

JULY 1991  
Issue 7

# TARGET TAUPO

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



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# SPORTING LIFE 86



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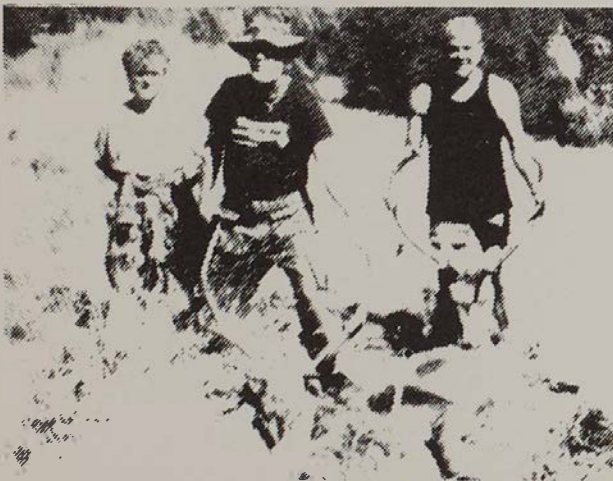
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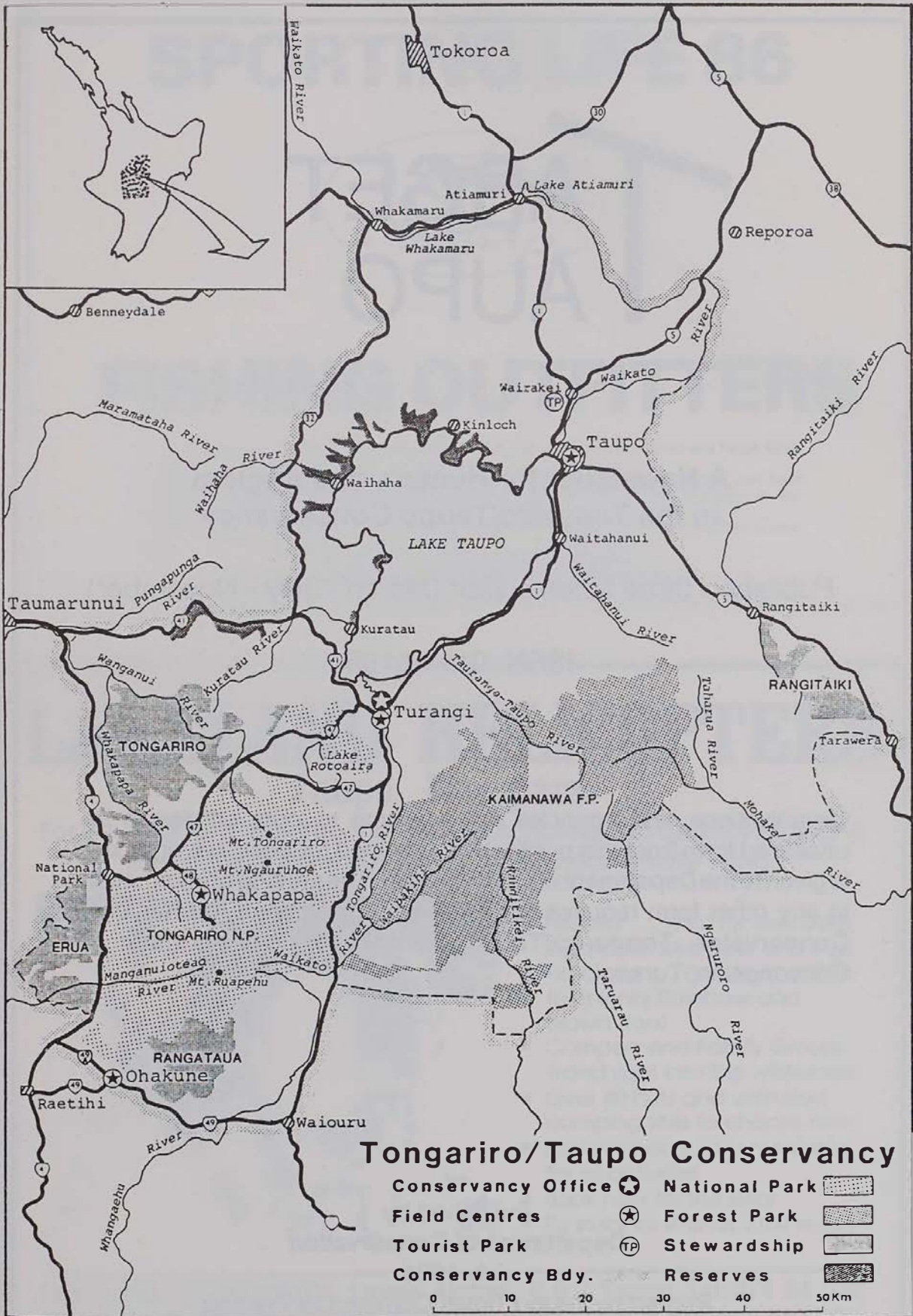
Published three times a year (March - July - November)

ISSN 0114-5185

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Published by  
**Department of Conservation**  
July 1991

Printed by Taupo Times Commercial Printing





CONSERVATION  
TE PAPA ATAWHAI

## DEAR SPORTSPEOPLE

Hello again! It's hard to believe that this is issue seven. When Glenn and I first conceived **Target Taupo** we never dreamed it would be as popular or successful as it has become. We now have some 200 subscribers, nearly 300 clubs and organisations, and 100 casual purchasers obtaining copies of each issue. A recent meeting of staff associated with the publication identified ways of increasing circulation even further and we have set a goal of distributing 1000 or more copies of the July 1992 issue. Thank you for your continuing support. We hope that you will help us market the publication further by telling your friends and colleagues of its existence.

Our recent meeting also tried to identify ways in which the publication could develop. The reader questionnaire included in the last few issues has helped in this respect and a new regular feature called "Finding Your Way" appears for the first time in this issue. In this feature we hope to give hunters and anglers up-to-date information on how to get to particular catchments or fishing waters, the problems they may encounter, and the conditions they can expect to find once they get there. We hope that this feature will add to the usefulness and enjoyment of the publication.

Remember, if you have any issues you wish to see raised or discussed in the publication, or you have a point to make, let us know via the reader questionnaire or a letter to the editors and we will do our best to address them. We hope that your input can create healthy debate on management issues.

The rainbows are starting to run despite the lack of rain and all is shaping up for a good winter for anglers. We hope the hunters among you will also get out for a 'cold' crack at the sika. July and August can be very productive in heavily forested sheltered catchments. Sika are often mobbed up in warm north-facing gullies. Whatever attracts you to the central North Island, we wish you a safe and enjoyable visit.

Hot barrels and tight lines.

**Cam Speedy**  
Co-editor

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ANYTIME

# 1.

## THE CATFISH *Ictalurus nebulosus*

Brown bullhead catfish were first recorded in Lake Taupo in 1985, the result of what seemed a quite deliberate but unauthorised release. Initially they colonised the shallow weedy areas of Tokaanu, Motuoapa, Tapuaeharuru and Whangamata bays. Conditions have proved ideal for the catfish and their numbers have increased dramatically so that they are now widespread over the whole lake and commonly caught by anglers fishing a fly close to the bottom. This has coincided with a decline in the fishery and many anglers are postulating that the two are linked. In this article we consider the possible interactions between catfish and the rainbow and brown trout and the potential effects on the Taupo fishery.

### **The biology of the catfish**

Catfish occupy sluggish-flowing weedy streams and lakes but do not inhabit fast flowing rivers. In Lake Taupo they are largely nocturnal, spending the daylight hours tucked away in crevices and weedbeds, moving out to feed under the cover of darkness.

The biology of catfish has been little studied in New Zealand (McDowall, 1990). However Patchell (1981), working on the catfish population in the lower Waikato River, found that females spawned throughout the spring, unlike in their native North America where a short spawning season is typical. While normally gregarious, during spawning catfish form pair bonds and become territorial, laying up to 6 000 eggs in a shallow depression which is initially guarded by both parents.

Commonly the male then assumes the sole responsibility for the eggs which hatch about a week after spawning, the young remaining near the nest for some time before dispersing in small shoals.

Catfish are predators and scavengers feeding predominantly along the bottom on insects, crustaceans, molluscs and small fish and fish eggs. Weed is also found in the gut of Taupo catfish.

In the lower Waikato River, Patchell (1981) found that their growth rate was quicker than recorded in the United States, fish reaching 180mm by the time they first spawned in their second year of life. Most fish were between one and five years old but Patchell suggested that some may live to be eight years old. In the United States catfish may grow to at least 500mm in length and more than 3kg in weight (McDowall 1990) but the limited information in New Zealand suggests fish of more than 2kg are uncommon. In Taupo large specimens are only 250-300mm in length, though it is thought that some larger fish could be present.

### **Possible impacts of catfish on the Taupo trout fishery**

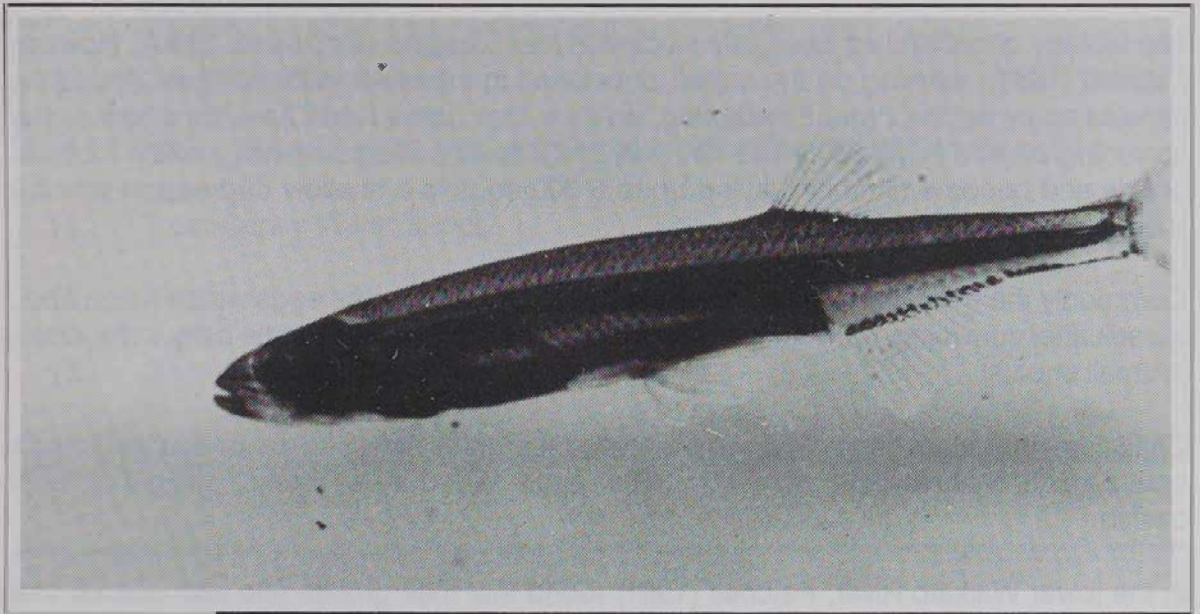
*Predation of young trout* - Autopsies of adult catfish netted in Lake Taupo (many hundreds) have yet to reveal any young trout in the diet. Juvenile trout rear in the tributary streams then migrate out into the pelagic (open water) zone of the lake in search of the dense

concentrations of immature smelt. Recent research suggests that trout must be at least 90-100mm to survive in the lake and it would seem highly unlikely that catfish would be capable of catching healthy trout larger than this size, particularly considering the trout's open water habit. Occasionally catfish are taken by adult trout though they remain a very insignificant component of the diet.

Catfish would almost certainly prey on trout eggs but the fact that they do not inhabit the fast-flowing waters of the tributary streams where trout spawning occurs ensures that this is not a problem.

*Predation of forage species* - Adult catfish take bullies, smelt and koura when the opportunity arises and prey on the eggs of these species. However, despite the common perception of anglers, bullies and koura are not an important part of the trout diet.

Cryer (1991) found that smelt made up 98% of the diet of juvenile trout (by biomass) decreasing to between 58 and 80% in rainbow trout over 45cm. These larger fish take a higher proportion of less mobile prey such as koura and bullies, particularly in the colder months. Large brown trout seem to take more bullies than do rainbow trout, probably due in part to adopting a more littoral foraging strategy than the rainbow trout.



***Smelt, by far the most important prey for trout***

Stephens (1984) and Cryer (1991) both suggest that starvation is widespread in the smelt population, indicating smelt are well up to the carrying capacity of the system. They do not seem to be limited by the availability of spawning or nursery habitat, or the size of the spawning stock, but rather by the amount of available food. There seems to be a considerable surplus production of juvenile smelt which zooplankton productivity cannot support. This occurs in the vast open waters of Lake Taupo, an area apparently unoccupied by catfish.

One possible interaction could be if catfish were to prey excessively on the smelt eggs laid in the littoral (lake edge) zone. Stephens (1984) comments that predation by bullies, aquatic



insects, koura and other smelt is only a minor cause of the very large smelt egg mortality and there is no evidence that catfish are any more significant an egg predator.

Cryer (1991) suggests that fewer juvenile smelt might even enhance the fishery by limiting the degree of starvation amongst the juvenile population and allowing greater numbers to survive through to maturity where they are available to large trout.

It would appear that catfish should not limit the smelt population and therefore not affect trout numbers. Potentially any effect would be on the bully and koura populations which might limit the size trout attain. However, at present, given the abundance of bullies and koura in the lake, this seems very unlikely. (See 'Something Fishy' for comments on trout condition.)

## Summary

It certainly would have been better if catfish had never been introduced into Lake Taupo. They exist in large numbers and must have had an impact on the biology of the lake. Hopefully, like most introduced species, the catfish population, once past an initial boom, will stabilise at a much lower level, more in balance with the ecology of Lake Taupo. At present, however, there is no reason to believe that they have had an impact on the trout fishery. Direct competition with trout is an apparently obvious reason for the decline of the fishery. But when we consider what is known about catfish, other impacts such as over-harvest seem much more plausible causes. With the limited funds available (all work in the fishery is funded by licence revenue) it does not seem wise to invest heavily in strategic research into catfish at the expense, for example, of work into determining the harvest or protecting the spawning stocks from poaching.

We are continuing to monitor the catfish populations and are always interested in reports of any captures, particularly if they appear to contradict the current understanding of the catfish biology. Recently we have had two reports of catfish caught in the Tongariro River but we have been unable to validate either. After the first report we drift dived several areas of the Tongariro at night, viewing several thousand juvenile trout but not a single catfish. A third report was identified as a large koaro - a native galaxiid.

And the report of a 4lb catfish from the Breakaway Pool - well even catfish stories appear to grow bigger in the telling!!

### Sources

Cryer M 1991 Lake Taupo Trout Production. Science and Research Series No 26. Department of Conservation, Wellington.

Fechney LR 1986 Catfish : Lake Taupo. Wildlife Service internal report.

McDowall RM 1990 New Zealand Freshwater Fishes. Revised ed. Heinemann Reed, Auckland.

Patchell GJ 1981 Catfish in New Zealand. Freshwater Catch (NZ) 10:16.

Stephens RTT 1984 Smelt population dynamics and predation by rainbow trout in Lake Taupo. DPhil thesis, University of Waikato, Hamilton, NZ.

## 2. AUTUMN HUNTING SUMMARY

Despite the cold blizzard conditions experienced during two of the four weeks in April, the autumn of 1991, in the central North Island at least, won't be remembered by many hunters as the most vocal roar on record.

Hunter numbers were high again this year reflecting the confidence they have in the opportunity the conservancy offers. As with the same period for 1990, well over 3100 individual hunters obtained permits between 1 February and 30 May.

All those who visited the conservancy must take pride in the fact that so many hunters can visit one region over a relatively short period of time without a single firearms accident. The high standard of safety is a credit to both the clubs and organisations that teach it, and to the individual attitudes of the hunters.

The most productive period generally appears to have been the fine spell of weather that fell between April 13 and 20. A total of 21 deer jaws were deposited by hunters in the Clements Road jaw box during this week, 19 of which were stag jaws including three 8 pointers.

Over the whole period some 84 jaws and 29 gut samples were provided by hunters from the Kaimanawa ranges. This is a good sample and analysis will add further to our growing knowledge of the herds so keenly sought after in this area.

A total of 849 hunting diaries went into the prize draw on 16 June 1991, representing around 25% of the total issued. This is a little lower than we had hoped for but diaries are still coming in and we hope to lift the rate to nearer 35% by the end of the winter period.

The winners of the prize draw were as follows:

Air Transport with Heli-Sika :

**D Thompson, Oparau**

Air Transport with Lakeland Helicopters :

**James Campbell, Wanganui**

Air Transport with Air Charter, Taupo :

**A Beeby, Whangaparoa**

\$100 worth of sports goods from Fly and Gun Shop, Taupo :

**S Ching, New Plymouth**

Accommodation at Sika Lodge :

**M Belfield, Tokoroa.**

Plus ten hunters also received free copies of this issue of **Target Taupo**.

Congratulations to these winners and thanks to all the hunters who returned diaries. The information, especially the many wildlife records and observations you have provided us with, is extremely valuable.

A summary of the hunting data obtained is presented for your information in table 1.

Table 1: Tongariro/Taupo Conservancy Recreational Hunting Summary February - May 1991

AREA	BLOCK	DAYS HUNTED	ENCOUNTERS				KILLS				DAYS/ENCOUNTER	DAYS/KILL	
			SIKA	RED	PIG	GOAT	SIKA	RED	PIG	GOAT			
KAIMANAWA RECREATIONAL HUNTING AREA	Clements	436.0	329	8			57	4			1.3	7.20	
	Hinemaitia	53.0	69				7				0.8	7.60	
	Cascade	183.5	154	17			32	9			1.1	4.50	
	Kaipō	61.0	71	4			18				0.8	3.20	
	Oamaru	79.0	73	1			18	1			1.1	4.20	
	Tikitiki	31.0	38				12				0.8	2.60	
	Te Irianga	20.0	8				4				2.5	5.00	
	Jap Creek	23.0	29	1			1	1			0.8	4.25	
	Upper Oamaru	17.0	20	3			4				0.8	5.2	
	ALL	1135.0	1004	44	5	1	200	9			1.1	5.2	
	1990 FIGURES	1008.0	941	50	5	1	161	5			1.0	6.0	
	KAIMANAWA FOREST PARK (excluding RHA)	Waipakihī	176.5	98	41			22	16			1.3	4.7
		Desert Road	33.5	20	2			4	1			1.5	8.7
		Access 10	54.0	13	17			2	5			7.7	1.8
Umukerikeri		52.0	4	28			1	11			1.6	4.3	
Mount Urchin		11.0	3	6			1	2			3.7	1.2	
Waioatake/Whitikau		57.5	30	51	12		7	11	5		0.6	2.5	
Waimere		42.0	24	8			5	4			1.3	4.7	
Kiko Road/Tauranga-Taupo		184.5	149	1	1		32	6			1.1	4.9	
Tireki		52.5	81	6			22	12			0.7	2.4	
Rengitikei		32.0	4	33			2	12			0.8	2.3	
Ecology		13.0	4	7			1	3			1.0	3.3	
Ngauroro		38.5	32	1			6	1			1.2	5.5	
ALL		977.5	553	248	13	144	144	84	5		1.1	4.2	
1990 FIGURES		1015.5	528	290	28		135	103	15		1.2	4.1	
TONGARIRO NATIONAL PARK	Rengatua	39.0	1	43			1	24			0.9	1.6	
	Ohakune	49.5	33	33			19	19			1.5	2.6	
	Southwest	72.0	1	57			4	17			4.2	1.2	
	Hauhangaatahi	42.0	22	22			10	10			1.9	4.2	
	Whakapapa	42.0	48	48			20	20			0.9	2.1	
	Phanga/Thia	4.0	1	1	1		1	1			4.0	4.0	
	Desert Road	6.5	3	3			1	1			2.1	6.5	
	ALL	378.0	10	285	1		111	111			3.2	3.2	
	1990 FIGURES	553.0	20	336	5	2	7	131			1.6	4.0	
	TONGARIRO FOREST	ALL	235.0	2	92	11	87		45	1	9	2.2 *	5.1 *
1990 FIGURES		237.5	3	144	7	153	3	59	13	48	1.8 *	3.2 *	
ALL		53.5		19	2	65		9	1	31	2.5 *	5.4 *	
ERUA FOREST	1990 FIGURES	54.5		47	4	139		18	1	78	1.1 *	2.8 *	
RANGITAKI FOREST	ALL	50.0	36	15	5		7	2	1		0.9	5.0	
	1990 FIGURES	82.5	50	27	2		12	5			1.1	4.9	
LAKESHORE RESERVES	ALL	3.5		3	1	1		1	1		0.7	1.2	
UNSPECIFIED RETURNS	WHOLE CONSERVANCY	323.5						48	3	24		4.8 *	
TOTALS	WHOLE CONSERVANCY	3179.0						326	11	85		4.5 *	
	1990 FIGURES	3551.6						400	41	206		4.4 *	

\* Deer and Pig Only

The overall figures for the conservancy are similar to last year with an average effort of 4.5 days required to obtain a (deer or pig) kill. Tongariro Forest appears to have been a little slower this year, while Tongariro National Park produced a little better than last year.

The RHA figures also suggest hunting was a little better this year. Hunters certainly reported seeing plenty of hinds although many were just after stags. Rumour has it there were three or four very good heads taken this year. One very pleasing aspect of the data is the lower goat harvests recorded from Tongariro and Erua forests. The figures suggest that goat control efforts by both departmental and recreational hunting have reduced goat numbers considerably in these areas. Table 2 summarises the Department of Conservation's control efforts for the February to May period.

*Table 2 - Departmental Goat Hunting, February - May 1991*

<b>Area</b>	<b>Hunter Days</b>	<b>Helicopter Hrs (Hughes 300)</b>	<b>Goat Kills</b>
Erúa Forest	15	5.25 (over 3 days)	65
Pukawa S.R.	3	1.2 (over 3 days)	4 *
Waiotaka S.R.	-	1.0 (over 3 days)	22
Waituhi-Kuratau S.R.	3	1.0 (over 3 days)	17
Whakaipo S.R.	3	-	- *
Tongariro Forest	29	-	71
Mangakowhiriwhiri Stewardship Area	2	-	4
<b>Totals</b>	<b>55</b>	<b>8.45</b>	<b>183</b>

\*Eradication campaigns thought to have been successful. Monitoring will continue for at least 12 months.

It is great to see reasonable numbers of hunters getting into most of the conservancy's catchments and obtaining reasonable harvests. Helicopter access to some of the 'more difficult to get to' areas appears to be helping in this respect.

If you are now looking forward to the winter hunting, remember that winter can be a very productive time to hunt sika, if you can find them! Try poking around on warm north-sloping faces, about mid-slope, in the heavily forested areas of catchments like the Kaipo.

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### Auckland:

Phone Garth (09) 653-103 or Greg (09) 537-1231 or write to: P. O. Box 51-482, Pakuranga, New Zealand.



### 3. WILD ANIMALS IN AUSTRIA

The following appeared in the February 1991 edition of the Taumarunui Rod Rifle and Gun Club newsletter:

*"In Austria (Central Europe), which has a well developed wild animal management and hunting system, the following number of wild game were shot in 1989:*

<i>Red deer</i>	<i>41,000</i>
<i>Chamois</i>	<i>29,500</i>
<i>Wild boar</i>	<i>10,200</i>
<i>Roe deer</i>	<i>229,000</i>
<i>Total</i>	<i>309,700</i>

*Austria is about the size of the North Island and has a population of 7.5 million people. How come their forests can sustain such a large number of game animals without any damage to their ecosystem?*

*We think DOC could learn a few lessons from them if they would bother to look."*

We felt the points raised deserved a reply.

Austria is a mountainous country which has much of its forest and mountain land habitat remaining in a natural state. In contrast, New Zealand's landscape has been drastically modified over the past 150 years as natural habitats have been turned into pasture. Only about 30% of this country's land area remains in a natural state, including regenerating forest habitat.

The game animals harvested in Austria all occur naturally (i.e., they are native animals) and have evolved over millions of years along with the plants and other animals of that region. Deer, pig and chamois are all a natural part of European ecosystems, just as kiwi, kakapo, giant wetas and tuatara are (or were) a natural part of New Zealand ecosystems.

The difference is that the plants and animals that evolved over millions of years in New Zealand had never been exposed to the influences of browsing or predatory mammals. So when these animals were liberated here the ecological balance tipped and dramatic changes occurred. Many species, due to their genetic makeup or behaviour, were able to survive the changes but many others became extinct, while still others are desperately struggling to hang on.

It is DOC's role to ensure that as many as possible of our native species have a long term future in New Zealand. Unfortunately for big game hunters, introduced animals do affect natural ecosystems and the native organisms which depend on them. They therefore must be controlled on DOC estate to levels below those that could be supported by the habitat.

But all is not lost for New Zealand game hunters. They have an important role to play as the major harvester of introduced animals.

A survey of hunters conducted by Forest Research Institute in Christchurch in 1989 estimated that the following numbers of introduced game were shot in New Zealand in 1988 by recreational hunters:

*	Red deer	40 407
	Sika deer	6 683
	Fallow deer	3 607
	White tail deer	1 502
	Other deer	282
	Pig	101 653
	Goats	87 677
	Chamois	1 794
	Thar	782
	Total	240 454

While many of these animals were taken on private land (the survey estimates 31% of hunting is undertaken off DOC estate), the figures show that New Zealand game harvests don't compare too badly with those of Austria, particularly if you consider that we only have half the human population.

So despite likely differences in game species, available habitat and population densities, as well as different management objectives, hunters in New Zealand do well compared to Austria. On average, the figures suggest that 0.04 game animals per capita are taken each year in Austria, compared to 0.08 per capita in New Zealand (i.e., twice as many animals are shot per person each year here). Hunting is also free and available to all in New Zealand, a situation you won't find anywhere in Europe.

\* Harvest figures courtesy of:

Forest Animal Ecology Section  
Forest and Wildland Ecosystems Division  
Forest Research Institute  
PO Box 31-011  
CHRISTCHURCH

## 4. TAUPO 1991 : CHANGES IN THE FISHERY

A Guest Article by Peter Gould

*Views expressed in this article are not necessarily those of the Taupo fishery management.*

This year, more than any other I can remember, has seen anglers questioning just what is happening in the fishery.

It has been a time after some changes have been introduced, the most far-reaching being the reduction in the limit bag from eight fish to three fish, and a reduction to two in some wilderness areas.

The intention of these law changes is, of course, to preserve the resource, and a side-effect is that it forces the resource to go round more people. In other words the skilled angler is forced to release fish or stop fishing once the limit is neared or achieved.

Some would argue that the angler who, through good skill and management, has put himself into the right place at a time when the fish are biting deserves this good fortune. However, people can hardly argue with the fact that if numbers are down action has to be taken. Only time will tell whether it is the right action, for the other complicating factor is that the condition of the trout has been poor, and that is an unusual factor in the situation where numbers are supposed to be down.

As well as this reduction in the limit bag, some steps have been taken to curtail the growing effectiveness of the nymph as it came to be practised in this district. These steps limited the size of the hook able to be used, and prohibited the use of indicators which were really floats supporting the nymph bombs being used. These measures have been fairly well accepted by fishermen.

My recollection of this season starts with the spring fishing in 1990, which I found dominated by slabs, fish in poor condition. These didn't seem to recover condition with their normal speed, or at least numbers remained high. Whenever I boat-fished the lake shallows good fish seemed to be absent.

The same would be true of the stream mouths over summer, where the fishing was very patchy and the fish mostly in poor condition. The cool-water mouths didn't seem to attract their usual numbers of fish, even when conditions looked good and tried and proven techniques were used.

When we came to the winter, the runs just wouldn't start. Different people had different theories. Some said that the fish were shooting through the lower river stretches, or that the low lake level or lack of river flooding had kept them out in the lake. The odd good westerly blow brought a few fish into the Waitahanui, but nothing like the number one would expect, and the Hinemaiaia and Tauranga-Taupo remained hard.

Time after time fishing sorties found an empty river, or a few fish running up, but still without condition on. Some Tongariro fishing was had, but to nowhere near the extent one would expect.



Anglers were concerned on learning that their lake is now also host to increasing numbers of catfish, and these are being taken on the fly, at night, at the southern and eastern stream mouths, and now seem to be spreading around the lake. The fact that they are often full of smelt when caught has anglers wondering about competition for the food resource.

Certainly the hot lures and flies of recent years don't seem to be as effective. Most anglers would know that the luminescents, the flies that glow in the dark and have been so effective on rainbows in recent years, don't seem to be so reliable in taking fish any more. The fish often either ignore them, or bite cautiously, or in fact become shy. They still work sometimes, but without the consistency of the past.

The Glo-Bug and Muppet variations of the Egg-Fly aren't the same fish producers they were. Some would say that this is good. Anglers probably can't say whether the fish are indeed changing their habits or nature, or whether it is just that there are less of them about.

I do know that it wasn't until about the start of June that I had any good night fishing at the stream mouths, and it was only about then that the fish seemed to start reaching their condition.

Out in the lake some good fish were still being taken quite deep, and some anglers spoke of lots of small fish being present. So if the resource is in fact there one wonders. Many anglers are asking questions like these. Did we then miss out on a generation of trout? Was there a year when summer floods killed the fry? It is unusual that all the rivers have suffered, for it hasn't happened like that before. Has the low lake level put the fish off running into fast flowing and shallow lower river stretches, and have the normal stream mouth accumulations of fish in fact not come in to gather there?

Other questions anglers could ask concern whether the low lake level has affected the smelt spawning, or whether the catfish are giving the smelt or trout fry a hard time.

There are many questions anglers ask, from those about pine forests affecting the acidity and therefore the productivity of the lake, to shag numbers increasing, to whether the super-effective and sometimes dubious fishing practices have exploited the fishery. Some of these thoughts are pure desperation stuff. The question of pressure on the fishery has also been posed.

We are now in an excellent position to judge some of these things, for with the lowered bag limit and a decrease in the number of licences being sold, some of the questions will have to be answered. The resource as it stands must become less exploited and if fish numbers don't increase it will be a worry, particularly if the condition of the fish remains poor and the runs into the rivers don't come.

Some anglers would feel that now is the time we have to grapple with some of the issues. The small streams that struggle into wide bays and are the important life-givers through spawning opportunity need to be carefully managed, in particular streams like the Whangamata and Mapara. They have to be checked for good spawning habitat, without pumice silting and weed encroachment over the spawning gravels.

More needs to be made of the smaller streams with spawning potential where waterfalls impede the progress of the trout.

One could also say that the food resource could be looked at critically to see if it is sufficient and whether there are any factors affecting it.

Some of the most knowledgeable anglers I know feel that Taupo will come again, for it always has, and that the unusual weather is the most critical factor affecting it.

Certainly, the lake is low, as low for as long a time as it has been in the memory of most people. The rivers are suffering from this lack of rain also. Whether the smelt have had the spawning opportunities they need in the shallows is a good question.

Also, the rivers are shrunken; fishing in them is going to be hard, and the fish scary.

These things provide a challenge, and if anglers want to make the most of what is offered, they will have to cope with them. Whether the trends are signs for the future or just the symptoms of an unusual year remains to be seen. Time will tell.

There are things that the fisherman can do to enhance the opportunities that are offered. There are fish in the rivers, and anglers will have to look harder and fish more conscientiously for them in the low, clear-water conditions.

Another move can be back to the wet fly, for there are signs that the fish are tiring of the nymph. This will mean more dawn and dusk fishing, for the nymph fisherman has certainly become lazy in that middle-of-the-day fishing has become the norm.

The angler may have to look at foregoing the luminescents, or using them less often, as they aren't the productive force that they once were. The traditional night-fly patterns like the Scotch Poacher and Craig's Night-time or Marabou may be better bets.

One can only hope that the lake level comes back up to an intermediate level, and that the normal winter rain pattern returns.

The wider questions involve whether fish stocks which can be harvested need to be released to provide a resource for the angler. Perhaps this will help to reduce the rumblings of discontent heard frequently this season. Certainly some interesting scenarios with this have developed in the Rotorua fishery, particularly in terms of numbers of big fish.

Above all, if the big runs arrive soon with the rains all will be forgotten, and some anglers will have worried a lot, and all for nothing. But if nothing happens, all in all it will have been a most unusual season, and some anglers will have worried a lot with reason. The fact is that all this is a lot of conjecture, pretty inconclusive stuff, and some hard facts would be interesting. As Taupo has never let us down before, it couldn't really happen - could it?

## 5.

# BITZ 'N' PIECES

### **Kalmanawa Forest Park Helipads**

The temporary helipads which were opened for the roar in the Tiraki, Waimarino, Waiotaka and Whiti-kau catchments of Kalmanawa Forest Park appear to have been well patronised again this year. Aerial concession holders report considerable interest in the Whiti-kau and Tiraki sites in particular. A recent inspection of all sites revealed minimal rubbish and other impacts, paving the way perhaps for further access to other areas in the future.

### **1080 Operations - Winter 1991**

Both the Waikato and Manawatu/Wanganui regional councils have requested approval from DOC to lay 1080 poison to kill TB-infected possums within the Tongariro/Taupo Conservancy this winter. The areas involved are clearly identified on your June-September conservancy hunting diary. Please make yourself familiar with the poison areas, and if you have any queries, ring us here in Turangi. The operations will not affect the majority of hunters using Kalmanawa Forest Park, Tongariro National Park, Tongariro Forest and Erua Forest.

### **Closure of Access Road 10 to Kalmanawa Forest Park**

At 4.00 p.m. on 22 May 1991 the Rotoaira Forest Trust Board, acting on behalf of the owners of access road 10 which gives access to the Kalmanawa Forest Park 15km south of Turangi, closed the road to all traffic except authorised Electricorp personnel.

Since the closure, a number of rafting companies have negotiated access rights to the upper Tongariro River. However, at the time of this issue going to press, blanket public access rights have not been negotiated. The department will continue to look at various options for public access but in the meantime persons wishing to use access road 10 should contact the Rotoaira Forest Trust Manager, George Asher, telephone (074) 68832 during normal office hours, to negotiate private access.

### **Southern Conservancy**

"A quiet roar" was how most hunters in the southern part of the conservancy summed up their adventures during the March/April period. Wet, windy weather and less vocal than usual stags were the main reasons given for the lack of success.

Goat control by ground hunters in southern Erua Forest has met with limited success due to inclement weather and the ruggedness of some of the country encountered.

Overhanging vegetation encroaching upon the main access road through Rangataua Forest was cut back by six New Zealand Conservation Corps members during May for a distance of 5km. This will enable a large truck to manoeuvre more easily when overlaying the road with gravel, a job which begins next spring.

Other road maintenance included the construction of a culvert and the overlaying of gravel on the worst sections of the access road through Bishop's property at Horopito. Further gravelling is hoped to be carried out next spring also. Hunters are reminded that they require an access permit, obtainable from DOC offices with the conservancy, before they can travel over this road.

### **New Public Access**

The recent development of 'The Point' subdivision at Whakamoenga Point on the northern shores of Lake Taupo has closed the somewhat historical public access across private land to Whakamoenga Point and the Maori rock carvings. Access to the point was very popular, particularly for anglers and picnickers, but the news for these and other people is good.

DOC Taupo staff have constructed a walk track leading off the existing Rangatira Point walking track down through the reserve to the boundary. It links with a well sign posted walking access along the newly designated Crown 20-metre wide public access strip round the lakeshore to Whakamoenga Point.

Users are reminded that this access is for walking only and are asked to respect the private property adjoining the access way round the lake edge.

### **Temptation!**

Users of Clements Road and many other areas are often fearful of vehicle break-ins while away hunting or tramping and most people have the good sense to take reasonable precautions against this happening. However there are exceptions!

During the height of the 'roar' and at a time when the 'Kaimanawa Thieves' were operating, staff came across the classic example of why thieves are so successful. A car parked at a campsite beside Clements Road had a fully operational semi-automatic rifle in full view on the back seat (presumably for the thieves' protection in case they were disturbed), a cheque book in full view also on the back seat (to buy goodies when thieves got back to town) and a cell phone on the front seat to tell their mates about the easy pickings!! We ask you!

TAUPO, NEW ZEALAND



Situated right on the boundary of Kaimanawa Recreational Hunting Area and Kaimanawa State Forest Park, Sika Lodge provides budget accommodation with hot showers, full toilet facilities and well equipped communal cooking area. Your own sleeping bag will be necessary.

Vehicle security services can be offered.

### **SIKA LODGE**

Phone Brent or Val Keightley  
Taupo (074) 84-728  
for reservations

**PLEASE BOOK EARLY**

## **Good Work by Conservation Corps**

A group of Conservation Corp workers spent several days with Taupo Field Centre doing an excellent job on a re-vamp on Clements Road.

Pot holing was completed on the full length of road, culvert entrances and exits dug out up to Clements clearing and most of those culverts cleared. This was done in conjunction with rotary slashing by a contractor up to Clements clearing.

Although more work is needed to complete road maintenance this was a valuable contribution by an enthusiastic group. Thanks also to Sika Lodge for providing accommodation for the group.

## **6. MEASURING HOW MANY FISH WERE CAUGHT LAST SEASON**

Over the past 12 months many anglers will have been approached by DOC staff and asked about their day's fishing, or seen a small plane flying overhead, zooming from one boat to the next or circling the Tongariro. Anglers may well have wondered exactly what has been going on.

These interviews and aerial counts of anglers have been part of the methodology used by DOC fisheries staff to estimate how many trout have been caught in the Taupo fishery over the past year - in other words, the annual trout harvest. Previous studies have shown that Lake Taupo and the Tongariro River account for approximately 68% (Shaw 1985) of the fish caught in the Taupo fishing district, so the survey has been conducted in these two areas to make the best use of the money and resources available for such a large job.

Unfortunately, because of the size of Lake Taupo and the huge numbers of anglers who fish here, it is impossible to talk to every angler who has caught a fish over the season. Instead we get a reliable and accurate estimate of the harvest per day by sampling the fishery at set times over the whole season, and then scale this up to derive a figure for the whole fishing year.

The easiest approach is to work out how many days of sampling we could do with the funds available and select sample days at random over the year, but this can cause various problems. Firstly, as an example, if a large number of the sample days fell over the peak smelting period in late spring, any harvest estimate for the year would be biased towards the very high catches which occur over this short season. Secondly, the variation of our final estimate (the "plus or minus %") will be very large, especially when we compare the harvest, for example, of mid-winter days on the lake where few fish are caught to December days when "every man and his dog" are catching fish.

What we have done to reduce this variation is to take all of the summer holidays as its own little group and sample four random days within that group. The same for winter weekdays, winter weekends, winter public holidays, etc., for each season, so that we have twelve groups of days on which we might expect similar effort and catches. This gives us twelve little surveys on the lake which, when combined, will give a more precise result than would random selection of days over the year. The same procedure has been used on the Tongariro River, with seven groups of days over the year and four sampling days in each group. This gave us 12 groups with four days from each sampled on the lake (48 days), and seven groups with four days from each sampled on the river (28 days), a total of 76 days sampled over 12 months.

So now that we have our sample days, what were the interviews and flights for? We can't interview every angler on a given day, but we can go out and find out the average number of fish caught per hour. These catch rates vary with the different angling methods used, the time of the day, and are also very dependent upon where people were fishing. This is why these factors were recorded by the interviewers. Anglers have been approached on the river banks and at various boat ramps and asked where and when they were actually fishing on that day, what method they have used, and how many fish they have caught. From these interviews we can establish the average number of fish caught per hour for each area, time and method.

The next step involves trying to estimate how many hours of fishing occur each day. Once we know this and the number of fish caught per hour, we multiply the two together and get the total number of fish caught. To estimate the effort we flew around the lake and up the Tongariro River counting the anglers actually fishing during set time periods. We made the assumption that this instantaneous count represented the average number of people fishing at any one time in that period. Trials indicated that this assumption is valid. If we know the number of people fishing at any one time in the period, and multiply this number by the length of the period, we get a measure of the total angler-hours of effort spent fishing during that period. For example, if we fly up the river in the middle of a four hour period and count 100 anglers, we can estimate that 400 angler-hours of effort were put into fishing over that four hour period. If the average catch rate for those four hours was 0.3 fish per hour, we can estimate that the total catch was 400 hours x 0.3 fish per hour, i.e., 120 fish.

This is done for each day sampled and the average harvest is then determined from the four days in each group. Once this average is calculated, we multiply it by the number of days in that group to give a total harvest for that type of day. Adding the totals for each group together gives a total estimate of the trout harvested from Lake Taupo and the Tongariro River for the whole year.

Now that the interviews and flights have been completed we are beginning the analysis of the large amounts of data collected. 6 380 interviews were taken from anglers fishing on Lake Taupo and the survey flights counted 18 100 anglers fishing on the lake during the 48 survey days. The largest single count of anglers was 667, taken on the morning of Easter Monday.

The 28 days of sampling on the Tongariro River resulted in staff interviewing 2 450 anglers and counting just over 3 000 anglers from the air. The largest single count from the air was 121 anglers, observed on the morning of 3 July 1990.

It is expected that the analysis of the data obtained will take approximately two months, so preliminary results should be available for the next issue of **Target Taupo**. Once the estimates of the harvest have been checked, the fishery managers will see how the actual number of trout caught compares to the annual trout production. It may be that the number of trout taken by anglers is approaching a level whereby the natural production can't keep up with the anglers' demands. If this is the case, further steps may need to be taken to limit the harvest.

A much smaller version of this survey will be carried out each year to monitor changes in the harvest.

### **Thank you note**

This survey is the largest of its type ever undertaken on a recreational fishery in New Zealand. A great deal of its smooth running and support from anglers can be attributed to the conscientious and reliable efforts of the small group of interviewers who toiled throughout the year on our behalf collecting the bulk of the interview data. We would like to thank the interviewers for their efforts and Cam Shepherd of Turangi Scenic Flights for his ever reliable and highly skilful flying. Most of all though we would like to thank the many thousands of anglers who were approached during the course of the survey for information on their day's fishing. Almost without exception interviewers and observers received a friendly greeting and full co-operation which made a difficult task that much easier. Thank you.

## **7. SOMETHING FISHY**

### **National Trout Centre - Kids' Fishing Days**

The fishing pond at the Tongariro National Trout Centre will be open on the following days in 1991:

- Sunday 12 May
- Sunday 16 June
- Sunday 14 July
- Sunday 1 September
- Sunday 22 September

Age Limit and Conditions - The pond is available to children from 6 to 14 years of age and they must be able to hold and control a fly rod. Tuition will be available from Tongariro and Lake Taupo Anglers' Club representatives. After learning to cast, children can register and purchase a day licence (\$1.60). They will then be assisted at poolside to catch a trout which will be weighed and measured and presented to them, along with a certificate to take home.

Hours - The pond will be open between 9.00 a.m. and 3.00 p.m.

Rods - Complete sets of gear are provided. Due to the possibility of disease being introduced, no other fishing equipment is to be used in the pond.

Facilities - Parking space is available and there is a picnic area near the pond. Barbecued food will be on sale - profits go toward future development of the centre. No facilities are available for cleaning fish and these must be removed whole from the premises.

The fish do not always bite on command and there may be some delays. Enjoy a stroll in the grounds and view our facilities while you wait for the kids.

### **24-hour Fishing Licence Agents**

For those anglers who are visiting the Turangi/Taupo area and wish to purchase fishing licences after hours, the following agencies are open 24 hours a day for your convenience:

Shell Turangi, State Highway 1, Turangi  
Midway Motors, Tongariro Street, Taupo  
BP Taupo, Cnr Ruapehu and Heu Heu Streets, Taupo

### **New Taupo Fishing Regulations**

A change to the fishing regulations means Taupo licence holders are no longer able to fish in the Mohaka and Rangitaiki rivers or the Waikato River downstream of the Huka Falls.

The change has been made at the request of the neighbouring Eastern Region Fish and Game Council.

Under the previous DOC administration, holders of Taupo licences were given a concession allowing them to fish the Mohaka River and tributaries, the upper Rangitaiki River above the Otamatea Stream, and the Waikato River between Huka Falls and the Mihi Bridge. These areas actually lie outside the boundaries of the Taupo fishing district.

Doubts had been raised about the legality of this concession and suggestions made that the newly constituted Eastern Region Fish and Game Council would seek financial compensation for lost revenue. Therefore it was decided to remove the provision from the Taupo fishing regulations to ensure that Taupo anglers were not prosecuted by a neighbouring fishery authority for inadvertently breaching its regulations.

This change is highlighted on the front of the new licences.

### **New Taupo Fishing Licence Fees**

The Government has approved a new scale of licence fees for the Taupo fishery for the 1991/92 season.



From 1 July an adult's whole season licence will cost \$45, compared with \$42 last season. Other classes of licence have also increased by similar proportions. Month, week and day licences will cost adult anglers \$30.00, \$21.50 and \$8.00 respectively. Licences for children under the age of 16 will be \$6.00 for a whole season and \$1.60 for one day.

The increases were necessary to partially compensate for falling revenue due to a decline in licence sales. This trend began with the share market crash in 1987. Among the first savings people make in difficult economic times is their spending on discretionary items like holidays. Because the great majority of Taupo anglers are visitors to the area this is reflected in a downturn in licence sales.

The Taupo fishery is managed solely with revenue raised from licence sales. There are no general government or other funds supplied. DOC has cut its budgeted expenditure on the fishery by 25% (\$280,000) this year. However, it was still necessary to increase the licence fees to the new rates to meet the minimum level of funding required.

The proposed budgets and new fees have been discussed with the Taupo Fishery Advisory Committee. They were concerned at the reduced level of funding available for the fishery. However it was accepted that the present economic climate dictated, to some extent, the fees that could be charged.

Cuts have been made across the board, but particular efforts have been made to maintain a high level of compliance and enforcement activity. It is intended to establish an additional permanent position in fishery enforcement early in the new financial year.

While it was regrettable that licence fees had to be raised, the management and protection of the world famous Taupo fishery is paramount.

### **Anglers' Access Tracks**

The anglers' walking access track from Major Jones footbridge down to the Lonely Pool on the true right of the Tongariro River is one of the most difficult to maintain. From the footbridge down to the Island Pool the track is sound, but below this the river demonstrates a mind of its own by attempting to cut back into the original river bed. If the track is to continue, a small bridge will need to be built to cross this sidestream, a costly exercise for something unlikely to last very long.

Our advice to anglers who wish to fish the Lonely Pool is to wear chestwaders and come up from the main road bridge.

A bit of good news - thanks to John Johnson and his band of merry volunteers, the Waitahanui is now a cleaner place to fish after their annual cleanup of the riverside rubbish. An excellent effort!

## DOC Blows Blockages

DOC staff recently attempted to remove two log jams high on the Waiotaka River. These blockages had been preventing trout from migrating through to prime spawning water above. The department's explosive expert, Tom May, was called in to deal with these jams and, with assistance from fisheries staff, successfully demolished the obstructions.

The Lake Taupo fishery is totally sustained by natural spawning and the Waiotaka River with its extensive bed of coarse greywacke gravels is one of the key areas.



*A rather apprehensive Bonzu (middle) and Tom May prepare to abseil into the Waiotaka gorge to blow an obstruction in the river. Rob Pitkethley looks on.*

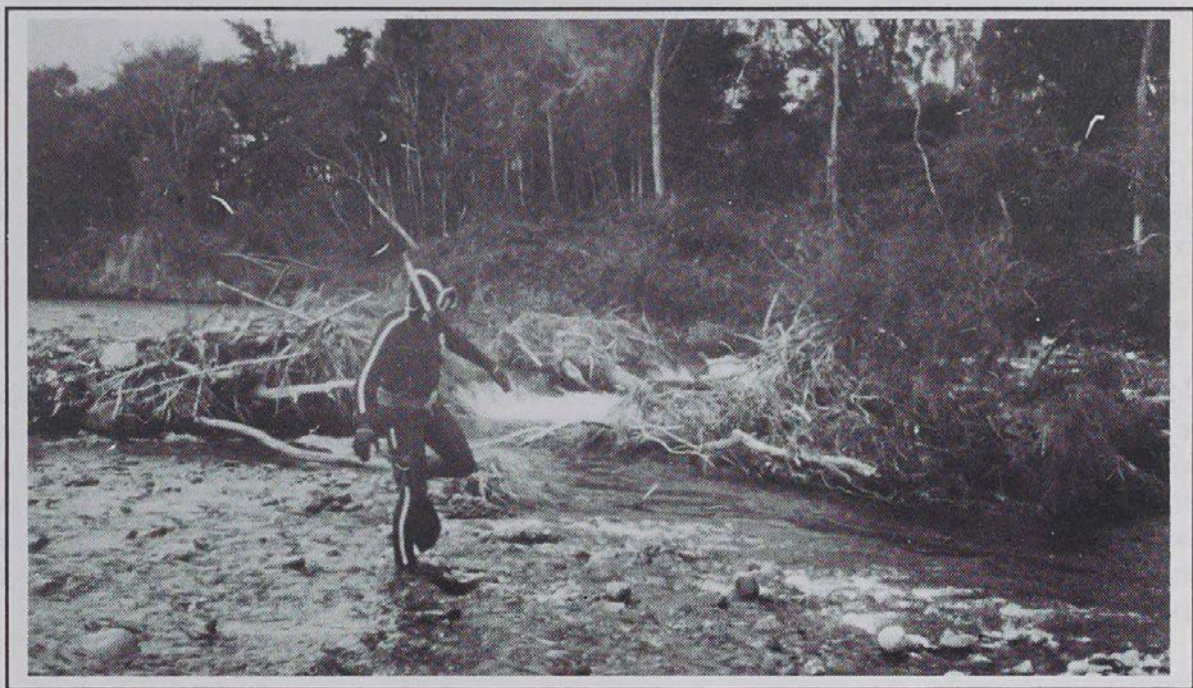
## Releases into Lake Otamangakau

1,000 adipose clipped fingerlings were released into Lake Otamangakau recently as part of an increased management effort planned for this lake. By monitoring the growth of these fish we gain a better idea of what the wild fishery is doing. It is essential that anglers catching any of these fish, characterised by a missing adipose fin, weigh and measure the fish and forward the information to us. As part of a change in our monitoring plan we are shifting our emphasis from opening weekend to increased effort over the peak fishing period in late summer. In this period the fish are in their peak condition, angling effort is the greatest and we can gain valuable information on the quality of the fish, the size of the fish and angler satisfaction.

It is also intended to write up the project involving releases in 1987 of Ruakituri and Taupo strain fish into Lake Otamangakau and the Whakapapa River. Look for a report in the next issue of **Target Taupo**.

## Escapement Surveys

Regular monthly surveys of spawning fish in the Whitikau, Waipa and Waimarino streams, and the Te Whaiiau Stream flowing into Lake Otamangakau, began in early May. These will continue through to October and involve counting all the mature fish present in selected sections of each river. Staff walk the smaller streams and drift dive the larger waters, a chilling experience in mid-winter. In addition, MAFish staff are undertaking a research contract into the Hinemaiaia River fishery on our behalf, and they drift dive three sections of that river each month. The reason for the surveys is to ensure that sufficient fish are reaching the upper river to fully utilise the available spawning gravels, and to provide a means of monitoring changes in the trout population brought about by future management actions. It is also planned, after several years, to compare relative numbers with angler satisfaction to determine how many additional fish are necessary to ensure quality winter angling.



*There's plenty of walking as well as swimming*

## Closed fishing areas

This time of the year heralds a closing of some fishing waters for the winter months to protect the spawning fish.

For the closed season, 1 June to 30 November, new signs have been placed in the following areas:

**Hinemaiaia River** - 300m downstream of the powerhouse using the old pole to fasten the sign to. It is located on the true left bank. From the bridge on SH1 upstream to the sign is approximately 3km. A sign has also been placed at the main entrance next to the main sign on the left-hand side of the road as one travels up the valley towards the dam.

**Walotaka River** - At a point known as the Korohe Crossing. The sign is positioned on the true left bank.

**ALL** these signs have black printing on a white background. The wording is simply - **“NO FISHING ABOVE THIS POINT FROM 1 JULY TO 30 NOVEMBER”**.

There is no doubt that signs of this nature may be open to vandalism, abuse, theft, etc. However, we will do our best to keep the general fishing public informed of matters of this nature.

With the new season now underway we would ask anglers to read their licences as a first reference to where they may and may not fish.

Me nohoro te kotou kainga maha.

### **Hirangi Stream**

This is a small stream which flows into the lower section of the Tongariro on the left side in the vicinity of what was the Jones Pool. In times gone by, the stream was an important little spawning area for Tongariro trout. However, over recent years the stream had become choked with willows and the gravel covered with sediment to the extent that few adult fish were using it.

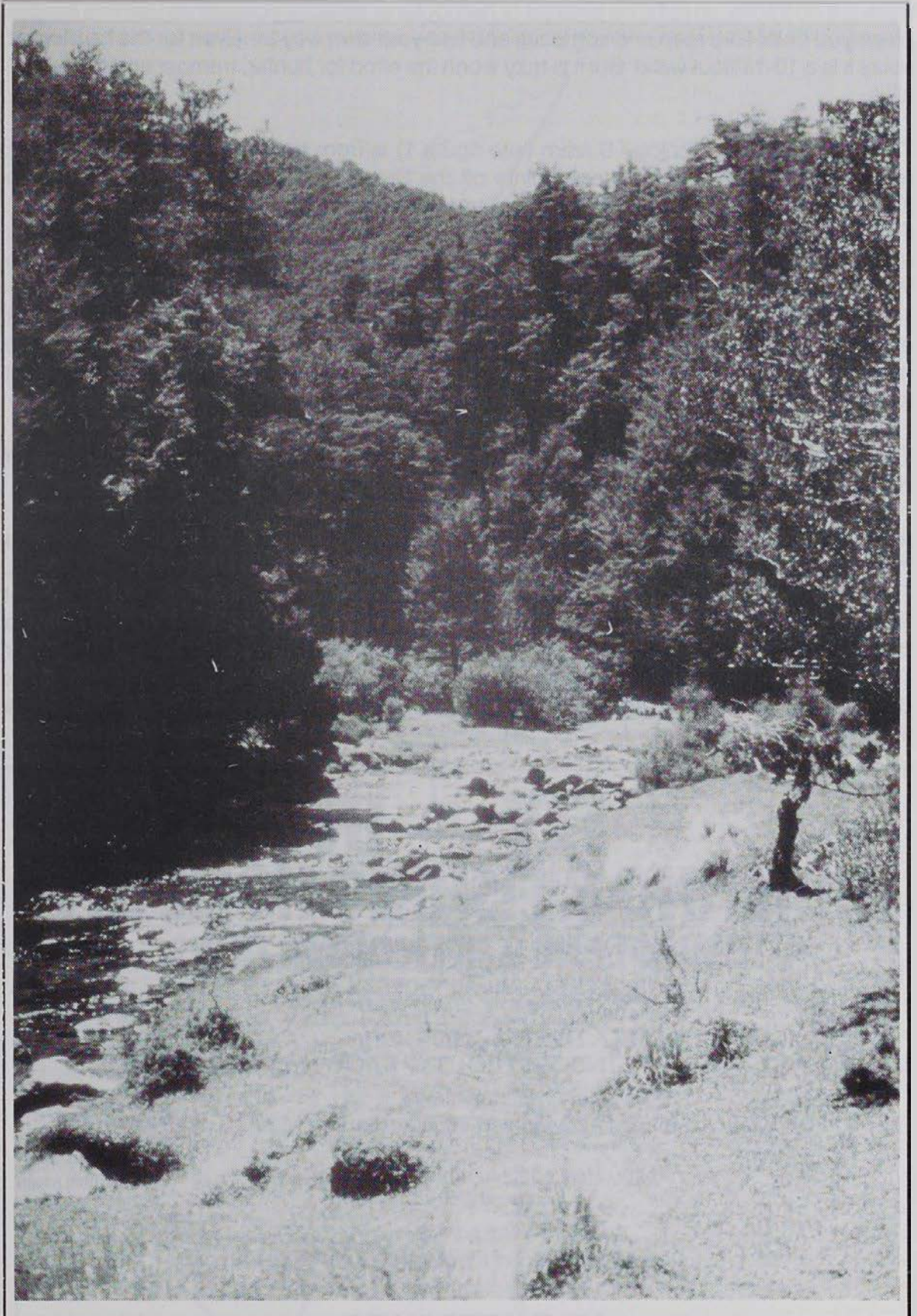
In response to this and in consultation with departmental fishery staff, the Turangi/Tongariro chapter of Trout Unlimited NZ completed the first phase of a restoration project on the stream during the autumn just passed. This involved clearing willow and weed growth to reopen the stream channel and the resultant improved stream flow has carried away much of the sediment and re-exposed the underlying gravel. TU stalwarts Frank and Carol Harwood have already reported several pairs of fish using the stream this season and numbers should build up as the spawning runs progress. This is good news for the future of the fishery.

Well done TU.

## **8. FINDING YOUR WAY**

You've perhaps heard of a mystical catchment called Ecology Stream in the headwaters of the Rangitikei River, where deer abound, blue duck are seen every day from camp, and the beech forest cloaks some of the most rugged mountains in the North Island. It is indeed a special place!

But how do you get there? DOC does not allow your friendly local helicopter operators to fly you there because the area has a “remote experience zone” designation. This means



*A typical stretch of Ecology Stream*

there are no tracks, no huts, no airstrips or helicopters - in fact, if you wish to visit this special place you must take map and compass and find your own way in. Even for the hardest of souls it is a 10-15 hour walk! But it is truly worth the effort for hunter, trumper and fisherman alike.

The best access to Ecology Stream (see figure 1) is from the Waipakihi Valley which is reached from one of two access points off the Desert Road. The most direct is from Kaimanawa Road, 15km south of Turangi, over Mt Urchin to the mid valley (about 3-5 hours). From the point where the Urchin track drops into the Waipakihi Valley it is a 15-20 minute walk upstream to the start of a route known as "Thunderbolt". Thunderbolt takes you out of the Waipakihi Valley and over the "Kaimanawa" or "Middle" Range. The journey varies from 6-12 hours duration depending on fitness, weather conditions and the weight of your pack, but expect to be on the open tops at altitudes exceeding 1500m a.s.l. for at least 4-6 hours. We recommend you do not try to cross the route in bad weather as it is not poled and is difficult to follow except in clear conditions.

Thunderbolt falls steeply into the Upper Rangitikei River about 30 minutes upstream of the Rangitikei/Ecology Stream confluence.

An alternative route to the upper Rangitikei River is via Waipakihi Hut in the head of the Waipakihi Valley, accessed via the Umukarikari track from Kaimanawa Road (4-6 hours). From Waipakihi Hut a 2-3 hour walk over Junction Top will put you in the upper Rangitikei River about 3 hours walk upstream of the Ecology Stream confluence. You should be aware that as you climb to Junction Top you cross into private Maori land leased by Air Charter Taupo. Once you reach the Rangitikei you remain on this leased land for about 1 hour's walk downstream. Permission should be sought from Air Charter Taupo before accessing via this route.

# FLY — IN HUNTING & FISHING HOLIDAYS

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INTO KAIMANAWA & KAWEKA RANGES  
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HUNT: ★ SIKA DEER ★ RED DEER

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15 Private Blocks available.

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huts and helipads.

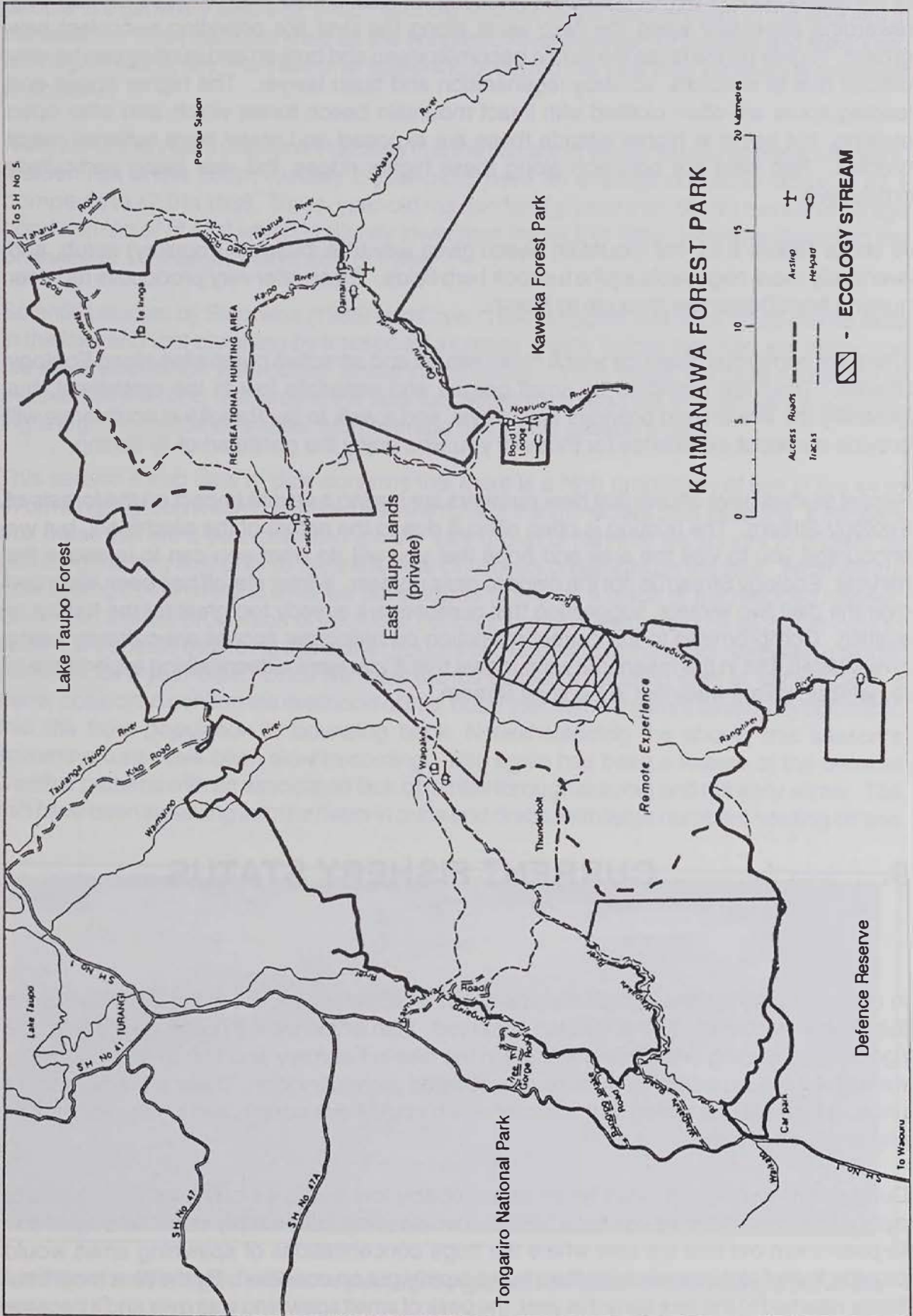
We fly rafting parties  
into the head-waters of the Mohaka & Ngaruroro Rivers



Write to  
**AIR CHARTER  
TAUPO**  
P.O. Box 2, Taupo  
Phone (074) 85-467  
for more information

**AIR CHARTER TAUPO**

Figure 1 - Access to Ecology Stream



So what do you find once you reach Ecology Stream? The mountain beech forest typical of the valley floor is dense but open. Hunting for sika on the river terraces can be very rewarding especially when the herb fields along the river are providing succulent new growth. Higher on the faces the terrain becomes steep and broken and hunting can be very difficult due to windfalls, scrubby regeneration and bush lawyer. The higher ridges and leading spurs are often clothed with intact mountain beech forest which also offer open stalking, but being at higher altitude these are exposed and many have suffered major windfall. Red deer are common along these higher ridges, the roar being particularly productive.

At about 1250m a.s.l. the mountain beech gives way to sub-alpine (monkey) scrub, and eventually more negotiable alpine tussock herb fields. These offer very productive red deer hunting from December through to March.

There are numerous clearings which make natural and attractive camp sites along Ecology Stream. Trout are restricted by small gorges and waterfalls low in the catchment, but generally the stream bed provides easy travel, and a walk to the Rangitikei confluence will provide a special experience for those of you who enjoy the gentle art of fly fishing.

Recent studies have shown that deer numbers are having a severe impact on the forests of Ecology Stream. The hunting is often difficult due to the nature of the catchment, but we encourage you to visit the area and hope that you will do what you can to increase the harvest. Ecology Stream is not the place to pass up deer. Winter die-off has been recorded over the past two winters, suggesting that numbers are already too great for the habitat to sustain. Compromises to the current restriction on helicopter access are currently being investigated, but in the meantime we suggest that if you want a deerstalking experience to remember, take a week out in Ecology Stream.

## 9. CURRENT FISHERY STATUS

In our guest article, Peter Gould comments on an apparent decline in the condition of the fish. This was something that we also observed. Fish which were still very poorly from the rigours of spawning (kelts) were evident in the lake in February and March when normally we might have expected them to have recovered more condition. There are a number of unusual features this spring and summer which could have contributed to this, rather than any shortage of food.

During spring when river flows fell to unseasonably low levels, we observed far more kelts dying in the rivers than we had seen before. It would seem there simply wasn't enough water to push them out into the lake where the huge concentrations of spawning smelt would provide fruitful pickings allowing the trout to rapidly put on condition. By the time most trout finally returned to the lake early this year, the peak of smelt spawning was over and it became

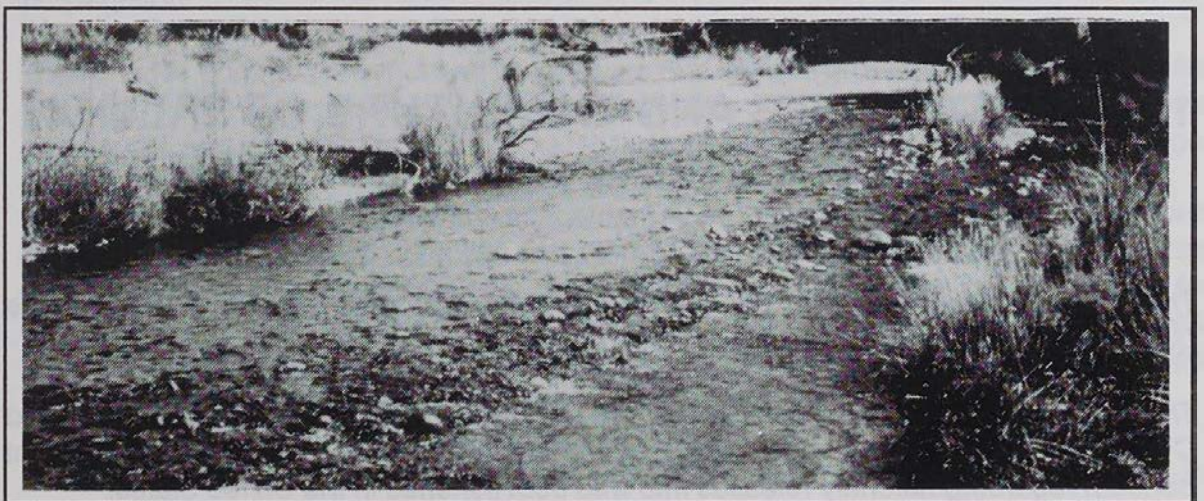


that much harder for fish to regain condition. Summer spawning also occurs a lot more than people are generally aware of, which also contributes to the kelts present in the lake late in the season. This year a run went up the Tongariro River between Christmas and New Year, although whether any more summer spawning occurred this year than in previous summers is doubtful.

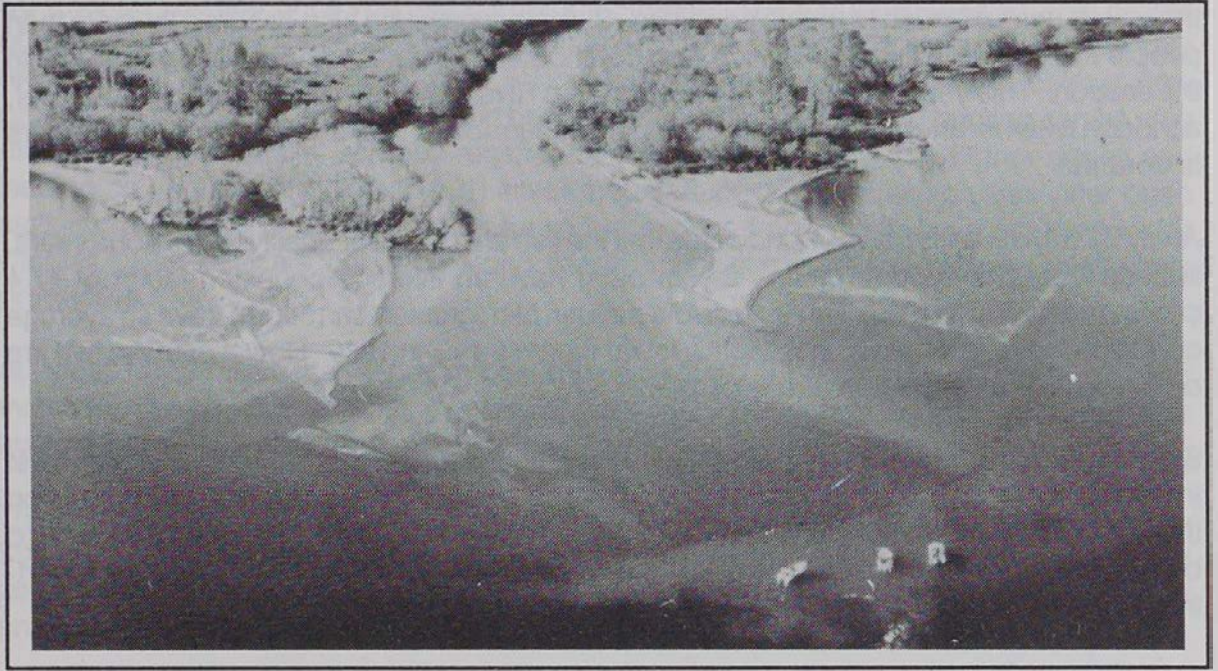
Analysis of this year's trap runs indicates that the fish are of similar quality to previous years. Maiden fish under 50cm (usually 2-year-olds) have an average condition factor of 47.4 compared to 47.0 in 1986. Three-year-old maiden fish (greater than 50cm) have an average condition factor of 41.0 which is slightly lower than the 44.6 in 1986. However these fish are on average 1cm larger than those of 1986.

Scientific studies by Stephens (1985) and Cryer (1990) suggest that huge smelt stocks exist in the lake and that cropping by trout could increase greatly before they had any impact on the smelt population (see catfish article in this issue). At this stage, we have no reason to believe that the food resource in the lake has deteriorated and yet river anglers are reporting a high incidence of smaller than average fish in this season's runs.

This season's trap data to date confirms that there is a high proportion of fish in the 44 to 47cm length group when compared with the runs of the immediate past seasons. It appears that these fish are 2-year-olds and are the very group of fish that we sought to protect by reducing the bag limit prior to the traditional Christmas onslaught on the lake. What we are now seeing in the rivers is what we have hoped to see as a result of the reduced harvest. Given that a small proportion of each age cohort in the population returns as 2-year-olds to spawn, we should be seeing this same group of fish returning to the rivers next year in bigger numbers as 3-year-olds. Once we have the full season's trapping data in, we will be in a better position to confirm the likelihood of this, but at the moment we are cautiously optimistic that the trout population is bouncing back. Notwithstanding the above, this season's spawning runs have been slow in coming. This again has been a feature of the unusual weather patterns with an associated lack of rainfall through autumn and the early winter. The fish have been sneaking into the rivers in dribs and drabs, with large numbers holding off and



*Low flow conditions and extensive periphyton growth are ideal for the young trout in the river*



*With the trout holding off the river mouths the Tongariro Delta has provided some excellent angling*

waiting for a significant flood before they run. Not surprisingly, the fishing in the lake off the stream mouths has continued to be very productive. On a further positive note, the low flows and associated weed and algae growth on the river beds has been very good for the survival and growth of juvenile fish from last season's spawning. These fish have therefore had a very good start before entering the lake and should add another strong age class to the apparently already improving population.

## **10. HATCHERIES AND THE FUTURE OF SALMON AND STEELHEAD IN THE NORTHWEST**

*The following is a shortened version of an article written by Dr Ray Hilborn, Professor at the University of Washington's Fisheries Research Institute.*

*This article was first published in "The Osprey", a newsletter published by the Steelhead Committee of the Federation of Flyfishers in the United States. It summarises current concern regarding hatchery releases into wild trout fisheries in the United States.*

*The trout population in Lake Taupo is totally 'wild' and, at its current low ebb, anglers have suggested supplementing the fishery with hatchery stock. American fisheries manage-*

*ment has already been down this track. The views expressed in this article are not necessarily those of the Taupo Fishery management but the article does highlight many of the less obvious problems associated with hatchery releases and summarises the real doubt now being cast on the value of hatchery releases into wild trout fisheries.*

Below my office window at the University of Washington School of Fisheries is our small salmon hatchery.

Every fall thousands of school children come to see the chinook and coho salmon return to their natal waters. Our graduate students show them the fish and demonstrate how eggs are taken, mixed with sperm and how, magically, the life cycle of salmon is renewed.

These tours are the most significant public relations activity of our school.

It was only after three years of seeing the annual cycle of school visits that I began to wonder if we were really doing the right thing. Hatchery tours are common throughout the Northwest and I fear that the message they convey is that 1) salmon come from hatcheries, 2) habitat loss and pollution are so widespread that natural spawning fish are dying out or are extinct, and 3) the long term survival of salmonids depends upon hatchery technology.

I believe that fisheries scientists share a collective responsibility for the public belief that the maintenance of salmon runs depends upon hatchery operation.

This belief is particularly pernicious because it inexorably leads to the acceptance of hatcheries as a mitigative measure for habitat loss and dam construction. This view can be expressed as "If the wild stocks are doomed anyway, let's just build the hatcheries and get it over with."

This belief is not just found among the general public; many professional fisheries scientists also believe that the future of salmonids is in hatcheries. They believe that resources that could go into habitat protection or fisheries management would be better spent on artificial propagation.

The fisheries community in general is not aware that artificial propagation in the Northwest has failed to live up to expectations. Nor are they aware that artificial propagation poses a substantial, and perhaps the major, threat to the long-term viability of our salmon heritage.

Indeed, throughout the world most management agencies seem to be relying on some form of artificial propagation to "rebuild" fish stocks that are depleted due to poor fisheries management or poor habitat management. Artificial propagation has been proposed for such diverse species as herring, tuna, abalone and giant clams - the list is nearly endless. Thus the lessons we have learned with salmonids in our part of North America are of direct and important relevance around the world.

### **Are hatcheries sustainable?**

Fisheries management is a long term proposition, our responsibility is to assure that the fisheries resource will be maintained by our generation for the next generation. We need to

assure that 20 and even 100 years from now there will be salmon and steelhead in our rivers.

If hatcheries are to be used as mitigative measures, we must ask not only do they work now but will they continue to work, and will they permit the maintenance of natural runs?

Unfortunately, most evidence suggests that while hatcheries may work initially, their success decreases after a few years.

Figure 1 shows the trend in survival for a major hatchery programme, coho in Oregon.

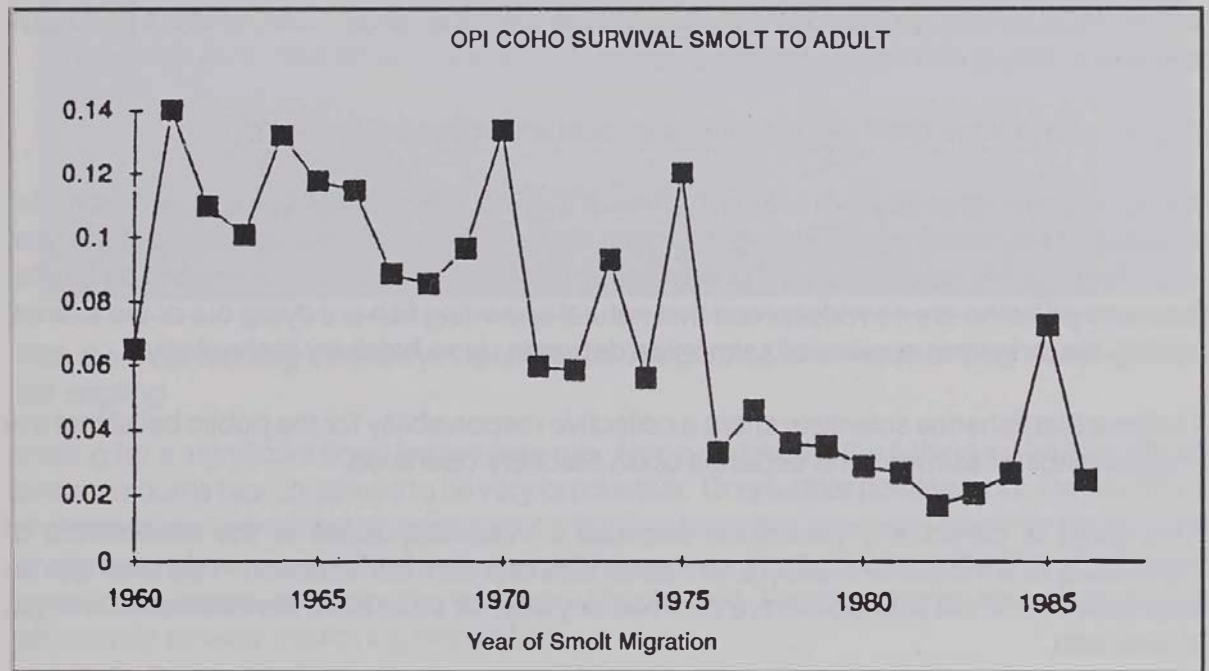


Figure 1

This pattern of declining survival of hatchery-reared fish is found in nearly every hatchery programme in North America.

There is no well accepted explanation for the declining survival from hatcheries. The causes may be genetic changes, predator build up, disease accumulation or a host of other potential problems.

The cause doesn't matter as much as the conclusion - hatchery production is probably not sustainable over decades. To assume it will work for a century is a bold assumption indeed - one that puts the salmon/steelhead resources of our children at great risk.

### Impacts of hatchery fish on wild stocks

Artificial production poses a great threat to the maintenance of wild fish. This threat comes in at least four forms:

- direct competition for food and other resources between wild and artificial fish;

- predation of artificial fish on wild fish;
- genetic dilution of wild fish by artificial fish allowed to spawn in rivers and streams;
- and increased fishing pressure on wild stocks due to artificial production.

There is ample evidence that salmonids compete for resources at most stages of their life history.

Figure 2 shows the survival rate of sockeye salmon from Babine Lake, a tributary of the Skeena River in British Columbia. The number of juvenile sockeye leaving Babine Lake was increased by artificial spawning channels.

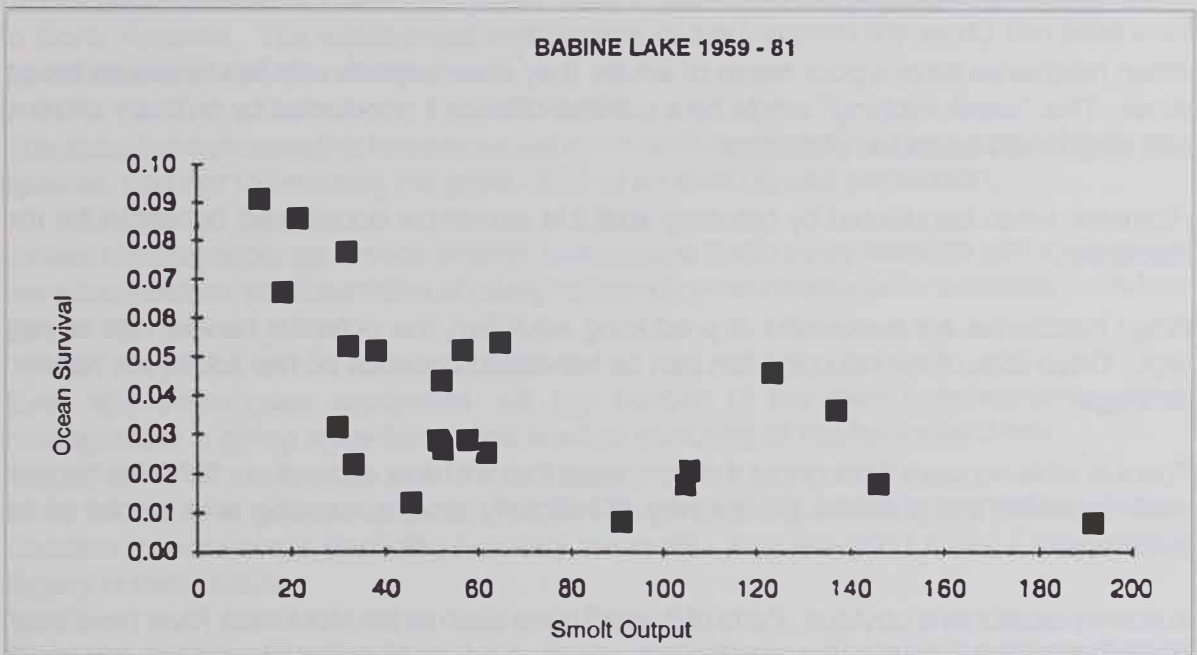


Figure 2

The more fish that left Babine Lake and swam down the Skeena River, the smaller proportion of them survived their ocean life.

A major impact of this change is that the wild runs from the Skeena River have declined approximately 50%.

Salmon and steelhead compete for food and space in freshwater and in the ocean. We should expect that as we increase the numbers of hatchery fish they will compete with wild fish, and the survival of wild fish will decrease. It is foolish to assume this will not happen.

Proponents of artificial propagation like to think of their hatcheries "giving a boost" to the wild stocks, particularly by allowing surplus hatchery fish to spawn in the wild. These extra spawners, turned away from the hatchery, are hoped to add to the natural spawning population.

Accumulating evidence suggests that the hatchery fish often do poorly in the wild, and that by reproducing with wild fish, the hatchery fish cause poorer survival of offspring of wild parents.

Two mechanisms explain this. First, hatchery managers select for fish that do well in hatcheries; that is, for fish that can hatch in plastic trays and learn to feed on a man-made diet. In the wild, fish must find mates, lay eggs in gravel, avoid predators, and find natural food. The requirements of a successful hatchery fish are very different from a successful wild fish and it should be no surprise that fish selected for a hatchery may do poorly when facing the rigors of a real river.

Second, hatchery practice often has involved taking brood fish from a watershed and using them in a hatchery elsewhere. Thus, the thousands of years of natural selection for particular rivers have been swamped.

When hatcheries have a poor return of adults, they often capture wild fish to use as brood stock. This "creek robbing" would be a criminal offence if conducted by ordinary citizens and they would be called poachers.

However, when conducted by hatchery staff it is somehow considered beneficial for the resource.

When hatcheries are successful at producing adult fish, the potential harvest rate is very high. Often 95% of the returning fish can be harvested because so few adults are needed for eggs.

There is wide concern throughout the Northwest that we have allowed our fisheries harvest rates to match the potential productivity of hatchery stocks, causing wild stocks to be overfished.

In some places this is obvious. Parts of Puget Sound such as the Nooksack River have been declared off limits for wild fish, and the harvest rates are so high that no wild fish can make it back to spawn.

Just north of Puget Sound, in Canadian waters between Vancouver Island and the mainland, harvest rates on coho salmon are as high as 95%, sustainable only by the most successful hatchery stocks. The net result of these high harvest rates is that as hatchery production has increased, wild stocks have declined. But the Canadians have no more coho now than they did 15 years ago. They have swapped hatchery fish for wild fish.

### **The real threat : the technological fix syndrome**

The real danger of hatcheries and other forms of artificial production is that they provide an excuse for habitat loss and poor fisheries management.

If we believe in hatcheries, then we can allow the rivers to be dammed, silted and destroyed. Just mitigate with a hatchery.

Even more dangerous is the spread of the technological-fix syndrome. If hatcheries don't work now, we will try some other form of hatchery technology.

The current new idea is 'supplementation' by which eggs are incubated in a hatchery and then spread throughout a watershed to rear naturally.

### **Great hatchery successes**

Whenever I speak out against the hatchery fetish, people ask about the great successes - trout in freshwater lakes, salmon in the Great Lakes, and the Japanese chum salmon hatcheries.

These programmes are undoubtedly successful. Introduction of exotic species or monoculture often works reasonably well. Rabbits did very well in Australia, starlings do well in North America. The widespread introduction of trout around the world has produced some valuable recreational fisheries.

However, in most cases this has amounted to the replacement of indigenous species by new species, and not to boosting the production of an existing wild population.

Indeed my first response to each of these examples is that in every case the wild species that were there before have been almost totally replaced by the introduced or artificially produced fish.

Even with these great successes, we see echoes of our own concern here. Trout management is going away from hatcheries to nurturing of habitat for wild fish.

In the Great Lakes, where introduced Pacific salmon generated a major recreational fishery, concern mounts about declining hatchery survivals - they just don't know if their salmon fishery is sustainable.

The highly successful chum fishery in northern Japan has produced large catches of chum salmon for Japanese fishermen, but the total yield of salmon from northwest Pacific waters has not increased. It is quite possible that Japanese chum have simply replaced the naturally occurring mix of six species of salmon with a single species.

### **What should be done?**

Is there a place for hatcheries? I really don't know. Certainly if all hatcheries were now closed, the catch of chinook and coho salmon in the Northwest would drop greatly. We could certainly expect some wild stock production to rebound, particularly if we devoted some of the resources that have gone for hatcheries to habitat protection and improvement. Closing all hatcheries now would certainly cause a lot of pain to recreational, Indian and commercial fishermen - but it might ensure the long-term survival of the fish and the fishermen who depend on them.

## 11. TROUT CENTRE WATER SUPPLY

It's taken 65 years, but now it's there! The hatchery water supply intake at the Tongariro National Trout Centre was recently extended to the spring at the source of the Waihukahuka Stream giving a cleaner, more dependable supply of high quality water for rearing trout.

During the past six weeks a Taihape firm, Byfords Construction Ltd, has carried out a \$36,000 project to connect the spring to the existing intake with a 600mm diameter, 120m aluminium pipeline, which was designed and supervised by Works Consultancy Services.

The work has been cold and difficult, coinciding with a period of snowfalls and icy conditions; it was hard enough getting to the job and home again without spending 6-7 hours each day doing heavy work in a wet suit in freezing conditions.

An alternative water supply was pumped from the Tongariro River to the hatchery raceways while the work went on. This allowed the present supply dam to be drawn down over a metre, easing working conditions a little. Nevertheless the depth ranged from 1-2.5m, the water temperature was 11°C and the chill factor was high with a south wind coming off the snow. It was a lazy wind which blew most of the time - too lazy to go around anyone standing in its way.

The 20m sections of pipe were sealed and towed upstream with a rubber ducky to be fitted together, sealed off and bolted up. The downstream end butts into the existing concrete intake while the upstream end pokes out of a small weir built across the mouth of the spring. The pipeline is supported by wooden trestles rammed into the streambed and with the water level in the supply dam restored it is covered by 1-2m of water.

The new intake removes the need to screen out algae and plant litter from the hatchery supply and it protects the supply from pollution and run off from State Highway One which is adjacent to the stream.

A 1981 letter from the then hatchery manager to the Conservator of Wildlife appears to have first alerted people to the danger of run off from the highway but the algae growth and plant litter problems have existed from 1926 when the hatchery first began operating.

At first the hatchery supply was drawn from a dam 30m upstream from the hatchery building. Over the years the intake has moved upstream through two other dams to the existing one, built in 1974 by Ministry of Works and Development. Now it has arrived at the spring and hopefully that will be the end of it for many years to come.



## 12. TARGET TAUPO READER QUESTIONNAIRE

As a reader of "Target Taupo" you are invited to formally have an input into the type of information you would like to read about in this newsletter. By answering the few questions below you will also give us a clearer picture of how we can best circulate the newsletter to ensure that all who are or might be interested can get hold of it. Your contributions and comments are appreciated.

1 How did you get to read **Target Taupo**?

- a) Subscriber
- b) Through your club
- c) Purchased from sports shop
- d) Other (please specify) .....

2 Is the newsletter useful to you as a hunter/angler or does it just have interest value?

.....

3 What other types of information would you like to see included in the newsletter?

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4 General comments:

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A complimentary copy of each issue will be sent to your club or organisation and further copies are available at a cost of \$2.25 each (GST inclusive). Individuals are also welcome to purchase copies. Please complete and return the form below.

Copies of earlier issues are available on request.

**NAME OF PERSON/CLUB/ORGANISATION**.....

**POSTAL ADDRESS**.....  
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**PHONE NUMBER**.....

Please send .....copies of issue number.....at cost of \$2.25 per copy.  
Enclosed is the sum of \$.....(cheque/money order)

OR

1 year's subscription (3 issues) beginning issue number.....  
Enclosed is \$6.75 (cheque/money order).

Copies additional to the complimentary copy will not be forwarded unless payment is received.

POST TO:

**Department of Conservation  
Private Bag  
Turangi**

**Attn: SHIRLEY WEIR**

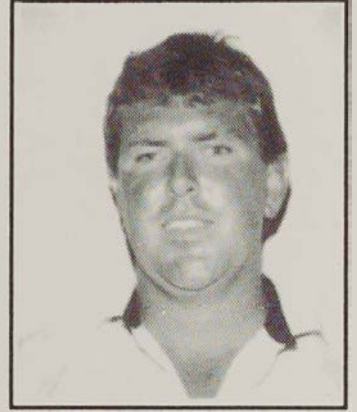
# 13. MANAGER PROFILE

## WAYNE BONESS

Wayne is based in Taupo and is part of the Compliance and Enforcement team responsible for the Taupo fishery and crown legislative requirements.

On leaving college, Wayne joined the New Zealand Forest Service and gained his New Zealand Certificate in Forestry. After completion of his training (much of which was spent in the Taupo area) he was posted to Tararua Forest Park where he worked until returning to Taupo in June 1990.

Wayne's varied interests include cricket, claybird shooting, gun-dog trialing, hunting, photography, gamebird hunting (perhaps ducks could be painted orange to increase the strike), and fishing (a pastime he found more time for before shifting here).

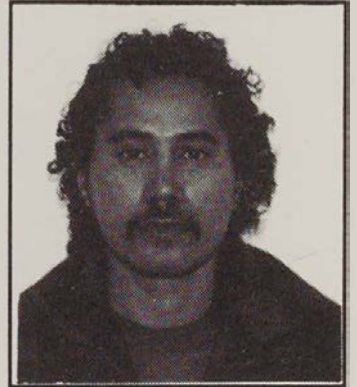


## ADRIAN (BONZO) NGAMOTU

Adrian Ngamotu, better known as "Bonzo", is based in Turangi. Bonzo is responsible for maintaining anglers' access, willow control, water advocacy and trout habitat protection.

As a qualified electric fishing machine operator and more recently a scuba diver, Bonzo will try his hand at anything!

A keen horseman and pig hunter, he combines both these sports in his spare time, and although not yet an accomplished fly fisherman (whatever that is), Bonzo has landed a couple of trout.



Proud of his Tuwharetoa descent, Bonzo has a great interest in the Taupo basin.

# TAUPO



CONSERVATION  
TE PAPA ATAWHAI



WORKING  
FOR  
YOUR  
SPORT



*A Sporting Paradise*