TARGET TAUPO

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

NOVEMBER 1996, ISSUE 23

Department of Conservation
Te Papa Atawhai

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Cover photo:
Sika stag on the Oamaru River flats.
(Mavis Davidson).

Can Recreational Hunting Pressure Help to Limit the Impacts of Sika Deer in the Kaimanawa Recreational Hunting Area?

by Wayne Fraser (Manaaki Whenua - Landcare Research) and Cam Speedy (Department of Conservation)

The following article is a summary of a Landcare Research contract report and is the first in a proposed series of three articles based on a recent DoC-funded study of sika deer and their impacts on the habitat in the Kaimanawa Recreational Hunting Area (RHA). This article provides an overview of the study, gives some key findings and their implications, and outlines possible options for future deer management in the RHA. Subsequent articles will look more closely at vegetation impacts and deer demography. The views expressed in the article are those of the authors and do not necessarily reflect Department of Conservation policy.

Background

Recreational hunting on land administered by the Department of Conservation is both a legitimate recreation in its own right and a potential tool for controlling introduced game species which impact on conservation values. In managing RHAs, DOC's primary role is the protection of indigenous natural resources. Fostering recreation is a secondary role where this does not conflict with the department's primary protection function.

The protection of conservation values typically requires very low animal densities. Hunters however, generally prefer higher animal densities. To evaluate the options for hunting management in RHAs and similar areas, DOC needs information on hunting usage, hunter requirements and the impact of hunting on deer populations, including an assessment of any conservation benefits that may result. As a step to providing such information, we attempted to assess the conservation benefits of recreational hunting in the Kaimanawa RHA.

We did this by examining patterns of road and aerial access, track and hut facilities, forest types, browsing pressure, seedling densities, and forest regeneration between hunting blocks within the RHA, and comparing these with indices of deer density.

The Kaimanawa RHA was chosen for this study because detailed data on recreational hunting effort and success has been systematically collected since the mid-1980s, as well as more than 1000 deer jawbones which provide good information on deer population age structure and condition. In addition, the vegetation in the RHA had been surveyed in 1978/79 and again in 1987/88.

Key findings and their implications

While the lower altitude forests in the northern parts of the Kaimanawa RHA (particularly around Clements Road) with their

richer species diversity and greater abundance of palatable species should have a higher ecological carrying capacity (i.e. the maximum number of deer that the habitat can sustain), the highest densities of deer actually occur in the higher altitude forests to the south. Consequently, browsing pressure on the vegetation is highest in the southern hunting blocks.

Despite the gradient of browse pressure from north to south however, forest cover in the Kaimanawa RHA does not appear to be seriously threatened. In particular, seedlings of the dominant beech canopy species appear sufficiently abundant to ensure canopy replacement, even in the southern blocks where there is greater reliance by deer on plant species of lower palatability. This is not the case in parts of the neighbouring Kaweka Range where heavy browsing pressure by sika deer is inhibiting mountain beech regeneration on critical sites following natural canopy collapse. These critical sites in the Kaweka Range are generally at higher altitudes and therefore closer to the natural limits for mountain beech. The presence of widespread beech regeneration in the Kaimanawa RHA suggests that the present level of recreational hunting has some conservation benefit, even if it is only in maintaining an intact forest canopy.

Ultimately, browsing by deer will cause a decline in the biodiversity of beech forests in the central North Island although many of these changes may not be fully apparent for many years. For many highly palatable species (e.g. *Coprosma robusta, Fuchsia excorticata, Griselinia littoralis, Pseudopanax simplex, Pseudopanax arboreus*), deer impacts are severe. While these species are still present (although only at very low densities in most cases), there is little or no replacement occurring and in the longer term they are likely to disappear from all but a few sites that are inaccessible to deer. Even at the lowest deer densities in the northern part of the RHA where good access and facilities (roads, tracks, camp sites, huts) for hunters result in intense hunting pressure, deer browsing pressure is still too high for widespread regeneration of these highly preferred species. Much lower deer densities would be required to achieve a reversal of the vegetation modification that has resulted from almost a century of browsing by deer in the north-eastern Kaimanawa Range.

The variation in seedling densities and browse indices that we recorded in different hunting blocks within the Kaimanawa RHA suggest that the impact of deer can be lessened to some extent by

increasing hunter access to more remote and inaccessible areas, particularly at higher altitudes. However, even if such measures reduced deer numbers throughout the RHA to densities similar to those found in the northern part of the RHA, it is unlikely to lead to anything other than subtle changes in the forest understorey.

Despite the variation in deer density from north to south, the apparent differences in impacts on the vegetation between the areas were not as great as we had expected. We suspect that this is because deer rely heavily on fallen leaves (litterfall) of species like broadleaf. Although only a small proportion of the litterfall produced is consumed, it does increase the amount of food available to deer and means that the ecological carrying capacity of the habitat is substantially higher than would be sustained by plant production within the reach of deer alone. However, unless recreational hunting pressure reduces deer numbers to well below the ecological carrying capacity, there is likely to be continued high browsing pressure on species whose seedlings (i.e. regeneration) are preferred over litterfall.

The current deer harvest is male-biased and there is some indication that this hunter selectivity favouring stags is increasing. If so (and if the total harvest remains similar), greater survival of females (the productive segment of the population) is likely to lead to population increases. However, small population increases are unlikely to lead to markedly greater deer impacts on the vegetation because of the buffering effect of litterfall. Other changes in hunting impact such as increased hunting success and a reversal of the harvest trend back towards more females may also result if such population increase occurs, particularly if hunters understand and support conservation management objectives for the RHA.

Options for future management of the Kaimanawa RHA

Although the level of recreational hunting pressure in the Kaimanawa RHA (300 hours per square kilometre per annum) is considerably greater than the national average (40 hours/sq.km/annum), there is probably some scope for further enhancement or manipulation of this hunting pressure to help improve conservation outcomes. Some of the possible options include:

1. Increasing access to remote and less accessible areas (particularly at higher altitudes). This would result in increased hunting pressure in sites where deer densities are highest. Provided that such a change involved an increase in the total hunting effort rather than just a redistribution of the existing effort, this should result in an overall decrease in deer density within the Kaimanawa RHA.
2. Increasing hunting pressure outside the roar period (when a significant part of the annual deer harvest occurs but is biased towards males). This would probably help to increase the female harvest. Such efforts to increase hunting pressure outside the roar would be best targeted towards spring when females appear to be more susceptible to hunters. This option has been successfully trialed in the Rangitikei catchment (to the east of the Kaimanawa RHA).
3. An education campaign aimed at increasing the number of female deer killed regardless of season. Publicity would be required in order to explain to hunters the need to maintain high hunting pressure on breeding-aged female deer. A focus on trophy stag production in the Kaimanawa RHA rather than 'deer' production

could help to increase hunter understanding and support for such an option since the production of good trophies requires high survival of male deer in an overall lower density population.

The potential cost of achieving these options would need to be assessed against any potential conservation outcomes.

Recognising the significant recreational value placed on the sika deer within the Kaimanawa RHA, alternative management goals could be (i) to increase hunting opportunities, (ii) to increase hunter satisfaction, or (iii) to reduce hunter concerns relating to safety and competition.

Increasing hunting opportunities is probably the most feasible and could be achieved through improved or additional access and facilities (e.g. huts, tracks, helicopter landing sites), particularly in less accessible parts of the RHA. This is likely to result in some small conservation benefits but again the potential cost of achieving these would need to be assessed against any potential conservation outcomes.

Increasing hunter satisfaction is generally associated with improving individual hunting success (i.e. increasing sighting and kill rates), but alternatively could also relate to overall hunter satisfaction with the area (i.e. maximising the annual harvest by all hunters). But hunter satisfaction is also related to an individual's motivations for hunting. A survey of hunters using part of the Kaimanawa RHA in 1986 and 1987 indicated that besides the attraction of hunting sika deer, it was more important to take home some venison than to shoot a good quality trophy. This suggests that management that focused on maximising the harvest from the RHA would find most favour with hunters and any measures designed to reduce deer numbers and to improve trophy quality might meet with resistance.

While any restrictions on hunting opportunity for reasons of safety or reducing competition between hunters to improve hunting success would be likely to meet with approval from the hunting fraternity as a whole, such restrictions would probably fail to find favour with individual hunters if they thought they would personally have to forego hunting opportunities. For many hunters, the Kaimanawa RHA is one of the most easily accessible sika deer hunting areas and has always been an open block and unrestricted hunting area. Furthermore, any measures which attempted to increase hunting success by restricting opportunity would inevitably be met with resistance from conservation interests as a result of the perception

that this would result in increased threats to conservation values.

The preceding discussion pre-supposes that DOC's conservation goals for the Kaimanawa RHA are simply to maintain an intact forest cover. If this is the goal, the present hunting regime is probably appropriate. However, if the goal is to increase regeneration of highly palatable species and prevent any further loss of biodiversity, then significant increases in recreational hunting pressure or alternative options (e.g. official control, commercial venison recovery) would need to be considered. It is doubtful whether recreational hunting pressure could ever be increased sufficiently to achieve this. Once animal densities become low, success is unlikely and most hunters will look elsewhere.

The option of official control would be expensive since deer numbers would need to be reduced to very low levels to achieve any significant vegetation recovery. Furthermore, it is likely that there are many other areas that would far outrank the Kaimanawa RHA for deer (or other ungulate) control funding in terms of conservation values as they are presently defined. While removal of RHA status and allowing venison recovery by commercial operators would involve minimal economic costs to DOC, the fluctuating economics of wild animal recovery, the smaller body size of sika deer, and the heavily forested nature of the Kaimanawa RHA means that such an option is unlikely to ensure significant long term benefits to conservation values. Furthermore, the political fallout from such an option among the recreational hunting fraternity would be significant and almost certainly outweigh any potential benefits.

Clearly, there is an ecological cost in having deer present, even at low densities. However, as we are unable to eliminate deer from anything other than small localised sites using current deer control techniques without huge expense, it is a cost that conservation managers may have to accept. Even if the funding resources and technology were available, it is arguable whether it would be politically acceptable to attempt to eliminate or control at very low densities a recreational resource as highly prized by hunters as sika deer populations in the central North Island. Therefore, it is unlikely that changes to the present management of the Kaimanawa RHA would extend beyond improved monitoring and limited manipulation or enhancement of the present hunting pressure.

Summary and Conclusions

Our results indicate that selective browsing by deer has influenced and will continue to influence forest composition and dynamics in the Kaimanawa RHA, as it does elsewhere. The current level of hunting pressure within the RHA appears sufficient to maintain a forest canopy, even in the southern hunting blocks where deer densities are highest. While present deer densities do not seriously threaten forest cover, they have had and will continue to have an ongoing negative impact on forest composition, and a negative impact on its quality as deer habitat as the most palatable species are completely removed. Currently, the most notable effects of deer on the forests of the Kaimanawa RHA are serious declines in the abundance of these highly palatable species (e.g. broadleaf, pate, Asplenium ferns, and large-leafed Coprosma species, five-finger, etc.). How much more deer-induced change occurs will depend on the level of control exerted. The effectiveness of recreational hunting as the principle means of control is dependent on access, facilities, the seasonal distribution of hunting effort, and perhaps more importantly, on the attitudes of hunters to the harvesting of female deer. If DOC wants to influence the attitudes of recreational hunters and their consequent impacts on deer populations in the Kaimanawa RHA, its conservation managers will require an effective rapport with hunters and hunting groups. This will be enhanced by the provision of quality access, facilities and information. In turn, a greater understanding by hunters of the impacts of their harvesting efforts could potentially further assist conservation outcomes. Support and co-operation from hunters in the provision of quality data, including hunting diaries and jawbones, will at the very least aid routine management of the RHA which in turn will increase our understanding of the relationships between hunters, the deer population, and the habitat. Such understanding is vital to ensure the long-term viability of recreational hunting as an animal management mechanism in this and similar areas of conservation land.

How many fish are caught from Lake Taupo?

by Rob Pitkethley

Over the 1995/96 fishing season we repeated the trout harvest survey which was done previously during 1990/91. The survey measured the catch and harvest of trout taken from Lake Taupo and the Tongariro River over a full season. Catch is the actual number of fish caught, while the harvest is the number of fish kept. Very briefly the survey involved interviewing anglers at boat ramps and along the river banks to calculate catch and harvest rates (how many fish anglers caught or kept per hour) as well as estimating the number of anglers-hours fished by counting anglers from a small aircraft several times during the day. The fishing season was split into different groups of days, and we sampled four days at random from each group, and then added all the groups together to give the season total. Once all the number crunching was finished, some interesting aspects of the harvest were revealed. In the following article you can compare your own fishing experiences to the general picture.

Lake Taupo

The total harvest of trout taken from boats on Lake Taupo over the 1995/96 season was 79,705 fish (95% confidence interval of +7609), or a mean harvest of 218 fish per day. An overall catch of 99,140 fish (95% C.I. ± 19,482) indicates 19.6%, or one in five legal sized fish caught by boat anglers are returned to the water. The total effort expended by all anglers was in the order of 341,000 hours (95% C.I. ± 32,748). At an average trip length of 2.9 hours this represents 117,560 angler visits over the season.

Table 1: Comparison of the 1995/96 Lake Taupo harvest with the 1990/91 season

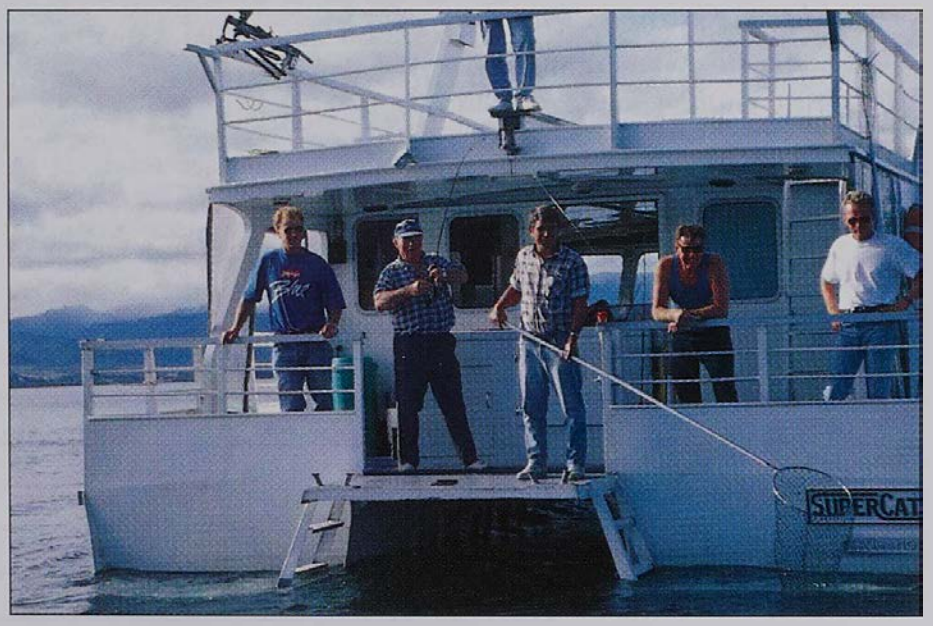
Characteristic	1995/96	1990/91	% change
Total angler hours	340,940	340,000	+ 0.03%
Catch	99,140	82,881	+ 19.6%
Harvest	79,705	69,248	+ 15.1%
% oversized returned	19.6%	16.4%	

Comparing the 1990/91 and 1995/96 survey results shows that the estimate of harvest taken during the last season has increased significantly. The calculated harvest of 79,705 fish taken during 1995/96 compares to the harvest of 69,248 fish from 1990/91, an increase of 15% (Table 1). Total angling effort was identical between the two seasons so the increased catch reflects that catch rates were considerably higher in 1995/96 than they were five years earlier.

A significant difference between the two surveys was in the distribution of angling effort through the year. The daily effort for the late summer and winter period was approximately half of what it was five years earlier, and over the spring period the effort was similar between surveys. However, the Christmas and January periods during 1995/96 showed an increase of 30% in daily angler effort from the 1990/91 survey.

Analysis of the catch and harvest by method shows that non-guided anglers take 53% of their catch by deep trolling (lead and wire lines), 36% by shallow trolling, 7% by downriggers and the remaining 4% fly fishing from an anchored boat. Of 16,950 anglers counted from the air only 620 (3.5%) were using downriggers.

The guided harvest from Lake Taupo over the 1995/96 season was estimated at 10,900 fish (95% C.I. ± 1,386) from a total of 13,680 legal sized fish caught over 31,710 (± 4,100) hours. This represents an average catch rate calculated over the whole season for guided anglers of 0.43 fish per hour compared to 0.26 fish per hour for non guided anglers. Guided anglers make up 9.2% of the lake angling



Angling effort has remained unchanged since the first survey five years ago but higher catch rates mean the harvest is significantly higher

effort and take home 13.7% of the total lake harvest. They also returned 20.2% of their legal catch compared to the 19.5% returned by unguided anglers.

The Tongariro River

On the Tongariro River the estimated harvest for the period from 1 July to 23 October 1995,and 5 April to 30 June 1996 was 13,853 trout (95% C.I. ± 1,864), taken from a total catch of 20,860 fish caught over 71,610 hours of fishing. This is a harvest of 69 fish per day (95% C.I. ± 5 fish). A small sample (n=159) of completed angler trips obtained from Tongariro anglers indicated the mean length for a trip on the river to be 2.82 hours. This equates to approximately 25,390 trips over the season or an average of 126 anglers every day.

Analysis of catch rates shows that the start of the winter has a higher catch and harvest rate by anglers using sinking lines. The figures for sinking line suggest that the runs are already well underway in April and it is known that this method fishes very well early in the season. However as we move into winter sinking line catch rates fall quickly, and anglers using floating lines start catching more fish per hour. Catch rates for both methods seem to be lower during the middle of the winter and rise again later in the spawning runs.

Comparing the Tongariro harvest with that estimated over the 1990/91 season indicates that the harvest was up 11.2%, the catch up by 26.4% and the total effort down by 19.0%. As this suggests, the catch rates for the winter fishery were substantially higher during the 1995/96 season than those experienced five years earlier. The overall catch rates (total fish/total effort) from all river data collected during the two surveys are shown below in Table 2.

As well as substantially higher catch rates during 1995/96, many more legal sized fish were released. Last season 39% of such fish were released compared to 23% in 1990/91. This is likely due to the restrictions imposed by the reduced bag limit (cut from eight fish to three in December of 1990) combined with the increased practice of

Table 2 :
The catch rates (fish per hour) by method as estimated from the two major Tongariro River surveys

Method	1990/91	1995/96
Floating line	0.18	0.27
Sinking line	0.15	0.17
Combined	0.17	0.25

catch and release.

The considerable drop in angler effort on the Tongariro River over the last season can in part be attributed to the influence of the 1995 Ruapehu volcanic eruption, and several floods which moved large amounts of volcanic ash into the river. As well as this making the river difficult to fish for small periods of time, a lot of anglers may have perceived that the river was not fishing well at any time. However those anglers that persevered caught considerably more trout per hour than five years ago. The data also show that the traditional wet line fishing methods are becoming less favoured by Tongariro anglers. The 1990/91 survey indicated that nymph anglers comprised 57% of the anglers and took 68.9% of the catch. This is considerably less than the 80% effort and 84% catch measured in the 1995/96 season.

Using the figures for the lake and the Tongariro we can calculate over the 1995/96 season an estimated 643,000 hours of fishing resulted in a harvest of 129,600 fish from the whole fishery. This represents 96.6% of the estimated effort and 114.5% of the estimated harvest of 113,200 from the fishery calculated over the 1990/91 season. To calculate the tonnage of trout caught this last season the total fishery was split into river fisheries (using an average weight of 1.95 kg per fish), and lake fisheries (1.52 kg per fish). These weights are higher than those used in the 1990/91 survey (1.75 and 1.4kg respectively) and reflect the slighter larger average size of trout in recent years.

Table 3:
The calculation of the total tonnage of trout caught in the Taupo fishery.

Season	Tongariro River	Lake Taupo	Whole fishery
1990/91	21.80	96.94	175.60 tonnes
1995/96	27.02	120.50	216.92 tonnes

Angler experience

It is obvious from the data the more frequently an angler fishes the higher their catch rates are and they harvest a considerably greater proportion of the fish. Adult season licence holders had the highest catch rate of all anglers, and those anglers that fished more than 100 days per year caught more than twice the fish per hour than those anglers who fished between seven and 20 days per year.

The results show that the Taupo fishery is still heavily harvested, although the decreased bag limit since 1990 and increasing catch and release has held the harvest to similar levels to 1990/91. With higher

catch rates and an increased fish size it appears the fishery is now in a healthier state than it was five years ago, and the monitoring of natural production supports this view. Production is known to cycle through high and low years, and as poorer years approach it will be important to monitor the harvest as accurately as possible to try and

Table 4:
The average catch and harvest (trout killed per hour) rates for anglers grouped by their reported number of days fished per year

Number of reported days fished per year	Mean catch rate	Mean harvest rate
2 to 7	0.21	0.16
8 to 19	0.21	0.17
20 to 49	0.32	0.25
50 to 99	0.39	0.28
100 plus	0.51	0.33
One day unguided	0.21	0.15
One day guided	0.43	0.34

prevent the effects of a very high harvest that were seen in the late 1980s and early 1990s. It is good to see anglers taking an active role in the protection of this world renowned fishery and as more anglers appreciate its unique qualities, and with careful management, its sustainability should be assured.

Investigations of the Stress Caused by Trapping Rainbow Trout in the Whitikau Stream

by Shaun Clements, University of Waikato

In 1995 the Department of Conservation funded a masters student to undertake research into whether our trapping programmes caused stress on the trout. The following is a brief summary of his findings.

Introduction

In many countries, including New Zealand, trout are trapped and subsequently released to provide data for fishery management purposes. At present the Department of Conservation (DOC) operates fish traps at two locations in the Tongariro region to assess spawning populations. Each year approximately 13,500 pre-spawning fish are trapped. In addition, approximately 500 post-spawning trout (kelts) are caught by a variety of methods, on their return migration to the lake. The majority of these fish are trapped in the Whitikau Stream (12,480 pre-spawners in 1995). The information gathered from the trap (e.g. annual run size, proportion of males to females, mean length and weight of fish, and the age structure of the population) is used in conjunction with other research data (e.g. harvest surveys and echo sounding of the lake) to aid in the management of the fishery.

The present study was designed to evaluate the effects of trapping on a wild population of rainbow trout from the Whitikau Stream. This was achieved by measuring primary (plasma cortisol) and secondary (plasma lactate) indicators of stress in fish before, during and after different components of the trapping procedures. Plasma cortisol is a general indicator of 'psychological' stress while lactate is an indicator of physical stress. Both are measured by taking a blood sample from the fish and assaying for the relevant indicator. The trapping procedure consists of three distinct components which may be stressful; interruption of upstream migration by the netting

barrier; confinement in the cage; and processing. The emphasis of this study was to determine the effect of each of these components, both in isolation and in combination, on the magnitude and duration of the stress response. The effects of increasing fish density during confinement in the trap was also assessed. Field work for the study was carried out over the winter of 1995.

Results

Confinement - To examine the effect of confinement in the trap, trout were held in the cage, in groups of five or six, for 1, 5 or 10 hours. Following this their blood was sampled. The results showed that levels of cortisol and lactate peaked during the first hour and declined thereafter. Plasma cortisol levels (psychological stress) were still elevated after 10 hours in the trap, while lactate levels (physical stress) had returned to normal after five hours.

Density - To look at the effects of fish density during confinement, trout were held in the trap in groups of 10, 20 or 50 for 2-1/2 hours. The results of this experiment show that as the number of fish confined in the trap increases above 10 the level of cortisol (psychological stress) also increases. No such increase was observed for plasma lactate. During processing fish are removed from the trap one at a time so that the last fish processed will have spent

Obstruction by the barrier, confinement in the cage and handling may all produce stress responses in migrating trout. Conservation Officer Iain Maxwell processes fish in the Whitikau trap while Norrie Ewing records the details.

considerably more time in the trap, than the first fish processed. This had a considerable effect on the levels of plasma cortisol (psychological stress) with the levels increasing progressively from the first fish processed to the last fish processed.

Recovery - To see how long it took for trout to recover from the trapping, groups of 4-6 fish were held for 1 or 10 hours in the trap before being processed. They were then transferred to a stretch of stream which was blocked at either end and left to recover for up to 40 hours before their blood was sampled. Plasma cortisol levels (psychological stress) peaked sometime between 1 and 5 hours after processing and declined thereafter, but were still significantly elevated 40 hours after processing. In contrast, plasma lactate levels (physical stress) peaked sometime between 1 and 5 hours and declined rapidly thereafter, returning to normal within 15 hours of processing.

Discussion

Stress, through the action of cortisol, may:

a. lead to a reduction in the trout's immunity by lowering white blood cell numbers and reducing antibody production capacity;
b. negatively affect reproduction by altering levels and patterns of reproductive hormones that influence maturation;
c. reduce growth.

It is also well documented that the cumulative effects of several sublethal stresses may lead to a reduced ability to cope with subsequent stresses. This could lead to, among other things, reduced reproductive success, or death, even though, by themselves the contributing factors may not be harmful to the trout. Thus it is clear that any reduction in the stress response invoked by the trapping of fish will be beneficial to both the fish's survival and possibly, reproductive success.

The results of this study showed that the fish are clearly stressed by the trapping procedure. In particular, it seems that the first hour of confinement is the most stressful as levels of cortisol and lactate are at a peak. In addition, the fish confined for one hour took longer to recover than the fish that were confined for ten hours. Further, the density fish were confined at significantly affected the levels of plasma cortisol (psychological stress). A further consequence of the increased density was the increase in the time taken to process the

fish. This resulted in the last fish processed having some of the highest levels of plasma cortisol measured throughout the study. Therefore, on the basis of these results it is recommended that the number of fish in the trap be kept, where possible, to ten or less to reduce the stress. On occasions when the numbers of fish moving through the trap are low the fish should be left in the trap for up to ten hours before processing, or until the number in the trap exceeds ten. Hopefully these, and other measures, will ensure that the trapping procedure is least stressful and provides for minimal disturbance to the normal spawning migration of the rainbow trout.

Editor's Note:
On a typical day only one or two fish may move into the trap during daylight and perhaps 10 in the first few hours after dark. Clearing the pen at dusk and again at sun rise in the morning, as is our usual procedure, is in keeping with Shaun's recommendations. However, when a major run is on it is clear from Shaun's work we are better to process the fish regularly so that densities in the pen do not build up with the associated increases in stress that this causes.

To Catch A Catfish

by Glenn Maclean

In the last issue of *Target Taupo* (issue 22, July 1996) Grant Barnes summarised the results of his M.Sc. thesis into the biology of catfish (*Ictalurus nebulosus*) in Lake Taupo. This article obviously caught peoples' interest and prompted a number of enquires regarding how to catch catfish and what, if any were the legal constraints.

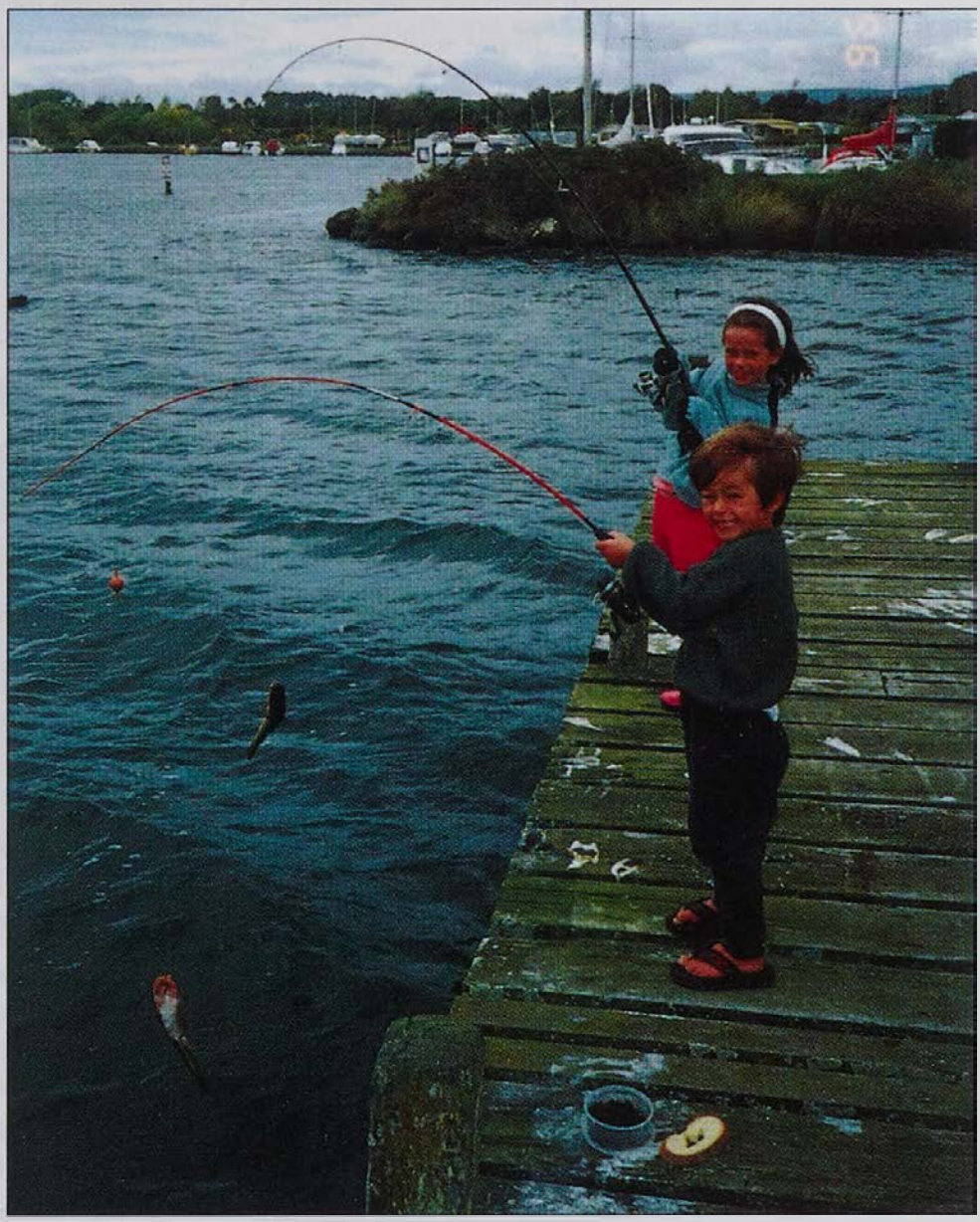
Fishing for catfish is not subject to any specific regulations, though there are of course many affecting the way in which you may fish for trout. If while fishing for catfish you accidentally catch a trout, using a technique which is illegal, you must release it unharmed immediately. Perhaps the regulation to be most aware of is that the use of any mollusc, koura (freshwater crayfish), worms, creepers, huhu grubs or fish roe as bait is specifically prohibited.

Should anyone think of using the excuse of fishing for catfish as a way of indulging in more nefarious ways of catching trout it is important to note that offences under the Taupo Fishing Regulations 1984 are strict liability. Basically that means the onus is on you to prove you were not fishing for trout if you are using an illegal technique, not on the ranger to prove you were. Don't be put off fishing for catfish by this, just be aware of it. Fishing off the Motuoapa breakwater into a couple of metres of water with a hook baited with bread is not a problem. However no catfish occur in any of the Taupo streams and someone fishing with roe in the lower Tongariro would find the excuse of fishing for catfish of little use. As a general guideline don't fish for catfish in any of the rivers, or use any of the baits listed above, or keep any trout. If in doubt give us a ring first.

As Grant highlighted, catfish are essentially nocturnal (night-time) bottom feeders, using their sense of smell to locate food rather than their poor vision. Their behaviour is also strongly influenced by water temperature and they are much more active and voracious when temperatures rise in summer. Occasional fish are caught on deeply sunk flies fished close to the bottom, especially by night anglers at the stream mouths. Very rarely fish are taken on deep trolled lures but by far the most successful technique is much more simple than that.

In Lake Taupo catfish thrive in shallow weedy areas like Motuoapa Bay, Waihi Bay and Acacia Bay. Find a spot like the breakwater wall, a jetty or anchor the boat so that you are fishing into several metres of water. As little as one metre of water is enough, especially at night. Use

a light spinning rod and knot a size #10 or 12 hook directly to the end of the line. A second hook can be attached to a short dropper 300mm above the bottom hook and the hooks baited with bread squashed onto the hook or a small piece of meat or bacon rind. At the most one or two split shot can be added to the line above the hooks but usually no weight is necessary. Cast the bait out gently, preferably into a reasonably clear area of the bottom close to a clump of weeds. Catfish tend not to be subtle about taking the bait but even so give them opportunity to take it properly before setting the hook. There are a lot of similarities to fishing for sprats off the wharf and needless to say, local kids have quickly become very proficient. The largest catches



The Motuoapa jetty is a popular spot for kids to fish for catfish

are made at night but in summer fish can also be readily caught during the day.

There has been quite a lot of comment that they are good to eat. I know of people who swear by them smoked or filleted and fried in butter. Equally though I am aware of others who were not so impressed so I suggest you try them for yourself. One word of warning. On the front edges of the dorsal and pectoral fins are sharp spines which catfish are very adept at inserting in your hand, with painful results.The easiest way to handle them is to use a cloth to hold them.

Catfish are not a desirable species in the lake so if you don't want to eat them they are still best killed and used for compost.Whatever you do, do not transfer them to any other waterway. Apart from the fact it is illegal under the Conservation Act catfish are extremely adept at colonising new areas, the population quickly reaching large size with a consequent impact on other aquatic life. For this reason don't let the kids take them home in jam jars. Catfish can survive for several days out of water or in any old ditch. Who knows where that may lead?

Something Fishy

Lake Taupo catfish monitoring

During 1995 a masterate student from Waikato University studied various aspects of the biology of the catfish (*Ictularus nebulosus*) in Lake Taupo. A summary of the results was presented in the July issue of Target Taupo. Following on from this study a programme has been designed to monitor changes in catfish density and diet at three sites around Lake Taupo. Each year, once a month for five months (November to March) two fyke nets will be set overnight at each site. Numbers of fish, their length and stomach contents will be collected and analysed. The programme will begin in November this year and results will be published in future issues of *Target Taupo*.

Monitoring juvenile trout

The survival of young trout in the Tongariro River last spring was severely affected by two very large floods and ash from the volcanic eruption. Numbers were greatly reduced but by just how many was very difficult to quantify.

As a consequence we have set up a monitoring programme to assess changes in spawning success from year to year. This is unlikely to allow us to predict how many fish will survive to reach maturity, as much of the key mortality occurs when the juveniles enter Lake Taupo, but will allow us to assess how different events affect spawning success and juvenile survival.

The programme utilises electric fishing and baited Gee Minnow traps (funnel traps) to catch young trout at five sites in the Tongariro River and two in the Whitikau Stream. Once a month the sites are sampled and juvenile trout densities assessed. The electric fishing machine is used for sampling the shallow margins of riffles and runs, and the traps set overnight in areas of woody cover and debris that the electric fishing machine cannot fish effectively.

The programme will also provide information on how juvenile trout use different parts of the river as they grow.

Winter river fishing survey results

From July to September this year many anglers on Lake Taupo's

eastern tributaries were interviewed by DOC fishery staff. Apart from having their licence checked, they were asked about how many fish they had caught and how they felt about their fishing experience this winter. This survey is now in its fifth year and provides a valuable insight into angling success each winter and anglers' degree of satisfaction with their Taupo fishing experience.

Over the three months, 529 anglers were interviewed, with 360 from the Tongariro and 82 from the Tauranga-Taupo. The following table summarises the catch rates (fish caught per hour of fishing) for the latest survey and compares them to those recorded over the previous four years.

Table 5 shows that the catch rate in the Tongariro is consistent with previous years and judging by the satisfaction survey answers, acceptable to anglers. It was noticeable that up until late July the fishing in the Tongariro was patchy, some very good days interspersed with some very ordinary days. However, through August the fishing was consistently very good as large numbers of fish finally ran the river. For most of the winter the river contained huge quantities of ash which changed its whole character. The Bridge Pool was definitely the hot spot this season but many other hot spots were just small pockets rather than the more traditional pools. Anglers able to put time in on the river and who moved around soon discovered these pockets, often quite insignificant looking water, which would produce four or five fish on a regular basis.

Table 5: Overall catch rates for anglers interviewed on the Tongariro and Tauranga-Taupo Rivers, 1992 to 1996

River	1992	1993	1994	1995	1996
Tongariro	0.27	0.30	0.21	0.24	0.24
Tauranga-Taupo	0.23	0.41	0.31	0.27	0.13

Recently, several large floods have cleaned the river up significantly and it is much more like its old self.

The Tauranga-Taupo is a different situation, the catch rate declining since a high in 1993. There are several possible reasons for this. Firstly, over the past few years there has been a steady increase in the numbers of anglers fishing this river, a situation compounded by anglers leaving the Tongariro when it became contaminated with volcanic ash. As the river is relatively small and the water clear, trout tend to be put off by large numbers of anglers in the pools. It also takes a few visits to become educated in the knack of fishing the

Tauranga-Taupo, particularly if an angler's previous experience was on the Tongariro.

The apparently low trout numbers also raises the possibility that the very high harvest which occurred at the mouth of the Tauranga-Taupo over late summer and autumn this year directly resulted in fewer fish running the river to spawn.

A breakdown of the catch rate data shows a marked difference between wetfly and nymph fishing. In all sections (lower, middle and upper) of the Tongariro, fishing a nymph was more popular (86% of effort), and effective (0.25 fish per hour c.f. to 0.19 fish per hour for wetfly anglers). In the Tauranga-Taupo nymphing was also the most popular (91% of effort) and effective (100% of catch). In past seasons the wetfly has proved very successful on this river and its lack of use suggests that some of its skilled proponents were not present, at least on the days surveyed.

Table 6 shows the catch rate recorded for the Hinemaiaia and Waitahanui rivers this year.

As can be seen from the table the Hinemaiaia fished very well reflecting the very high trout numbers counted as part of our spawning surveys (see note on spawning counts in Something Fishy).

Another important aspect to these surveys is to assess anglers

Table 6:
Combined catch rates for Hinemaiaia and Waitahanui River, 1996

River	Catch Rate
Hinemaiaia	0.52
Waitahanui	0.22

perceptions of various aspects of the Taupo fishery. Anglers were asked how they rate the size and quality of the fish they caught, their success and enjoyment this season. The categories were rated from 1 to 5, where 1 is terrible and 5 is excellent. This year instead of asking separate questions about the size and quality of the fish they were combined as most anglers consider size and quality to be closely linked. Table 7 shows the average response for each of the various categories. It is interesting to note how these have varied over the past five winters.

Anglers view of their own level of success has fallen from several years ago but the high levels for enjoyment show that most anglers are still deriving a great deal of pleasure from fishing these rivers.

To finish the survey, anglers are asked about those things that detract from their angling experience. On all of the rivers surveyed the

Table 7
Average ratings given by anglers interviewed from 1992 to 1996

	Tongariro				
	1992	1993	1994	1995	1996
Size of fish	3.7	4.2	4.2	3.8	
Quality of fish	3.8	4.3	4.2	3.9	
Size & Quality of fish					3.9
Your success	3.5	3.7	3.6	3.4	3.3
Your enjoyment	4.3	4.8	4.6	4.6	4.5

	Tauranga-Taupo				
	1992	1993	1994	1995	1996
Size of fish	4.0	4.2	4.2	4.0	
Quality of fish	4.1	4.3	4.3	3.9	
Size & Quality of fish					3.8
Your success	3.6	3.9	3.9	3.6	3.2
Your enjoyment	4.8	4.8	4.8	4.7	4.5

majority of anglers said there was nothing (60% on the Tongariro, 76% on the Tauranga-Taupo, 81% on the Waitahanui). Interestingly overcrowding on the Tongariro was not raised as often as in the past three years (30% in 1993, 17% in 1994, 24% in 1995, and 11% this year). This reflects the decline in angler numbers this winter and was one positive aspect of the aftermath of the eruption.

Already this summer the harling is underway and anglers are reporting catching numerous small fish which is a very positive sign. These fish were the 1+ juveniles in the rivers at the time of the eruption. Our annual acoustic survey of trout numbers in the lake in November will give more definite information on prospects but at this stage we are optimistic that this summer should be rewarding on the lake.

Radio tracking trout in Lake Otamangakau

To live trout need reasonably cold water with a good concentration of oxygen. During the last three summers DOC has been monitoring these two water parametres in Lake Otamangakau. The results show that at the peak of summer, water in the bottom part of the lake may occasionally lack oxygen and that water close to the surface becomes too warm (see *Target Taupo*, issue 12 - March 1993). Under such conditions we wonder how the trout react. Are they squeezed in one

depth layer of the lake where conditions are still suitable? Does lake level influence the area that trout use? Do rainbow trout behave similarly to brown trout? These are the major questions that we will try to answer this summer by studying the movements of fish in Lake Otamangakau using radio tracking.

The Department of Conservation started this experiment in July. The same tagging technique was followed as in the Tongariro River experiments. However, this time we used tags with a longer lifetime of eight months so we will be able to track the fish throughout the summer. We will follow the movements and record the positions of both rainbow and brout trout. Another difference from the Tongariro experiment is that rather than following fish on their way to spawning, we will follow them on their way back after spawning. The tags were inserted into spent trout passing back through the Te Whaiau trap. These fish will have to recover and are likely to choose the habitat in the system where they can regain condition quickly.

We also want to assess if the fish use the same habitat day and night and what their reactions are when lots of boats are present.

The results of this experiment will be compiled to determine the effects of lake level flucutations, water temperature and oxygen content on trout biology in Lake Otamangakau. In future issues of *Target Taupo* we will present the full story to help anglers learn more about Lake Otamangakau trout and perhaps how to catch them!

In the meantime you will see, on a regular basis, an aluminium dinghy loaded with two people carrying aerials cruising around the lake. The erratic course of the dinghy may make you think that the skipper has lost the plot, but actually he is following the main channel. If you catch a fish carrying a transmitter (recognisable by the aerial extending out past the vent) please contact us directly. We are particularly interested in the length of the fish, species and sex, state of the scarring on its belly or at the point where the aerial exits, and the area of the lake where it was caught. This information will allow us to tell you about the life history of the fish you caught and tell us eventually how the tagging technique could be improved.

Licence fee setting

A new and more efficient method for the setting of Taupo fishing licence fees has been adopted. Previously, the Conservation Act 1987 and the Maori Land Amendment and Maori Land Claims Adjustment

Act 1926 required fee changes approved by the Minister to be actually set by amendment to the Taupo Fishing Regulations 1984. This was a lengthy process requiring drafting by parliamentary counsel, submission to Treasury, Ministry of Justice and Te Puni Kokiri before consideration by the Cabinet Industry, Environment and Economic Committee. Ultimately, approval by Cabinet is then necessary, followed by a 28 day delay before regulations could come into effect. The convolutions in this process made it very difficult to get a change of licence fees at the time, as the need is revealed by the annual budgetting process.

Amendments to the appropriate legislation now make it possible for the Minister with the concurrence of the Tuwharetoa Maori Trust Board to set licence fees via Gazette Notice rather than regulation amendment. This will remove the constraints imposed by other agencies and the limitations of Cabinet and Cabinet Committee timetables. Game hunting licence fees have been set this way for many years and fishing licences for the rest of the country now follow suit. The essential advantage of this will be to speed up the fee setting process while maintaining present consultation and accountability.

Meetings with Tuwharetoa Maori Trust Board

The Department and the Tuwharetoa Maori Trust Board have arranged to meet formally on a regular basis to work together on mutual interests and concerns specifically related to the fishery. The 1926 Maori Land Amendment and Maori Land Claims Adjustment Act binds the TMTB and the Crown together in a management agreement for matters associated with access to and use of Lake Taupo and its river environs. The trout fishery is of primary importance in this regard. The first of these meetings was held in September and feedback to anglers from these meetings will occur through the Taupo Fishery Advisory Committee.

Upgrade on Tongariro foot bridges

An independent engineering consultant firm was used to report to the Department on the safety and condition of the Major Jones and Red Hut swingbridges. They recommended that the sway wires be re-tensioned, some boards on the decks be replaced and a ramp

constructed for the Red Hut bridge. This work was undertaken and completed in August and should ensure these bridges, valued for the access they provide to the true right bank of the Tongariro, last for many years yet.

Tuki Road upgrade

Tuki Road, on the true left of the Tauranga-Taupo River, has had roading metal spread along it following damage done to it by a contractor using heavy vehicles over the road. After some discussion a compromise was reached and the contractor has agreed to pay the costs of the work. You will also notice a willow tree has been felled across the road near where it comes back to the river. This is to stop vehicles being driven along the edge of the river where most of the road that was originally there has been washed away. We will attempt to put in a new section of road to the car park over summer, once the ground is dry enough to make this feasible.

Lure trials

In June we were approached by an angler inquiring about the reason for the regulation prohibiting the use of more than one hook on a lure (Regulation 16 (e), Taupo Fishing Regulations 1984). Like a number of

Some flies and lures used in the Tongariro River in the 1920s

our regulations it originated many years ago, as a consequence of concern about the survival of fish released after being hooked on multiple hooks. Given the sort of rigs used in earlier days of the Taupo fishery it would seem quite appropriate.

Today there are numerous lures available which come rigged with two hooks and removing one hook as required under the current regulation often causes a change in the action of the lure. Do lures with two single hooks cause more injury to the fish? Our correspondent who is a keen advocate of this type of lure suggested a trial to investigate this aspect. The Department is comfortable with this approach. The Taupo Sport Fishery Management Plan lists as a goal 'To cater for as wide a range of recreational angling opportunity as possible within the confines of fishery sustainability and maintenance of recreational values'. To have the choice of using these lures rather than other accepted lures would seem reasonable so long as the sustainability of the fishery is not threatened.

We have designed a trial to be undertaken by our correspondent. The purpose of the trial is to investigate whether lures with one hook removed are any less successful than the same lure with two hooks and whether lures with two hooks cause any more injury to the fish and so reduce itís chances of survival if released. The trial involves running paired lures of the same colour, one with two hooks and one with the belly hook removed. Data is collected on the catch rate of each lure, the number of fish lost, the position of each hook in the fish landed and the size of the fish, along with any comments. This trial will be continued over summer so as to hopefully establish a large database. The angler is bound by all current fishing regulations other than that he may use a lure with two hooks and more than one rod. However all people on the boat must be licensed. To be able to do this we have had to issue the angler a special permit, a condition of which is it must be produced on request.

No decision will be made on the basis of the results alone but if they indicate little difference in how fish are hooked we may investigate it further.

Waitotara Stream badly affected

Around the lake are a number of very small streams, most of which you could jump over. However significant runs of spawning fish use

these streams and their importance to the fishery is much greater than their size would indicate. One such stream is the Waitotara which enters at the southern end of Halletts bay.

Unfortunately in July a massive slip in the headwaters of the Waitotara sent a slurry of debris and pumice downstream. This blocked a culvert on a forestry road, creating a dam upstream. The road fill is approximately 10 metres above the culvert but when discovered the water level was only a couple of metres from the top. It became imperative to release the dam before the pressure blew the road out which was already showing cracks. New Zealand Forest Managers had the unenviable task but with a long reach digger they were finally able to unblock the culvert. The resulting rush of water swept pumice and sticks out into the lake but was not as dramatic as perhaps expected. The reason soon became clear. As the level dropped it exposed a semi solid bank of pumice and mud extending up the valley for several hundred metres. The accompanying photos on page 32 show just how extensive this was. These photos were taken after the stream bed had cut itself back down into a series of small falls rather than one major fall at the culvert entrance. As this material continues to wash through there is an ongoing problem with the culvert blocking which requires regular cleaning.

The stream is now of course totally unsuitable for trout. With time it will slowly settle down and stabilise depending on how active the slip upstream remains but it will be a few years before trout can again use it. While it is unfortunate large pumice blowouts are a feature of this area and one of those things we have to work around. The Otakatake Stream draining into Whangamata Bay was similarly affected several years ago as reported in *Target Taupo*, issue 18 (March 1995).

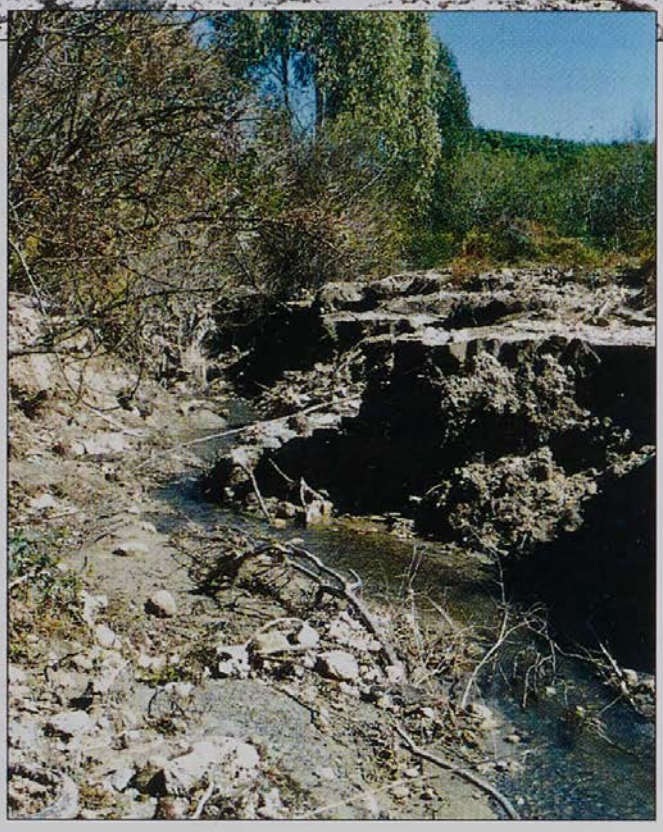
Whitikau blockage removed

The Taupo Fishery is a wild fishery sustained totally by natural spawning. Perhaps the single most important spawning tributary is the Whitikau Stream in which as many as 15,000 fish breed. There is approximately 12 kilometres of ideal spawning water, 10 kilometres of which occurs above what is known as the Grotto. The Grotto is a narrow 500 metre long chute where the river cuts down through the ignimbrite shelf which extends down the eastern side of Lake Taupo. It is this shelf which creates the falls, preventing trout access to the

headwaters on all the eastern rivers other than the Waiotaka and the Whitikau.

The Grotto in many places is only 5 or 6 metres wide and is a series

Rob McLay (centre of photo) stands part way up the pumice bank deposited after the culvert blockage. Previously the valley floor was at the height of the current stream bed.



The huge pumice deposit means the stream is no longer suitable for trout spawning.

of small falls and cascades. The upper catchment is strewn with large beech logs and in a flood they occasionally become wedged in the chute. The only surprise is it doesn't happen more often, but once it does occur the log quickly traps other logs and debris. This creates a

Conservation Officer Tom May prepares the charge holes while Conservation Officer Roy Baker looks on

Conservation Officers Bonzo Ngamotu (left) and John Carter lay the charges

fall over it which is made more difficult for fish to negotiate by other debris lying in the plunge pool from which they would normally jump. Often these blockages become impassable denying fish access to this key spawning area.

At regular intervals we check the Grotto, and a similar area on the Waiotaka River, in case a blockage has occurred. In June we discovered a large pine tree in the worst possible place in the Grotto. To remove it we had to work suspended from climbing ropes, first limbing the tree using chainsaws then setting explosives to shatter the trunk and sever the butt. It took two attempts to remove all of it but even as the dust was settling the first fish could be seen swimming past.

Spawning counts high again

Each winter monthly counts of the number of spawning trout are made in selected stretches on the Hinemaiaia, Waiotaka, Waimarino and Whitikau rivers. This year the count was also extended to the Tauranga-Taupo river. The stretches chosen are areas where we can be confident we are able to see and count all the fish present and vary in length from approximately 1km (Hinemaiaia) to 4km (Whitikau). This year in order to improve the accuracy of the Whitikau count we shortened it from the 12km done previously and altered our technique. In the upper river, areas of the bank are lined with overhanging toitoi and often large numbers of fish can be lying in only a few centimetres of water completely out of sight. The best example occurred when after counting a handful of fish lying in the shallows a dog ran through the overhanging toitoi barely up to his elbows and in only a few metres scattered another 20 fish out into the open. So now we count a smaller stretch using two staff, one of whom drift dives down the river. It is still easier for the person on foot to count most of the fish but we can use the diver to push them out of the holes and from under the toitoi and into sight. It has proved a very successful technique and greatly increased the precision of the count. A similar technique has been used on the Waimarino since 1991 and will also be used on the Waiotaka from next year. However on the Hinemaiaia and Tauranga-Taupo it is necessary to do the count totally by drift diving.

Counts are not comparable between rivers. Different lengths of river

are counted and stretches are chosen because of the ease of counting, not because the greatest concentrations of fish necessarily occur there (though that is the case in the Hinemaiaia). However counts for the same river are comparable between years.

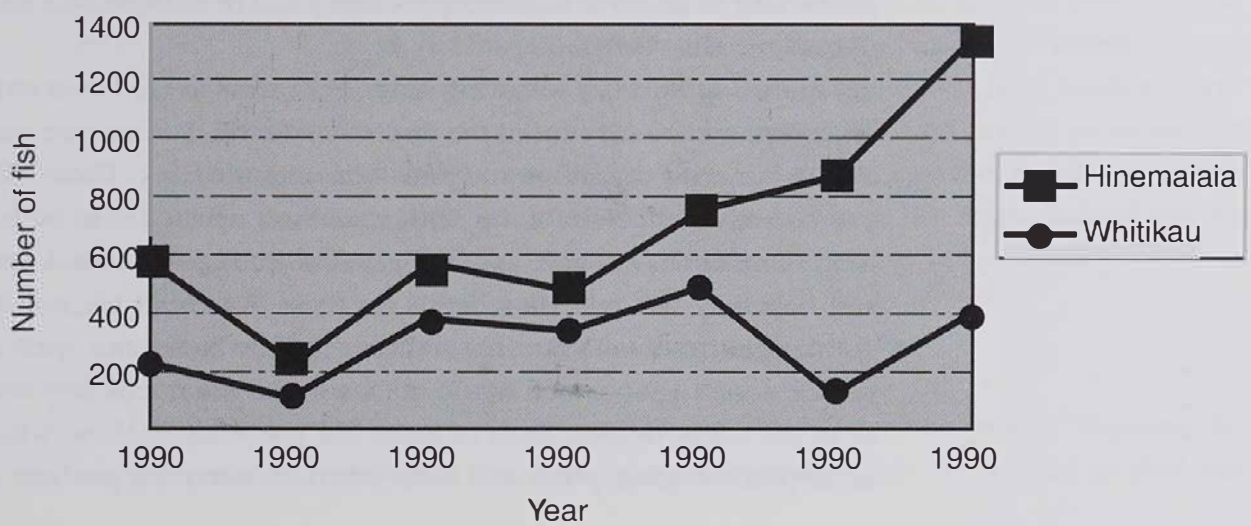
Depending on the river the largest counts are made in August or September each year. Unfortunately this year the September count was not possible with the inclement weather that plagued the country for several weeks.

The following graph compares the counts for the Hinemaiaia and Whitikau rivers over recent winters. The Hinemaiaia count is the largest ever and reflects the very good fishing experienced, particularly before the upper river closed. Each year one river comes to the fore. In the last couple it has been the Tauranga-Taupo but this year it was definitely the Hinemaiaia. The trend in the Whitikau is more indicative of the overall picture. Counts are high and at levels which reflect good angling, but are less than the peak of two years ago. This was as predicted on the basis of the results from last November's acoustic survey of the size of the lake population.

As this was the first year counting the Tauranga-Taupo River we can't compare it with previous years but it seems that this was one river that experienced a smaller run than in recent years. How much smaller is hard to assess. Anglers have been treated to very good fishing in recent years and expectations have increased as a result. This success has also attracted more and more anglers. It is only a

Graph 1: August Spawning Counts 1990 - 1996

Selected stretches of the Hinemaiaia and Whitikau rivers



small river though and almost certainly the level of fishing pressure this year will also have affected success.

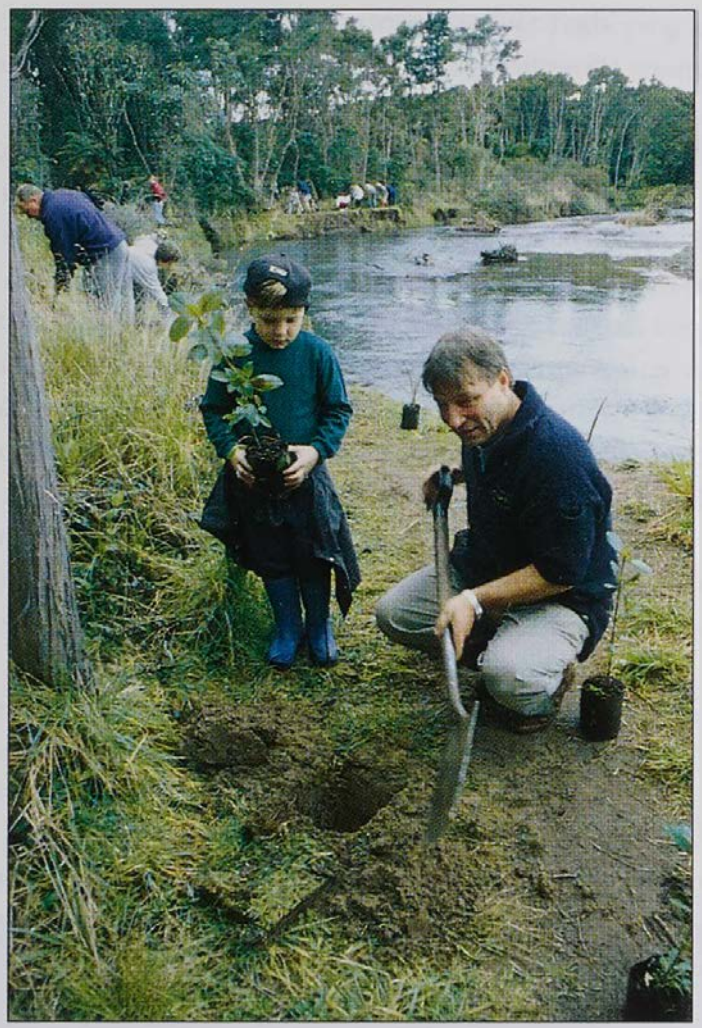
It was noticeable that numbers of fish in the Whitikau stream were slow to build up this year with comparison to previous years and with other rivers. This was reflected in the fishing in the Tongariro. While trout enter the rivers throughout winter, most spawning actually occurs in August and September. It is possible fish held off running the river because of impacts from the eruption until the urge to spawn became strong enough to drive them in. Whatever the reason, trout appeared in large numbers in August with a corresponding improvement in fishing.

So far this spring, conditions for spawning have been excellent. In late August during a reasonable flood ECNZ scoured Rangipo dam and then left Poutu canal closed for four days. This allowed the flow in the Tongariro to recede naturally, scouring much of the accumulated ash through to the lake and leaving the river much more like old. Already fry are evident along the margins of the Tongariro and invertebrates (insects) amongst the stones, unlike last spring. So long as we avoid any major floods in the next couple of months it looks promising . At this stage we are optimistic that the impact of the eruption will be largely confined to a weak year class of trout from last year. It demonstrates yet again the recuperative ability of mother nature.

Work on the Hinemaiaia River begins

As discussed in the last issue of *Target Taupo* (issue 22, July 1996) the Department agreed to undertake limited work on the lower Hinemaiaia to improve angling opportunity and to stabilise two areas of badly eroding banks.

In June we spent a day removing snags from areas in the lower river. Trust Power Limited reduced the flow from the HB dam and we were able to cut many snags free and pull them onto the bank. There were many snags too deep to be cut with chainsaws which had to be left. Next summer we will have another go using scuba gear and jack saws and hopefully this will allow us to get these. We could use our log skidder but this would do a lot of damage to the banks and open up vehicle access again which we do not want. We will not be removing all of the snags, or even most of them, but just some of those which lie in prime angling pools and runs. Often by removing just one or



DOC Landscape Architect Herwi Scheltus and a young helper planting one of the many native shrubs during a Saturday morning working bee.

two snags a previously unfishable spot can become productive. It is a matter of balancing angling opportunity with the value of the snags as juvenile trout habitat and resting cover for adult spawners.

Following this two working bees involving the local residents were held to plant native shrubs adjacent to the major erosion sites. A very large turnout on each day made short work of the planting. The number of people present, many from out of town indicates the interest and commitment residents have towards the river.

A third aspect involves removing debris lying in the river near the erosion sites. This material would be used to line the river bank at these points, hopefully lending some protection and improving the flow of the water past, rather than into, the bank. This work requires a resource consent from Environment Waikato but on receiving the consent we were not prepared to accept the initial conditions imposed . After much discussion the issue has been resolved and we will undertake the work shortly.

Lake Otamangakau trapping results

In August we completed our third successive winter trapping the spawning run from Lake Otamangakau. Fish are trapped as they run

the Te Whaiau Stream in a trap sited just upstream of the outfall of the diversion from the Whanganui River. A second trap in the outfall collects fish trying to return to the Whanganui. Full details of the traps and their operation is detailed in *Target Taupo*, issue 16, (July 1994). This year for the first time we also installed a temporary trap in the Papakai Stream, a small heavily overgrown flow entering the TeWhaiau Stream just upstream of its confluence with the lake. These three traps are intercepting almost all the mature fish from the lake.

A number of fish avoid the traps each year passing over the barriers when they are overtopped by flood flows. However by recapturing a sample of spent fish as they return to the lake after spawning, we can determine the proportion missed from the number of fish lacking the current yearís trap clip (half a fin is removed when the fish pass through the trap). The total run is then calculated by adjusting the total number of fish trapped to take into account the proportion missed.

A feature of the run this year was an increase in the number of rainbow trout trapped.

The comparison between the estimated run for the last three years is listed in Table 8

Table 8: The adjusted run for 1994 to 1996 broken down by species and sex

Species and Sex	1994	1995	1996
Rainbow male	151	183	232
Rainbow female	427	361	582
RAINBOW TOTAL	578	544	814
Brown male	201	235	215
Brown female	497	591	575
BROWN TOTAL	698	826	790

Note: The 1996 totals do not include fish trapped in the Papakai stream. A further 37 rainbows and 84 brown trout were trapped in this stream.

With such an increase in rainbow numbers a strong young year class should be evident in the data. Assuming young fish will be smaller they should be apparent in a graph of the length distribution of fish trapped and this is the case. Graph 2 is the percent of the population falling within 2cm length intervals.

The distribution of large fish is very similar between the two years but a significant part of the population this year is composed of fish

between 47 and 50cm long. This is in keeping with observations last season which suggested larger numbers of young fish present than for several years previously.

Brown trout numbers have been constant over the last three years. A feature of this population is the old age of many of the fish. Forty five percent of brown females and thirty percent of males are spawning for at least the third time which is a very high proportion. Less than one percent of Taupo spawners survive this long. Such high survival reflects that in Lake Otamangakau spawning does not take a great deal out of fish, nor are they easy to catch. Despite such high survival the population is remaining constant in numbers, suggesting that recruitment must be low. This highlights just how susceptible this population could be to overharvest and how important it is that anglers continue to release the majority of their catch. Surveys in the last two seasons indicate anglers currently release 77 percent of legal size fish caught.

The increase in numbers of small rainbow females is reflected in a decrease in the average size of these fish.

Graph 2: Length distribution of rainbow females 1995 and 1996

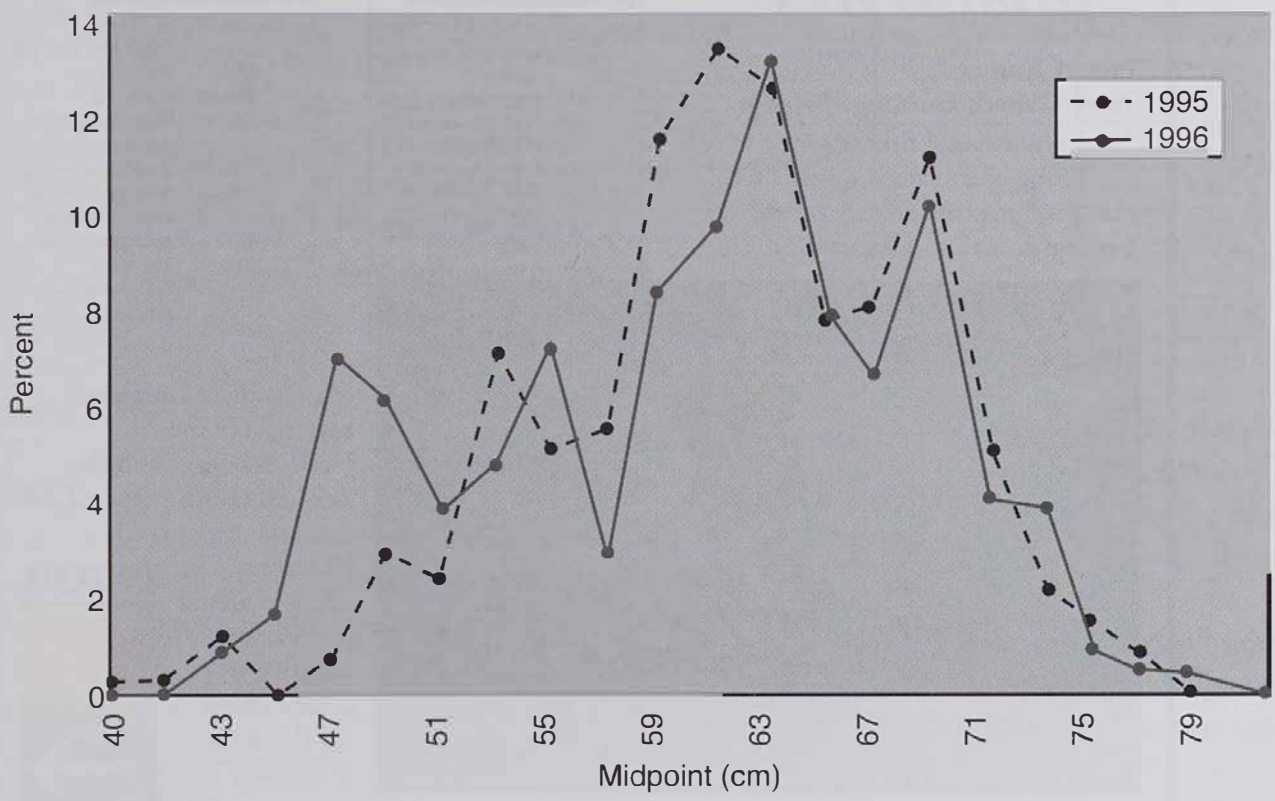


Table 9:
The average length (mm) of fish trapped 1994 to 1996

Species and Sex	1994	1995	1996
Brown female	572	599	597
Brown male	599	627	622
Rainbow female	600	615	600
Rainbow male	593	616	623

Table 10:
The average weight (kg) of fish trapped 1994 to 1996

Species and Sex	1994	1995	1996
Brown female	2.34	2.85	2.87
Brown male	2.62	3.08	3.04
Rainbow female	2.82	3.18	3.01
Rainbow male	2.63	3.05	3.18

This decrease was not evident among rainbow males. This is because there were fewer small males but also an increase in the number of very large fish. Table 11 lists the number of fish 4.45kg (10lb) and bigger, and the proportion (in brackets) they comprised of actual fish trapped.

Table 11:The number of fish and proportion 4.45kg or bigger trapped each year

Species and Sex	1994	1995	1996
Brown	2 (0.4%)	9 (1.5%)	8 (1.4%)
Rainbow	15 (3.8%)	36 (8.6%)	42 (9.2%)
Total	17	45	50

Last year 19.7% of rainbows were 4kg or bigger but this year, despite the occurrence of the strong young year class, 21% were at least this big. This reflects that last summer must have been another good season for growth. The average size of brown trout was very similar to last season with 8 fish of 4.45kg or bigger. However two of these fish were the largest browns ever recorded through these traps. The previous largest was a brown female of 5.1kg last year but this year two males of 5.75 and 5.65kg were measured. This indicates that the maximum size reached by brown trout in Lake Otamangakau is continuing to increase, though still less than 1.5% of the population reaches 'double figures'.

The largest rainbow ever through the traps was also recorded this year, a female of 6.9kg. The 7 largest fish this year are listed in Table 12.

Table 12

Species and Sex	Length (mm)	Weight (kg)	Weight (lb)
Rainbow female	790	6.9	15.2
Rainbow male	760	6.2	13.6
Brown male	745	5.75	12.7
Brown male	700	5.65	12.4
Rainbow female	750	5.6	12.3
Rainbow female	740	5.6	12.3
Rainbow female	730	5.4	11.9

Despite the large proportion of trophy sized rainbows in the mature population it is important to remember that the overall flyfishing catchrate last season was only 0.15 fish per hour, identical to the year before. Thatís one legal size fish of either species for every 8 hours of effort. The odds are a trophy will be hard earned.

It is pleasing to note the number of young rainbows appearing in the population. Releasing these carefully to grow for another couple of years should ensure the opportunity to catch double figure fish continues.

Removing fish guts

In the past, anglers often gutted their fish on the riverbank or lakeshore and buried the offal believing this was the right way to dispose of it. However these days many other users share these areas with anglers. Not all appreciate the sight or smell of rotting fish guts dug up by some inquisitive dog or hungry rat.

If you have to clean the fish before you get home please put the offal into an old ice-cream container or similar and take it with you. It makes excellent fertiliser under the lemon tree or in the vegetable garden.

Licence Sales

Total licence sales for the 1995/96 season are shown below, with the previous year's sales in brackets:

Adult Season	11,522	(11,587)
Child Season	5,740	(5,929)
Adult Month	928	(936)
Adult Week	9,155	(10,135)
Adult Day	33,559	(35,437)
Child Day	5,973	(6,681)
Total	66,877	(70,705)

An overall reduction in sales for the 1995/96 season of 5.4%.

At the end of September of this season (1996/97) sales are again down compared to the same period in the previous year, by 6.8%.

We believe that this continuing downturn is a direct consequence of winter visitors staying away because of the Mount Ruapehu eruptions and the numerous floods in the rivers. However, word of excellent fishing in the latter part of winter quickly spread and this has had the effect of arresting the rate of decline.

CLE Update

This winter staff have noted a reduction in serious poaching offences in key spawning areas throughout the fishery. We believe that this is a direct result of the significant apprehensions that have been made over the previous three winters. The word is out among the criminal fraternity that anyone contemplating illegal activity in our spawning

streams has a very high likelihood of being caught. Although this downturn in activity is encouraging, maintenance of our enforcement effort this winter has resulted in a number of serious offences being detected resulting in successful apprehensions. Notable among these are two cases, one where four offenders took 25 trout using a gill net and another where three offenders took 49 trout, also with a gill net. It doesn't take long with a calculator to work out that it would not take too many poaching episodes of this magnitude to seriously impact on the spawning runs in some small streams.

In addition to protection of the spawning areas, our staff have maintained a high level of patrolling over all of the key fishing areas. It is pleasing to note that the level of non-compliance with licensing requirements and the regulations remains very low at around one percent of the overall angling population. Our ranging activity has also provided an excellent opportunity for anglers to communicate issues or concerns directly with staff members on the river bank.

A net and some of the 49 trout recovered after a successful operation this winter.

A little gem to finish with - and maybe a lesson to be learned!

This letter was received by the National Trout Centre Manager after a school group had visited the kids' fishing pond:

Linton School, Akers Road, RD 4

"Thank you very much for letting us come down to the trout hatchery and go fishing. I learnt you never ever go fishing without a licence because you could get caught and sometimes if you are a adult you can get arrested if it is that bad, so if I go fishing I will always have a licence with me. I also learnt that you don't just get any old licence you buy a brand new one. I really enjoyed fishing at the Children's rainbow trout fishing pond."

Thank you again, Yours sincerely, Rebecca Fothergill

Central North Island Sika Trophy Production

by Cam Speedy

What Have Four Years of Trophy Competition Data Told Us?

In the spring of 1992 when Neil Philpott and I first conceived the Sika Trophy Competition, we really didn't know what would come of it. The goal was to provide hunters with information that would improve their understanding of sika deer in the central North Island and to help them get the best from that resource in a way which does not compromise sustainable habitat and land management. Hunter support for effective management of the wider land resource has important implications for conservation as well as hunting. If we could also maximise the economic benefit of the sika deer herd to the local economy by raising awareness of the hunting opportunity in the central North Island, then the businesses involved would, we thought, provide ongoing support for such information gathering and dissemination.

Support from local hunting oriented businesses was indeed strong and the New Zealand Deerstalker's Association were also very positive. The involvement of Landcare Research deer ecologist, Dr Wayne Fraser was an additional bonus. Hunters too were supportive of the idea and that first year (1993) over 500 people turned up to view the 89 entries on measure-up day.

Four years on the annual competition has become a major commercial event attracting tens of thousands of dollars of sponsorship and thousands of hunting and outdoor enthusiasts. Such is the attraction of the species and the region. The event is certainly helping to promote the herd, attracting hunters from far and wide but what are we learning from the data? This article summarises some of the findings to date.

As a result of the competition we now have a database which includes 418 sika stags from all corners of approximately 8,000 sq. km of sika deer range in the central North Island. We have data on location, habitat, age, size (jaw-length is used as an index of body size),

and antler quality (as measured by the Douglas Scoring system). Nearly half the heads (205) in the database are 8-points or greater. Of these, 186 heads have the classic sika head of 8 points. In addition to this database, a larger jaw database of more than 1,600 sika deer (stags and hinds) harvested from the Kaimanawa RHA since 1984 is also available. With such databases some reasonably accurate conclusions about the herd can now be made.

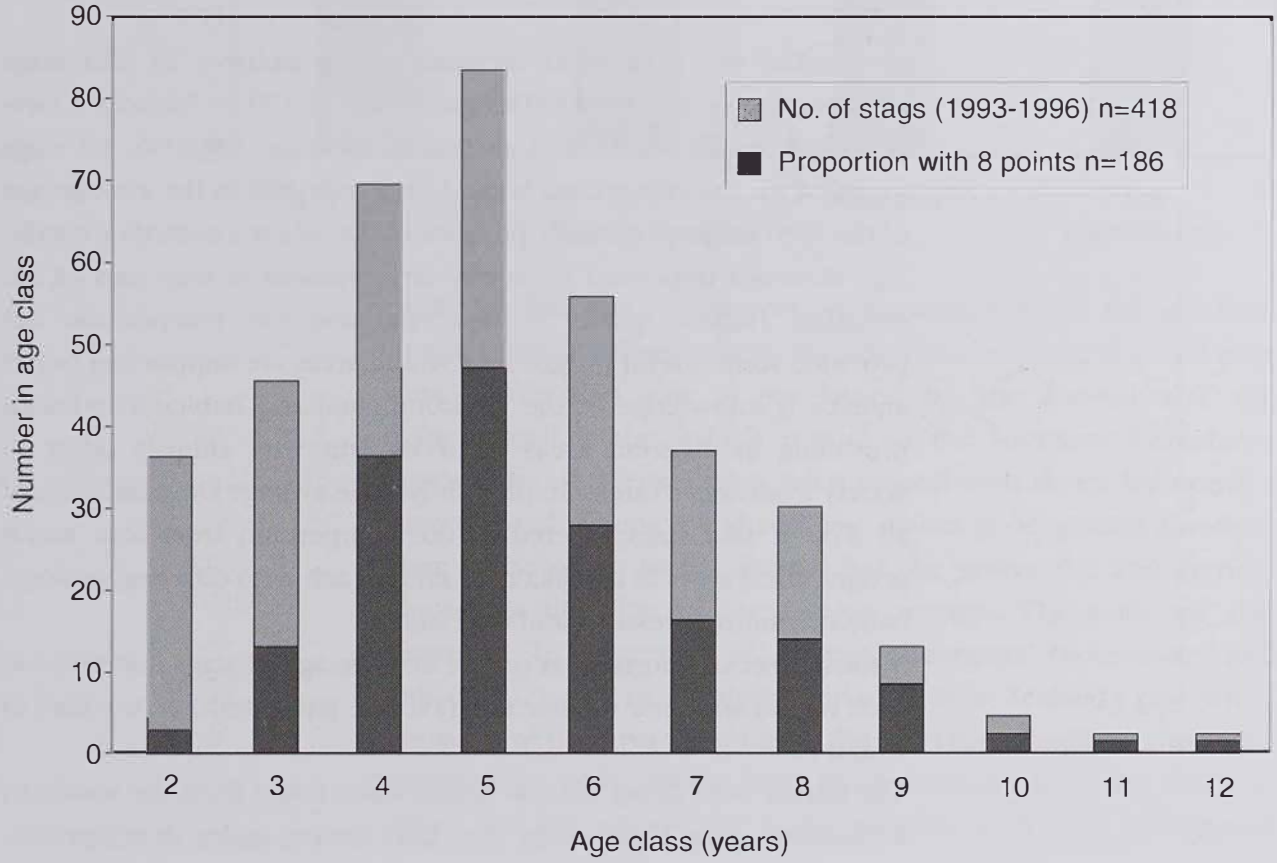
Graph 3 shows the age distribution of the sample including the proportion of 8-point heads in each age class. It should be noted that only heads of 6-points or larger were accepted in the 1996 competition so younger stags (<3 years) are therefore likely to be under-represented in the 1996 competition sample. Younger stags are also likely to be generally under-represented in the trophy database for other reasons including behavioural differences between mature

and sub-adult stags during the rut and hunter selection, which often favours larger antlered stags during the rut. Other information on the sika herd (see articles in both this issue and in *Target Taupo* Issue 12, March 1993) indicate that 58% of the annual stag harvest occurs in the month of April and that up to 60% of those stags are 5 years old or less. The data presented in Graph 3 confirms this trend. Combine this harvest data with the fact that a further 30% of the annual stag harvest occurs between November and January, and that up to 65% of this harvest each year is 2 years old or less, and we can see why there are so few older stags around.

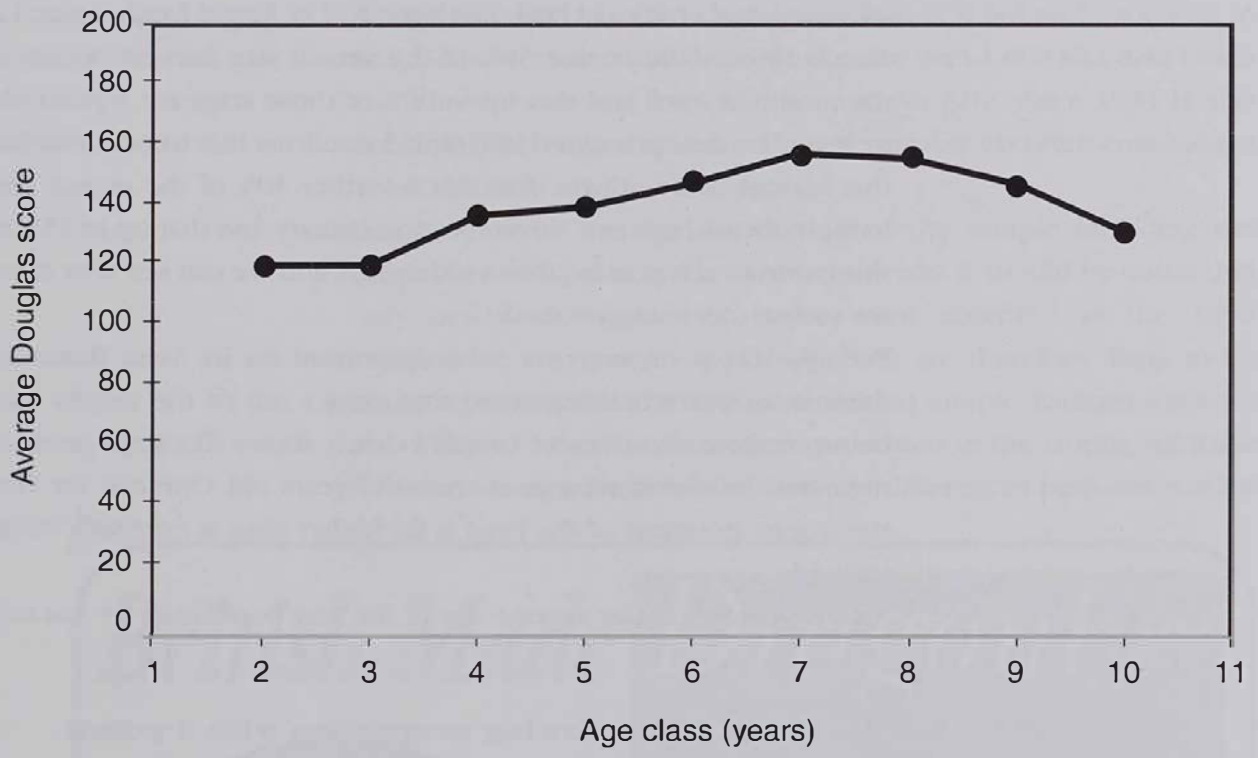
Perhaps this point may not seem important on its own. However, there is an overwhelming trend that comes out of the trophy data between age and antler size. Graph 4 clearly shows sika stags produce their best heads on average at around 7 years old. One can see that the trophy potential of the herd is far higher than is currently being realised.

A shift upwards in the average age of the stag population by just one

Graph 3: Age distribution of stags showing proportion with 8 points



Graph 4: Average Douglas Score for each age class 1993-1996 (8 point stags only, sample size 186 heads)

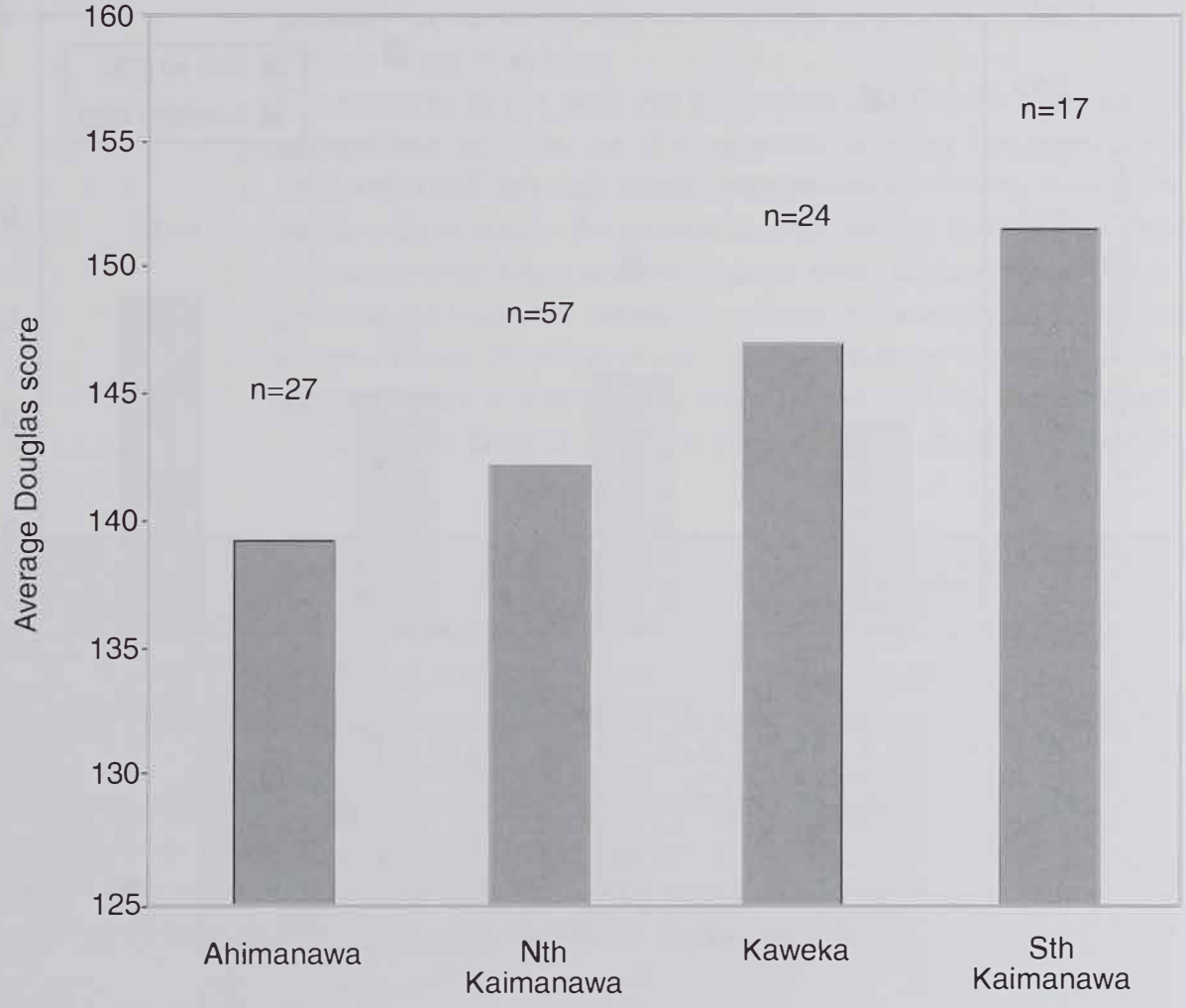


year could see a two-fold increase in the number of sika stags reaching the record books (Douglas Score of 170 or higher). A two-year shift could result in a three-fold increase. In 1996, 10 stags qualified for the sika record book. A two-year shift in the average age of the herd might potentially produce about 30 such animals annually. Age, although important to trophy development, is only part of the equation. Habitat quality is also vital and the competition has provided some useful insight into which areas are supporting better animals. A knowledge of the environmental and habitat conditions prevailing in different areas helps explain why animals differ so widely from area to area. Graph 5 shows the average Douglas Score of all 8-point sika stags entered in the competition from four major geographical areas in the sika deer range, each with differing geology, habitat, hunting pressure, and deer density.

A further set of information on the average age of stags harvested in each region and their relative size (average jaw length) is provided in Graph 6.

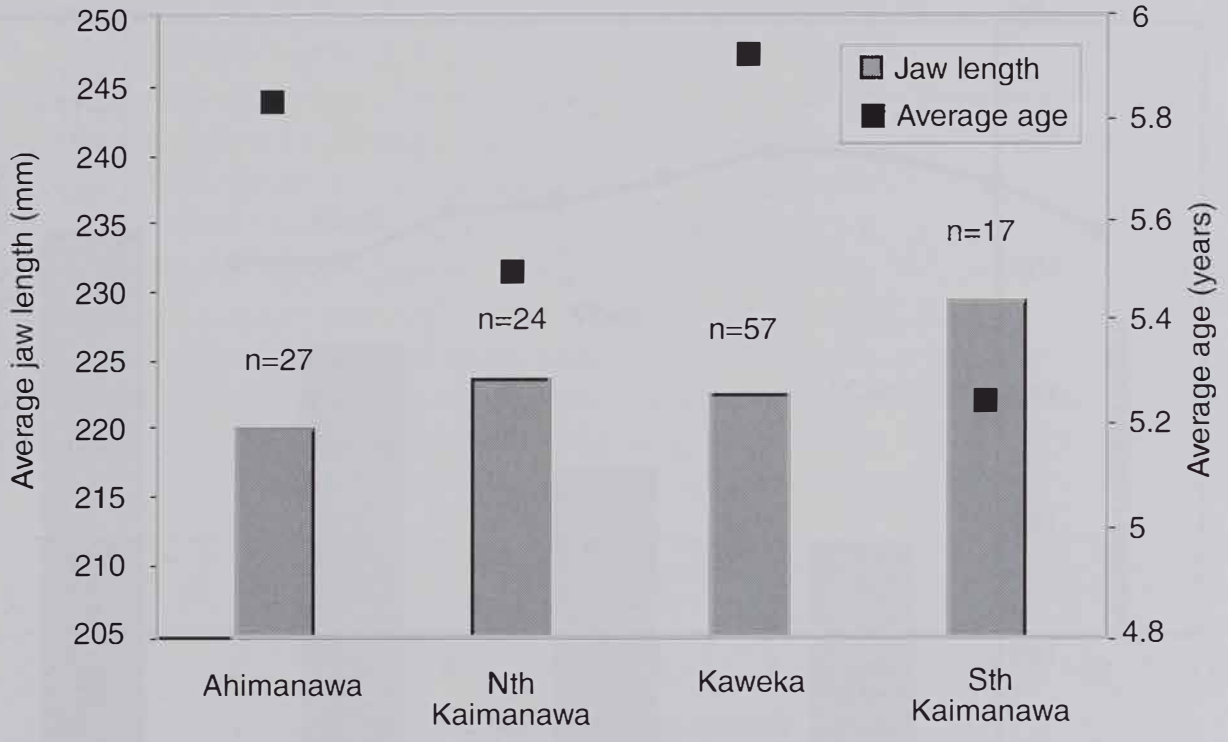
The largest deer (from the jaw length data) come from the southern Kaimanawa area. These stags also have better antler development,

Graph 5: Average Douglas Score for four area of the central North Island sika range 1993-1996 (8 points only, n = number of stags in each sample)



despite the fact that they are on average almost a year younger than the stags harvested elsewhere, an indication of lower survival rate. These differences can be explained by the habitat and the environmental factors which prevail in the southern Kaimanawa Ranges. Parts of the area have been farmed with sheep for nearly a century. Good grazing for sheep also makes good grazing for deer. Other parts are no longer farmed but the severe fire and grazing-induced modification of the habitat remains. The soils are also influenced by outcrops of marine sediments (limestones and mudstones), a relic of a warmer period in New Zealand's past when large parts of this area were under the sea. These modified grasslands nourished by soils with a little more fortitude than the volcanic pumice and ash soils to the north, together with their widespread

Graph 6: Average jaw length and average age in four areas of the central North Island sika range 1993-1996 (8 point stags only)



cover in the form of manuka scrub and beech remnants, provide ideal sika deer habitat. However the open nature of much of this habitat leaves the deer vulnerable to harvest and this at least in part might explain the younger average age of stags harvested in the southern Kaimanawa area.

Stags from the Ahimanawa Range appear on average to be smaller with poorer antler development despite older average age.The dense manuka and beech forest habitats of this area provide good cover for sika but the soils which are pumice and ash based are poor and there are no extensive grass areas, limiting quality feed. In addition, deer density tends to be higher because these habitats are difficult to hunt (from both ground and air) and animals survive longer.The net result is poorer stock. In the longer term the scenario for such areas is not good because the deer have an unsustainable impact on the habitat. Reproductive rates, animal size and antler development are compromised by poor nourishment. Over time, continued habitat damage will mean that the land will be able to sustain fewer and fewer deer (decreasing carrying-capacity). Large, sustained reductions in herd density are important for both habitat protection and quality

sika deer hunting in this area. However, the fact that the land is privately owned and that the economic return from it is based primarily on hunting will make achieving sustained herd reductions difficult in the short term.

The sika deer in the northern Kaimanawa and Kaweka areas fall at intermediate positions on the spectrum between the worst case Ahimanawa and best case southern Kaimanawa situations. Stags from the Kaweka area have the greatest average age, but the fact that they do not develop larger antlers suggests some environmental stress, probably related to the nutrition available in the depleted forests of the area. Winter die-offs in recent years are evidence of this, as are the reported forest regeneration problems in parts of the Kaweka high-country (see Kaweka Beech Report summary in this issue). The

average size of deer and antler quality of stags in the Kaweka area are also likely to be exaggerated by data from stags harvested along the eastern boundary adjoining the sheep country of inland Hawkes Bay. These stags mask the patterns in the high country to some degree. This is perhaps an area on which future data collection could focus.

The northern Kaimanawa data support other information which suggests that while deer have an impact on forest values there, the impact is less severe than in the Ahimanawa or Kaweka areas. However, stags taken in the relatively rich, healthy forests along the northern boundary of this area are again likely to be masking trends of poorer deer condition and performance due to habitat problems in the high country.

While most hunters would like the mountains to be full of trophy stags, the reality is that no matter what management regime is adopted, management invariably involves a trade-off between quality and quantity. Sadly from the hunter's perspective, there is no regime that allows for both. But hunting a big trophy is not every hunter's aspiration - many just want to shoot a deer for the freezer. A good freezer deer is one which is in good condition. Only healthy habitat will produce well conditioned deer. Parts of the sika deer range provide for this but others clearly do not. Hunters and land managers must start to realise that the trade-off for higher deer populations is a decline in habitat quality which is reflected in the quality of the deer. If deer numbers remain excessive for long periods, irreparable damage to the habitat and the land occurs. The land and the habitat, at the end of the day, are the most important resources of all and they must be nurtured in a sustainable way, not over exploited for short term gain.

Looking to the future and making a conscious effort to protect the wider 'land resource' in the central North Island is in every sika hunter's and local land manager's interest. Many hunters still can't see past where they are going to hunt next weekend when what they should be focusing on is where they will hunt in 5 or 10 year's time or perhaps even more importantly, where our grandchildren might hunt if the areas currently being over-grazed continue to decline. The Sika Trophy Competition and other data collection like deer jaw programmes, hunting diary systems, disease surveillance surveys, exclosure plots, and vegetation monitoring programmes are all aimed at providing important information to guide the future management

of the central North Island. Much of this information is provided by you, the hunter.

While a vital part of management though, information alone is not enough. Those who have an opportunity to make a difference must look to the future and use that information wisely. If you hunt in the central North Island, you now have that opportunity. It's up to you to use it.

Bitz 'n' Pieces

News Items from Around the Conservancy

Target Taupo Sent to Hunting Diary Returnees

You may have noticed that a complimentary copy of the July 1996 issue (Issue 22) of *Target Taupo* was sent to all hunters who returned a hunting diary for the Tongariro-Taupo Conservancy's Autumn hunting permit period. This is to encourage hunters visiting this conservancy to provide the feedback necessary for management, to help ensure they are aware of various management activities, and to promote wider discussion and understanding of hunting and forest conservation issues in the central North Island

We trust that hunters enjoy the material and are encouraged to support conservation management in the conservancy. In the first instance by returning their hunting diaries but also by understanding the complex nature of forest conservation issues, deer impact and the potential benefits for both conservation and hunting of carefully controlled deer populations.

Many hunters also fish at Taupo and some of you may inadvertently receive two copies of *Target Taupo*. If this is the case we ask that you pass the spare copy on to a friend.

The wider our readership the greater the collective understanding, and hopefully, support for management there will be. Understanding and support must be beneficial to the protection of the resource that, for differing reasons, we are all concerned with.

Kaimanawa Tb Deer Survey

During July, Environment Waikato undertook further Tb survey work in the north western Kaimanawa Range involving aerial recovery of 49 deer carcasses (42 red deer, 7 sika deer) for autopsy. None of these animals were found to have Tb which indicates that the aerial 1080 carrot baiting operation in August 1994 over 10,000ha of the northern Kaimanawa Forest Park has had a positive influence in lowering the disease status in the area.This is supported by a dramatic drop off in the Tb reactor rates of local cattle.

The deer autopsied during the survey were generally in excellent

condition compared to the generally poor condition of deer prior to 1994, which indicates that the habitat is also responding to lower animal densities. Few deer could be located in the Waiotaka and Whitikau catchments during this most recent survey (an area which produced 41% diseased deer during a similar survey in 1993), so a second, more intensive survey of this area is planned in late November/early December.

Winter Possum Control Programmes

There were two large scale possum poison programmes on lands administered by the Department of Conservation in the Tongariro-Taupo Conservancy this winter. Both were related to the control of Bovine Tuberculosis, funded by the Animal Health Board (AHB) and conducted by Regional Councils, but both will result in significant benefits to conservation:

1. In July the Manawatu/Wanganui Regional Council completed Stage III of the Hauhangaroa Bovine Tb control programme over some 16,000ha of the upper Wanganui River Catchment, 9000ha of which lies within Tongariro Forest Conservation Area, Pukepoto Forest and the Waituhi/Kuratau Scenic Reserve. This operation involved 1080 pellet bait distributed by helicopter at a sowing rate of 5 kg/ha.
2. In September the Manawatu/Wanganui Regional Council undertook a Bovine Tb control operation in the southern Erua Forest Conservation Area.This operation involved 1080 pellet baits distributed at 5 kg/ha over 3,300ha of land in the Manganuiateao/Mangaturuturu River catchments west of Horopito including 1,800ha of land administered by DOC.

In addition to these major operations, a number of small scale ground based possum control operations will be ongoing around the conservancy through the year, funded by the AHB, DOC, farmer co-operatives and by ratepayers. These mostly involve trapping in areas of high public use. In areas which are less accessible to the public, cyanide poison and/or bait stations with 1080, Campaign or Talon pellets are used.

All operations involving toxins require the approval of the Medical Officer of Health and all areas where toxins are laid are clearly sign-posted as per the Pesticide (Vertebrate Pest Control) Regulations. For your dog's sake, please take note of any poison signs in areas where

you are hunting or fishing this winter and please, DO NOT remove any signs!

Winners of the Autumn diary prize draw are as follows:

Air Transport with 'Lakeland Helicopters' : Dan Rushton, Auckland
Air Transport with 'Air Charter Taupo' : Tim Holt, Auckland
Sika Safari Video from Neil Philpott : R Thorpe, Rotorua
Sporting Goods from 'The Fly & Gun Shop', Taupo : T. Peck Waiouru
100 Rounds of Ammo from 'NZ Ammunition Co. Ltd' : O Rumble, Rotorua
Outdoor Clothing from 'Stoney Creek' : Mike Adams, Whangarei
Winners of the winter prize draw will be identified in the March issue of Target Taupo.

The 1996 Sika Competition - The Deerstalker's Viewpoint

'Once again the sika competition was held at the Spa Hotel, Taupo, proving the capability of this venue to cope with large numbers of competitors, spectators and commercial sponsors.
The Douglas Score measuring team of the Taupo branch, New Zealand Deerstalkers' Association were impressed with the quantity and quality of the Sika heads entered in this year's competition. The Douglas Score system of measuring heads is nationally recognised, requiring qualifications gained by study and examination so results are comparable from year to year, and competition to competition.
This year the quality of the heads was exceptional, the winning head coming from the Sparrowhawk range with a Douglas score of 212-3/8. Ten heads will be entered in the national record book, compiled by NZDA. Significantly five of the top ten heads came from Clements Road, the main access road to the Kaimanawa Recreational Hunting Area. The value of good access to all recreational users cannot be over emphasised and as six out of ten users of these areas are hunters it is especially important to us.
Taupo deerstalkers were pleased to see such a large turnout of hunters and friends, ensuring a successful afternoon for the promoters and competitors alike. The quality and variety of the goods and services offered combined with great hunting opportunities on

our doorstep augers well for the future of recreational hunting.
Taupo deerstalkers would like to thank all those who took part, our members who put in so much of their time and expertise, the promoters for making it all possible, and Cam Speedy for his enthusiasm and input from the beginning.'
Bob Neckelson, Publicity Officer, NZDA

Winning head shot by Glen McRae (DS score 212-3/8) - Mount by Vern Pearson - 'Sika Country' Taxidermy

Winter Hunting Summary

The need to get copy for this issue of *Target Taupo* to the printers earlier than previous years means we have less data for the winter period this year. However, hunting diaries are starting to roll in and these will provide additional information to support the impressions we have of what has gone on over winter. If you have a diary amongst your hunting gear, please don't throw it away. Even if you didn't go out for a hunt it still provides useful data. If you did, it is very important that you fill it out accurately and return it! You may even win one of the $1250 worth of prizes we give away each period.

The winter of 1996 has been another wet one but in contrast to the previous few years, warm northerly patterns prevailed and overall the winter was comparatively mild. Three cold blasts coated the high country in snow at different times but this never stayed longer than a few days, quickly washed off by warm rain.

Hunters report shooting deer in very good condition from all areas of the conservancy. The condition of the animals probably reflects first and foremost, the excellent growing season that allowed deer the opportunity to put on body fat. The kill of deer in eastern parts of the conservancy by the ash-fall from Ruapehu in spring last year will have also given those deer remaining a better chance to make the most of the summer. Secondly, a number of fat breeding hinds without fawns at foot were reported shot from the eastern ranges during July/August suggesting that they perhaps lost their fawns or aborted following the stress of the ash-fall which then allowed them a summer to regain body condition. A third factor could be the generally mild winter which will have put less demand on energy reserves.

The implications of fat deer going into this spring are strong reproductive performance this year and perhaps, another year of strong antler growth. Early signs are, effects of Mount Ruapehu and summer growing conditions aside, that next roar could be better than average.

A total of 1446 permits were issued for the period which is exactly the average over the past seven years. To date less than 100 diary returns have been received so no data has been processed. However, although rather incomplete due to the low response rate, figures for the autumn period are now available. These are presented in Table 13.

Table 13: Tongariro/Taupo Conservancy Recreational Hunting Statistical Summary February 1996 to May 1996

Area	Block	Days Hunted	Encounters				Kills				Kills/1000 days hunting
			Sika	Red	Pig	Goat	Sika	Red	Pig	Goat	
Kaimanawa Recreational Hunting Area	All	438	312	5	1	-	79	3	1	-	190
Kaimanawa Forest Park (excluding RHA)	All	454	216	88	9	-	67	24	-	-	200
Tongariro National Park	All	208	10	150	1	-	5	70	-	-	361
Tongariro Forest	All	136	-	93	11	44	-	23	1	4	176*
Erua Forest	All	23	-	17	6	18	-	10	4	8	608*
Rangitaiki Forest	All	44	31	-	-	-	7	-	-	-	159
Lakeshore reserves	All	-	-	-	-	-	-	-	-	-	-
Unspecified returns	Whole conservancy	274	-	-	-	-	10	17	-	-	99
Totals February - May 1996		1586	-	-	-	-	170	147	6	13	204*
Totals February - May 1995		2761	-	-	-	-	297	244	5	97	198*

* Only deer and pig kills have been used, for comparative purposes.

Kaweka Beech Collapse

In early 1995 a survey of mountain beech forest condition was carried out in the Kaweka Forest Park. Landcare Research analysed the data and compared this to data from earlier survey work. A report entitled 'Mountain Beech Dynamics in the Kaweka Range and the Influence of Browsing Animals' has been provided to the Department of Conservation and was publicly released at a meeting held in Napier on 10 July 1996. Representatives from various interest groups attended the meeting including both local and national representatives from the New Zealand Deerstalkers' Association.

The report indicates that deer, particularly sika deer, are impacting on mountain beech regeneration in some areas of the Kaweka Forest Park.

Canopy collapse is a natural event in mountain beech forests and can be initiated by a number of events including drought, snow and wind damage. Later insect and fungi attack cause further damage and the forest collapse can progress over several decades. As trees die the canopy opens up and mountain beech seedlings grow to form a dense thicket of seedlings and saplings, and later develop into pole stands of mountain beech.

In parts of Kaweka Forest Park, forest collapse has occurred over the past two decades but the expected prolific regeneration has not happened. The cause of the damage has been identified as browsing by deer. Where areas have been fenced off to prevent deer from browsing seedlings, the mountain beech has formed thickets of seedlings and saplings as expected.

The research also shows that as well as impacting on mountain beech regeneration, deer are causing declines in their preferred food species. For example, broadleaf trees are getting larger in size but fewer in number. This means that broadleaf trees are getting older and as mature trees die they are not being replaced by seedlings. Other tree and shrub species which are not palatable to deer are increasing in number. These include *Podocarpus hallii* (Halls totara), *Phyllocladus alpinus* (mountain toatoa) and some small leaved *coprosmas spp.*

The report concludes that if mountain beech forest cover is to be maintained the Department of Conservation needs a prompt management response to ensure that a pulse of regeneration will take place on as wide a range of sites as possible. Under current conditions

the problem will eventually become more extensive as additional mountain beech stands break down and are not replaced.

In order to address the problem the Department of Conservation has set up a working group to provide advice on possible solutions.

The working group consists of representatives of New Zealand Deerstalkers' Association, Royal NZ Forest and Bird Protection Society, iwi, Federated Mountain Clubs, concessionaires and the Rangitikei-Hawke's Bay Conservation Board.

The first meeting of the working group was held on 30 August 1996. The group agreed to the terms of reference and was provided with background information. It is expected that the working group will have four meetings with a final meeting in late November. If people wish to contribute information to the working group they can go through one of the organisations in the working group or contact the DOC conservancy office in Napier [Keith Briden - (06) 835 0415].

Copies of the Landcare Research report have been sent to hunting organisations and can be viewed at field centres in the Hawke's Bay Conservancy, or at any DOC conservancy office. If you want your own copy of the report they can be ordered from the Napier Conservancy Office (PO Box 644, Napier) at a cost of $5 per copy.

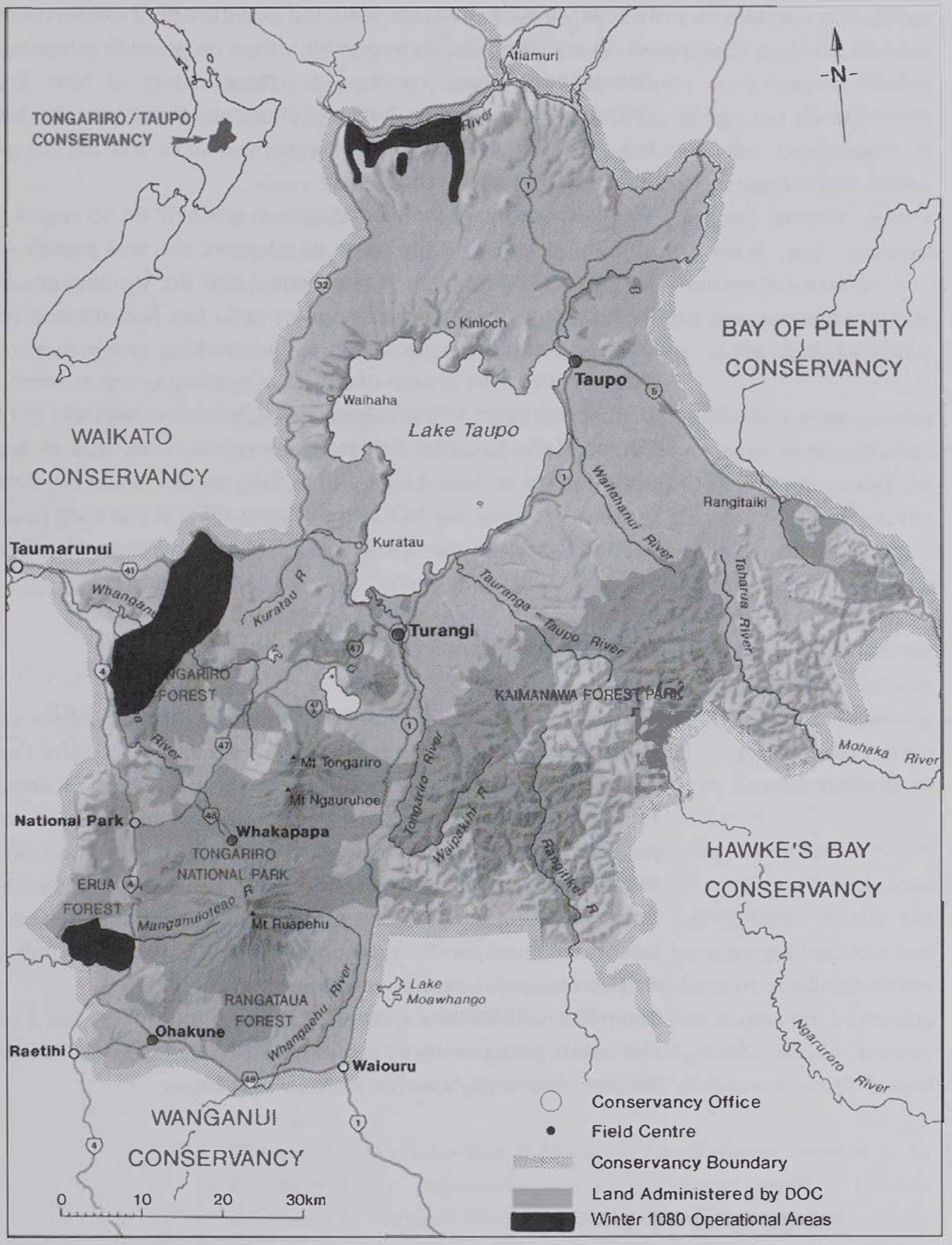
News from Turangi Field Centre

Many of you who have had an association with Kaimanawa and/or Kaweka Forest Parks over the past 15 years will know Dave Lumley, previously Forest Ranger, Puketitiri, Officer in Charge of Kaimanawa Forest Park and currently Field Centre Manager in Turangi. Dave has recently accepted a two year secondment to the position of Field Centre Manager, Chatham Islands and will be leaving in November.

Dave's knowledge and experience will be sorely missed but we wish him and his family well for their time on the Chathams and only hope that he returns when the secondment is up.

Terry Slee will fill Dave's shoes while he is away. Terry has a strong recreation background from his time in Turangi as the Tongariro-Taupo Conservancy's recreation/tourism planner.

Tongariro/Taupo Conservancy



Team Profile

Cam Speedy

Cam Speedy is based at the Turangi Conservancy office and has co-ordinated activity in wild animal management, habitat management and protected species in the Tongariro/Taupo Conservancy since 1989. More recently he has taken over wider protection duties as manager of the conservancy Protection Team.

Prior to his placement at Turangi, Cam was Game Management Officer in the previous Taupo District Office and before this spent four years in the Environmental Section of the New Zealand Forest Service working throughout the central North Island.

Cam is a keen hunter and angler with interests that revolve around wildlife and wild places. A keen sportsperson, at 33 Cam now spends less time at the physiotherapist and more time with his family but still has a keenly competitive spirit.

With a wide network of wildlife management contacts around the world, Cam hopes to travel more over the next few years to investigate new approaches that might be applicable to our unique New Zealand situation. Cam co-edits Target Taupo with Glenn Maclean and has had numerous articles on wildlife and hunting published in various magazines. While some of what he writes does not sit comfortably with all groups, Cam believes a pragmatic approach to management, with the support of an informed public, provides the best opportunity available for achieving realistic, sustainable protection of the natural resources New Zealanders value.

Taupo Field & Stream Directory

To advertise in the Taupo Field & Stream Directory and reach 12,000 annual fishing licence holders, contact Peter McIntosh on (09) 579 3000

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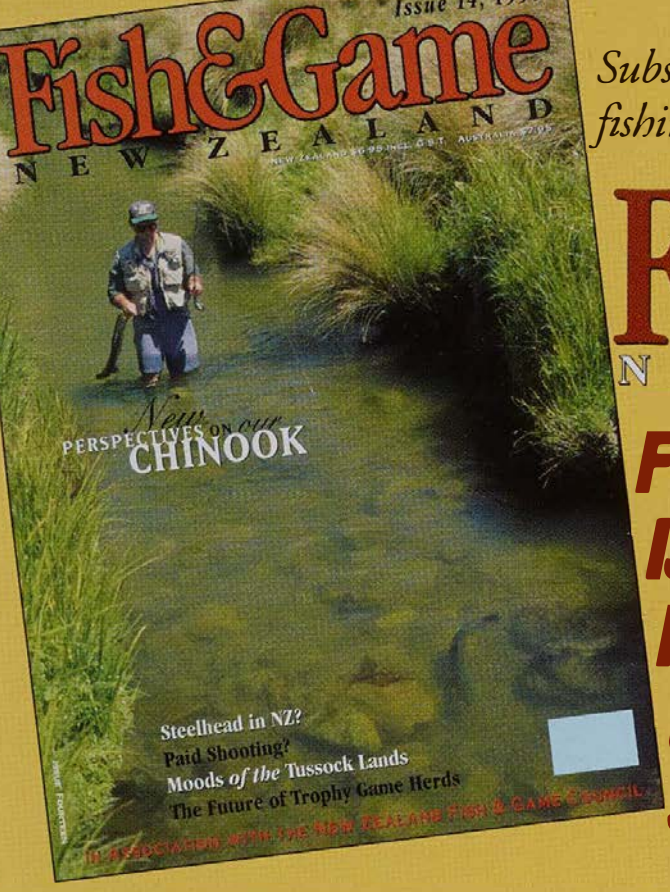

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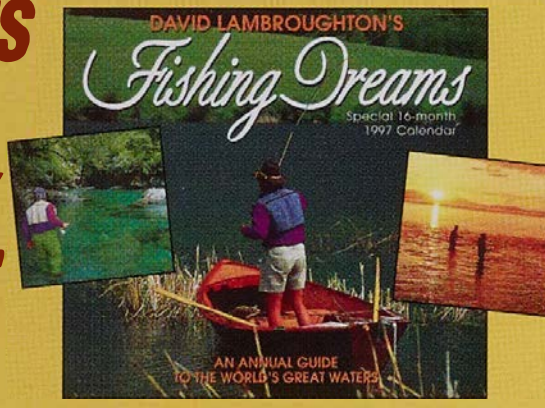

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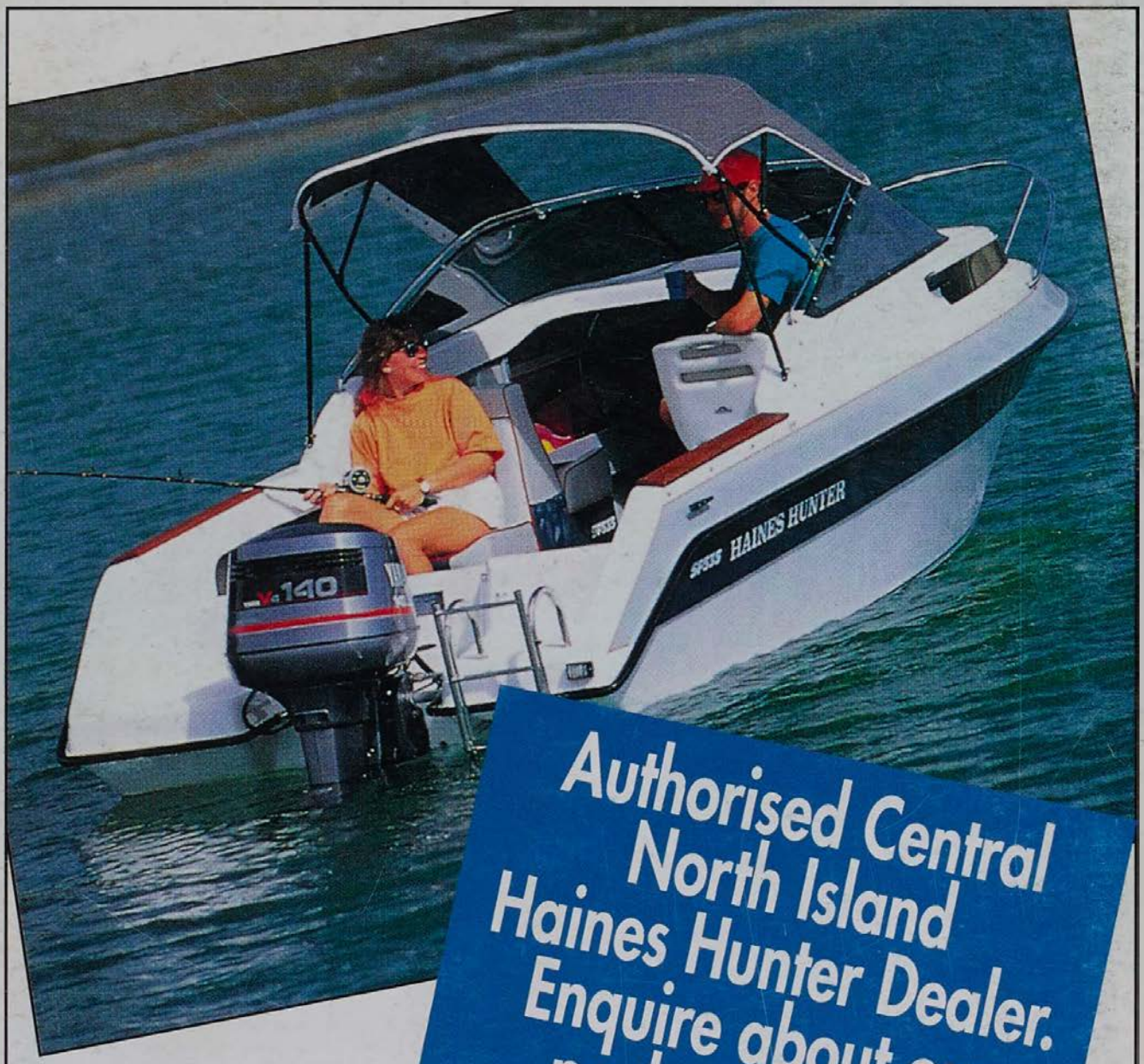

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