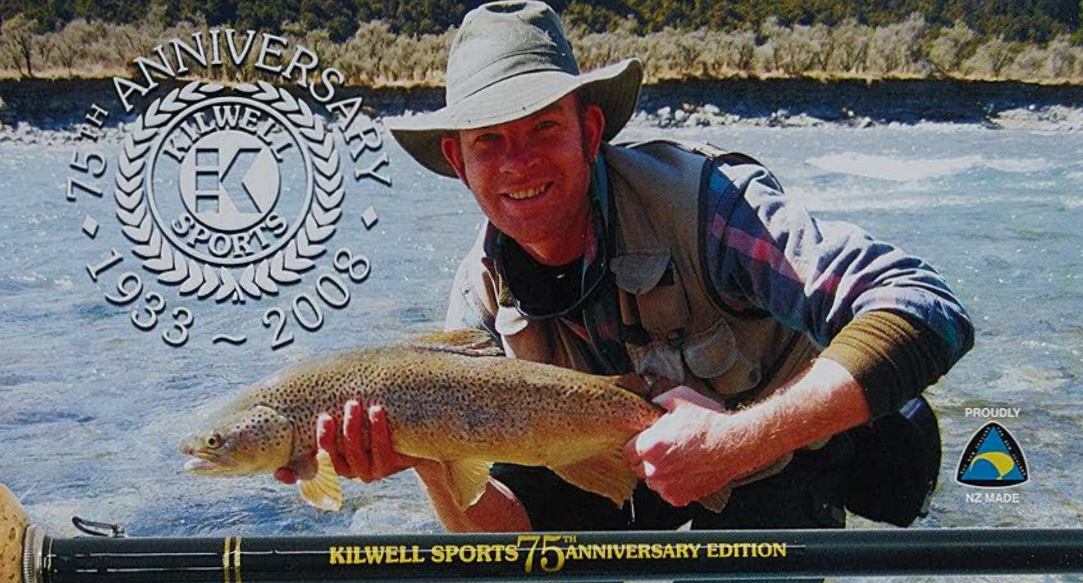
TARGET TAUPO

A newsletter for Taupo anglers

AUGUST 2008, ISSUE 58

Department of Conservation
Te Papa Atawhai

New Zealand Government



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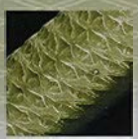

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Front cover: A nice rainbow typical of modern fish, in the Tongariro River
Photo by: Rob McPeek

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Tommi Venman on Lake Kuratau

Brown & rainbow, Tongariro

Juvenile trout monitoring

Fly-fishing the delta

Target Taupo

A newsletter for Taupo anglers

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Fishery foreword

By John Gibbs
Taupo Fishery Area Manager

Photo by: Kim Alexander-Turla

WELCOME TO THIS ISSUE OF *TARGET TAUPO*. It's funny sometimes that no matter how we try, we still struggle to get it right. In Issue 57 I wrote how I had been corrected for my long-term mis-spelling of the title of this column as "Forward". I happily confessed my sin and announced that from then on I would use the spelling "Foreward" and proceeded to do just that. Well thank you John Parsons (again) and a couple of other readers who have pointed out that I still had it wrong and the indubitably correct spelling is actually "Foreword".

Well, it really is a period of mixed fortunes in the Taupo Fishery just now. That the fishery is going through a downturn in quality and productivity is not disputed. Similar events have happened several times in its century-long existence and this is hardly surprising given that it is dominated by natural influences such as floods, droughts and even volcanic eruptions. On top of all this are the impacts of human activity including urbanisation, intensification of agricultural land use, declining water quality, energy development, increasing angling pressure, etc. The factors controlling the state of the fishery at any one time are complex and some of them not well understood. DOC takes this very seriously and the fishery team are very focused on monitoring and research to inform appropriate management responses. The simple answer is: it's not simple!

Over the last two years these changes have been addressed at length in *Target Taupo*, and again in Glenn Maclean's feature article in this issue. While it is perfectly reasonable that anglers are concerned about the present state of the fishery, as is the Fishery team, it is disappointing to see some of the ill-informed comments being made. It is even more damaging when some of those comments are made by civic leaders.

The management of the Taupo fishery is paid for solely by anglers' licence fees at no cost to the community. The fishery is a recreational resource of international importance. Generating some $80M annually, it is arguably the single most important asset in maintaining the Taupo district visitor industry - the mainstay of our tourism-based economy. Thus, much of the wealth of the community rides on the back of the fishery. It seems strange that people would publicly denigrate such an important source of the district's prosperity without at least taking the trouble to ascertain the facts.

As I implored last time, please read these articles carefully and form your views using all the information available. Better still, come along to the public fishery forum at the Lake Taupo Yacht Club on 11 September and have your say.

On the upside, the Lake Otamangakau fishery is going through a boom at present. The last few years have seen a steady increase in trout numbers and indications are that the Te Whaiau Stream spawning run this year will be a record. In its brief 36 year existence this fishery has gone through cycles with large variations in trout numbers and size. Although its ecology is quite different from Lake Taupo it does illustrate yet again that wild fisheries are not constant in their attributes or state.

We also received a huge boost in late July with the announcement by Genesis Energy that it was expanding its partnership with DOC and the Tongariro National Trout Centre Society. Genesis has pledged $1M over the next five years to the trout centre. Half of this will fund the popular Taupo for Tomorrow education programme and the remainder will go towards the development of a whio (blue duck) captive rearing conservation project and an aquarium at the site. It's great to see a major player in the local community take such a huge part in helping with the sustainability of the fishery.

Fishery Doomed – Yeah Right!

By Glenn Maclean
Glenn is our Programme Manager, Technical Support, and manages the research and monitoring work done in the area

At the risk of being proven wrong over the next few months, all the indications are that the fishery is beginning to rebound from last season's low point.

Over the last 18 months there has been considerable concern expressed about the small size of the trout at Taupo, and in particular their poor condition. In many ways these characteristics go hand in hand. If the trout are in poor condition then they are unlikely to grow well and so remain small. However trout may also be small simply because they are young. As it has turned out the fish were small because of both these reasons.

The later spawning runs in the Taupo Fishery are now very well documented. For example last year 58% of the total rainbow trout run passed through the Waipa trap in October and November. This pattern of later spawning has now been in place nearly a decade. Traditionally peak spawning occurred in August through early September, so baby trout now emerge from the gravels perhaps three months later than previously occurred. Given the young trout are growing approximately 1mm a day once they start feeding on smelt in the lake, then being 3 months younger may make a difference of perhaps 100mm in length. Whereas typically a young trout would pass through the minimum legal length limit of 45cm in around December, now even in late summer and autumn

TOP: Wild winter storms are the catalyst for the lake mixing each winter
Photo by Julie Greaves

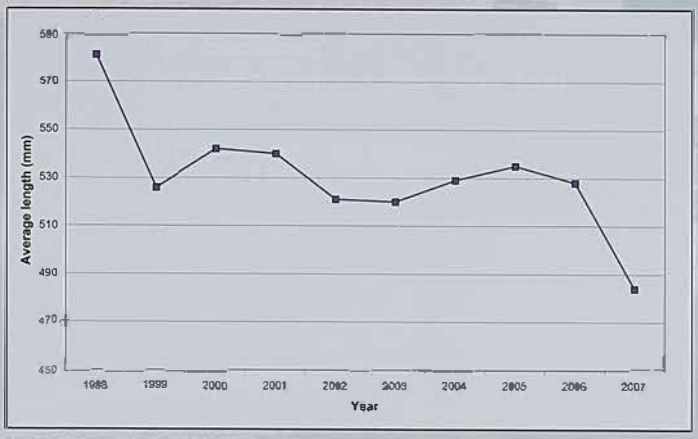

Figure 1: Average length of rainbow trout through the Waipa trap 1998 to 2007

many of the trout are smaller than this.

However as became evident through last winter the trout were also in generally poor condition and simply didn't grow. This was exemplified by more than 12% of the run through the Waipa trap being shorter than 45cm as mature fish, compared to less than 1 percent in 2000, or even in 2005 when the late runs were already firmly established. The poor growth is also reflected in the reduced average size of fish measured through the trap (figure 1). Note that even in the years of later spawning runs the fish still typically mature at or close to the long term average size, it is just they make this growth in the lake over winter now, rather than as previously over summer and autumn.

So what was the cause of the poor growth last year and is it a long term concern? In simple terms the lake went through a period of poor productivity, most likely as a result of not fully mixing in 2005 and no, it is not a long term concern unless changes in the climate were to make this a more regular occurrence.

Typically each summer the surface waters of the lake heat up creating a layer of warmer water floating on top of the cooler bottom waters. The density difference between the two layers becomes such that they cannot physically mix. Much of the life is in the top layer where the light is, but as this dies and sinks into the bottom waters, the nutrients previously locked up in the cells are released back into the water. By late autumn the surface waters have become low in nutrients having been used up by the various algae, and the bottom waters nutrient rich but unavailable.

However in nearly all years, as winter progresses the surface waters begin to cool, once again reducing the density difference between the two layers. With the onset of wild winter storms churning the surface waters these layers mix. Suddenly an enormous boost of nutrients is again available to the phytoplankton (small plants, many of which are microscopic algae which float in the surface waters) it's no different to putting fertilizer on your lawn to make your grass grow, and this stimulates a whole new cycle of growth. As the phytoplankton thrive so too do the zooplankton which are the small creatures which feed on algae. In turn the smelt feed on the zooplankton and the trout on the smelt.

Or at least that is how it works in most years. However in 2005 the lake did not fully mix and many of the nutrients were

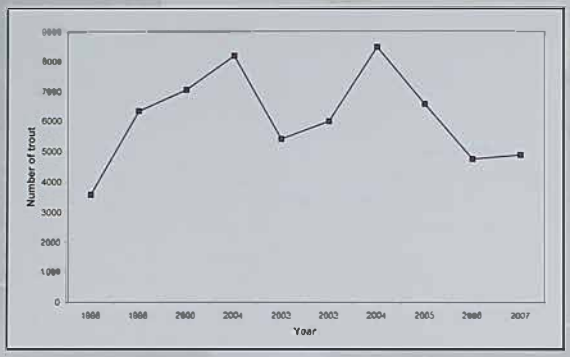

Figure 2: Number of rainbow trout through the Waipa trap 1998 to 2007 (adjusted totals to account for fish which bypassed the trap in floods)

not re-circulated back into the surface waters. Perhaps surprisingly the flow-on impacts on the smelt population do not appear to have occurred until 2007, rather than a single year later. This is certainly something we have learnt from this episode. in any year the size of the smelt population is limited by the lack of food in early winter, not by trout predation as we tend to imagine. Many simply starve to death. in the winter of 2007 there was likely even less food available than usual and mortality amongst the smelt even more severe, reducing the population to unusually low levels. Not surprising then that trout in the lake found it tough too.

Since 2005 the lake has mixed each winter and given how cold and wild this winter has been so far it will almost certainly mix again in 2008. However the improvement in conditions takes a little while to flow through. For example, the smelt population can't rebound until it actually spawns and produces new fish, which occurred in spring and summer this year. As a consequence the biomass of smelt has only started to build in the last few months and we are now starting to see a marked improvement in the condition of the trout. The key are those fish coming into the river from now on that have had the opportunity to feed up in the lake in recent months. Their condition will tell the story.

It seems to be one of those low points that come along in natural systems occasionally. A comparable example is the drought experienced in the central North Island over summer and autumn this year. On local farms a lack of rain meant no grass growth and the stock struggled. Farmers have had to reduce stock numbers but even then the remaining animals have generally done it hard and not made much growth. This has continued into winter because while

'There is no argument: the fish were skinny' last summer
Photo by Julie Greaves

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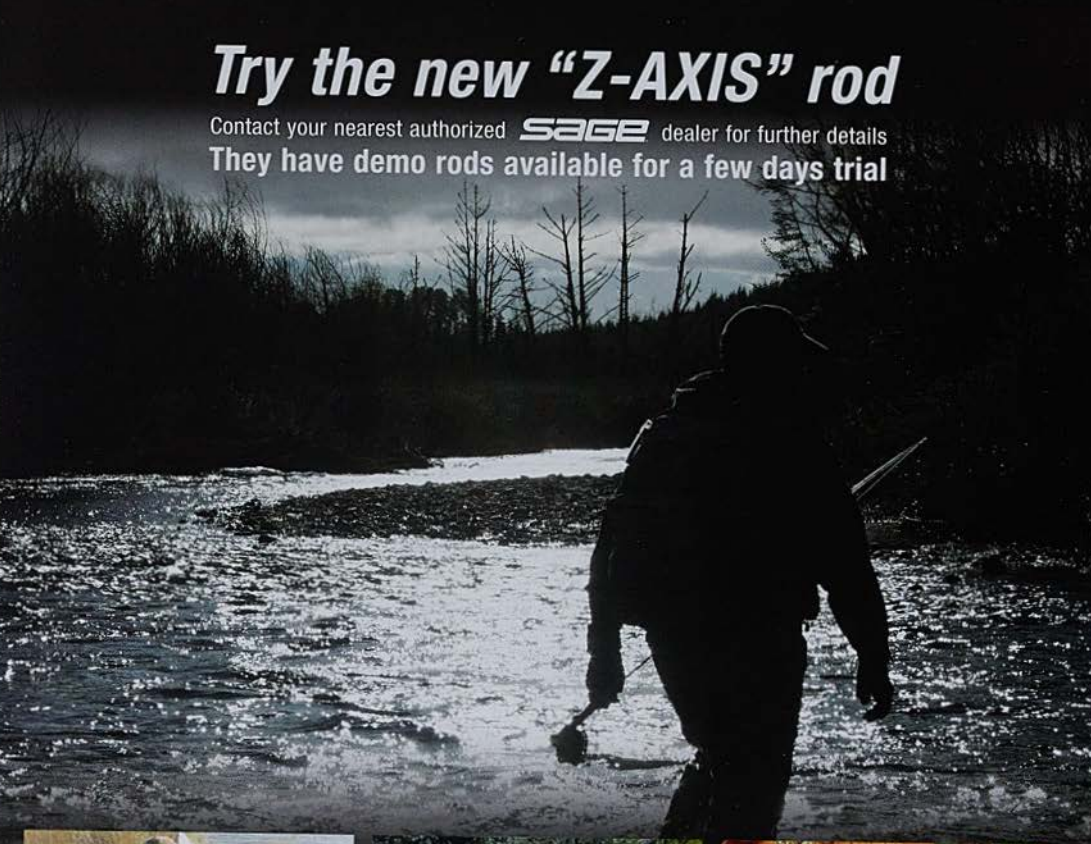

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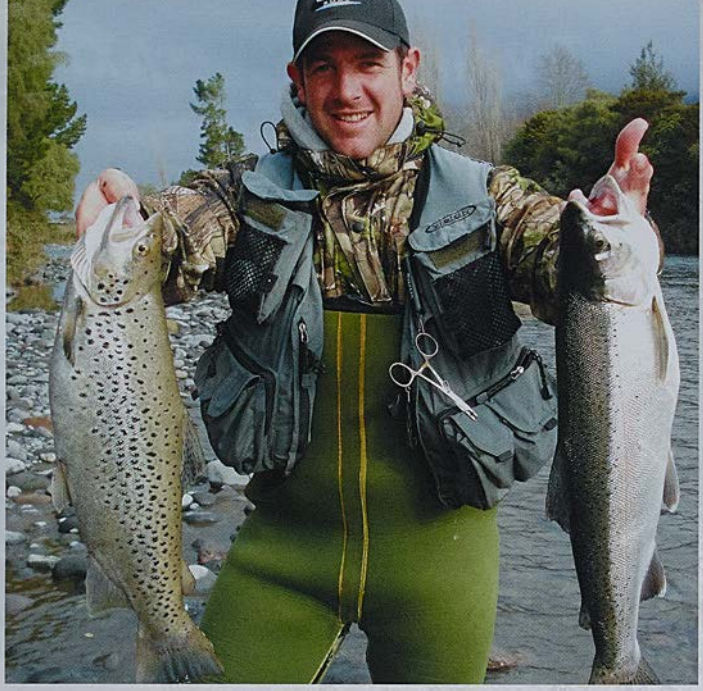


The indications that things are looking up - Andrew Christmas with a couple of great Taupo fish from the Tongariro - June 2008
Photo by Julie Greaves

the rains finally came, by then temperatures were too cold for grass to grow and so it's a tough period until next spring. We all expect it to recover and business to resume as normal, it was just one of those unusual climatic events and so too with the lake.

In fact over time the lake is generally becoming more nutrient rich reflected by the reduced water clarity, albeit that it is still very clear by many standards. Clarity is a function of not having too many little green algal cells floating around in the water and the clarity of lake Taupo reflects that it is a relatively unproductive system. Intuitively this seems contradictory; we think of Taupo as a very healthy ecosystem because it is clear, but this also reflects that life is relatively hard. The trend of a decline in water quality, that is more nutrients in the water, may benefit the fishery at least in the short term but it is a very dangerous road to go down, hence the measures being implemented to try and maintain the quality of the lake.

A related issue is the question of whether there are too many trout. Many of you may argue not, based on your angling success over the last season and in reality both answers are right. As evidenced by the Waipa trap last year (figure 2) the run was one of the lowest since 1998, and our counts of spawning fish in other eastern tributaries were below average to average also.

However given the condition of the trout then maybe there were too many for the available food. Again using our farming example, many farmers reduced stock numbers but if there is no grass growth then it is still a struggle for what is left, short of having almost no stock.

One option on the farm is to buy in stock food (if it makes economic sense which is debatable in the central North Island at present), but this is not an option on the lake. The practicalities of distributing smelt around the 193 km of shoreline on a daily basis are absurd, the only hope would be if we could release huge numbers to live in the lake for the trout to feed on over the following months. Practically, smelt are one of the most fragile and difficult to

handle freshwater species, but even more critically if there isn't enough food for the existing smelt population then it's not a good idea to add even more smelt. If your cows are starving you don't go out and buy more

A common question is whether anglers should keep a prime Taupo rainbow if the fishery is struggling. If it is a large early run fish then maybe it would be preferable to let this fish spawn; there aren't that many of them at present. However by all means take a smaller fish or later running large trout, it is part of the Taupo fishery to take and enjoy a prime eating fish, and if anything an increased harvest is desirable at present.

Let's also address a couple of other concerns anglers have raised. Catfish are not the cause of the reduced smelt numbers. As discussed in *'Catfish in a Goldfish Bowl'* on page 59, catfish numbers have stabilised in recent years at much a much lower level than their peak in 2000, ironically also the last major peak in the trout population. Catfish are opportunistic feeders eating whatever they can find on the bottom. In fact they are very clumsy feeders, feeding mostly by touch and smell with no real ability to catch mobile prey like smelt. Watching them feed reminds me of a pig feeding, half blind to what is going on around them but very quick to smell food left on the ground. Catfish clearly feed on smelt which have died on the bottom but they are not an influential predator of live smelt.

A more effective predator are the shags. Shags are a natural predator world wide and the Taupo Fishery was established in the presence of large shag numbers, which previously fed on the koaro (white bait) and koura. They are part and parcel of the ecosystem and their numbers are much more influenced by the size of the smelt population than the other way around. By and large smelt are a species of the deep open waters where they are out of reach of the shags. Shags have to make do with the smelt on the fringes, either those close to the surface or in the shallows and almost certainly if the smelt population has declined then so too will the shag population on the back of this.

WHERE TO FROM HERE?

The rain that broke the drought in late April bought a short flurry of trout into the rivers but generally there were relatively few fish in the rivers through to late June. This was reflected in our spawning counts and the very low run recorded through the Waipa trap to this point. However the vigorous weather patterns that have swept the central North Island since have been the catalyst for considerably larger runs and we expect these to build further over the coming months. Perhaps most encouraging though is the marked improvement in the condition of many of the fresh fish. They are not all wonderful and indeed we don't expect them to be, if for no other reason than that there is a significant component of the run that are repeat spawners from last year. These fish were small and tired then, and are never going to develop into particularly good specimens. It is early days but it does appear that the condition of the maiden trout has improved significantly in recent months. Similarly anglers are reporting catching trout in some parts of the lake spewing smelt. These maiden fish are not necessarily going to be big fish as their growth was likely checked over summer, but they are now carrying more weight and fighting correspondingly harder.

So we are not too concerned about the issue of trout condition but this still leaves the issues associated with the pattern of late spawning. The smaller size of the trout simply because they are younger, has a number of undesirable impacts;

1. Much of the catch on the lake over summer is less than the current legal length of 45cm which is a significant disappointment for lake anglers

2. This means anglers are releasing a considerable portion of their catch at a

Gebhard Krewitt with a 3.4kg (7.5lb) Tongariro rainbow, July 2008. *Photo by: Joe Beattie*

time of year when this is not desirable because of reduced survival

3. There is very strong selection pressure on the few remaining early spawners because these are the majority of fish which exceed the size limit. Similarly there are relatively few of the these fish in the early winter run when there are large numbers of anglers on the river and so they are subjected to intense pressure.

4. The fish which are protected in the lake by the current size limit largely don't benefit the winter river anglers either, because they run after most river anglers have given their sport away for the year.

5. Shifting the period the trout spend in the lake towards a greater time over late winter when smelt numbers are at their lowest may impact on their overall size

To address some of these issues we are reducing the minimum size limit to 40cm. We had hoped to have this in place for the start of the new season but the change is still passing through the legislative process. However it is happening and should be in place shortly. We have held off printing the bulk of our licences so as to hopefully incorporate this change on the reprint, and it will be publicised widely when it occurs.

There may also be some other options available to us in the medium term depending on the outcomes of Elizabeth Heeg's genetic investigations (see page 48). If the timing of spawning is linked to shifts in the genetic makeup of the population than we maybe able to manipulate this by exploiting the later run fish more and protecting the early run fish. For example we could have a closed season over part or all of the rivers early in the run and an open season covering the later part of the run. Another option is the use of minimum and maximum size limits to protect the desirable large early run fish. There are likely to be a number of variations which we could explore and at this stage we are flagging that we are in favour of a return to an autumn run if this can be achieved.

While we believe that conditions are improving in the lake we have come to the view in recent times that it is the functioning of the lake that is the key to determining the size of the trout population and the size and condition of individual fish, all other things being equal. In light of this emphasis on needing to understand how the lake influences the fishery we are currently reviewing our key information needs and how we can best address these. There will be more on this in the next issue of *Target Taupo*.

The reduction in the size limit is a big step forward. On its own it will not bring the spawning runs back earlier but it will make a significant difference to anglers' enjoyment and opportunity. It's not all doom and gloom.

Note: There will be a public presentation on the status of the fishery on the 11 September at the Taupo Yacht Club at 5.30pm. If you would like to attend please advise Kim, email kturia@doc.govt.nz or 07 386 9259.

TAUPO FISHERY REGULATIONS AMENDMENT UPDATE

As discussed above the amendment to reduce the minimum size limit to 40 cm has been approved by the Minister of Conservation and is progressing through the legislative process. We expect it to be signed off shortly It is an essential change and will be brought in as soon as available which will be mid season. The change will be widely publi cised in the media, with posters in local shops, on the reprint of the licences and on the DOC website. If you are unsure of the status give us a ring on (07) 386 8607 or email fishinfo@doc.govt.nz

The other much more minor amendments designed to clarify the intent of some existing regulations and also to remove the depth restrictions on downriggers which were discussed in *"Minor Amendments to Fishery Regulations"* in *Target Taupo #57* will also come in at the same time.

Fishery History Documented

By Callum Bourke
Callum is acting Programme Manager, Field Operations responsible for many of our day to day activities in the field

Pukawa resident John Ball is embarking on an exciting project to create a documentary on the history of the Taupo Fishery. Hailing originally from Canada, John came to New Zealand in 1970 to instruct at the Chateau Ski School. This began a cycle of 35 years of continuous winters instructing, directing ski schools and coaching in Canada, USA and New Zealand. Having spent 20 years working full time on Mount Ruapehu directing ski schools at Whakapapa and Turoa, he is now a New Zealand citizen and resides at the southern end of Lake Taupo more or less full time.

This is not the first time John has embarked on such a project having earlier made a documentary on the history of skiing on Mount Ruapehu. It was the story of the many skiing pioneers who helped make a contribution to the development of the sport. The story seemed to touch the hearts and souls of many and reached a wide audience screening in cinemas around the country and often to a full house.

So with the Ruapehu documentary under his belt, John looked for another similar story. And he didn't have to look far. John saw the history of the Taupo Fishery as another great New Zealand story of the cooperative spirit of many to achieve something for all to share. John decided for this documentary, that he would trace the development of trout fishing from its beginning when the first brown trout were introduced to the lake and its tributaries to where it is today, a valued recreational resource that makes a huge

John Ball interviews fishery scientist, Dr Michel Dedual
Photo by: Kim Alexander-Turia

contribution to the local economy as well as being a valued cultural heritage. Three lines of this history will be explored:

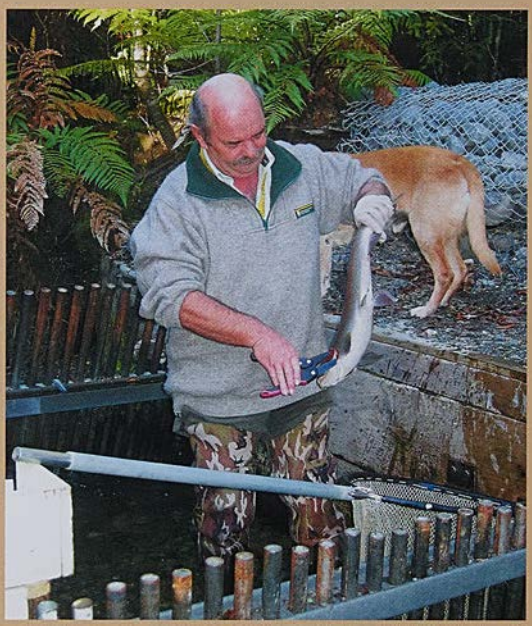
- government involvement and management
- the role of Ngati Tuwharetoa, the owners of the lake and river beds
- the stories of anglers and businesses that have used and benefited from the fishery

John would like to include stories and memories of the many who have been involved in the fishery. He believes that history is about people and their stories have to be recorded to be preserved. If we wait too long, too many generations will have passed so some stories will be lost forever.

He sees this documentary as having an appeal to the many users of the fishery. In addition it will be an educational tool to increase peoples' knowledge, understanding and appreciation of this economic and cultural heritage. The documentary will also go beyond history and touch a bit on the future. There are many threats to the fishery: water quality, didymo, river modified flows to mention a few. John believes that research may be carried out to understand the causes of these threats but often it requires education to change peoples' ideas and habits before the necessary corrective actions take place. Hopefully this documentary will go some way towards providing that education.

John anticipates that the documentary will take 18 months to complete. He requires the generous cooperation of many people to make this project possible and is in need of archive material such as photographs and film, and most importantly peoples' time to sit down in front of the camera.

If you could be of assistance and have some stories or information about the Taupo fishery, John would love to hear from you. His contact details are (E-mail) jbproductions@ihug.co.nz or (phone) (07) 3865138.



Farewell to Rob

Rob Mclay (in his moustache days) doing what he enjoyed most – hands on in the river working with trout. After 35 years working in conservation, a good deal of that with the Taupo Fishery Rob retired in early July to head back to his roots in the deep south. One of the old school, Rob was highly valued for his understanding of and instinctive feel for the resource, and his robust pragmatic approach, a great balance for some of us more ethereal types. We can't do his contribution justice in the short time before this issue goes to print so we will profile Rob's important contribution to NZ sports fisheries and Taupo in particular in the next issue of *Target Taupo*.

The Waihukahuka Stream

By John Webb
John is Community Relations Ranger based at the Tongariro National Trout Centre

The Tongariro National Trout Centre (TNTC) is an important facility for the Taupo Fishery. In partnership with the Tongariro National Trout Centre Society, the site offers a fully functional trout hatchery (a back stop should a catastrophe ever strike the wild fishery) and a variety of displays, activities and ongoing education programmes that are essential to raising the profile and understanding of freshwater fisheries in the Taupo region and throughout the world. However, few people realise that there is an important natural feature of the TNTC site upon which all of these things depend. It is the Waihukahuka Stream or as it was popularly known 'the hatchery stream'.

Although often taken for granted, the constant clean water supply of this small Tongariro River tributary is the lifeblood that supports all that TNTC functionality is about.

This article is a journey through the development of TNTC with reference to the Waihukahuka Stream. The journey begins in 1923 when the then Marine Department's Chief Inspector of Fisheries, L. F. Ayson, was asked to investigate suitable sites in the Taupo region for the establishment of a trout hatchery. Ayson's investigations culminated in the recommendation that the Waihukahuka Stream be used and this was followed by a decision by the Department of Internal Affairs in 1925 to go ahead

Top: John Webb checks the TNTC spring intake
Photoby: Kim Alexander-Turia

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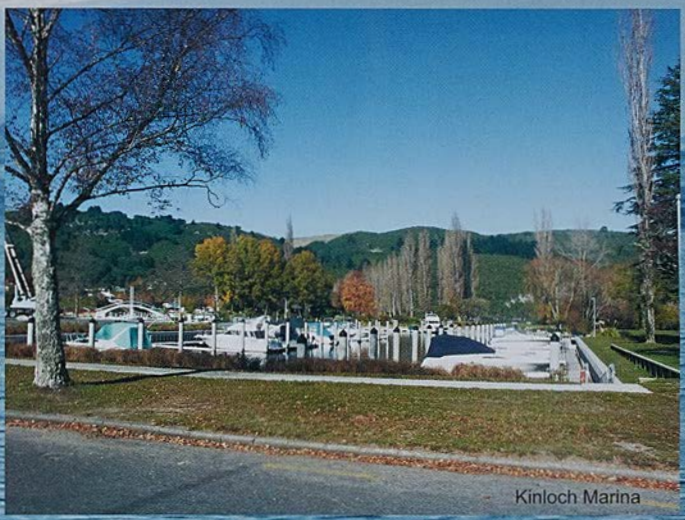
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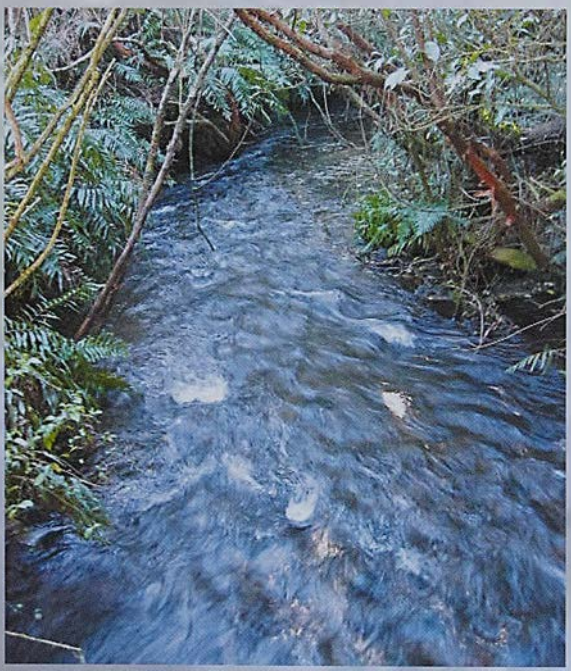
with the development. To quote their annual report of the time; *"Recognising that the Taupo trout are of exceptionally fine quality, it has been decided to erect a hatchery in the vicinity of Tokaanu"*. Tokaanu was the nearest recognised village to the Waihukahuka Stream as Turangi was not in existence at this time. Land parcels totalling 18.8ha (approximately 58 acres) surrounding the Waihukahuka Stream were acquired from the Downs family for the express purpose of establishing a hatchery and also interestingly, an anglers camp which was to become very popular with Tongariro River anglers in subsequent years. The hatchery and camp were completed in early 1926.

As an interesting sideline and contrary to popular belief, the Waihukahuka hatchery was not the first established in the Taupo region. Taupo Postmaster G. M. Park with support from the Reverend Henry Fletcher established a hatchery at Nukuhau near the outlet of Lake Taupo circa 1894 and successfully hatched brown trout ova obtained from Masterton. The fry were liberated at the stream mouths on the western side of Lake Taupo in 1895.

The Waihukahuka Stream meanders for the most part through native bush
Photo by John Webb



The Waihukahuka Stream itself is an attractive stream that meanders largely through native bush and ferns for around 1km from its source within the hatchery grounds to the Tongariro River. The bed is comprised of fine pea sized gravel which although suitable for trout spawning, would ideally be a little heavier. Aside from its attractiveness the Waihukahuka was chosen by Ayson as a hatchery water supply for a number of reasons. Firstly it is spring fed. The Waihukahuka Spring is just one of a number of springs in the general area including a smaller one at nearby Kowhai Flat, most of which originate from the slopes of Mt Pihanga. There is some anecdotal evidence that groundwater from the Tongariro River may also contribute to the supply. Being spring fed the Waihukahuka Stream is not prone to flooding or drying out and the water is of exceptional quality. It is pure and clean with little sediment, which is important for avoiding clogging or fouling of hatchery pipes, valves and tanks. The water emerges from the spring at a relatively constant temperature of around 10.6oC which is at the lower end of the optimum range for trout but the cooler water limits disease and improves its ability to carry oxygen which is a positive trade-off. Water quality of the Waihukahuka has been tested numerous times. One of the more interesting findings was that isotope analysis of the water in the 1970's indicated it is around 30 years old when it emerges from the spring.

A key advantage to its use as a hatchery stream is the fact that the Waihukahuka has a small catchment enclosed within the TNTC complex so it is easily protected from other land uses that might affect spawning trout. Furthermore the Waihukahuka Stream is an impor-

tant spawning stream in its own right. Relative to its size, high numbers of trout enter the stream to spawn every year and this is supported by data from the Waihukahuka fish trap. The trap was run originally to collect ova (eggs) and from 1963 to 1995 also as a monitoring station when up to 3000 trout were recorded between April and October. The good trout numbers were important not only to ensure the amount of ova collected at the hatchery could consistently meet demand, but also to make a contribution to the wild trout population of the fishery.

A common assertion is that the hatchery was originally established on the Waihukahuka Stream to stock the Taupo fishery. This is not the case. The Taupo fishery was deemed to be completely wild and self supporting by about 1905 and therefore the role of the hatchery was one of collecting trout ova for distribution to other New Zealand and international fisheries. In the early years of production around 250,000 fry from the hatchery were released back into the Taupo catchment, but this was considered a "replacement" for the stock taken by extracting ova for the hatchery rather than a stocking exercise. In its first year of production (1926/27) the hatchery collected more than 4 million ova from spawning trout in the Waihukahuka Stream. The hatchery was originally developed as an "eyeing station" where green ova taken from the trout in the stream would be incubated through to the eyed stage (about 18 days after fertilisation) and then shipped or distributed to their final destinations. Consignments were transported in boxes lined with wet sphagnum moss. However the small troughs and tanks were also installed in the hatchery to raise trout to the fry stage for local distribution, chiefly outside of the Taupo catchment e.g. to what is now western Tongariro National Park waters. The first international consignment was one of 1,402,000 eyed ova to State Fisheries in Sydney Australia late in 1926. As alluded to earlier, the high quality of Taupo trout was viewed as a very favourable attribute in establishing or improving these other fisheries.

There have been a number of configurations for supplying water to the hatchery from the Waihukahuka Steam. In the first year of the hatchery water was taken from a dam just upstream of the hatchery (where the fish pass now resides) but it was unsuccessful for a number of reasons. One of these was possibly the seeps entering the water supply from the true left side above the dam. These are still visible today and may have lowered the water quality to unacceptable levels. The next dam was built further upstream in 1927 about 250m above the hatchery building and operated until 1938. The buttresses of this dam are still visible either side of the stream about 100m up from what is now the service entrance crossing. Wooden flumes were used to feed the water to the hatchery. The lower dam was turned into ornamental ponds, which are still there and various other pieces of infrastructure, such as the fish ladder were added at later dates. A further dam was constructed in 1938 yet another 100m further up from the 1927-38 dam using gabion baskets. The water was supplied to the hatchery in much more reliable concrete half-pipes, the remains of which can still be seen beside the hatchery and fish pass display today. This arrangement operated until 1966 when the intake was rebuilt in concrete.

During construction of the Tongariro Power Scheme in the 1970's the Tongariro River was badly affected by silt discharged from tunnelling operations. Due to the terrain it was not possible to build settling ponds to prevent the silt entering the river and there were grave concerns about the damage this might cause to trout spawning and rearing. By way of mitigation the

power scheme builders, the Ministry of Works, offered to expand the production facilities at the hatchery so yearling trout could be stocked in the Tongariro River if necessary. The solution was to build the Burrows Raceways (or rearing ponds) which were installed in 1974. In the event, the damaging silt discharges ceased and the new ponds were never used for their original purpose. Also installed later in 1983 was a settling pond which collected all of the water from the raceways prior to being discharged back into the Waihukahuka Stream. This was later to become the childrens' fishing pond providing much enjoyment to successive generations of budding anglers through fish-out programmes. The settling pond was the catalyst for further changes to the water supply from the Waihukahuka Stream. Underground pipes were installed to feed both the rearing ponds as well as the hatchery. Subsequent to this the current pipeline was joined to the MWD pipeline by Byford Construction in the winter of 1990. This was done to overcome problems with having to screen the intake and remove leaves and debris causing blockages or other interruptions to the supply. A lean-to roof has now been put over the spring to protect it from debris and falling material, however it is still checked on a regular basis for obvious reasons.

For the first 60 years of its life, the Tongariro hatchery operated in synergy with the wildlife service hatchery at Ngongotaha, near Rotorua. High quality Taupo trout eggs were collected and eyed at Tongariro then taken to Ngongotaha for hatching and rearing to yearlings. Most of these fish were released in the Rotorua lakes, which lack adequate spawning and rearing streams, but many were distributed all over the country. The Tongariro facilities were also maintained as a back-up should disease or natural disaster strike Ngongotaha.

From a national perspective, demand for ova from the Waihukahuka hatchery remained strong from acclimatisation societies and conservancy councils until 1987, as the health of various fisheries was often viewed as a function of the amount of stocking or re-stocking that was undertaken. Since that time it has become increasingly obvious that the management of natural resources, habitats and harvests were just as, or

The Waihukahuka Stream is an excellent environment for spawning trout
Photo by John Webb

even more important, to the health of many of these fisheries as stocking was. Further, there were a number of subsidies available up until around 1987 that helped with the costs of ova procurement and the rearing of trout fingerlings for release. When these subsidies were removed such opetations often became uneconomic. So the focus of many fisheries changed from one of constant restocking to active management of the natural habitat and trout harvest. This, coupled with the drive by many fisheries to procure ova from their own established stocks meant that the demand for eyed ova from the Tongariro hatchery quickly ceased. Accordingly, so did full scale operations at the hatchery until today's situation where the hatchery only collects 8000-12000 ova from the Waihukahuka Stream annually, primarily to rear enough trout for the childrens' fish-out pond.

However, the hatchery, rearing ponds and the water supply from the Waihukahuka stream remain as a critical lifeline for other nearby fisheries. Although hardly ever fully utilised now the hatchery and rearing facilities can be re-commissioned and used very quickly during adverse events outside of the Taupo region. A good example of this was when Ngongotaha Hatchery lost its water supply in 2004. Many of their fish were able to be transferred and reared at TNTC preserving much of their produe tion that year.

In 1987 responsibility for the hatchery site and the Waihukahuka Stream passed from the Wildlife Service of the Department of Internal Affairs to the Department of Conservation. Through the foresight and hard work of a number of individuals and organisations in the ensuing years, the site was opened to the public and became the Tongariro National Trout Centre with a focus on advocating for trout fishing and the Taupo Fishery. The site remained largely unchanged until 2001 when the Tongariro National Trout Centre Society was incorporated and, in partnership with DOC, expanded

The Viewing Chamber is always popular with all visitors to TNTC. *Photo supplied*

the TNTC, promoting education about the site, water quality and freshwater habitats as well as providing insights and displays about the history and equipment associated with the Taupo Fishery. Many of the excellent displays and facilities at TNTC afforded by this partnership revolve around the water supply from the Waihukahuka Stream. These include the viewing chamber, stripping pens, various ponds, fish passes, bridges and of course the hatchery itself. The history that TNTC has of informing children about freshwater values has led to initiation and development in 2004 of the education program *Taupo for Tomorrow*. During these education programmes children are taken to the lower reaches of the Waihukahuka Stream to learn hands on about water quality, freshwater flora and fauna and the value of freshwater habitats. On many occasions they catch their first trout with assistance from TNTC volunteers using fly-fishing equipment in the pond fed by the Waihukahuka Stream.

TNTC has seen many changes since its early inception in 1926 but one thread has connected them all and that is the consistent flow of pure clean water from the Waihukahuka Stream. The future is also bright; fisheries managers have recognised the attractive and interesting values of seeing wild trout behaving and spawning in their natural habitat. A new entrance pathway with viewing platforms to the Waihukahuka is in the final stages of planning and there is an aquarium proposed for the site that will display the habitats and creatures of New Zealand's freshwater ecosystems. Surprise, surprise the water supply for this will be the Waihukahuka Stream. There is also a planned rearing facility for the rare whio or blue duck that will potentially utilise a disused rearing pond and water from the Waihukahuka Stream as habitat for rearing chicks for subsequent release into the wild.

So next time you visit and cross the bridge into TNTC, stop and admire the Waihukahuka Stream but don't take it for granted for it really is the lifeblood of the trout centre and its many facets - and hopefully it will continue to be that way for generations to come.

We gratefully acknowledge the help of Errol Cudby (recently retired Trout Centre Manager) in preparing this article.

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Graeme Sinclair with his 11 pound South Westland brown trout caught on a G.Loomis 8wt GLX Rod, Shimano BioCraft 7/8 LA reel, Cortland Line.

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CORTLAND

The Real Deal

Distributed by Douglas Johnson & Co. Member of I.G.F.A.

Left to right: Paul Green, Conservator, Murray Jackson, Genesis Energy CEO, Brian Corban, Genesis Energy Board of Directors Chairman, and Rob Lester, TNTCS Deputy Chairman.
Photo by: Ken Kimmins

Genesis Sponsorship

GENESIS ENERGY EXTENDS PARTNERSHIP WITH THE *TAUPO FOR TOMORROW* PROGRAMME

By Kim Alexander-Turia
Kim is our Programme Manager, Community Relations

The Department of Conservation has reached agreement with Genesis Energy to extend its support of the *Taupo for Tomorrow* learning programme, and to become a leading sponsor of the Tongariro National Trout Centre in Turangi. *Taupo for Tomorrow* is a programme that takes learners outside the classroom and asks them to have fun thinking critically about our natural resources and long term sustainability issues.

Left to right: Paul Green, Ian Kusabs, Genesis Board Director, and Brian Corban
Photo by: Kim Alexander-Turia

The new agreement builds on the relationship between the Department of Conservation, Genesis Energy, and the Tongariro National Trout Centre Society, and paves the way for significant enhancements to the existing facility. These are proposed to include integration of the hatchery into the visitors' centre as part of major refurbishments, the installation of a freshwater aquarium and the development of a Whio (Blue Duck) captive breeding facility.

"We are absolutely delighted with Genesis' decision to continue with what has been a very successful partnership. Our relationship really typifies the huge potential to be gained from building relationships across the wider community, and achieving great conservation outcomes along the way" says Paul Green, Conservator

Genesis Energy says their support of the Tongariro National Trout Centre gives the company the opportunities to develop its existing investments in Whio

Primary sponsor:

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Tongariro National Trout Centre Society

Maureen Shaddick - Genesis Energy General Counsel and Company Secretary with Genesis Board of Directors -Annabel Cotton, Dr Nicola Granford & Jo'mna Perry at the River Walk Visitor Centre
Photo by: Kim Alexander-Tuita

(Blue Duck) and fresh water ecology. It will also bolster Genesis Energy's educational portfolio for students across New Zealand. *"The development of Taupo for Tomorrow and the National Trout Centre will make the facility accessible for even more of New Zealand's young people. It will give visitors a deeper appreciation of New Zealand's unique ecology and environment,'* says Mr Jackson, Chief Executive Genesis Energy.

Taupo for Tomorrow educator, Mike Nicholson states *"As an educator, it is tremendously rewarding to see Genesis' commitment to developing critical thinking amongst our learners, who will be the problem-solvers of the future"*. The Tongariro National Trout Centre is a national resource for all students in New Zealand. Schools across New Zealand can take part in Taupo for Tomorrow by visiting the centre or by accessing the programme online at www.taupofortomorrow.co.nz

NOTICE TO ALL ANGLERS FISHING LAKE OTAMANGAKAU OVER THE UPCOMING SEASON.

An Animal Health Board pesticide operation is scheduled to occur in the VA003 (Turangi) Sector 2B during August/September 2008, although the exact timing is weather dependant.

The operation will affect the shoreline of Lake Otamangakau from the North Arm, along the northern shoreline to the Waiehu canal and will involve the use of 1080 poison in a cereal ground bait. Anglers are advised the bait will not be placed near the lake edge, however animals which have ingested 1080 may enter the shoreline area.

Due to the toxicity of 1080 to dogs, anglers are advised NOT to take dogs with them on the affected shoreline. The cautionary period for 1080 is 6 months after bait is laid, so anglers should not take dogs before at least March 2009.

Please look out for the signage which will be in place at the boat ramps to warn visitors of the need to keep their dogs safe.

For more detailed information, including updated information about the dates of the operation, contact the operation contractors: EPRO, PO Box 1748, Taupo. Ph 07 378 4852

Alternatively, a Pesticide Summary is available from reception at DOC Turangi, or online at www.doc.govt.nz/templates/page.aspx?id=33368

Rules of the Water

By Michael Hill
Mike is a ranger in our field operations work

Above: It is the responsibility of the boat overtaking to stay out of the way of the other boat
Photo by Kim Alexander-Turia

Image 1

Image 2

Image 3

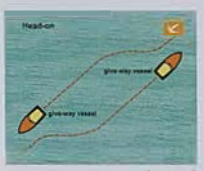

Image 4

Diagrams courtesy of Coastguard New Zealand

Do you know what to do when approaching other boats? Who has right of way? Are we all familiar with the code at sea? It's easy to forget when we only use a boat occasionally and I often take a quick glance at the diagram in the boat to remind myself.

At times it can be confusing knowing the right course to manoeuvre when boats become congested and more so with a jet ski or two zooming to wherever the adrenaline takes them. Because of this a lot of boat operators rarely practise the rules of the road. Some just don't know, opting to stay well clear of any oncoming vessels, or others simply disregard the passing code hoping it will just pan out and be ok.

Most of us have probably seen or heard of a close call or near miss, leaving you thinking *"boy that was lucky."* That's why there are regulations much the same as the road code, designed to ensure boats pass each other safely.

A boat must display a pattern of navigation lights from which its direction of travel can be identified either at night or in poor conditions during the day. These lights are green sidelight on starboard (right looking forward), a red light on port (left) and usually a single all round white light, though the arrangement of white lights can vary depending on the size of vessel (image 1). This pattern of lights helps you to know in which direction the boat is heading to. For example, if you can see a green light you are looking at the starboard side (right) of the vessel and it must be travelling left to right as you look at it. Lights must be switched on from sunset to sunrise or in rain or fog.

Recently we heard of an incident on the lake where a boat had these sidelights the wrong way around. Obviously this could have very serious implications so just check the lights on your vessel are green on starboard and red on port.

However there is one major exception to this pattern of green and red side lights and that is boats less than 7 metres and not capable of speeds greater than 7 knots which need only display a single all-round white light. In most cases this means a dinghy, of which of course there are many used on Lake Taupo, in particular for harling in the early morning or into the late evening.

To avoid collision there is a right of way rule. When two boats are approaching each other, one has the right of way and it is called the stand on boat. The other boat is called the give way boat. Essentially you must give way to another boat on you starboard (right) or when overtaking (image 2 and 3).

The give way boat must make an early and obvious manoeuvre so there can be no confusion. In all cases when giving way turn to the starboard side (right).

If you meet head on, both boats must turn to starboard (right). The easy way to remember this is that you pass 'port to port' i.e your port (left) side passes down their port side. It's no different in a channel or in a harbour where every boat must keep to the starboard side so once again you pass 'port to port' (image 4).

Ultimately these rules are to keep you safe. Ideally though, do a boating course run by Coastguard NZ and ensure you are a proficient and safe skipper for your benefit and that of other lake users. For more information contact www.cbesorg.nz/courses/

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Protecting our rivers with just a rake?

By Michel Dedual
Michel is our Fishery Area Scientist

This is a shortened version of an article called *'And a river runs through it ....but for how long?'* written by Bruno David, Michel Dedual, Murray Neilson, and David Kelly. This was written to encourage consideration of new methods to recommend environmental flow regimes in New Zealand rivers.

During the last 100 years as the human population quadrupled, it is estimated that the area of irrigated agricultural land multiplied more than six-fold, and that water take from freshwater ecosystems increased eight-fold. Human control of river flows is everywhere and more than 800,000 dams now block the flow of the world's rivers.

While manipulation of waterways has provided benefits to humanity it has also caused considerable ecological damage and the loss of important ecosystem services valued by society. The health of rivers deteriorates when the natural flow of water, sediments and organic materials and temperature regimes are substantially disrupted or modified by human activities. The deterioration accelerates and amplifies further when water is used for activities that produce toxic effluents that eventually percolate through the soil and water table back into the river.

Fortunately there is now an acceptance that it is in society's best interests to consider rivers themselves as legitimate "users" of fresh water. Worldwide mitigation of the environmental impacts caused by water flow alterations has become an essential component in

Top: How much water is enough?
Photo by Julie Greaves

water resource planning and management. Much of this is focusing on maintaining some semblance of the natural river conditions necessary to support ecosystem health. Recently it has also received extensive attention in New Zealand, where pressure to use streams and rivers for irrigation and hydro-electric power development is greater than ever. Central and local governments are facing an increasingly important question: How much water can be removed from an aquatic ecosystem before significant negative impacts occur?

In April 2007, the Ministry for the Environment commissioned a report called *'Scientific Input to a Proposed National Environmental Standard (NES) on Environmental Flows and Levels'*. The purpose of the report is to set out a consistent national approach to selecting appropriate tools to be used to set environmental flows and levels in any New Zealand stream, river, lake or wetland. Once the NES is implemented, these methods will apply for the next 10 years.

Several hundred methods have been developed internationally in an attempt to address this question. One of the most commonly used in New Zealand is a shorter version of the In-stream Flow Incremental Methodology (IFIM) developed in the US during the 1970s. An important building block of IFIM is the physical habitat simulation modelling (PHABSIM) that estimates mathematically how the physical habitat for target aquatic organisms is affected by different flow scenarios. This methodology assumes that the quantity of physical habitat (water velocity and depth) will limit the organism's potential habitat, hence its abundance.

The numbers generated by physical habitat modelling constitute the "currency" that is often used to negotiate the maximum amount of water that can be taken out of the river and still maintain riverine values or functions. Having such a currency is very useful for decision makers and as a consequence physical habitat modelling, rightly or wrongly, is an appealing method. Unfortunately, assessing whether the new flow regime does in fact maintain river values or functions is almost never undertaken.

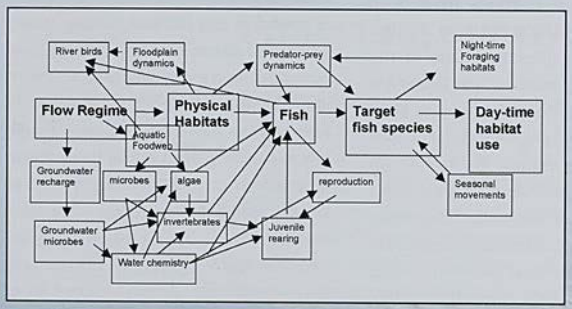
The question is frequently asked *'what is the optimal flow velocity and depth for trout?'* In a basic ecological sense, fish and other aquatic organisms learn to exploit or else seek new resources depending on the conditions they're under. If the conditions are not suitable those organisms will either vacate, die out or may be present but at reduced densities. Most have probably wondered why some rivers seem to support more fish than others or consistently produce larger fish. A large part of this has to do with food production rather than water velocity and depth. In other words the quantity (and quality) of food and how regularly and readily it is accessible to the fish (be it aquatic or terrestrial in origin) often dictates where fish will be found. Often there are also other factors involved such as the threat of predation (e.g. humans hunting trout!) which also dictate how organisms behave. Nevertheless in a very simplistic way, trout and salmon farms are a good example of how you can have high densities of large fish in concrete lined ponds that provide little habitat other than clean water and suitable temperatures. On the other hand we will struggle to find fish in a pristine river that has low insect production and has copped a lot of fishing pressure. From a human perspective, it is easier to survive alone in a basic hut with the meat safe full than in a mansion with an empty fridge!

The point of these analogies and observations is to spur some thought on the sorts of things that are important not only for fish but aquatic organisms in general. Without a doubt the most essential requirement for all aquatic organisms is of course water. However scientists now recognize that arbitrary "minimum" flows are not adequate

to protect the structure of a riverine system. Furthermore, the modern view amongst ecologists is that the flow regime also has an impact outside of the river channel for example, see page 65 of *Target Taupo #56*.

For instance, historically the Waiau River downstream of Lake Manapouri in the South Island, naturally had a mean flow of more than 350 cubic meters per second (cumecs). Physical habitat modelling indicates that to maintain a viable trout fishery 16 cumecs (4% of the original flow) is sufficient, but is this sufficient to meet other values and functions further down the catchment that were formerly dependant on the higher mean flows (e.g wetland inundation, duck hunting, whitebait runs)?

While this example highlights that the 'designer' type flow approach is intended to address some of the needs of a particular species, often there are multiple values that need to be considered. To illustrate this point take a look at what is a relatively simple food web.



It's pretty obvious that there are a whole lot of interactions going on here and each living organism has its own requirements at different stages throughout its life. What's even harder to comprehend is that the strength of these interactions changes through time and will be influenced by many other environmental variables such as flows, temperature etc. For instance just one high flow event would be sufficient to change many of these interactions. For some organisms a flood may translate into a positive effect and for others it may be negative. In other words, these interactions are not static. Nevertheless having a sound understanding of all these interactions can provide very useful insights into why one particular river tends to support more or larger trout than others. It is important to recognise that physical habitat alone (while important) is only part of the answer.

In a Physical Habitat Simulation only the bold elements highlighted above are considered for a target species (e.g brown trout). In contrast, a more holistic view (such as the Range of Variability Approach which we will discuss later) considers all elements of this diagram and all species. The main point is that when setting flows it is important to consider more than just one organism, value or parameter (e.g physical habitat).

While New Zealand boasts a unique assortment of aquatic fauna, our rivers, lakes and wetlands are also used for a diverse array of commercial (e.g hydro, irrigation, water supply) and recreational activities (e.g whitewater rafting, jet-boating, water skiing, swimming fishing, hunting, and whitebaiting). It is not surprising then that the debate around flow allocation becomes increasingly complex at places where multiple values or activities exist.

For instance let's consider a realistic albeit hypothetical situation. Let's say that a particular unmodified stream is recognized as "waahi tapu" for the local Iwi, is valued as a world class rainbow trout fishery but in the lower reaches of the catchment there are naturally inundated wetlands that provide excellent duck hunting and white-baiting opportunities. In the headwaters, permission to build a hydro dam has been given. If the objective of setting flows in this catchment is to provide for all these values and recreational pastimes how do you go about deciding what

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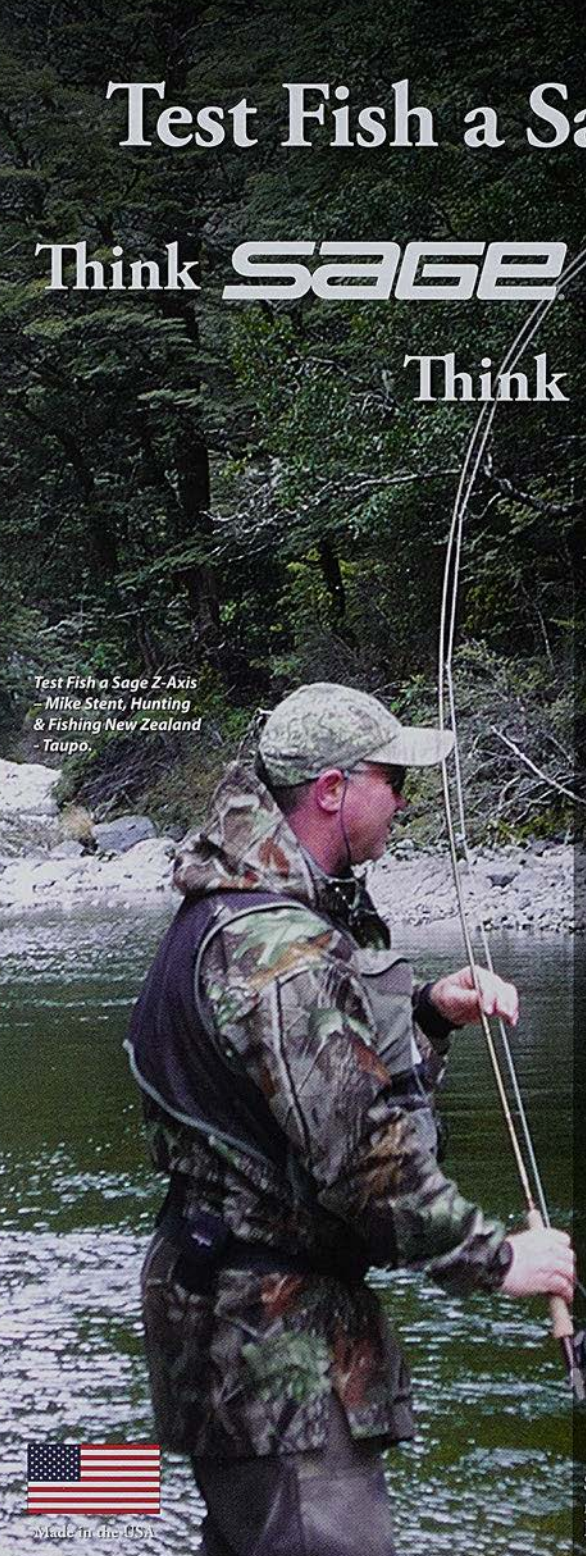

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the flows should be? There are many things to consider for example; what is the optimum flow for maximising invertebrate production? Or rainbow trout biomass? How often would the wetlands need to be inundated to provide good duck hunting? When and how frequently should the flooding occur to support vegetation amongst which whitebait spawning would occur? Do we even know the answers to many of the questions? In most cases, particularly when trying to provide for multiple uses and objectives, the information may not exist. In complex cases it is important that scientists acknowledge that there is no scientific "silver bullet" to determine an appropriate environmental flow regime.

So when you don't know the answer, what do you do? One commonsense option would be to mimic as close as possible what the natural flow regime was like prior to the dam going in. You then accept that the further you depart from the natural flow regime, the greater the risk that the values will be affected.

Holistic methods tend to operate on this premise. That is, they recognise how complicated the problem is and as a result tend to be more conservative (in terms of how much water is available for ont-of-stream use) than other methods. Holistic methods also recognise that mimicking the natural flow regime (the quantity, very importantly and the variability of a river's flow), while still allowing the abstraction of some water, is likely to result in better long-term sustainability of these resources.

Holistic methods rely on the use of hydrological parameters to characterise the essential components of the natural flow regime. That is, the magnitude, duration, frequency, timing and rate of change of hydrological conditions. Data on these parameters are routinely collected by regional councils as patt of their normal monitoring activities. Some holistic methods can calculate how much a proposed flow regime is departing from its natural state. These calculations, as with IFIM, also provide a "currency" that can be used to negotiate a flow regime. However, because results tend to be more conservative, the use of such methods may not be supported by some commercial sectors. Nevertheless, holistic methods based on a natural flow regime are likely to be the most defensible method for applying to rivers which possess important natural, cultural or multiple recreational values as they are likely to leave more water in stream to support natural conditions.

Currently, holistic methods do not appear in the National Environmental Standards (NES) document for setting flows. It is important to recognise that there is no silver bullet to setting flows, but one thing is certain: it makes sense to have more tools in the toolbox than not enough. Therefore it is critical that such methods are included in the NES document particularly if we are to protect waterways with high natural and/or cultural values rather than relying on other less precautionary methods. The effective use of holistic methods has proven successful in many situations and numerous countries overseas, so why is there opposition to their inclusion?

Many of New Zealand's most celebrated pristine wilderness trout fisheries exist under natural unimpaired flow regimes. Indeed the natural flow regimes of New Zealand's rivers and streams are probably amongst the major reasons why trout have done so well here. However, one of the problems that we face in this debate is that some scientists assert that we know enough about the requirements of our fish species (both native and introduced) and ecosystems to be confident that the use of traditional habitat modelling approaches will be sufficient to ensure their long-term sustainability. We certainly beg to differ on this point!

So, what is to be done? Regional councils currently grant resource consents for up to a maximum term of 35 years, and although the NES will set the instream

flow methods to be used for a lesser period, 10 years, that is still an appreciable amount of time. Our recommendation is to include the use of holistic methods in the NES document now and to provide for the inclusion of other new methods still under development.

However, there is opposition to this approach. Including that these methods have not really been tried here and/or that flow regime conditions in New Zealand may not be suitable for holistic methods. In our opinion, holistic methods need to be applied to water development projects, along with appropriate monitoring regimes, to assess their effectiveness. They do, in effect, need to be considered as long-term living experiments.

It is acknowledged that there are two schools of thought on flow assessments that have gained prominence over the last 10 years. One is deterministic - practitioners believe that they can determine flow requirements from the physical characteristics of the river and a knowledge of the habitat and energy requirements, and sediment transport and morphological processes. The alternative approach, i.e. holistic methods, aim to preserve the main characteristics of the natural flow regime along with the environmental status quo of natural character and aquatic community. In New Zealand only the deterministic approach is currently used. If there are two valid schools of thought on how environmental flows can be set we think it is perfectly reasonable to ask for both to be included in the NES document.

Should we take advantage of the new holistic methods (more shovels to add to the tool-shed) which are available, and which will leave more water and more natural flows in our streams and rivers, or should we trust traditional in-stream methods to look after our future? Why dig a hole with a rake when you could use a shovel?

An end of a great day!
Photos by Kim Alexander-Turia

Close Encounters of the Trouty Kind

By Mike Nicholson
Mike is our Educator for Taupo for Tomorrow

On the 20th of May this year, the Havelock North High School Special Needs Unit visited the Tongariro National Trout Centre as part of the *'Taupo for Tomorrow'* learning programme. The ages of the visiting students ranged from 13 -18 years, with all appearing extremely keen to make the most of what would turn out to be a fintastic EOTC (Education Outside the Classroom) experience for all involved.

The day kicked off with a guided tour of the facility, focusing primarily on trout ecology and the need to protect the quality of our abundant, yet fragile fresh water resource in New Zealand. Judging by the students' well constructed questions and the obvious pleasure when they observed the trout in their natural habitat, this first part of the programme really appeared to engage these learners, some of whom had rarely, if ever, seen a trout in its natural surroundings.

Havelock North teacher, Bethne Hocquard,

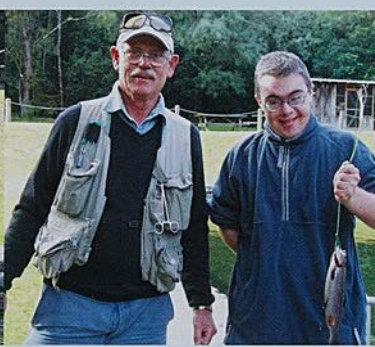
Below: From left to right: Henry Nancarrow with volunteer Fred Watts. Wade Gardiner with volunteer John Milner. Johann Landkroon with volunteer Ian Jenkins
Photos by Kim Alexander-Turia

Teacher Bethne with William Askew and Johann Landkroom and the biggest and smallest trout of the day
Photo by Kim Alexander-Turia

sees introducing her students to a range of outdoor experiences as extremely rewarding for them, both in terms of cementing contextual learning and providing opportunities that they would never normally get to participate in. During a feedback session to parents after their camp, the students were asked to write a speech about their experiences and according to Bethne, the lasting impressions and learning that occurred that day were very obvious, *"It appeared to be a real highlight of camp"*.

There was much anticipation for the chance to fly-fish in the childrens' fishing pond later in the day. Many of the students' were extremely keen to demonstrate their fly fishing prowess and the excitement was palpable. As you can see in the pictures, the students did indeed prove to be more than competent anglers, revelling in the opportunity to catch a trout and taking the time to interact extensively with the volunteers who assisted on the day. If indeed laughter, cheers, and squeals of delight are indicators of children enjoying and learning within the context of an outdoor experience, then this group of young people were, by the trout load!

Bethne also regards taking the opportunity to enable her students to visit places they would normally not visit and learn from people they would not normally meet, as extremely valuable. Being placed in an unfamiliar situation challenges young people to think and act in a variety of ways that suit the situation and environment. Given that most of these students had never picked up, let alone seen a fly rod in



Above: Left to right: Liam Warner with volunteer John Milner. Felicity-Lowes with volunteer Jim Baggot. *Photos by Kim Alexander-Turia*

their life, they adapted quickly, efficiently, and enjoyed a high degree of success. As is usually the case the competitive nature of angling reared its head, with much good natured banter and comparisons of trout size among the students. The programme ended with a range of acknowledgements for those that had assisted the students at the centre and some small prizes for the anglers securing the biggest and smallest fish of the day. Thanks to the students and staff from Havelock North High School Special Needs Unit for a very memorable day indeed!

Tongariro Whio

By Lucy Roberts
Lucy is a Biodiversity Ranger for Turangi-Taupo Area Office

This summer was special. Being English most people would automatically think I was referring to the wonderful hot and sunny weather we had. No, I am referring to being able to go down to the Tongariro River after work and watch a family of whio (blue duck) made up of 2 adults and 7 ducklings. This was the same family described by Julie Greaves in *Target Taupo* #56, which first alerted the wider public to the new residents near the Blue Pool on the Tongariro River.

The whio is endemic to New Zealand which means is not found anywhere else, and one of four torrent ducks in the world which are adapted to living in fast flowing river systems. It is under threat from introduced predators, in particular the stoat.

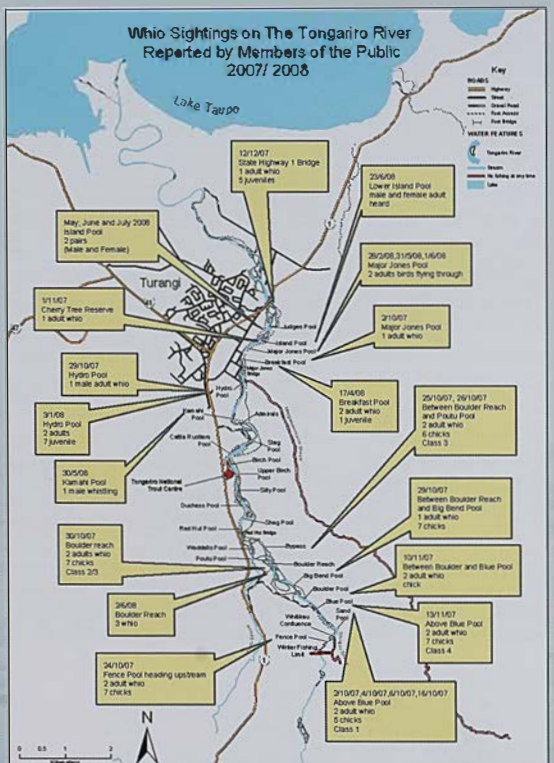
For identification purposes young whio have 5 age classes (including juvenile). What was so wonderful about the Tongariro whio was I was able to watch the ducklings develop from these small rounded, fluffy little bundles (class 1) to more elongated ducklings developing feathers on their shoulders and flanks (class 3), to juveniles.

Watching the whio family this summer has made me more aware of their behaviour, of the way they care for their young and how well camouflaged they are. Their beautiful slate blue colouring with

Top: Whio family between Boulder Reach & Poutu pool
Photo by Bryan Williams

SPOT THE WHIO

Due to their wonderful colouring spotting whio on the opposite boulder bank can be difficult! How many whio can you see on this photo?



a breast daubed with chestnut is very difficult to spot, particularly when they are hanging out on the boulder bank opposite. Often it was only a flash of the adults whitish pink beak that gave their location away. Then trying to count the young was even more of a challenge! See if you can spot how many whio are on the photo. The answer is opposite on the following page.

I was not the only one eagerly keeping an eye on these birds. Following Julie's article in *Target Taupo* and a press release in the local newspaper many of you have been in touch and kept us up to date with your sightings of the family. Thanks to your information we have been able to map their progress from October through to today.

Most whio pairs are very territorial with an average territory length of 1.5km of river. As Julie mentioned in her article, *"Whio have always been present on*

SPOT THE WHIO - ANSWER

Answer: The number of whio visible in the photo - 2 adults and 1 chick. However as I watched the whio over the next hour the adult on the right of the photo had 7 chicks hidden under its wings and under adjacent rocks and vegetation!

Photo by Lucy Roberts

the Tongariro River but tend to move around a lot. As you can see from the map this whio family did just that, using approximately 9 km of the river.

The family spent much of the time when the ducklings were Class 1 to 4 between the Fence Pool and Boulder Reach. By early December the young birds had the characteristic plumage of juvenile birds and your sightings showed they had ventured further down stream to the Hydro and Breakfast pools.

The funniest sighting reported to me was on the 1/11/07 near Cherry Tree Reserve where an adult whio was seen hanging out with a Shag! I'm sure someone could come up with a joke about that type of behaviour!

Our last sighting of the family all together was early in the New Year in the Hydro Pool. We hope they successfully fledged and have now dispersed. There are currently 4 whio occupying the Island pool area (2 females and 2 males) which we believe are the now grown members of this family. The location of these birds gives us all the opportunity to see this rare and threatened native species. Unfortunately for the birds' safety they seem tame and unafraid. We would therefore be grateful if people would give them space and watch the birds from a distance", particularly when walking their dog.

Studies have shown that whio inhabit streams and rivers which have high water quality and a wide diversity and abundance of aquatic invertebrate. Measuring the health of an ecosystem was a favourite discussion point in my conservation biology tutorials. Whio are at the top of the food chain in river ecosystems and therefore a key indicator of river health.

Having whio on the Tongariro river is therefore another good reminder for us to

This whio located on the Tongariro River was banded in the Ruapehu catchment.
Photo by Janet Hart

promote the cleaning of fishing and other gear to prevent the spread of the freshwater algae didymo. Didymo grows like a thick mat on rocks and on the bottom of streams and rivers which could adversely affect the very things that make Tongariro River so special for us and whio.

"The effect of didymo on whio is unknown but the most likely scenario would be a reduced food supply and in turn reduced productivity. Whio may be forced into sub-optimal habitats where they are more vulnerable to predation." (Blue Duck Recovery Plan 2006).

If you had not guessed already, whio are my favourite New Zealand bird. I like the idea that the male whistles and the female growls! I even have a whio in the bath at home...well it's a purple colour but changes to blue when the water is hot enough! Though for me it's not just about the bird, it's about the beautiful river systems they are found in. In Turangi we are lucky enough to have so many of these on our doorstep.

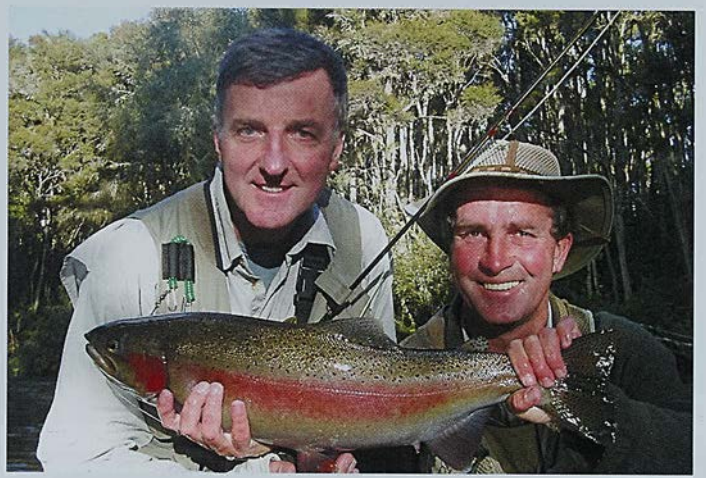
Thank you very much for reporting your whio sightings. Please keep reporting them to the Turangi DOC Office. The sightings are entered into a database which can then be used to map the distribution of whio in this area.

LATEST NEWS....

On the 21st July Janet Hart contacted us to report her sighting of 3 whio on the Tongariro River. One of the ducks had a coloured band on its leg. DOC staff from Central North Island Blue Duck Programme, based at Ruapehu, confirmed this was an eight month old breeding male, which had dispersed from the Upper Whanganui/Whakapapa River. Population dispersal of young male birds is a good indicator that the Ruapehu blue duck programme is succeeding in improving the future of whio....great news.

A Guided Life

A DAY IN THE LIFE OF A TAUPO FLY FISHING GUIDE



Happy client, Doug, & Peter
Photo supplied

By Peter Wilton
Peter has been a local professional fly-fishing guide for nearly 20 years. He has also worked for the Taupo Fishery as a harvest survey interviewer.

Its almost dawn as I roll over, pulling the blankets a little tighter around my neck. The alarm shows 6.20am and I've woken to the sound of a strong south westerly rattling against the window pane. It's been like this for three days now, wild squally weather, white-caps racing across a deep blue wind-swept lake. The barometer has taken a dive and the lake edge poplars have turned to gold, their remaining leaves shimmering in the early autumn light.

Many of the locals have that far away look in their eyes, the older anglers especially know that with this change comes the first of the winter runs. Plump, bright flanked rainbows primed by a summer of active feeding in the lake will now be holding deep in the river flow, drawn upstream by some primitive instinct. This is the Taupo anglers love, for the draw of the river is strong.

I'd spent the previous evening chatting with Doug, an eye surgeon from Melbourne. He had returned to Taupo to follow his ongoing passion to fish our rivers and streams. Bitten by the lure of Taupo and its trout, some seasons past he had proven himself a skilled angler with fly rod in hand, and was keen to introduce himself once again to some of our spotted friends. The evening had been spent discussing a few river options looking over a few freshly tied nymphs and reminiscing over seasons past, fish hooked, others lost and a favourite pool or two that had always treated him well. A beer, another handshake and we had agreed to meet at 7.30am, our river of choice one of his favourites, the upper Hinemaiaia.

So this morning, a final check before our dawn meeting, was everything there? I'd carefully packed the four wheel drive last night, breathable waders, felt soled boots 'yes clean and dry', vest, both fly-boxes, fluorocarbon leaders, spare rod, polaroid glasses, folding landing net and most importantly our lunch and licences.

As I arrive at his motel, Doug's already at the door, dressed for the occasion and ready for the day ahead. Fly rod in hand, his favourite six-weight Sage, breath-

"Keep steady pressure and we're almost there"
Photo by Rob McEwen

able waders, clean boots, wading jacket pulled up around his ears. *"Couldn't sleep much last night"*, he says, *"must have been that wind and those waves crashing on the beach"*. I smile and he grins back, we both know it's really the anticipation of what our day may bring. Fifteen minutes drive lies between us and our river. Across the Waitahanui highway bridge, a quick glance reveals a couple of locals in the Bridge Pool, once again well clad against the elements with balaclavas pulled down low. As we descend the hill into the Hinemaiaia Valley the scene ahead is one that always inspires me. A narrow steep sided gully of dense green manuka lies to our left, a line of tall golden poplar following the dark blue ribbon of twisting water which is the Hinemaiaia on its course to the lake.

In the distance across the rippling, blue waters of the lake, Motutaiko Island and the Karangahape Cliffs of the Western Bays are bathed in the first rays of bright morning light. Overhead, menacing grey clouds recess across a stormy skyline. The whole scene is wild and moody reflecting the challenging often unpredictable nature of the Taupo fishery.

Arriving at the river edge we nose the vehicle quietly into the small manuka clearing before turning our attention to the river itself. The Hinemaiaia at our chosen spot is as picturesque piece of fishing water as any you'll find in the Taupo District. Upstream the river sweeps around a left hand bend, above which a run of fast water cascades through a rocky chute before descending into the depths of an emerald green pool. The entire inside bend of riverbank is clothed in toi toi, their tall fluffy heads bowing heavy with morning dew. On the opposite bank tall stands of kanuka and native ferns overhang the water. The scene is dominated by bush and the white pumice cliffs forming the walls of the gorge. Below the tranquil pool the river divides around a small fern covered island before the flows again reunite, gather momentum and dance their way down another promising run towards us. Enough you would think to quicken the pulse of any enthusiastic fly-fisher *"Its good to be back"*, says Doug.

Fly-rod assembled a little more hastily

then normal I select a small tungsten bead nymph and secure it to the leader. The river's flow after recent rain has a slight tinge of colour, probably should pick up a small glow-bug as a point fly but a small natural seems somehow more appealing and a tiny hare's ear completes the duo.

Forging upstream against the flow, current swirling to our hips, we link arms crossing to the opposite bank. This first run of the day always holds a fish or two, especially after a recent fresh when new arrivals are still moving from the lake. The rod arches, fly-line glistens in the sunlight and the first of our mornings casts snakes upstream. We watch intensely as the small yarn indicator drifts towards us, anticipation high. Another cast, a little deeper this time, almost reaching trailing toi toi on the far bank. Again no early take, a strip or two of line, a moment of concentration and suddenly the indicator dips. Doug's reaction is immediate, no need for my advice here. A firm rod lift, a shout of joy and then that magic few seconds where time seems to stand still if only for a moment. A flash of red flank, a defiant head shake and a strong Hinemaiaia rainbow tumbles in the current, surges downstream ripping fly line off the reel, determined it seems to rid itself of the tiny nymph embedded in its jaw. Twenty metres below us he turns holding against the opposite bank, we scramble over the last of the boulders in pursuit, applying a little side pressure. A broad tail breaks the surface, 'gentle now' and the little Sage performs its magic, two short explosive runs and his bright spotted flank relents to the rod's pressure! Beaten

in the shallows, Doug's first fish of the day. Wet hands, a quick photo and we gently hold him till he's ready. A little wiser now he swims forward, and we watch as red and gold flanks merge with the green of his watery world. Upstream lies our pool and the promise of more to come.

Nothing comes to our little scraggy, well presented nymph in the fast water in the lee of the island or again in the glide of the pool's tail, so we walk on. Slowing at the head of the pool just below where the chute of fast water crashes against a moss covered cliff we stop, carefully observing the bottom. There on the lip, at the drop off to the pools depths three dark silhouettes hover, occasionally drifting slightly to one side to intercept some helpless morsel trapped in the flow. Surprisingly the first few casts bring little response, nothing appears wrong with our presentation or drift to the fish. A browse through my fly-box and I select a small green caddis. Another cast this time, directed slightly higher upstream. Three quick strips, a slightly bigger mend and one of the silhouettes appears to lift a little then veer to the left. Time pauses, the indicator flinches, Doug tenses, *"Hit him"*! I shout and the rod bows to the pressure. Our pool, with the sweet smell of surrounding bush, screaming reel and several wild sunlit leaps all add to a special moment. A permanent image forever etched in an angler's mind.

We fish on upstream searching pools and runs, pausing occasionally to take in the natural beauty around us or observe a fantail capture a mayfly in full flight. Lunch is spent at a favourite pool high in the confines of the gorge. A hearty sandwich or two, cold beer, sitting on that old water-worn log we've stopped at in seasons past. The late afternoon sees us at the top of our beat, it's been a good day, six or seven rainbows have made their presence known since lunch. They are a little smaller than past seasons, but then it's always been the quality of the sport that mattered, and they've come to the nymph from a variety of water. We've had several dark hump-backed jacks from the fast runs, plump bright fresh run hens from the deeper pools. The last fish of the day, a real beauty at a little over six pounds, she came from a deep, fast lie in one of the top pools. Deep sided and almost bronzy gold, with dark red gill plates and blood red flanks she captured the beauty of the pool from which she came.

We make the long walk back to the vehicle, and its time for hot coffee and a moment's reflection on the day. A final glance upstream reveals late afternoon sun on towering white cliffs, while the gentle upstream breeze stirs the last of autumn leaves and the faint roar of the rivers rapids ring in our ears, *"Some place this office of yours"* says Doug, *"Ever tired of it?"*, *"Not a chance"* I reply, *"Everyday's a passion"*. *"I'll be back next year"* he replies.

Somewhere upstream in the tree tops a bell bird's song rings out across the valley floor, beautiful river, and beautiful fish.

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Fire and Water

FISHERY FIRE-FIGHTER

Nathan Walker
Nathan is a ranger in our field operations work

"BLEEP BLEEP BLEEP ...." Just as the Turangi based DOC staff are settling into their sleepy summer evening, the intruding sound of a pager means its time to go. For the majority of people not involved in emergency services their working day ends when they get home. However, for thousands of DOC staff dotted around the country, responding to rural fires at anytime of the day or night is part of the job. In fact, fires have the top priority over any operations for obvious reasons. Fishery staff are no exception, and are actively involved in Doc's fire fighting force.

A recent example of a fire call out was fairly typical. After the pagers were set off, available staff jump into their vehicles and headed down to the fire store in Turangi to get their gear and await further instructions. On this occasion, which was at 8.20pm, Thursday night, an abandoned car had been set alight near DOC administered land and was spreading into the bush.The better news was that the fire was along Te Ponanga Saddle Road and easily accessible. Three Fishery staff (amongst the rest of the response team) were soon at the scene with their allocated equipment. When we arrived it was clear that the fast and efficient work of the local Fire Service had brought the blaze under control. For the next 90mins the DOC team then dampen down hotspots and made sure the fire was good and out. Once the all clear was given the crew was pulled out for the night. The next day a fire audit is carried out, the remaining hoses taken away, and the scene cleaned up.

In this case the fire was clearly threatening departmental land. However DOC also attends any rural fires within 1km of public conservation land unless stood down by another response service. As an aside, it is important to note that for 365 days of the year, any fire lit within 1km of public conservation land requires a permit obtainable from the nearest DOC office.

Top right:A helicopter spraying a fire with the monsoon bucket
Photo by Ian McNickle

The Department, both within a conservancy or between them, works together when faced with larger fires. This was shown recently when a large fire broke out in forest near Owhango. Although the Ruapehu Area has their independent fire response units, the fire engine from Turangi was also dispatched to help out.

Julie Greaves comes to grips with the Tohatsu pump. *Photo supplied*

The next night a Turangi based crew was sent over to dampen down and manage the still flaring area whilst the Whakapapa crews had a well deserved break. Inter-conservancy assistance was also given this season with a local team getting helicoptered into the Pipriki area from Taumaranui to help out the Whanganui Conservancy. In our own backyard we were fortunate this season with only 8 fires and approximately 3 hectares lost. Still we have had big fires before especially in the central Kaimanawa Ranges and know we will have our turn again.

There is a fire season that runs from October through to the end of April. During this time all staff qualified to attend fires fill out a weekend and holiday availability roster. This guarantees there is suitable cover at any given time. Likewise in times of extreme fire risk when weather indices are high, staff can choose to be on standby where it is compulsory to attend a callout. Over this dry summer there was a standby alert over 3 weekends.

Now that we've covered when staff need to attend fires, there is still the matter of can they? Like many professions, fire fighting can be a potentially dangerous and physically demanding activity to the unaware or unfit. Before training can begin the body has to be up to the job. A medical clearance is needed and then a pack test taken. For frontline staff a high level pack test involves walking 4.8km in 45mins. I must add a specially made vest pocketed with 20.5kg of lead bricks comes along for the walk with you. Long legs are certainly handy for this one. There is also a medium and low level test for both pump operators, drivers and the like right through to staff dealing with the media and associated light duties.

Depending on their fitness level, staff then obtain NZQA unit standards in personal safety at fires and two pump operating qualifications. During the fire season this learning is put into practice in monthly fire training that the Turangi/Taupo Area runs (Fishery and Conservancy staff also attend). Run over a half-day, exercises are set up and staff practice setting up, using, and packing up the fire equipment. It's often a fun day especially if a helicopter is involved. With the practice of filling monsoon buckets and/or jumping in and out (with equipment) and flying for short hops these days tend to get a bit wet also. Still getting wet goes with the territory for fishery staff.

Cleaning the trucks and equipment after a fire or exercise can be a big job in itself with potentially plenty of gear and hoses to clean. In total we have 8 pumps including 4 Wajaxes, which are high pressure but low volume. Light, they are good for small blazes or dampening down. Next in grunt is the 2 Aqualites. With high volume and low pressure they are good for helicopter or tanker filling. Finally there is a Tohatsu and trusty old 'V8'. These are serious pumps and used when you need a lot of water in a hurry. The pumps (less the trailer bound V8) are packed into heli-boxes with everything needed

for the operation. At a moment's notice they can be loaded onto a ute or flown to the scene. Finally, there is the fire engine with a capacity of 3600 litres. This is often all that is needed for smaller accessible fires. A big part of cleaning the gear is to prevent any potential didymo outbreak. You can imagine in a big fire if resources are being bought in from elsewhere, the potential risk if a rigorous cleaning protocol, using a detergent solution just like anglers and other users, is not followed.

Once the staff have been physically tested and trained, are they ready for fires? Well nearly. All staff that have met the above requirements are issued with a full kit of Personal Protection Equipment (PPE). This includes overalls, helmets, visors, steel capped boots, gloves, spare clothing, food, hydration packs, and ear protection to name most. Along with meeting the physical and training requirements our 'rookies' are ready to go.

Out of a permanent staff of 16, 12 Fishery Area personnel are classified as frontline fire-fighters with 4 voluntarily able to attend fires overseas if a NZ contingent is required. However there are multiple levels of skills and learning that can be obtained in the fire fighting structure including the Co-ordinated Incident Management System (CIMS). This is the framework that DOC uses in times of substantial fires. Simplified, it is basically a template for the hierarchy of command and overall management of fire fighting resources. Ranging from the Incident Controller (IC) right down to the catering staff bringing food to hungry fire-fighters, it is a system optimised for safety, efficiency and results. A key component is that CIMS is used by all the emergency services which makes it much easier for the many different agencies to work together in a major emergency.

As we've seen, DOC Fishery rangers are no different to our DOC co-workers when it comes to fighting fires. When the pager goes off it is all hands to the pumps, literally.

Finally, it's worth noting that the substantial resources for fire fighting are met entirely by the Department and not from the Fishery budget which is reliant on license revenue. Furthermore often the skills learnt in fire training are utilised by the team in our various operations. A recent example of this was when fire pumps were used in the Poutu canal as part of a fish salvage - all part of the job for a fire fighting fishery ranger.

CHILDRENS FISHING DAYS

By Kim Alexander-Turia

It's been an exciting start already to commencement of the children's fishing days for 2008 at the Tongariro National Trout Centre. We have had excellent weather and large turnouts to our early fish-outs, with the new smoke house and fish cleaning continuing to be a hit with the parents (no messy fish to take home). All the effort that goes into the day just reinforces what a great job the volunteers from the Trout Centre Society do and how vital they are to making the day fun and rewarding for all involved.

This year is extra special for the fact we will be holding fish-outs over summer for the first time ever, a fun addition to the family holiday.

Bookings can be made by telephoning the Tongariro National Trout Centre Society volunteers at The River Walk visitor centre on (07) 386 8085 between 10am and 3pm (1 May to 30 November) and between 10am and 4pm (1 December to 30 April) or by email: troutcentre@reap.org.nz by website: www.troutcentre.org.nz or by fax: (07) 386 8490.

REMAINING DATES FOR 2008/2009

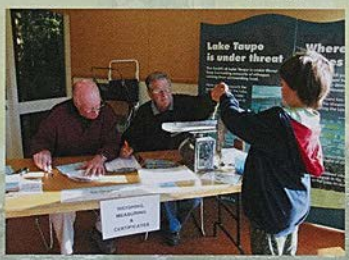
Sunday 17 August
Sunday 28 September (School Holidays)
Sunday 26 October (Labour Weekend)
Sunday 16 November

NEW ADDITIONAL DATES!

Sunday 11 January 2009
Sunday 18 January 2009

Younger anglers learn to cast with Volunteer Brian Johnson

Kelly Bruce from Palmerston North



Left: Volunteers, Brian Wills & Bruce Pascoe weigh & measure fish

Above: Emma-May Loretz from Henderson, Auckland. Left: Fishery Scientist, Michel Dedual hot-smokes the trout.

Ranger John Webb preparing the fish for hot-smoking

Volunteer Trent Corbett filletsfish

The Simpson & Connor children. Jamie Simpson took biggest fish of the day at 1.03kg.

Volunteers Rachel & Parekaawa wrap the fish after hot-smoking

Volunteer Randle Hart

Yum!

Arekatera Turia with Volunteer Peter Baldwin

Eager young anglers patiently wait for a free volunteer

A big catch for a young angler!

Bottlenecks

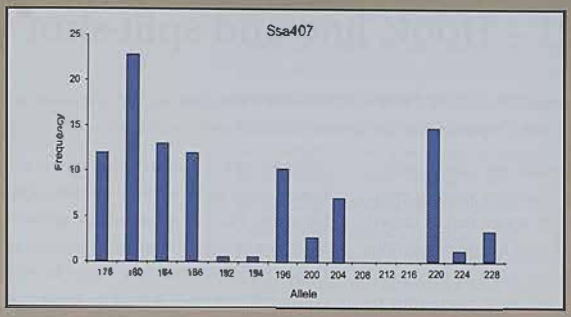
By Elizabeth Rose Heeg
Elizabeth Heeg is a PhD student working under Dr Peter Ritchie at Victoria University

When many of us hear "bottle neck", we probably picture traffic jams where one lane is closed, or the awkward back-up in the supermarket when part of the aisle is blocked by someone's cart. But in population biology a bottleneck means that a group has been reduced to very small numbers and then the population has increased again over time. This is what happened to people in Europe during the Black Plague - many people died but after a while the population expanded again.

Species introduced into a new place, like trout into Taupo, trout go through a bottleneck because only a small number of individuals from the source population are transported. Often in these introduced populations there are "founder effects", when a trait or gene that is normally diverse in the original population has vastly reduced variability. This means there are more similarities between individuals in the new population than between individuals in the original population. For instance, the Dutch colonists who founded South Africa had a higher-than-average incidence of the genetic Huntington's disease. Today that disease is found in a higher percentage of South Africans than in the original Dutch population. The whole genome is affected the same way by bottlenecks, so one way to detect bottlenecks is to look at the pattern of genetic diversity across many different genes or genetic markers.

Populations at Lake Taupo appear to have gone through a bottleneck, based on an analysis of the frequency and distribution of different genotypes. A genotype is the genetic code at a genetic marker. The genetic markers I am using to evalu-

Top: Unlocking his inner secrets
Photo by Dean Conley



Graph 1: This is an example of the allele distribution we observe in Taupo rainbow trout, here at the genetic marker Ssa407, which indicates that the trout populations have been through a bottleneck. In a non-bottlenecked population we would expect one large peak instead of several small peaks.

uate the populations at Taupo, called microsatellites, are repeat sequences in non-translated parts of the trout genome, which means they aren't used to make proteins. The repeated sequence of DNA nucleotides (for instance:AGAGAG) makes the DNA replication machinery more likely to slip. Try writing out a pattern of letters like AGAGA a hundred times and see how long it takes before you make a mistake! The slip-ups make different sized repeats over time, for example instead of 100 there is 99 or 101, this is great for us because it means that there are often many different sizes or alleles (each size is referred to as an allele) in a population.

In a native population you would expect to see a normal distribution of sizes of alleles This means there would be a lot of alleles around an average size, eg. 100 with fewer and fewer as you get further from the average. But in the Taupo population we are seeing two equally tall peaks in the allele size distribution. This likely means that the individuals that were introduced back at the turn of the 20th century had alleles from both ends of the range of the parent population, or that multiple populations were introduced to Taupo. Either way we see gaps in the middle of the allele size distribution where we would expect to see a tall peak.

Further testing with genetic analysis programs tells us that this bottleneck is statistically significant, meaning that the pattern we see is not likely due to random chance.

In the next few months I'll be sending some samples to California so they can compare our Taupo rainbow trout with a broad sampling of the California trout populations to try and determine the relatedness of California and New Zealand populations. It will tell us not only potentially where Taupo rainbow trout came from, but also how many various sources. We will then begin to understand what characteristics the Taupo fish might have inherited, and how much they've changed from their parent populations since they were introduced here.

I'll also be analyzing more genetic markers and more fish from each population, and continuing to look at the patterns of genetic diversity. Adding fish and markers will give us a clearer picture of the current relatedness of fish around the lake. Right now it looks like there isn't a significant difference between different spawning populations around Lake Taupo, but with more data that pattern might change.

So what does this mean for Taupo fishing? Having a complete picture of current diversity will also help the DOC managers plan for events that might cause another bottleneck, like a volcanic eruption. For instance, if fish around the lake are all pretty much the same, managers would be able to restock different parts of the lake without worrying about mixing different populations of fish. Or, if all the populations are different, managers could work now to develop plans that will preserve any important differences. Those differences might be important in accounting for founder effects during the regeneration of trout populations after a blow. I'll be sure to keep you updated as I continue to develop a clearer genetic picture of Taupo rainbows and their origins.

Caught! – Hook, line and split-shot

Following on from *'Poached Fish – A Timeless Recipe'* in the last issue of *Target Taupo*, the Department has several success stories to share.

By Jill Larsen-Welsh
Jill is a ranger in our field operations programme and is responsible for compliance and law enforcement

Several months ago three males were apprehended netting trout in an area of water that is closed off for part of the year for spawning. The booty was 38 trout, most in very good condition and obviously preparing to spawn. Sadly, they did not get the chance. The offenders were apprehended as part of an ongoing operation throughout the winter months. Fishery staff invested a lot of time in order to make the final catch. At the time of the apprehension two of the offenders gave false details to the rangers but this fact became evident quite early on in the piece and further investigation revealed the offenders' true identities and eventually they were lead off to court.

One offender was fortunate that the court acted leniently when handing down the sentence. He was sentenced to complete 100 hours of community work. The second offender didn't appear in court on the hearing date and a warrant was issued for his arrest. He was subsequently arrested by Police in Upper Hutt and appeared in Upper Hutt District Court where he was convicted and fined a total of $750 plus court costs. The third offender also didn't show in court and a wartant for his arrest has been issued.

Another recent incident started with a call from a member of the public who had seen three people using roe to fish for trout. A couple of fishery rangers attended and apprehended the offenders. The cases have since been to court and resulted in one offender having his case dismissed due to external circumstances after entering a guilty plea, (he was jailed on other matters) and the other two being convicted and fined.

When apprehended some offenders will argue that they are allowed to take

(left to right) Rob Mclay, Joel Houthuijzen, John Welsh and Glenn Maclean with the 38 trout seized from the Waimarino River
Photo supplied

trout by any method because it is their customary right. In fact, this is wrong. Rainbow and brown trout are not indigenous to New Zealand and, although the claim of customary rights has been used as a defence over the years, it has ultimately been found wrong in law. The judgement of *McRitchie v Taranaki Fish and Game Council [1999] 2 NZLR 139* is case law in which the Court of Appeal ruled against the defendant in a similar argument.

Fishery staff are on the front line dealing with issues such as these on a regular basis. Although it can be quite trying at times, the outcome is usually a positive one – both for the staff and for the fishery as a whole.

Other recent compliance issues have been regulation breaches or offences against the Conservation Act. A lot of staff time is taken up in policing this type of offending, and although in general anglers are pretty good at staying within the rules, there are still a number of people who think they are immune to the law or that it simply 'doesn't apply' to them. Some seem genuinely surprised when they are stopped by a ranger for fishing in areas that are closed for the spawning season, and get noticeably upset when their fishing gear is seized. They don't seem to stop and consider that these areas are closed for the protection of the fishery and their actions are a form of poaching.

People who fail to comply with the Act or Regulations cause a lot of effort for the Department. Precious hours are spent following up, and in some cases, prosecuting these offenders. As with most things legal, the paper trail alone is horrendous and matters that are to go before the court take up a lot of staff time – time that could be better spent within the fishery. So, think before you go out. Check the rules and regulations on your licence and save yourself and others a lot of bother in the long run.

Te Whaiau Trap Cabin has arrived!

By Callum Bourke

Top: Callum having an early morning cuppa with visitor Malcolm Swanney
Below: The old dunga
Photos by Kim Alexander-Turia

The wait is over. The flash new cabin has arrived at Te Whaiau fish trap at Lake Otamangakau with positive reviews!

After 14 years of housing trap operators over the cold and wet winter months in the lee of Mount Tongariro, our old 1974 Classic caravan has finally moved on making way for a new custom made transportable cabin. We needed accommodation that was warm, dry and comfortable for our staff and the new cabin meets all the criteria.

After arriving by truck in early May, we parked the cabin in our workshop and went to work on fitting out the interior. At this stage it was essentially a foam lined metal shell with no kitchen or furnishings. It was a case of designing the kitchen, laying tiles, choosing the carpet, blinds, bed and all the essential furnishings that a cosy cabin needs.

While the cabin interior was being fitted out we adapted our old caravan awning to fit the new cabin. This involved replacing the poles and fastening the roof of the awning to

the cabin by chains attached to the steel chassis. With this design, the awning sits firmly onto the cabin roof and is easy to disassemble at the end of the trapping season. It is pleasing to note that the cabin has been subjected to some very heavy winds over the last six weeks at Te Whaiau and it has stood up to the test with ease.

After an initial hold up, the LPG heater finally arrived in mid June and was installed just in time as a series of cold fronts descended on the central plateau dumping copious amounts of snow and rain. Now our cold and wet trap operators can warm up next to a quality heater in an insulated room. In the old caravan we had an oil heater that took forever to heat up and a fan heater that was too small to be effective and both required a noisy gas guzzling generator to run. The most important and essential aspect of this heater is that it is flued to the outside preventing the build up of harmful carbon monoxide gas inside the cabin. It is run off a 9 kg gas bottle and starts from the push of a button.

Because there is no mains power on site, we decided to wire the cabin with both 12 and 240 volt capacities. This allows us to run lights, VHF base set radio and battery chargers off the 12V system which is supplied by two 6V deep cycle batteries connected in series and sustained by two 130 Watt solar panels. The 240V system is powered by a generator and used to provide back up to the 12V system should it be needed but also to run a spotlight during floods. It is pleasing to note that after 10 straight days of inclement weather with little sunlight to charge the batteries, the system was still running effectively. The beauty with this

A motley bunch, many of Taupo Fishery Area team having just installed the cabin
Photo by Kim Alexander-Turia

system is that once the batteries reach a low voltage threshold the solar regulator shuts the system down automatically, then starts again once the solar panels have charged the batteries up sufficiently. This prevents serious damage to the batteries. The solar panels are mounted on a free standing frame as opposed to mounting them on the roof. This way they can be moved and accessed easily and they are not subjected to strong winds to the same degree they would on the roof.

Like anything, there is always room to improve our camp which we will no doubt tinker with over the coming seasons. At least now we have some comfortable accommodation for our trap operators who often work in adverse conditions and deserve to have some decent shelter from the elements. Bring on another 14 years of Te Whaiau trapping!

Licence prices – why they increase!

By Storm Bester
Storm is the ranger responsible for day to day administration of our licence system

Many of you ask, *"Why do the licence prices have to keep going up, like everything else?"* We're all getting a little tired of price hikes, from fuel to food to our fishing licences.

The Taupo Fishery Area has a key job to do, managing the Taupo Fishery, and like everyone else, our running costs keep going up in the current economic situation. The Conservation Act requires us to set licence fees to cover the costs of managing the fishery. We are reliant on the revenue we collect, as unlike the rest of the Department of Conservation, our running costs are not funded by government tax revenues. We do our very best to cut costs and keep them to a minimum, and this year we are reducing expenditure across our work programme including in overheads, training, computing costs, willow control and provision of visitor assets and access, use of temporary staff and contractors and holding several one off projects including an updated economic assessment of the worth of the Taupo Fishery. However with decreasing sales and increasing costs of fuel, electricity, salaries and other overheads, some increase is inevitable.

Ideally we like to increase licence fees a little each year, instead of a big hike every couple of years. The other thing we do is try and keep the childrens' licences as low as possible to keep them affordable and encourage our younger generation to get out there and do it. However we don't make them free, the idea being to teach children that the licence has value and importance.

So Taupo licence prices (corresponding Fish & Game NZ fees in brackets where applicable) for this year are:

Adult Season	$ 85.00 ($96.00)
Adult Week	$ 36.00
Adult 24 Hour	$ 16.00 ($19.00)
Child Season	$ 11.50 (free)
Child 24 Hour	$ 4.50 (free)

Hope to see you out there, especially with your children and grand children.

Shameful Theft

By Ken Kimmins
Administration Manager,
Tongariro National Trout
Centre Society

Cash donations from the public are generally the mainstay of funding for most charitable organisations, so it was a big blow to the Tongariro National Trout Centre Society when our donation box was stolen along with its healthy contents on Saturday 19 April 2008.

Society volunteer, Bob Appleton, was managing The River Walk Visitor Centre on the day the donation box was stolen and is staggered to think the box disappeared on his watch. Bob said that he normally keeps a very close eye on things but believes the thieves picked their time when he was busy looking after customers. He is amazed the thieves managed to carry the donation box the 200 metres to the public car park given it has a large metal base that weighs many kilograms. Bob also believes that someone must have seen them carrying the box as there were many visitors at the centre that afternoon.

Ken with the infamous donation box
Photo by Kim Alexander-Turia

Fortunately the society has invested in camera surveillance systems for both the visitor centre and car park and the footage from these cameras gives clear coverage of the theft and of the people and motor vehicle involved. This material is now in the hands of the Police. The society and its supporters are hopeful of a positive result in this regard but are not expecting to recover the donation money, estimated to be about $100.

In most theft situations recovery of stolen items is often only a faint possibility and so the society had resigned to the fact that the donation box would probably never be found and that a replacement would have to be built. So it was with some surprise and relief when we received a call advising that it had been found.

It had been some three weeks since the theft and local couple, John and Anne Murray, were enjoying foraging for water cress in the Poutu Stream when one of them spotted a bright orange object in the nearby bushes. On inspection they realised its importance and delivered it to the Turangi DOC Office. The society is very appreciative to John and Anne as this has saved us the cost of a new donation box.

Other than some small repairs the donation box is in good order and now sits back in its normal place at the visitor centre, but this time it is firmly bolted to the floor.

TONGARIRO NATIONAL TROUTCENTRE

WHAT'S UP?

By JohnWebb

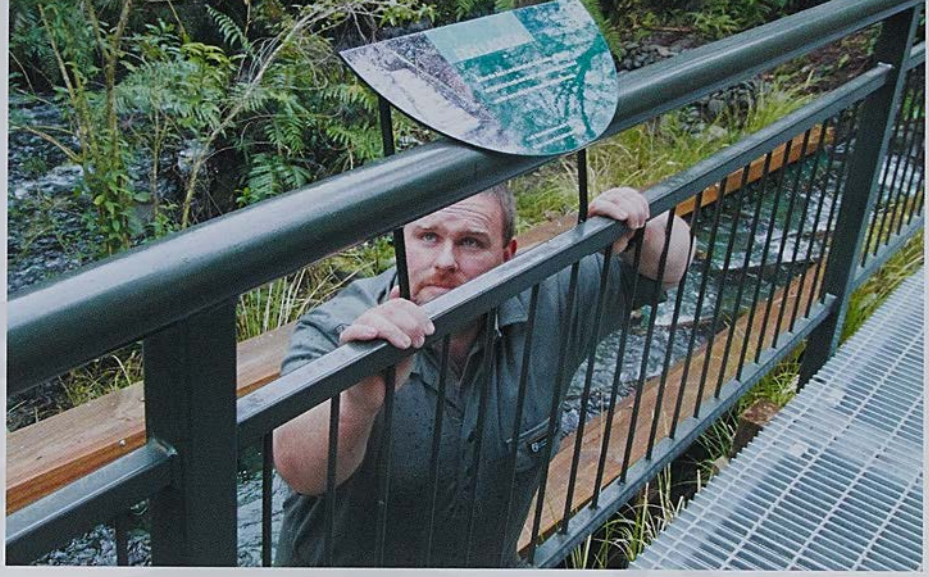
The Tongariro National Trout Centre (TNTC) has moved into a new era as I take over from Dave Conley as the on-site ranger. It has been a very opportune time to take over the TNTC reins as there are some new and exiting projects underway.

The first of these is the new entry path which is in the final phases of planning. This will be an excellent addition to the site as it will have a gentler grade and scenic entry to the centre. This will be beneficial not only for aesthetic reasons but it will give easier access to those in wheel-chairs or others less able.

The fish pass interpretation panels are also approaching completion. It's the final addition to this display which shows why fish passes are so important in freshwater fisheries. The fish pass will be one of the first displays visitors see as the bridge on the new entrance path will cross at this point.

The TNTC site has also been somewhat "future-proofed" recently with the instalment of a new telecommunications cable and junction box. This is an excellent addition as it provides the capability for high speed internet access as well as other benefits for use in future educational and operational programs. How best to distribute these capabilities throughout the site is still to be decided but the potential for this new infrastructure is great!

While we are talking about future developments, a group of representatives from the Department of Conservation and the Tongariro National Trout Centre Society recently visited the National Aquarium in Napier to get ideas for the construction of a new aquarium on the TNTC site. A full



Above: Ranger John Webb lines up the new fish pass panels
Photo by Kim Alexander-Turia

Left: John Webb strips fish for the children's pond under Area Manager John Gibbs watchful eye
Photo by Kim Alexander-Turia

feature about the aquarium can be seen on page 62. The aquarium will display a variety of native and introduced freshwater flora and fauna and is intended to be a major highlight for visitors.

The trout fry that were in the hatchery were moved out to the outdoor rearing ponds during April. They are growing very well and a recent weigh and measure has shown that they have increased in size around 3 fold since being moved there. A constant vigil has to be maintained for shags however as some have got it in their minds that these young fish would make a tasty snack. So if you are at TNTC and see a shag do your best to scare it off or tell a Riverwalk volunteer or ranger so that they can attend to the issue.

The early childrens fishing days have been a success this year. Positive comments have filtered back about the good condition, but especially the good size of fish. There have been several trout come out of the pond 1kg or larger. In fact the very first trout to be caught at the very first fish out was one such specimen. We plan to keep feeding the trout at around the same rate for now to keep the average size of fish increasing a little further. After all we want what is often a first fish for many budding anglers to be something memorable.

A number of smaller cosmetic jobs have been completed or are underway to improve the management and aesthetic values of TNTC. The road and track to the intake spring on the Waihukahuka Stream has been opened up so that it can be inspected regularly. A number of small dead trees, some that were posing a risk to public safety, have been felled and removed. Some of the potholes on the footpath have been filled with cold mix – once again with help from the local Rotarians. More chain has been placed across the inlet pipe to the fish-out pond to make it safer for small children and the rotten seats near the BBQ have been replaced. There has also been a removal of broom from the entrance path and Tongariro Walk.

The revamped carpark is looking good with the last of the mulch being spread on the centre gardens. The planting program of red tussock, flaxes and various trees and shrubs appears to be a success. There were a few losses over the long dry summer this year but in general everything has found its feet and is growing well.

The first round of stripping occured on

Ranger John Webb checks a hen for ripeness in preparation for stripping
Photo by Kim Alexander-Jurta

17 July, taking eggs for the 2010 cycle of fish for the childrens fish-out pond. Around 2500 eggs were taken and are progressing well in the Heath incubators in the hatchery. A second round took place, of a further 5000-7000 eggs in late July. The timing of the first stripping coincided with the school holidays and drew quite a crowd with a number of volunteers, staff and the general public in attendance.

So it is full steam ahead for TNTC As we move into the spawning season a range of facilities in the hatchery will be operating again in preparation for the raising of next years'crop'for the children's fish-out pond. The next few months will be a good time to come down and have a look at different aspects of the hatchery working, the wide variety of displays, The Riverwalk fishery museum or just simply for a pleasant stroll through the native bush or beside the Tongariro River See you there!

This catfish is about as big as they get in Lake Taupo
Photo supplied

Catfish in a goldfish bowl

Mark Venman
Mark is our Technical Support Officer and part of the research and monitoring team

This summer marked the 12th consecutive year of monitoring catfish in Lake Taupo. Although catfish do not appear to be having an affect on the trout population it is still valuable to keep an eye on what is happening to the population. This article summarises the data collected last summer and compares it to previous years to identify any trends within the catfish population.

Of particular interest this summer was the exceptionally low level of Lake Taupo (Figure 1). In previous years we have had the opposite where the lake has been exceptionally high especially during mid summer, which had the affect of increasing the usable habitat as the rushes flooded around Waihi Bay. This summer, available habitat was reduced and it will be interesting to see what affect this has had on the catfish population in future years. The low lake level also made setting sampling nets difficult as finding the correct depth anywhere near the rushes was extremely difficult this summer. The dense, partly exposed weed beds also made accessing the sampling sites at Waihi very difficult by dinghy.

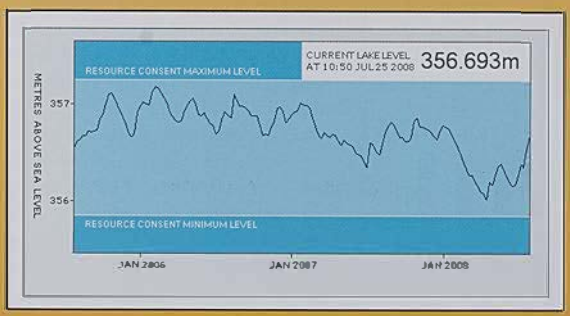


Figure 1: Level of lake Taupo during recent years (courtesy of www.mightyriverpower.co.nz)

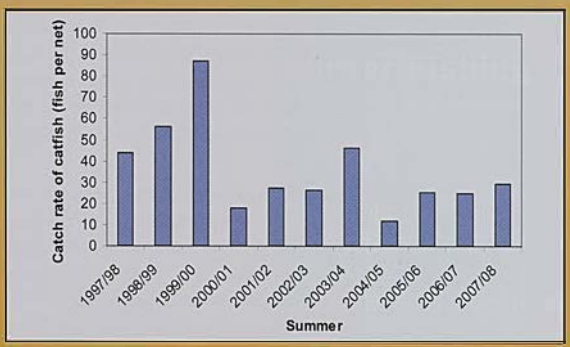
However, despite these problems, the catches of catfish this summer were similar to recent years with almost 2,200 being caught from 75 nets set overnight equating to an overall catch rate of 29.3 catfish per night per net. In comparison to

Occasionally catfish are caught on a fly, but they are ineffective predators of live smelt
Photo by Jared Goodhart

previous summers the catch rate is below the annual average of 36.1 catfish per net. In recent years the population appears to have stabilised at levels lower than recorded in the late 1990's (Figure 2).

During droughts and low lake levels, catfish are one of the better suited species to survive these harsh conditions and can even live out of water for several days. They are also capable of spawning essentially anywhere there is water. Once hatched the catfish fry remain in tight schools and so can effectively live in a goldfish bowl if needed. Once conditions improve and the habitat represents a swimming pool instead, then the catfish can spread out. Given their robustness, the relatively low lake level this summer may not have had such an impact as first thought as the population has remained relatively stable over recent years.

Figure 2: Catch rates of catfish during the summer months since 1997



Waihi Bay remains the most productive of the three sites sampled producing 1,210 catfish or 55.2% of the total catch this summer, which was on par with the annual average. This was followed by Moruoapa with 943 catfish (43%) which was also very similar to the annual average. Whakaipo produced only 41 catfish (1.9%) although low catches are the norm at this site. A lack of suitable habitat is likely to be a reason for their low numbers at the northern end of the lake. Over the 12 year period, Waihi has accounted for almost 58% of the total recorded catch followed by Motuoapa on approximately 40%.

As part of our monitoring programme,

a sub sample of catfish are measured, weighed and sexed. This provides us with a wealth of information on the size structure of the population and the general condition of the fish over time. This summer catfish were on par with those caught during recent years but were longer and heavier in general than those caught during the mid to late 90's. Overall, the condition of these catfish has changed very little over the 12 year period and does not seem to be affected significantly by any changes in the population size Catfish caught at Whakaipo had a slightly higher condition factor than those from the two southern sites but overall they were generally similar regardless of their location.

Male catfish outnumbered females by 2.2: 1 which is the highest sex ratio out of the last 12 summers. Interestingly, the percentage of males within the population has been increasing since the late 90's and now accounts for two thirds of the numbers. It is thought that survivorship is greater amongst male catfish due to the costs of the higher reproductive effort and/or successive spawnings in females.

The stomach contents of catfish are analysed every three years to determine if they are affecting any food sources for trout, as the reduction in smelt over recent years anglers may quickly point the finger at catfish. However, very few smelt are ever found in the stomachs of catfish. This is due to catfish being opportunistic feeders rather than active predators that specifically target certain prey items. Any smelt eaten are likely to be due to the catfish picking up the dead smelt from the bottom of the lake rather than preying on them while they are still alive and actively swimming around. In previous articles in *Target Taupo* we have also shown that catfish will consume koura or crayfish but they need to be of large size (>250mm) before they can begin tackling these larger prey items. Although Koura are being consumed by catfish and are therefore not available to trout, they still only form a very small part of the diet of catfish as they do with rainbow trout.

Thus overall, the summer of 2007/08 was a stable one for catfish in Lake Taupo with another average catch rate combined with an average distribution. It appears that consistent with what often happens when a species is introduced into a new habitat, the population has gone through a cycle of boom, peaking in 2000 and since stabilised at a lower level. Catfish were slightly larger than in the early years but were still on par with recent years. Despite the low lake level which made setting the nets difficult, catches were still similar to those made during more recent years when the lake has been higher than normal. It will be interesting to see what affect the lower lake level will have on the progeny of catfish that were spawned this summer and whether this affects their survival, but given the hardiness of the species we should expect similar catches of catfish again in future years.

An Alligator at the Trout Centre?

By Kim Alexander-Turia

Well, ... nor quite, but there certainly are some other exciting opportunities coming to the trout centre, like an aquarium!

The Tongariro National Trout Centre (TNTC), is undergoing a bit of a make over and we are always looking for ways to develop the site.

The aquarium concept

Currently one of the most popular and effective displays is the underwater viewing chamber. The chamber allows visitors to view trout in their natural surroundings. As a display it is very simple but clearly the combination of living fish, clear water and a natural stream setting captures peoples imagination. This concept is to be extended to allow people to view a number of different freshwater fish species in a 'natural' aquarium.

This vision originated back in 2004 with Glenn Maclean, Programme Manager, Technical Support and Herwi Schultus our landscape Architect. It was envisioned as some sort of outdoor aquarium that people walk through and possibly under, set in a bush setting so that the trees, sights and sounds of the site become an important part of the backdrop. It would not be banks of aquariums but rather a seamless stream which flows around the visitor in a transparent moulding, similar to the approach used at places like "The National Aquarium' in Napier. The design brief was that the visitor should feel they are on the stream bottom looking out at the inhabitants and the wider world.

The National Aquarium – Napier

Representatives from DOC and the Tongariro National Trout Centre Society visited Napier to meet with Operations Manager, Rob Yarrall and his staff, in particular Kerry Hewitt.

The National Aquarium was opened in 1956 under the War Memorial Hall in the form of a weekend fish show by the Hawke's Bay Aquarium Society. As with many new entities it went through many transformations and in this case it was due to its huge success. It was identified as being too small, and the success of the aquarium in its cramped conditions led to the proposal of a joint aquarium and dolphin pool. In 1964 an architecture firm was commissioned to design such a complex. The main dolphin pool and the kidney shaped pool next to that were opened in 1966.

By June 1971, 1 million people had visited the basement aquarium and the executive was still trying to get a new building. In 1973 planning commenced

and the circular two storey design with a 350,000l. oceanarium was suggested.

On the 10th December 1976 the new aquarium was opened and within the first year had won the NZ Tourism Award as well as the Building Design for a round building made from square bricks.

The first year saw 230,000 people pass through its doors (at a time when the population base was 50,000 people in Napier), and the first 5 years saw over 190,000 people visit per year.

Izzy the alligator arrived at the National Aquarium in 1990 and he is a real draw card for the visiting public.

Our Aquarium

The visit to the National Aquarium was valuable in a number of ways. It identified a number of advantages of our site, including a ready source of high quality clear water, a natural outdoor setting and compatible activities.

It also helped us see solutions to some of the difficulties we were facing, like how to display species of native fish which are generally acknowledged to be secretive and difficult to view, and which also tend to be very similar in appearance. We saw examples of how to overcome the need to keep species like koura, trout and eels separate from other species and most importantly, how to ensure the containment of pest species.

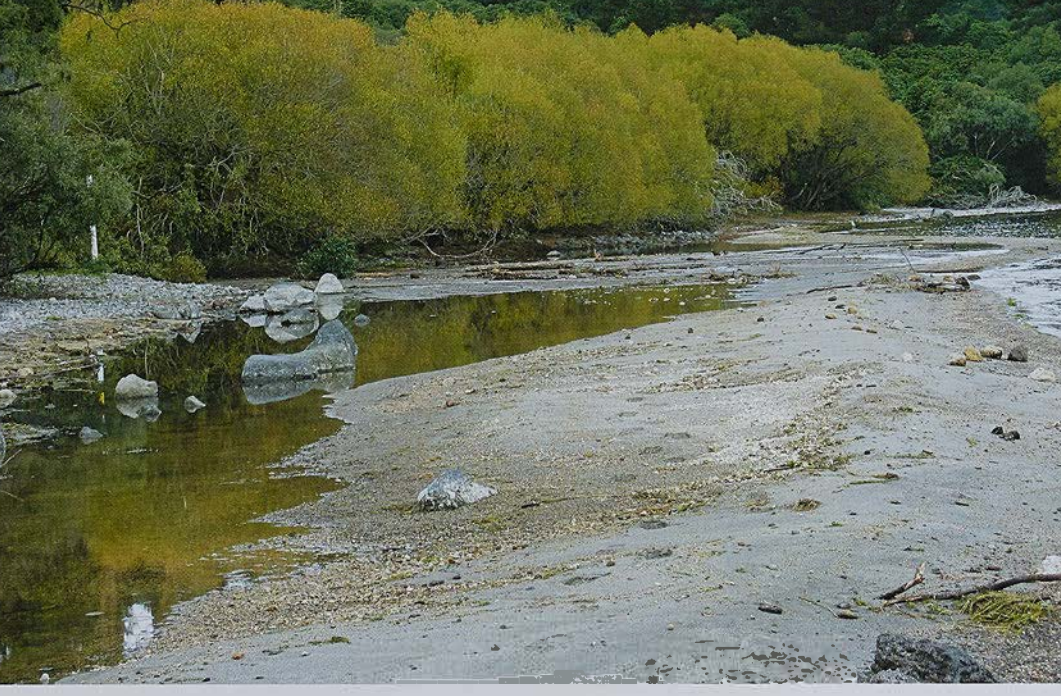
The aquarium will require some sort of hidden partitioning to keep some species apart. Species on display would be typical of the central North Island and could include rainbow, brown and brook trout, native galaxiids (whitebait species), bullies, smelt, koura (freshwater crayfish), goldfish, eels, catfish and kakahi (freshwater mussel). It may not be feasible to keep pest fish species not currently established in Lake Taupo due to the risk of escape but if containment can be assured then these species could include perch, rudd, tench and koi carp.

We have seen several very sophisticated freshwater aquariums around the country but what makes us special will be the outside open concept we can offer. The key to setting the TNTC aquarium apart is to take advantage of the site's unique natural setting and stream flow.

We appreciate the valuable assistance and advice that we have received from the National Aquarium which makes our job that little bit easier in designing our own special place and we acknowledge their willingness to share their hard earned experiences.

The concept and drawings are in the process of being finalised - now it's just a case of raising funds to bring our project that little bit closer – and maybe Izzy can come visit!

This aquarium at The National Aquarium illustrates the concept we are seeking where the aquarium is more than just a glass tank
Photo by: Kim Alexander-Turia



Mapara Mayhem

By Nathan Walker

The Mapara Stream is a tributary that feeds into Whakaipo Bay on the northern shores of Lake Taupo. Like other smaller streams, it plays a small but important contribution to the overall spawning run particularly at the northern end of the lake where suitable streams are few and far between. It is often surprising how many fish actually use such streams. They can often look closed to fish passage but the numbers spotted upstream attest to their viability.

As the only stream of any significance between the hills east of Kinloch and west of Acacia Bay respectively, Mapara Stream also plays an important role in the drainage of surrounding farmland. In times of heavy rainfall however, the stream cannot cope with this large run-off and is susceptible to flooding. This is further exacerbated by the narrow gully it encounters before entering the lake.

In early May this year, there was a day when 120mm fell in only 6hrs. The following details the damage that occurred and the corresponding work for the fishery team.

On the day after the downpour a staff member who lived in the area stopped off to check the stream. He quickly ascertained that the mouth had basically been blown out, there were stranded trout scattered in various pools, and that the access track had been completely washed away. On this occasion the local knowledge of a staff member brought the issue to attention. However, it is often information provided by anglers that brings about timely action for such matters.

Later that day we arrived with hand nets and shovels to salvage the 20+ trout stranded in various pools. We also had to dig a temporary channel to both avoid further strandings and allow fish

Top: Debris from the flood closed the stream mouth stranding trout
Photo by John Gibbs

access into the stream. Over the following months the new channel was closely monitored and occasionally modified as it found its natural bed and the rip slowly moved westwards.

With the access track now a 4m cliff face a new route down to the mouth was needed. Within the week our DOC colleagues from the Taupo Field Centre were on the job and a new track was formed. It was a good example of where the Fishery Area benefits from the wider the resources made available in the Department locally.

A check of the lower stream found that there was a number of logjams caused by falling trees and debris swept down in the flood. Later that week a team was back at the site with chainsaws in hand, to clear blockages extending back hundreds of metres from the mouth. Whilst doing this work it was decided that the stream bed itself would be thoroughly cleared all the way back to Mapara Road. This work is ongoing as the culvert is approximately 1.2 kms away. The dense blackberry found in places can be both a good and a bad thing. It provides good cover to trout on their travels, keeps the stream temperature cooler and acts to prevent the bank eroding. Furthermore

it certainly acts as a deterrent to any illegal activities along the banks (as our bedelearing rangers can attest too!). However, it has the tendency to trap debris where it lies in the bed itself and cause obstructions.

With the above jobs done the Mapara is now back in business as a spawning stream for the winter with access to the mouth for anglers. Finally, we greatly appreciate any information from anglers or the public at large concerning storm damage. Working together we can keep our fishery in great shape.

Right: Ranger John Webb opening up the stream for fish passage
Photo supplied

Below: Nathan & Julie Greaves digging the new channel
Photo by John Gibbs

TAUPO TAILS

These caddis larvae were found in two trout caught in Waddels Pool, July 2008! The pile on the left was from a 1kg jack and the pile on the right from a 1.8kg jack. Some of them were still alive and squirming around. Caught by Jonathan Wilson and a friend.
Sent in by Jarett Goodhart, Sporting Life

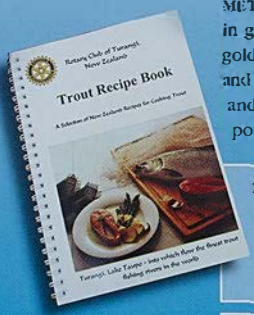
A nice brown trout caught and released in the Breakfast Pool, July 2008 by an American guest of Creel Lodge. He only had a 10lb scale and it went way off the end.
Sent in by Jared Goedicke, Sporting Life, courtesy of Creel Lodge

Roast Trout Fillets with Rosemary Potatoes

INGREDIENTS

50gms butter
450gms potatoes, peeled and finely sliced
2 cloves garlic, finely sliced
1 red onion, finely sliced
sprigs of rosemary
2 rashers of streaky bacon roughly chopped
4 trout fillets about 175gms each
50gms shredded almonds, browned
2 tablespoons horse radish cream
250g crème fraiche
juice of a lemon
salt and pepper

METHOD: Use a knob of butter to grease a large dish. Lay sliced potato on dish. Scatter in garlic, onion, rosemary, bacon and season. Bake at 200 degrees for 20 minutes or until golden. Arrange fillets on top of potatoes and add remaining butter. Scatter on almonds and season. Cook for 5-6 minutes or until fish is cooked. Mix together the crème fraiche and horse radish with the lemon juice and seasoning to make a sauce. Serve the fish and potatoes dressed with the sauce to accompany.



This recipe is from the trout recipe book recently produced by the Rotary Club of Turangi. The book is a collaboration between Raewyn Groombridge, David Hayman and Gavin O'Connor, and is sold locally to raise funds for local community projects. The publication has been a very successful with 760 copies sold to date.

You can buy a copy from local Turangi outlets, New World, Taylors Bookstore, Sporting Life and the River walk Visitor Centre at the Tongariro National Trout Centre or by email Neil Groombridge: ngroom@xtra.co.nz

Photo and this recipe made by Kim Alexander-Turia (Yum!)

If you would like to make contributions to Taupo Tails (letters, photos, anything of interest) please write to Kim Alexander-Turia, Taupo Fishery, Private Bag, Turangi or email Kim your contributions to kturia@doc.govt.nz

Mark of a Good Angler

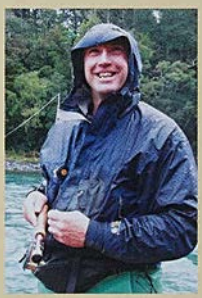
By Glenn Maclean

So far so good. Didymo has still not been detected in the North Island and it's really encouraging to see more and more anglers and other users actively cleaning their gear and taking responsibility to do their bit.

As part of the campaign to encourage Taupo anglers to actively clean their fishing gear, the Central North Island Didymo Partnership Group have produced a declaration form for anglers to sign. In return for undertaking to clean their gear anglers are provided with a free retractable zinger reel to wear on their fishing vest. It's useful in its own right to hang your forceps or line cutter from, but this distinctive reel has also rapidly become a badge of being a good angler who cares for their sport.

"IT IS IMPERATIVE THAT YOU RIGOROUSLY CLEAN YOUR WADING BOOTS WHATEVER TYPE THEY ARE"

These reels are only available from local Taupo and Turangi tackle shops so if you would like your own one on your vest, call in and ask. We would also like to acknowledge the proactive way that some of these shops have embraced this campaign, and really reinforced the didymo message with anglers buying their new season licences.

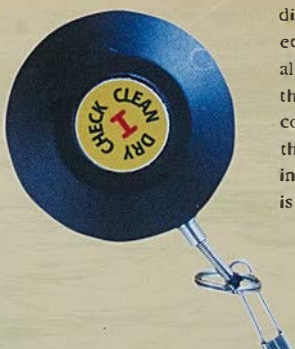


Jay Bennett with one of the new zinger reels
Photo by: Mike Nicholson

In other news, Fish and Game NZ are proposing to seek a ban on anglers wearing felt soled wading boots over the rest of New Zealand, to remove this potential vector for the spread of didymo. Our view, as managers of the Taupo fishery, is that while felt soled boots are more difficult to clean, ultimately all boots are equally risky if they are not cleaned at all. The research shows that any boots that remain damp have an equally high concentration of live didymo cells on them before they are cleaned. By focusing on felt soled boots we believe there is the potential of sending the message that other footwear is less risky, which is not the case. Ultimately the key is that anglers rigorously clean any footwear, including the laces, often multi layers of the lining and the stitching. Perhaps the easiest and most reliable way to be sure of this is to throw your boots in the freezer overnight. Cleaned this way felt soled boots are no greater risk but we acknowledge it is not easy to freeze your boots in a campervan or between rivers on the same day. However the responsible action is to avoid fishing multiple rivers in the same day anyway, the risk is too great.

Nevertheless we also realise that it would be nonsensical for the ban to apply over the rest of the country but not at Taupo. Therefore, with the support of the Taupo Fishery Advisory Committee, we have agreed that if the Fish and Game ban comes in we will also seek to amend the Taupo Fishing Regulations to prevent the use of felt soled boots here. To be absolutely clear about this, felt soled boots are not banned at Taupo at this stage but a prohibition may occur in the next few months if a similar ban occurs over the rest of NZ. The ban on their use will be widely publicised if and when it occurs. None of this changes the fact that it is imperative that you rigorously clean your wading boots, whatever type they are.

So the campaign continues. There is a risk of people tiring of the message but the key is that we simply develop the behaviour of cleaning our gear as a routine part of any outdoor trip. We don't think about it, it's just what we do as a matter of course. The issue may be didymo today, but there are any number of other nasties out there that it could be tomorrow. It's now part and parcel of taking part in the sport we cherish and the mark of a good angler.



New to the Big T

By Mike Nicholson

Early January, standing at the edge of the Tongariro River clutching my trembling wee 6-weight rod and sighting the Birch Pool for the first time, I must admit to feeling somewhat apprehensive about just how I was going to find a fish to catch in this famous and expansive piece of water. Numerous trips to the Rotorua region, fishing the lake edge and smaller streams, had not prepared me for this imposing and revered river. Even previous experience on the mighty Waikato with its slow moving and deep flow appeared to offer little hope in the way of a clue to unlocking the secrets of the Tongariro.

My rod, by now in a state of total shock and trying desperately to return to a nice little spring creek, hid in the bushes while I sat and observed a couple of anglers regularly catching and landing a succession of fish on an increasingly evident evening rise. This was something new. All the books I'd read over the years extolling the virtues of this famous fishery had seemed devoted to the deeply sunk lure and more latterly to weighted nymphs of immense proportions, propelled long distances to the head of very famously named pools. The appearance of a number of fish feeding on or just under the surface gave me new hope.

Somewhat fortuitously, after a short time one of the anglers joined me on the bank and enquired as to the whereabouts of my fishing paraphernalia. After explaining that this was new water for me and a period of observation appeared to be the order of the day, he very graciously demonstrated his set up, a floating line, very short leader and a small bedraggled un-weighted hare and copper. "Just fish it down and across mate, it's the easiest way to catch a fish in this river at this time of year", were his words of advice and very helpful they would prove to be in the coming weeks. I did not fish that night but the very next evening I caught my first brace of Tongariro rainbows.

The second piece of good luck I enjoyed during the first few weeks fishing the Tongariro was having access to the advice of Dave Conley, someone who

Mike Nicholson casting from his favorite pool - upper Birch
Photo by Kim Aldridge-Turia

Summer and autumn options
Photo by Kim Alexander-Tutela

knows the river very well indeed. The hare and copper was soon changed to a deer hair caddis pattern in a variety of sizes that really appeared to spark the attention of the trout. Much enjoyment ensued over the next month or so during the twilight hours and just after. As is often the case, all good things come to an end and with the disappearance of the caddis I was once again flummoxed as to quite how to approach the river.

The answer appeared once again in the form of Dave. A short afternoon fishing the river on a sultry February day with him ensured I caught the 'dry fly' bug well and truly. Now I do not profess to much confidence with the dry fly at the best of times, so being encouraged to tie on a very big cicada or 'stimulator' pattern and explore the riffles and pocket water with a short and hopefully accurate cast did not inspire much confidence. How wrong I was to be, with presentation and a stealthy approach low on the list of requirements for success, this was a perfect scenario for the six-weight and me. Once again much enjoyment ensued for a period of time on a succession of hungry mending rainbows, with the odd well conditioned fish thrown in for good measure.

With summer drawing to a close and a bite to the air appearing in the evenings, the hatch began to dwindle. With plenty of fish still holding in the edge water, once again a new technique was called for. This time I did revert back to my night time lake edge experience and experimented with fishing a slow sinking line down and across the pools and runs with a Woolly Bugger or Craig's Night Time on a reasonably short and sturdy leader. It certainly took some time to discover quite where the fish were stationed in the river at night, though when just on the point of giving up a fish or two gave the game away. For a period this technique was reasonably productive and a lot of fun.

I guess I learned a few things in those initial months. Summer and autumn fishing on the river can be very productive, and a heck of a lot of fun to boot. For those of us new to the river there are a variety of techniques that will catch fish other than those normally associated with the Tongariro and its winter runs. Secondly, a little assistance and observation of those that fish the river on a regular basis can save a lot of misguided effort. The Tongariro is a large piece of water and can produce a certain kind of anxiety for angler and rod alike when first making its acquaintance. With a degree of patience and perseverance, we begin to understand a little of where the fish may be at any given time of the year and enjoy the variety of opportunities the river offers us.

As I am writing this the Kaimmiwas have their first dusting of snow and there's rain on the window pane. I'm told the first decent runs from the lake can be expected. The wee six-weight may well get some respite during the winter, as I am sure something with a little more armhority may be called for.

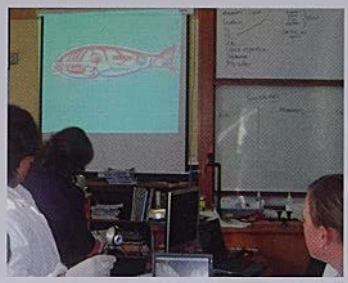
I intend to approach the winter fishing in much the same manner as earlier in the year. Find somewhere or someone to observe, ask questions and then give it a go. First I will need to learn to cast a heavy nymph, if for no other reason than to avoid too much damage to the back of my head. I'll need plenty of practice. What a shame the only way to achieve this is to go fishing.

Taihape Gasbags

By Taihape Area School

When Taihape Area school approached us to help with one of their latest projects we were only too happy to oblige...

On Wednesday the 11th of June three of our Year 12 biology class at Taihape Area School (Kendra Mower, Rebecca Somerville and Kendra Pye) dissected a trout (thanks to Tongariro National Trout Centre for donating it), a sheep's lung (supplied Alex Wongs Butchery,Taihape), three rats (supplied by Victoria University) and five locusts (supplied by Bio Lab,Auckland).



Our class is doing a comparative study on the gas exchange system of three different animal groups, bony fish, mammals and insects. This practical experience enabled us to look at the different gas exchange structures hands-on. It was great! It helped us to see how the organs were positioned in the animals and this experience together with our theoretical research helped us greatly in our comparative study.

We were shocked to discover that water contains less than 1% of oxygen whereas air has 21% of oxygen! Fish live in water and have an active life style. They need to get oxygen from the water rapidly.As the oxygen concentration is so low in the water, the gas exchange process has to be highly efficient. Efficient diffusion takes place in the gills because the gills have folded filaments with projections called lamellae which allow them to have a very large surface area. We were surprised to find out that blood flowing through the gill capillary encounters water of increasing oxygen content. This is called the counter current effect which helps maintain the oxygen concentration gradient across the gill.

In contrast terrestrial insects live in air. Bet you didn't know that insects don't use their haemolymph system (blood) to carry their oxygen around their body. Instead they use their simple trachea and tracheal tubes to deliver oxygen faster. They have a trachea system which consists of tubes connected to many spiracles. These spitacles allow entry and exit of gas into and out of their body. The oxygen diffuses directly into the tissues and carbon dioxide diffuses out rapidly to meet their active lifestyle including flying.

Mammals don't need such a high amount of energy all the time and instead use their blood system to transport oxygen around the body. Oxygen comes into the alveoli and the gases diffuse into the blood capillaries where it is then pumped around the body.

We studied what supports the gills and trachea in insects and mammals. Did you know that if fish are taken out of their habitat and put into air their gills collapse and the fish will die? It is not simply because they unable to breathe out of water. Insects' trachea tubes are lined with chitin, a strong substance that gives strength for the trachea and tracheoles. However the chitin can only take a certain amount of pressure which means

the insect can only grow to a certain size, luckily for us. Mammals on the other hand have only one trachea which is lined with c-shaped cartilage which gives strength to stop it from collapsing. It is able to take more pressure allowing the animal to grow to a larger size.

Wow! We discovered heaps. What we mentioned above was only a needle in the hay stack. We now have improved our understanding of diversity in animals because of their way of life and their habitat which enabled us to achieve our unit standard. The dissection has prepared us for our end of the year exams which we hope to ace. On behalf of Taihape Area School we would like to acknowledge and thank all parties concerned with the supplying of the resources needed for our dissection.

Fish Dissecting Project
Level 2 Bio
(Gas Exchange)

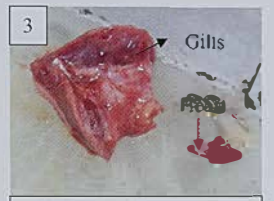
1

The gills and heart are still intact of the fish.

2

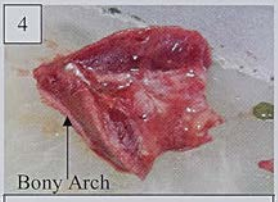
The gills and heart have been taken out but are still together, the arrow is pointing to the heart.

3



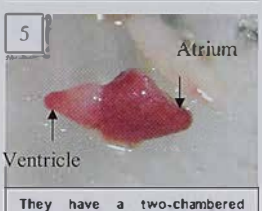
These are the gills and the heart separated.

4



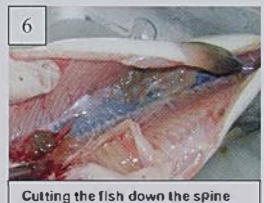
They have four pair of gills each supported by a bony arch. The gills are made up of filaments that have a great many folds (lamellae) which are supported and kept apart from each other by water. This gives a high surface area for gas exchange.

5



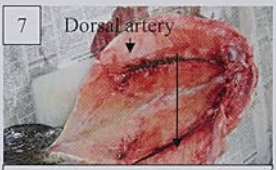
They have a two-chambered heart with a conus arteriosus that sends bloods through the gills and a sinus venosus that collects blood from the rest of the body. A series of one way valve prevents the back flow of of blood.

6



Cutting the fish down the spine to get a better look at the dorsal artery carrying the oxygenated blood.

7



The dark lines called the dorsal artery transporters that carry oxygenated blood around the body.

8

Looking at a diagram of a fish and the way the blood moves around the body

Preparing for winter

By Julie Greaves
Julie is a ranger responsible for visitor assets management.

It's a new year but before we know it Easter has come and gone, the leaves on the trees are diminishing and winter is starting to rear its cold head.

In preparation for the influx of river anglers we gear up to maintain angler tracks on the eastern side of Lake Taupo including the Tongariro, Waiotaka, Waimarino, Tauranga Taupo, Hinemaiaia and Waitahanui Rivers. Even though we have endured a long hot summer the vegetation growth along these tracks still managed to explode, limiting access to many of your favourite fishing spots.

Moorland Services Ltd were the perfect contractors to take on such a challenge. Armed with chainsaws and scrub cutters and having completed the vegetation trimming last year, they knew exactly where to go and how to tackle it. The crew turned up before Easter and started on the Tongariro River as this would be the first river to receive high angler numbers. The sun was out in full force this week and the crew worked at a steady pace. When lunchtime came around on the first day they decided a leisurely dip in the all too inviting Tongariro waters would be a good idea. I did warn them that the Tongariro was slightly cooler than Lake Taupo but they did insist. Only once though!

After Easter they moved onto the tracks on conservation land at Waitahanui. With the warm sun still beating down the crew managed to find three wasp nests lurking in the scrub. Out of a crew of six all but one ended up with nasty stings. On the positive side they received praise from two anglers who often wander these parts of the river and who were delighted with the work done.

Top: John Hunt (NZFM) & Julie with the latest sign, reminding anglers not to trespass
Photo by Glenn Maclean

The Tauranga-Taupo tracks had to wait until after Easter because of the fire risk, some of the track being in and close to the pine forests. Instead this work was completed in the last week of March. The river was very low and the contractors were very happy not having to venture too deep when crossing it. They also cut around the track marker poles which were becoming overgrown.These can now be easily seen by anyone wandering along these tracks, which should reduce the chances of becoming geographically embarrassed. One crew made the most of the last of daylight saving working until 8.00pm one evening on the Hinemaiaia. The other crew who were working else where started to wonder if they had fallen into the river and drowned.

The long dry spell finally ended on the last day of the month, the day the track work was completed.A big thanks goes out to Nick Doney and the team at Moorland Services for their quality work. I'm sure all anglers will appreciate the quality access this season to their favourite fishing possies.

However this has not been the end of our track maintenance for the winter. As a consequence of the heavy rain in late April and again in July we have had to re-route several sections of track on the Tauranga -Taupo from the main carpark to Tuki Street where the track was undercut or washed out. Further up, a section of 100m was also taken out and plans are to align a new section of track behind the vegetation here so as not to de-stabilise the bank in future floods. This work will have occurred by the time you read this so that once again anglers have access almost to Kereru Lodge without needing to cross the river.

In association with NZ Forest Managers (NZFM) new 'No Trespassing' signs have been erected down Kiko Road where anglers and other users have been illegally accessing the river. Anglers are reminded to stick to the official walking track. We are working with Forest Managers to address non compliance so there will be eyes watching these areas.

A small 10m section on the Hinemaiaia was also re-routed as it was washed out in the same flood. Anglers will be pleased to know that we are extending the Hinemaiaia track and creating improved access down to the lake on the true left bank.

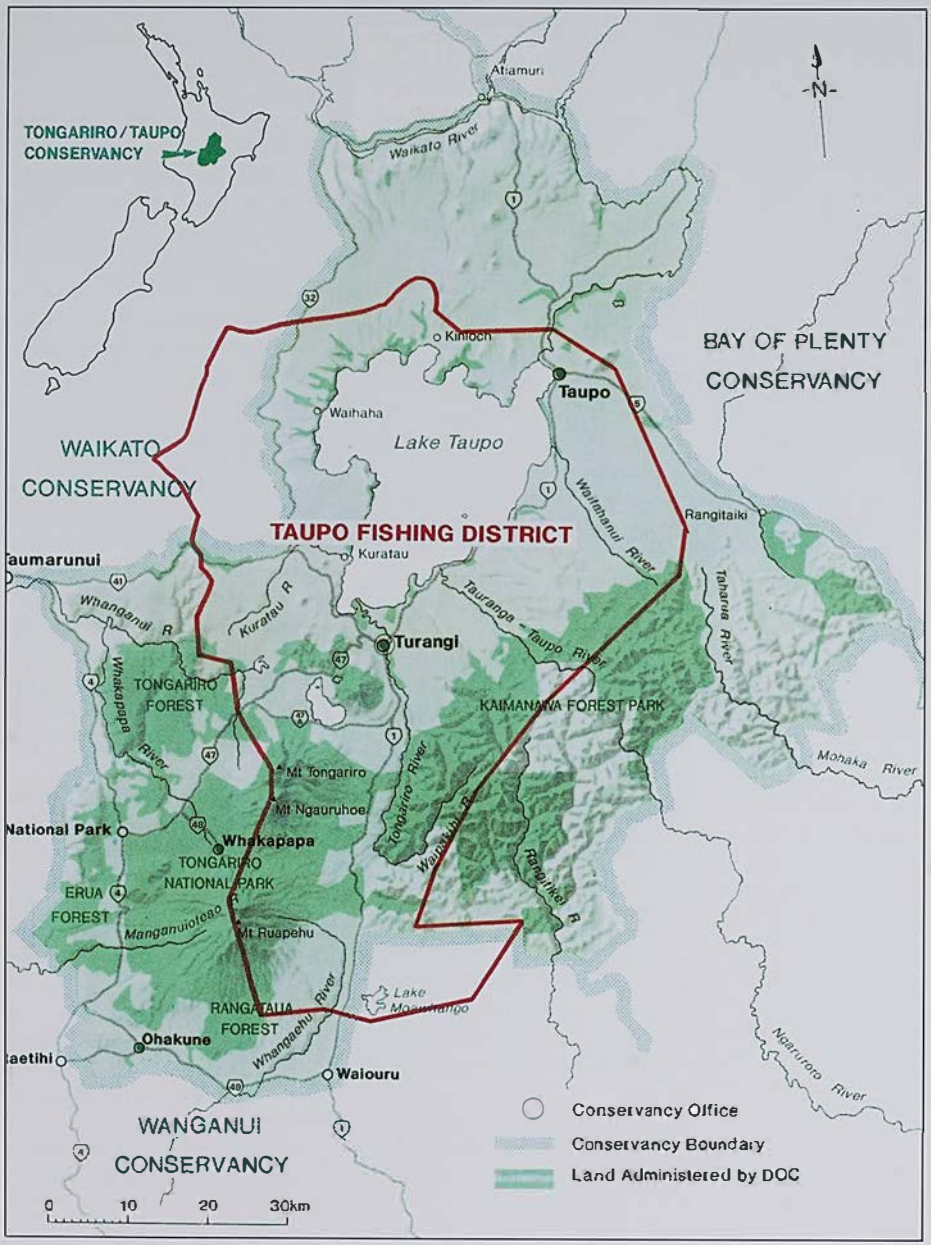
The Tongariro track was affected by heavy rain. A 10m section above the Duchess Pool was re-routed as it had been badly undercut creating a very significant hazard for walkers and anglers, had it collapsed.

Household rubbish dumped beside the Waitahanui track has been an issue for locals and has become unsightly to visitors. Vehicle barriers have been erected in the main carparks to help try to stop this problem. Gradual upgrade plans means we are re-pumicing areas of the Waitahanui track. Two sections between SH1 and the Cliff pool bridge have become boggy so we have created drainage channels and partially realigned the track in these areas and are planning to pumice these side tracks.

The Blue Pool, Admirals, Tauranga -Taupo, Waimarino and Hinemaiaia access roads have also just been given a recent vegetation trim. The contractor has cut a good distance into either side of the road so overhanging vegetation and blackberry won't scratch or damage vehicles.

We have been working hard clearing tracks over the past three months. Track damage and wind falls are expected throughout winter,but if you are out on the tracks and encounter a tree down or a slip, please give us a call so we can repair it as soon as possible.

Tongariro/Taupo Conservancy



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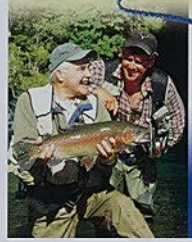

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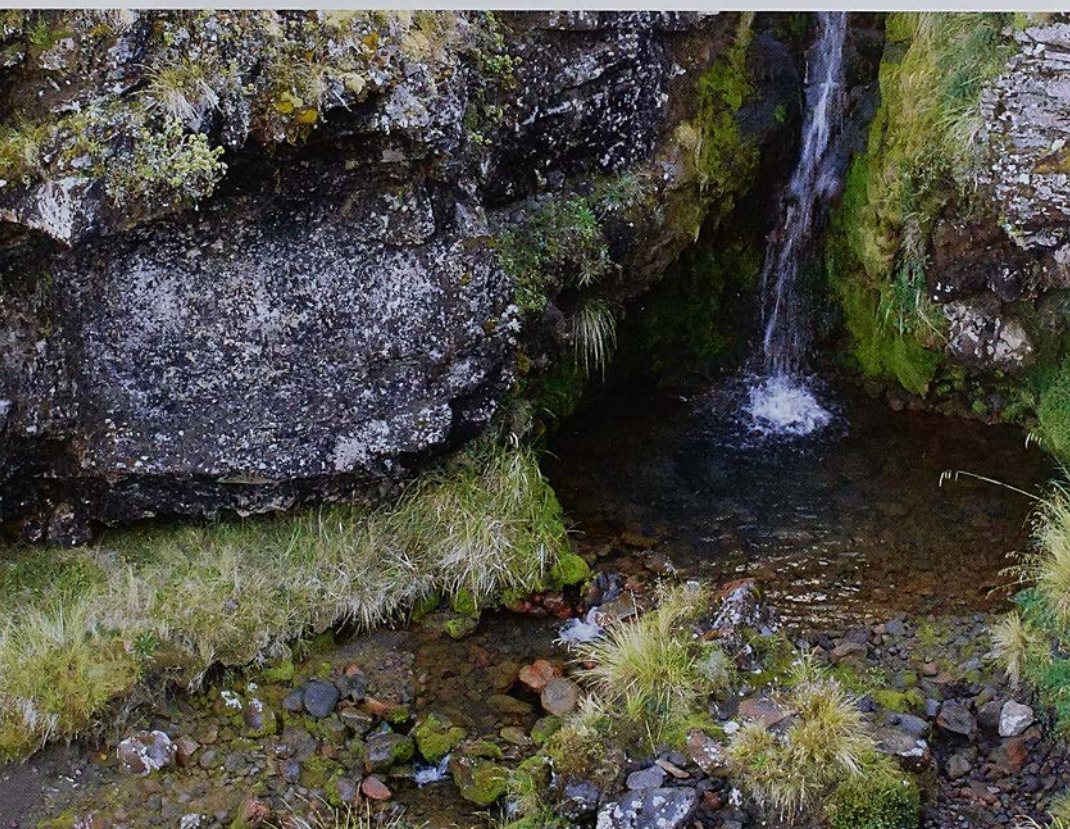

Our best kept Secret

THE SS660

The vision has been created. The design team at Haines Hunter is proud to present this superb 6.6m. craft that meets the demand for mid-size hardtops. Our no compromise approach to the design has achieved functionality with grace and style. The Haines Hunter SS660 is a new boat, designed and built from scratch. The hull is a completely new development. The 21 degree deep V that is the standard for Haines Hunter has been taken to a new level that provides maximum beam aft (for stability and fishing room) combined with a totally new approach to the forward sections. The fine entry provides softness in the ride. Add our famous planing strakes to provide maximum lift for performance and dryness and we have "the ride" that only Haines Hunter boats share. The pedigree of this design exhibits superb, vice free handling without the need for big horse power. Inside the boat is big, very big, with huge cockpit space for fishing or diving and no compromise for family comfort. The Sports Sedan Hard Top offers protection from the elements along with a great look. Excellent seated visibility with all driving & electronics functions at your fingertips. Spend some time and enjoy a thorough look at this all new Haines Hunter SS660. We are very proud of this new machine. It's a beauty.

5 YEAR STRUCTURAL GLASS HULL WARRANTY

HAINESHUNTER™

THE SECRET IS IN THE RIDE

Marine Industry Association NEW ZEALAND

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PERFECT BALANCE

"JD Power and Associates (US) ranked Yamaha highest in Customer Satisfaction with Four Stroke Outboards, two years in a row"

THE REVOLUTION CONTINUES

Once again Yamaha leads the way...for many the new Yamaha 150 four stroke offers the most perfectly balanced boating experience available. Innovative and technologically superior, the Yamaha 150, a purpose built four stroke outboard offers clean running, superb performance, economy, and amazingly low noise levels...with no weight penalty over 2 stroke outboards. Join the four stroke revolution, choose from NZ's most comprehensive four stroke model range at your Yamaha dealer...today.

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LOW EMISSION 4 STROKE

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