2	0	155
1-16 August	14	3	0	0	17
Total	**265**	**133**	**383**	**163**	**944**
Plus unclipped fish returning downstream	13	2	12	43	70
Grand Total	**278**	**135**	**395**	**206**	**1014**

TABLE 2

Length

Of interest to both managers and anglers is the size (length) of the fish trapped. Figure 1, opposite, shows the length frequency of all trout trapped at Lake Otamangakau in 1994. The graph illustrates the percentage of fish that fall into each length category.

The overall shape of the graph gives an insight into the age of the fish moving through the trap. Generally, older fish are longer, so a fishery dominated by long fish may be dominated by old fish. Changes in the shape of the overall graph in future years can give us an idea of how harvest is affecting the fish stocks. If harvest is detrimentally impacting on the fishery the population will tend to shift towards young (shorter) fish. This is because the likelihood of a fish remaining uncaught to an old age decreases as harvest pressure increases.

The rainbows, at 597 mm, are on average bigger than the brown trout at 579 mm. Rainbow females averaged 600 mm, rainbow males 592 mm, brown males 598 mm and brown females 572 mm.

Table 3, opposite, summarises the length data.

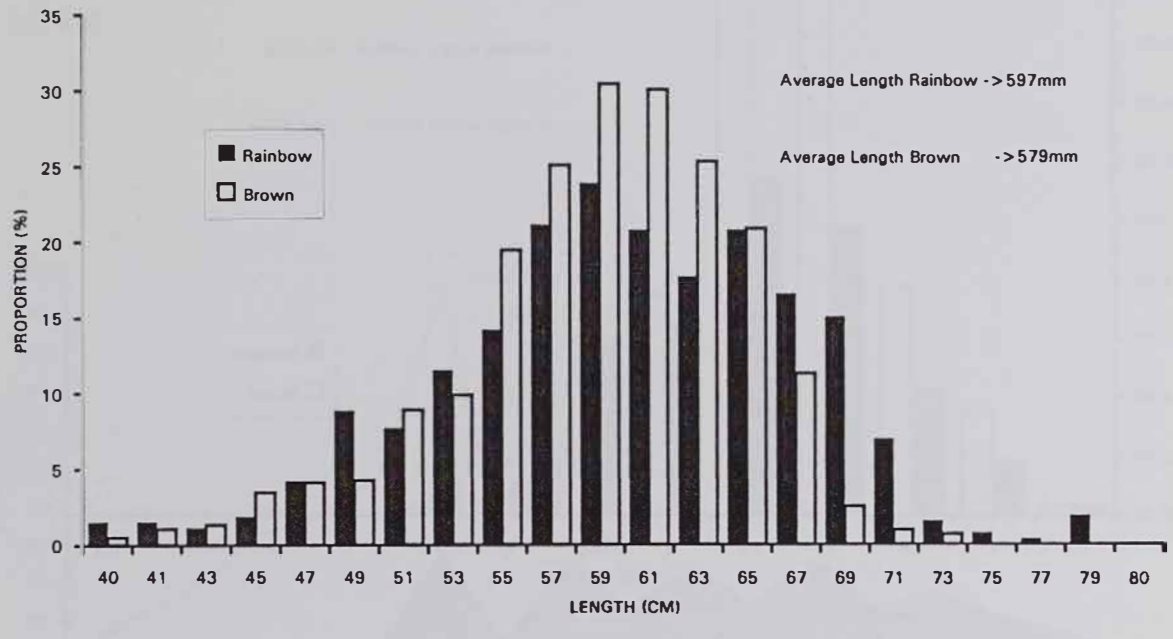

FIGURE 1 *Length frequency of trout trapped at Lake Otamangakau, 1994.*

Average Rainbow Female 600 Average Rainbow Male 592	Average Rainbow 597	Average Female 586
Average Brown Female 572 Average Brown Male 598	Average Brown 579	Average Male 595

TABLE 3

Weight

Also of interest and closely tied to length is weight. The runs were dominated by a large number of very well-conditioned fish in the 2 to 2.5 kg range but there were only a few very big fish over 4.5 kg (10 lb). In all, 15 "double-figure" rainbows were captured, including fish of 5.9 kg (13 lb), 5.95 kg (13.1 lb) and 6.10 kg (13.4 lb). Only two browns, both 4.5 kg, reached this mark. Figure 2 (overleaf) shows the relative proportion (percent) of the run that fell into each size category.

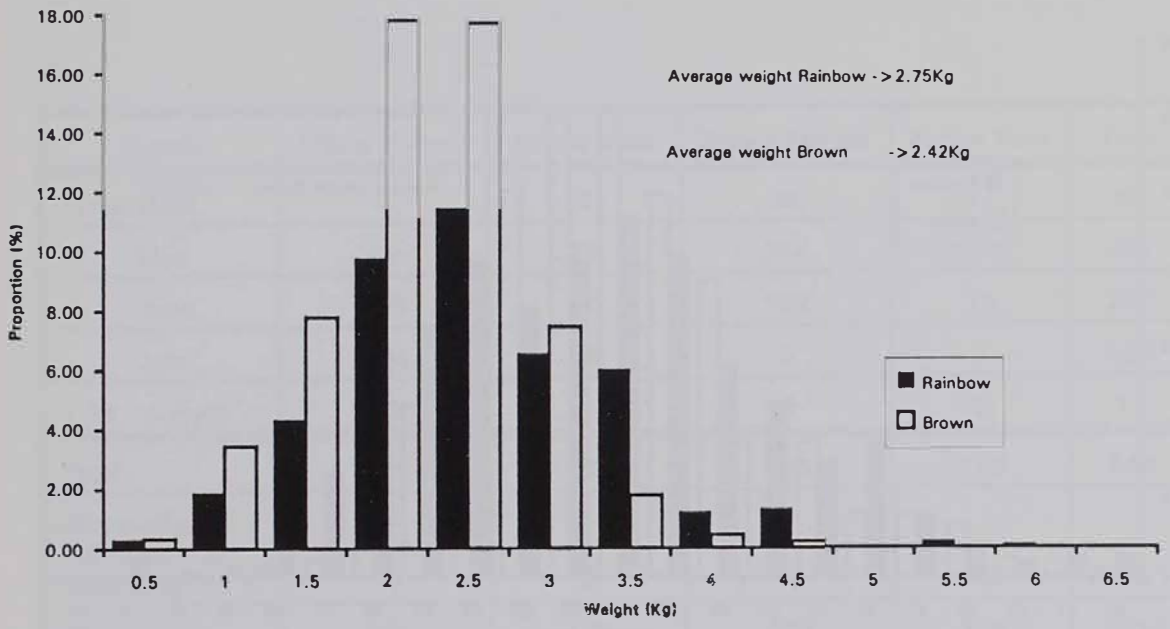

FIGURE 2 *Weight frequency of trout trapped at Lake Otamangakau, 1994.*

It is evident that the browns were more abundant in the 1.5 to 2.5 kg range but that the heavier fish tended to be rainbows. Rainbow females were on average the heaviest (2.81 kg), followed by rainbow and brown males (2.62 kg), and then brown females (2.34 kg).

If we look at all the fish over 4 kg in weight there were 32 of these in the total run, i.e., 3% of the run. Sixty-five per cent were females and of these 81% were rainbows. Some big fish may have attempted to migrate up the Whakapapa and some of the lake's other tributaries but this still does not add up to a lot of big fish. The timing of the run of these big fish, with a clear peak in June, reinforces the need to close the fishery over the winter months to protect these larger spawner migrants as they move up the Te Whaiau Canal.

From this early information it would appear that your trophy fish is likely to be a rainbow female. This is a little biased as at this stage of the year the trout (especially females) are carrying extra weight because they are gravid (i.e., ready to spawn).

The Timing of the Runs

Figure 3 shows the weekly runs through both traps over the 1994 trapping period.

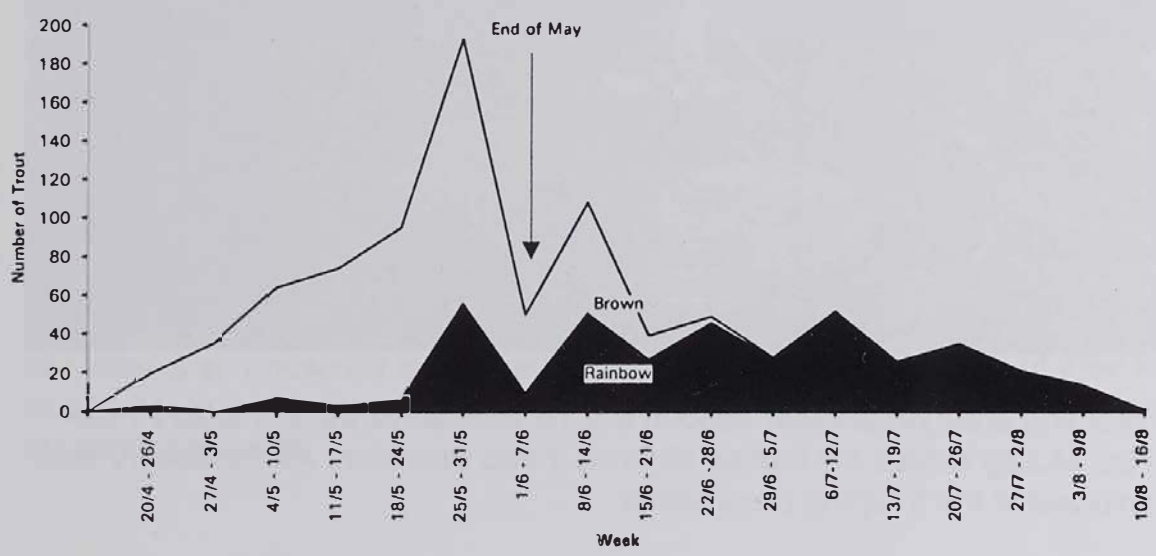

FIGURE 3 *Weekly runs through both traps at Lake Otamangakau, 1994.*

A close look shows that the runs are in two distinct parts. At the start of the trapping period the run was dominated by brown trout with few rainbows. The brown run peaked at the end of May, coinciding with the beginnings of the rainbow run, and had another, smaller, peak in early June. The rainbow trout run never really had a clear peak but rather maintained a steady presence from mid-May to shortly before the end of the trapping period.

In both species females outnumbered the males. This is a common feature of trout as the males are able to fertilise more than one female.

By the middle of August the runs of both species had dwindled away to nothing. At this stage the trap was dismantled until next season.

The morning after yet another flood in the Te Whaiau Stream. Fishery Planner Rob McLay relives his trainee days as a trap operator. All the fishery staff are involved in the trapping programme.

The Run Through Each Trap

A feature of the Lake Otamangakau trap is that it is constructed in two parts. One part traps the outfall of the Whanganui River while the other traps the Te Whaiau Stream proper (see Target Taupo, issue 16).

Over the period of the spawning run fish were caught in both traps. The results of this highlight some interesting features.

Trout of both species were notably more abundant in the Te Whaiau trap than the Whanganui. If it is assumed that the theory of homing to natal waters applies to the fish returning to the Whanganui then the fish that are appearing in the Whanganui trap are the progeny of spawners above the intake on the Whanganui River. Managers wonder how important these areas are to the lake fishery in terms of recruitment, i.e., the fry hatching above the intake are swept down the intake and into the lake. It would appear at this early stage that there may, in fact, be brown trout recruited from the headwaters of the Whanganui River. However, numbers of adult rainbows in the Whanganui

headwaters have declined to the point where juvenile recruitment from there is minimal. This decline is likely to have occurred because juvenile rainbow trout have more of a tendency to migrate downstream than brown trout and the Whanganui intake and diversion tunnel to Otamangakau acts as a one-way valve allowing young fish to pass downstream but preventing upstream migrants from recolonising the headwaters. If this tributary is important to the lake in terms of rainbow trout recruitment then fish passage past the intake may need to be investigated.

Summary

The 1 014 trout that were trapped in Lake Otamangakau are composed of a split of species and sex that is unusual. 57% of fish trapped were browns and 69% were female. This highlights that the fishery currently appears to be dominated by browns, which supports managers' perceptions that the previously dominant rainbow trout may not be coping as well as the brown trout population. Another question that requires investigation is why the proportion of males is so unusually low. Are they susceptible at some stage of their lives to a factor to which females are not? These puzzles should be unravelled as research proceeds. ■

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P708A	7MM-08 Remington loaded with 140 gr Nosler Partition
P7RD	7mm Remington Magnum loaded with Sierra 150gr B.T.S.P.
P308C	308 Winchester loaded with Sierra 165 gr B.T.S.P.
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A BIG FISH PROGRAMME FOR TAUPO?

Following the impact of the Eastern Fish and Game Council's 'Big Fish Programme' in some of the Rotorua lakes, we are sometimes criticised for not repeating the programme in Lake Taupo.

This programme involves annual releases of young trout at specific sites along the lake edges. These juveniles have been grown in the Ngongotaha hatchery from eggs stripped from carefully selected fish. Parent fish are chosen for their ability to grow to very large size which appears at least in part to be a genetic characteristic. Unlike their cousins these fish take an extra year to mature and therefore an extra year for growth to trophy proportions.

So could we repeat this at Taupo? There are two questions we need to answer: *"Is it a practical option for the Taupo fishery?"* and, equally as important, *"Is it an appropriate option for the Taupo fishery?"*

Is a Big Fish Programme a practical option for Lake Taupo?

Lake Taupo is only 100 kilometres or so from the various Rotorua lakes and, not surprisingly, many people think of the fisheries as being very similar. In reality, however, there are numerous physical and biological differences which make the trout fisheries and approaches to their management quite different.

Many of the Rotorua lakes have insufficient spawning streams to provide enough wild trout to utilise the lakes' carrying capacities and to support the level of harvest that Rotorua anglers have come to expect. In order to provide quality angling, hatchery-reared juveniles must be released each year to supplement the trout population. Although there is a large cost associated with rearing these fish there is a ready opportunity to manipulate the stock released and it allows the fishery to be very heavily utilised. Mature trophy-sized fish returning to the shore are unlikely to be able to spawn successfully anyway so the most practical use of them is to harvest them. Anglers are encouraged to target these fish and quite rightly keep them if they so wish.

In Taupo, huge recruitment is provided from natural spawning in the hundreds of kilometres of ideal spawning streams. It is essential that the lake harvest is managed to protect the viability of this spawning and to ensure that sufficient fish run the Taupo rivers to support the very important winter river angling.

Another distinction is the significant differences in the smelt populations of the two areas. Lake Taupo supports huge numbers of smelt, almost all of which, if they survive, mature at two years old and grow to 45 to 50 mm in length. In the Rotorua lakes, however, in some years in particular, many smelt grow much faster reaching up to 100 mm in length. So what does this difference mean?

In both areas the success of the trout populations is in part a consequence of feeding on smelt. Vast numbers of smelt provide an ideal food source for the rapidly growing trout and in Taupo, for example, make up 90% of the diet of young trout. But although the energy return from eating a single smelt is a lot higher than that from, say, a mayfly nymph, so too is the energy which must be expended to catch it. For smaller trout the benefit greatly outweighs the cost and the surplus is readily put into growth. As the fish grows, though, it takes more and more energy to move its larger bulk through the water, while the energy return from a single smelt still remains the same. Thus energetic advantage (growth rate) becomes less and less until all the energy gained from feeding on smelt is simply replacing that used to catch them.

In Lake Taupo this slowing in growth occurs when the trout is about 550 to 600 mm long. The very big fish which occur are inevitably 'koura munchers'. Why more trout do not switch to this food source, which is plentiful all over the lake bottom, is a puzzle.

In the Rotorua lakes the presence of significant populations of much larger smelt with correspondingly much higher energy returns per fish provides an opportunity for trout to grow larger. Trout can grow very large on very small items of food but what is important is the effort they must expend in order to feed. In Lakes Otamangakau and Aniwhenua huge trout grow on an invertebrate diet. The secret to growth in these lakes is that the invertebrates are so dense that enormous numbers can be eaten with very little effort.

Much is made of the need for trout to possess special genes to allow growth to large size. Obviously the trout must possess the potential to grow to trophy size but this in itself is not enough. The food source must be able to provide for this growth. The Rotorua smelt populations can generally accommodate this requirement whereas Taupo smelt generally cannot because of their smaller individual size.

Anglers often suggest that the Rotorua fish are unique, quite different to all other rainbows. In reality nearly all, if not all, rainbow trout in New Zealand are derived from the same source. Rainbow trout from the Auckland Acclimatisation Society were stocked in the Rotorua lakes prior to the turn of the century. Similarly Taupo was stocked initially by the Wellington Acclimatisation Society using rainbow trout from Auckland and the main releases were direct from the Auckland society's hatchery at Okoroire. Until about 10 years ago, annual restocking of the Rotorua lakes used trout reared from wild Taupo parents. Any genes present in one population are almost certainly present in another if they are derived from the same source. In terms of genetic divergence a separation of only 100 years is insignificant.

In a wild population all sorts of crosses will occur so that some fish will contain a particular gene and others will not. Environmental conditions determine just which genes may be expressed. For example, all sorts of physical variations can be seen amongst the thousands of mature fish passing through the Whitikau trap. Not at all uncommon are the classic "R" type males.

One advantage of a wide gene pool is that if conditions change there will still be individuals able to take advantage of the new conditions. A good example occurred when fish from the Turangi hatchery were released into the Ruakuturi River headwaters nearly 50 years ago. Amongst these fish were some individuals which had less of a tendency to migrate downstream as juveniles. Unlike other rainbow trout these fish remained in the headwaters above the waterfalls where they grew to a huge size.

This example, along with the success of Taupo strain fish in Lake Otamangakau and the occasional double figure fish from Lake Taupo and its tributaries, indicates that Taupo rainbows do possess the genes for growth to very large size. For the most part, however, environmental conditions are not conducive to this. What conditions do support is a huge, self-sustaining population of quick growing, superbly conditioned trout providing high catch rates of acceptable sized fish.

Is a Big Fish Programme appropriate for Taupo?

Within a couple of hours drive for any central North Island angler there exists just about every trout fishing opportunity he or she might wish to pursue. Anglers seek their own experiences and somewhere within either the Rotorua or Taupo fisheries it should be possible to find the desired opportunity. As fishery managers looking at the bigger picture there seems little value to anglers in trying to repeat something the Rotorua fishery already offers. Besides, plugging away in a lake in the hope of catching a big trophy-sized

rainbow does not appeal to all anglers. Their wish may be to fish for prime spawning rainbows in the Tongariro. Let's face it, at an average size of just over two kilograms these fish are still bigger than the trout of most fisheries throughout the country. Alternatively, anglers may wish to troll for the top table quality maiden fish in Lake Taupo.

The strength of the Taupo fishery is its ability to produce large numbers of prime rainbow trout.

The Big Fish Programme poses a potential risk for the Taupo fishery not faced at Rotorua. As discussed, most of the Rotorua fisheries are dependent on hatchery releases. Taupo, however, is a wild fishery and evidence is mounting overseas of the negative impact in the long term of hatchery-stocked fish on such fisheries. A number of fisheries, including the salmon fishery in the South Island, experienced short-term improvements when initially supplemented by stocking but 20 years on fish numbers are now no greater than before stocking began. Rather than being wild fisheries these fisheries are now sustained by hatchery releases. There are many arguments about why this may occur. The fact remains that fish are stocked to support catch rates higher than the wild fishery can sustain. If these high catch rates are perpetuated through hatchery stocking the wild population will continue to be over-harvested. In fisheries with low natural production like Rotorua lakes, this scenario is unavoidable if acceptable angling is to be maintained. So the hatchery becomes an essential management tool.

Such is not the case at Taupo. The economic reality is that to rear trout to a size for release in the lake will conservatively cost $1 to $2 per fish. To stock Taupo to support a population similar in size to the current population would take all of the annual licence revenue. There would be no money left for any

other management activities like compliance or track maintenance. So, if we don't have to do it, we certainly don't want to.

It can be tempting when managing wild populations to try and improve them through such activities as genetic manipulation, introduction of new prey species or controlling predators. Unfortunately examples of success are a lot harder to find than those of unforeseen disasters.

Another difference between the Rotorua and Taupo fisheries is in the organisations responsible for their management. In the eyes of many anglers and of those involved in fish and game politics this is a major difference. It can be convenient when having a swipe at one of the management agencies to play that agency off against its neighbour. In reality these fisheries are not and cannot be mirror images of each other. They are complementary and collectively provide anglers with a wonderful range of opportunities.

A Big Fish Programme similar to that in Rotorua is neither a practical nor desired management option for Lake Taupo. This view remains consistent with the original decision to establish the programme in Rotorua and not Taupo. It should be remembered that, at that time, the Rotorua and Taupo lakes were part of the same conservancy and were researched and managed by the same team of people. Back then the decision to implement the Big Fish Programme, initially at Tarawera, was made on the basis of the foregoing reasoning and an identified need to try and recapture something that had been lost (i.e., big fish!) in Lake Tarawera. Based on the individual merits of the various lake fisheries, nothing has changed since then when comparing Taupo with the Rotorua scene. Therefore today's managers, some of whom were involved in establishing the original programme, can only continue to conclude that a Big Fish Programme for Taupo would be inappropriate. ■

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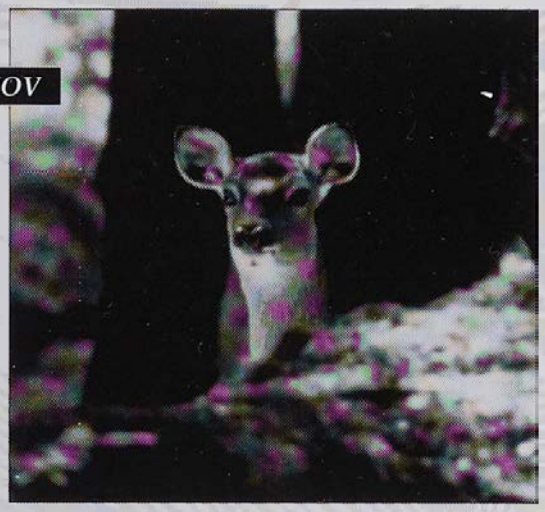

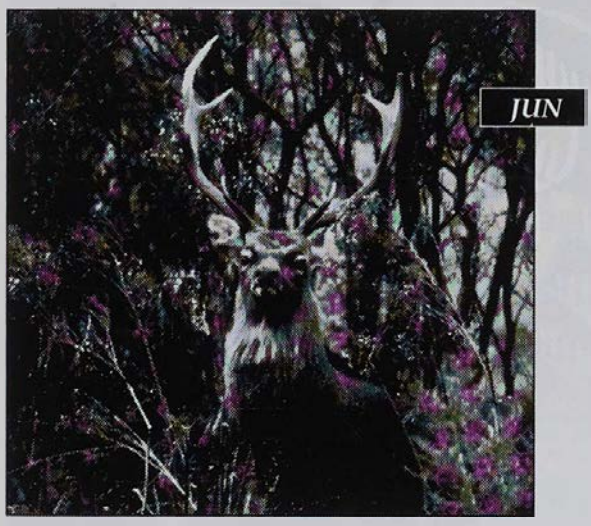

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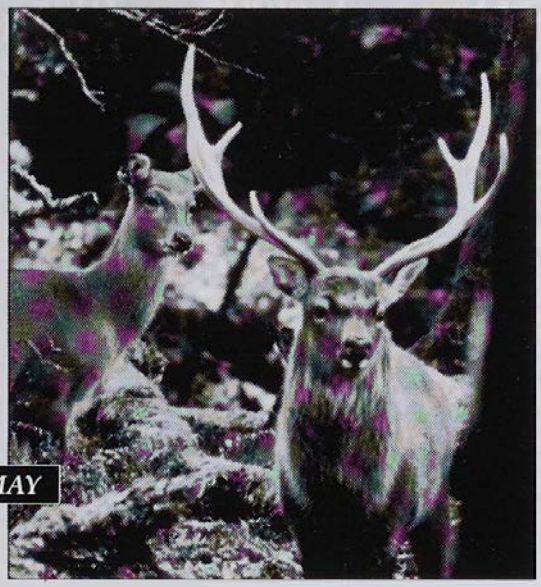

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BITZ 'N' PIECES

NEWS FROM TAUPO

Good news for users of the Hinemaiaia Track off the end of Clements Road in the Kaimanawa Forest Park. Two tricky log crossings have been eliminated as a result of a combined effort by DOC Taupo staff and a section of the NZ Army Assault Pioneers from Linton Camp.

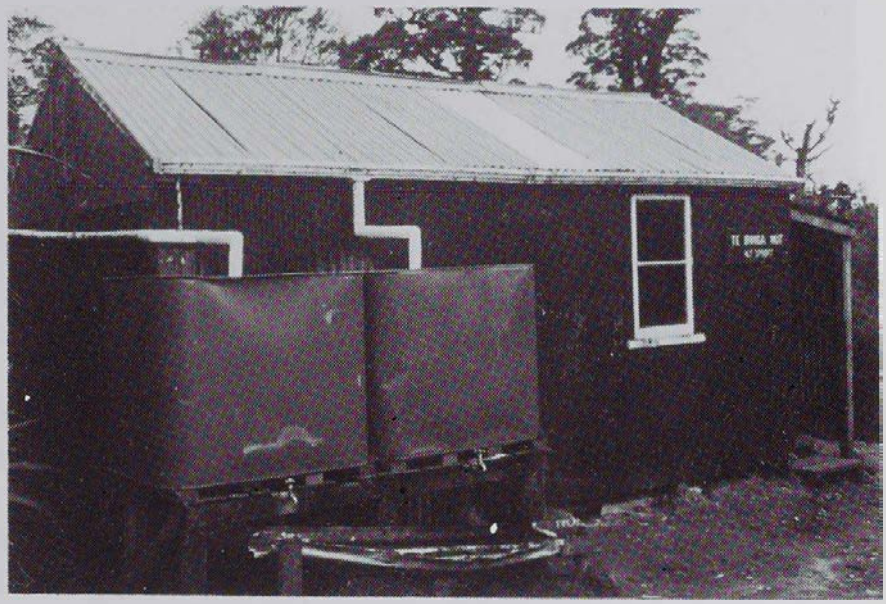
In April of this year, after an offer by the Army to do some voluntary work in the Kaimanawas, gear was assembled according to plans drawn up, all items helicoptered into site and the Army took over.

In three very wet days these Army engineers completed a new swingbridge across the Hinemaiaia River to replace a rather slippery, slowly submerging old beech log used as a crossing.

Our thanks to those cheerful Army guys for their work. To add icing to the cake DOC staff have built a wooden bridge across the nasty little "ankle-busting" log crossing 30 metres in from the car-park at the end of Clements Road.

New track markers are also being installed on all tracks in the Recreational Hunting Area.

Well worth a mention also is the work done by the Taupo branch of the NZDA in upgrading Te Iringa Hut. As well as the stove, covered porch, new cupboard and seating, general maintenance and firewood collection, we now have new water tanks. In July of this year some enterprising individual procured two wine tanks as replacement water tanks. These were duly flown in and two NZDA volunteers installed them - sorry people, the wine will be rather watered down!



New water tanks at Te Iringa Hut.

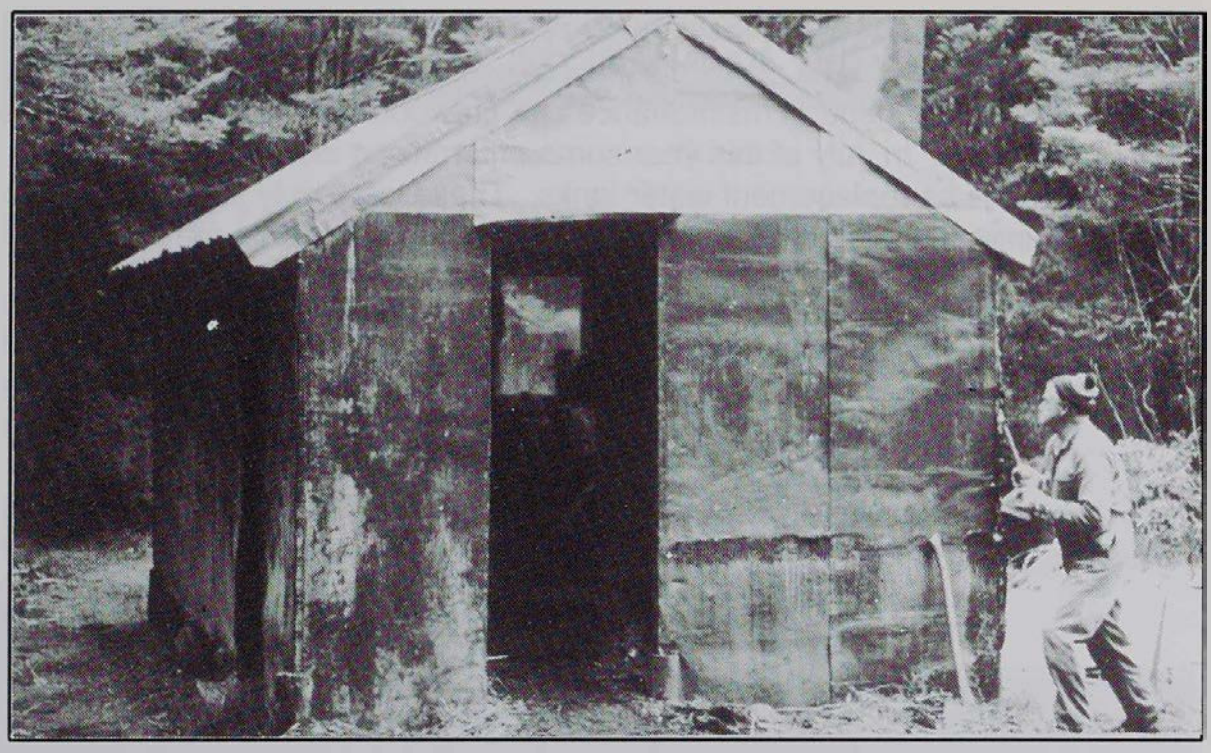
For those who use this facility, please respect the efforts of these volunteers. Our thanks to them, as well as the thanks of all the users, for this home away from home.

A reminder also that the rubbish hole beside the hut is not to be used any more - PACK IT IN, PACK IT OUT. Thanks.

CASCADE HUT

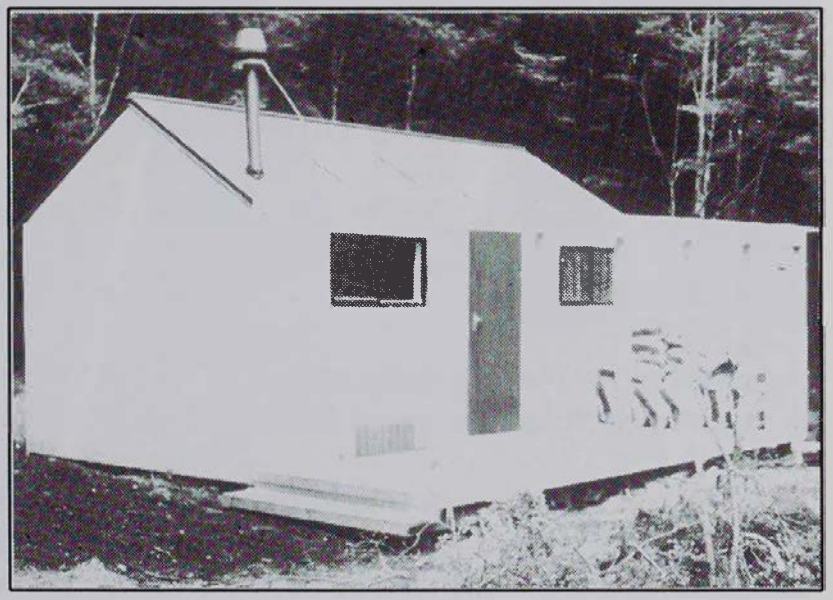
As promised in the July 1994 edition of Target Taupo, Cascade Hut received a much needed facelift during early October.

The first (and worst) task was to remove all of the 30-year-old flat iron from the exterior of the hut - a job made all the more difficult by the thousands of flathead nails with which it was securely tacked to the framing.



Conservation Officer Neil Small does battle with flat iron and flathead nails at Cascade Hut.

The second job, nearly as bad, was removal of the old chimney and fireplace. A new "corker cooker" wood/coal stove was installed and plywood sheets replaced the flat iron as exterior cladding. A new door (where the old open fireplace was) now opens on to a spacious covered-in deck which provides ample room for gear and having a brew outside. Aluminium windows have replaced the old wooden framed perspex ones.



Cascade Hut after its facelift, October 1994.

Inside, the bunks were remodelled and new mattress covers supplied, the flooring replaced and "bats", a new lining, installed. As luck would have it we discovered in the midst of flying material by helicopter to the hut that a rather large red beech tree had fallen onto the toilet so we've replaced that as well.

Although at present there is a reasonable supply of firewood and coal, hut visitors should note that firewood supply will continue to be a problem at this site so you are advised to carry a gas cooker with you. If you are flying in it would be a good idea to take a bag or two of coal with you. Cascade Hut is a great little spot and if *you* look after it, it should easily last another 30 years.

WINTER POISON PROGRAMME

Environment Waikato, through funding from the Animal Health Board, undertook three separate aerial poisoning operations within the Tongariro/Taupo Conservancy this winter. These operations included the Taupo lakeshore reserves (8 000 ha), Pihanga/Tihia (11 000 ha) and the Whitikau/Waiotaka catchments of Kaimanawa Forest Park (14 000 ha). A total of 19 000 hectares of land administered by the Department of Conservation was included in the 33 000 hectares treated. All these operations involved the use of carrot baits impregnated with 1080 poison and distributed by helicopter. They were aimed primarily at reducing possum populations in an attempt to reduce the levels of *Bovine Tb* in local cattle herds. As feral deer are implicated as vectors of the disease, however, a reduction in deer numbers was also anticipated.

The Department of Conservation funded a further operation of approximately 2 200 hectares in the Ohakune area aimed at reducing the damage possums are causing to rata/podocarp/hardwood forest along the southern boundary of Tongariro National Park. This operation utilised pellet baits distributed by helicopter.

The results to date show that all operations have been very successful at knocking down possum populations. Possum trap-catch rates have declined to less than two possums caught per 100 trap-nights set in all treatment areas. Some treatment areas had pre-poison trap-catch rates as high as 37 possums caught per 100 trap-nights set.

Dead deer have been found in all treatment areas although the overall effects on deer populations are not yet known. The greatest number of deer deaths appears to have occurred in the Whitikau/Waiotaka area. This is not unex-

pected as this area had the highest deer density prior to the winter poisoning programme.

Pig populations in the Taupo lakeshore reserves have suffered very little from the poison operation.

Small numbers of dead birds have been found in some treatment areas and these have been sent away for analysis. With the exception of two tomtits, the birds involved were all introduced species, blackbirds and chaffinches.

Dog owners are warned that while baits will be non-toxic following heavy post-poison rainfall, possum carcasses will remain toxic until the decay process can allow rain to wash all traces of 1080 into the soil were it can be broken down by soil micro-organisms.

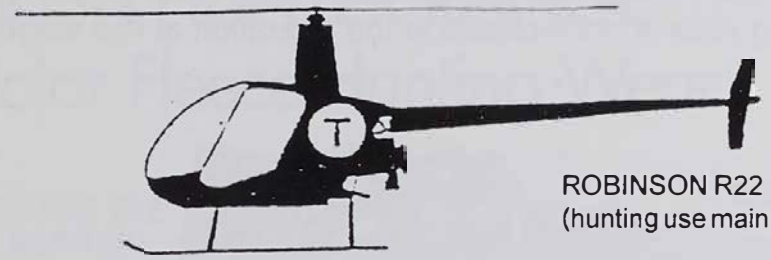
Hunters are also reminded that both Environment Waikato and the Manawatu/ Wanganui Regional Council will be undertaking maintenance possum control work along bush/pasture margins in many parts of the conservancy over the spring/summer period. This work involves 1080 baits or paste in bait stations and on spits or cards, cyanide and traps, set on possum runs coming out of bush areas into pasture. Please be aware of poison signs and keep your dogs under control.

ILLEGAL HELICOPTER ACTIVITY

With spring upon us regular complaints about illegal helicopter deer recovery operations have started to flow in. On 25 October good information passed on quickly resulted in the apprehension of a helicopter operator in Tongariro Forest.

Hunters are reminded that accurate details of helicopter descriptions and associated vehicles, colours, identification/registration numbers/letters, dates, times and places, if passed on quickly are most helpful to enforcement staff. Vague descriptions passed on a week after the incident are very difficult to follow up.

The silhouettes opposite may help hunters identify the helicopters most commonly used for aerial deer recovery.



ROBINSON R22
(hunting use mainly)

HUGHES 300
(hunting use mainly)

HUGHES 500

BOVINE TB SURVEILLANCE

A permit to recover feral deer from parts of Kaimanawa Forest Park for autopsy to determine the true distribution of *Bovine Tb* in the Kaimanawa deer herds has been issued to Environment Waikato for the spring/summer period. This work is being undertaken on behalf of the Animal Health Board and follows on from the work undertaken last summer. A Robinson R22 helicopter, registration ZK-HIO, coloured blue and white and carrying a black ID letter L on a yellow roundel painted on the turret will be used for this operation.

Small numbers of animals are involved, but these will be removed from a large area between the Waimarino River and the Hinemaiaia River. The Recreational Hunting Area is not included in the operation at this stage.

TONGARIRO FOREST

Access via John McDonalds Road is poor at present as the road has been severely damaged by logging trucks.

New toilets have been installed at the Okupata Caves car-park and at the informal campsite at Pukehinau mill site on Pukehinau Road.

Access on Dominion Road near Owhango will be restricted by bridge repairs during November. Replacement of two spans of decking on the Ohinetonga Bridge will result in no access for up to a week sometime during November. Hunters should contact the Whakapapa Visitor Centre for more information.

A team of six staff will be working in Tongariro Forest during the summer to improve the access tracks.

ERUA FOREST

Hunters are reminded that hunting is prohibited in the area bounded by Makatote Gorge, State Highway 4 and Waimarino Stream for the safety of forestry workers in that area. ■

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BUSH HUNTER

"Never seen. Never heard"

SOMETHING FISHY

WHANGAMATA STREAM PLANTING

In early July another 1 100 *Carex* sp. plants were planted along the banks of the Whangamata Stream. The planting was carried out by local Trout Unlimited members, Taupo Venturer Scouts and Kinloch residents. This annual event is a continuation of the revegetation programme undertaken by the Department in an effort to shade out the troublesome muskweed. Volunteers were happy to see that their previous years' plantings are looking healthy and are starting to do the job they were planted for.

It was disappointing not to see any of the local anglers at the planting. These people are often quick to complain about the muskweed but slow to respond when the opportunity arises to do something about it.

WHANGAMATA STREAM BRIDGES

The local Taupo Venturer Scout unit recently undertook a project to build two foot-bridges across the Whangamata Stream. DOC provided the materials and advice on the construction. The bridges have been built so that temporary bridges, which inevitably end up blocking the stream, can be done away with. One of the new bridges is sited just up from the mouth of the stream and the other is further upstream to allow access for residents and visitors to the local airstrip.

A small amount of work has yet to be completed but this should be undertaken in the next few weeks. All time spent working by the Venturers goes towards various Scouting Achievement Awards.

NEW APPOINTMENTS TO THE FISHERIES TEAM

Iain Maxwell, who had previously been employed on contract as a trap operator, was recently appointed to a permanent position within the Fisheries team. This is a new position created to provide field support for the various monitoring and research projects while providing Iain with a wide range of training.

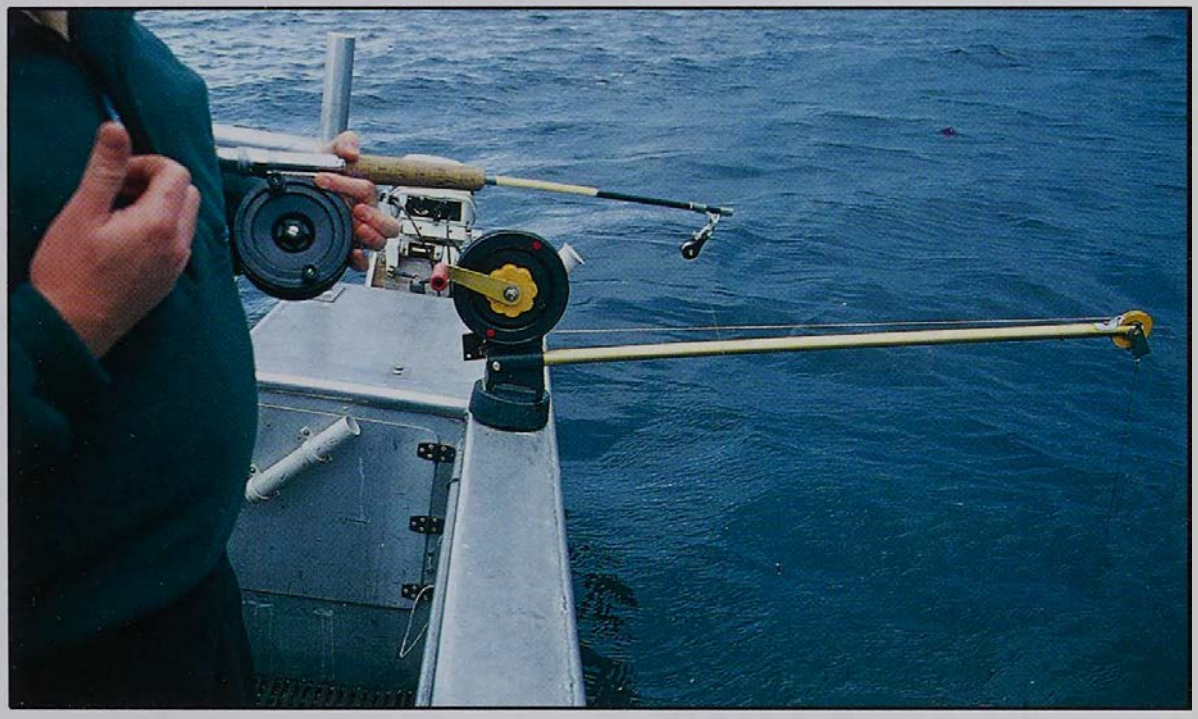
Roy Baker has also recently been appointed to the Fisheries team and will work with Adrian Ngamotu and Gordon McKenzie on anglers' access tracks and other fisheries-related work. Roy was recently employed under the Task Force Green Scheme at the Taupo Field Centre for 12 months as a supervisor on both possum trapping and track work.

We welcome both Iain and Roy to the team and wish them well in their careers in fisheries management.

MONITORING LAKE HARVEST

Analysis of harvest estimates from Lake Taupo over the spring and Christmas periods in recent seasons indicates that the level of harvest is largely dependent on the number of anglers. This year we have decided to continue to monitor angler numbers but to do away with surveying anglers about their success as they return to the boat ramps. If angler numbers continue to increase, as appears likely, we can assume the harvest increases likewise.

Instead we will put extra resources into interviewing anglers on the lake. In a single, brief interruption, officers will undertake a routine check of your licence and the length of cables on any downriggers in use, measure any fish and record details of your fishing success. This information will be used to assess how widely downriggers are being used, catch rates compared to other trolling techniques, and to ensure downriggers are not being used illegally.



Conservation Officer Wayne Boness demonstrates how simple it is to measure the length of a downrigger cable. The downrigger weight attached to the downrigger cable is also clipped to the reel in his hands. The weight is then lowered to the end of the cable on the downrigger drum. Note the swivel just above the water attached to the line held by Wayne. If the cable is of legal length this swivel will still be out of the water. If it isn't, we will be taking your downrigger home with us.

If you are approached on the lake this summer by a boat displaying a "STOP" sign, please stop and wind your lines in. It is much easier to work beside a stationary boat and winding your lines in avoids any unnecessary tangles or breakages - thanks.

NATIONAL TROUT CENTRE

Kids' Fishout Days - Attendance picked up on each of the last three public fishout days in July, August and September, proving the value of advertising. The total for the five public days (1 326) was the best since 1991.

Fishing in the pond became even more challenging in July and August than it had been. Many of the three-year-old fish were trying to spawn in the pond, males were busy trying to keep their territory clear of intruders and two-year-olds were intent on eating any eggs they could get at. Bedlam in the pond resulted in frustration on the bank as the trout ignored the lures.

In August the fishing was so slow that many children went home disappointed at being unable to have a go. People were being turned away after 1 p.m. when it became obvious that the existing queue would take at least two hours to clear. The counter recorded 1 060 visitors for the day and 306 children caught a fish. In comparison, 1 100 visitors and 449 children were recorded on 17 May 1992.

September 18 was brilliant weather-wise, the fish were a little more co-operative and the number of children (361) was highest for the year. This was also the highest for this particular day in the twelve years the fishouts have been held. People were queuing at 8 a.m. and the fishing started at 8.30, as soon as the earliest arriving anglers could gear up. Shy trout and a group of late arrivals who cajoled a few anglers into staying stretched the finishing time to 5 p.m. - it was a long day!

In addition to the open days run by the Tongariro and Lake Taupo Angling Club, National Trout Centre staff and a small group of volunteers have put on fishouts for 458 children from 29 visiting schools and special needs groups since May.

Kids' Fishout Days, 1995 - Next year's fishout days at the National Trout Centre for 6- to 14-year-olds (inclusive) will be held on:

* 7 May
* 11 June
* 9 July
* 20 August
* 17 September.

NTC Displays - The interpretive displays on the Trout Centre tour are being complemented by the addition of six more outdoor panels which will be installed on the walkway to explain the history of the area, names of nearby river pools and their origins, the food web of aquatic creatures and trout fishing methods and etiquette.

The artwork was done by the Conservation Design Centre in Nelson and Process Signs of Napier printed the signs on self-adhesive vinyl which was stuck on glass and mounted with powder-coated aluminium channel framing on stands of weathered wood (old telephone pole cross-members).

The displays are robust, weatherproof, non-fading and give a clean, crisp image.

NTC Visitors' Book - The visitors' book in the viewing chamber at the National Trout Centre is used by one-third to one-half of the people who pass through. Most comments are favourable, appreciative and supportive; a few are not. Here is a small selection from 18 May to 31 August when over 10 000 people passed through ...

Each time I come it gets better

Two dollars chips and some of your fish

Didn't think much of your s... food, what a smell

Bad, no fish today

Nice place to visit on your honeymoon!

THIS PLACE IS TO THE MAX, MAN!

Wonderful experience - very well presented and laid out

It was really neat finding out what fish eat and I think the trout are beautiful

Loved it, interesting to learn about it all

IT'S AWESOME TO LOOK AT THE FISH LIKE THAT (BOLIVIA)

Getting run down, not as good as last time

New Zealand, you have your act together! (Santa Cruz, California)

Wet, cold and very fishy!

I found this place very very marveless (Iran)

I like very much (Japan)

Fantastic, first time ever - I'm 80 years old.

FISH INNARDS - WHAT CAN THEY TELL YOU?

When you visit new water for the first time and don't have a clue as to what fly or lure to use, you can look on the water or under the rocks to find the most likely item trout are feeding on. Once you have decided select an artificial pattern which best matches the natural one. If you catch and keep a fish you can check how good your guess was by looking in the stomach of the fish when you clean it.

This procedure is especially helpful during summer when trout are actively feeding. In winter on Taupo rivers, however, it could be quite unfruitful for the simple reason that running fish are not actively feeding. When a trout

takes a fly or a lure at this time of the year it is often simply an aggressive response. When you look in the stomachs of your fish you will notice that almost all of them are empty of food.

So what else can you learn about the feeding behaviour of trout in such a situation? There is an easy way to assess when the trout took its last meal. To be able to digest its food, especially fat, the fish requires bile. Bile is produced by the liver and it is stored in the gall bladder. The gall bladder is a little, clear, pear-shaped vesicle inserted in the top of the liver. The bile of actively feeding fish is pale yellow in colour whereas in non-feeding fish it is blue or green. When the fish is not feeding, bile is not used and is stored in the gall bladder which becomes progressively fuller and darker as the period of starvation proceeds.

By looking at the size and the colour of the gall bladder you can gain some idea of when the trout took its last meal. Here are some indicators:

1 An empty gall bladder indicates that a meal has been eaten within the last six hours.

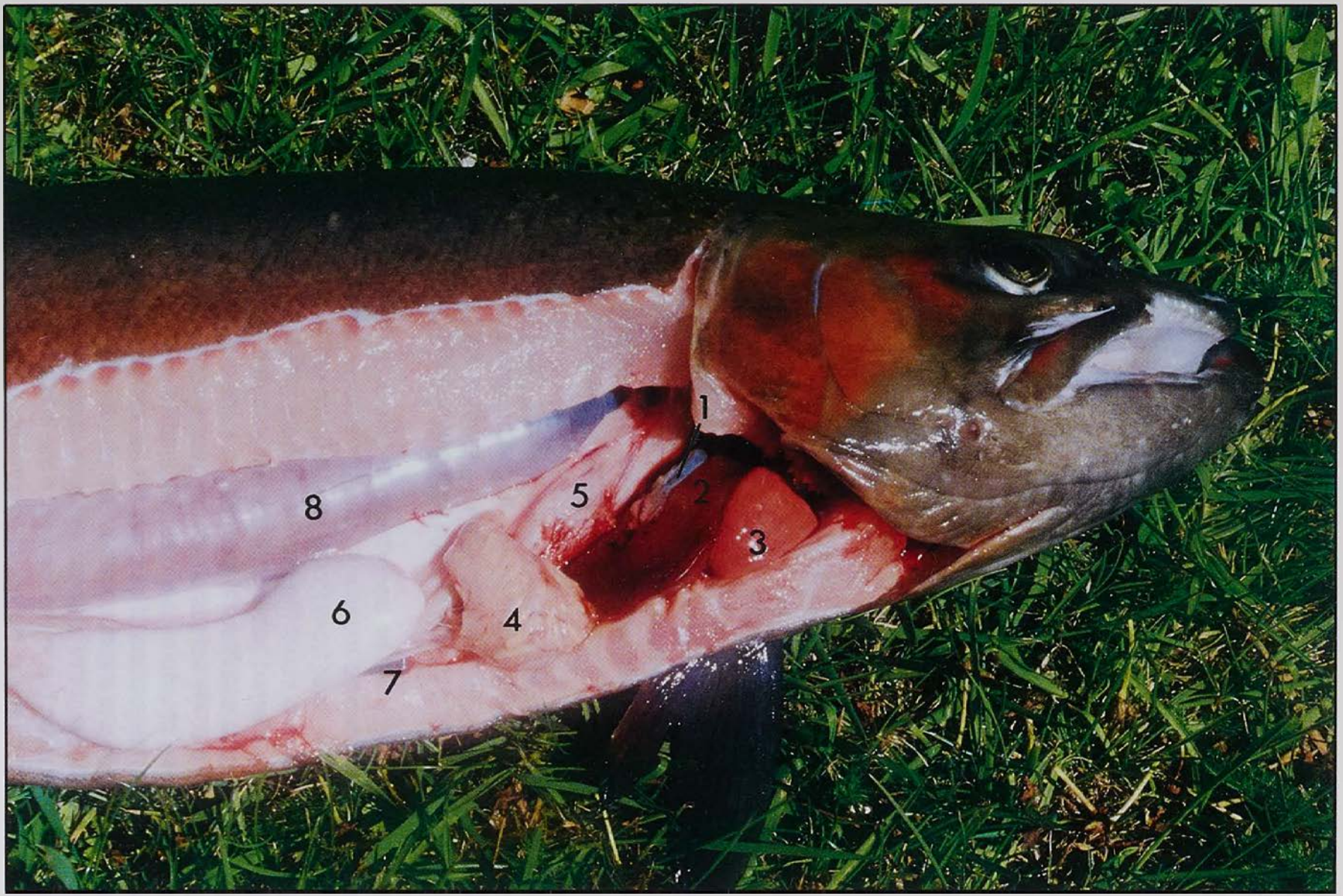
2 A gall bladder with an appreciable quantity of pale yellow-coloured bile indicates that the fish has not fed for approximately 24 hours.

3 A gall bladder with a large quantity of dark green bile indicates starvation for approximately four days and dark blue bile indicates starvation for a period in excess of six days.

This information is not only interesting from an angler's point of view. An estimate of the time since a fish last fed may be useful in certain pollution investigations. Usually it is sufficient to know whether or not the fish have been feeding on a regular basis and, if not, to know within a day or so the period of fasting. For example, the timing of a spill resulting in fish kill might be estimated based on the time since surviving fish went off the feed due to toxicant exposure.

The photograph opposite shows the internal anatomy of a male rainbow trout.

1 gall bladder
2 liver
3 heart
4 pyloric caeca
5 stomach
6 testes
7 spleen
8 swim bladder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FISHING LICENCE SALES

Final sales figures for the 1993/94 season were:

Adult Season	10 307
Child Season	5 321
Adult Month	1 013
Adult Week	9 761
Adult Day	35 244
Child Day	6 496.

An overall total of 68 142 licences sold, an increase of 1 354 from the previous season.

NIWA RESEARCH IN THE TONGARIRO RIVER

Flow in the Tongariro River has been controlled for power generation since 1973. Under the Resource Management Act, ECNZ is now required to obtain a resource consent for the operation of the power scheme. As part of the consultative process adopted by ECNZ (see past issues of Target Taupo), a fishery working party was established to identify the major information needs with regard to the impacts of power generation on the fishery. This party identified the need for a major study into the Tongariro River and the fishery it supports. The study was put out for tender and was awarded to NIWA.

A major emphasis of the study will be on the description of the physical habitat used for redds, and by fry, fingerling, and adult running rainbow trout, and how it varies with different flows. Another point of the study will address the extent and effect of sediment deposition on the redds.

Much of this work will be undertaken on-site in the river and anglers can expect to see people measuring depth, velocity, and water clarity in certain stretches of the river from Poutu Intake down to the delta during the next two years. In order to count the number of trout present in the river and to describe their preferred habitat, divers will also drift along the river. Generally you are likely to see four divers forming a line across the river. In addition you may also come across structures made of waratahs erected on certain redds. These structures are clearly identified with signs. Their purpose is to estimate the deposition of sediment in the redds and the resulting proportion of eggs which were suffocated by the silt. It is important that these structures are not disturbed. We appreciate that it could be upsetting to get your fly snagged in them but in the long term the information derived from this experiment should be to the benefit of everyone's angling.

FISHERY DISPLAYS AVAILABLE

The much awaited fishery displays are now available for showing at trade displays, fishing competitions, conferences, in shops or at local events. These large, bright, eye-catching panels provide information on the Taupo fishery, its management, angling opportunities and on angling practices such as catch and release and river bank etiquette. If you have an upcoming event or opportunity where you would like to show these off, please contact Fisheries and Water Manager John Gibbs at the Department of Conservation, Turangi.

COMPLIANCE NEWS

Labour Weekend signalled the start of the lake fishing for most anglers and from the comments of many people checked it appears that boat numbers were higher than for the last few years. Compliance levels were good although some anglers are starting to troll too close to streams entering the lake. Remember to keep a 300-metre radius around stream mouths, which are usually marked with yellow-, black- and white-ringed landmark poles, if fishing from a boat.

Lake Otamangakau and Lake Kuratau opened on 1 October. Reports to hand indicate a quiet day but this should pick up as temperatures start to climb.

The upper reaches of Taupo rivers closed for spawning reopen to angling on 1 December. Check the map on your licence or contact our office if unsure of the boundaries.

A successful prosecution was undertaken against a person who had taken 70 trout with a pitchfork from a small spawning stream. The defended hearing took place almost two years after the incident due to the offenders fleeing the scene. Twelve months of intensive investigations by Fisheries staff led to charges being laid. In sentencing, the judge said that he would not tolerate such actions and fined the defendant a total of $3 380.00, including costs. ■

National Trout Centre Manager Errol Cudby with one of the centre's new outdoor interpretive display panels (story, page 48).

TAUPO

Do you hunt or fish at Taupo?

Do you want to know:

* The latest about the resource you use?
* Current issues so that you can have an input?
* What the Department of Conservation is doing for your sport and why?
* How to get to those special spots and the technique to use?

Find the answers to these key questions and more in

TARGET TAUPO

a newsletter for hunters and anglers in the Tongariro/Taupo Conservancy.

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NOTES...

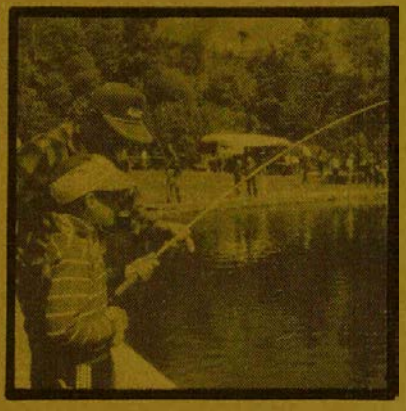
TONGARIRO/TAUPO

WORKING

FOR

YOUR

SPORT



A Sporting Paradise