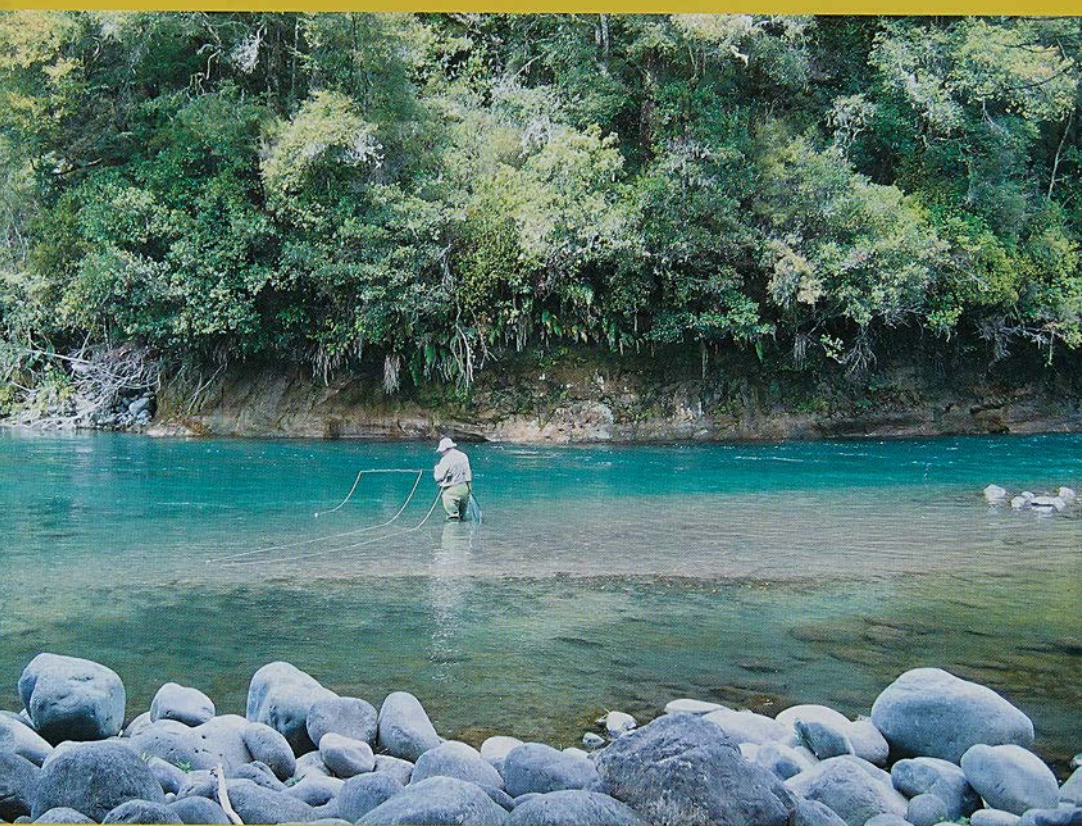


OUR **50th** ISSUE!

TARGET TAUPO

A newsletter for Taupo Anglers

NOVEMBER 2005, ISSUE 50



Department of Conservation
Te Papa Atawhai

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Model	Length	Line	Pieces
8554	8'6"	5	4
9053	9'0"	5	3
8564	8'6"	6	4
906	9'0"	6	2
9064	9'0"	6	4
9073	9'0"	7	3
907	9'0"	8	2
9083	9'0"	8	3
958	9'6"	8	2
959	9'6"	9	2

Presentation

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Model	Length	Line	Pieces
804	8'0"	4	2
8564	8'6"	6	4
9055	9'0"	5	5
9064	9'0"	6	4
906	9'0"	6	2
907	9'0"	7	2
9075	9'0"	7	5
908	9'0"	8	2
9084	9'0"	8	4
959	9'6"	9	2

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NYMPH TAPER (WF)

WT	TIP	FRONT TAPER	BELLY	REAR TAPER	RUNNING LINE	HEAD LENGTH	TOTAL LENGTH
4	0.5"	5.5'	20.0'	25.0'	24.0'	65.5"	100.0'
5	0.5"	6.0'	20.0'	25.0'	23.5'	66.0"	100.0'
6	0.5"	6.5'	20.0'	25.0'	23.0'	66.5"	100.0'
7	0.5"	7.0'	20.0'	25.0'	22.5'	67.0"	100.0'
8	0.5"	7.5'	20.0'	25.0'	22.0'	67.5"	100.0'

TROUT TAPER (WF)

WT	TIP	FRONT TAPER	BELLY	REAR TAPER	RUNNING LINE	HEAD LENGTH	TOTAL LENGTH
4	0.5"	5.5'	21.5'	10.0'	53.0'	37.0"	90.0'
5	0.5"	6.3'	21.7'	11.0'	51.0'	39.0"	90.0'
6	0.5"	7.0'	22.0'	12.0'	49.0'	41.0"	90.0'
7	0.5"	7.3'	22.2'	13.0'	47.0'	43.0"	90.0'

TROUT TAPER (WT)

WT	TIP	FRONT TAPER	BELLY	REAR TAPER	TIP	TOTAL LENGTH
4	0.5"	5.5'	79.0'	5.5'	0.5"	90.0'
5	0.5"	6.3'	77.4'	6.3'	0.5"	90.0'
6	0.5"	7.0'	76.0'	7.0'	0.5"	90.0'

FISHING **K** SHOOTING

TARGET TAUPO

A newsletter for Taupo Anglers

NOVEMBER 2005, ISSUE 50

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Front cover: *Winter fishing in crystalclear water at the Fence Pool on the Tongariro River. Photo: Calum Bourke*

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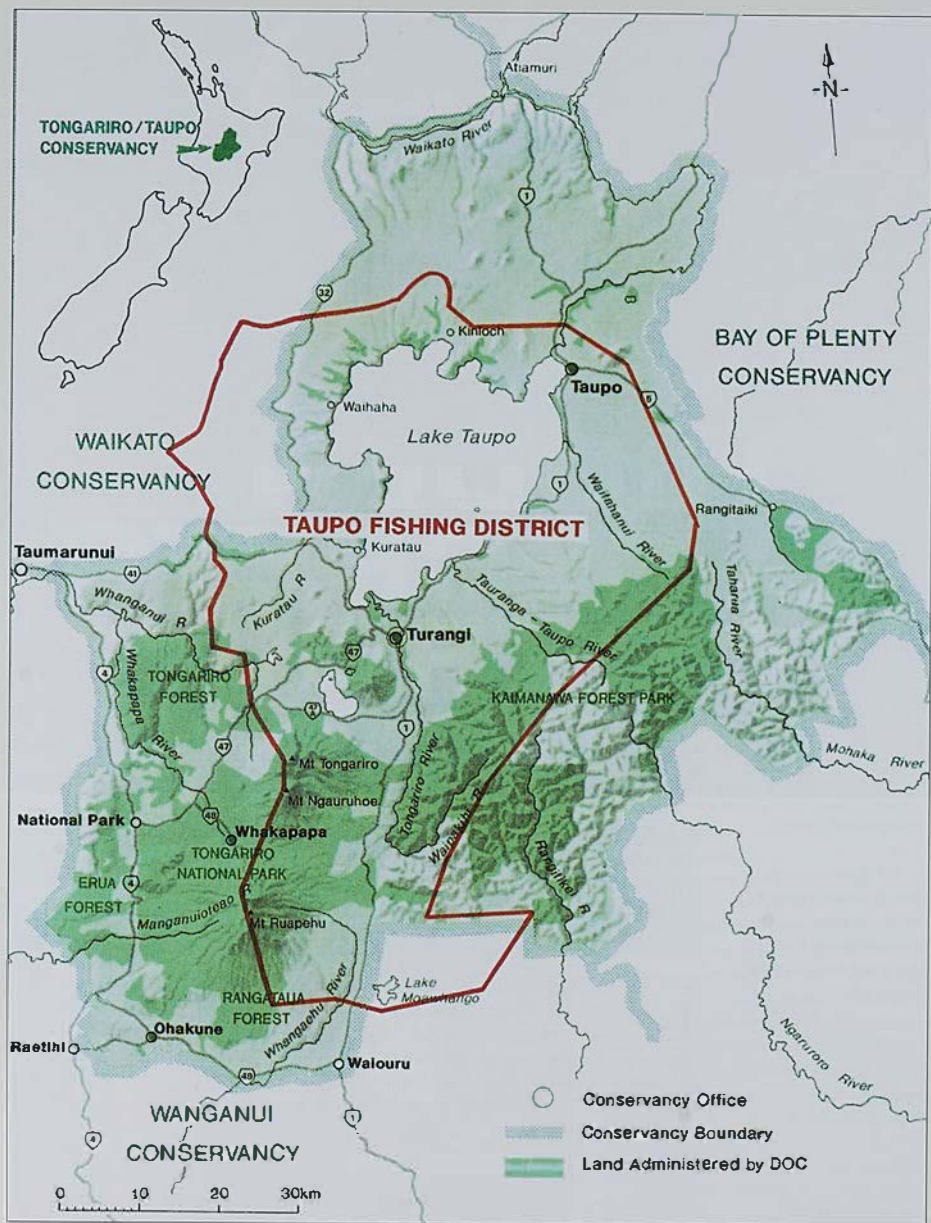
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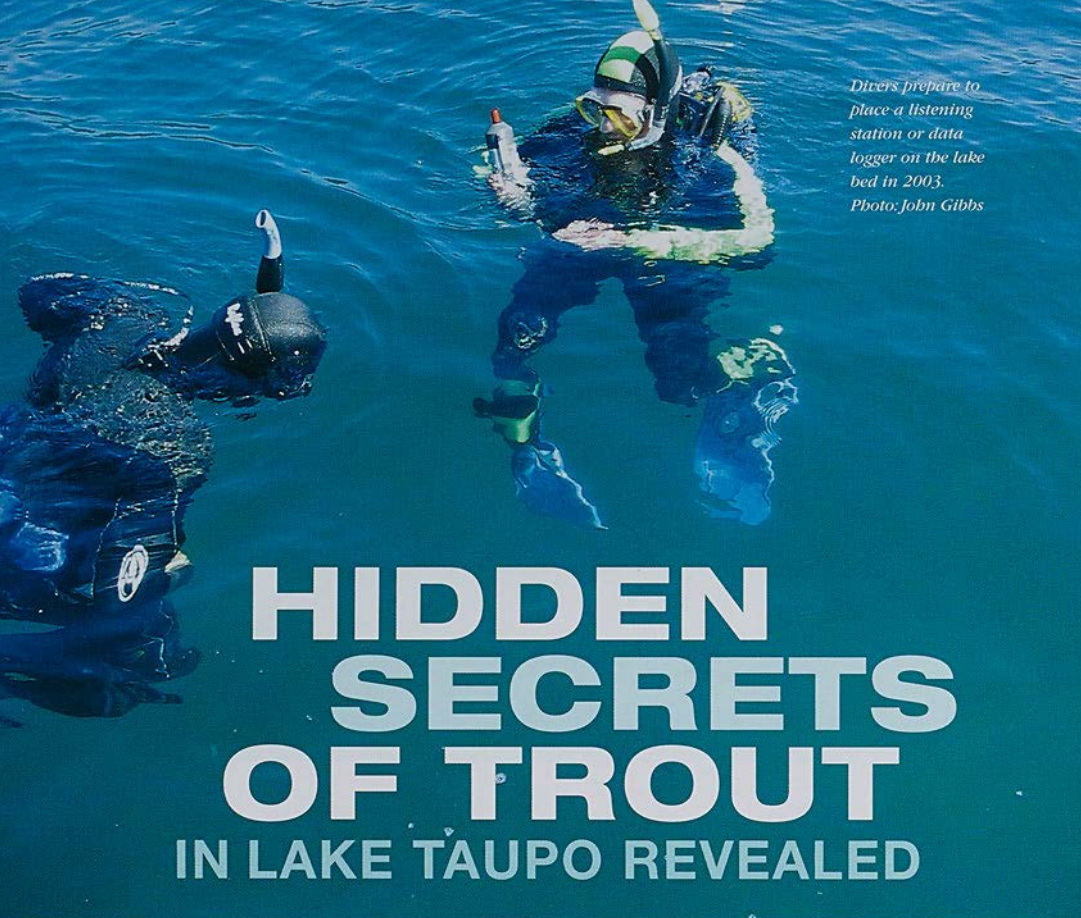
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Tongariro/Taupo Conservancy





*Divers prepare to place a listening station or data logger on the lake bed in 2003.
Photo: John Gibbs*

HIDDEN SECRETS OF TROUT

IN LAKE TAUPO REVEALED

by Dr Michel Dedual

Michel is our Fisheries Area Scientist, Hailing originally from Switzerland he is also a very enthusiastic angler and hunter

THIS GROUND-BREAKING YEAR-LONG STUDY TRACKING THE MOVEMENTS OF RAINBOW TROUT IN LAKE TAUPO CAME AS A BIG SURPRISE TO US AND WILL LIKEWISE ASTOUND MANY TAUPO ANGLERS. THE INTERNATIONAL SCIENTIFIC COMMUNITY IS ALREADY BUZZING ABOUT ITS IMPLICATIONS.

Lakes are characterised by vertical and horizontal gradients of temperature, dissolved oxygen, light, currents and other water parameters that influence the distribution and movement of fish. While more than 30 years of research has greatly advanced our understanding of many aspects of the river dwelling phase of rainbow trout in the Taupo catchment, the behaviour of individual trout in the lake remains poorly understood. What do rainbow trout do in Lake Taupo during the course of a day, a season, or a year? How do they respond to

physical factors such as temperature and current? What is their home range and does this vary with season or in response to other variables? This information on trout movement and habitat preferences is vital when designing monitoring programmes, making management decisions, particularly in regard to the impact of angling, and when considering the potential impact of changes in lake water quality on the fishery.

Our knowledge of the movement of rainbow trout in Lake Taupo until recently was limited to the recovery of tagged fish which



Trout caught for the acoustic tracking project were held overnight in a floating plastic bag to check for any delayed mortality.

Photo: Glenn Maclean

Dr Michel Bédard implants a transmitter into a trout. The fish was then allowed to recover and released back into the lake. From that moment on its movements were transmitted and recorded by data loggers on the lake bed.

Photo: Glenn Maclean



provided information only on the release and recapture locations. Where the trout went between those two points, which could be months or years apart, was unknown. For example, we have some information on tagged fish that were marked in the Tongariro River and recaptured later at different points around the lake but we don't know what they did in the meantime.

A range of techniques have been used to attempt to describe the vertical distribution and movement of fish in oceans or in the open water zone of lakes amongst which radio and ultrasonic tracking are the most common. These techniques apply a tag which sends out a radio or acoustic signal which requires tracking from a boat.

Contact with the fish is typically lost within a few days. Although these transmitters send a signal every few seconds, which is great for real-time tracking, it also means they have a short battery life.

However in recent years the development of efficient and cheap automatic logging stations has created an opportunity to deploy an array of receivers that can record transmitter signals over long time periods and large areas. Also, the rate of signal transmission can be reduced to as low as one signal per minute, which enables the tag to last many months but still provides a large data set that allows description of the fish's finer movements.

If the transmitters also contain depth sensors then vertical movement can also be described. Similarly if a temperature sensor is added to the same tag then the data recorded by the detectors will describe water temperature as well as horizontal and vertical movement. Tags with the ability to record depth and temperature have been used before but the problem was that this could only be done using archival tags which stored the information in the tag rather than sending it to a receiver. This meant that the animal carrying it had to be recaptured in order to download the detailed data. For fish then, most tags and their information would never be recovered, ruling them out as a practical option.

In 2003 we collaborated with a transmitter manufacturer in Canada to develop a "silver

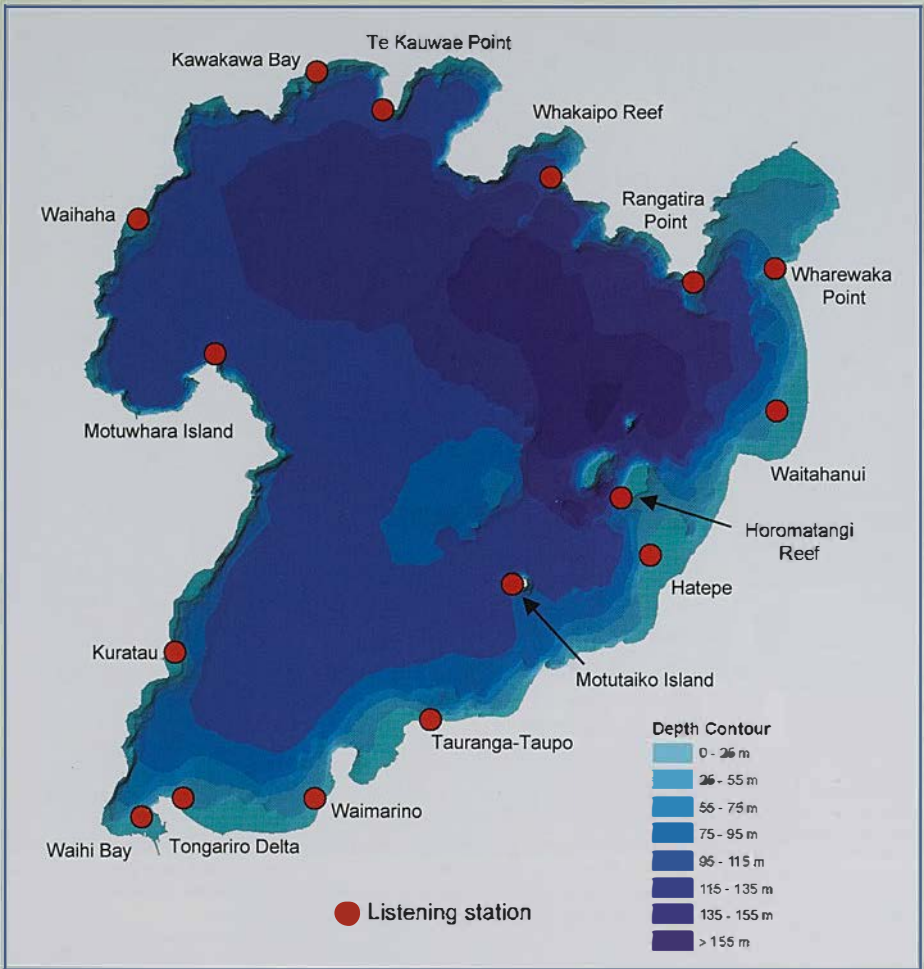


Figure 1: The locations of the data loggers around Lake Taupo

bullet". This hi-tech tag sends a signal relaying the temperature and depth where the fish is swimming every minute or so, day and night, for a year to any remote data loggers within range. We used this tag to discover rainbow trout behaviour in Lake Taupo and these acoustic transmitters are now demanded by scientists world-wide.

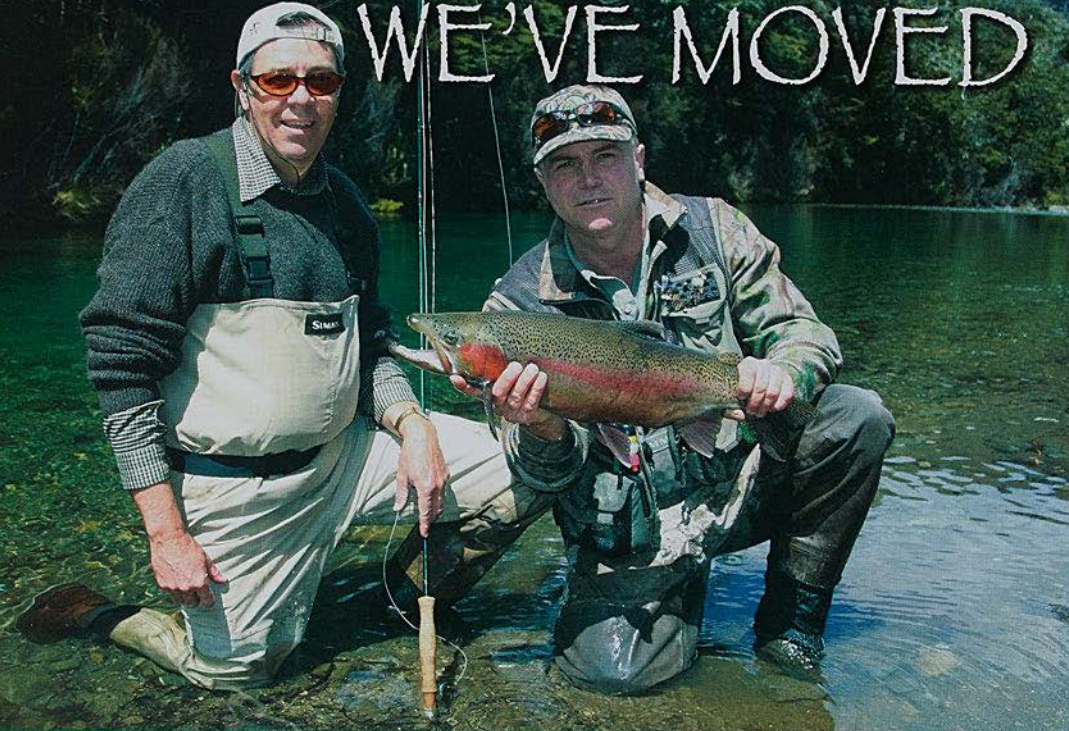
HOW WAS IT DONE?

Thirty six fish were caught between November and December 2003 at different locations around Lake Taupo by trolling and fly fishing along the drop-offs. Each fish suitable for tagging was transported by a pick-up

boat in a plastic bin filled with water to the tagging site. Here the fish was held overnight in a floating black plastic bag to check for any delayed mortality. In the morning it was anesthetized in a solution of clove oil and a transmitter implanted in its body cavity. The incision was stitched and the fish was released after several hours recovery. From that moment on it was transmitting the depth in which it was swimming and its body temperature.

To record the data we installed 16 "listening stations" or data loggers at strategic locations around the lake bed (Figure 1) that automatically recorded any tagged fish swimming

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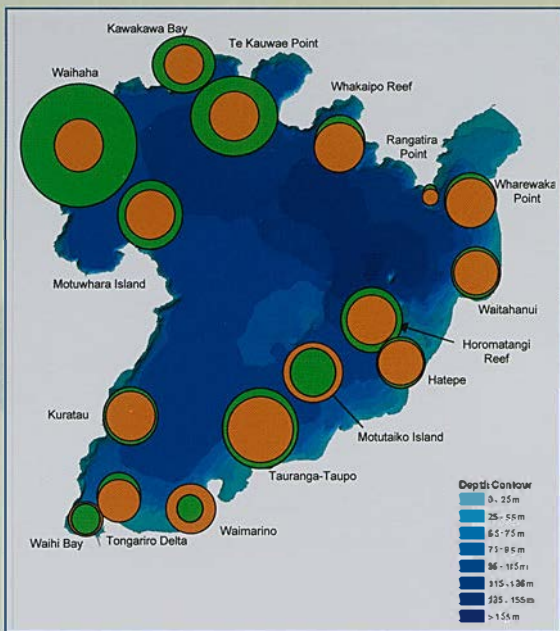


Figure 2: The number of signals received by each data logger (green circle), and the number of different fish visiting each site (orange circle).

Table 1: The number of visits made to each location by individual trout, the number of days each fish was tracked and the minimum distance it swam

within 800m to 1km from the station. The receivers were bolted on a stake that was driven into the sand or jammed in rocks by divers. The position of each station was recorded by GPS. A year later, at the end of the trial in December 2004, we recovered the data loggers, downloaded the data and started to explore it.

The first surprise was the number of individual pieces of data collected. In total more than 2 million records were downloaded. This mammoth data bank provides limitless opportunities for analysis. Its exploration will be ongoing for some time and there are many paths yet to be investigated. However,

in this article I will answer some of the most obvious and burning questions.

DO TROUT FAVOUR ANY SPOTS IN THE LAKE MORE THAN OTHERS?

If we look at the number of signals received by each logger from each fish (Figure 2) it appears that the Western Bays, especially between Waihaia and Karangahape Cliffs were the most attractive part of the lake. The eastern side of the lake from Wharewaka Point south to the Tauranga-Taupo River mouth was also favoured. Interestingly we expected favoured fishing spots such as The Delta and Rangatira Point to be more attractive than they proved to be.

However, it is possible that a large number of signals may have been sent by a small number of fish that remained in the same area for a long time. Therefore another way to assess what are the most favoured areas is to look at the number of different tagged fish that visited each site. Generally there was a good relationship between the number of detections and the number of fish that visited the different locations. However, at Waihaia this proportion was higher than in the other locations indicating that the large numbers of detections were in part the result of some fish remaining close to the logger for long periods. Again Rangatira Point was the least visited area.

THESE FIRST RESULTS CLEARLY INDICATE THAT TROUT MOVE AROUND LAKE TAUPO, BUT HOW OFTEN AND WHY?

From the data we can look at how many times each fish visited a particular location and what locations received the most "traffic". A single visit is defined as the period from when the fish is first detected by

Location	Fish #																																	Visits Total	Number of fish visiting
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
Motuhara Is	4	15	25	12	7	23	2	9	1	1	3	2	6	5	23	138	1	15	15	35	84	31	4	15	1	7	53	4	543	27					
Rufage	14	17	25	11	61	48	31	23	1	1	1	21	3	107	619	96	84	15	144	1	3	42	1	48	8	20	8	20	8	20	8	20	8	20	
Tauranga-Taupo			30	13	9	19	2	6	1	2	2	24	5	20	108	1	31	6	34	54	31	6	9	1	7	41	3	88	26						
Motuhara Is	16	19	24	1	19	16	9	31	26	1	1	3	5	118	189	1	74	98	20	187	2	1	2	5	37	30	2	114	27						
Motuhara Is	9	6	5	2	11	3	4	13	1	14	2	12	12	1	1	3	27	4	168	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Waimarino	3	12	17	8	4	4	4	3	3	2	3	7	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Motuhara Is	9	48	39	91	1	97	36	40	87	18	5	158	2	6	172	11	286	44	1	2	188	91	0	149	23										
Te Kauwae Pt	0	31	96	47	60	1	26	60	84	16	3	84	61	389	13	10	25	9	38	38	847	26													
Whakaipo Reef	7	7	12	1	9	5	14	1	4	4	5	1	2	5	8	6	4	1	2	4	2	82	20												
Delta Tauranga	3	7	22	7	2	2	1	1	2	6	5	16	6	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Motuhara Is	0	26	28	80	64	57	38	78	53	3	153	1	80	174	8	767	38	4	1	131	74	1	1	1	1	1	1	1	1	1	1	1	1		
Waihi Bay	2	1	2	1	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Waihaia Reef	7	4	8	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Wharewaka Pt	5	8	2	6	14	13	33	1	10	1	17	12	1	3	4	101	1	2	6	3	5	293	84												
Karanga Bay	8	28	61	43	60	26	80	38	14	65	53	144	14	8	28	2	28	28	30	30	365	13													
Kura Is	3	15	35	14	6	7	3	3	4	2	4	25	1	17	3	3	15	2	1	2	6	28	2	203	36										
Detected	214	150	296	180	203	191	388	83	325	245	8	7	263	514	348	249	26	230	213	386	251	384	369	344	186	213	329	231	150	40					
Total fish	85	253	453	4	357	88	586	3.9	273	32.8	5	5	411	33	376	687	10	601	3	576	867	740	879	130	15	542	37	476	938	21	843				
Locations visited	16	15	15	3	15	12	15	9	15	14	4	34	10	15	10	9	15	4	12	13	18	15	7	4	13	3	15	14	5						
Min (m) distance	415	895	294	3	5	2703	798	3822	304	1737	13	63	2	2	8	2791	316	2052	3148	1465	5448	4	3444	6752	4228	6402	925	37	785	73	30	86	3786	167	

Where did it go	When did it arrive there	When did it leave
Kuratau	11/05/2004 14:16:31	11/05/2004 14:24:31
Waimarino	12/05/2004 14:38:18	12/05/2004 15:13:25
Waimarino	12/05/2004 15:59:23	12/05/2004 16:27:31
Waimarino	12/05/2004 16:53:09	12/05/2004 16:53:09
Waimarino	12/05/2004 17:37:08	12/05/2004 17:44:50
Tauranga-Taupo	13/05/2004 01:59:56	13/05/2004 02:01:48
Tauranga-Taupo	13/05/2004 02:48:34	13/05/2004 03:06:24
Tauranga-Taupo	13/05/2004 03:36:20	13/05/2004 04:21:47
Tauranga-Taupo	13/05/2004 03:36:20	13/05/2004 04:21:47
Kuratau	13/05/2004 12:08:49	13/05/2004 12:12:10
Tauranga-Taupo	13/05/2004 17:11:00	13/05/2004 17:39:12
Tauranga-Taupo	13/05/2004 18:01:17	13/05/2004 18:01:17

Table 2. Movements of fish # 2 between 11 and 13 May 2004. The fish was a maiden female 480mm caught on a downrigger at Waikaiti Bay on 24 November 2003. When the fish shows at the same location several times during the same day this indicates that it was holding in the general area but on occasions moved far enough away to be outside of the area of detection.

a logger until the fish moves out of range again. The results are presented in Table 1 on page 8.

With the exception of Rangaitia Point, most tagged fish visited most locations at some time during the year. Motuwihara Island, Waibaha and Horomatan gi Reef had the heaviest traffic being visited 1468 times by 23 fish, 1372 times by 21 fish and 1114 times by 27 fish respectively. By comparison, Rangaitia Point was only visited 11 times by 7 different fish. Interestingly a large number of fish visited Motutaiko Island, an isolated rock outcrop in the middle of nowhere in the lake. It may be that trout use Motutaiko as a "lake mark" when travelling between other locations.

Comparing the number of locations each trout visited and the number of visits made by each fish shows that individual trout in Lake Taupo do their own thing rather than following a similar pattern of movement. Some travel a great deal and visit many different locations with three tagged fish (fish # 3, 7, and 25) visiting every location in the lake during the year. Other fish travelled much less (fish # 4, 11, 12, 20, 29). Some others visited few different locations but travelled regularly between these (fish # 28).

By knowing where and when each fish changed location it is possible to determine the swimming path each one followed. An example of the movement of a single fish is presented in Table 2.

The movement of each fish can therefore be reconstructed for the year-long study period (Figure 3). This shows that Taupo rainbows can be classified into several types according

to their patterns of travelling. The large majority are "wanderers" that travel anywhere around the lake and frequently crisscross the middle of the lake just like goldfish would travel in a fish bowl. Another type of fish roams widely but avoids some parts of the lake, in particular these "partial roamers" seem to avoid the southern end. A third type could be called "eastenders" as they travel backwards and forwards along the eastern shore and rarely cross the lake.

Yet another pattern of movement is to go along the entire edge of the lake without crossing it ("sideliners"). Finally some fish didn't move much at all remaining most of the time in the area where they were caught and tagged.

The pattern followed was independent of the size, sex, or maturity of the fish, or the methods and location of capture. It is interesting that similar variable patterns of movement were also found in sea-run rainbow trout (steelhead) in British Columbia. The fact that several patterns of movement exist in Lake Taupo is good news. It indicates that there are several options for Taupo trout to choose from; they don't have to all do the same thing. Any trout population where fish don't have a choice of movement or location is very vulnerable to overharvest by anglers concentrating their effort in these particular areas.

It is still unclear if fish originating from the eastern and/or southern tributaries are more likely to show an "eastender" behaviour. During this study one fish that was tagged at the Tauranga-Taupo River mouth was recaptured at the Waipa trap in the Tongariro returning to spawn presumably where it was

born. The swimming path of this fish indicated that it was a typical "eastender" so it is possible that some of the pattern observed relates to the trout's stream of origin. Unfortunately it was not possible in this experiment to identify from which tributary any other tagged fish originated. Tagging kelts in the different spawning tributaries would be one means to overcome this if we repeated the experiment, but is complicated by the difficulty in ascertaining which kelts will survive another year. With each transmitter costing over \$1000 it is important to only tag fish that are likely to survive.

HOW FAR DO TROUT SWIM IN LAKE TAUPŌ?

From the swimming paths it is possible to measure the total distance that each fish travelled by adding the distances from one location to the next where the fish was recorded. It is however important to realise that this calculation provides the absolute minimum estimation as the distance is measured in a straight line between stations and doesn't allow for the vertical movements or any

wandering that the fish may have done on its way. Table 1 shows that the roamers have travelled a lot with the champion fish being a 470mm long male previous spawner caught on a downrigger at the White Cliffs. This trout swam at least 5752 km between 16 December 2003 and 23 August 2004 (or an average of 22.9 km per day)! Such a distance is comparable to that of its ancestors, the steelhead, which swam in the Pacific Ocean between Japan, Alaska, and Canada prior to returning to their rivers of origin draining the west coast of America. Another way to look at these distances is to realize that even if Lake Taupo appears to be huge it is in fact just a large fish bowl that rainbow trout know like the back of their fins.

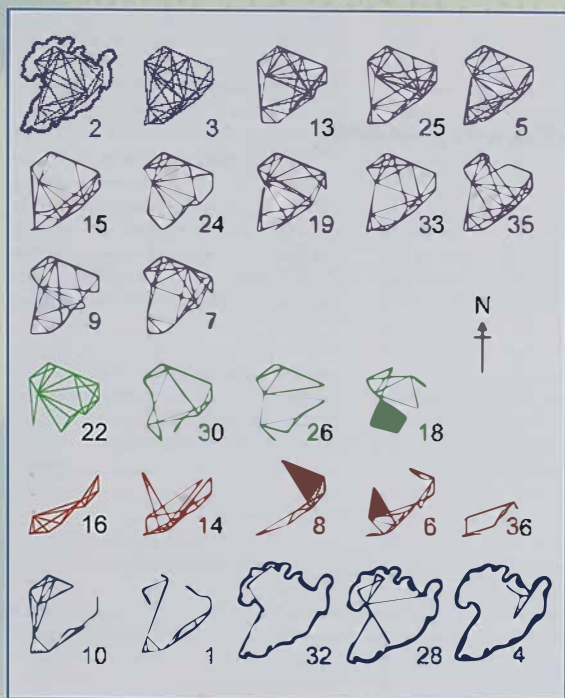
Notably, the distance and the rate of travel in the lake is much higher than in the Tongariro River. During the Tongariro tracking experiment we estimated that the fastest fish travelled from the Tongariro Delta to the Waipā trap (26 km away) in 16 days. This equated to a maximum average daily movement of only 1.6 km.

WHY DO THEY TRAVEL SO MUCH?

It is well established that trout in Lake Taupo rely on smelt for food. Smelt spend most of their lives in the open waters of the lake before returning to spawn along the sandy beaches and river mouths in late spring and summer. For the last 3 years we have been monitoring the abundance of smelt monthly along the shore of Lake Taupo. One monitoring location is on the beach at Waitahanui. This site is in the same overall area that was covered by a data logger. This allows us to compare the number of tagged trout recoded by the logger with the abundance (catch per unit effort or CPUE) of smelt along the beach during the year. When the abundance of smelt caught in each beach seine haul is high then the number of trout detections and the traffic intensity also increases (Figure 4). This confirms that the abundance of smelt is a key factor to explain trout distribution in Lake Taupo.

When smelt are out in the open waters offshore they show up on our annual trout echosounding surveys. These surveys indicate that smelt are not evenly distributed across the lake. This patchiness in their distribution forces trout to travel and they have to travel far because the distances between smelt concentrations may be large, not helped by the fact that the smelt also move around a fair bit too. This search for food is likely to be the main

Figure 3: The travelling route of individual fish around Lake Taupo



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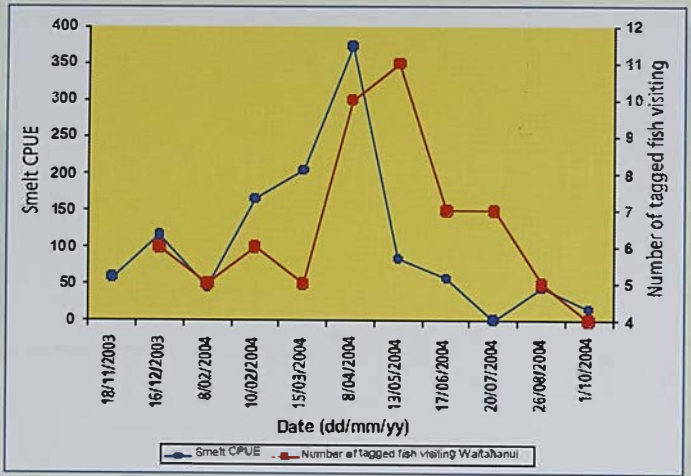



Figure 4

driving force of trout movement in the lake. If we could predict where smelt will be at any particular time of the year then anglers could use this information to target the areas where the fishing was likely to be the best. Unfortunately at this stage we can only speculate where smelt are most likely to be found. Angling lore, experience and "intuition" may still be your best guide. Just like the trout, every predator in the food chain has to follow its prey and in Lake Taupo smelt follow zooplankton that follow phytoplankton. All these organisms can swim except phytoplankton which are microscopic floating plants and not equipped with any active locomotion

system. However this doesn't mean that phytoplankton don't move around the lake, as they are at the mercy of its currents.




There are three main currents in lake Taupo and these are strong enough to easily stir phytoplankton sending it into big eddies (as shown in the photos on pages 14 and 15). Measurements of current velocity made by the National Institute of Water and Atmosphere (NIWA) indicate that the current and consequently the phytoplankton can move faster than 30 cm per second (Figure 5 - page 15). This is serious current, equivalent to the flow in rivers where anglers cross at the tail of pools. The "western current" creates a backwater area in the Western Bays between Waihaha and Karangahape Cliffs. This backwater is where the phytoplankton will be transported by the centrifugal force of the current and accumulate. In turn this rich brew will act as an irresistible trout magnet. It is worthwhile noting that the current doesn't always spin in the same direction. For example the picture taken in March 2004 indicates that the current was spinning clockwise. Conversely when NIWA measured the current in 2002 it was spinning anticlockwise. However, regardless of the direction of the current the Western Bays area will still form a backwater and remain attractive. It is interesting how this correlates with our own observations made over 15 years of echosounding surveys, that this area of the lake invariably has high smelt densities and whenever this occurs then there will also be a lot of trout evident on the echograms.




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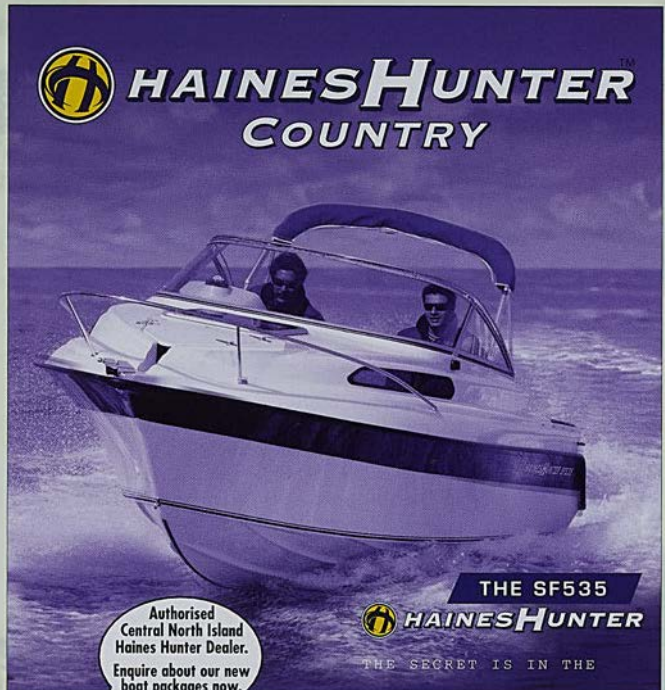


There are also currents along the eastern and southern sides of the lake. However in these areas the currents are not as strong and there are no backwaters created. The current on the eastern side of the lake is nevertheless easily detectable when fishing, for example at the mouth of the Tauranga-Taupo River. Most anglers familiar with the area know that it is common to see the line dragged down in a direction opposite to the waves.

IS THERE A PARTICULAR TIME OF THE YEAR WHEN TROUT MOVEMENT INCREASES?

The frequency of fish changing locations was limited during spring and early summer but

increased dramatically in March and remained high until August when it abated (Figure 6 - page 16). This indicates that trout movement is more intense during autumn and winter than during spring and summer. Again, smelt may be the key to explaining this pattern. Smelt concentrate near the shore and spawn from November to March. During this period trout can focus on this area and as a result don't have to travel much. However, when smelt spawning is over, trout have to find and follow them in the pelagic zone of the lake, inducing some large movements. This is where the position, directions and strength of the currents will provide some clues as to where the rainbows will be.



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Photos of Lake Taupo taken by Jonathan King while sky diving on 5 March 2004. He thinks the plume was derived from bank erosion off the White Cliffs due to high lake levels and wave action during the storm and flood event on 1-3 March 2003. The surface sediment plume from the Tauranga Taupo River is also visible at the south end of the lake - but moving in the opposite direction. The colder Tongariro River plume lined beneath the Tauranga Taupo plume at a depth of 30m.

Since the intensity of travel varies between locations it is worthwhile exploring what happened at each data logger site. The date of arrival and time each fish spent at each location indicates that there is no predictable seasonal pattern of movement by trout around the lake, other than they all move much more over autumn and winter. However, the lake can be split in several areas where the listening stations share similar traffic patterns. The engine room in Lake Taupo is the central part of the lake stretching from the Tauranga Taupo River mouth in the south east to Karangahape Cliff in the west to Kawakawa Bay to the north west to Wharewaka Point to the north east. In this area the traffic is substantially heavier than in the rest of the lake (Figure 7 - page 18).

The southern end of the lake south in a line from the Waimarino River to Kuratau has its own pattern of visitation that doesn't show any obvious increase in fish traffic during winter. In the east from Te Kauwae Point to Rangatia Point and including Whakaipo Reef, the lack of traffic compared to the other areas was dramatic and clearly indicates that this part of the lake functions very differently to the others. The causes of these radical differences in traffic between the different parts of the lake are unclear. The traffic intensity in the central part of the lake indicates that trout have to travel a lot to capture enough smelt in this

area. However, the number of tagged fish using the central part of the lake also suggests that even though a lot of swimming is required, it is still worthwhile. It is certainly an effective strategy when you consider the excellent fitness and condition of maiden trout in the lake. Maybe in the other parts of the lake such as The Delta area, there is a consistent but limited supply of smelt providing opportunities for a smaller number of fish.

DO TROUT TRAVEL MORE AT NIGHT OR DURING THE DAY?

Trout arrive at new locations at all times of the day (Figure 6). However, Figure 8 (page 20) reveals that the frequency of arrival and departure at new locations is usually the highest between 07:00 and 08:00 in the morning and lowest between 16:00 and 17:00 in the afternoon. The results also indicate that in general trout are probably less active at night. Overseas researchers have also found that salmon in the north Pacific travel in the open ocean more during daylight than night hours. The same researchers suggest that in the ocean, salmon need light direction as a compass to travel. Another plausible explanation for Taupo is that rainbow trout are visual feeders and are therefore more efficient during daylight hours. Trout feeding opportunities are especially good at dawn and dusk when enough



light is present and the smelt are still close to the surface of the lake.

HOW LONG DO TROUT REMAIN IN THE SAME LOCATION?

During this study the majority of trout stayed at the same location (within a detection range

of 800 to 1000 metres from the logger) for only very short periods of time (Figure 9 - page 20). Indeed, 54.8% of all visits lasted for less than 10 minutes and only 6.8% lasted more than 2 hours. This reiterates that rainbow trout are highly mobile in lake Taupo and that they are on the move most of the time. But are there any particular locations where trout make shorter or longer visits than others? For this analysis I omitted Rangaiira Point because of the low number of visits at this location. Overall there are no major differences between locations in relation to the duration of trout visits (Table 3 - page 17).

It does appear that the locations where the proportion of very short visits (less than 10 minutes) is low are also those where the duration of long visits (greater than 2 hours) are high. The locations fitting this pattern are Waihaha, Tauauaga-Taupo, Tongariro Delta, and Waitahanui. Interestingly these are all river mouths. The opposite trend where the proportion of short visits is above average and the proportion of longer visits is lower, exists at Waiharino, Motutaiko Island, Te Kauwate Point, and Motuwhara Island.

Anglers instinctively know that some of the best water to fish is where there are rapid changes in physical features like depth, temperature, substrate or current velocity.

Figure 5: Currents measured 18m below the water surface by vessel mounted ADCP on 5 May 2002. Data was collected in two runs sequentially from north to south starting at the Western Bays ending at Turangi, and then a south to north run, from Turangi to Taupo. Boat speed ~5 knots. Broken lines indicate potential eddies within the epilimnion. (Strong wind from South West). Data courtesy of Max Gibbs, NIWA Hamilton, New Zealand

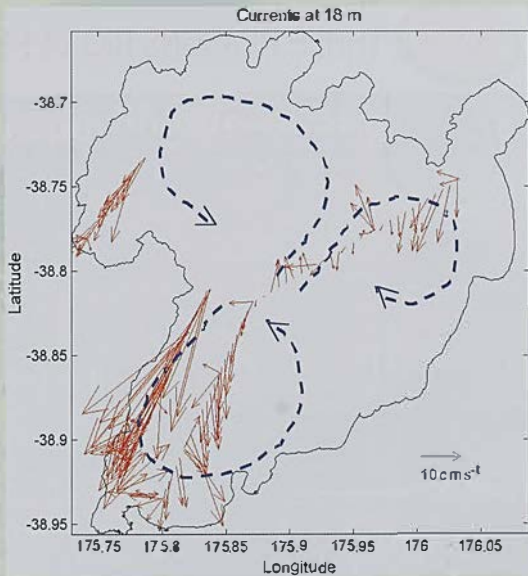
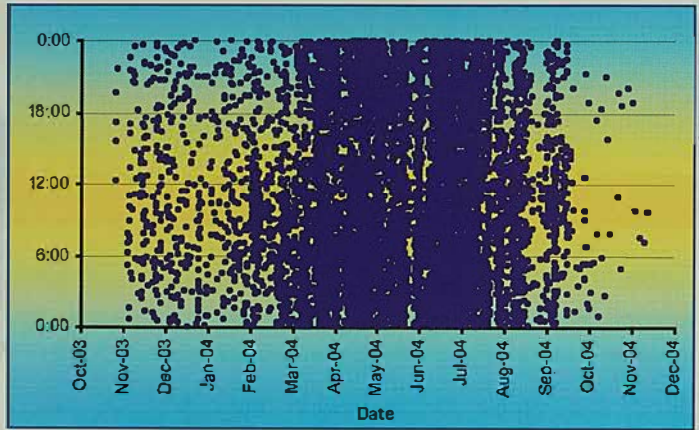


Figure 6. Date and time of arrivals at new locations (all fish combined).



Such rapid changes affect not only fish but all types of living creatures. Ecologists talk about the "edge effect" to describe these areas that are more attractive and productive in ecological systems. In Lake Taupo the "edge effect" can be created by a rapid change of depth such as at the drop-off or a change of temperature and also current velocity at the "rip" where cold river water runs into the slow, warm water of the lake. The boundary between weed beds and the open sand, such as in Motuoaapa Bay, also

creates an appealing edge effect to trout. The theory of "edge effect" provides some explanation for the differences between the time fish spend at different locations in the lake. For example it is easy to conceive why the river mouths are attractive and, conversely, why trout don't generally hang around locations surrounded by uniformly deep water (Morutaiko and Motuwhara islands and Whakaroa Point). However, it is puzzling why trout don't spend longer at the Waimarino River mouth which has some of the most

extensive edge effects in the lake. The results of the number and duration of visits suggest that fishing prospects in 2003/2004 may have been slightly better at the Tauranga-Taupo mouth or the Tongariro Delta than at the Waimarino mouth. My fishing records certainly verify that this was the case between the Tauranga-Taupo and Waimarino mouths but I would be very interested to hear from other anglers about their own observations. Nevertheless this doesn't mean that the fishing prospects are not good at the Waimarino because at times they clearly ate. It is also important to remember that the signals sent by tagged fish can be detected up to 1 km away from the station and therefore the trout detected may still be well beyond the anglers' reach.



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Visit duration	0-10 min	10-30 min	30-60 min	1-2 h	>2h	(n)
Location						
Motutaiko Is	57.2	21.6	10.6	7.0	3.6	1877
Hatepe	56.6	19.2	10.6	6.6	5.0	2062
Tauranga-Taupo	49.7	18.9	11.9	9.3	10.2	2193
Horomatangi Reef	55.7	20.5	10.7	7.4	5.7	3201
Waitahanui	52.9	19.1	11.4	7.3	9.3	1145
Waimarino	62.0	18.3	9.2	7.0	3.6	589
Motuwhara Is	58.4	21.7	9.9	5.6	4.4	4876
Te Kauwae Pt	56.0	21.6	11.5	7.0	4.0	1827
Whakaipo Reef	56.6	19.2	10.7	7.2	6.3	1219
Tongariro Delta	52.4	20.8	9.9	7.7	9.2	937
Waihaha	49.1	20.6	11.6	8.3	10.4	5539
Rangatira Pt	29.8	19.3	17.5	19.3	14.0	57
Waihi Bay	46.8	20.8	15.5	9.5	7.4	476
Wharewaka Pt	59.2	19.4	9.5	6.4	5.4	2268
Kawakawa Bay	55.8	21.1	9.1	7.0	7.0	1923
Kuratau	53.6	20.1	10.4	7.4	8.5	1560
Average	54.8	20.5	10.7	7.3	6.8	31849

Table 3:
Proportion of visits

IMMEDIATE IMPLICATIONS

This study has clearly shown that rainbow trout in Lake Taupo move much more extensively than previously thought and are not territorial. This is in contrast with brown trout. For example during the study we carried out in Lake Otamangakau, brown trout displayed a clear territorial behaviour, remaining for weeks and even months within an area of no more than a few hundred square metres, usually along the shallow margins of the lake.

This lack of territorial behaviour in rainbow trout in Lake Taupo is positive from a management perspective. It means that the

effects of a concentration of fishing effort and therefore harvest in one particular area will not create a 'hole', but rather reduce the total abundance across the whole lake. Furthermore, because most trout move throughout the entire lake, catching a fish in a particular location in the lake will not affect the number of fish running in a particular river but the impact will be shared by all the spawning tributaries. In other words the population can be managed as a whole rather than a series of distinct groups.

Similarly fishing prospects are good throughout the lake though it is very

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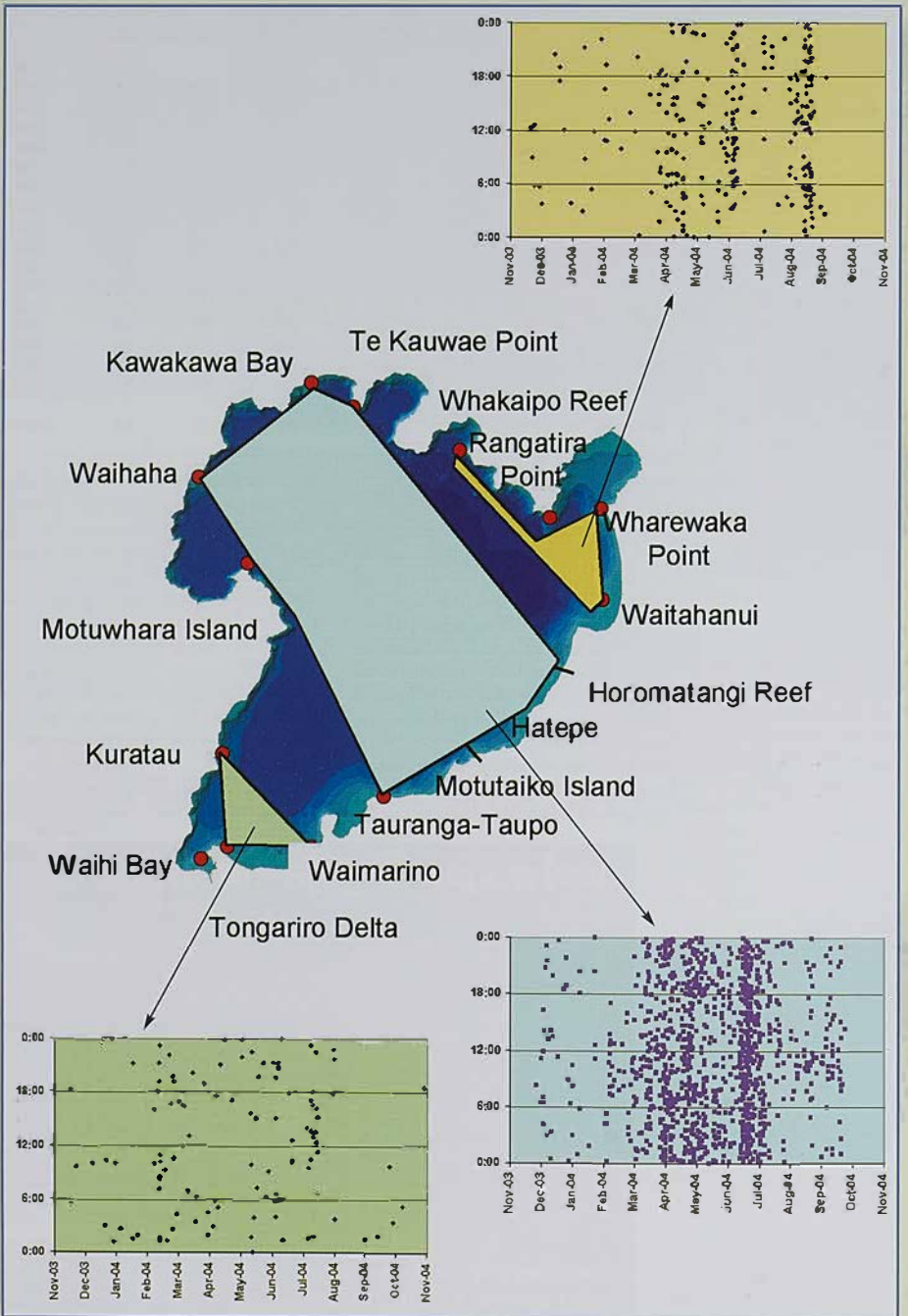


Figure 7

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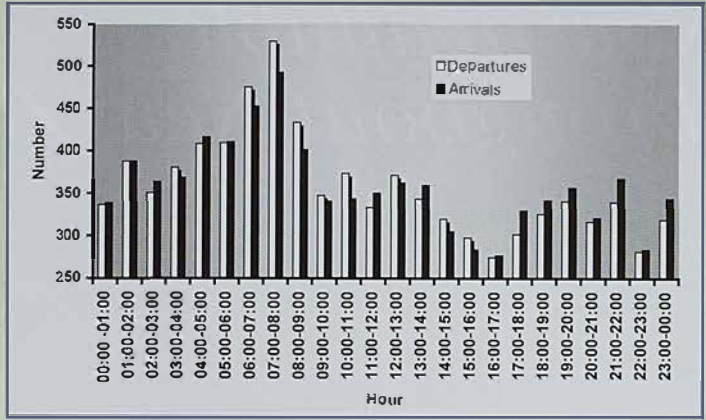
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Figure 8: Frequency of arrival and departures at new locations (all fish combined) by time of day, between November 2003 and November 2004



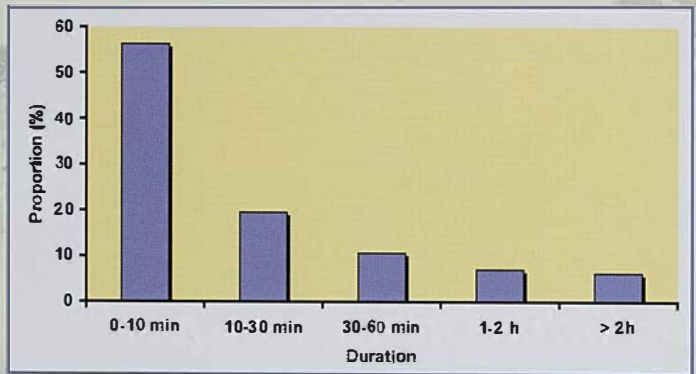
puzzling that some areas thought of as being very productive, like Rangitira Point, were not more attractive to trout. It is possible that the patterns of favoured locations will change from one year to the next; for example the prevailing climate will no doubt affect the current patterns, temperature gradients and other aspects like the timing and location of smelt spawning. However, the engine room of trout movement is likely to remain in the central part of the lake where it was found in this study. The extent of fish travel also means that just because fishing is good in one spot on one day, there is no certainty that it will be good the next. From an angling perspective this suggests that if you are not catching fish then you are better covering as much water as possible

rather than persevering with the same area for a long period. Similarly, it confirms what many experienced lake anglers already know: that a big part of the secret is to find where the smelt are.

AND THE REST OF YOUR QUESTIONS?

Being in the right area is only half the battle and the correct depth to target is also paramount. The depth and temperature the tagged trout preferred during this study, and its implications for anglers and fishery management will be the subject of future articles in *Target Taupo*. So next time you catch a Taupo trout, spend a moment to appreciate what great athletic wanderers they are and treat them with all the respect they deserve.

Figure 9: The duration of visit (all fish and locations combined)





LOG JAM IN THE WAIPA STREAM

by Rob Hood

Rob is a Ranger and part of the team that carries out our Field Operations work.

Top: Rangers Roy Baker (using chainsaw) and Julie Greaves clear debris after the Waipa log jam was blown up.

Photo: Rob Hood

Taupo trout are a wild self-sustaining population and it is important they have access to suitable spawning habitat to ensure a successful breeding season. In late June we discovered a significant log jam in the Waipa Stream, a tributary of the Tongariro River, several hundred metres upstream of the Waipa fish trap. A couple of large red beech trees had fallen across the stream during a storm and subsequently other logs and debris had washed down and lodged against them, creating a significant blockage for spawning trout to try and negotiate. It was obvious it needed to be removed quickly as hundreds of trout had built up below the jam, unable to reach their spawning grounds. There was also a possibility the log jam might collapse during a flood and the resulting debris could damage or destroy the trap downstream. In mid-July several fishery staff went to the site to begin removal. The team used explosives to blow apart the main logs. After the blast they removed the remaining debris from the stream so it couldn't cause another log jam, or be washed downstream to wedge against the trap. With the log jam removed, trout were observed immediately moving through the opening to take advantage of the excellent spawning grounds now opened up to them.

Right: A feature of a wild fishery - hundreds of trout use small tributaries for spawning over the winter period and it is important that they have access to as much suitable spawning habitat as possible.

Photo: Glenn Maclean





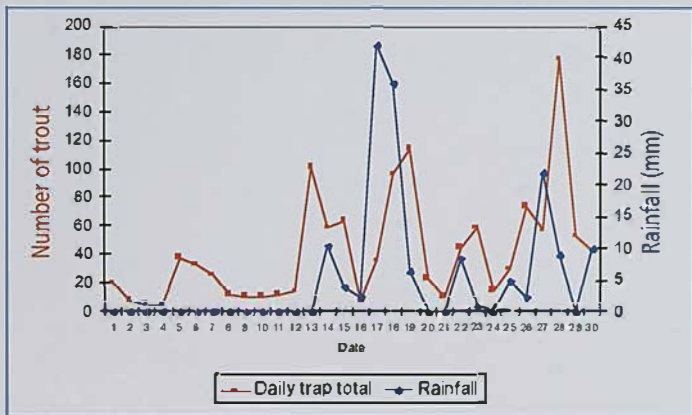
WINTER FISHING FINALLY DELIVERS

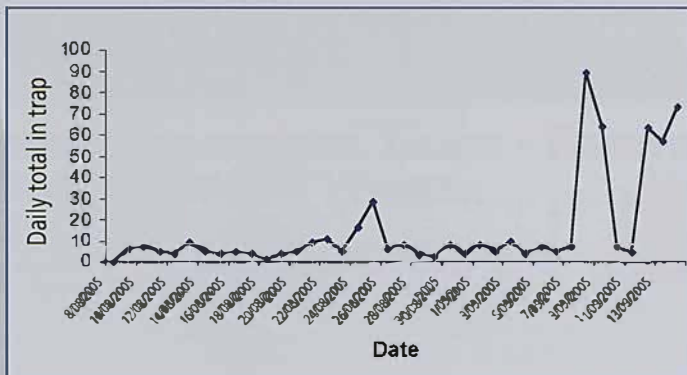
by Glenn Maclean
 Glenn is our Programme
 Manager Technical
 Support and manages the
 research and monitoring
 work done in the area
 Photo: Callini Boukce

Over recent months we had predicted that the best of the winter river fishing was yet to come but August came and went with no real improvement. Fortunately the rain finally arrived in mid September and so too the peak runs of

the season. A graphic example of the effect of rain (or impending rain) on stimulating the runs is shown in graph 1 which plots the September daily run of fish through the Waipa fish trap on the Tongariro River versus the rainfall over the previous 24 hours.

Graph 1: Daily trap run through the Waipa trap versus the 24 hour rainfall, September 2005. Note that the river was also affected by the two recreational releases on 24 and 25 September





Graph 2: Daily number of trout through the Hinemaiaia trap 8 August to 14 September 2005

Another revealing example of the effect of flow on influencing fish behaviour was the run through the Hinemaiaia trap through August and early September. This trap is situated in the bypass channel immediately below HB dam and so unless the dam spills the flow is constant here. Such a constant flow was the case through the trapping period until the dry conditions caused TrustPower to spill the dam to meet their resource consent conditions. The dramatic effect of the two spill events on 8 and 9 September and 12 to 14 September on the number of fish running can be seen in graph 2.

The smaller peak on 25 August occurred when 19mm of rain fell overnight which presumably had a small effect on the flow in the bypass channel. An interesting aspect of the fish response to the spill events is that the overall flow in the lower river didn't change as the water simply came over the dam rather than through the power station. Many of the fish were holding below the power house and even though the flow quantity didn't change in this area they were able to detect the change in the source of the water and moved into the bypass channel.

The numbers of fish moving in the Tongariro in late September

was reflected in anglers success through this period. Table 1 shows the monthly catch rate estimates (fish caught per hour for the Tongariro and Tauranga-Taupo Rivers this winter.

The earlier catch rates are respectable by Tongariro standards though tended to reflect short bursts of very good fishing and extended periods of much harder fishing. Generally, anglers found it hard work through this period. The catch rate for September however is exceptional for this river and

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ACCOMMODATION

Month	Tongariro River	Tauranga-Taupo River
June	0.27	0.24
July	0.28	0.27
August	0.30	0.38
September	0.77	0.36

Table: Monthly catch rate estimates (trout caught per hour) for the Tongariro and Tauranga-Taupo Rivers June to September 2005 (average of individual anglers' catch rates)

reflects how well the fishing went once regular rain occurred. For example on the 3 harvest survey days chosen at random late in the month, the catch rates were 1.14 fish per hour (95 interviews) on 23 September, 0.79 fish per hour (75 interviews) on 25 September and 0.67 fish per hour (51 interviews) on 30 September. Interestingly the fishing in the Tauranga-Taupo River did not respond in the same way.

Another feature of the fishing this year has been the very good size and quality of the trout particularly later in the winter. Fish kept by anglers have averaged 1.85kg (4.1lb) in the Tongariro River and 1.94kg (4.25lb) in the Tauranga-Taupo River.

Until we adjust the Waipa trap run to take into account fish which bypassed the trap in floods (we can only do this once the spent kelts migrate back downstream and we see what proportion have a current trap clip) it is difficult to compare the size of run with last year though it appears to be similar. This is also consistent with our monthly counts of

spawning fish in selected stretches of the other eastern tributaries in comparison to last year. However in 2004 counts did not peak until October and it is likely that this will also be the case again.

Last year 69% of the run through the Waipa trap occurred after 1 September and the runs in November and December were larger than June through August. Given that the runs are following a very similar pattern this year there is likely to be some good fishing in the rivers through to Christmas. This is also consistent with reports from lake anglers who are still catching big ripe fish in amongst large numbers of small well conditioned fish. When we repeat the acoustic surveys in November and March we will have a better indication of the prospects for this summer but the large numbers of small fish are a good sign. While catching these fish which are still under the legal size can be frustrating for anglers fishing in late winter and spring, these fish are growing at a millimetre a day and will form the basis of this summer's lake angling. Therefore it is essential that anglers release these small fish correctly so that they survive, preferably by not handling the fish at all.

The late spawning will also mean that many kelts will only return to the lake around Christmas time and therefore will not have regained condition when most people are fishing the lake over summer. While these fish look poor it simply reflects the rigours of spawning and with time many will recover and make a further contribution to the fishery. So, as with the little fish, release these kelts carefully.

*Syd Beantland with a 3.4kg (7.5lb) rainbow jack from the Tongariro River which Syd, who first fished the Tongariro in 1947, describes as the best conditioned fish he has ever caught in the river.
Photo: Jared Goedbart, Sporting Life*





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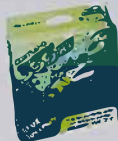
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THAT'S A GOOD



By Rob McLay

Rob is our Programme Manager for Field Operations. His wealth of knowledge about the Taupo trout fishery combined with years of angling experience fishing Taupo waters, made Rob the ideal author of an article explaining what different fishery terms mean and how anglers can recognise a good fish.

Each year our rangers interview several thousand anglers on the lakes and rivers in the Taupo district to obtain information on catch rates and angler's impressions of their fishery. When doing this work, we often see trout taken that are in such poor condition that the only likely benefit they could provide to their captors is as garden fertiliser. To quote one of my late father's favourite sayings, these fish are "neither use nor ornament" so why would someone keep such a fish? Well, for experienced Taupo anglers there is really no excuse, however our data shows that anglers taking poor quality fish generally fall into the category of being new

to the sport or have had little fishing experience in the Taupo district. Once a trout is landed, to kill or not to kill is a decision that must be made quickly and making this judgment call with regard to the condition and potential eating quality of the fish must be achieved at a glance. Getting this call consistently right takes a practised eye that only comes from having caught and handled many fish. Therefore, it is understandable that the less experienced angler may kill a fish that appears to be a good one when first landed, but proves to be a disappointment later. To assist in avoiding that disappointment, this article provides some clues on what to look



FISH - OR IS IT?



That's a good fish! - or is it? Photo: Rob McLay

for when considering fish quality and whether or not a given trout may be worth taking home for the table.

The Taupo rainbow trout life cycle

Before discussing this issue in detail, it is worth briefly running through the life cycle of a typical Taupo rainbow and in so doing, highlighting some terms that are commonly used when referring to various stages of a trout's development. Our typical Taupo rainbow starts life as an egg buried in a gravel nest called a **redd** in a tributary stream sometime between July and November. The egg hatches and ultimately the new arrival emerges from beneath the gravel as a trout fry about 20mm long and commences fending for itself in the stream or river environment.

18 months on, our budding star is around 100 to 150mm long and is known as a **fingerling**. At this point the little fish is feeling like a change in scenery and so migrates downstream and into Lake Taupo and commences a roaming existence throughout the wide

expanse of the lake feeding primarily on smelt. The fish will spend the remainder of the year and about half of the year following feeding in the lake and growing rapidly at about 1mm a day. Throughout this period and up until it first spawns, our fish is known as a **maiden**. At around three years old the fish matures. Sleek, silver and in the peak of condition and strength it measures around 530mm and weighs around 2 kg and is the highly sought after prize that makes the Taupo fishery famous.

Up to three months before it actually spawns, our fish will leave the lake and migrate into the river catchment from where it originated, travelling upstream slowly and occasionally back downstream and sitting tight for long periods in various locations of its choice which anglers refer to locally as **lies**. As the need to spawn becomes imminent, the appearance of our fish changes. Up until now, even after several weeks in the river, it still looks identical to the day it left the lake and if caught would be referred to by most anglers as **fresh run**. Now the overall skin colour darkens, the

*The maiden Taupo trout - sleek, silver and in the peak of condition
Photo: Rob McLay*



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The kelt - a very sorry sight indeed
Photo: Rob McLay

shades of pink become a deeper red and if our fish is a male, the jaws and teeth become more pronounced. Anglers often refer to fish in this state as **dark** or **black** and consider them to be poor quality, but our fish is still a maiden in the peak of condition on its way to spawn. At the same time, the urge to complete the trip to the spawning grounds of its birth is becoming paramount and the fish completes the last part of its journey very quickly.

The fish will spend between three weeks and 2 months on the spawning grounds and when the process of breeding is complete, it is a very sorry sight indeed. Fins and tail tattered and torn, open wounds some harbouring visible fungal infections and most significantly, a major reduction in body weight and condition. Post spawning, our trout is now known as a **kelt** although anglers may call it one of several locally used titles such as slab, snake, garden rake and spent, to name a few.

The first priority for survival as a kelt is food and so our intrepid voyager drifts down out of the spawning stream and takes up station in a pool in the main river to commence feeding avidly on the ready supply of aquatic insects that are available in the early spring. Very quickly our fish's health improves, wounds heal, fins re-grow although there will be scars for life particularly on the lower lobe of the tail. Over the next two months it feeds continuously, rising to surface insects in the evenings and taking submerged nymphs by day and although the bright silver colour returns, condition remains poor relative to its pre-spawning glory. Through this period, the fish occasionally drifts further downstream and takes up residence in a new pool but usually at some point significant

rain brings a small flood to the river and our trout goes with the flow and is quickly carried back into the lake.

Our fish, now known as a **mending kelt**, immediately finds itself among a rich and plentiful food resource of spawning smelt in the shallow margins of the lake. Its body condition starts to improve much more rapidly than was the case while it lived in the river. By March/April it is fully recovered and is again a very worthy prize for Taupo anglers. The only clues that the fish is a **previous spawner** are the slightly leaner appearance than its maiden cousins and the tell tale scar tissue on the lower edge of the tail. From this point on, most of the growth value of food eaten goes into the development of the reproductive products rather than overall body condition and later that winter, the fish is ready to repeat the spawning cycle. This need to put all the energy from their food into firstly recovering from spawning and then preparing for their next spawning means there is little left for growth which is why Taupo trout generally don't grow much more after their first spawning.

So, there we have a summary of the significant events in a Taupo trout life cycle and the changes the fish goes through as a result of these events. In most trout fisheries, all spawning adults will do their thing at roughly the same time over about a four month period but with most of it occurring over perhaps a two month period within that. This makes it a simple matter for anglers to target and catch prime quality fish by choosing the appropriate time of the year to fish. For example, in the Lake Otamangakau fishery, the brown trout commence

spawning in April, peak in May/June and finish in July. The rainbows start in May, peak in June/July and its all over by the end of August. Therefore, all fish caught from mid summer through to the end of May when the season closes can be expected to be in top condition but conversely on the 1 October when the next season opens, all adult fish that spawned will be mending kelts and in relatively poor condition. The significance is that anglers will enhance their chances of consistently catching high quality fish or very poor fish according to the time of year that they fish there. Not so in Lake Taupo and its inflowing rivers. While there is a peak in the spawning runs and in the last few years this has been around August/September and even October, the reality is that Taupo rainbows are spawning all year round. High densities of kelts can be expected in the rivers from August through until Christmas and in the lake, primarily around the margins, from November to March. But the reality again is that these poor conditioned fish could be encountered at any time. Because they are hungry they are easy to catch and because they are mixed in with the prime fish that anglers normally target, Taupo anglers are constantly faced with choices on what to keep.

Catching poor fish

We can see from this discussion that the scene is set for kelts to be caught in significant numbers and this is indeed what happens. If we now consider the overall fishing experience of Taupo anglers it is understandable why so many poor conditioned fish are kept.

*Spot the difference
Photo: Rob McLay*



Over 80% of the people that fish here are visitors and a majority of these have only fished the Taupo waters for four years or less. In our surveys we encounter many anglers who are trout fishing for the first time or who are first time visitors from elsewhere in New Zealand or overseas. These circumstances mean that there is a significant number of anglers who, because of limited previous opportunity and/or experience have caught very few fish, and so when they do get one, it is a significant event for them.

There is a bit of the "hunter gatherer" in most of us that fish and part of this is an innate compulsion to take something won from our outdoor endeavours home to share with family or friends. This is especially so for novice anglers or those who for whatever reason have not had much prior luck. Returning home with a fish in the bag is tangible proof to sceptical loved ones that the game is being mastered. Often on our surveys we meet anglers who have caught the biggest fish of their life so far and proudly present their "trophy" for us to weigh. We meet anglers with fish on the bank who comment that they wanted one for a friend or to smoke or for tea and so on, or simply that they kept the first fish caught because the fishing had been hard and it seemed likely it might be the only fish of the day. These are all worthy objectives and excellent outcomes. For most anglers, capping off all of the anticipation and effort with a prize in the bag is intensely satisfying and is what draws them back again and again to their favourite fishing spots. However, if the prize in the bag happens to be a kelt, the proud angler will almost certainly regret taking it at some later time, especially if an attempt is made to turn it into a meal of some sort.

Kelts, whether they be recently spawned or in the process of mending, do not eat well regardless of how they are processed. The condition of a fish will be immediately apparent when it is opened up for cleaning. There is no visible fat in the body cavity and the flesh is white and insipid looking. If you try and eat it, it will taste as bad as it looks. A good conditioned Taupo fish is fat and oily when you open it up. The flesh is a rich orange to red colour caused by the diet of fish (smelt) and crustacea (koura) and they taste more like a sea reared salmon than anything else.



A close look at the tail will provide clues on whether the fish is a maiden or has spawned.
Photos: Rob McLay

We often hear anglers with a poor conditioned fish on the bank trying to salvage something from the situation by saying "never mind, it will smoke up alright". Sorry folks, but it will not. A poor fish will become a poor product regardless of what you do with it. Most commercial smokehouses will reject such fish because they know this and are understandably reluctant to risk their reputations.

How to tell the difference


So, how do you tell the difference between good and poor condition at the time you land the fish? The first clue actually becomes apparent immediately after hook up and

before the fish is landed. If the fish fights lethargically and comes ashore or to the boat with little resistance, you should suspect that you have hooked a recently spawned kelt. In the rivers, female fish that are gravid with eggs and close to spawning will often behave the same way when hooked but the visual difference between these and kelts is reasonably obvious with the pre-spawner appearing exceedingly fat for its length and with a bloated look about it.

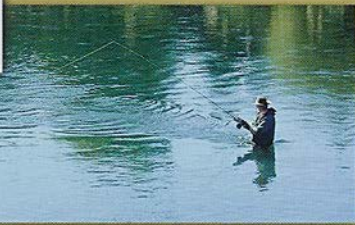
The most significant clue is how the fish looks when landed. If some time has elapsed since it spawned, it is likely to appear healthy and bright in colour but it will be visibly thin for

its length and with a hollow gutted look about it. If there is still doubt, check the lower edge of the tail. If the fish has spawned there will invariably be some deformity and scaring evident caused by abrasion from the streambed gravels when the fish was on its spawning grounds. Occasionally it may be almost impossible to tell the difference between a very well mended kelt and a maiden but at that point both will be very good eating anyway.

There is little benefit to be obtained in keeping a kelt, except perhaps for the family cat, the best thing to do is to handle the fish with care to maximise its chance of survival and release it. We have seen that kelts can recover to again provide worthwhile fishing opportunities and valuable spawning. From time to time, previous



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Three fish - which one would you keep?

Photo: Rob McLay

Should I keep it or release it? Stephen Roddis of Snells Beach, October 2005

Photo: Callum Bourke

spawners are largely responsible for sustaining good fishing when the numbers of maiden fish are lower than normal as a consequence of natural events such as major floods or volcanic eruption as was experienced in the mid '90s. In the photo above, the top fish is a kelt and the difference in condition from the lower two is easy to see when they are placed side by side like this. The middle fish is a maiden and the lower fish is a recovered previous spawner and the difference between these two is more subtle and not so easy to spot. The previous spawner is slightly leaner for its length than the maiden and even without the photo being close up, the abrasion on the lower edge of the tail from previous spawning activity can be seen. Which fish would I keep? The top fish doesn't

warrant any consideration at all. Either of the lower two would make a fine presentation on anyone's table but if I was forced to choose, I would lean toward the lower fish, the previous spawner. This is because the maiden in this photo is very close to spawning as evidenced by the somewhat bloated look in the front end of the belly and the papilla through which the eggs will pass protruding from its vent. In this condition the muscle tissue will be just commencing to become a little softer and washed out in colour as the final development of the eggs occurs. The previous spawner on the other hand looks to be still some time away from spawning and therefore the flesh will be a slightly better proposition for eating.

Hopefully after reading this, you may have a better idea of what to look for when deciding to take or release a fish based on its condition. As fishery managers, one of our primary objectives is to provide a resource and fishing experience that anglers are happy with. If an angler derives a great deal of excitement and satisfaction for whatever reason from catching and taking a kelt, then good on them. Indeed, in a literal sense, our objective of having a happy angler is met in this case. All we would say though is that it is not necessary to remain contented with inferior quality fish, it is just a matter of learning the difference between these and the prime specimens and then being selective in what gets taken home. However to make the choices, first the fish have to be caught and in numbers so, get into them and good luck.



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- One piece die-cast aluminium frame
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Rod: Beastmaster 5'8" Baitcaster

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NASTY ALGA CONTINUES TO SPREAD

by John Gibbs

Didymo mats carpeting the bed of the Upper Buller River.

Photo: Biosecurity NZ

John is the Fishery Area Manager and has fished Lake Taupo since the 1950s, with a working involvement with the fishery since 1964

A moderate coating of Didymo on a Waitai River rock

Photo: Biosecurity NZ

Biosecurity New Zealand have announced the discovery of the invasive river alga *Didymosphenia geminata*, more commonly known as didymo or "rock snot", in a total of 8 rivers in the South Island. Originally known only from Southland, didymo has been confirmed in parts of Otago and Nelson.

The implications for anglers from the spread of this nasty plant are not good. It has the potential to affect the production of trout in rivers by smothering the gravels which provide homes for the aquatic insects on which the fish feed. This will reduce trout growth and survival and ultimately the numbers of adult fish available for anglers to catch. As well, when it "blooms" or forms dense colonies, didymo will make most forms of angling difficult as it entangles lines and lures, both from the fixed mats on the river beds and from material drifting in the water. An indication of the seriousness with which Fish and Game NZ views this pest is that they have closed fishing in the Mararoa and

Waijau rivers and are seeking a similar closure in the Buller River. Additionally, a special permit system is being introduced for Fiordland rivers which requires mandatory gear cleaning for anglers fishing there.

A preliminary survey by Biosecurity NZ has found no didymo in the North Island and there is some hope of preventing it establishing here if anglers and other river users are fastidious in following the check/clean/dry procedures in the fact sheet (see opposite). Because there are no effective catchment wide control methods known for this alga it could be a long time, if ever, before it can be controlled. So containment seems to be the best option in the short term.

The message is pretty clear from the South Island experience that didymo is likely to be spread before its presence has been recognised. Anglers should not assume that didymo is not present in their river just because it hasn't been reported. Instead, act as if it was present and be vigilant in ensuring you thoroughly check, disinfect and dry all fishing gear before using it in another catchment. Finally, report any suspicious algae to Biosecurity NZ or the local regional council. DOC is assisting Biosecurity NZ in the distribution of information kits to all Taupo fishing licence holders, primarily through our licence agents, but also through DOC offices, angling clubs, fishing guides and visitor centres. If you have already bought your current licence and would like a kit, please contact Petrina Francis at our Turangi office (phone 07-386 9259, email pfrancis@doc.govt.nz), for fishery-related information check <http://www.doc.govt.nz/Explore/Hunting-and-Fishing/Taupo/Fishery/014-Didymo.asp>.



DON'T SPREAD DIDYMO



Background

Didymosphenia geminata (Didymo) was identified in October 2004 in the lower Waiau and Mararoa Rivers in Southland. In September 2005 multiple finds were made including the upper reaches of the Buller River in the Tasman District and the Hawea River in the Otago District. Didymo has the potential to establish in many New Zealand rivers.

Its arrival in New Zealand is the first recorded occurrence in the southern hemisphere. Its natural distribution is the northern part of the northern hemisphere.

Didymo is not considered a significant human health risk.

Description

Didymo is a freshwater diatom (type of alga). It can form massive blooms on the bottoms of streams, rivers and occasionally on lake edges where there is wave action.

The alga attaches itself to the streambed by stalks. These stalks can form a thick brown mat that smother rocks, submerged plants and other materials. Established mats form flowing streamers that can turn white at their ends and look similar to tissue paper.

Although the algae appears slimy, it feels like wet cotton wool.

Stop the spread

Didymo is made up of cells that cannot be seen with the naked eye until large colonies form. It only takes one of these cells to survive and be transported to a nearby waterway for Didymo to spread. Didymo cells thrive in freshwater and if you are cleaning with freshwater you are helping to keep them alive.

Didymo is an unwanted organism under the Biosecurity Act 1993. Under the Act those knowingly spreading an unwanted organism can be liable for up to five years' imprisonment and/or a \$100,000 fine.

To ensure you do not spread Didymo, wherever possible restrict equipment, boats, clothing and other items for exclusive use in a single waterway.

If you are moving items between waterways you must:

1. **Inspect:** Before leaving the river, remove all obvious clumps of algae and look for hidden clumps. Leave them at the affected site. If you find any later, do not wash them down drains. Treat them with the approved cleaning methods below, dry them and put them in a rubbish bin.
2. **Clean:** Soak and scrub all items for at least one minute in either, hot (60°C) water, a two percent solution of household bleach or a five percent solution of salt, nappy cleaner, antiseptic hand cleaner or dishwashing detergent. A two percent solution is 200ml, a five percent solution is 500ml (two large cups), with water added to make 10 litres.
3. **Dry:** If cleaning is not practical (i.e. livestock), after the item is completely dry to touch, wait an additional 48 hours before contact or use in any other waterway.

Fish, plants, rocks and other river items should not be moved between waterways.



THE THREAT



Didymo is an invasive species that can form massive blooms. Thick growths can adversely affect freshwater fish, plant and invertebrate species by reducing the number of suitable habitats. Aesthetic impacts to river users are high.

If you require more information please visit:

www.biosecurity.govt.nz/didymo

To report a suspected find of Didymo please call 0800 80 99 66

October 2005



**BIOSECURITY
NEW ZEALAND**



HARVEST SURVEY AT TAUPO WELL UNDERWAY

by Rob Hood

Above: Don't be surprised if you are met at the boat ramp this summer by one of our survey interviewers. Here Dave Lebdorf gathers information from a couple of anglers who have been fishing on the lake.

Photo: Dave Hart

As reported in the March issue of *Target Taupo* (issue 48) we are undertaking a survey of angling harvest throughout this fishing season. Information collected from this survey will provide an estimate of the number of trout caught and taken each year from the Taupo fishery by anglers.

The survey is well underway. On the rivers we have conducted over 750 individual interviews and 45 aerial counts to date. On Lake Taupo we have completed 30 aerial counts and interviewed anglers on over 250 boats. Lake Taupo charter boat operators are also assisting with the survey and an identification sticker on their boats enables us to count them separately from the air. At the end of each survey day the operators are then phoned and asked for their catch information.

Throughout the summer, Department of Conservation staff will continue with the survey. There is a high probability, given the number of aerial counts being undertaken and the number of boat ramp interviews being conducted, that at some stage you will either see a light aircraft flying overhead conducting the counts or you will be approached by one of our staff at the boat ramps when you are returning from your outing. Please answer the questions they ask you about your days fishing. The information gathered, even if it seems minor, is important and will give us a more accurate assessment at the end of the season of the total angling harvest of trout. This information will, in turn, be used by fishery managers to ensure that the harvest is managed at a level where it does not threaten the sustainability of the wild fishery.

Two of the more noteworthy 'senior citizens' at Waipā trap, Ranger Norrie Ewing with brown female JO 886 on 2 August 2005.

Photo: Rob Hood



by Rob Hood

Last year we reported a tagged female brown trout had gone through the trap for the sixth time (*Taupo* Issue 47, p24). We stated at the end of the article "while it gets less likely each year, it will be interesting to see if she reappears next year!" Not only has she returned again, but did so on the same date! On 2 August, brown female JO 886 once again beat the odds and returned to spawn (see photo). Ranger Norrie Ewing was on duty at the Waipā trap and recorded her weight as 2.80kg. When going through the trap last year, her weight was recorded as only 2.25kg, so she had recovered well since last year. She obviously likes all the attention because on 11 October she was recaptured yet again, this time by Dave Hart on her way back downstream after having spent 70 days spawning above the trap. Another noteworthy female brown trout was caught on 12 August by Ranger Callum Bourke. This fish was 660mm in length and weighed 3.35kg. Her fin clips show she had been through the trap to spawn every year since 1998. This means she is likely to be 10 years old and spawning for the eighth time! Considering her age, she was still in remarkable condition.

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● OutBound lines are available in line weights 7-10 in Intermediate, Type 3, Type 6 and Type 8 density compensated sinking heads.

Rio's NEW OutBound lines are ideal for distance casting at lake stream mouths, deep drop-offs at river deltas or powerful fast flowing rivers.



Distributed in New Zealand by Tight Lines Ltd. www.tightlines.co.nz

SUMMER LAKE SEMINARS

We are again holding two summer angling seminars over the holiday period. These popular seminars are designed to help anglers learn more about the Taupo trout fishery and how to catch trout successfully on Lake Taupo. Unfortunately, last year the seminars were cancelled due to poor weather. To try to avoid this same scenario again this year, we have two dates for each seminar:

KINLOCH MARINA RESERVE

Wednesday 28 December 2005,
10am – 12 noon


Alternative date if cancelled:
Thursday 29 December 2005

OMORI RESERVE

Friday 30 December 2005,
10am – 12 noon

Alternative date if cancelled:
Saturday 31 December 2005

The seminars are free, and held outdoors. They are an excellent opportunity for holiday anglers or those new to fishing at Taupo to pick up tips from the fishery team on how to fish the lake. The seminars cover basic boat fishing methods, the life cycle of trout, how seasonal changes and temperature can affect where and when fish are found in the lake, simple rig setups, how to release trout carefully, and key angling and boating regulations. Don't miss the seminars this year! Just remember a chair, drink, sunscreen and hat. If the weather is doubtful and you would like to check if the seminar is being held closer to the time, please call our 24 hour Duty Officer mobile 027 290 7758 to find out more. **WE LOOK FORWARD TO SEEING YOU THERE!**

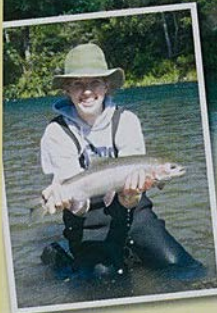


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TARGET TAUPO is 50!

by John Gibbs

This is the 50th issue of *Target Taupo*. The occasion is a real milestone for the Taupo Fishery Area team and provides an opportunity to look at just how the magazine has evolved in the last 46 years. Born only two years after the formation of the Department of Conservation, *Target Taupo* started as a modest 27 page A5 black and white publication in July 1989. It has been published three times a year since then, but has undergone many changes.

THE CONCEPT

The formation of DOC in 1987 brought together two agencies, the NZ Wildlife Service managing the Taupo fishery and the NZ Forest Service, managing the Kaimatawa Ranges and its sika deer herd. In those days DOC also managed game bird hunting, prior to the formation of fish and game councils

from the old acclimatisation societies. The original DOC structure established the Taupo District office under District Conservator Kevin O'Connor. My team managed the Taupo trout fishery and recreational hunting came under the wing of Cam Speedy.

The Taupo fishery and the deer hunting opportunities of the Kaimatawa are renowned throughout the country. They attract scores of thousands of anglers and hunters, most of whom live outside the Tongariro-Taupo Conservancy. Communication with such widely scattered groups is virtually impossible through traditional media. *Target Taupo* started from a recognised need to provide information for and seek feedback from the anglers and hunters who enjoy the region's outdoor resources.

We were clear from the outset that we were not competing with the commercial fishing and hunting magazines, so tried to steer

All the issues of *Target Taupo*, including the very first from 1989 and the most recent, issue 49 July 2005
Photo: Petrina Francis





The old and new: original co-editor Glenn Maclean and current editor Patrina Francis. Photo: John Gibbs

clear of the "where to go and how to do it" type of article. Rather, *Target* was intended to be more of a newsletter and information bulletin. We consciously decided to have most content written by our own staff to provide a unique and authentic look and feel from the managers of the resources. In early 1989 Glenn Maclean and Cam Speedy were tasked with the production of this publication. Choosing the title was the first hurdle and, recognising the dual topics, the regional focus and the unique content, *Target Taupo* seemed the logical choice.

FIRST STEPS

At the time, Glenn Maclean was the technical specialist for the fishery team and Cam Speedy was Conservation Officer Game Management. While neither had any previous popular writing or editorial experience, both were well qualified scientifically in their fields of aquatic and terrestrial ecology and, most importantly, were avid and experienced anglers and hunters. They wrote most of the earlier editions, with lesser contributions from myself and other members of our teams.

SO MUCH TO WRITE ABOUT!

Early issues covered a huge range of topics. These have included seasonal summaries of hunting and fishing prospects and results, progress from monitoring and research projects, how resources are managed and why, developments in fishing and hunting tactics and opportunities, stories about technical and policy issues and brief biographies of new staff. Despite our fears of eventually running out of things to write about, there always seems to be something new or interesting, or a durable subject that people want to hear about. One thing we have realised is that with the turnover in numbers of anglers especially, there are numerous topics about the management of the fishery that we need to repeat quite regularly.



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THIS CATCH HAS A **STING** IN IT



by John Gibbs

Detective Craig Bolton (left) and Detective Sergeant Neale Saunders (right) beside the warning sign kindly donated by the Turangi Police for the Tongariro National Trout Centre carpark. Photo: John Gibbs

Turangi Police recently conducted a very successful operation following a series of thefts from cars in the new anglers' carpark at the Taurangi-Taupo River. As a result, a person is now facing charges and several anglers have been reunited with their missing property.

In early September Police received reports of a number of break-ins and thefts from cars at the Oruatua carpark off SH 1. These reports indicated a pattern of activity in the afternoons and a sting operation was mounted at the site.

Detective Sergeant Neale Saunders and Detective Craig Bolton parked and locked a car with a wallet visible in the front console and concealed themselves nearby. Just 53 minutes later a man approached the car put on a pair of gloves and proceeded to break the front passenger window. He rummaged through the car, took the wallet and, as he was

leaving was arrested by the watching officers. Subsequent enquiries and search warrants of the alleged offender and his associates resulted in recovery of most of the property stolen from the earlier thefts, including a \$7,000 laptop computer, overnight bags of clothing and other personal items. The alleged offender is now facing a number of charges in the district court.

Thefts from cars sometimes plague our district, which is such a popular tourist destination, and seems to come and go in cycles. It is a real deterrent for many visitors who would otherwise love to experience our walkways, tramping tracks and fishing locations. Even the Tongariro National Trout Centre is not immune and a small number of break-ins have been reported this year. As a result, new security measures have been installed, including warning signs and a surveillance camera.

With the vehicle windows intact this angler was much more fortunate than an earlier visitor to the Tauwanga-Tampe carpark.

Photo: John Gibbs



It's great to see the Police taking such an active interest in this problem and the success that they are having. There is sometimes a perception that investigating car crime is relatively low on their priorities, given their limited resources. However they do take it seriously and have provided warning signs for popular tourist carparks around the district.

Neale and Craig say that there are a number of lessons from their experiences and they promote several messages to visiting anglers. These precautions are just as relevant to your accommodation, especially if staying in lodges or motels.

Local police frequently recover valuable stolen property during enquiries for other matters. Often they are unable to trace the owner either because the theft hasn't been reported or because the property has no identifying markings. It's as simple as putting

your name on your \$500 fly rod or Goretex parka. Always report break-ins and thefts, as they can establish patterns of activity and allow laying of a greater range of charges against offenders, leading to more severe penalties. Because serial thefts from cars are often the work of a single individual or group working together, successful prosecutions take these people out of circulation and the crimes drop.

If you are unfortunate enough to have property stolen from your car, take a look around the vicinity before leaving. Thieves frequently discard property nearby - within 50 to 100 metres - after rummaging through bags, or leave it for later collection when there are fewer people around.

Car crime is an unfortunate and distressing occurrence in this district, as in others with high tourist numbers. If you follow these rules you'll not only be doing your bit to reduce its incidence, but also have a much better chance of not becoming a victim yourself.

Lock it or Lose it! DOC has placed these warning signs in many fishing and tramping carparks in the Tongariro-Tampe conservancy.

Photo: John Gibbs

Anglers Access →

WARNING

Lock it or Lose it!

- Get theft occurs when you encourage it. Always lock your car securely. Close all windows.
- Always lock your boot. Take valuables with you or keep them out of sight.

- Never leave valuable items in your car, even if they are out of sight, and certainly not in view.
- Always lock your car, even if leaving it for only a few minutes.
- Ensure your property is identifiable and traceable to you in the event of it being found or recovered.
- Promptly report thefts and break-ins.
- Report suspicious persons or vehicles at fishing and tramping carparks.

SO YOU THINK SOMEONE IS FISHING ILLEGALLY?

by *Petrina Francis*
Petrina is our
Programme Manager
Community Relations

It's a beautiful morning and you are standing on the riverbank casting quietly into your favourite pool hoping to catch dinner. You are reminiscing about how wonderful it is not to have to put up with those annoying people you deal with at work, and deciding you should have taken early retirement when it was offered to you, when you notice another angler on the opposite bank also fishing. Down at his feet are a couple of shiny fat trout that he has obviously caught that morning. To your disbelief, his line tightens and you watch as he brings in yet another good trout, knocks it on the head and places it by the other two. Well, that's him for today, you think as you retrieve your line and wonder why you don't seem to have the flavour-of-the-day fly. Perhaps you will have a chance now he has his limit and goes. It does, cross your mind that maybe the other side of the river is a better proposition? But to your dismay, and horror, he keeps fishing! Yes, the line goes back out and in no time at all, another trout is on its way to being put on the bank.

Your mind is screaming, "but that's illegal! He has his three nice fish, and now he has a fourth!"

WHAT DO YOU DO?

Unfortunately this is not a rare occurrence, and yes, you are right in your understanding that to keep fishing after having caught and kept three fish is illegal. For some people the automatic reaction is to try and do something about it themselves. Perhaps you should yell at this person, or go over to the other side of the river and give them a piece of your mind?

We strongly urge anglers ~~not to take the situation into their own hands~~. The best course of action is to notify the Taupo Fishery Area team as quickly as possible. We have an on-call 24 hour Duty Officer mobile 027 290 7758 specifically so we can try and catch those fishing illegally in the act. If we have the information promptly, we have a much better chance of apprehending offenders. Also, our staff have been trained in law enforcement work and are able to enlist police support if necessary.

You can make a valuable contribution simply by contacting us immediately and passing on what you have seen. The Duty Officer mobile number is on your licence for quick reference, or why not programme the number into your cellphone. Let the fishery team know what is happening as quickly as possible, and there is a much higher probability these people will be dealt with.

Just think how satisfying it will be, after having passed this information on to the fishery team, to resume fishing your pool as though you haven't noticed a thing and watch as the rangers turn up and catch them in the act!

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550 TROUT LIFTED ABOVE HB DAM

by Rob Hood and
Mark Venman

In the July issue of *Target Taupo*, (Issue 49) we reported the Hinemaiaia trap and transfer project to lift spawning fish above the HB dam was occurring again this winter. We undertake this project on behalf of the power scheme owners TrustPower Ltd. The intent of this project is to allow fish from Lake Taupo to access the Pahikohuru and Kakapo spawning streams, which they used prior to the construction of the HB dam in 1965.

The trap and transfer component was successfully completed mid September. Over the 65 days of trapping a total of 629 trout were

captured, of which 547 were transferred and released into HB dam. The objective is to transfer at least 200 fish each year so we are very pleased with this result. These fish were all trapped in the bypass just downstream of the dam where their spawning success would be very limited because of a lack of suitable spawning sites not already fully occupied by earlier trout. The remainder of the trout trapped were returned to the bypass channel as they had already spawned, were immature or were used for stripping eggs from.

It is obvious from the table that there was a significant increase in the number of trout trapped in the latter two months of the operation. In August the increase was largely due to significant rainfall (19mm) on the 24th. The high numbers caught in September occurred when TrustPower's resource consent requirements resulted in spill from HB dam into the bypass during a long period of dry weather.

The average size of fish transferred above the dam was 530mm and 1.80kg. The largest trout transferred was a rainbow male 680mm in length which weighed 3.55kg.

Over the next couple of months we will be continuing counts of spawning trout in the Pahikohuru and Kakapo streams. Early indications are that the transfer appears to be successful as a number of trout have already been seen spawning in these streams along with newly hatched fry. These streams were also supplemented in early November with an additional 20,000 fry reared in the hatchery from eggs collected from Hinemaiaia adults. It is hoped that this effort to provide trout access to the spawning grounds and juvenile rearing areas in HB Lake will ultimately result in greater numbers of adult trout in Lake Taupo and the Hinemaiaia River. With a greater surplus of spawning fish and more area for them to utilise, this would then open up options to increase angling opportunity in the Hinemaiaia River perhaps through changes to the season timing or areas of water open to fishing.

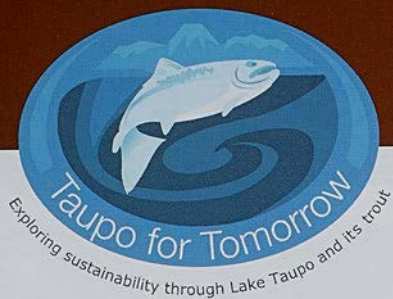
Trapping period	Number of days trapping	Number of trout transferred	Average number of trout transferred per day
June 9th - 21st	13	14	1
July 5th - 18th	14	31	2
Aug 8th - 31st	24	144	6
Sep 1st - 14th	14	358	26

Table: Details of the Hinemaiaia trap operation 2005



Spawning trout in the lower Pahikohuru Stream, October 2005.

Photo: Callum Bourke



TAUPO FOR TOM

by *Petrina Francis*

The new education programme, Taupo for Tomorrow, at the Tongariro National Trout Centre is gaining a momentum all of its own as development continues and more and more school groups take part.

It is great to see children participating in Option 1 of the programme, which is a guided tour around the centre and teaches the value of trout, their lifecycle, what a fishery is, and preliminary discussions on resource use. Thirty schools from around the North Island have participated in this programme since May. Thea DePetris, the Educator developing the programme, is now designing Option 2, a more comprehensive lesson with activities that involve water quality testing, trout ecology, a study of resource use using the Tongariro River as an example, and discussions on sustainability of resources such as the trout fishery and the freshwater environment.

Recently Taupo District Council (TDC) also came on board with funding to add another dimension to the programme. The Council are keen for young people to learn about stormwater education and have a catch-phrase "what goes in the grate, ends up in the lake". This message fits nicely with the programme's current framework and will help to emphasise how important good water quality is to the whole freshwater environment at Taupo, including the trout fishery. The key is to try and change behaviour and attitude, and develop a respect for the environment and what it supports.

The funding from TDC will cover the transportation costs to the trout centre for every Year 6 student from 13 schools in the Taupo District. This means over 700 students (31 classes) will be able to participate in a programme next year at the centre, and come away having learnt valuable lessons about the Taupo trout fishery and the importance of looking after the environment in a sustainable way so that it is there for future generations to enjoy.

Taupo-Nui-A-Tia College student Adrienne Viljoen with two beanbags she designed. The class made 35 of these colourful beanbags for the new classroom, decorating them with graphics depicting what lives in Lake Taupo and the environment. Photo: Taupo Times

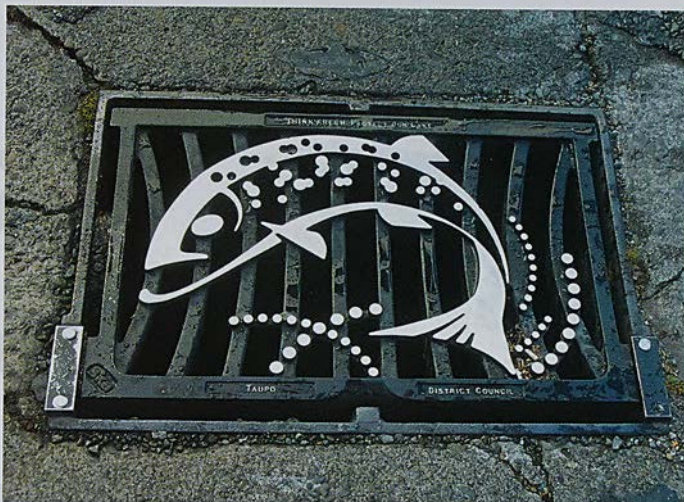
The education programme is made possible through a partnership between the Department of Conservation, Tongariro National Trout Centre Society and the primary sponsor, Genesis Energy.

TOMORROW GAINS MOMENTUM



Stormwater education will also be incorporated into the programme at the trout centre, to teach young people "what goes in the grate, ends up in the lake".

Photo: Taupo District Council



In a world which is only just beginning to realise that humans are not living in a sustainable manner, it is vitally important that we reach young New Zealanders, who are the decision-makers of the future, with messages about the sustainable use of resources. We need to also encourage young people to get into the outdoors and enjoy the recreational opportunity fishing provides, while at the same time protecting and managing water and trout as resources that are vital to the Taupo region.

2006 will be a big year for Taupo for Tomorrow. Not only will these 13 local

schools be participating, as well as a number of other North Island schools, but Thea will also be developing Option 3 of the programme. This is aimed at secondary students, and it is intended to include NCEA case studies based around the trout fishery and the Tongariro River. Also, a new website for the programme will be created, enabling schools all around New Zealand to tap into the programme no matter where they are geographically located.

We look forward to updating you on the progress with this in future issues of *Target Taupo*.

FOR FURTHER INFORMATION ABOUT TAUPO FOR TOMORROW, PLEASE CONTACT:

Thea DePetris, Educator

**Department of Conservation, Taupo Fishery Area
Ph: (07) 386 9246 or email: tdepetris@doc.govt.nz**



**Tongariro
National Trout
Centre Society**





The hole that had developed in this popular part of the Hinemaiaia River track was a serious hazard for unsuspecting anglers and walkers, especially those leaving the river just on bank!

Photo: Callum Bourke

HOLE IN THE HINEMAIAIA TRACK

*by Callum Bourke
Callum has recently joined us as a Ranger, after working as a trap operator over recent winters.*

*The hole was converted into steps for anglers to use for access to the river, and rails positioned on either side. Although only a small task, this repair work will help to ensure anglers have a safe and enjoyable fishing visit to the river.
Photos: Callum Bourke*

The Hinemaiaia River, like many Taupo rivers, is susceptible to bank erosion. Often this erosion is caused initially by flooding which can weaken parts of the bank causing them to slip or collapse in, often affecting our adjacent angling tracks. Part of the work the fishery team does is to maintain angling access tracks to a standard that is safe for public use. Recently a large hole developed on a popular section of the Hinemaiaia track approximately 100 metres below the main road bridge, that had the potential to cause a nasty injury to an unsuspecting angler or walker. The erosion was probably caused initially from bank collapse, but was then exacerbated by anglers using it as access to a popular run in the river. The hazard was brought to our attention by the Hinemaiaia River Care Committee, and knowing how popular this river is for winter fishing, the team realised it needed to be dealt with quickly. So Rob Kirkwood, Callum Bourke and Roy Baker were dispatched to remedy the problem. The hole was converted into a series of steps leading down into the stream, enabling easier access to this popular stretch of water. Railings were then positioned on either side of the steps to keep anglers and walkers away from the edges and out of harms way. Feedback on the condition of popular fishing tracks is appreciated, as often damage can happen quickly, as was the case in this instance and may not be detected by our team. Please pass any useful information on to Erol Cudby, Programme Manager Visitor Assets, Taupo Fishery Area, either via phone: (07) 386 8607 or email: ecudby@dof.govt.nz





PROMISING PROSPECTS FOR LAKE OTAMANGAKAU

by Mark Vennum

Mark is our Technical Support Officer. In this article he reviews recent monitoring of the Lake Otamangakau fishery.

Photo above: Rob McLay

This winter we completed the twelfth consecutive trapping season of the Te Whaiiau Stream. The Papakai Stream was also trapped for the tenth successive year (see *Target Taupo*, issue 49). These are the only significant spawning streams of Lake Otamangakau, situated on the western slopes of Mount Tongariro. Rainbow and brown trout are trapped in both streams with the Te Whaiiau Stream accounting for the majority of the run. By trapping these two streams, we are able to measure nearly all of the mature fish from Lake Otamangakau, which allows us to get an accurate measure of the overall state and health of the trout population and identify trends over the years. Lake Otamangakau has a reputation for producing trophy sized trout although catching these large fish is often a different story! The secret to these trophy fish is that they live to an old age while continuing to grow each year. The trapping programme allows us to keep a close eye on the age structure of the population to ensure that current limits and angling practices are not excessively impacting on the likelihood of a fish surviving long enough to become a trophy.

Every day between 1 April and 26 August, any upstream fish caught in the Te Whaiiau trap were fin clipped, sexed, measured, weighed and released. A total of 2336 trout were processed along with 528 kelts (spent fish) moving back downstream. Over the 148 day period, staff handled an average of 20 fish each day. The highest number of spawners

processed on the one day occurred on 22 June when 113 fish were trapped following 20mm of rain. Fifty three kelts were also processed that day, taking the total to 166, and not including the 31 trout trapped in the Papakai Stream! Trap operator, Norrie Ewing, was certainly kept busy and noted in the logbook that he had "had enough for a while" after wrestling nearly 200 feisty trout for the day.

So the trapping operation was very successful, helped in part by the mild and dry winter this year. The Te Whaiiau trap was only flooded on one occasion during mid July, and the total rainfall was considerably less than the previous winter. This meant that we trapped continuously except for the 10 hours the trap was out of action while in flood on 15 July. By trapping kelts on their way back downstream we calculated the total size of the run (including those fish that bypassed the trap in flood) using the proportion of clipped kelts to adjust the number of upstream fish we had processed. This adjustment produced a total run of 2581 fish with some 245 trout finding a way past the trap while it was in flood for less than 10 hours!

SIZE OF THE RUN

Based on this adjusted run, the number of rainbow trout (1656) trapped during 2005 was the second highest recorded since trapping began behind the peak of 1800 rainbows recorded during 2001 (Figure 1). However, the number of brown trout record-

ed during 2005 has decreased slightly, though since 2000, numbers have essentially been stable at around 1,000 fish.

TIMING OF THE RUN

The drier winter overall this year meant that the run of rainbow trout was slightly later than recent years with June in particular, being drier than normal with just 112mm of rain. Rainbows ran between April and August with the run peaking during July produced 56%

of the total female run and 42% of the male run. The entire run of brown trout occurred between the months of April and July with May being the peak month for both sexes. Such a narrow period for spawning is typical of many trout populations but in complete contrast to the extended spawning which occurs in nearby Lake Taupo.

SIZE AND CONDITION

In comparison to 2004, the average length and weight of female rainbow trout (602mm & 2.8kg) was higher this year with a similar increase observed with males (623mm & 2.9kg). Such averages are approaching those recorded during the last peak in the trophy fishery 10 years ago (Figures 2 and 3).

Female brown trout averaged 583mm & 2.5kg and brown males 625mm & 2.9kg (Figures 4 and 5). Again these are as good as recorded since the peak in 1995 and 1996. Consistent with the large average size, a total of 20 trophy size trout (>4.54kg, 10lbs) were trapped during 2005 including one brown. The heaviest rainbow trout trapped was a 770mm long male weighing 5.55kg (12.2lbs) with a condition factor of 44. The overall percentage of rainbows trapped greater than 4.54kg in weight this year was 1.3% which was the second highest since 1996 (Table 1). The heaviest brown trout trapped was a female measuring 730mm and weighing 5.55kg with a condition factor of 51. The overall percentage of brown trout greater than 4.54kg trapped during 2005 was 0.2% and consistent with earlier years.

This winter 14% of rainbows weighed 3.6kg (8lb) or greater. There is therefore a significant number of larger fish that have the potential to gain trophy status if they recover from spawning this winter and continue to grow over the coming summer. However the fishery still has some way to go to match the actual numbers of trophy sized fish that were produced in 1995 and 1996.

The fact that the rainbow trout tend to grow to a larger size than the brown trout is an interesting contrast with Lake Taupo where the reverse occurs, despite the two rainbow trout populations being very similar genetically. This highlights the role that the environment and food plays in determining the characteristics of the fishery.

PAPAKAI TRAP

A similar pattern was observed at the Papakai Stream trap with browns being the

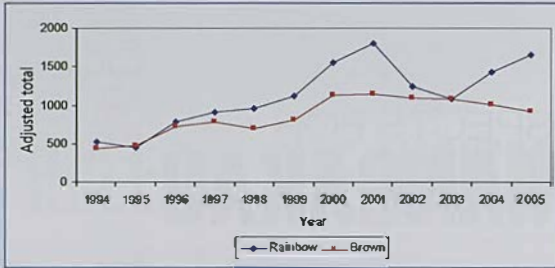


Figure 1: Adjusted totals for rainbow and brown trout through the Te Whaiti trap between 1994 and 2005.

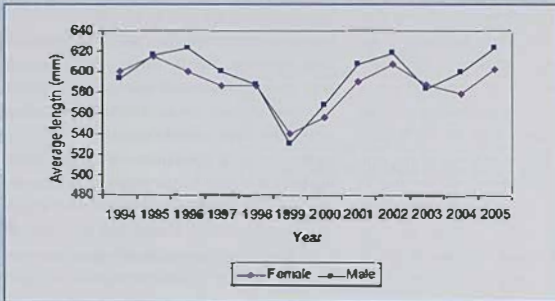


Figure 2: Average lengths of rainbow trout trapped in the Te Whaiti Stream since 1994.

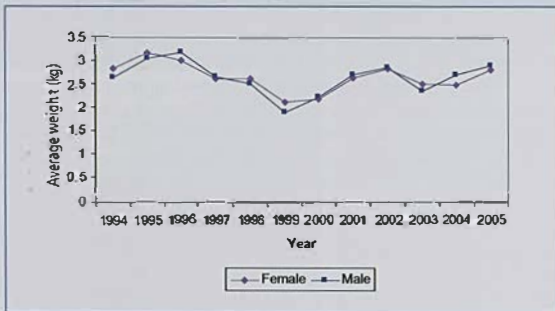


Figure 3: Average weights of rainbow trout trapped in the Te Whaiti Stream since 1994.



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models) the availability of half weight fly line sizes, two new tapers to help you identify the line and an exciting new Taper Guide called the Rock Bed. We've before has a fly line manufacturer made available fly lines designed by a hall and has really is. In order to be the most successful fly fisher and anglers, fly anglers will now be able to more precisely match their fly line with the conditions of a



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Taper: WF
Weights: WF4F, WF5F, WF6F, WF7F



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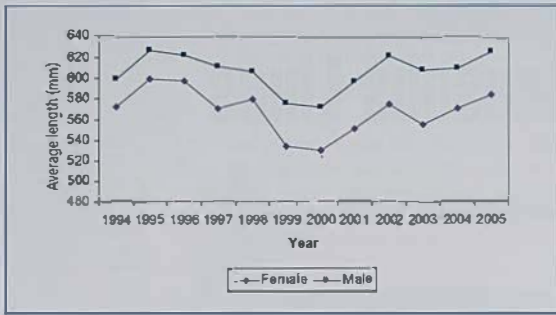


Figure 4: Average lengths of brown trout trapped in the Te Whaitan Stream between 1994 and 2005.

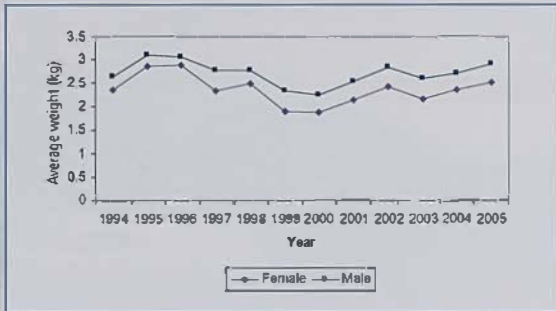


Figure 5: Average weights of brown trout trapped in the Te Whaitan Stream between 1994 and 2005.

longest and heaviest since 1997 averaging 609mm & 2.6kg. Rainbows followed a similar pattern averaging 614mm & 2.8kg. This winter produced a total run of 286 trout with the majority (94%) being brown trout. This run is down slightly on the 320 trapped during 2004 but similar to that of 2003.

ANGLER SURVEYS

The other significant techniques we use to monitor the Lake Otunangakau fishery are angler surveys and interviews with experienced anglers at the season end. Angler surveys allow us to estimate the catch rate and keep an eye on the harvest of trout from the lake. Interviews were mainly carried out during the peak fishing period between January and March but several interviews and licence checks were also con-

Table 1: Percentage and number of trout trapped (in excess of 454kg) since 1994

Species	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Rainbow	5.8	8.6	9.2	1	1	0.6	0.07	0.4	1.9	0.1	0.5	1.3
Brown	0.4	1.5	1.4	0.2	0.2	0	0.09	0	0.2	0.1	0	0.2
No. of 4.54kg fish	17	45	50	10	9	5	2	5	23	2	6	20

ducted on opening day, 1 October.

Overall, the catch rate was very good at 0.25 fish per hour (1 fish ever 4 hours) with almost 200 anglers being interviewed during this period. Anglers largely released their catch with only 13.3% keeping the fish. The 17 rainbows measured and weighed by staff averaged 577mm & 2.5kg which were slightly lighter on average than those trapped this winter. Only two browns were recorded and averaged 580mm & 2.6kg.

Data gathered from angler satisfaction surveys once the summer season had closed corresponded well with the data from our trapping programme and lake surveys. Experienced anglers rated the size and condition of rainbows the second highest out of the previous 5 summers behind last year's peak. They similarly rated the number of trophy trout caught as the next best to summer 2003/04. In contrast to our trapping programme, those anglers rated the number and size of browns caught as the second lowest out of the previous five summers although they did rate the quality of those browns that they did catch quite highly. Although low numbers of young fish were reported for last summer, anglers had a high catch rate scoring their success at 7.3 out of 10.

SUMMARY AND FISHING PREDICTIONS

A good 2004/05 summer season was predicted (*Target Tarepō*, Issue 47) based on the number and condition of fish trapped during the winter of 2004. With a further improvement in the number of fish through the trap this winter and especially the number of large fish, the fishing prospects for this summer look very promising. It just depends whether the fishery is already at its peak or will kick on further yet. Whichever, most trophy fish will still be hard earned, as is usual for this lake.

A WEEK IN THE MANAGEMENT OF THE TAUPO FISHERY

by Glenn Maclean

Have you ever wondered what is involved with managing the Taupo trout fishery, week by week? To help you understand the variety of tasks undertaken, we plucked a week out of September this year and wrote a diary highlighting some of the tasks done each day. It is by no means a complete summary of what was achieved that week. But it will give you some idea of the range of work undertaken in our role as managers of the Taupo fishery.

MONDAY

8.15am Fortnightly team meeting to catch up on various issues and plan up coming activities.

10.00am Dave and Pete Devlin from the conservancy office walk the proposed route for a new track from Admirals Pool to Never Fail Pool on the Tongariro River, modifying the alignment to avoid a flood prone area.

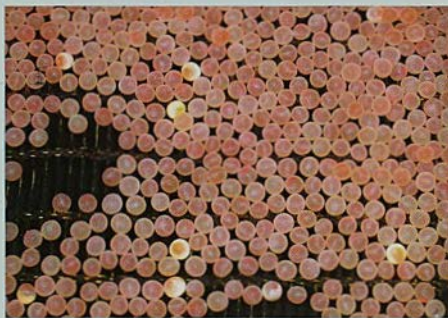
Rob and Bob walk for an hour into the upper Whitikau Stream then walk and dive 43km down stream counting the spawning fish. The 394 fish seen are consistent with counts in other streams indicating spawning is well underway. Many of the fish are recent arrivals indicating that the Whitikau Grotto is free of blockages and that trout are able to access this key spawning stream. It's a rush for Bob because he has to take over from Glenn manning the fish trap on the Hinemaitia River at 3pm.

Glenn has spent the weekend on the trap and made some further modifications to the trapping protocol to enable a single operator to better handle a large number of fish without needing assistance. Trialling this approach on Monday he has transferred nearly 50 fish into HB dam and is pleased with the outcome.

8.00pm Rob as the fishery duty officer contacts Bob on the Hinemaitia trap and Julie on the Waipa fish trap as part of the daily routine to check they are safely tucked in for the night.

Thea DePetris, Educator, talks to a group of students from Maungakarama School about the lifecycle of trout at the Tongariro National Trout Centre. Photo: Glenn Maclean





Top: John Gibbs & Petrina Francis shock eggs at the Tongariro National Trout Centre hatchery, by dropping them into a basket. This breaks the membrane of infertile eggs so that they can be removed. Photo: Thea DePetris
Below: Infertile eggs turn white and are easily sorted out from the healthy eggs. Photo: Thea DePetris

TUESDAY

8.00am Rob calls Bob and Julie to check how things are going. There were a couple of heat showers after dark which did nothing to the flows in the rivers but were enough to encourage a run of fish into each trap. The fish are getting to the point that they have to run and it is taking very little change in conditions to excite another run.

9.30am Dave, Petrina, Glenn and Mark meet with the hapu of Ngati Rongomai, Marae and representatives of the Department of Corrections and Environment Waikato on the banks of the Waioatoka River. We all share concerns about the impact of willows on aspects of the river and agree to work together to develop both an immediate and long term plan to improve the river environment. Another meeting is scheduled for the following Friday.

10.00am Thea hosts 26 children from Maungakaramca Primary School at the Tongariro National Trout Centre introducing them to the Taupo Fishery and the importance of looking after the aquatic environment.

11.00am John and Petrina shock trout eggs held at the Tongariro National Trout Centre by dropping them into a basket. This physical agitation breaks the membrane of the infertile eggs causing them to go white so they can be easily sorted and removed. The fry which hatch from these eggs will be released into the Pihikohuru and Kakapo streams above HB dam on the Hinemaitia River to help reestablish the spawning run in these streams.

1.00pm Carolyn and Harry spend several hours on monthly vehicle checks. With a large fleet of diesel vehicles and boats used by many different staff formal checks are essential to ensure that vehicles are roadworthy and that WOF's and mileage are current.

3.00pm Harry baits 24 minnow traps with a small portion of trout roe and then sets these overnight at 4 locations along the Tongariro and Whitiakau Rivers.

WEDNESDAY

8.00am Harry retrieves the minnow traps weighing and measuring each of the juvenile trout caught. These fish of between 50mm and 120mm long are the key to the future size of the trout population.

10.00am Callum, Mark and Dave drift dive a section of the Waimarino River to count spawning trout. It is a nice day but still cold work despite 7mm wetsuits and all the gear. In all 5 rivers are counted each month over the winter.

10.30am John and Petrina meet to discuss the possibilities of a fish stamp to help fund the development of the Tongariro National Trout Centre. Legal and practical issues would seem to rule this strategy out.

All day Michel continues his analysis of the data collected from the year long study of the movement of acoustically



Tania Greaves, licence administrator (left) and Carolyn Boers, Programme Manager Service prepare a fishing licence order

Photo: Glenn Maclean

tagged rainbow trout in Lake Taupo. With two million pieces of data it is a big job but the results are very enlightening with major management implications.

PM Rob, Dave and Callum check out known poaching spots along some of the eastern rivers. These are rapidly filling with spawning trout but there is no sign of any visits. This is consistent with recent years but a major change from 10 years ago when each of these spots had well trodden tracks by this stage of the winter.

THURSDAY

8.30am Programme Managers Petrina, Dave, Rob, Glenn and Carolyn meet with John to plan the next weeks activities. Carolyn then has the unenviable work of scheduling all the tasks into an effective weekly plan, organising the appropriate staff, vehicles and other resources.

9.00am Mark, Bob and Julie electric fish 5 sites along the Tongariro and Whaitikau rivers as part of routine monitoring of juvenile trout numbers. Moderate numbers of newly hatched fry are caught, the first progeny of

this winters spawning. It is noticeable that the growths of algae are unusually heavy for late winter which is another reflection of the lack of rain over recent months. Nevertheless conditions look great for the imminent peak in spawning activity.

10.00am Sid represents the department in court prosecuting a defended case of trout poaching. Harry takes the stand as a witness describing the events he saw. The Judge finds in the department's favour and the defendant is fined \$1050 plus court costs.

10.30am John, Glenn, landscape Architect Herwi Scheltus and Planner Rowena Cudby from the conservancy office meet with representatives of Turangitukua and Environment Waikato to discuss planned work to control willows in the lower Tongariro River and to remove debris islands forming in the main channel.

1.00pm Herwi and Petrina discuss the details of the contract to complete the renovation of the classroom at the Tongariro National Trout Centre. This classroom is the centre of the new education programme between Genesis Energy, the Tongariro National Trout Centre Society and us to promote trout fishing, the fishery, the need to look after the aquatic habitat and use natural resources wisely. In the long term the degradation of the aquatic habitat is the single biggest threat facing the Taupo Fishery and this programme under the direction of educator Thea DePetris is a huge step forward in shaping the attitudes of tomorrow's decision makers.

3.00pm Back from electric fishing, Mark prepares a media release on opening day for lakes Otamangakau and Kuratau. Petrina discusses an editorial change with Glenn and then distributes it to the media, angling clubs and local groups.

FRIDAY

9.00am Bob, Julie, Dave and Callum remove the Hinemaiaia fish trap and caravan after a successful season. Getting the cage and screens up the 20 metre bank to the vehicle taxes the new tripod and winch set up which will need to be further modified if we repeat the trapping next winter.

Friday is always a busy day for Tania taking and processing licence orders for the weekend.

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Perhaps the least glamorous aspect of what we do efficient fishing licence administration and financial reporting is fundamental to our success, totally funded as we are from licence revenue. John delivers the packages of licences to Taupo agents on the way home.

10.00am Petrina makes a public presentation to 80 people at REAP (Rural Education Activities Programme) in Taupo on the value of the fishery. Part of the Continuing Education programme this provides a great opportunity to raise community awareness of the importance of looking after the fishery and the lake and rivers that support it.

10.00am Glenn and Callum clamber up the Pahikohuru and Kakapo Streams to check how many spawning trout are present. These streams flow into Hā Lake on the Hinemaiaia and the intent of the trap and transfer programme is to re-establish the spawning run in these streams. 18 trout are seen, not a lot but it is still early in the run and twice as many as last year. The streams are narrow and deeply incised but the gravels look good. In a couple of weeks we will seed the streams with the fry currently rearing at the TRTC to further boost the production.

3.00pm Bob checks that all the details are in place for tomorrow's harvest stavey on the river including that each staff member is clear about when, where and what they have to do and has the appropriate data books and other equipment.

4.00pm Glenn and Herwi meet with consultants acting for a property developer to discuss how they plan to handle the stormwater runoff from the development. Agreement is reached on a suitable treatment.

8.15pm Rob as the fishery duty officer receives a call expressing concern over the actions of two people at the Waiotaka River Mouth who the caller suspects are preparing to set a net.

8.35pm Rob is standing quietly in the dark at the Waiotaka Mouth. The only people present fit the description given but their mind is clearly on other activities than poaching fish. After a few minutes the car starts and drives off and Rob makes sure with the night vision gear that they haven't left a net set in the lake. No cigar this time but always worth checking on.

SATURDAY

6.25am Mark starts interviewing anglers on the Tongariro River to get a measure of their angling success. This data combined with the aerial estimates of the total angling effort allows us to calculate the total number of fish caught over the day and eventually the season. In the past an excessive harvest has affected the quality of the fishery, particularly the winter river angling and it is essential we have accurate information. Mark goes until 2.25pm which is a long day when you are continuously talking to people. At least everyone is licensed and following the rules and there is no need for any compliance action.

Harry Hamilton sets a minnow trap on the Tongariro River.

Photo: Mark Venman



This article chose a week in September of this year. The people referred to were part of the Tonga fishery team at that time and were:

Dave Hart
Rob McIay (Rob)
Rob Hood (Bob)
Glenn Maclean
Julie Greaves
Purlina Francis
Mark Venman
Theda DePetris
John Gibbs
Cecilynn Poole
Harry Hamilton
Cathryn Bourke
Michel Dechuel
Sid Pinta
Doron Whyte

● on leave: Errol Cudby

6.40am Rob and Bob take to the air to count the number of anglers fishing on the eastern rivers. If you like flying it is great fun but not an activity for staff prone to feeling sick. 70 anglers are counted on the Tongariro but only 9 on each of the Tauranga-Taupo and Waitahanui Rivers

8.00am Sid arrives at the Tongariro National Trout Centre for the day. It's busy for 2 hours feeding fish, cleaning toilets, sweeping the underwater viewing chamber, clearing leaves off the trucks, clearing the trap and picking up rubbish before opening the gates to the public at 10am.

10.00am Contract interviewer Dave Lehndorf begins collecting catch data from anglers on the Tauranga-Taupo River continuing until 4pm.

11.30am Rob and Bob take off to complete a second aerial count of anglers on the rivers.

2.25pm Michel takes over from Mark interviewing anglers along the Tongariro until dark.

4.35pm Rob and Bob start the third aerial count of the day.

9.00pm The rain sets in and trainee ranger Doron Whyte faces a long night on the Waipa trap. As the flows build up the fish start to run and Doron is busy processing both the upstream spawners and the kelts moving back downstream. On top of this he needs to clean the trap regularly to remove the floating pumice and debris which would otherwise cause the trap to scour out. It is challenging work in the swirling waters and the rain and wind late at night.

SUNDAY

8.00am Doron makes contact with Rob as the duty officer. He has had a long night but as still raining and the fish are still running.

12.00pm Rob arrives at the trap with Julie who is to take over from Doron. Over the next few hours they work the trap continuously processing 96 upstream fish and 167 kelts. The rain continues and ultimately the stream beats them and overtops the trap. With nothing more that can be done they batten down the trap to minimise the risk of damage and pull out for the night. With the rain starting to break Rob and Julie will be back first thing tomorrow morning to try and re-instate the trap.

DON'T RUBBISH YOUR RIVERS

The following provided by Jared Goedhart at Sporting Life in Turangi says it very well.



A mess from only two pools. This doesn't include cans, bottles, cigarette butts, food wrappers and the like. Photo: Sporting Life, Turangi.

This pile of nylon was not pulled from the water; it was collected on the bank at the Reed and Bain Pools on the Tongariro River Culprits. I wonder who? I definitely can't lay blame on anyone else apart from anglers.

WHAT TO DO ... take it home with you. If you change your trace wrap the old one around your hand, stuff it in your pocket and then dispose of it in the rubbish bin when you get home. Another idea suggested by a local guide is to get a film canister and cut a X in the top to stuff the nylon in. The same also applies to general rubbish: you are good enough to carry it to where you are fishing so how about carrying it back to your house or motel to dispose of in the rubbish bins there. We've got a beautiful river. Let's keep it that way.

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CHANGES IN THE FISHERY AREA TEAM

JULIE GREAVES

Julie recently joined the Taupo Fishery team as a Field Operations Ranger. Initially she was contracted to interview anglers as part of the harvest survey team, but quite quickly realised that it was an interest she wanted to pursue further, and jumped at the opportunity for a permanent position.

Julie is originally from Pahiataua in the Wairarapa, but is familiar with the Taupo area as she has been living in Tunangi for four years. She started working for the Department of Conservation 10 years ago as part of the Turangi-Taupo Area biodiversity team, involved in weed and pest control. Previous to that, Julie worked as a rafting guide on the Tongariro River and did a two year diploma in Adventure Eco-Tourism at UCOL in Palmerston North. She is currently involved in the local community as a volunteer for the Turangi Coastguard and St Johns Ambulance. All of this has given her a wide variety of outdoor experience.

Julie includes mountain biking, skiing, boating, wakeboarding, and tramping amongst her favourite outdoor pursuits. She is now keen to pursue fly-fishing and is looking forward to meeting anglers during surveys and gaining as much knowledge as she can about trout from the fishery management team.



Julie with her much loved Alaskan Malamute, Nike. Photo: Craig Lyons.

NORRIE EWING



East of the summer wine! Norrie Ewing (right) chats with Conservator Paul Green on the deck at the Turangi office. Photo: Rob Hood

along with his ability to construct a functional object out of mere mortals' rubbish. Insiders claim this is a legacy from the 1950s and 60s when the impoverished Wildlife Service scavenged through the construction dumps around the various Waikato River hydro schemes for materials to build everything from fish traps to staff accommodation.

Norrie's role in Rotorua disappeared during the change of sports fish management responsibilities from DOC to Fish and Game NZ in 1989. After a few years' break he rejoined the Taupo Fishery team as a winter contractor, building and operating our trout spawner monitoring traps, giving us the benefit of his vast knowledge of trout, their habits and habitats. Finally, after a further 13 years, Norrie has retired to his superb beach-front property at Pukehina Beach where we wish him a long and happy retirement with lots of fish to catch and deer to shoot. Taupo anglers owe him a huge debt of gratitude.

ROY BAKER

Roy Baker took a position recently with the Taupo Field Centre of DOC. Roy had been with the fishery team for 11 years involved predominantly in our field work. The new position is with the Taupo visitor assets team, ensuring that Roy will continue to be involved in the outdoors maintaining tracks and structures for the public to use.

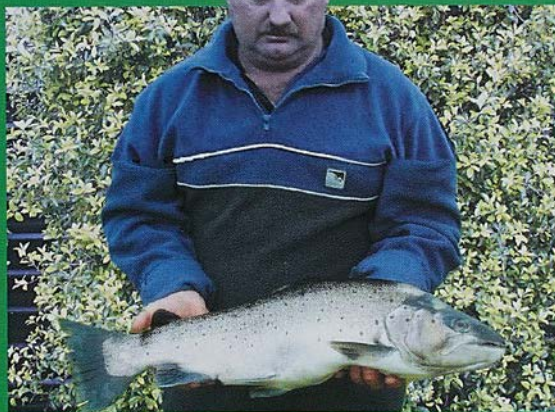
SID PUIA

Sid Puia also recently retired. Sid had also been with the fishery team since 1989 and prior to that with the Wildlife Service investigation unit and DOC in Rotorua. This followed a 21 year career with the NZ Army where he became a senior NCO. Sid was responsible for coordinating the Tongariro-Taupo conservancy's compliance and law enforcement operations, training and prosecutions. Within the Fishery Area he had taken the lead in our law enforcement and compliance work. We wish Sid a very happy and enjoyable retirement.

ROB KIRKWOOD

Rob joined us in 2003 from a career as chief glacier guide at Fox Glacier on the West Coast. Although a keen trout angler Rob couldn't resist the call of the ice when offered a posting with the NZ research team in Antarctica. Rob worked extensively in our field operations team for the two and a half years he was with us, assisting with track maintenance, fish trap work, and our regular monitoring projects. Rob has already sent us an email from Antarctica where he is enjoying the challenge of life on the ice again.

SEND US YOUR PHOTO!



A photo of a very nice fish sent in by Phillip McNabb who caught ibis 3.65kg (8lb) brown jack at Tokaanu on the 2nd October. The fish was 64 cm long with a condition factor of 50.

Readers are invited to send in photos of memorable fish they catch from the Taupo Fishery for possible inclusion in this magazine. In the first instance send to the Editor of *Target Taupo*, Taupo Fishery Area, Department of Conservation, Private Bag, Turangi or email fishinfo@doc.govt.nz. All hard copies of photos will be returned.

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 - Free phone for booking 0000 1 trout (067 6000)
- emails: ross@tongariorivermotel.co.nz

Contact Pip or Ross
at TRM now - ph 07 386 8555

Tongariro River MOTEL

CORNER STATE HIGHWAY 1, LINK ROAD & TAUPAHI ROAD, TURANGI

FOR SALE:

Tongariro River Motel Units
Tongariro River Motel, P.O. Box 2, Turangi
Corner State Highway 1 & Link Rd. & Taupahi Road
Eleven individual fully equipped motel units
Units managed & maintained for owners
Prices from \$100,000 (studios) to \$170,000 (2 bedroom
units) Only 300 m level walk to Tongariro River pools
Contact Peter Battell, First National Tongariro, MREINZ
Ph. (07) 386 0030, Fax (07) 386 6922.

To advertise in the Taupo Field & Stream Directory for only \$85 + GST per issue
and reach 12,000 annual fishing licence holders, contact: Peter McIntosh on (09) 634 1800.

Email: peter.mcintosh@fishgamenz.co.nz

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THE NEW SS720

Designed for people who need more than one lifestyle in one boat. Luxury when you want it and hard core fishing when you need it. Rugged, reliable and with the best ride on the water the Haines Hunter SS 720 has a lot more to offer people who need more than an average boat. The Sports Sedan provides shelter from the elements while providing fantastic all round visibility through the toughened glass screens that also bring a whole new look

to the Haines Hunter range. The handling characteristics of this boat are the envy of many, providing seamless performance and comfort with a sporting flare of a true thoroughbred. It all adds to a less strenuous day on the water. Test drive the Haines Hunter SS 720 and experience a new direction in boating.

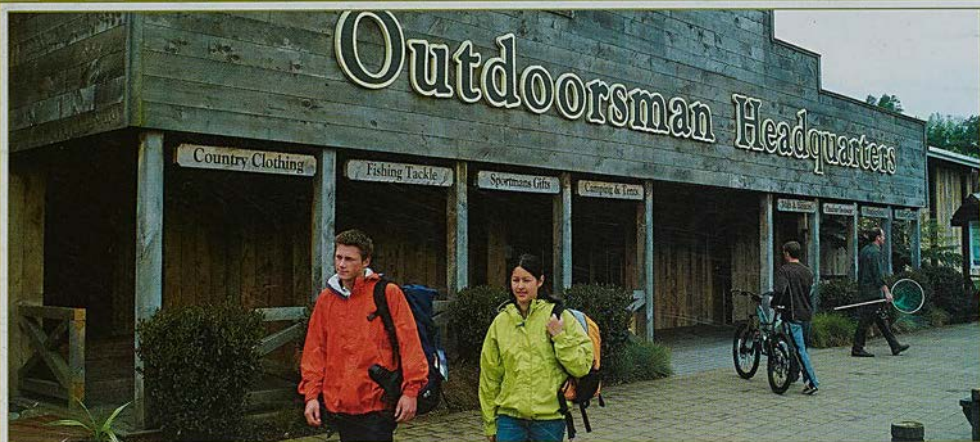


HAINES HUNTER



THE SECRET IS IN THE RIDE



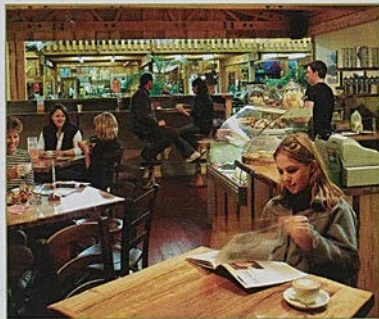


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