

TARGET TAUPO

#67

Issue 67 / October 2015
A MAGAZINE FOR TAUPO ANGLERS

Girls on the fly

A hardening facility; what's that?

More fish... more catch for all?



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A magazine for Taupo anglers

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FISHERY FOREWORD



By Kim Alexander-Turia
Conservation
Services Manager,
Taupo Trout Fishery

*>Welcome to issue
67 of Target Taupo.
Since the last issue
there have been some
changes to the fishery
team, and some great
innovations.*

Our team consists of Michel Dedual as our Fishery Science Advisor, Mark Venman (Senior Ranger), Mike Hill, Annette Richards and Harry Hamilton. Randal Hart retired on 30 June; and Tom Scott-Simmonds has moved up in the team to take his position, and Jeremy Robb is a welcome addition to the team. We continue to receive support from other DOC staff, including Peter Shepherd and other partnership rangers who provide communications (media, Facebook etc) and help identify future angler opportunities.

With our much smaller team we have been focusing on innovations that will help us work smarter. All-weather 'rugged' tablets to record angler surveys have saved data-entry time when back at the office. The tablets also give us access to our online database in the field, so we can check licence purchases in real time if we have mobile phone coverage. This means if someone cannot produce a licence to a ranger, we can sometimes find out while out on the water whether or not they have purchased a licence rather than following-up once back at the office.

The tablets are also being used to record data from the Waipa fish trap, again saving on double-handling of data. We can send 'real time' photos of the condition of Waipa trap via a game camera, which combined with an automated rain gauge at the trap that sends data via mobile text, means we are better prepared and aren't caught out by flood events. Other innovations include a trout transporter (see p8) and a Waipa digital counter system.

Compliance is one of our priorities, and the team continues to make up a fifth of DOC's national compliance effort as measured by active prosecutions. As noted in the last issue, this is impressive given the reduction in ranger numbers from the last restructure as we are achieving the same number of compliance checks, and apprehending and/or prosecuting more offenders, with a smaller workforce than ever before. This speaks volumes of the dedication of our team to this important work, and the changes we have made to our overall compliance strategy.

On another positive note we are continuing to work on the review of Taupo Trout Fishery (the *Exploring future opportunities for the Taupo fishery* report was released 20 May 2013). This means working closely with our key partners - the Tūwharetoa Māori Trust Board, and the Taupo Fishery Advisory Committee - to provide an effective angler voice in the management of the fishery. As part of this process we are about to start a couple of key projects that look at new licence categories, such as boat-licencing options.

So how's the fishing? Personally, over summer I enjoyed a bit of harling and jigging on the Great Lake with some very successful results. The Tongariro seemed to really fire up during the summer as well, with many anglers talking about awesome fishing during the evening rise, or chasing the big browns which can be found right through the main stem of the river.

All signs are pointing to a great season on all of Taupo fishery's tributaries. Anglers are reporting well-conditioned rainbows throughout the system, which follows on nicely from the fat fish we were seeing out on the lake during the warmer months. So hopefully we are going to enjoy spectacular fishing throughout the winter and spring as the runs build into October and beyond.



By Amelia Willis / Partnerships Ranger

GIRLS ON THE



It's a man's world' - well that's what most people think about the sport of fly-fishing - but is it really true? My friend Evelien and I went out at the weekend in the Taupo Fishing District, to find out.

I'd like to say we were up and going at the crack of dawn, but in reality it was a pretty cruisy start to the day. After a quick coffee stop - we'd managed to save some time by buying our Taupo Fishing Licences online - we headed south to the Hinemaiaia River, and had made it to the river bank by noon.

Evie has fished on and off since childhood thanks to her Dad, but I'm still new to fly-fishing although I've fished on the lake for many years. So neither of us profess to be experts, in fact we both have a lot to learn (well when it comes to fishing that is!) It was also our first outing together - needless to say arriving in the car park with a bunch of male anglers around was a little intimidating!

We definitely had preconceived ideas about the angling community which didn't help this trepidation: male, closed off, competitive, condescending, and absolutely ready to judge two young women out for a fish.

In this way, we set out - with apprehension, searching for pools that were vacant and where we wouldn't get into anybody's space. After a little time exploring different pools, chatting and relaxing into our casting we - like the frosty winter day - began to thaw out.

ABOVE

Kererū and other native birds are common sights on the Hinemaiaia Stream.
Photo: Amelia Willis

LEFT

Amelia and Evie ready to go fishing.
Photo: Photo supplied

“... arriving in the car park with a bunch of male anglers around was a little intimidating!”

FLY





ABOVE

Billy Thrupp helps Evie play her trout to the bank.
 Photo: Amelia Willis

INSET

Success! A 6 lb rainbow hen.
 Photo: Evelien Van de Ven

BELOW

Gareth (left), Evie and Billy – with proof that it doesn't hurt to ask!
 Photo: Amelia Willis



Late afternoon, not having had much luck we headed to a new pool – bumping into two guys looking like they were having a successful time of it. As the pool was full we were about to go, but then the boys beckoned us over: “How’s your day going? What’s your set up? What are you fishing with?” A little advice, some positive reinforcement, a gifted nymph – and two minutes later Evie had a six pound rainbow on her line!

Gareth and Billy were great – and once we had changed our attitude, we realised most people on the river that day were happy to help. Those passionate about the sport of fly-fishing are pretty stoked to see newcomers getting into it, knowing the sport they love will carry on and hopefully grow.

The moral of the story: just get out there and give it a go! If you’re not ready to go out alone, just head out for a walk along the river banks and have a chat to some of the anglers. This can be really inspiring, and can help you plan your first solo trip.

And when you’re out there in the river don’t be shy, ask for advice – most anglers are really friendly, and more than willing to share in your success (provided they’ve already had a bit of success themselves!) 🐟

Seven months as a Taupo Fishery Ranger

TIMOTHY MAULE
TRAINEE RANGER, SERVICES



My name is Tim Maule. I'm 26 and grew up in Hamilton, where I spent my spare time hunting and fishing around the central plateau. In 2013, I went down to NMIT in Nelson for the Trainee Ranger Program; and in 2014, out of the 20 NMIT students, I was lucky enough to get one of seven 2-year contracts with DOC. Starting in July 2014, I have spent my first year working with the Central North Island services and the Taupo fishery teams based out of Turangi.

With the trout running up the tributaries for spawning in July, the main focus was on angler surveys up the rivers and collecting data about the fishery. I was straight into processing the Waipa fish trap, drift dives and manning the Tongariro National Trout Centre (TNTC). With summer coming up the TNTC becomes a hive of activity, with lots of visitors and 'kids fish-out' days. When the Waipa trap is removed, getting out on the lake for licence checks and angler surveys becomes the priority.

There have been loads of highlights. One of the best for me would be the drift dives. Due to its size, the Tauranga Taupo River has to be done with four divers. There are nice deep pockets to duck-dive down into. At the start of the Kuratau dive, the water from the spring has such clarity it looks 2 or 3 metres deep, when in truth is more like 10. It's a very special spot.

Other highlights would be walking into and processing the Waipa trap: getting hands on and seeing the condition of the running fish and what the fishery is doing. And getting out on the lake for angler surveys is pretty hard to beat.

From setting nets and dissecting the stomach content of catfish to drifting down the Hinemaiaia in a wetsuit surveying fish numbers... I've really enjoyed my seven months with the Taupo fishery team – the time flew by too quickly. I've had a blast, learnt a lot, and even managed to crack a couple of good fishing spots. 🐟



ABOVE
Ranger Mike Hill transfers trout into the transporter.
Photo: Tom Scott-Simmonds



RIGHT
Trout are herded into pens then transferred by net.
Photo: Tom Scott-Simmonds

MOVING TROUT AROUND THE TNTC SITE

By Randal Hart / Fishery Ranger

Every year there is a program to move trout around the Tongariro National Trout Centre (TNTC) site. Trout in the kids' fish-out pond are removed and sent off in the dedicated Fish & Game tanker to other kids' fish-out sites in the North Island, such as the Happy Valley facility in Wellington. The 18-month old trout in the raceways are then moved to the pond, and fingerlings in the hatchery are moved outside into the raceways.

In the past the method used to catch the trout in the pond and raceways was time-consuming, so the decision was made to invest in equipment that made this process more efficient and less stressful for the trout. Various options were discussed; staff decided to build a portable corralling system for the pond (similar to what a farmer uses for their stock), and to design and build an improved tanker using ideas similar to the Fish & Game 'trout transport tanker'.



BELOW TOP

A large valve provides a quick release option.

Photo: Tom Scott-Simmons

BELOW BOTTOM

A water slide means less handling and less stress to the trout.

Photo: Kim Turia



The design and builds were achieved using the expertise of DOC Fishery staff and local engineering firms.

The corraling system uses a series of screened gates joined together with large hinge pins, and a screened pen with removable gates at the end. This system is very easy to install in the pond, and takes significantly less time to remove than the previous system. Trout are slowly herded into the pen using a long seine net, and are contained by the removable gates. They are then lifted out with hand nets and put into the tanker.

The tanker has been designed to carry the trout in about 1.2 tonnes of water. It is fitted with an oxygen micro-bubbler system to ensure the trout are not stressed from a lack of oxygen while in transit. Trout are released from the tanker via a large valve at the rear, which reduces the amount of handling and therefore their stress. A water

slide gets the trout from the tanker to the pond, about 8m down a slope. The tanker can be removed from its trailer base and fitted to a flatbed truck if the trout need to be moved to other sites.

The corraling system and tanker were commissioned this year and have been very successful. Fish are moved more efficiently and trout are less stressed when they arrive at their destinations. There's also an added bonus of less stress on DOC staff due to the reduced amount of lifting needed – as well as the entertainment factor of watching the trout swim down the water slide.

The success of this new trout-handling system at the TNTC is a tribute to the expertise and dedication of DOC Fishery staff and the local engineering firms involved in its design and build. 🐟



NEW SPECIES at Genesis Native Freshwater Aquarium

By Tom Scott-Simmonds / Fishery Ranger

The Taupo Trout Fishery team is involved in a wide variety of assignments: catfish monitoring, drift diving, track maintenance, tagging juvenile trout, and even helping to fight fires. But it is not often that we get asked to help out with locating native freshwater fish. March saw fellow ranger Michael Hill and me working with the Rotorua DOC team in a dwarf galaxias (*Galaxias divergens*) project along the Te Waihou stream, Putaruru.

DOC has been monitoring these fish since 2009; however only recently have substantial numbers been caught. The overall aim of the project is to verify the population distribution of dwarf galaxias, to enable development of an effective management plan. Kristina Thompson, the lead Biodiversity Ranger, was keen to trial drift diving to help identify suitable areas for setting the fyke and southland sock nets – which is why we were asked to help out. There was also the chance (depending on whether we were any good!) to find a few fish for the aquarium here at the Tongariro National Trout Centre in Turangi.

The new drift diving method proved successful, with large numbers of larvae, juveniles and even a few adults identified during the dives. It also allowed the team to discover new habitat preferences, leading to new survey



FAR LEFT
Ranger Michael Hill
scoping the banks.
Photo: Sjaan Bowie

LEFT
Dwarf galaxias.
Photo: Tony Eldon

BELOW LEFT
Fyke net set in the
Te Waihou Stream.
Photo: Sjaan Bowie



SPECIES SPOTLIGHT: DWARF GALAXIAS

SIZE: Up to 90mm long

LOCATION: North Island – the headwaters of the Waihou River near Putaruru, at a few sites in the Rangitaiki River near Galatea, in Hawke’s Bay, and in the Wellington region. South Island – Marlborough and Nelson, and on the West Coast as far south as the Hokitika River.

DID YOU KNOW? Unlike whitebait (which migrate to sea), dwarf galaxias live their entire lives in the stream or river in which they hatched.

sites and net configurations. Areas with tree fronds and native tree roots going directly into the spring were ideal places for large groups of larvae to hang out and be seen during the day. Other notable species present included Cran’s bullies and high numbers of kōura, of which six individuals were found in the stomach of a rainbow trout. Thanks to Fish & Game, trout stomach analysis is also a key part of the monitoring programme (to help establish whether trout threaten native fish populations). Few trout were seen through the survey section of the stream.

As many dwarf galaxias were observed and captured, Kristina kindly donated a dozen (along with a couple of

big brute Cran’s bullies) to the Genesis Native Freshwater Aquarium. Having these fascinating and understated non-migratory species in the aquarium will, no doubt, increase awareness for the public and the many school groups that come through daily. With their tiny mouths they have been gorging themselves daily on the frozen *Daphnia* and *Artemia* (small planktonic crustaceans) that we feed them. The larvae are currently very happy and have put on great condition during their compulsory 4-week stay at our quarantine facility. In this time they have been exposed to a saltwater treatment, which helps kill unwanted pathogens and/or bacteria and helps lower the risk of cross-contamination in display tanks. 🐟

FACE[BOOK] TIME WITH TAUPO TROUT FISHERY



By Dave Conley / Partnerships Ranger

Now that our Facebook page has been up and running for a year or two we are starting to get quite an audience, with more than 1,500 followers. While that may not seem like many we have been steadily growing, so we must be doing something right. It is interesting to break our stats down and try and make sense of what people find interesting on the page, and what gets them engaged and talking about Taupo fishery 'stuff'.

As a general approach, we see our Facebook page as a place for light, easy-to-read messages and information about the jobs we do, and information that is immediately interesting to anglers – such as track closures.

It can also support other forms of media, such as the website and *Target Taupo*, to get out the information that we need to pass on to our customers – that being you, the anglers who buy licences to fish in this awesome fishery.

This other media does the 'heavy lifting' of more detailed information about the fishery, our science and monitoring, and other detailed content that is not ideal for the quick consumption of the average Facebook post.

WHAT WORKS AND WHAT DOESN'T?

A quick scan of the analysis available through Facebook of our posts quickly points to what works and what doesn't with our followers. Unsurprisingly the most interactive content is the most popular.

Type	Average Reach	Average Engagement
Video	8,038	1,633 266
Photo	1,771	755 80
Link	781	62 22



ABOVE

Devon Ball landed this 7 lb brown on the Tongariro River.
Photo: Dave Conley

RIGHT

Video post of the trout transfer slide had over 6,000 views.
Photo: Dave Conley

BELOW LEFT

Video clips are by far our most popular content.



As you can see from the information below, video is by far and away our most popular content. It reaches more people, and of those it reaches, there is a greater level of people 'engaging' with it, (clicking on the post). We recently posted a clip of us transferring some fish at the trout centre using a hydro slide to avoid handling the fish, which causes them unnecessary stress. It's a pretty routine thing we do, so perhaps we underestimated how people would react... but the post went nuts, reaching over 13,000 people and being viewed nearly 6,000 times.

Other videos have been big hits as well, including one from last year that showed fish attempting to climb a waterfall, with some epic wipe-outs in the process!

Interestingly though, watchers don't go on to like, comment on or share videos at the same rate as other posts. This is probably because, being unique and visually interesting, our videos attract a much greater audience who are just 'passing through', browsing content for light entertainment rather than genuine interest.

Photos are next on the list in terms of engagement, but people act on these posts at a much higher rate than videos. On average over 30% of people who engage with one of our photos then go on to like, comment or share it, as opposed to about 17% of clip watchers. We do try to keep a steady stream of nice pics on the page, particularly when the fish are fat and well conditioned like they are now.



Anglers always seem to be keen to get a fix of a good fish photo, especially if they can't get out for a fish themselves!

Last are the links we put up, which are often to either our webpage or others, where there is something of interest to anglers but often involves time spent reading and absorbing the information we have linked to. Our monitoring report is a classic example. It's really popular with a segment of our followers, but not widely appealing probably because it is heavy on fishery-related detail. However, users who open the links we post act on the post at a greater rate, even higher than the photos. On average 34% of engaged users then act on a link post. This is perhaps not a surprise, as we can assume they are more interested and engaged to begin with, and are therefore more likely to act on a post.

So a little bit of analysis on post type would indicate some basic principles: for the biggest reach and engagement, concentrate on visual posts - but remember there is a good audience for the meaty stuff too, and these people are often those who are really interested in the detail.

WHO IS OUR AUDIENCE?

This is quite an interesting picture too, and has changed a lot since our early days. I remember looking at some data early on in our Facebook life, and noting that women made up a large percentage of our audience. Over time however, this has settled back to a much smaller proportion of our overall audience, as illustrated in the graph below. The first snapshot from this table is that our audience is male-dominated - which we would expect to see, as our licence holders are predominantly male.

A deeper scan of our demographics gives a strong indicator of why we invest in our Facebook presence. It becomes clear how many of our fans are young males, who will presumably make up the anglers of the future - as we know our current licence holders are primarily males over middle age. So by trying to build an interest in angling in this younger demographic we are helping to encourage their future ongoing participation.

The following data adds a little more context to this, as we can see how people appear to engage more as they get older.

Our younger audience observes, but doesn't engage to the same extent as our older audience. It will be interesting to watch this over time: as this younger audience sticks with us we should see a large increase in engagement from them.

So all in all, Facebook appears to be helping us in a variety of ways. We are getting interest and engagement from

people outside of our traditional customer base, and are building a strong audience of the group who will make up our customer base in the future.

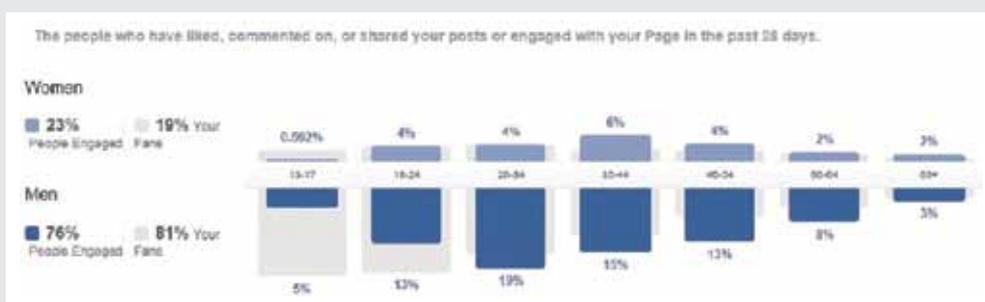
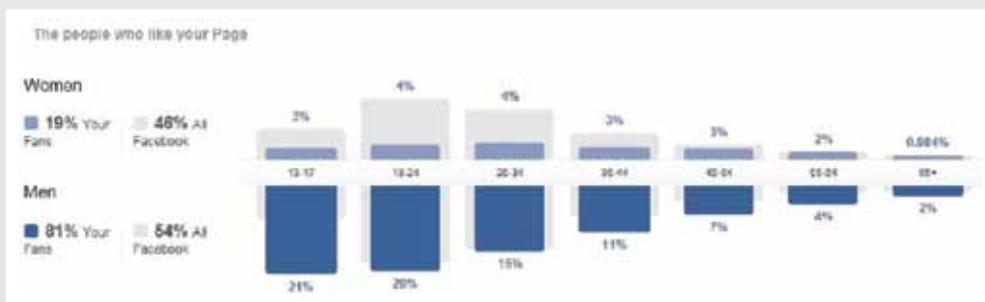
The biggest challenge is often trying to get photos and videos from our rangers who are hard at work doing their core delivery work, but we'll keep chipping away as it is increasingly evident that it's worth the effort! 🐛

TOP LEFT

Our facebook followers are largely male (81%), much like licence holder demographics.

BOTTOM LEFT

Facebook data provides a good indication of who engages with our posts.





ANOTHER YEAR AT THE WHANGAMATA STREAM

By Mike Hill / Fishery Ranger

The amount of Monkey Musk that reinstates on the Whangamata stream is considerably less than previous years. We have learnt a lot about combating the freshwater weed over this time but to completely eradicate it has been a challenge: you can never be sure that every plant has been hit with weed spray, as plants can be hiding under other foliage. The rhizomes (fine root systems) are the cause of re-infestation – all it takes is one small fragment to survive, rejuvenate and begin a new colony. In some cases penetration of the regulated poison may have little effect, particularly as these fine roots subsist in saturated soil. Revisiting annually is needed, and will continue as we would rather not use a stronger dose. Trout have clear passage to travel through this tributary to spawn – therefore our aim is being met and plenty of adult trout, fingerlings and fry have been sighted.

ANGLER TRACKS

Winter is upon us and so begins another spawning season. This is a time when many anglers descend upon the rivers and streams to enjoy the excellent fly fishing this region has to offer. Therefore it is our commitment to you, the licensed angler, to ensure clear access to some of your favourite fishing grounds. Maintaining angler tracks is a big task as there are miles of foot-trodden pathways along the banks of these tributaries. Work is frequently required, particularly in spring, which can be time-consuming.

Fortunately we have been able to use this time elsewhere, thanks to the help of the Department of Corrections which recently provided a work crew led by Turangi local Tim Whakatihi. Tim and the gang got stuck in and did a great job. They were pumped and eager to move. In fact I had to ask them to ease up a little as tracks were becoming twice as wide! I would like to give my appreciation to the Department of Corrections, Tim, Lance and the boys. On three occasions we also used a contractor, who did a sterling job. Ex-employee Nathaniel Melon started with

the Department of Conservation as a trainee cadet and has been a success now forming his own business Manaaki Taiao Environmental Care.

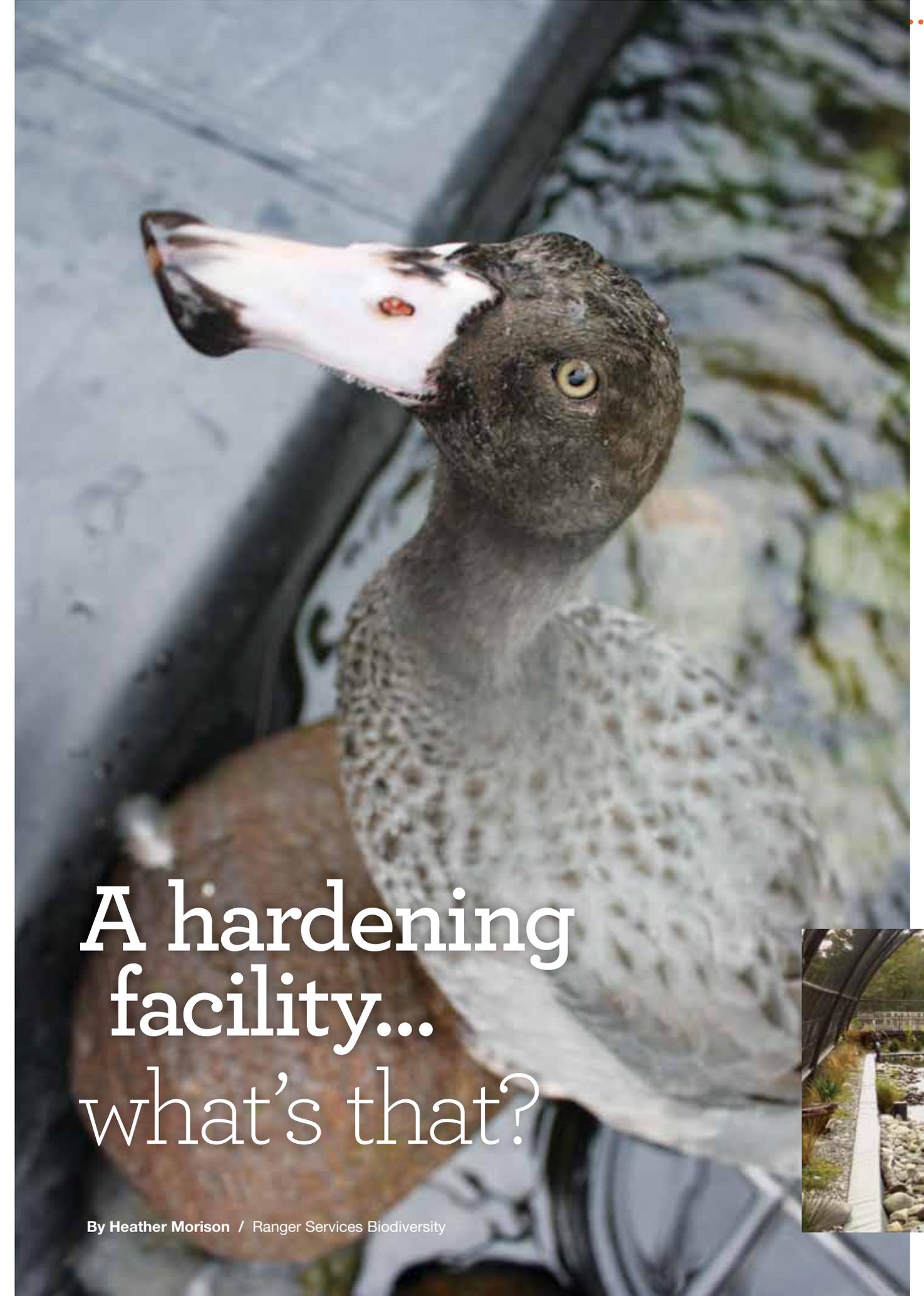
There is still a lot to do. We planned to have all angler tracks maintenance done prior to the runs and this has been accomplished. We will now concentrate our energies on getting access roads free of pot-holes. This has been the case in Waitahanui, with the road leading to the cliff pool and the Hinemaiaia car park below the bridge. These areas have both received a long overdue facelift. Other areas of focus will be the Blue Pool Road and Admirals Road, Tongariro, Tauranga Taupo car park, and the upper Hinemaiaia. 🐟

MAIN
Whangamata Stream is an important spawning stream for Taupo Trout Fishery.
Photo: Amelia Willis

BOTTOM LEFT
Monkey Musk can reinfest a site quickly so continued control is critical.
Photo: Mike Hill

BOTTOM RIGHT
Angler track along the Hinemaiaia Stream bank.
Photo: Amelia Willis





A hardening facility... what's that?

By Heather Morison / Ranger Services Biodiversity



WHIO-EW!

It's been a busy but successful first season at the Whio Hardening Facility.

Locally known as the whio 'crèche' or 'bootcamp', the facility is made up of two large aviaries with fast-flowing water and space for training flights, where whio ducklings bred in captivity prepare for their release into the wild.

Whio/blue duck normally inhabit fast-flowing rivers and streams; past experience shows that these ducklings stand a much better chance of adapting after release once they've had at least two weeks practising their white-water skills in a safe environment. It is a seasonal facility, used between November and April each year following the breeding season.

The young birds learn to surf the rapids, dive and feed on invertebrates, practise their flight paths, and socialise with other whio in the facility.

Our first season started on 4 December 2014 when the hardening facility was opened by the Minister of Conservation, the Hon Maggie Barry – and then the fun began!

We all underwent a steep learning curve, supported by the local Tongariro whio team, the Whio Recovery Group and the Isaac Wildlife and Conservation Trust (aka Peacock

Springs) in Christchurch who are all part of the 'Breed for Release' programme.

The Turangi facility is staffed by a mix of local DOC staff and volunteers. The two volunteers this season were a student studying Ecology at Massey, and a recent graduate in Zoology/Animal Husbandry from Otago. We also received great support from VetPlus in Taupo, and Wildbase located at Massey University who provided advice and training in aspects of health assessment.

WHY DO WE NEED ONE?

Previously, ducklings raised by captive breeders in the North Island needed to be flown to Christchurch to spend some time in the hardening facility down at the Isaac Wildlife and Conservation Trust facility. After a few weeks they would be flown back to their North Island release sites. This was a lot of effort, not to mention a hassle for the birds. Thanks to the Whio Forever programme (a partnership between Genesis Energy, Forest & Bird and DOC), a North Island facility could be built. Now all birds hatched in the North Island are only a short drive away from their local 'bootcamp'. ▶

MAIN

Whio/blue duck are rarer than kiwi and classified as Nationally Critical.
Photo: Sarah Congdon

BELOW LEFT

Converted trout raceways are now home to whio.
Photo: Amelia Willis

BELOW RIGHT

Minister of Conservation, Hon Maggie Barry opened the facility in December 2014. Seen here with students of Hastings Intermediate School.
Photo: Catalina Amaya-Perilla





WHAT HAPPENS AT THE FACILITY?

WHERE IS IT?

The Tongariro National Trout Centre (TNTC) was identified as a prime location as it is centrally located, close to captive holders and potential release sites. This minimises the travel time for ducklings to and from the facility. It also brings great advocacy opportunities to support the goals of the Tongariro National Trout Centre Society, the Taupo for Tomorrow education programme and the Whio Forever programme. These organisations seek to increase the level of public support and involvement in whio protection and raise recognition of their plight in the wild.

A DAY IN THE LIFE...

The ducklings are usually up at dawn to check out each other's wing spans, compete in posturing and to preen ready for the arrival of the rostered 'wing commander' who starts the daily routine around 8 am. The wing commander's job is to make sure the enclosures are clean and the birds are fed. Unfortunately for them, a poop check for parasites or bacteria is a part of each day's schedule.

Moving in and around the ducklings gives ample opportunity to quickly visually scan each duckling for

potential health issues, and volunteers quickly become good at identifying a bird that looks a bit 'down and out'. Just like the school yard, volunteers also have to make sure bullying is kept to a minimum – you'd be surprised how mean some of these cute cuddly ducks can be.

Throughout the day observations are made while the ducks are playing tag, chasing each other underwater and searching the rocks for invertebrates.

The aviaries are permanently in general quarantine as there can be a large number of birds at any one time. To minimise the presence of parasites and bacteria that can naturally occur or could be introduced by equipment or footwear, we follow basic quarantine practices throughout the season.

Catching these characters for individual checks, micro-chipping and weight checks – in particular, on release day – is more in the line of a sheepdog trial, thanks to Bubs Smith's invention (soon to be patented I'm sure). We use large black plastic drainage pipes with shade cloth secured at one end and we simply 'herd' them behind one of their shade shelters and into the pipes sitting at the back.



MAIN

Volunteer Julia Peters observes bird behaviour as part of the daily duties.
Photo: Dee Wilson, Taupo Weekender



ABOVE LEFT

The facility allows juvenile whio to acclimatise to fast flowing water before they are released.
Photo: Catalina Amaya-Perilla

ABOVE RIGHT

Working with whio, Sally Aiken of VetPlus (left) and DOC Ranger Heather Morison.
Photo: Bubs Smith

Until this system was in place it was a very entertaining experience for visitors! This has proven to be less stressful for the ducklings and allows much faster processing.

WHAT HAPPENS AT THE END OF THE SEASON?

On release days (often weather-dependent towards the end of the season), ducks are transported in specially-designed boxes to the release site by the local area team involved in the release. It's often a bittersweet feeling seeing the aviaries emptying as each release occurs, but knowing the ducks are going back into the wild to supplement the wild population helps.

At the end of the season the aviaries are given a thorough clean, any maintenance needed is done and then 'rested' until the next season. This rest breaks the cycle for any parasites or bacteria present in the surrounding plants or soil, and helps us manage the birds' health when in residence.

During our first season we 'hardened' 33 whio, with 13 from Isaac Conservation and Wildlife Trust, 15 from Pukaha Mt Bruce and 5 from Orana Wildlife Park. A further 5 from the Isaac Conservation and Wildlife Trust travelled up from the South Island for release at the end of the season. One duckling fell ill shortly after arrival at the hardening facility and unfortunately, despite urgent attention by Wildbase he passed away overnight. A total of 37 birds were released in the North Island.

One duck from Orana Wildlife Park near Christchurch suffered an injured wing, which needed a check-up from Sally at VetPlus, and two separate trips to Wildbase at

Massey for X-ray scan and assessment. Wildbase advised that, unfortunately, the duck was unsuitable for release as the repaired wing showed signs of arthritis that would eventually prevent any wing movement at all. So thanks to the Whio Recovery Group's Captive Coordinator, Peter Russell, he has flown courtesy of Air New Zealand to Auckland Zoo. He will live in their large whio aviary, providing an additional opportunity for breeding under the auspices of the 'Breed for Release' programme.

Ducks were released on the following rivers:

- 7 Little Maketawa (Taranaki)
- 10 Manganui (Taranaki)
- 4 Whakapapanui (Ruapehu)
- 1 Waimarino (Kaimanawas)
- 4 Tongariro (Turangi)
- 2 Kaiwhakauka Stream (Whakahoro - Blue Duck Lodge - Whanganui)
- 8 Lower part of the Upper Retaruke (Whanganui)

And one will remain in an aviary:

- 1 Auckland Zoo - permanent captive breeding opportunity

Having been lucky enough to be involved in an amazingly successful first season, the DOC team in Turangi and the TNTC can't wait to see what the next season will bring.

So call in and see us, take a tour of the TNTC aquarium and hatchery before finishing with a walk around the aviaries. As we are 'seasonal' (and release dates are not set in concrete) it might pay to give TNTC a call first to ensure whio are resident in the bootcamp when planning your visit (07 386 8085). Checkout www.troutcentre.com for opening hours and location map. 🐟



TEACH, UNDERSTAND, VALUE,

By Mike Nicholson / Partnerships Ranger-Teacher

Late last year we saw the opening of the Whio Hardening Facility at the Tongariro National Trout Centre (TNTC). The facility consists of two large aviaries with fast-flowing water and space for training flights, where captive-bred whio/blue duck ducklings are prepared for release into the wild.

All involved in the development of the facility hoped the design would be effective and that it would prove to greatly benefit whio recovery efforts. We also hoped that the facility would be an excellent avenue for visitors to engage with, and learn about, our iconic whitewater specialists. After great anticipation, we celebrated the first of the whio to arrive at their new temporary home in Turangi.

In terms of both recovery (preparing young birds for the wild) and advocacy, the hardening facility has been a great success: 38 young whio spent time at the TNTC this year, 37 of whom were released. For those involved with the facility, it was a rewarding experience to see these birds released into the wild. It was also gratifying to see that the

birds could cope with the extreme freshwater conditions that would become their home for the rest of their lives.

In an education sense, the facility has also been of huge benefit to the site and the species in terms of engaging students. Learners are able to get up close and personal with these wonderful birds, view them first-hand, and observe just how adept these animals are at surviving in a clean, clear, cold, fast-flowing, freshwater environment. Whio are the 'entertainers' of freshwater habitats, and therefore command the attention of those lucky enough to witness their antics at the hardening facility.

It is also hugely beneficial to the species that learners and general public alike are able to view and engage with whio first-hand, as this engagement is important for increasing awareness of the species. Visitors quickly realise just how special and unique these birds are due to the fact that they live out their entire lives on our fast-flowing rivers and are inextricably connected to the river's health.



LEFT

Whio/blue duck are a 'key indicator' species of pristine freshwater environments.
 Photo: Catalina Amaya-Perilla

BELOW

The Whio Hardening Facility offers visitors an up close experience with this unique bird.
 Photo: Catalina Amaya-Perilla



CONSERVE

Understanding that whio are fully 'connected' to healthy river systems is one of the 'big ideas' or concepts that we deliver on site. Whio must have access to clear, clean, cold, high-quality river environments in order to survive. Whio are therefore an 'indicator' species: if a river is healthy it will provide whio with all necessities of life, particularly macro-invertebrates like mayflies and caddis flies (themselves 'indicator' species), which are whio's essential food source. If whio are present and doing well, the river itself is likely to be healthy.

If we are to continue to protect this special species and increase its number on our rivers then public awareness of the whio and their connection to high-quality river environments is essential. This awareness can and does turn into action in the form of increased community efforts to support existing work with whio, or in the development of new recovery initiatives. The fundamental idea – that we are more likely to support and conserve species that we are engaged with and value – reminds me very much of a conservation quote that over the years has been very much

to the fore in my thinking when delivering conservation and sustainability learning to our young people:

*In the end we will conserve only what we love;
 we will love only what we understand; and we
 will understand only what we have been taught.*

– Baba Diom –

This iconic species, these whitewater specialists, these key indicators of river health – they deserve to be valued and loved for being a really vital part of what it means to be Kiwi. Whether you are rafting on, fishing in, mountain biking by, or generating energy from our natural river systems, the presence of whio is a tangible measure of success that we are looking after the rivers and striking a balance. If whio are present, the river is healthy.

If we are to increase public understanding of whio and their value to our society then facilities like the hardening programme at TNTC are an important tool in introducing many to the wonderful world of whio. If we want more whio on our rivers, we need New Zealanders to value and recognise whio and take action to support them. To achieve this, Kiwis need to observe, engage with and value whio.

Next time you are passing TNTC, stop in and spend some time with these iconic whitewater specialists – they really are whiotastic!! 🐼

SUMMER FISHING ON THE GREAT LAKE

By Mark Venman / Fishery Ranger



I personally can't remember such a good summer of boating weather like the one we have just had. The long hot days with minimal wind and no rain just never seemed to end. I sit here writing an update on the fishing over summer, regretting not getting out on the lake more - not only due to the perfect weather conditions but also the overall improvement in fish size and quality evident this summer. Although fishing was a little slow to start in November, the presence of some very large smelt in trout stomachs prior to Christmas was an exciting preview of the fish that would be caught in 2015.

This summer the Taupo Trout Fishery rangers interviewed over 750 anglers fishing from boats, and measured more than 300 trout from Lake Taupo (Taupomoana), which is consistent with last year's efforts. The team covered all the busy weekends and holiday periods from Labour Weekend through until Easter with a strong presence on the lake over the very busy Christmas and New Year period. Thanks to all those anglers who were checked and provided their catch information, including those who were surveyed many times throughout the season. Your catch information and fish provide us with important data to help us directly manage the fishery and these interactions with the rangers allow you to provide us with direct feedback.

So where do all of these anglers come from? Based purely upon the survey data collected, local anglers from Turangi and Taupo made up just over one-fifth of all Kiwi anglers who fished Lake Taupo over the summer (**Figure 1**).

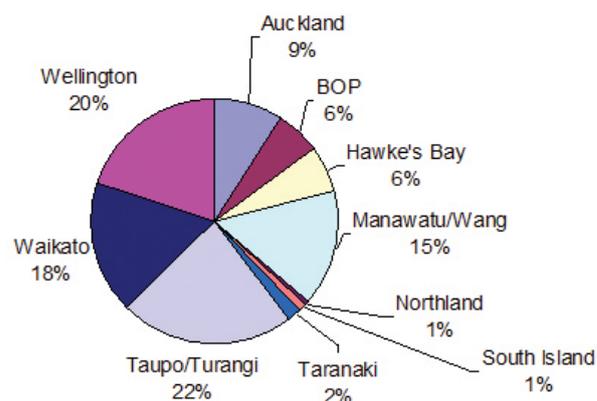
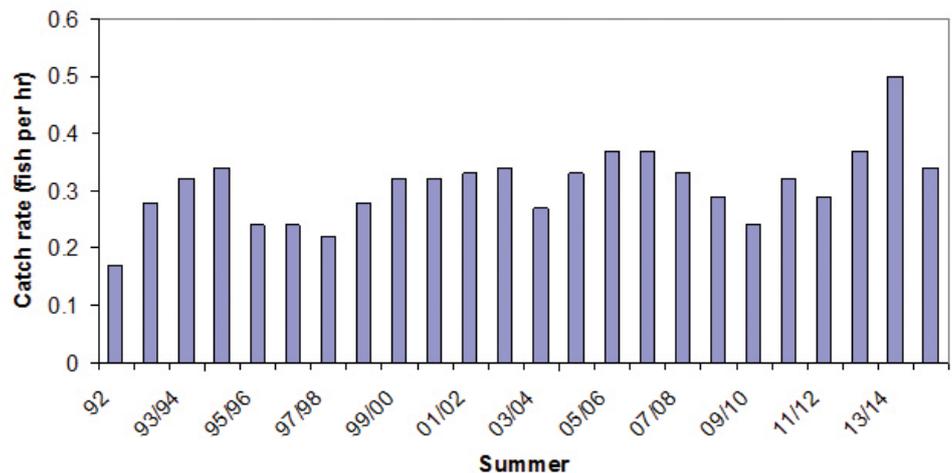


Figure 1. Graph showing where New Zealand-based anglers come from to fish on Lake Taupo during the summer of 2014/15. Those living in Taupo and Turangi were classed as 'local' anglers.

The Taupo Trout Fishery remains a visitor fishery, with Wellington producing the highest percentage of anglers from outside of the local region (20%), followed closely by Waikato (18%) and Manawatu/Wanganui (15%). Auckland was a distant fifth (9%) followed by Hawke's Bay and the Bay of Plenty (6%). Anglers from the South Island as a whole made up just 1% of all Kiwi anglers interviewed. Less than 15 anglers represented Taranaki and Northland combined. Overall, if we include Taupo and Turangi anglers in the Waikato region, the Waikato region accounts for 40% of all New Zealand-resident anglers. A further 23 anglers were also interviewed from overseas with the majority coming from the UK (39%) and Australia (18%).

Figure 2. Summer catch rates for guided and non-guided anglers fishing on Lake Taupo since 1992.



LEFT INSET

Gail Wolf, a successful day out on the great lake.
Photo: Mark Venman



CATCH RATES

Overall, who was more successful this summer; local anglers or anglers from the rest of New Zealand? The old adage 'local knowledge helps you catch more fish' was proven once again with local anglers having a catch rate of 0.44 fish per hour (1 legally-sized trout every 2.25 hours) compared to visiting Kiwis on 0.31 fish per hour (1 legal fish every 3.25 hour).

The overall catch rate for all anglers fishing on Lake Taupo this summer was calculated at 0.34 fish per hour (1 legally-sized trout every 2 hours 56 minutes), based on 667 complete angler interviews where anglers had been fishing for at least 15 minutes. This is down on the peak catch rate of 0.5 fish per hour during the summer of 2013/14, but is similar to summer 2012/13 and just above the 24-year summer average of 0.31 fish per hour (Figure 2).

Catch rates were lower than expected in November at 0.21 fish per hour (1 legally-sized fish every 4.75 hours) before peaking in December at 0.40 fish per hour

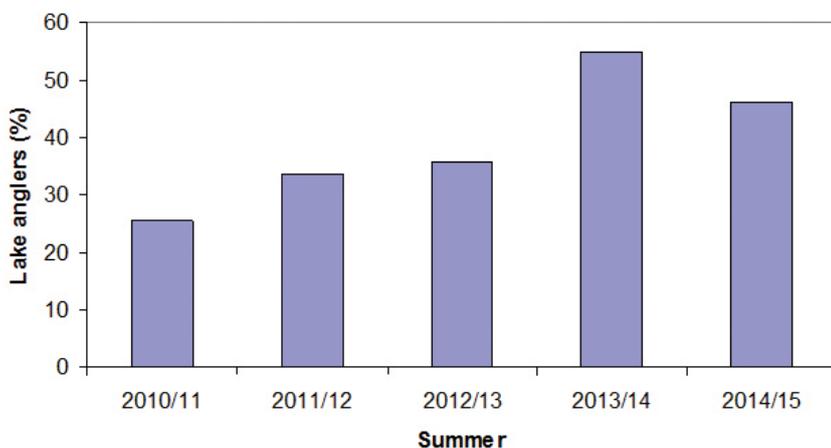


Figure 3. Trend in the popularity of jigging over the last five summers on Lake Taupo.

(1 legally-sized trout every 2.5 hours). After Christmas catch rates remained high, with a slight drop observed during February before picking up again to 0.37 fish per hour during March. This pattern is consistent with recent years.

ANGLING METHODS

Jigging was the preferred method of fishing on Lake Taupo over summer, with 46% of all anglers interviewed using this method, and it continues to be very popular (Figure 3). Over the past decade, jigging's popularity has doubled from about 25% to 50% of all anglers, with a peak of 55% observed during the summer of 2013/14.

Anglers jigging had an estimated catch rate of 0.32 fish per hour (1 legally-sized fish every 3 hours) based on more than 300 interviews. Trolling with 3-10 colours of lead line has remained popular with lake anglers despite more sporting and effective methods (such as downriggers and jigging) being readily available. Just over one-third of anglers interviewed over summer were lead lining, with an overall estimated catch rate of 0.31 fish per hour (1 legally-sized trout every 3.25 hours). Downriggers produced the highest catch rate at 0.51 fish per hour (1 legally-sized trout every 2 hours) but were used by less than 9% of all anglers interviewed. Overall, the use of downriggers has remained relatively constant amongst non-guided angler on the lake since their introduction 20 years ago. Shallow trolling or 'harling' accounted for only 7.5% while deep trolling with wire lines accounted for less than 1% of anglers surveyed.

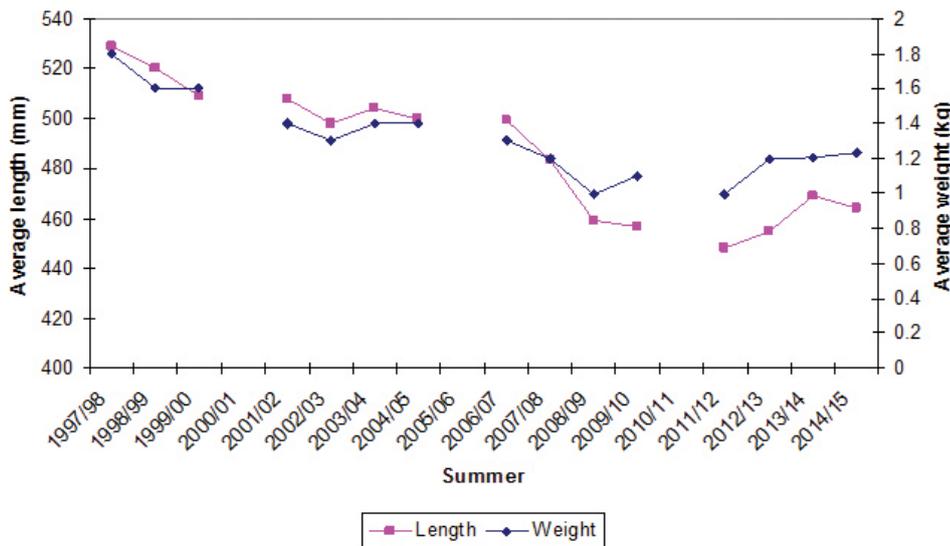


Figure 4. Average lengths and weights of rainbow trout caught in Lake Taupo by anglers since the summer of 1997/98, where data is available.

FISH CAUGHT

A total of 293 legally-sized rainbow trout were measured by staff over summer as part of the licence check and angler survey process. Four undersized rainbows were also measured, one as small as 370 mm. Anglers are reminded of the need to take care when measuring trout caught on the lake to ensure that they are legally-sized to avoid unnecessary paperwork, fines, and the risk of losing both their fish and their fishing gear.

Overall, the rainbows kept by anglers averaged 464 mm and 1.2 kg with an overall condition factor of 44.2 (Figure 4).

The heaviest rainbow measured over summer was a jack measuring 590 mm and weighing an impressive 3 kg (6.6 lb) with a condition factor of 53. Another jack of the same length (weighing 2.8 kg) was also measured by staff, with both of these notable fish coming from the northern end of Lake Taupo. The winning male rainbow trout in the local Taupo Fishing Club competition in March measured 585 mm and weighed 2.97 kg, with a condition factor of 53. The heaviest rainbow trout from the southern end of the lake was yet another jack, measuring 565 mm and weighing 2.5 kg with a condition factor of 50. This particular fish was caught jigging near Motutere point on the eastern side of the lake.

The heaviest rainbow hen checked by staff measured 560 mm and weighed 2.26 kg (5 lb). Figure 5 shows the length distributions of male and female rainbow trout kept by anglers; it is noticeable that more larger males than females were kept this summer according to the survey data.

A total of five brown trout were also weighed and measured during the summer surveys, averaging 592 mm and 2.8 kg with an average condition factor of 47.3. The heaviest brown measured was a jack measuring 630 mm

and 3.4 kg (7.5 lb) with a condition of 50 from the northern end of the lake.

Overall, anglers chose to keep 59% of all of the trout that were recorded during the scheduled angler surveys this summer. They returned 17% of legal size and 24% that were under the legal limit of 400 mm. Of the legal fish landed, anglers chose to kill 77%, which is higher than the 64% recorded during summer 2013/14 but down slightly on the 80% recorded during summer 2012/13. With anglers choosing to keep three out of every four legally-sized fish that were caught this summer, it would indicate that the trout were in very good condition for the table.

ANGLER SATISFACTION

Given the positive feedback from anglers this summer on the general state of the Taupo fishery, it was encouraging to see this reflected in this summer's angler satisfaction scores. Overall anglers rated the trout they were catching at 7 out of 10, which is on par with last summer.

Anglers were also asked their satisfaction with their catch rate, and rated it at 6.3 out of 10 this summer. This is down slightly on the 6.9 out of 10 calculated for the summer of 2013/14 but reflects the peak in catch rate observed that summer. Anglers were also asked to rate their angling enjoyment, and rated it at 9.5 out of 10, on par with the previous summer and joint highest of the last nine summers.

Anglers were finally asked if anything spoiled their fishing experience while out on Lake Taupo. Two-thirds (67%) of anglers couldn't cite anything that spoiled their lake fishing experience over summer. Others mentioned jet skiers and water skiers (8.2%), bad boating manners and poor etiquette (6.8%) as the main detractors, followed by fishing

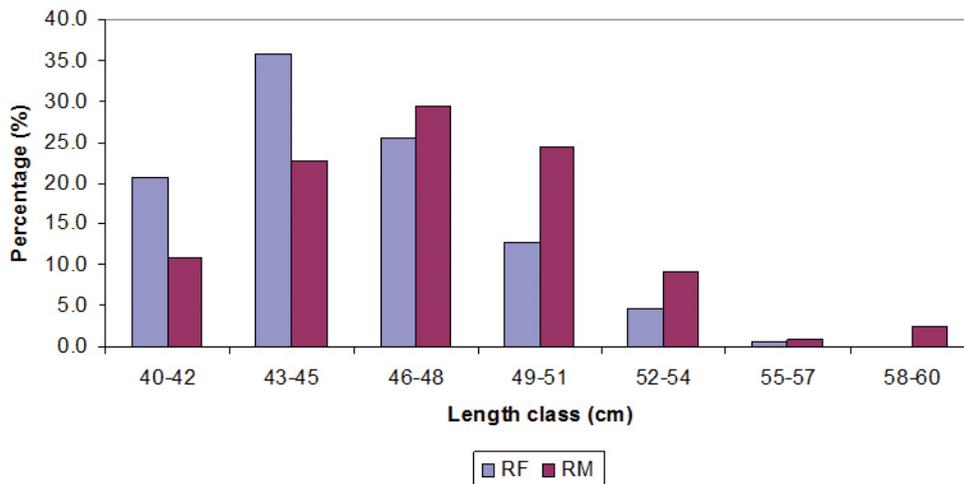


Figure 5. Length distributions of rainbow trout kept by anglers during the summer of 2014/15

regulations (2.3%), overcrowding (2.2%), and weed (2.2%). Not surprisingly, 'weather' was a detraction for just one angler – perhaps it was too hot out there on the lake this summer!

SUMMARY

A summer of perfect boating weather and some very nice fish made for a lot of happy anglers. Although the average length and weight of the rainbows is not quite where we would like, based on historical data the young maiden fish that were maturing over summer have done well and are in very good condition for their size. It was encouraging to see some very large rainbows amongst anglers' catches that were not only long and heavy but also in great condition.

The early runs of spawning trout have already begun with some nice rainbows already being caught at the Tongariro Delta. Time will tell, but we could be in for a good run of trout this winter with some very nice fish amongst them! 🐟



ABOVE
Angler Steve Dickinson caught this great fish at the Tokaanu hole during the summer. Photo: John Morgan

PROTECT OUR WATERWAYS

www.biosecurity.govt.nz/cleaning



ONE LINE VERSION!
COME TO TURANGI, WHERE
YOU CAN GET YOUR HANDS
ON A BIG OLD TROUT! :)

FOREVER AN OPTIMIST

By Vinny Maitland, / DOC Volunteer

During a chance conversation with a DOC ranger on the Abel Tasman Track in December 2012, I discovered that DOC has a volunteer programme. At that time I was travelling around New Zealand as part of a round-the-world trip and thinking of staying for six weeks. A few days later I was signed up as a DOC volunteer at the Tongariro National Trout Centre (TNTC) for four months.

I started at TNTC a couple of weeks later – and quickly realised what a fantastic place it was. The commitment of the fisheries rangers and TNTC staff really opened my eyes to conservation issues, not only in New Zealand but worldwide. I can't stress enough the sphere of influence that the DOC volunteers programme has in educating and empowering people of all nationalities to get involved in conservation for life.

I've always fished since being a kid but growing up around Manchester I had never really tried fly-fishing. Once I was settled in at the centre I decided to give it a go. Where better than the mighty Tongariro? A river that's as big and beautiful as its inhabitants. Fly-fishing is a tricky business to say the least, but with great encouragement and advice from the anglers and rangers at the centre, I started to get the hang of it and managed to start catching those legendary New Zealand trout.

At the end of my time I was a confirmed fly fisherman for life and I had already signed up for another six months the following year. When the time came I couldn't wait to get back, get involved with the fishery again and keep honing the fly-fishing skills I'd learned last year. I had a fantastic summer, teaching kids fly-fishing on the kid's pond. When I wasn't working I could usually be found out on the river somewhere, annoying the trout population with a fly.

One fine summer's morning in February, a quick hour before work turned out to be my greatest day's fishing. I was lucky enough to catch a monster brown trout. With a fair amount of luck and some timely advice from a fisheries ranger about landing big brownies, I managed to net a 7.2 kg beauty. It soon became clear that it was an extraordinary specimen, both in size and condition. I'm pretty sure I won't ever catch another one like it but being a fisherman makes me an optimist by nature. There's always a chance its big brother is out there, just waiting for me or you to come along!

I'd recommend anyone to get involved in the DOC volunteers programme, and if you've never tried fly-fishing to give it a go. You will find yourself immersed in the natural beauty of the Taupo area – and who knows what you might catch! 🐟



MORE FISH... MORE CATCH FOR ALL?

There is an adage that 10% of anglers are catching 90% of the fish. The question is why?

By Michel Dedual / Fishery Science Advisor

It's reasonable to expect that fish abundance or scarcity is at the heart of catch inequality in sport fisheries: the idea being when there are more fish around more people (including less skilled anglers) are likely to catch them, and so catch inequality is reduced.

However, it is not easy to get direct accurate estimations of fish abundance, so the Catch Per Unit Effort (CPUE) the number of fish caught per hour per angler, is often used to indicate fish abundance.



LEFT

Newcomers to the sport of fly-fishing, Johan and Sam enjoying the view.

Photo: Amelia Willis

change only slightly, when fish abundance decreases or increases. We call this phenomenon 'hyperstability'.

WHY IS THIS IMPORTANT?

CPUE data are often used to indicate the pulse of the fishery; e.g. if the CPUE goes up or doesn't change it can be wrongly concluded that the fishery is in good health – and this conclusion can have dire consequences. This is famously illustrated by the collapse of the commercial cod fishery in the Northern Atlantic. In his highly-recommended book *Cod* (ISBN 978-0-099-26870-3) Mark Kurlansky explains that for decades fishermen and fishery officials believed that the cod population was so abundant that fishermen would never seriously threaten the fish population.

The increasing exploitation of cod was accompanied by improvement in fishing technology: nets were getting larger, boats bigger, and sonar more capable. Under this increasingly efficient onslaught, the cod CPUE didn't show any marked declines as the dwindling cod population was offset by technological improvements. In the absence of signs that CPUE was declining, it was deemed that 'she'll be right'. But when eventually CPUE started to drop it was too late – and in July 1992 the fishery for the northern cod stock was closed, putting 30,000 fishermen out of work. The cod population hasn't yet recovered, the fishery is still closed and the most pessimistic forecast is that the cod stocks will never recover. Many of the remaining cod fishermen along the Canadian coast have now turned into shrimp (the main food of cod) fishermen.

HYPERSTABILITY IN TONGARIRO?

Hyperstability in CPUE has also been reported in sport fisheries where anglers target fish congregations, particularly during spawning. Targeting the high concentrations of fish that occur in such gatherings provides the best opportunities for anglers to catch many fish, and thus improve their catch rate. It's possible this is happening in Tongariro River where trout congregate during their spawning migration, increasing their vulnerability. A typical example is the HW1 Bridge Pool where fish are particularly vulnerable, especially during low-flow conditions.

CPUE for Tongariro River has been monitored since 1948 and spawning fish abundances (runs) in diverse tributaries ►

Previous research has suggested that when CPUE declines catch inequality will increase because unskilled anglers are more affected when CPUE is low – allegedly because fewer fish are available. However, there are serious pitfalls and extreme caution is needed when interpreting CPUE data.

CPUE does **not** always reflect fish abundance, because of the complex relationship between these two factors. In extreme cases CPUE may even remain unchanged, or

since the early 1960s. These historical datasets are invaluable because they allow us to explore the variations in CPUE and catch inequality for rainbow trout, and to explain the relationships between CPUE, catch inequality and fish abundance.

More importantly, it's an opportunity to investigate whether hyperstability is prevalent in Tongariro River, which has important implications for management of the fishery.

DATA CRUNCHING

We used the data from angling surveys collected along the Tongariro River. CPUE was calculated as the number of legally-sized fish caught (kept and released) per angler, per hour of fishing. As we don't know the exact number of fish present in the river at any point in time, we instead used the data from the trapping program established in 1998 in the Waipa Stream to index the abundance of trout available in the river.

We also used the total number of fishing licences sold in Taupo to explore if the trend in licence sale is affecting CPUE and/or inequality. To measure catch inequality we applied an analysis that is routinely used in socio-economic studies to measure gaps between rich and poor. In our analysis the rich were the very successful anglers achieving high catch rate and the poor were the least successful.



The extent of inequality ranges from 0 to 1, where 0 indicates perfect equality (10% of anglers are catching 10% of the fish, 30% are catching 30% of the fish, etc.) and 1 indicates total inequality (0% are catching 100%).

The analysis indicated that for the Tongariro Trout Fishery between 1985 and 2013:

- the level of catch inequality declined (**Figure 1**)
- the average CPUE increased
- the total licence sale declined
- the number of fish available to anglers declined (**Figure 2**).

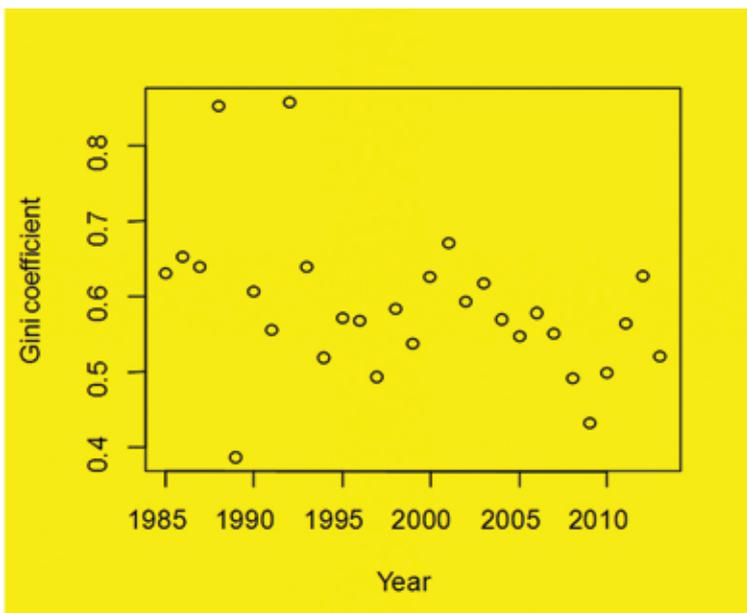


Figure 1: Levels of inequality represented by the value of the Gini coefficient in the catch distribution of rainbow trout in the Tongariro River between 1985 and 2013.

DECLINE IN CATCH INEQUALITY

The decline in inequality was interesting because we expected the contrary, i.e. that an overall decline in fish abundance would be matched with an increase in inequality. This could be explained by improvements in angling technology and/or a change in angler demographics.

Since 1985 there has been an overall increase in fishing efficiency from improvements in materials and legalisation of new types of fishing tackle that make fishing easier, which improves unskilled anglers' success rate. However, such changes are just as likely to improve the success of skilled anglers as well.

Trends in fishing licence sales give interesting insights. Our results indicate that when licence sale increases so does catch inequality; in other words when there are more anglers catch inequality increases.



Highway 1 Bridge Pool is a popular spot on the Tongariro River
 Photo: Catalina Amaya-Perilla

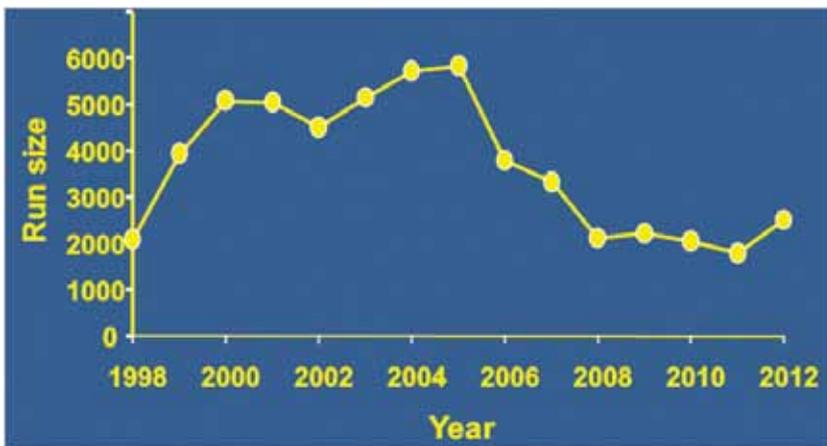


Figure 2: Spawning run monitored in the Waipa Stream and used as an index of overall abundance of fish in the Tongariro River.

The contrary is also true, when there are fewer anglers catch distributions are more equal. Therefore, the Smith hypothesis that *when population and technological growth occur and resources are scarce, greater relative inequality is the result* may not hold for every fishery. Fish abundance would have no impact on catch inequality if skilled and unskilled anglers increase or decrease their success at the same rate. However, if skilled anglers become disproportionately more successful than unskilled anglers, then we would see inequality increasing.

Licence sales were also negatively related to the CPUE, indicating that when sales go up, CPUE drops and vice-versa. So the **type** of angler leaving the fishery (reduced licence sale) is having an effect on both the CPUE and the inequality. The declining trend in licence sales seen between 1986 and 2013 is primarily driven by a sharp decline in the number of short-term (24-hour) licences sold. These are mainly sold to visiting anglers who are not familiar with the local waterways and, consequently, are

less likely to be successful. The recent world economic downturn has reduced the numbers of visiting anglers (as reported by local hoteliers and tackle shop retailers). Many people now, when deciding how to spend their discretionary money, have given up trout fishing for other more-accessible leisure activities.

The increase in CPUE, together with the decline in participation, supports the hypothesis that when unskilled (short-term licence holders) anglers are the first to abandon fisheries, a higher proportion of experienced (season licence holders) anglers will remain. Therefore, any change in the number or proportion of unsuccessful anglers will affect the level of inequality and the CPUE.

This means that if we (as managers) aim to reduce catch inequality we have few effective actions available. Taupo fishery is an open-access fishing meaning that anybody (skilful or not) can legally fish; we cannot control which type of angler is leaving or joining the fishery. ►

The lack of a strong relationship between CPUE and fish abundance demonstrated for the Tongariro River indicates that when hyperstability occurs, CPUE is a poor index of real fish abundance and should not be used as a barometer of the fishery's health.

The increase in average CPUE seen since 1985 can also be explained by this. The decline in unskilled/visiting anglers (reflected by the decline in the short term licence holders) leads to a higher proportion of local experienced anglers achieving higher CPUE.

The important lesson is that it may be misleading to interpret a decline in catch inequality and an increase in CPUE as signs of good health of the fishery without having any information on the type of the anglers who are visiting the fishery.

WHAT DOES THIS MEAN?

From a management point of view the most significant result of this work is that between 1998 and 2013 fish abundance had very little effect on CPUE (**Figure 3**) on a yearly basis or on a monthly basis (**Figure 4**); even when the index of fish abundance was changing by a factor of 4. This strongly suggests that some hyperstability in CPUE occurs in the Tongariro River. The exact mechanisms driving hyperstability in wild trout fisheries are not well understood but we know now that CPUE can increase – not because there are more fish but because there are fewer unskilled anglers. This means that the pattern of participation in angling can lead to hyperstability.

Anglers can now easily and quickly communicate with each other. The numbers and distribution of anglers on the Tongariro are routinely assessed using our aerial surveys. Counts are carried out on three flights. The first (in the morning) generally shows that anglers are widely spread along the river. Later flights show that if fishing is good anglers tend to remain spread out; however, if anglers are unsuccessful they tend to congregate where others have been more successful. This suggests that communication between them leads 'hot spots' where fishing pressure is concentrated, allowing anglers to maintain high CPUEs.

The lack of a strong relationship between CPUE and fish abundance demonstrated for the Tongariro River indicates that when hyperstability occurs, CPUE is a poor index of real fish abundance and should not be used as a barometer of the fishery's health.

The most common remedy proposed by anglers to improve their CPUE is to supplement the fish population by liberating hatchery fish. If the main or only goal of fishery management is to satisfy anglers by increasing CPUE, then this analysis suggests this is likely to fail in the Tongariro as CPUE is only marginally related to fish abundance. During this study, changes by a factor of 3 in the index of fish abundance did not result in any substantial increase in CPUE. In fact, our findings also indicate that increasing the population may have the opposite effect, because skilled anglers will be disproportionately advantaged.

Providing more fishing opportunities by allowing new fishing methods or limiting daily bag limits to protect the resource, will probably not result in detectable changes either, but may exacerbate inequality.

Fishery management rules apply equally to both skilled and unskilled/visiting anglers, but contribute to catch inequality because of skilled anglers' greater innate efficiency and because very few anglers catch their bag limit.

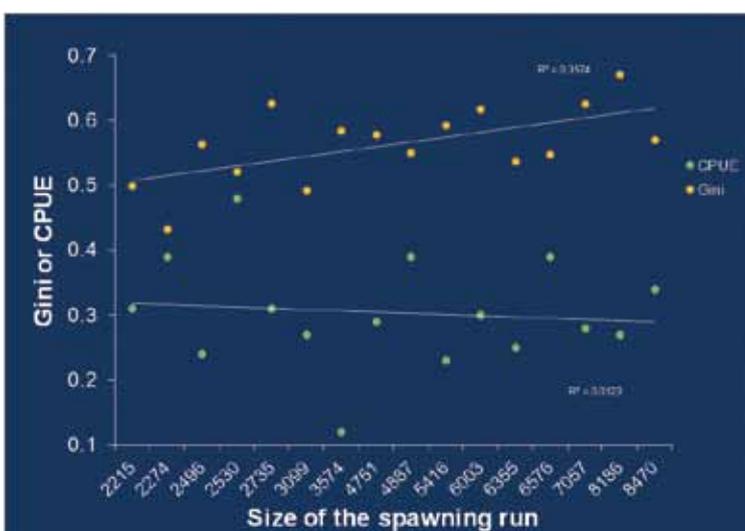


Figure 3: Relationships between the abundance of fish indexed by the size of the spawning run in the Waipa Stream and the level of inequality in the catch distribution (Gini) and the angler's success (CPUE).



The objectives when managing recreational fisheries are primarily to sustain or improve the quality of fishing so that anglers remain satisfied, and to sustain the fish population. Anglers can be satisfied for several reasons, but maintaining or increasing CPUE generally maintains or increases satisfaction. Therefore, if we assume that CPUE is an important measure of the fishing quality, then we can conclude that average fishing quality has improved between 1985 and 2014. 🐟

ABOVE
Tongariro River is an internationally renowned wild trout fishery.
Photo: Catalina Amaya-Perilla

INSET
An angler shares his success on the Tongariro River.
Photo: Catalina Amaya-Perilla

Your contribution: *I would like to thank the anglers who have been interviewed, sometimes more than once, and kindly paused for a few moments to provide data and feedback on their fishing. Without their input we simply wouldn't be able to improve our understanding of how this iconic fishery functions.*

This article is a summary of an article published in the journal *Fisheries Management and Ecology*: Long term trends in the catch characteristics of rainbow trout *Oncorhynchus mykiss*, in a self-sustained recreational fishery, Tongariro River, New Zealand, written by Michel Dedual and Rohan Maheswaran.

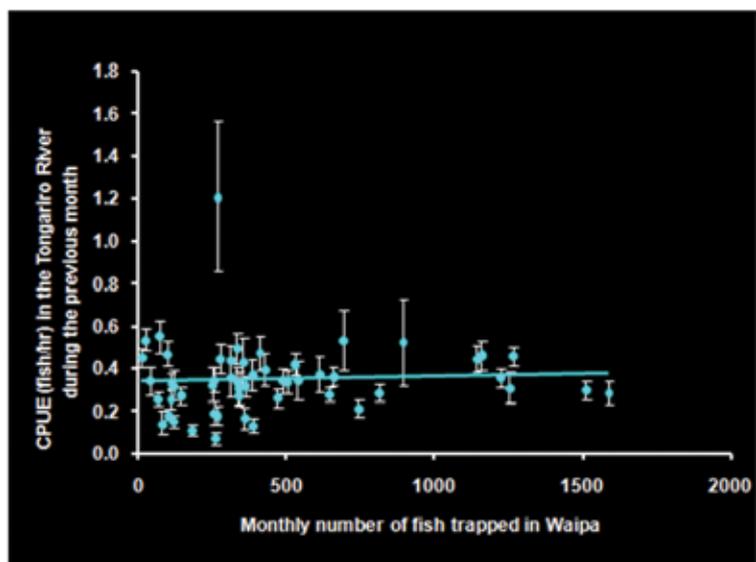


Figure 4: Spawning run monitored in the Waipa Stream and used as an index of overall abundance of fish in the Tongariro River.



Tongariro National Trout Centre is a popular visitor destination.
Photo: Tongariro National Trout Centre

REFLECTIONS AT TNTC

By Randal Hart / Fishery Ranger



After my retirement from the aviation industry I was offered the opportunity to be a Department of Conservation (DOC) ranger responsible for day-to-day operations at Tongariro National Trout Centre (TNTC). This was the start of an interesting and rewarding 'twilight career'. As I am about to retire from this twilight career I would like to reflect on some of the great things that have happened at the TNTC site during my time.

Very early on the Tongariro National Trout Centre Society (TNTCS) decided to expand its museum so existing displays could be enhanced and diversified. The extension also included new toilets and a play area for children to give the parents a welcome break while trying to look at all the displays. During this extension a new entry pathway was



LEFT
Marking juvenile trout for the Early Spawning project, Michel Dedual (left) and Randal Hart
Photo: Kim Turia

BELOW
Randal Hart played a large part in the success of the Genesis Energy Freshwater Aquarium.
Photo: Randal Hart

BOTTOM LEFT
Ranger Randal, a familiar face at TNTC.
Photo: supplied



The look on the project manager’s face was priceless as he walked away muttering “we may have a problem here”.

added; visitors now enter the site over the weir of the Waihukahuka steam, in an area where large wild trout are regularly seen. The sight of these trout is a great introduction to the site.

Shortly after the TNTCS museum extension was completed a long-awaited project to add a freshwater aquarium to the site was started. This was a vision held by DOC and TNTCS members for many years and its purpose is to display native and introduced species of freshwater fish that are not normally seen by the public. Shortly after the aquarium build began, the project manager asked me if I had cared for an aquarium before. My short answer was

“yes, when I was a kid and all the fish died”. The look on the project manager’s face was priceless as he walked away muttering “we may have a problem here”.

The aquarium build was a real challenge as most of it was done during the winter period, which presented a lot of weather and temperature-related problems. Necessity is a great inventor and it was interesting to see how the many problems were solved. In due course the aquarium tanks were prepared, staff trained and the fish introduced. Then the fun started. It has been a rewarding, sometimes frustrating, challenge learning all about the habits of freshwater fish and the tricks needed to make them display well. ►



LEFT
Organised 'Kids fish out' days are hugely popular.
Photo: Tongariro National Trout Centre

INSET
The River Walk Visitor Centre provides an in-depth history of the Taupo Fishery.
Photo: Tongariro National Trout Centre

TNTC was now becoming a freshwater advocacy site, enhanced by the recent addition of the whio/blue duck enclosures (see p16), which teach whio how to swim and feed in rapids and give them space to learn to fly properly. Modelling the water flow in the enclosures was a real challenge as there was only one chance to get it right due to the nature of the enclosures' design. The outcome was very successful and it has been rewarding to see the whio learning new tricks for survival in the wild.

Throughout my time at TNTC, the education programme for school groups, Taupo for Tomorrow, which aims to inspire the future guardians of our fishery and freshwater environment has gone from strength to strength through the efforts of the DOC educators, and various partners such as TNTCS, its volunteers and Genesis Energy. The education program has extended its learning horizons with the addition of the aquarium and whio enclosure, and now offers our younger generation many levels of learning opportunities and experiences. Participants in the education program come from all areas of the North Island and there are many school groups who come on a regular basis. This reflects the development of TNTC over the years and its value for educating our Future Guardians of Our Environment.

Another project I was involved in was Waihukahuka fish trap upgrades. The fish trap required repairs and as a part of this, we decided to relocate to an area by the fish 'stripping pens', adjacent to the hatchery building. This

new trap location has proved to be very popular with visitors as they can see the ranger of the day weighing and measuring trout who have progressed up stream for spawning.

There have been many other smaller enhancements around the site – such as a smoke-house facility for the public fish-out days; additional seating and access for visitors; upgrading of pathways and safety barriers around the large in-ground fish raceways; improvements to the golf cart used by site rangers; upgrade of the fish tanker for moving fish around the site; upgrade of the main hatchery water supply line; planting of increased areas of native vegetation; and some new interpretation in the hatchery.

In addition to the very popular public fishing days, TNTCS has hosted many events such as fly tying and fishing sessions for the Junior Anglers Club, advanced fly tying for anglers, fly tying for women, Police Blue Light fishing days, and the Taupo Hot Rod club day in Turangi. TNTCS also supports the Casting for Recovery program, a unique program whose mission is to enhance the quality of life of women with breast cancer through events, activities and workshops that combine breast cancer education and peer support with the therapeutic sport of fly-fishing.

It has been a challenging but rewarding time working with DOC, where my role has changed over time to include many interesting and diverse activities related to the Taupo Trout Fishery. I will always have a soft spot for TNTC. I am often asked what my best memory is from working with DOC. My answer is always “seeing the gleeful face of a child who has just caught their first trout from the fish-out pond”. That memory is **priceless**.

In closing, make time to visit TNTC – it is a very special place. Remember to Check, Clean, Dry your gear and tight lines when you go fishing. 🐟



Protect FRESHWATER



REMEMBER TO
'CHECK, CLEAN, DRY'

ABOVE
The CCD team attends many district events.
Photo: Amelia Willis

By Brenda Lawson / Partnerships Ranger-Freshwater Threats

Protecting New Zealand's amazing water has been in the spotlight this year. Coverage on TV, Radio and newspapers has been high, and many working and advocacy groups have been created. Politicians, business groups, farmers, environmental groups and communities are all talking about water pollution from runoff, the effects of damming, habitat loss, native species survival, weed removal, nitrogen levels, and whether rivers are safe for swimming.

Looking after our waterways can seem to be in the too-hard basket – what can we do as individuals? One thing we can do is use 'Check, Clean, Dry' (CCD) methods to make

sure we are not carrying invasive hitchhikers as we move around waterways. DOC presence at events is a great way for us to get the CCD message to many water-loving individuals in one hit!

SPORTING EVENTS

Sporting events in the area have increased over the last year, and so has their support of the CCD campaign. Competitors from all around the country and overseas enjoy our district for the unique opportunity to play and race in our awesome environment. Advocacy at sporting ▶

RIGHT

CCD staff cleaning gear, bikes and the odd rider at the T42 mountain bike event.
Photo: Amelia Willis

FAR RIGHT

Brenda Lawson discusses the importance of Check, Clean, Dry.
Photo: Amelia Willis

BOTTOM

Kuratau Trail Ride supporting the message.
Photo: Brenda Lawson

events is one great way to get the CCD message to large numbers. For events on water (or with waterway crossings) it is particularly important to include CCD so that there is no risk of invasive threats like hornwort and didymo being transferred.

Events this year included water sports such as trail riding, rafting, waka ama, rowing, waterskiing, jet skiing, hunting, mountain biking, trail running, as well as the more obvious ones such as fishing and kayaking. We want to make sure all competitors can arrive to play here and return home to their own beautiful areas without carrying invasive hitchhikers with them.

Event organisers appreciate the amazing spaces we have: they understand how they can make a difference in an environmentally-responsible way and add value to their event. Using their websites and pre-event emails to send out CCD information and requesting competitors to CCD their own equipment is a very important part of the process. We know we have succeeded when a competitor turns up to race saying that they have read the CCD information, that their equipment is clean and dry, and that they always do this!

CCD advocates at events have good conversations with each competitor on how they can best protect this place with good CCD habits. We also establish if they have recently been through any other streams or rivers, and decontaminate them if necessary. We rely on the honesty of competitors, and appeal to their sense of keeping these amazing places unspoiled. We aim to inspire competitors to choose to protect New Zealand's waterways themselves, and to pass the message to others.

At events such as Taupo Ironman and Half Ironman we have maintained a strong CCD presence over the years. At Ironman most of the competitors are from overseas or other parts of the country, so the potential for invasive threat transfer is very high. For this reason Ngāti Tūwharetoa requests that all wetsuits are 'dipped' (washed). It's a big day dipping and talking to 1,500 athletes; making it fun is really important as we don't want CCD to detract from competitors' Ironman experience.



EVENTS IN TONGARIRO

Events such as The Goat, The Tussock Traverse and T42 mountain bike and off-road marathon take place in Tongariro National Park and Tongariro Forest Park. These events cross the headwaters of the Whanganui – home to our amazing native blue duck, the whio. Since 2008 the DOC and Horizons Regional Council Check Clean Dry advocate teams have had cleaning stations at these sporting events, with loads of support.

Jason Cameron and Luke Garea from Victory Events hold The Goat and the Tussock Traverse mountain running events. Jason's aim was to get people to Tongariro National Park to enjoy its beauty. His support has gone above and beyond the DOC concession requirements that





Check Clean Dry be adhered to during events that cross waterways in the national park.

The T42 mountain bike and off-road marathon event is organised by Aaron Carter and Dave Franks from Total Sport. Aaron says: "I think you guys do a great job. Not only are the people who deliver the CCD messages cool and super positive, the presence of you and your team create an extra benefit at our events, and add legitimacy around what we do and the events we put on."

Project Tongariro are partners in these events with Victory Sports and Total Sport. Further collaborative partners working in Central Plateau Check Clean Dry messaging are Ngāti Tūwharetoa, Genesis Energy, and the Waikato Regional Council. Events like these are important tools to raising the profile of conservation in the park.

NEW SIGNS FOR ALL TAUPO BOAT RAMPS

Harbourmaster Philip King supported the addition of signage at all 17 Lake Taupo boat ramps and allowed us to include the CCD message in the redesign of the hugely-popular Taupo Moana boating guide.

Philip says: "Managing nuisance lake weed around many of Lake Taupo's marinas and navigable channels is one of our regular challenges, especially as the brilliant summer of 2015 produced perfect weed-growth conditions. We admire the Department of Conservation's dedication towards keeping our lakes and rivers free from invasive species and wholeheartedly support their endeavours. We implore locals and visitors to Check, Clean, Dry whenever entering a new waterway."

Gordon did a fantastic job getting all the signs up. Here's his post on our Check, Clean, Dry Taupo Facebook page in case you missed it:

20 Signs, 8 screws, 72 blind rivets, about a litre of sweat, 4 complete battery recharges later. Three sunny days of beautiful weather, some great conversations with fantastic people... All the new CCD boat ramp signs are up and about the lake, thanks for those that helped and it was great to chat with those that stopped to take the time. Remember it's our lake, our responsibility.



PROTECTING WHIO FROM DIDYMO

One of the highlights of my year was with DOC Ranger Bubs Smith counting whio on the Upper Whanganui River. Bubs wanted to show me why it is so important to keep didymo out of places like these headwaters. Our treasured native blue duck could be badly affected by didymo: mats of didymo would make in-stream foraging difficult and smother larger invertebrates (like mayfly nymphs) that whio feed on – meaning that whio would use more energy to find less food.

My previous experience of the Whanganui was rowing and kayaking the muddy lower sections towards Wanganui. I had no idea that the headwaters were so pristine. Travelling 18 km by inflatable kayak was exciting, and tough work too. Sneaking quietly past the whio families was tricky: whio parents are very protective and territorial, so pushing them downstream into the next family's territory causes much calamity. Counting them was tricky too as the chicks duck under water and hide behind rocks. By the end of the day, after counting many whio and their chicks, I was absolutely in awe of the amazing work that has been going on in this very special place.

Bubs believes the headwaters of the Whanganui are home to the highest density of whio in the country, and the population is of national importance. Intensive trapping, 1080 application and a well-supported breeding programme are having great results. In just one 4 km stretch of the river there are 28 resident breeding pairs,

Check, clean, dry is easy. It requires only a little forethought and preparation. Please phone DOC's Freshwater Threats team on 027 750 2104 if you need advice, especially about applying the treatment to larger equipment, or would like to promote the Check, Clean, Dry message at your work or an event.

Call the MPI freephone hotline (0800 80 99 66) about any suspected threat sightings.

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and in the next 5 km another 20 pairs. This indicates the quality of those pristine waters, and the crucial need to protect the whole ecosystem that sustains such a healthy population.

Bubs says: "It's vital we keep aquatic pest weeds such as didymo out of these waterways to ensure the existence of such an iconic endemic species."

KEEP VIGILANT

It's 10 years since didymo arrived in a southern New Zealand river. Since then the invasive algae has been spread by wilderness and water-loving adventurers to 184 catchments throughout the South Island. Thankfully, as best as we know, it has not yet crossed the Cook Strait.

The unhelpful rumour that didymo may not survive in North Island waterways is still going around. The Ministry for Primary Industries Incursion Adviser Rosemary Bird reports that Cawthron Institute has grown didymo in water from the Tongariro and 14 other North Island river samples in a laboratory. We also have no scientific evidence to prove it can't grow in the Central Plateau area – so it is important we don't become complacent about protecting our water.

Taupo and the Central Plateau area are still on high alert, and Check, Clean, Dry is the method we ask people to use when moving around our precious waterways to avoid transferring didymo. Our playground – our responsibility. Keep up the good work! 🐟

ONLINE LICENCES UPDATE

By Kim Alexander / Conservation Services Manager

In *Target Taupo #66* we reported on the online fishing licence programme that was being rolled out. Now that we are approaching the first anniversary of the system going live, it's a good time to look at how it's going.

Previously people wishing to buy a licence to fish on Lake Taupo had to use a paper-based system, usually through outdoor recreation agents. This system was costly to administer, labour-intensive, and accessible only during trading hours. It also gave managers poor quality information about our customers, and did not allow for further direct communication from DOC with anglers – as details like email addresses had to be manually entered into a database. After the Taupo Trout Fishery review undertaken in 2013, we decided that the fishery needed to:

- Reduce the labour-intensiveness of the current manual system
- Increase anglers' licence accessibility options (to 24/7 access via the internet)
- Collect better-quality information from anglers so we know who our customers are
- Improve communications with anglers via online media and email
- Produce a licence in a format suited to season anglers
- Improve flexibility by allowing for licensing updates in real time
- Move away from relying heavily on the goodwill and advocacy of agents
- Encourage and improve compliance.

As a result the online licence system had a 'soft' launch in early July 2014, with the public first invited to purchase licences online on 17 July 2014. Agents were brought online in October, with the first online sale by an agent taking place on 20 October 2014. Initially the new online system was run alongside the existing paper-based system. Since 1 December 2014, agents have sold in excess of 10,000 licences online. More than 2,300 licences have also been purchased directly by the public via the online system. Several thousand paper licences were also sold during this period but have now largely been phased out; exceptions are the week- and 24-hour licences, which are still offered to give charter boats a quick and easy means to licence large numbers of people at once.

As is often the case with any new IT system there have been a few teething issues. Early on the system revealed an issue that had been slowing the final transaction of the licence sale. Agents reported a lengthy delay of up to a

minute between finalising the licence details and entering the secure payment portal. This was remedied, and acceptable speeds of 3-4 seconds were reported after testing.

There were also problems for mobile devices due to poor internet service in the region. Transactions were sometimes slow, resulting in system time-outs before completion. This in turn put additional pressure on agents, who have been dealing with people unable to make mobile device purchases. We remedied this by making our system more mobile-friendly, and introduced a new feature that allows for multiple licences to be purchased in one transaction. This has reduced the time taken for agents to sell customers a licence. Some of this may continue to be an issue (eg when the local internet service is heavily loaded during peak season), but we won't know for sure until we hit another peak over Christmas and New Year.

We expect that obtaining email addresses via the online system will provide long-term benefits. For example, it will enable proactive campaigns prior to busy licensing periods, reminding people to get a licence before they leave home – which we hope will help minimise the load on the system by people who buy a licence at the last minute.

The main thing we are happy about is that despite initial technical issues thousands of anglers have successfully secured a fishing licence via the new system, and are out on the region's lakes and rivers enjoying some of the best fishing the district has seen for years. We are confident that over time, as anglers get used to buying a licence from home and our systems improve, purchasing a licence online will be no big deal!

Due to feedback from anglers we will also be printing the annual licence in card form. Anglers told us this would make it easier for them to have a licence on hand when our rangers come checking, so we are more than happy to accommodate that! New season licence purchasers will receive a card in the mail after they make an online purchase. 



To buy your licence visit www.doc.govt.nz/fishtaupo.

COMPLIANCE MATTERS

By Annette Richards / Fishery Ranger, Conservation Services

Fishery rangers have turned their attention to the many rivers and streams feeding Lake Taupo (Taupomoana). Spawning runs have started and we have been encouraged by the good numbers of spawning trout entering most rivers during autumn.

However, the river fishing has not started so well from a compliance perspective; since 1 April 2015, 15 fly-fishermen have been caught fishing without a licence on the Waitahanui, Tauranga Taupo, Hinemaiaia, and Tongariro rivers.

This is a concerning trend. With the rangers out most days over busy public holidays, weekends and evenings the risk of getting caught fishing without a licence is very high.

Table 1 shows the breakdown of offences detected by staff since 1 July 2014.

Although anglers view poaching as something involving gillnets or spears, regulation infringements can also increase the overall harvest and affect the number of trout available to other anglers. Fishing outside permitted hours, fishing in prohibited waters, keeping more than three fish, and keeping undersized fish are particular concerns.

Type of offence	Number of offences detected
No licence	45
Fishing with bait	11
Using illegal gear	7
Fishing in prohibited waters	10
Possession of undersized trout	8
Using two rods	3
Obstruction	1
Fishing within 300m of river mouth	2
Providing false details	1
Falsifying licence information	3
Failed to provide name and address	1

Note: Some offenders had more than one offence

Table 1. Offences detected across the Taupo Trout Fishery since 1 July 2014.

MAIN

2014/15 season has been busy for compliance related issues.

Photo: Mark Venman





Table 2 shows the outcome of being caught. Most first-time offenders are offered diversion (dealt with out of court), but conditions apply for eligibility and fines are often levied. As you can see from the stats, DOC has also prosecuted 15 offenders who were ineligible for diversion. With serious poaching of spawning trout now carrying penalties of imprisonment, as highlighted by a recent case in Rotorua, the Fishery rangers will also be out patrolling the upper reaches of the rivers this winter to help protect the spawning trout for generations to come.

As evidenced further, **Figure 1** shows that the Taupo fishery has completed one-quarter of the total nationwide DOC prosecutions for the latter half of 2014. From a regional perspective the Taupo fishery has completed the most prosecutions from the Central North Island region alone. With several new fishery cases due in court mid September 2015, it will be interesting to see how the Fishery team compares nationally next quarter.

On a lighter note, rangers are currently accepting electronic licences on smart phones and tablets while out checking in the field. These licences do not need to be signed; please just carry some form of identification for verification purposes until licence cards are issued.

It is also timely to remind all anglers of the requirement to use natural or synthetic yarn indicators in fly fishing-only waters. Bubble floats, indicator putty, foam indicators and 'thingamabobber'-style indicators are not legal in the fly-only waters of Taupo.

Finally, as always, if you see anything 'fishy' out there call the DOC Duty Officer on **027 290 7758**. Your prompt calls are important and help us to catch offenders in the act of fishing illegally. Vehicle descriptions and registration numbers are very useful, as is a general description of the offenders themselves. Given the sheer size of the Taupo Fishing District, the Fishery rangers cannot be everywhere all of the time - so please help us collectively guard the fishery for future anglers by reporting people that are not abiding by the rules and regulations. 🐟

ABOVE LEFT
Fishery Ranger Pete Wilton surveys anglers on the Tongariro River.
Photo: Amelia Willis

ABOVE RIGHT
Keeping undersize fish is of particular concern; always carry an accurate measuring tool or ruler.
Photo: Mark Venman

Outcome	Number of offenders
No action	0
Warning letter	7
Prosecution – Diversion	26
Prosecution	15
Still pending resolution	11

Table 2. Outcomes for offenders during the 2014/15 fishing season

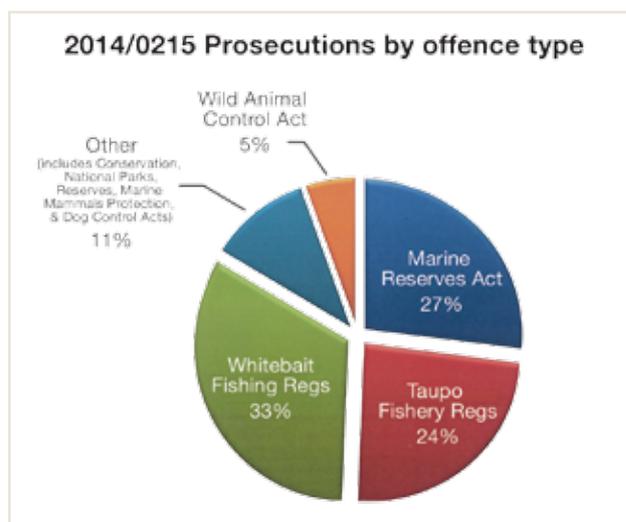


Figure 1. DOC prosecutions by offence type during the 2014/15 season



ANNETTE RICHARDS
FISHERY RANGER

New face to the Taupo Fishery

Ko Annette Karin Richards tōku ingoa
No Tāmaki-makau-rau, ahau
Ko Ingarihi, Airihi me Tiamana ngā iwi
He kaimahi ahau mō Te Papa Atawhai

I have moved from Auckland to Turangi, to be closer to my partner, based in Wellington, and to the mountains, backcountry, rivers and lakes that I love.

I'm not your average Jafa - I'm a qualified horticulturist and business manager. As well as parks, sport and recreation and I also have a farming background in poultry, sheep and beef. As an operational project manager and contract manager, I delivered large scale parks, tree, and natural built open spaces maintenance services to Central Auckland, Great Barrier and Waiheke islands, as well as technical advice to seven local boards and many internal and external customers.

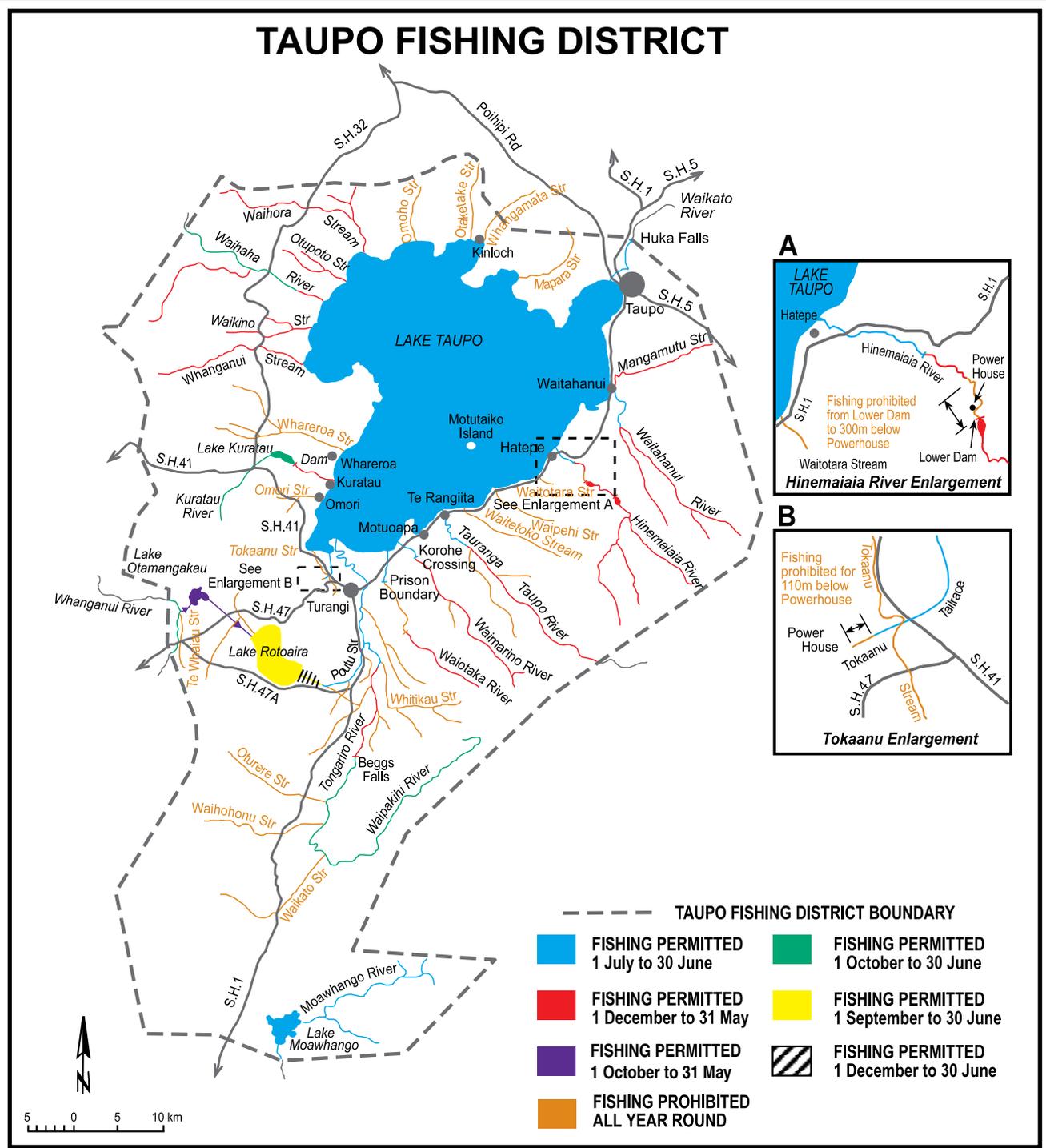
After a life-changing trek in the Himalayas last year my priorities have shifted beyond the mere management of land for people and animals. There I discovered a rich and diverse mix of cultures living side by side, with an amazing range of beliefs, needs and stories to share. It's one of the most awesome landscapes on earth.

I also discovered native forests decimated for firewood and housing, cities, and mighty rivers lined with plastic bottles and contaminated by rubbish and human waste - the result of a lack of education, care, wealth, infrastructure and global tourism.

I was humbled by the people I met trying to make a difference amongst the chaos, helping others and looking for a better life for themselves and their families and finding just that. It is because of their example that I now see things through very different eyes, and believe in the importance of kaitiakitanga in my own (new) backyard.

We don't know how lucky we are in NZ, how pristine our environment is, how easy access is for us. We can still drink from some of our rivers and not get sick. We can easily harvest fish for dinner tonight. We rarely see piles of rubbish in our streets or lining our waterways. My mission is that we keep it that way for generations to come.

TAUPO FISHING DISTRICT MAP



PROTECT OUR LAKES & RIVERS



OUR PLAYGROUND, OUR RESPONSIBILITY

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