

# ANNUAL FISHERIES REPORT



2017-18

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NELSON MARLBOROUGH FISH & GAME

*A summary of the 2017-18 fishing season, produced for licence holders and elected Councilors of Nelson Marlborough Fish & Game region.*

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# Summary of the Season

*Nau mai*, welcome to the 2017-18 fisheries report for the Nelson Marlborough region.

While last year was labelled as ‘hallmark’ due to the progression of the Wilhelmus hatchery and a fresh focus on backcountry fisheries management, the 2017-18 season has further built on the initiatives of the previous season in what turned out to be another lively, yet rewarding year on a number of fronts.

One of the central themes to this has been the continuation of the release programme, which has been ramped up to good effect, and we are now being well compensated in terms of angler satisfaction, improved fishing in numerous waterways, and licence sales. Considerable effort has been made in not only implementing the release programme, which has seen several thousand large brown and rainbow trout liberated, but also in post-release monitoring via targeted drift dives, electric fishing, spawning surveys and, importantly, angler success.

On the contested and nationally topical subject of backcountry fisheries management, this season in Nelson Marlborough two new backcountry designated fisheries were added, and a beat system put in place for the Upper Wairau. We have increased our compliance and monitoring efforts on our existing backcountry designated rivers in order to get a better understanding of these fisheries in the potential event of future management regimes.

Cyclone Gita struck the lower Motueka and Golden Bay area with a once in a generation deluge which we would not like to see repeated anytime soon. As a result the entire mid-lower Riuwaka could, for some time, be termed a piscatorial wasteland such was the damage caused. Climate change induced rainfall events will continue to have their effect on our fisheries going forward, and we will need the reassurance of our own hatchery to be there when these events occur.

The New Zealand Council has again approached the Minister of Conservation to enact the long overdue guides licence, however time will tell whether this becomes a reality. There has also been a change at the top with new CEO Martin Taylor now taking over the helm from the retiring Bryce Johnson who dedicated 37 years fighting the good fight for the benefit of anglers and hunters of New Zealand.

## HIGHLIGHTS

Without doubt, one of the standouts of the season has been the Lake Argyle fishery. Due to several releases of large rainbow trout and the frenzy surrounding these, one involving a tagged fish competition and another some trophy trout, the lake received attention from anglers the likes of which have not been seen for decades. Argyle is now a buoyant, popular fishing destination that appeals to a wide range of anglers, and this benefits Fish & Game regionally for a number of reasons, the best of which has been to engage new and current anglers and re-engage lapsed licence holders.

On that note, some of our experimental riverine releases have been winners while others remain to be seen. In particular the Branch/Leatham releases, entirely funded by TrustPower, have been a hit with excellent fishing to be had, particularly in the upper reaches of both rivers. The Rai/Opouri, Spring Creek, and Riuwaka releases also fared well, with good results manifested from drift dives and angler feedback.

The Motueka fishery was outstanding this season, which didn’t surprise Fish & Game staff, but certainly did some of the anglers who fished there on a good day. It was commonplace to hear of anglers attaining highly respectable, and in some cases exceptional, tallies of fish – particularly in the medium sized cohort. The hype was verified in our annual drift dive count, which, despite the ravages of Cyclone Gita on the lower river, saw the best counts since the halcyon days of the mid 90’s when some say the Mot was last in its prime.



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## ISSUES OF CONCERN

While things are going well in regards to angler satisfaction, grey clouds are starting to build on the horizon that will take some careful management in the future. There is a burgeoning anti-trout movement from several groups, which will mean we have to carry out a higher level of consultation before future trout and salmon liberations into some waterways. We need to have these conversations so a clear line is drawn in the sand and we can all achieve our objectives, which we believe are fairly mutual in most respects. It may mean we increase our monitoring of native fish populations in respect to trout populations in order to try and show the minimal impact of trout on natives in many cases, particularly when dialogue on habitat loss and human harvest remain largely untouched; and also highlight the good advocacy work Fish & Game does maintaining good environments for all freshwater fish species.

In terms of backcountry fisheries management, when Cawthron polled users about potential research areas the issue of how sustained angling pressure impacts on trout came out on top. There is a ground swell of displaced resident anglers, led by advocacy group Kiwi Anglers First, who are lobbying Fish & Game to better manage fragile fisheries (these include 'backcountry' rivers as well as popular lowland rivers). Fish & Game will be called upon here to gather solid, relevant data on angler use in respect to pressured fisheries, and investigate and potentially enact, new management approaches. Any such new management approaches which require regulation changes, will need to be first informed by robust angler use and satisfaction data, in order to convince the Minister of Conservations officials, that hard management measures are indeed now required on some fisheries.

The East Coast salmon fishery appears to be in trouble. In particular, fisheries in North and South Canterbury have had numerous poor seasons, and these are denting the egos of longtime salmon anglers as well as the Fish & Game coffers. Although the Wairau seems to work of its own volition in respect to the Southern Rivers, moves are afoot by a Fish & Game endorsed group to enhance the Wairau salmon run which will hopefully provide some added insurance to the Wairau run in the future. There is also genetic research underway presently through the Cawthron Institute, aimed at teasing out what (if any) genetic differences occur within the South Islands East Coast salmon fisheries.

Clouds still hover over the Wilhelmus hatchery, with the future of this still in a state of uncertainty. We must strive to do our best to hold on to this, which is far too greater a regional asset to let go.

## LOOKING AHEAD

Another eventful year is in the making in terms of fishery management. We hope to continue strengthening the release programme, and, at the time of writing, have thousands of brown and rainbow trout growing for future releases. Lake Argyle will continue to feature here as will Challies Island and the Taylor junior fisheries. On that note, staff will continue to work on establishing a junior fishing pond in Blenheim. With a national R3 (Recruitment, Retention and Reactivation) position commencing, Nelson Marlborough will work alongside the incoming coordinator and build on the current good work our staff are doing in respect to R3 principles.

There will also be a focus on backcountry fisheries management, with existing designated fisheries to be monitored, compliance within these enforced, and further designations to be considered alongside potential new approaches to management.

On the RM front, there will also be considerable time spent on the Marlborough environment Plan, in particular the present water allocation and minimum flow framework which will directly impact a number of trout fisheries if not challenged.

*Ngā manaakitanga*

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## Liberations

Hatchery liberations were previously the main fisheries management tool used in New Zealand. In most aquatic systems, the amount of suitable habitat and available food resources for adult fish limits population levels. However, in some circumstances, juvenile rearing habitat may be inadequate to provide enough ongoing recruitment for supporting consistent optimal levels of catchable sized sports fish for angling. Juvenile rearing habitat is usually constrained by either scale or substandard habitat conditions (due to pollution, temperature, floods or low flows).

The Branch River fishery is now a major riverine fishery for rainbow trout within the Nelson Marlborough Fish and Game Region, enhanced significantly through Trust Power funded hatchery releases from 2010 to mitigate the migratory impacts of the Branch Hydro scheme weir on the recreational trout fishery within this catchment. This rainbow fishery is currently a unique regional recreational resource within its own right, and compliments the existing brown trout fishery.

Along with the Branch River, a number of other degraded riverine fisheries are currently being investigated regionally to try and determine what the key limiting factor is for these fisheries. These include rivers such as the Spring Creek, Riuwaka, Opouri/Rai, Tinline, Wairoa, Takaka, and Anatoki. Part of this investigative work involves experimental releasing of tagged 1kg<sup>+</sup> adult trout into existing degraded trout populations, in order to try and determine whether they are recruitment limited through, for example, main-stem only spawning and rearing habitat availability such as the Riuwaka River. Preliminary drift dive monitoring work indicates the Riuwaka trial is delivering partial success for anglers in terms of numbers of adult fish the system is now supporting. With the growing prevalence of climate change induced damaging flood events it is likely this approach will need to be trialed more within other small riverine systems also within the Nelson Marlborough Region, as severe floods are a key limiting factor for salmonid fisheries within New Zealand, and flood frequency and intensity is on the increase.

Since 2016, the Nelson Marlborough Fish & Game Council has contracted Ormond Aquaculture to rear and grow salmonids for release with the region, under MPI licencing approval. The objectives of this hatchery initiative are 3-fold: First and foremost to provide fish for anglers within fish-out ponds and junior fisheries close to urban areas; secondly to provide 'put and take' fishing opportunities within enclosed waterways elsewhere within the region such as Lake Argyle and Argyle canals; and 3rdly to try and re-build existing damaged riverine fisheries as described above (or at least determine through post release salmonid population monitoring what the key limiting factors within these fisheries actually are).

As New Zealand society urbanises in a similar pattern to other western countries, the demand for fishing within supplementary stocked waterways close to urban population centres is growing rapidly. Recent market research from America for example, reveals anglers generally want 'easy' fisheries, within half an hour's drive from where they live. In the Nelson-Marlborough context, this is very difficult to achieve without supplementary stocking as we have predominantly clear sighted wild brown trout fisheries, subject to a lot of angling pressure from resident, tourist and guided anglers, with salmonid fishing in general being extremely challenging for a novice or junior angler. In 2016 for example, there were close to 30 full-time fishing guide equivalents in operation within the Nelson Marlborough region.

Supplementary stocking in appropriate habitats therefore enables the Nelson Marlborough Fish and Game Council to enhance the angling experience and to provide a wider range of angling opportunities, thus retaining and growing angler satisfaction and new participation rates.

Liberations of tagged sports fish are used to monitor the success of releases within a wild population including determination of key fishery limiting factors, or to provide promotional opportunities for fishing competitions. Returns of tagged sports fish provide important monitoring information for fisheries management decisions.

Liberations of hatchery-reared sports fish enable Fish and Game Councils to provide additional opportunities to improve the quality of the angling experience. Any fish liberations need to consider effects on existing sports fish populations, on existing native fish populations, on indigenous flora and fauna, and on natural character values.

#### SUMMARY OF FINDINGS FROM RECENT FISH RELEASES

Below is a preliminary summary of fish releases broken down into the enhancement programme’s three key objectives:

1. Junior fishing development
2. Put and take fishing in enclosed waterways
3. Rebuilding damaged riverine fisheries

Where possible Fish & Game have focused drift diving effort (using traditional drift dive sites), electric fishing, and foot surveys on rivers which have had prior releases. Unfortunately we have only one year’s monitoring data on all wild fishery enhancement initiatives except for the Branch system which has been running for much longer.

## 1. JUNIOR FISHING DEVELOPMENT

### *Challies Island*

Fish & Game release around 600-800 1 kg salmonids per year into Challies Island junior fishing ponds mostly for organised fishing events. A minimum size of 1kg is preferred as fish are generally deemed to be ‘shag-proof’ once they get to this weight. In the past two years the ponds have been open to junior anglers after organised events have concluded. The fish out events are hugely popular with the general public with most days fully committed. Staff are of the view having the ponds open outside of events is most beneficial to development of future anglers, who use their own skill to try and catch trout, rather than that of fishing guides provided at events. Junior fishing development has been a major focus for Fish & Game both regionally and nationally in the past few years and will continue to be a priority. This year junior licence sales have increased significantly within this region (see appended information relating to licence sales), much of which is attributed to this initiative.

Challies Island (2011-2018)	600-800 trout p/a	✓achieved objective	Events consistently fully booked. Highly popular with local residents. Very beneficial to have open season after events	No monitoring work required, best tracked through junior licence sales
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### Taylor River

The Taylor River has a junior only fishery (between Hutchison St and the Opawa Loop) where 350 adult rainbow and brown trout have been liberated in the past two years, with excellent feedback from parents of kids who catch these fish.

In Marlborough staff are also in the process of developing a kid's fish out pond near Blenheim adjacent to lower Spring Creek, which will utilise around 600 fish per year.

Taylor River (2016-2018)	350+ trout	✓achieved objective	Excellent feedback from parents, appears to be good fish survival	1 drift dive post release of brown trout, many released fish seen in dive
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## 2. ENCLOSED WATERWAYS

### Lake Argyle & lower hydro canal

Fish & Game released 200 tagged rainbow trout (1.1kg average) into Lake Argyle and the lower canal, and ran a promotion for licence holders where a \$500 Henderson's voucher was up for grabs for anyone catching the



lucky tag number. This promotion was highly successful in that it caused a flurry of anglers (young and old) fishing at the lake, and saw a spike in licence purchases immediately after media releases promoting the competition – see in R3 chapter. In fact, one Saturday a month or so after release our Fish & Game chairman counted around 100 anglers at various times throughout the day all trying to catch the lucky fish. It is important to acknowledge that there is a high survival rate with these fish, as floods are taken out of the equation.

Over 40 tags were handed in, but staff believe at least twice this number have been caught due to many being unreported.



Based on the success of this, staff released a further 200 untagged rainbows into the lake which was well received by anglers also.

In general, licence holders have been highly complementary of the releases into Lake Argyle, which is an extremely popular fishery for families and retired anglers in particular. Staff also witnessed guided angling taking place here. Owing to its popularity and success, Fish & Game will continue to stock this artificial lake with fish, and potentially run similar promotions to activate anglers over the holiday season.

Lake Argyle & canal	400 rainbows	✓achieved objective	Excellent feedback from anglers. Good media coverage saw a spike in licence sales.	Around 40 tags handed in, believed to be at least twice that caught. Photos of rainbows from 2 <sup>nd</sup> release handed in also.
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### 3. REBUILDING DAMAGED RIVERINE FISHERIES

#### WAIRAU CATCHMENT

##### *Branch/Leatham*

Branch/Leatham releases commenced in 2009 and have seen multiple releases since. These releases have been funded by Trustpower as a mitigation measure for the hydro scheme, and specifically, the ineffectual fish ladder at the weir. Essentially this means the fishery has an artificial population limiting bottleneck, in that fish are lost to the Wairau (over the weir) or through the intake in to Lake Argyle or the settling basin, but unable to then migrate back up into the catchment during favourable flow or temperature conditions.



*Right: Dean Phibbs with a prime tagged hatchery fish*

Historically, some releases have been successful while others that coincided with large flood events were less so. Angler feedback this year has been overwhelmingly positive about the fishing in the Branch River. This has been shown to have good numbers of rainbow trout in all age cohorts, and spanning the length of the catchment from the weir to near the Top Branch Bivouac. The high number of small and medium fish can be attributed to a relatively stable three year period.



... Fish & Game sent out a request to anglers/fishing guides for information in relation to the Branch releases, noting that any rainbow trout caught are likely to be either directly from releases, or progeny of released fish. Plentiful feedback from guides and local anglers indicated the October 2017 and April 2018 releases had gone very well, with the fish holding well in the upper part of both rivers.

*Left: Ollie McKenzie with a 6lb tagged rainbow from the Leatham, proudly displayed on Facebook*

Trust Power fund the annual drift dive monitoring of the fish population within this catchment and once the targeted adult population density of 7 large fish per kilometre is consistently achieved (consent condition), the fish release program will be reviewed by Trustpower. For the 2018 drift dive of the Branch (7 fish/km target met for first time in 7 years), record numbers of fish were counted at the lower Branch site, and in the previous year good numbers of rainbows in the Branch River, particularly in the medium sized cohort.

It is worth mentioning that the increase in the rainbow population has been of significant benefit to the Lake Argyle fishery. This was especially apparent in the 2017 drift dive of the headrace canal where a record count



was achieved (27 large, 256 medium and 212 small), compared to the previous year of 2 medium and 43 small rainbows (accepting some potential bias as trout move freely between lake and canal). No doubt this is as a result of three stable years which saw the small/medium rainbow population flourish, quite a few of which make it into the lake, but many also would have entered into the Wairau either via going over the weir, or through the intake to be sluiced into the lower Branch when flushing out gravel.

Some comments are as follows, including from three guides who fish many days on this river:

Location	Comments
Branch – u/s Nesbitts	Around 30% large rainbows caught fin clipped. Lots of mediums in ripple and runs. The fishing has been excellent in the Branch this year but last large flood may have moved them around.
Branch – below confluence	14 rainbows caught over 2 trips, 1.5 - 3.5pounds
Branch - upper	Caught 6 rainbows, 4 fin clipped adipose 2-3lbs. 1 PIT tagged fish 5lb from 2009 release. 1 unmarked 4lb. Released 2, ate 4. 15 rainbows in pool d/s bottom misery. Lots of small bows up Little Misery. Lots of small bows up to 2lb up to 300m d/s of top branch biv.
Branch – entire length	85% of fish caught now rainbows. River has lots of mediums in it. Some clients are saying it's the best fishing they've ever had. Many fish staying pretty close to release sites despite 2 floods post release. 60-70 hatchery reared released fish caught since October 2017. Mainly from swing bridge up. Side creek of Misery stream (Little Misery) someone saw hundreds of juvenile rainbows in there - shoals of them. Leatham fishing pretty good further up. Some fish caught fish around Caves Stream, they were easy to catch on dries and nymph.
Branch – entire length	Around 60% of fish caught are hatchery released fish. Still some big browns in residence (potentially feeding on increasing numbers of rainbow smolt)
Branch – below confluence	Pod of 10-12 hatchery fish seen, 4 fin clipped fish caught. Other small/medium rainbows caught

Branch/Leatham rivers 2009-2018	Multiple releases of brown/rainbow trout	✓achieved objective	Trustpower fund releases. Weir prevents upstream passage of fish. River flashy by nature.	Many reports of released fish caught from past 3 releases and good numbers of small/medium fish (naturally spawned). Increasing rainbow population in rivers and Lake Argyle. Highest numbers on record for lower Branch DD.
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### Spring Creek

Multiple releases of three size classes were undertaken in Spring Creek. Results from the November drift dive (before release of any large fish) show 7 medium and 7 small rainbows were present within the drift dive site from the two earlier releases. Extrapolated out over the catchment this indicates good retention within this flood proof fishery. If these fish survive and thrive it will indicate the current salmonid population bottleneck is inadequate recruitment. If they don't then the issue may be altered habitat and lack of sufficient food resources now introduced macrophytes, exotic weeds and mud dominate much of the benthos. Staff also re-dived Spring Creek in late March 6 weeks after the last release and counted 130 large rainbow trout – a good result from the 200 released. At the time of writing, a good number of 1kg+ fish have been caught close to the release sites on both fly and spin, providing good angling for some. Feedback from one angler also indicated he caught around 15 small/medium rainbows in lower Spring Creek at confluence with the Wairau, likely to be from the winter releases.

Additionally, 3000 surplus eyed ova were also buried into gravel in Spring Creek on Tim Crawford's property.

Spring Creek (2017-18)	Rainbows: 400 small 640 medium 200 large	✓achieved objective	Spring Creek suffering from siltation and lack of suitable spawning gravels. A good release river with no flooding and high survival rate. Some fish likely to feed into lower Wairau and supplement this growing rainbow fishery.	130 large fish seen in March DD from a total of 200 released; small/medium rainbows from release seen in Nov drift dive; good numbers of released rainbows caught by anglers.
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#### *Wairau North bank Tributaries*

While on most occasion's adult 1+kg fish are released into rivers, releases of 125g and 300g rainbow trout took place in the following streams as part of the Wairau rainbow enhancement trial and to reduce overall numbers within the hatchery being grown to 1 kg. In Mill Stream, 1500 fry were liberated in order to free up room in the hatchery, and additionally 800 small rainbows were released into 3 North bank tributaries (Tuamarina, Waikakaho & Onamalutu). It is likely these fish will migrate to the Wairau estuarine environment where food resources are very abundant, and those that survive kahawai, seal predation, and set-netting, will thrive. Future drift dive monitoring information from the lower drift dive site which ends at SH1 bridge, plus angler feedback are the only ways to monitor effect of these releases.

#### TASMAN/GOLDEN BAY

##### *Motueka Tributaries*

The Motueka is a generally resilient fishery owing to its wide distribution of spawning tributaries. Despite this, Fish & Game carried out an experimental winter release of 100 pre-spawning adult brown trout (Rainy genetics) into the Tadmor (66), Dove (23) and Stanley Brook (11), in an attempt to gain more information on what were historically important spawning tributaries. Winter foot counts in the Dove post release revealed one tagged fish guarding a Redd, just downstream of the release site. This Redd was one of a number of others all in the same stream reach, some of which are likely to have been from tagged fish. It would appear summer low flows are the limiting factor for the Dove and Stanley Brook, so while these releases have demonstrated it is easy to get spawning occurring again, the juvenile rearing habitat appears to be limited by low summer flows and high instream temperatures (due to plantation forestry now dominating the headwaters) in most summers, so further releases are not worth contemplating for these two systems.

It was expected that trout would spawn in the released river then migrate down into the main stem Motueka. No tagged fish were seen in the Upper Motueka Glenrae drift dive however staff question the durability of the streamer tags used, so some may have parted from fish. Staff carried out foot counts and electric fishing surveys near release upper release site in Tadmor with a higher than normal number of Redds and young of the year brown trout evident near a release site. These higher counts were likely to have been influenced by earlier adult fish releases (see page 26 for more information). The summer low flow and temperature regime for the Tadmor appears semi-favourable in a normal summer so monitoring of this tributary for recruitment success will continue, with further releases considered if these initial releases appear to translate into an increased abundance of juvenile brown trout within this system. It is a low priority catchment however given the abundance of recruitment elsewhere within the large Motueka catchment such as the Rainy River.



Tagged trout guarding a redd 11 approx. 1 month after release (Dove River)

Eyed ova boxes were also planted into Coal Creek (Wangapeka tributary) – once a noted spawning stream, however follow up electric fishing surveys revealed no young of the year trout in residence. It is recommended a trial release of adipose clipped juvenile brown trout now be released within this system given apparent ova hatching failure.

Tadmor, Stanleybrook, Dove	100 adult browns	→ in progress	All three rivers were once recognised fisheries and now suffer from low flows due to land use change. Trout released prior to spawning.	1 tagged fish seen guarding redd 1 month after release. No tagged fish seen in Upper Motueka DD. E-fishing undertaken in Tadmor near release site with good numbers of fry in residence.
Coal Creek	4000 eyed ova	× not achieved	Once a recognised Wangapeka spawning stream. High sediment load, high eel biomass.	No fish counted in follow up electric fishing survey over multiple sites.

#### Riuwaka River

Once an outstanding fishery with one of the highest levels of brown trout biomass in the country the Riuwaka collapsed in the early 2000's for reasons that remain unclear. Staff believe there is a lack of sufficient juvenile recruitment in the catchment as evidenced by drift dive results and annual electric fishing surveys. A release of 150 fin clipped and tagged adult brown trout (Motueka genetics) was carried out in March 2017 at various sites in the North Branch and main-stem.

Staff carried out an informal dive of the North Branch two days after release and found that just 3 tagged fish had remained, despite 75 fish released here. One week later, staff informally dived the entire river from the North/South confluence to the mouth and located 60/150 fish, with the majority of these in the lower reach below the SH bridge (note this was using just one diver for each section so it's possible some fish missed). It is expected the remainder were further downstream still in the tidal reaches of the river.

In January 2018 annual drift dives were undertaken at the traditional drift dive monitoring sites where 13 fin clipped fish were seen over 3.8kms of river (3 dive sites). When extrapolated over 15 km of potential adult holding water, this suggests that around 50 fin clipped fish may have still been in residence. These released fish made up approximately one quarter of the adult fish population within the sites dived. What was also observed however was a more than doubling of large wild brown trout (17 large in 2017 to 54-13 clipped = 41 large in 2018), and more than a 3-fold increase in mediums (6 in 2017 to 22 in 2018). Small fish observed remained very low, shifting from only 3 observed in 2017 to 6 in 2018. It is likely the major increase in medium and large fish was due to high summer temperatures pushing fish out of the lower Motueka which then migrated up into the Riuwaka. For example at midnight on January 30<sup>th</sup> Motueka River water temperature at Bluegum corner was measured at close to 23.5-24 degrees Celsius, but the Riuwaka measured just 15 degrees Celsius. Had this migration response to unusually high summer water temperatures not occurred it is likely that the fin-clipped fish observed during drift diving nearly one year after release, would have constituted around 40% of the large adult fish population observed, based on 2017 drift dive results for adult fish numbers.

All of the streamer tags had parted from the fin clipped fish seen, and a number of these fin clipped trout that had lost their tags were also caught by fishing guides and anglers in the 2017-18 season, most in good condition. Just one streamer tagged fish was caught approximately 1 month after release.

Staff considered the release a surprising success until the day of 20 February 2018 when Cyclone Gita arrived, which will have had a catastrophic effect on the trout population in this river, with numerous reports of dead fish found in orchards adjacent to river. Staff hope to re-dive the river if/when it clears to assess the actual effect. The hatchery will be a potential tool for re-building this fishery and staff believe releases of yearling brown trout (sourced from Motueka genetics) into the Riuwaka may be an even more cost effective approach as there are large areas of vacant juvenile rearing habitat observed during drift dives, and unusually low numbers of small fish counted. Around ten 100 gram juvenile brown trout can be released into this river for the same cost as 1 adult 1kg brown trout, so depending upon losses over the following 2 years of life, this may be more cost effective. Given recent concerns expressed by Iwi over trout releases into this Awa of great cultural significance however, the future of any fish releases into this catchment may have to be reviewed.

Riuwaka River (Mar 17)	150 brown trout 1kg+	✓achieved objective (until Cyclone Gita)	Experimental release. Problems with recruitment/sediment.	60/150 released fish seen in DD 1 week after release in 2017. 2018 release indicated roughly ¼ of resident large population released fish. A number of fin clipped fish caught by anglers/guides.
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*Anatoki and Takaka rivers*

A one-off experimental release was carried out in the Anatoki & Takaka Rivers after recent drift dives had seen an alarming decline in the trout population. Staff are of the view this decline is a combination of floods, didymo and, in the lower Takaka, seals. A release was carried out in August 2017, which included multiple sites in both rivers, including the Upper Takaka at Harwoods. Just one tag return was handed in from the lower Anatoki, and one angler said he saw 4 tagged fish in the lower Takaka in February 2018, however none were seen in our drift dives, apart from 1 tagged fish observed in a drift dive within the Upper Takaka at Harwoods.

Anatoki River (08/17)	44 brown trout	* not achieved	Experimental release. Susceptible to large floods.	No fish seen in DD, dived 300m of river at lower release site with none seen. 1 tag return from angler caught at lower release site.
Takaka River (08/17)	110 brown trout	* not achieved	Experimental release. Susceptible to large floods.	One fish seen in Upper Takaka DD, staff dived 300m of river at lower release site with none seen. 4 tagged fish seen at SH60 bridge in Jan.

*Wairoa River*

Staff initially proposed to release these fish into the lower Waimea in order to provide a ‘close to town’ incentive for those fishing the Waimea Park ponds to try their hand at fishing in a river. In the end, it was thought best to release these into the upper river in order to boost the relatively low numbers in this reach, but also allow a handy fishing option for Tasman anglers. Some of the fish were spectacular, with many in the 3kgs range and one tipping the scales at 5.2kgs. The fish were released in lots of ~10 fish into multiple sites above and below the confluence of the left and right branch.

A number of anglers have sent in information on the distribution of the released fish, which were said to be fairly transient. Staff walked approximately 1500m of river and spotted around 10 tagged fish (although someone had been fishing there beforehand). One angler counted approximately 60 fish one month after release, and caught 6 of these (on cicada imitations).



*Right: Some of the fish were staggering – this one 5.2kgs*

Wairoa River	100 brown trout	→ in progress	Idea was to provide put and take fishing close to urban area as well as attempt to boost wild population.	Many fish seen in month post-release by local anglers, but fish highly mobile. Angler caught 6 tagged fish and saw 60 (1 month after release).
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PELORUS CATCHMENT

*Tinline River*

Three separate liberations have taken place into the Tinline River in 2017 with 400 x 130g (06/17), 540 x 300g (08/17) and 100 x 1kg+ (11/17) fish released, mostly in the upper reach. Two boxes of eyed rainbow ova were also planted in a tributary of the Tinline in September 2017.

One drift dive has been undertaken at the historic site in October (before the release of the 1kg+ fish) but no fish of the size classes released were seen. 121 rainbow trout fry were seen in this dive, potentially from the planted ova boxes. Staff also carried out an informal dive of around two kilometres of water through other release sites, but no released fish were seen.

Tinline River (2017)	Rainbows: 400 small 540 medium 100 large 5700 eyed ova	→ in progress	Largely experimental, possible issues with sufficient food availability, despite excellent holding water.	1 tagged fish caught at Totara Flat on the Pelorus. No other fish seen/caught, however yet to DD post Nov release. 121 rainbow fry seen in DD
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*Rai/Opouri rivers*

The trout population in both rivers have been in decline for a number of years, with repeat negative angler feedback confirming this. In most annual dives there are high numbers of juvenile rainbow smolt in residence, however these do not generally translate to small/medium fish in subsequent years. An attempt to by-pass this low conversion rate was made in 2017-18 with 130 tagged fish released into the Rai and 164 into the Opouri at various sites over 2 occasions.



*Right: A tagged Rai rainbow caught by a non-resident angler*

The releases appear to have been successful, with a good number of tag returns, particularly after the second release using blue floy tags (see picture). At least 10 tagged fish were seen in the Rai drift dive carried out a number of weeks after the second release.

Rai/Opouri (2017-18)	294 tagged rainbows 1kg+	→ in progress	Earlier drift dives show fishery in decline, probably due to floods. Sufficient food available in both rivers.	20+ tag returns to date, and positive angler feedback. 10+ tagged fish seen in Rai DD.
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## EXTERNAL FUNDING FOR FISH RELEASES

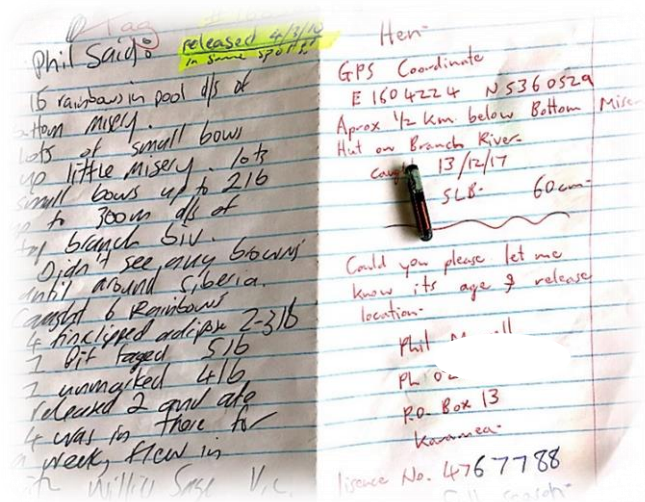
Fish & Game receive a substantial amount of external funding which is set aside in a trust account entirely for the purchase of fish. Local Nelson Marlborough fishing guides, most who are members of the New Zealand Professional Guides Association and some of their clients, donated money out of their own pocket to be used for releases into riverine fisheries; and there was also a very generous donation from Owen River Lodge. Trustpower have contributed a significant amount through paying for the Branch/Leatham releases (800 fish per year plus staff/helicopter time), as well as a tanker load of fish into Lake Argyle following silt removal works; the Sports Fishing for Youth Charitable Trust purchase fish for kids fish out events; and there was also monetary donations from a number of other anglers. All of this funding is greatly appreciated by Fish & Game and the anglers who benefit from the releases.

## THE STORY OF FISH #168388918

During the season we were handed in a PIT tag by a West Coast angler. This tag had been inserted into a rainbow trout by Fish & Game before release into the Branch River on 4 March 2009.

On looking at the records we could see that this fish, at the time of capture, was caught in pretty much the exact same place it was released. We could also determine that the hen rainbow was around 9 years of age.

Since that release in 2009 this fish would have, without doubt, spawned many times, contributing tirelessly to what is now a decent rainbow trout fishery.



## ARGYLE TROUT SALVAGE

In April Trustpower carried out their biannual dewatering and maintenance of the Lake Argyle hydro, in which the lake and canals were dewatered for silt removal. Most of the lake and canals were drained for the operation, and Fish & Game staff and volunteers were on hand to rescue stranded trout. Many of the remaining trout in the lake managed to make it to the remaining deeper waters where they'll easily survive the few weeks until the lake is refilled.



Three hundred and thirty one trout were salvaged from the lake and lower canal including 302 large trout, and a number of eels were also rescued. Using the fish transporter, the trout were immediately transferred to the Leatham and Wairau Rivers, with some of the ripening hens kept for hatchery brood stock.

Staff would like to thank members of the Marlborough Freshwater Anglers Club, as well as Bevan De Groot for their help on the two days.

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*“Catch tally this week. 8 year old Grandson: 3, Dad and Grandfather: 0. Location: Opouri River”*



*Dear Fish & Game, thanks very much for releasing some trout into the rivers. I caught about 4 trout all on the fly rod, one 4 pounds, one 5 pounds and I even caught a 6 and a half pounder, they put up some great fights.*

*“Winning tag or not, it was a brilliant day”.*



*“Caught in the Lake today. The first time the boys have been trout fishing. Sam caught his first trout. Thank you Fish and Game for the recent stocking of this fishery”.*

*“My family and I went and caught 8 fish on Lake Argyle on Thursday the 28<sup>th</sup>, 7 of them rainbows from the release and 1 brown trout. We got 4 tagged fish between us. My sister caught tag 0795. And I caught fish with tags 0917 and 0832. It was really cool to catch some rainbow trout in our region and I think it’s great what you have done for the fishery”*



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## Back Country Fisheries Management

As the impacts of non-resident angling effort increase each year, Fish & Game's efforts to manage our backcountry fisheries must also increase. Many believe our fragile backcountry fisheries are currently at a tipping point, and demand from resident anglers to better manage angler pressure is increasing. In saying that, Fish & Game need to ensure there is sufficient robust data on angler usage, experiences, and the fisheries themselves to support the anecdotal feedback before any future measures are put in place, in particular any hard management controls which will require regulation changes (and thus Ministerial approval).

While many say the first step is to bring in the guides licence, this will do little to alleviate the effect sustained angler pressure is having on our fisheries. The findings from recent backcountry fisheries surveys, drift dive results, and negative comments from anglers suggests that in some rivers, non-resident anglers are having a significant impact on anglers fishing experiences, as well as the behavior of trout, however it must be remembered that pressure comes from resident as well as non-resident anglers. Nationally, non-resident angler licence sales constituted just 6% of our national LEQ sales figures for the 2016/17 NZ fishing season for example. Within scenic Nelson Marlborough and West Coast fisheries however, we know already that the proportion of non-resident angler use is already approaching 50% of total use as South Island tourism booms.

In Nelson Marlborough, staff believe we need more tools at our disposal to curb the flourishing numbers of anglers using our backcountry rivers in order to reduce the impact of fishing pressure on fish health and behavior, as well as instances of angler conflict. It must also be remembered that, while we have just four designated backcountry fisheries in this region, angler pressure is having an impact on a number of other fisheries, even extending to more lowland rivers such as the Baton. This, of course, applies to other regions, in particular West Coast, Otago and Southland which have similar angler issues on an array of waterways – backcountry or not.

If future management measures are required, a financial barrier would be one effective tool to significantly reduce pressure on our most affected fisheries. As is the case for most other salmonid fisheries overseas, this could be achieved by charging non-residents an extra licence fee to fish our most pressured rivers (in time these would best be termed classified rivers, rather than the emotive term "backcountry"). Here non-resident anglers could be charged an additional licence fee on top of their existing non-resident licence cost to fish specific rivers, with a maximum number of days being allocated for each licence. Resident New Zealand anglers would not be charged for fishing classified rivers, nor would there be restrictions imposed on when they could fish. Under this system it would then also be possible to cap the amount of licences given out to non-resident anglers to fish these rivers. An alternative or additional option to imposing a cost-barrier to non-resident anglers, could also be the imposition of a controlled fishery such as the Greenstone/Caples model within Otago.

One or both of these options would reduce pressure on sensitive rivers which are negatively impacted by non-resident angler use and achieve the main objective, which is to disperse angler effort more evenly across the region and, in particular, to rivers which can handle more pressure. Over time, if non-classified waters begin to experience too much angling pressure, these can in turn be designated as classified. With tourism booming in the South Island of New Zealand, it is unrealistic to continue to provide unrestricted fishery access to the entire global freshwater fishing community.

If cost barriers are ultimately imposed, funds from extra licence fees would then go directly to the region to which the angler is fishing in, rather than the neighboring regions. For example, this season 62% of non-resident BCE's were from anglers who purchased their licence outside the region, and 68% the season before.

## BACK COUNTRY ENDORSEMENTS – A SUMMARY

This year the number of backcountry endorsements (BCE) increased by 726 compared to the 2016-17 season. Without doubt this would have been as a result of designating the Upper Wairau and Upper Matakītaki as backcountry fisheries requiring a BCE, but also potentially due to increasing usage in general.

B/C endorsements allocated	2016-17	2017-18
Resident	738	1004
Non-resident	796	1256
<b>Total</b>	<b>1534</b>	<b>2260</b>

While anyone can apply for a BCE regardless of what region the licence was purchased in, Nelson Marlborough saw an increase of 188 BCE's for residents and 231 for non-residents compared to the previous year. It is also worth mentioning that 22% of eligible Nelson Marlborough licence holders obtained a BCE this year, compared to 57% of eligible non-residents who purchased their licence in this region, highlighting the attraction (and thus subsequent crowding) of scenic back country rivers to non-resident anglers.

Finally, of all the non-resident whole season licences issued for the *entire* country, 19% got BCE's for Nelson Marlborough, meaning around one in five non-resident whole season licence anglers have indicated they wish to fish on our four backcountry designated rivers (note this does not factor in day licence purchases). This is, in fact, quite a telling statistic, and is the prevailing reason why problems continually occur on just a few of our backcountry fisheries, due to the top of the South Island being a popular fishing holiday destination for many non-resident anglers.

## COMPLIANCE MONITORING – LICENCE CHECKS ON BACKCOUNTRY DESIGNATED RIVERS

In order to get a better understanding on non-resident use of backcountry rivers, an analysis of all licence checks carried out on these rivers was completed. Of the total 96 licence checks on our four backcountry rivers, 46 (44%) were found to be non-resident anglers. Breaking it down to specific rivers, non-resident anglers accounted for 30% of angler use on the Travers (far lower than expected – although highly dependent on time of year); and 45% for the Upper Wairau. Angler checks on the Goulter and Upper Matakītaki were not of sufficient numbers to qualify meaningful data). Note: this includes fishing guides as resident anglers.

Total licence checks	446	
Total on designated backcountry rivers	96/446	22%
Total non-resident anglers on ALL rivers	155/446	35%
Total non-resident on backcountry rivers	42/96	44%
% non-resident on Travers	16/53	30%
% non-resident on Upper Wairau	14/31	45%

These findings, while still relevant, must be taken with a measure of uncertainty as non-resident use on backcountry rivers fluctuates over the course of the season, with less non-resident use early and late in the season, and a substantial influx from December-March. Therefore it all entirely depends of what time of year the compliance checks were being carried out, and, for this season, more effort was focused on the early part of the season thus a higher percentage of resident anglers would be expected.

Interestingly, 35% of anglers checked on all rivers were of non-resident origin. This is a percentage far higher than what the average would be for most Fish & Game regions considering only 3% of total effort (angler use days) is comprised of non-resident anglers, and 10% for the Nelson Marlborough region (2014-15 National Angler Survey). In saying that, this again depends on when rangers carry out licence checks, and using staff as

an example, most compliance is carried out mid-week when most resident anglers are at school or working and we expect higher non-resident angler use. As an aside, the 2014-15 NAS also determined that 84.2% of overseas angler effort is concentrated in the South Island and just 15.8% in the North Island, which gives weight to the view that back country crowding is predominantly a South Island issue presently.

**TRIVERS RIVER TRAIL CAMERA STUDY**

Owing to the continuous negative feedback from anglers fishing the Travers River, three trail cameras were deployed in the valley in order to monitor angler usage of this river, and verify backcountry survey data. The cameras were set on a timer and took still images every 5 minutes throughout the length of the day. Thousands of photos were then strung together and analysed for angler usage. The best site was from the middle camera which captured a sweeping pool and popular stop for anglers. It could be said that this location would be fairly representative of the middle to lower river. The upper site was not situated well, and has been discounted.

Unfortunately all of the cameras ceased to work in January, and therefore the peak angler run was not able to be monitored, however the below table summarizes angler use up until around Christmas.

Camera location	Number of days fished	% days fished
Mid Travers	29 days fished out of 73 available days	40%
Lower Travers	47 days fished out of 94 available days	50%

Staff will look to utilize these again in the Travers next season, taking learnings from this season, and changing the location for two of the cameras which did not capture angler usage as well as hoped. If possible we may also obtain more cameras and locate these on the Upper Wairau or Goulter.

*Hooked up on the Travers (middle camera site)*







Honourary ranger Nick King landing a fish on the Travers

### UPPER WAIRAU BEAT SYSTEM

The Upper Wairau was designated as a backcountry fishery for the 2017-18 season from the Wash Bridge upstream. As this river is one that we hear the most negative feedback from, a beat system was put in place from Six Mile up to the Molesworth boundary to try and alleviate some of the conflict which was becoming apparent, particularly during mouse years.



A large sign and map was drawn up and has been installed at the start of the beat system at Six Mile Creek.

This also has a pamphlet distributor containing **GONE UPSTREAM/GONE DOWNSTREAM** cards.



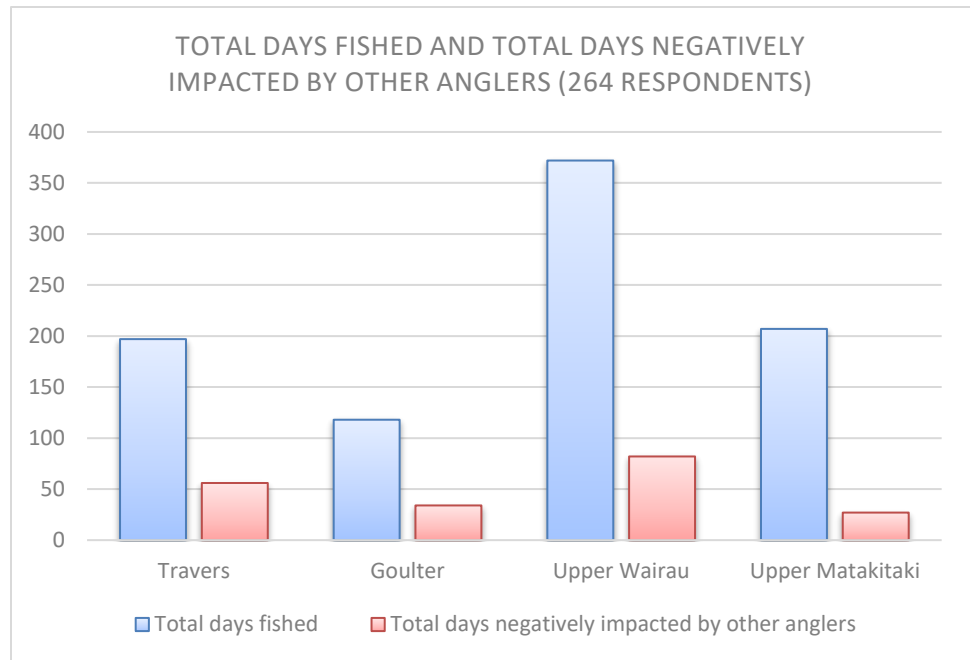
There have been mixed reports so far from the beat system – see Appendix 1 for comments. Many non-guided anglers are complementary but some have not been abiding by the rules, and it has been known that anglers (including guides) are ‘cherry picking’ parts of beats which afford easy access, which although disappointing, they are within their rights as this is entirely voluntary. In saying that, the Upper Wairau was largely unfishable for much of the season owing to unstable slips in the upper river causing clarity issues. The Rainbow Road was also frequently closed post rain events for the same reason, which contributed to this part of the Wairau receiving far less pressure than it has become accustomed to.



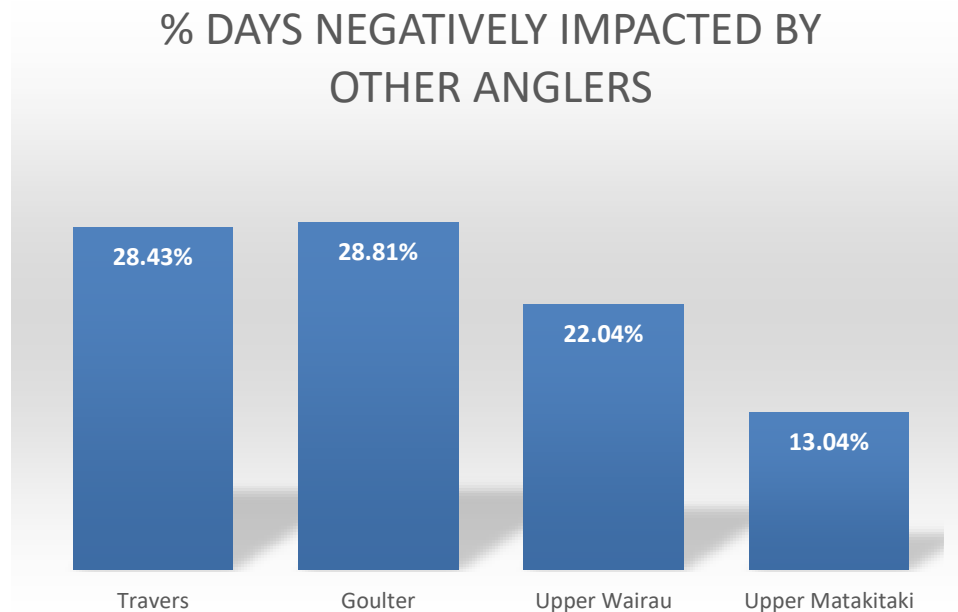
### BACKCOUNTRY SURVEY RESULTS 2017-18

At the time of writing the 2017-18 backcountry survey had just been sent to those who obtained a backcountry endorsement, so the results you see below are from 441 respondents up till 29 May. This year we simplified the Nelson Marlborough part of the questionnaire with the focus being angler satisfaction, and determining the percentage of days which were negatively impacted by other anglers. 264 respondents answered in the affirmative that they had fished at least one of our backcountry fisheries.

Of these, the Upper Wairau was the most fished with 372 days. Surprisingly, the Upper Matakaitaki had the next highest number of days fished at 207, followed by Travers (197) and Goulter (118) – see graph right. Note this is only up until 29 May.

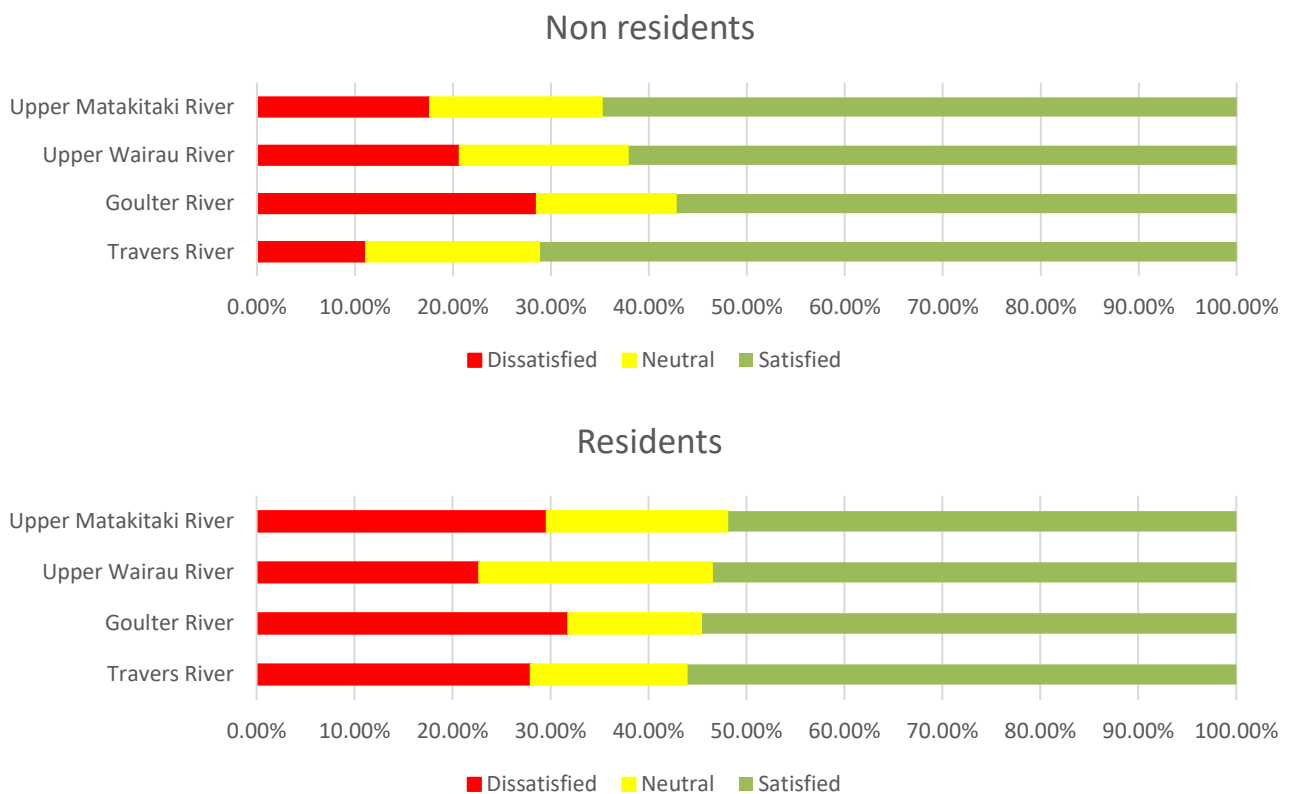


The Goulter and Travers had the highest percentage of days fished that were negatively impacted by other anglers (28% for both rivers), followed by the Upper Wairau (22%) and Upper Matakaitaki (13%) – see graph below (note – see Appendix II for split between resident and non-resident anglers). The Goulter stands out as the river with the greatest concern, as it is a small river with just three fishing beats and more susceptible to pressure, has unrestricted helicopter access, and not propped up by migratory lake sourced fish such as what occurs in the Travers.



The proportion of resident to non-resident use was almost equal with a 51%/49% split (286 respondents). Guided anglers accounted for 27% of angler effort on our four backcountry fisheries. Delving into the data further, our analysis worked out that 80% of *guided* non-resident anglers were satisfied with their experience. Helicopter use was lower than expected, particularly in the Goulter with just 5% utilising helicopter transport and 3% for the Upper Matakaitaki.

Importantly we monitored satisfaction levels which, similar to survey results from the season prior, had higher than anticipated levels of satisfied anglers considering the negative feedback. The below graphs show that differences in satisfaction levels between resident and non-resident anglers. In all cases, satisfaction levels exceeded the levels of neutral and dissatisfied combined, however caution is advised as a neutral rating is more reflective of a fairly average day fishing, perhaps giving cause to remove the neutral rating for next year.



Not surprisingly, dissatisfaction levels were higher for resident anglers, hovering between 22-32% for all four rivers, with the Goulter being the highest and the Upper Wairau the lowest. For non-residents, the river with the highest percentage of dissatisfaction was the Goulter, with the highest levels of satisfaction in the Travers. This is somewhat at odds with the feedback received from resident anglers, who highlighted with monotonous regularity the problems on the Travers. This further highlights the theory that 'the squeaky wheel gets the grease', and there are, in fact, lower incidences of negative angler encounters than we are led to believe.

# Monitoring

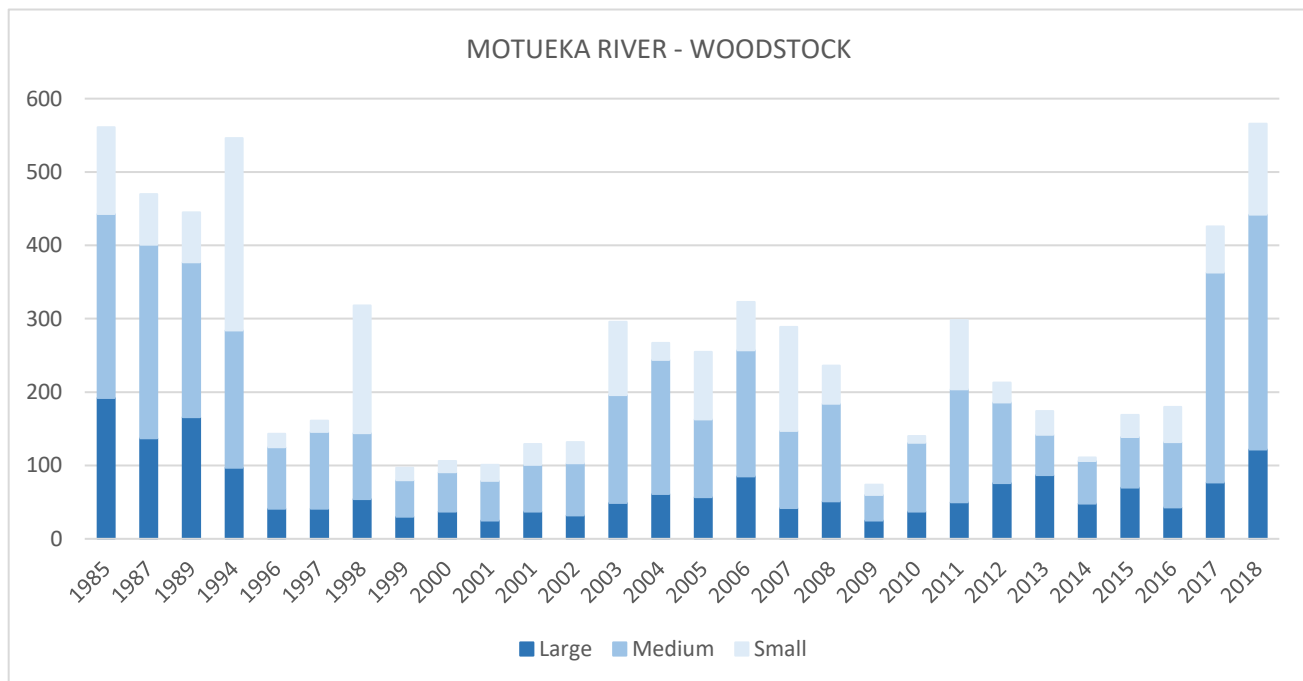
Staff carry out fisheries monitoring using drift dives, winter foot counts of spawning redds and electric fishing. This year Nelson Marlborough staff dived 21 rivers with 31 separate sites, while also assisting West Coast F&G with four dives. The number of rivers was reduced from last year in order to accommodate additional fish release work, but our performance target of 20 separate rivers was still achieved. Foot counts and electric fishing surveys were carried out in various catchments, with our efforts here predominantly targeting release sites.

## MOTUEKA CATCHMENT

### MOTUEKA RIVER

The Motueka River provided superb fishing as staff had predicted due to three very stable years conducive to excellent recruitment. Regular feedback from anglers indicated the average size was down on previous years with many fish in the 2-3 pound range evident, however quantity more than made up for the lower average sizes. A reduction in overall average fish size reported by anglers indicates this system is once again starting to support massive numbers of medium sized brown trout and possibly shifting back to a more food limited brown trout fishery, a phenomenon not seen since the late 1980's/early 1990's when this was documented by Cawthron as a unique feature of the Motueka fishery at that time. Despite the effects of Cyclone Gita on the Riuwaka and lower Motueka, staff therefore had high hopes for the upper sites, and this was proven to be true with some of the highest counts since records began.

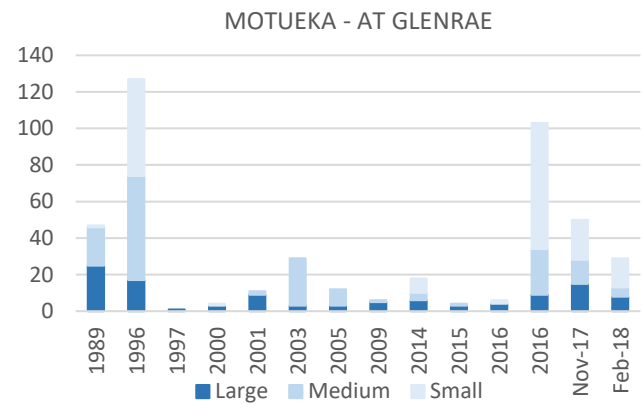
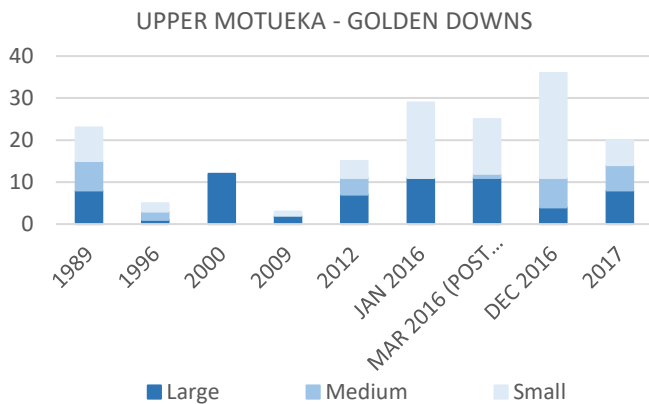
The Woodstock site could be said to be the yardstick for the river, and this years' dive showed similar numbers to the halcyon days of old when the Motueka was known to hold one of the highest numbers of trout/km, however it must be noted that there were more medium sized fish this year (320) than the peak years between 1985-1989 which had a higher number of large trout. The numbers of large fish present this year were still the highest since 1989. Many of these fish will transition from medium to large fish and Motueka River anglers can expect a couple of great seasons ahead, apart from fishing within the lower river which will likely have been significantly damaged from Cyclone Gita sand deposits.



Unfortunately due to insufficient water clarity as a result of the cyclone the lower two sites could not be dived. While the MacLeans and Dove sites were also the highest on record, the Pearse Confluence site was slightly lower than last year which may be due to the marginal water clarity which the divers experienced, and staff were not confident that an accurate count was achieved.

### UPPER MOTUEKA

The Upper Motueka at Golden Downs and Glenrae was surveyed in November, and the Glenrae was dived again in February after the Wangapeka had revealed a record count at the lower site. Staff concluded at the time this was due to the trout seeking thermal refuge in the cooler waters of the Wangapeka, so it was decided to re-dive the Glenrae site to see the effect the warm temperatures had on the Upper Motueka.

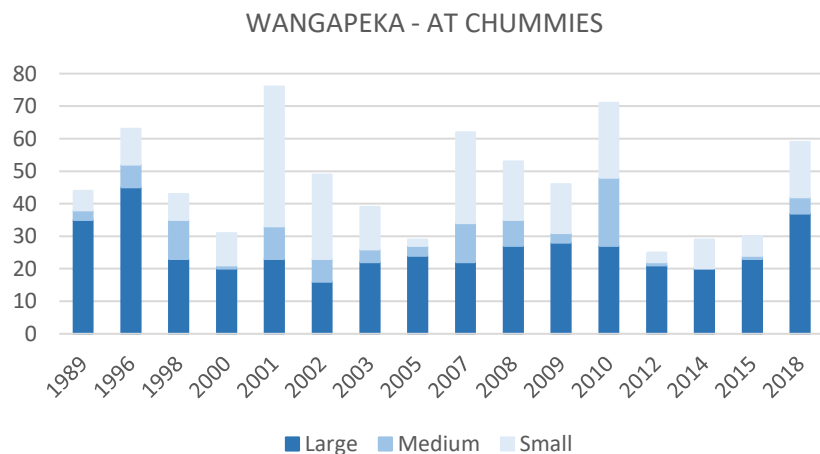


As expected, numbers at Glenrae were significantly lower than the November count, with most remaining trout located downstream of the Hinetai Spring or in deep pools which had cold groundwater flow coming through.

### WANGAPEKA RIVER

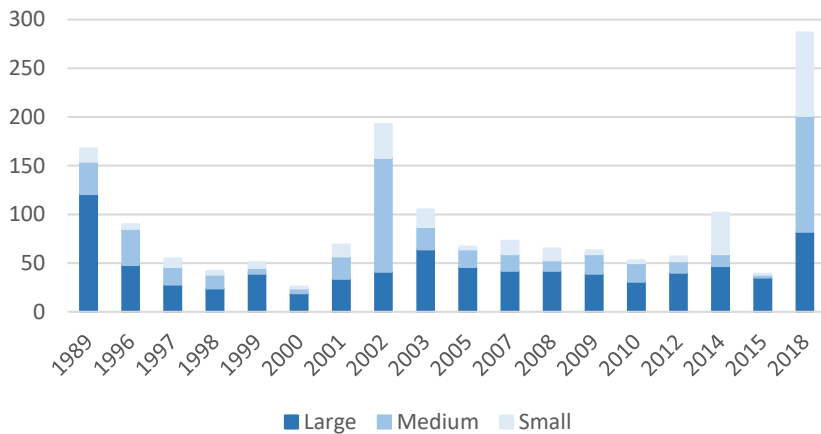
The Wangapeka had not been dived for a number of years so it was pleasing to see fish numbers return to excellent levels after a number of large flood events in the past 7 years had seen some tough years for this nationally renowned river.

The upstream Chummies site had the second best numbers of large fish on record, and the fish were seen to be in excellent condition.





### WANGAPEKA - AT WALTER PEAK



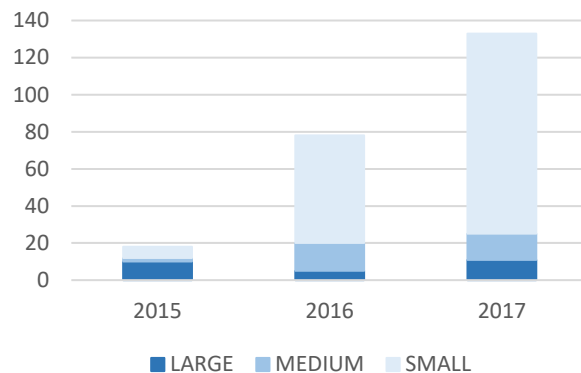
The lower site at Walter Peak was outstanding, and in fact, the best on record. Without doubt this was due to warm temperatures in the mainstem Motueka causing fish to seek the cooler waters of the Wangapeka. For this site, 82 large, 119 medium and 86 small fish were counted in the ~1km site.

### MOTUPIKO RIVER

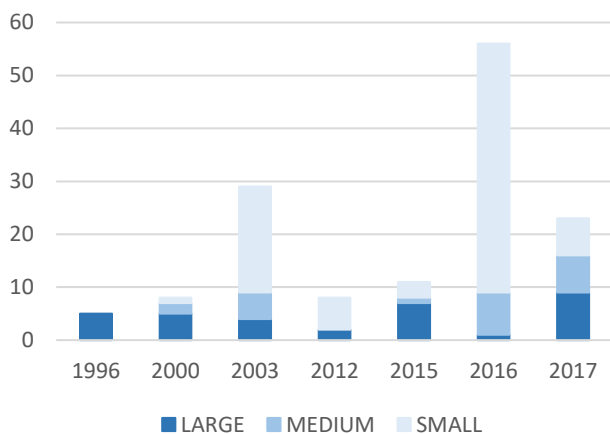
The Motupiko was dived in December, both at the upper (less modified) site at Newports, as well as the highly modified lower site above Quinney's Bush. Angler feedback from the previous season had been good on the upper stretch of the Motupiko, with one guide in particular heralding a significant increase in fish numbers, particularly with numbers of mediums in residence.

This was found to be true from as shown in the drift dive at Newports, with 14 mediums, 11 large and 108 smalls over the ~1500m dive. Interestingly, this record high small fish count resulted after what was considered a wet Spring overall in the region, however it may have been the case that the Motupiko/Rainy was more isolated from these events and received less rainfall than what occurred in the Western tributaries of the Motueka.

### MOTUPIKO - AT NEWPORTS



### MOTUPIKO ABOVE QUINNEY'S BUSH



The Motupiko above Quinney's Bush showed the best numbers of fish across all age classes since 1989 when this part of the Motupiko was exceptional. Staff believe this is a result of the general high numbers of fish in the Motueka catchment, but also due to a shift in TDC's river protection approach (resulting from our prior global river works Environment Court appeal process) where rock spurs are now frequently used in place of riprap, which provides better habitat for trout, in particular the large fish. Note the 1989 count has been removed from the graph in order to make the recent counts more readable, but for the record the 1989 count (prior to extensive lower river engineering works) yielded 11 large, 87 medium and 92 smalls, demonstrating what this productive small river is potentially capable of supporting if habitat conditions are suitable.

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## SPAWNING AND ELECTRIC FISHING SURVEYS IN THE MOTUEKA CATCHMENT

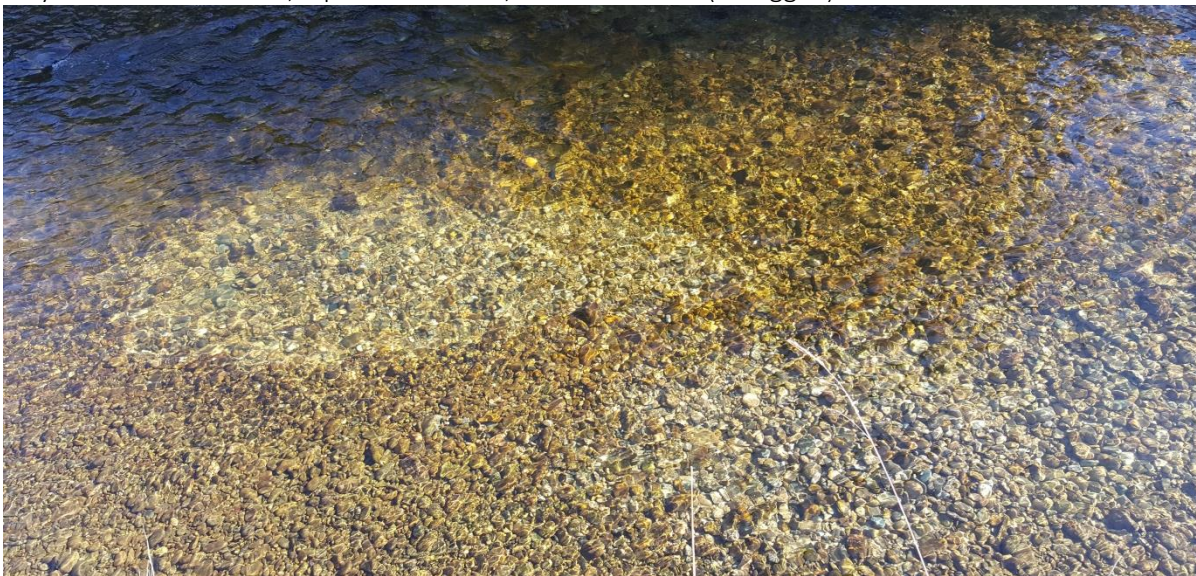
### *Coal Creek*

Coal Creek within the Wangapeka catchment was investigated on June 20<sup>th</sup>, 2017. Historically this stream recorded reasonable spawning activity however during the course of this visit little sign of fish spawning activity was present. Over a 1.5km surveyed reach, with only 1 definite Redd and 2 possible Redd's being located. This is of concern given that this same reach at the same time of the year yielded 30 Redd's in 2001. The streambed had a high amount of fine sediment and sand much of which appeared to have originated upstream of the dairy land from the upper forested (including pine) catchment, presumably sourced from either track work or slips (landowner noted there were several recent slips within the headwaters). Given the surrounding intensifying land-use, this tributary may also ultimately no longer be attractive to spawning brown trout despite it being fenced from cattle. Future follow-up monitoring of available spawning throughout the Wangapeka catchment (including a resurvey of Coal Creek) is recommended, and if this catchment is considered critical for juvenile yield, options for a pro-active spawning stream enhancement project with the land owner may need investigating. It should be noted that such projects are often very time/resource intensive and do not always address critical limiting factors within small lowland stream systems.

Ova boxes were planted in Coal Creek over winter in two separate locations, and an electric fishing survey was carried out in January, however no young of the year trout were observed.

### *Tadmor River*

The Tadmor River was investigated on June 20<sup>th</sup> 2017 at 2 separate locations. The first site investigated within the Tadmor was from the Bush-end Rd Bridge up to the private swing bridge 3.8 km upstream. A release of 29 one kilogram adult brown trout with blue streamer tags was undertaken at David Meades ford halfway through this reach on May 24<sup>th</sup> 2017. Over this reach, 6 definite Redd's, 4 possible Redd's, and 5 adult fish were located, none of which had tags. One dead tagged fish was located below release site, and an additional dead tagged fish was reported 200 m downstream of release site by landowner. The Tadmor Weir operated by TDC was also inspected as part of this survey and is considered unlikely to be a significant barrier to migrating fish during a fresh. Half of this reach was surveyed last year with only 1 possible Redd and no fish, as opposed to this year's tally of 3 definite Redd's, 3 possible Redd's, and 3 adult fish (untagged).



*Nice Redd 100 m downstream of gauging weir.*





*Tadmor gauging weir*

The second site investigated was a 2.6 km stretch of the Tadmor from an unnamed tributary on true left 1.3 km below Tui Road Bridge to the stock raceway crossing 1.3 km above Tui Rd bridge. A total of 13 definite Redd's, 3 possible Redd's 4 live adult fish, 1 dead adult fish, and 6 yearling fish were observed. Last year 0.8 km above the bridge was surveyed with one definite Redd located and 1 adult fish. This year the same reach yielded 2 definite Redd's and 1 dead adult fish, with one of the Redds in the exact same position as last year's record!

Interestingly, the lower 0.5 km stretch starting 0.8 km below the Tui Rd bridge below Donald Creek confluence, held most of the Redd's and fish observed within this survey reach (8 definite Redd's, and 4 adult fish). Donald Creek may possible contribute water chemistry or temperature characteristics more favourable for spawning fish. Indeed the temperature data logger information collected over early 2018 from the lower Tadmor indicates that at least for this summer, salmonids would have perished in the lower Tadmor River without thermal groundwater refugia or similar. It is unknown whether any of the spawning within this reach of the Tadmor can be attributed to the 33 tagged adult brown trout released at Tui Rd bridge halfway through this site – all we can confirm is that the 4 live and 1 dead adult fish observed to still be within this reach, did not appear to be tagged, although it was difficult to get close enough to these fish to be certain.



*Redd above Tui Rd bridge with good woody debris yearling habitat in back ground.*

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Anecdotally, anglers have reported that the Tadmor declined significantly once the Hope diversion was put in place. This observation (if correct) could potentially be related to low summer flows/high temperatures, and collection of good data-logger information this summer would be well worthwhile for this rearing tributary, perhaps profiling the influence of Donald Creek on summer water temperatures. Substantial areas of very good sized clean gravels exist within this WCO protected spawning water and the only likely limiting factor for fish within this tributary appears to be the summer flow/temperature regime, with the dark tannin stained nature of Tadmor water here over the summer months potentially contributing to summer temperature elevation. The Sherry River (much more naturally tannin stained than the Tadmor), does not support significant salmonid biomass for this reason. Whether the relative Tanin content of the Tadmor River increased historically as a result of the Hope diversion is unknown at this stage, however it could be ascertained through a summer site visit next season.

Electric fishing surveys were carried out on the lower Tadmor before and after the winter fish release, however no young of the year fish were seen in this lower site despite the fish release which was ~1km upstream. The upper site at Tui Road Bridge was a different story, although unfortunately no pre-release electric fishing was surveyed. In this instance, the survey at the Donald Creek confluence in December – 6 months after release yielded 40 young of the year trout, some most likely as a result of hatchery fish.

*Right: Good juvenile rearing water in the Tadmor*



#### *Stanley Brook*

The Stanley Brook was surveyed on July 6<sup>th</sup> 2016 from the Motueka confluence to the State Highway Bridge. Excellent habitat complexity exists within this system as Crack willow has not been touched by river Engineers. Only one medium sized fish, and no redds were located however, despite the presence of excellent clean gravels and past spawning records here. It is possible this waterway now gets too low/warm to support salmonids over the summer period.

The Stanley Brook was also electric fished on February 7<sup>th</sup> 2017, with one brown trout yearling only being captured, and two adult fish noted in a pool. Interestingly, 1 torrentfish, dwarf galaxiid, and redfin bully were also located.

#### *Dove River*

The Dove River was surveyed on July 6<sup>th</sup> 2016 from the Motueka confluence for 1.5 km upstream. One adult fish and no redds were all that was observed. Lawson Davey recalls this being a fishery in its own right 25 years ago. Good gravels were present but some sedimentation was also visible – upstream dairy support swede cropping land was not helping things here. It is possible this waterway now gets too low/hot over the summer months, due to extensive pine forest afforestation within the upper catchment. The Dove was also electric fished on 7 February 2017 with zero brown trout located within the lower Dove, and 1 fingerling and 1 yearling only located in the mid reaches of the Dove at Sunday Creek Bridge.

#### *Rainy River*

The Rainy River was surveyed on June 27<sup>th</sup> 2017 in order to determine whether any of the released tagged fish may have migrated back to their original collection site. No tagged fish were located but it was pleasing to see excellent numbers of adult spawning fish within this premier spawning tributary. A lower 2.2 km reach from the Hay paddock boundary up to the ford by old house was surveyed to reveal 12 definite Redds, 12 possible Redds,



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and 10 adult fish (3 pairs). The upper site which has been the location of a significant Cawthron research project in the past was also surveyed from the ford by old house up to the forks, a distance of 3.3 km. This site revealed 33 definite Redds, 21 possible Redds, and 55 fish (40 of which did not yet appear to have spawned and were located within one deep pool). Interestingly, the top 2.1 km of this site contained 28 definite redds, as substrate size and spawning gravel quality was the best within this zone. It was notable that some Redds had been located in small less flood-prone side braids, illustrating the benefits of unconfined natural meandering stream channels found within low intensity agricultural land use. It is for this reason we probably see such high recruitment and productivity rates within the Upper Clarence and Acheron fisheries.



*Large Redd in Upper Rainy*

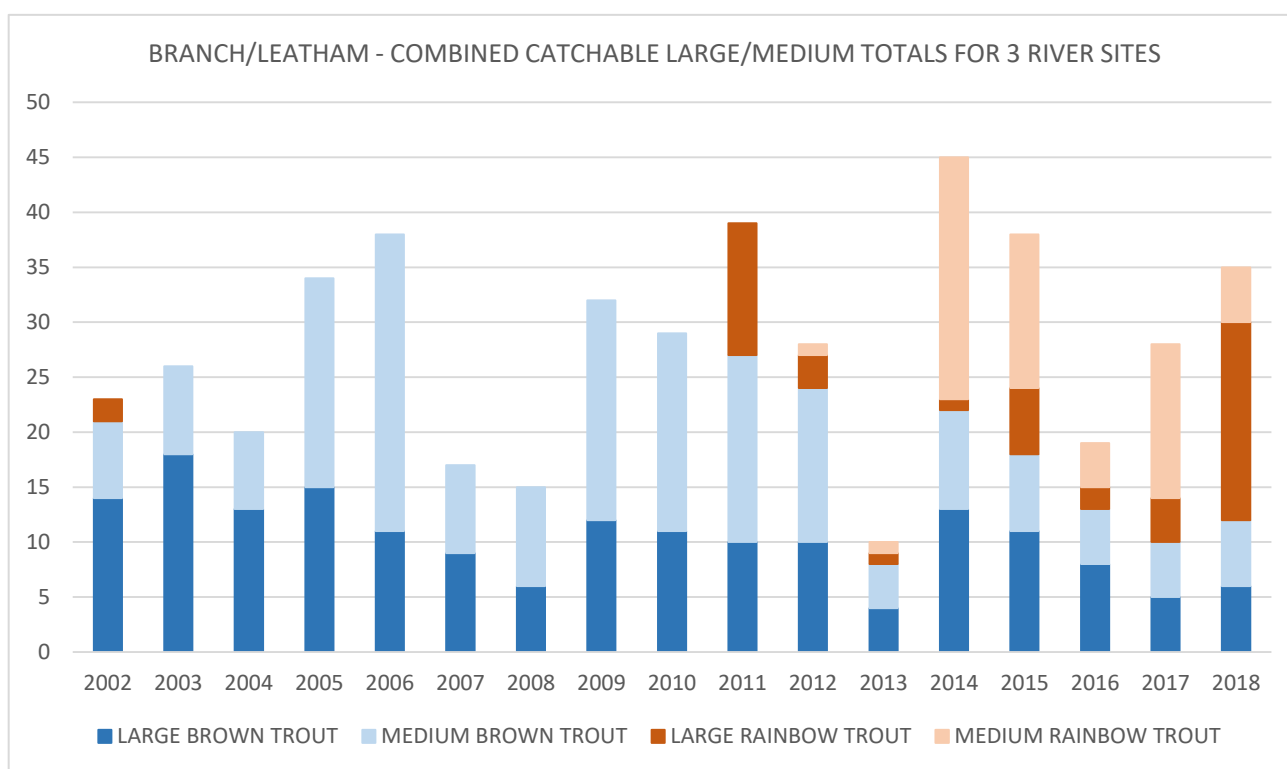
## WAIRAU CATCHMENT

Standout’s from the Wairau catchment for the season was the success of the Lake Argyle and Branch River releases. In both these waterways, excellent rainbow trout fishing was on offer for both released and wild fish. Lake Argyle was particularly popular owing to a tagged fishing promotion. Staff carried out numerous drift dives in this catchment, along with electric fishing surveys in the Waihopai and Leatham catchments.

### BRANCH RIVER | LEATHAM RIVER | LAKE ARGYLE

Drift dives were undertaken in this catchment on March 14. Staff were expecting good numbers of medium to large rainbows in both catchments, due to previous release, however this was not the case in the Leatham or the Branch at Nesbitts. The dive below the confluence, unsurprisingly, returned its highest count to date.

What was plainly evident, however, was the lack of juvenile trout in the riffles, no doubt a result of high intensity rainfall events which had taken place in the catchment during the 12 months prior to the dive.



While the Leatham dive only yielded 1 large rainbow, 1 medium brown, and 3 small browns, staff believe this was a result of unseasonably warm water temperatures that occurred during December, and many trout in the mid-lower Leatham had dropped down to the cooler waters of the Branch.

Anticipation was high for the Argyle headrace canal count, but it turned out to be far more relaxing this year than in 2017 when nearly 800 trout were counted, dominated by rainbow trout. This year, brown trout (25 large, 38 medium) outnumbered the rainbows (4 large, 33 medium). Small fish were distinctly lacking, as they were in the rivers above the weir, with only 9 small brown/rainbows seen compared to last year with 336 counted.

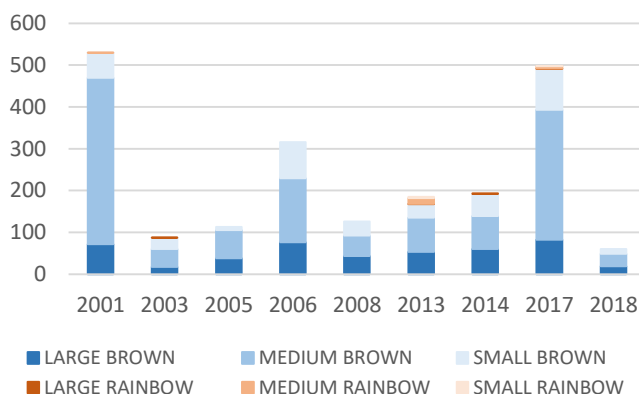
## WAIRAU RIVER

The Wairau this season had mixed reports. Owing to unstable slips at Hells Gate as a result of a Spring weather bomb, water clarity in the Upper Wairau was marginal for much of the summer, and although it was still possible to fish here, this popular part of the Upper Wairau did not receive the attention it usually gets.

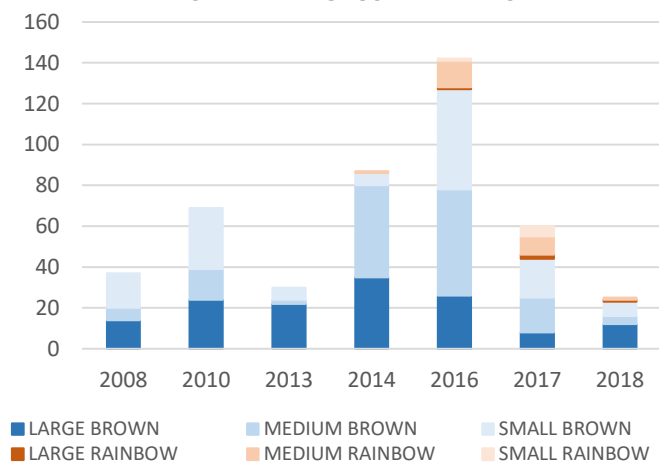
Reports from the lower reaches indicated better (yet still inconsistent) fishing, with an abundance of medium to large fish providing good fishing at times. Despite this, the lower dive at Rock Ferry yielded a poor count, however due to poor water clarity this count may have been inaccurate. It can be said, however, that this reach of the river had changed drastically over the past year and had lost much of the good holding water.

As can be seen from the graph to the right, this was the lowest count on record, with a disappointing number of rainbows, however due to clarity constraints and natural channel modifications, staff believe this dive was not accurate, nor a reflection on the trout population in the lower Wairau. Angler feedback on the lower Wairau this year has, in fact, been far more positive than what the graph suggests. Periodic rainfall events post-Christmas saw the river in prolonged periods of high flow and unsuitable for fishing. Disappointingly, no rainbows were seen in this dive.

WAIRAU RIVER AT ROCK FERRY



WAIRAU RIVER - PROPOSED INTAKE SITE

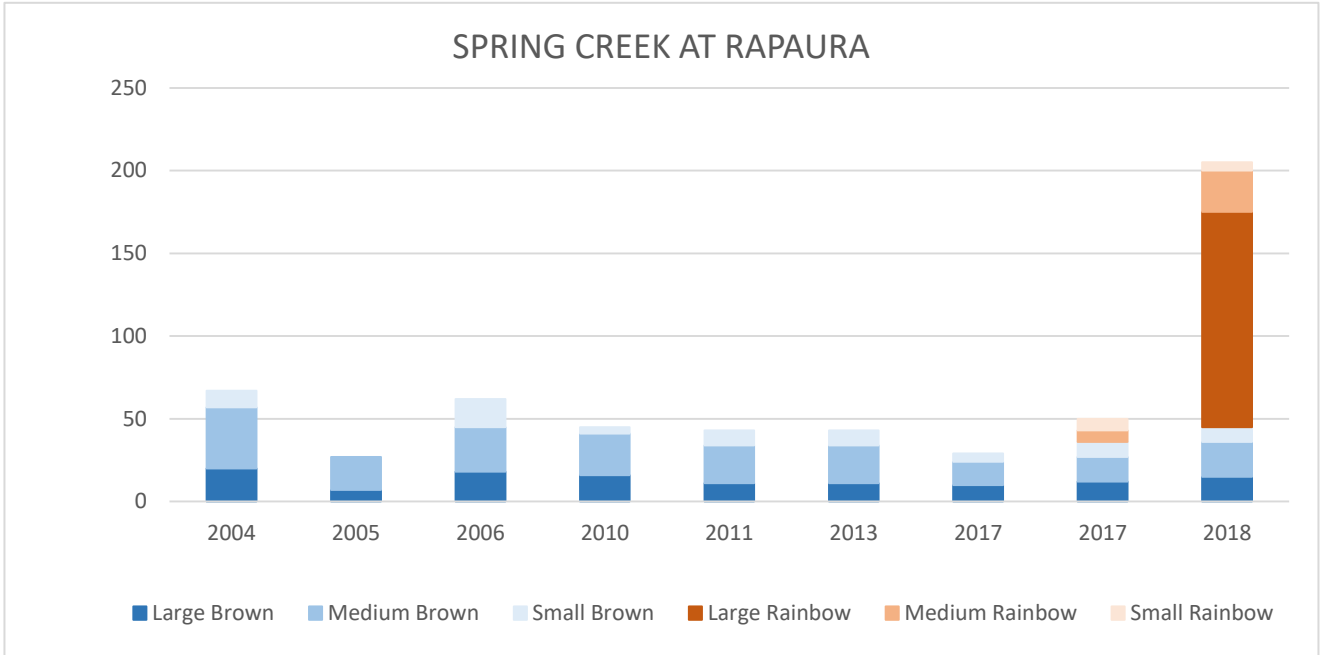


Below the Wash Bridge was again a different story, with numerous anglers professing poor fishing – a fact which was confirmed by our March drift dive at the intake site which was very poor indeed – see graph left.

Again, this site had altered considerably in the previous 12 months with good holding water for trout solely lacking. Much of this run was too fast moving, however where slower laminar flows were found, fish were in residence. An example of this being the bluff pool at the bottom where most of the trout and salmon were seen.

## SPRING CREEK

It's been a busy year on Spring Creek, with 4 separate releases of rainbow trout (400x120g, 320x300g, 100x1kg & 100x1kg+), as well as two separate drift dives – one before the release of large fish and one afterwards. It didn't take anglers long to cotton on to the releases, with frequent reports of feisty rainbows coming to the net. One angler who knows the river well also believed the more vigorous rainbows were drawing the browns out of their safe zones in order to feed and were now more visible to anglers.



As it can be seen from this season’s dives in the graph above, 7 medium and 7 small rainbows were seen in the November dive. Staff were happy with this result, as these fish were released at numerous sites throughout Spring Creek, meaning spaced out over the length of the river – many of these fish were still in residence. There was some outmigration to the Wairau though, as evidenced by one angler’s account of catching lots of small/medium fish lower down towards the Wairau.



With the two releases of 1kg fish (November & February), the second dive was of huge interest as it was unsure as to whether these rainbows would stay in Spring Creek or migrate to the Wairau. So on March 21 Spring Creek was dived again and yielded a staggering 130 large rainbows plus 25 medium and 5 smalls, meaning most of the rainbows had, for the time being, stayed put. More brown trout were seen this dive too with 15 large, 21 medium and 9 smalls. It was reported to staff that a decent number of fish had been taken home and consumed which was pleasing to hear also.



**SPAWNING AND ELECTRIC FISHING SURVEYS**

*Taylor River*

The Taylor River above the Taylor Dam was investigated to determine whether it would make a useful future release site or not. One possible Redd was located and some limited areas of suitable gravel but the low summer flows this waterway (forestry/climate change induced?) and poor summer water quality within Lake Taylor, mean this site is unlikely to constitute a suitable release site – past releases into the lake have not resulted in fishery formation, so future releases here are not recommended.

*Waihopai River*

The Waihopai River approximately 10 km upstream of the hydro dam (adjacent to road bridge), and a Waihopai River tributary site were electric fished on December 13<sup>th</sup> 2017. One fingerling brown trout, three upland bullies, and one Northern galaxiid were located within the 200m<sup>2</sup> main stem Waihopai River survey site. The main stem



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Waihopai riverbed at the survey site was comprised of very substandard habitat for both native fish and trout due to the very high sediment loads experienced within this system. Riffle habitat within the Waihopai River at this location is completely infilled with fine sediment originating from underlying South Marlborough geological processes (a similar situation exists for the Awatere and lower Clarence Rivers). This substandard habitat type appears to be the predominant driver for both native fish and salmonid distribution within the main stem Waihopai, both of which were recorded at very low biomass levels.

Byron Stream, a tributary of the Waihopai River, was surveyed from its confluence with the Waihopai approximately 2.5km upstream of the Waihopai main stem survey site. The substrate within this 200 m<sup>2</sup> tributary survey site was markedly different from the main stem Waihopai presumably due to a higher proportion of native forest, and better geological stability within this catchment. Due to this stability, instream habitat including the percentage of interstitial substrate fish cover was far superior to the main stem Waihopai substrate and this was reflected in the electric fishing results. In contrast to the main-stem site, this site yielded 16 fingerling brown trout, 29 adult and juvenile northern galaxiids, 2 juvenile eels, and 30 upland bullies. These results really illustrate the impact of excessive ongoing sedimentation on fish habitat and populations for both native fish and salmonids. They also give us insight into the substandard habitat conditions that likely exist within the lower Waihopai also given similar sedimentation issues exist there.

Waihopai catchment tributaries potentially gives us a useful control site for assessing what (if any), impacts are occurring on the present day non-migratory galaxiid distribution within the Branch/Leatham tributaries due to the Trust Power rainbow trout re-stocking program (a criticism of this program which has been raised in the past by DOC staff). The upper Waihopai system has a salmonid barrier in place similar to the Branch/Leatham system, so it forms a useful potential control catchment for any monitoring work undertaken within the Branch/Leatham catchments in future. It would be useful to focus a significant amount of electric fishing monitoring work within these two catchments during the 2018/19 year, to measure both the juvenile salmonid population, and also the non-migratory galaxiid populations, at a number of sites which have been historically surveyed prior to the commencement of restocking by Trust Power in 2010. Due to substandard ecological health of the main stem Waihopai River arising from a very high sediment bedload, future salmonid restocking within this system is not recommended, as main stem habitat conditions currently present are never likely to support a high sustainable salmonid biomass.

### *Leatham*

The Boulder stream approximately 300 m upstream of its confluence with the Leatham (100 m above road ford) was electric fished January 25<sup>th</sup> 2018. While significant numbers of Northern galaxiids had been observed up near the Boulder Stream hut where good interstitial cover was present, much lower numbers were observed at the electric fishing survey site located lower down within the system, likely due to much more embedded substrate and siltation impacts at this location (the lower site was chosen as historical survey data existed for it). Over a 200 m<sup>2</sup> survey site, a total of 10 Northern galaxiids, 9 upland bullies, 1 longfin eel, and 1 fingerling brown trout were observed. It is recommended in future to also survey a new site up near Boulder Stream huts where much superior instream substrate habitat was observed.

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### *Tuamarina*

The Tuamarina River was electric fished on November 28<sup>th</sup> 2017 up and downstream of a site located at Speeds Road Bridge with no fingerlings located despite a pair of spawning fish being observed at the top of this survey site last June. A 200 m<sup>2</sup> site surveyed yielded 3 yearlings and 1 adult brown trout however along with 24 upland bullies, and numerous eels.

### *Pukaka*

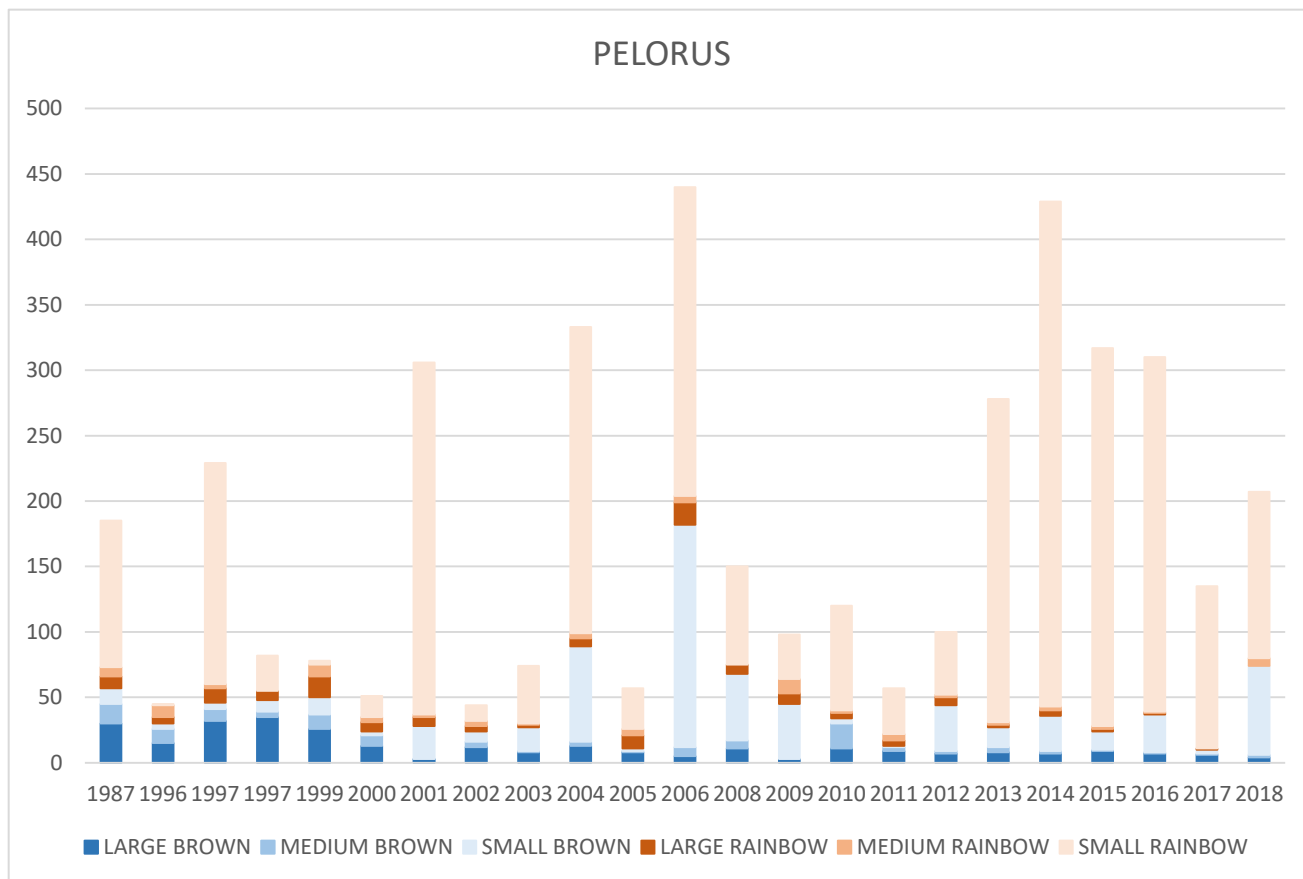
The Pukaka was the standout surprise of this year's juvenile brown trout survey work. Electric fishing a 200 m<sup>2</sup> site on November 29<sup>th</sup> 2017 located 200 metres upstream of the DOC carpark at the road end yielded a total of 60 juvenile brown trout. This is twice the density of other North bank tributaries surveyed historically and 2/3rds the level of our highest recorded juvenile densities within the Rainy which sit at around 90 fish per 200 m<sup>2</sup> on average. Future follow up survey work within this catchment may be warranted given this. Along with these fingerling brown trout, 3 yearling brown trout and 1 adult brown trout were also located. Other species included 9 koura, 9 dwarf galaxiids (adults/juveniles), and 3 upland bullies.



## PELORUS CATCHMENT

Significant effort has been put into the Pelorus catchment this season in terms of liberations and monitoring. The Tinline River received releases of 400 small, 540 mediums and 100 large fish as well as 5700 eyed ova (planted in tributaries), however none of the small/medium fish were seen when the river was dived in October (note: this was done before the release of 1kg fish). 121 young of the year rainbow smolt were seen, however, quite probably as a result of the ova releases.

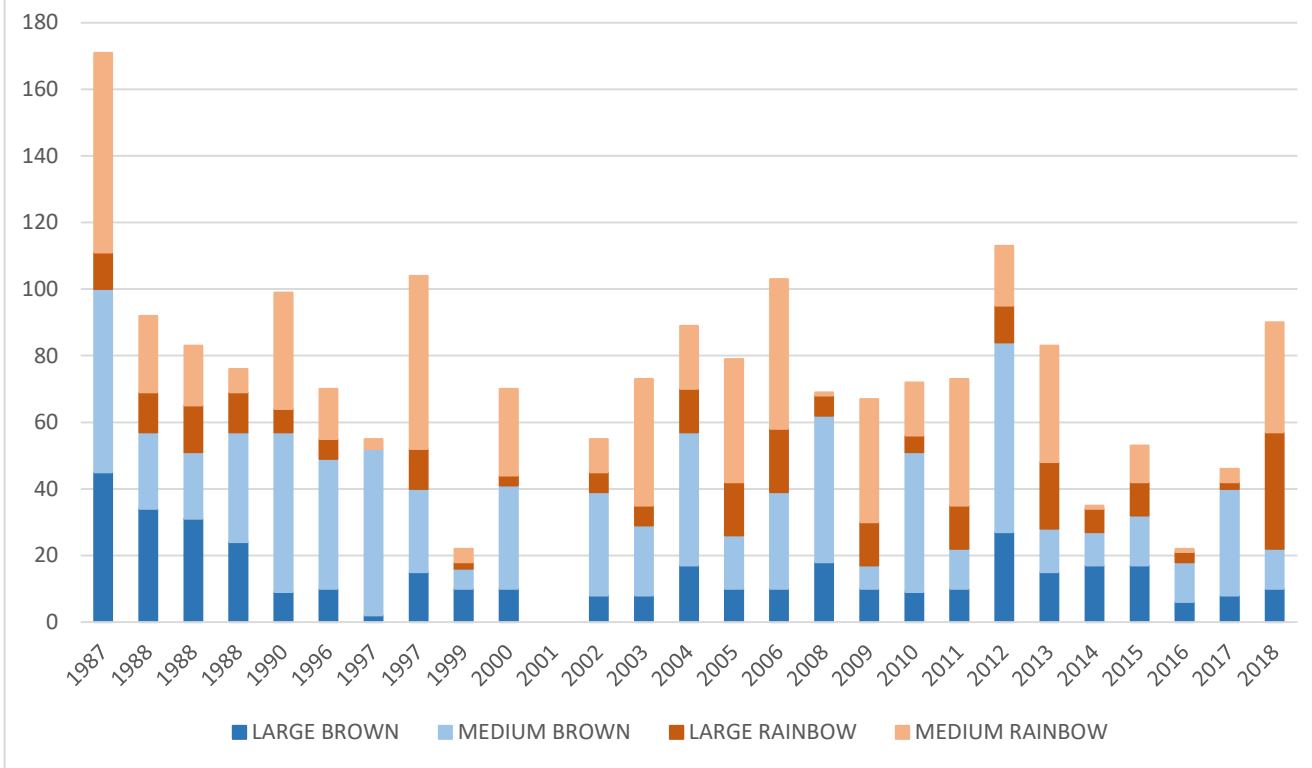
The Pelorus River was dived in March and, similar to last year, the results were disappointing, despite the release of rainbows into the Tinline upstream.



The Rai, on the other hand, fared much better – though this was foreseeable after nearly 300 1kg+ rainbow trout had been released in various locations upstream of the dive site. While many of the streamer tags had fallen out of the fish from the first November, a number of tagged fish from the second February release (using blue floy tags) were seen in the March drift dive. For this years' dive 68 catchable medium/large fish were counted, well up on previous years combined totals of 6 and 4 catchable rainbows. At least 10 of the fish were sporting blue fly tags from the second release – see graph below.

Angler feedback had been positive from the Rai and Opouri releases, too. This area is experiencing somewhat of a boom in angler effort owing to the surge in foreign freedom campers which take up residence at several camping sites in close proximity to the river, but also due to promoting these releases to local anglers.

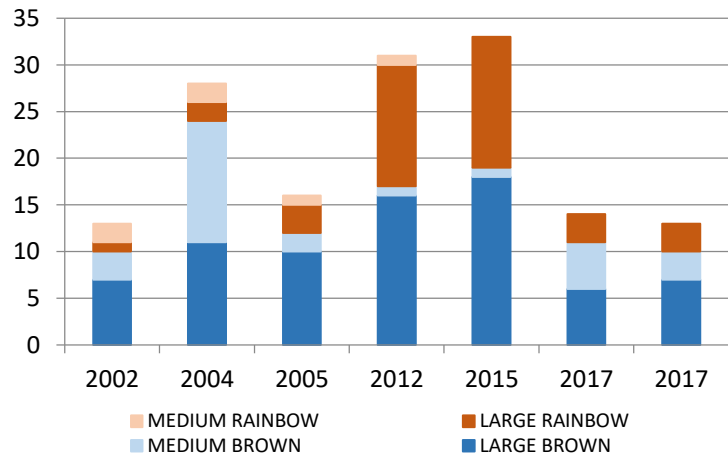
### CATCHABLE FISH - RAI RIVER



The Opouri River was dived in November and was found to be similar to the January dive from the previous season. Just 7 large browns and 3 large mediums were counted, with a lack of medium and small fish. Note – the Opouri graph (right) does not include small brown or rainbow trout.

A release of 100 tagged medium rainbows was undertaken in November after the drift dive, followed by another release in February. It was hoped staff would re-dive the Opouri in order to monitor the effectiveness of these releases, however due to time constraints this was not possible.

### OPOURI RIVER

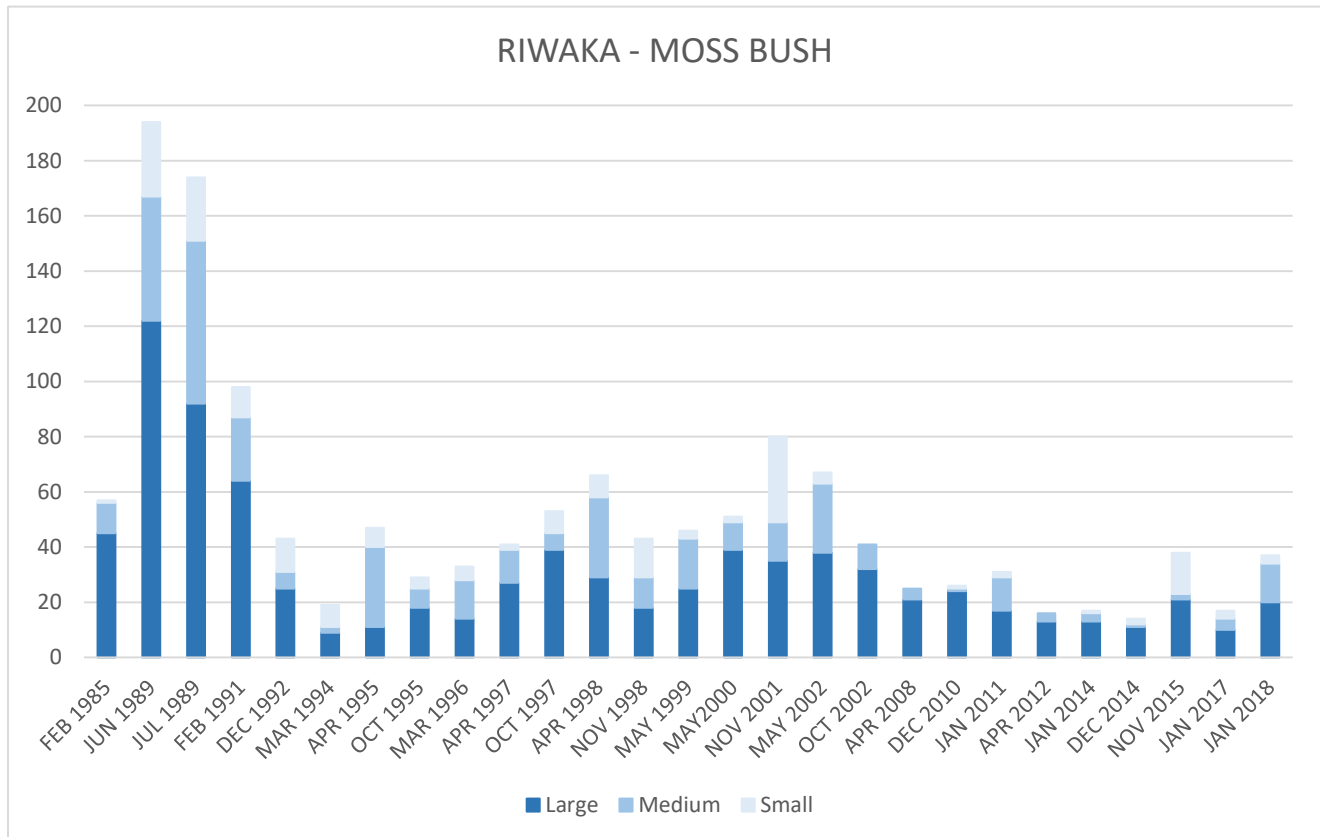




## RIUWAKA RIVER

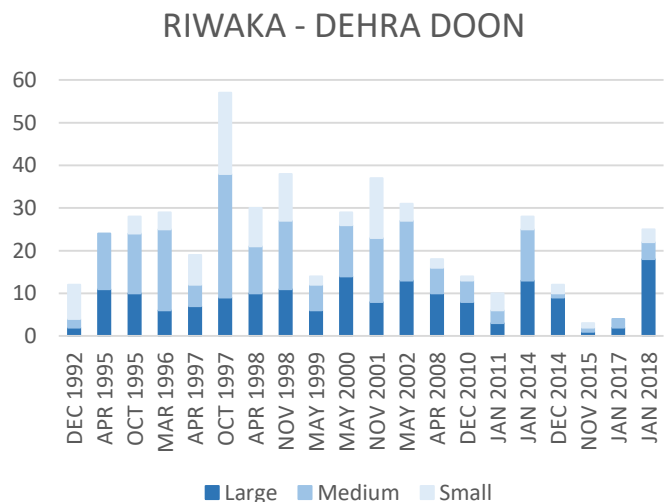
It's been a turbulent year for the Riuwaka River. For the first time in around 15 years, positive accounts were consistently flowing from anglers fishing this river. Not only were there good numbers of large fish, it was very evident that there was a good pulse of medium sized fish in residence too, meaning some decent recruitment (thought to be a prevailing issue with this river) had occurred 2-3 years prior.

This year's dive at Moss Bush was the best since 2002 when the Riuwaka was last fishing well, with 20 large, 14 medium and 3 small fish were counted. Still a long way off from the dizzying heights late last century, but still a respectable improvement on the past decade or so, with these results mirroring the anecdotal angler feedback.

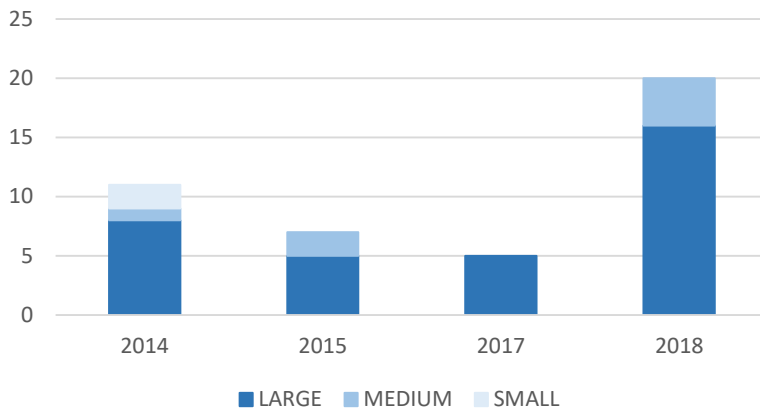


The middle Dehra Doon site showed an even better improvement and, in fact, recorded the highest number of large trout since records began in 1992 – a very pleasing result considering record lows from the two years prior when this part of the river was suffering from sedimentation issues.

Of course, one of the reasons for these increases over all three sites was the fish release in March 2017, where 150 adipose fin clipped fish were liberated into the river. One year on from the release, our calculations after the three dives revealed that approximately ¼ of the fish in the river were hatchery fish – a gratifying result to staff.



## LOWER RIUWAKA - HICKMOTTS



Trout had even returned to the highly modified lower river at Hickmotts, which considering the lack of available habitat, was good to see. One of the reasons for this was, again, due to the release, with at least five of the 16 large trout of hatchery origin.

Some of the feedback from anglers and guides included: **Anton Donaldson** 6 fin clipped fish caught in lower river, all around 3lb | **Don Clementson** tag #302 caught in lower Riuwaka | **William Hill** FC trout caught in South Branch | **Blair Daniel** FC trout caught in good condition.

Then came Cyclone Gita. This 'once in a generation' storm had a devastating effect on the mid-lower Riuwaka, which will take some years to recover from. The Wilhelmus hatchery may provide a key step to kick start this river again, in the form of releases of yearling trout, however we have some issues to work through with Iwi on this river whom are opposed to trout releases.



*Right: Cyclone Gita wreaked havoc on the lower Riuwaka. Upstream of these slips above Foley's Creek, the river fared much better.*

## SPAWNING AND ELECTRIC FISHING SURVEYS IN THE RIUWAKA

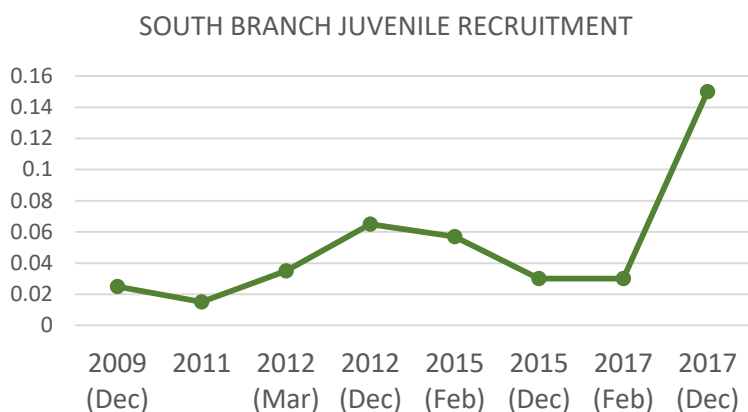


Winter foot counts were carried out on two separate occasions in the Riuwaka, the first on June 12 when zero fish/redds were seen in the South Branch; and 1 redd, 4 fish seen in the North Branch. Two weeks later both branches were surveyed again which revealed a far different count and proves the unpredictable nature of winter foot counts.

In this instance, the North Branch remained much the same with two redds and four fish seen, however in the South Branch 7 definite redds, 2 possible redds, and 7 fish were seen where two weeks prior there had been none.

*Left: One possible redd (foreground) and one definite redd (circled) in the Riuwaka South Branch. A fish was seen holding station on the upstream redd (rear). The lower redd in the foreground may have been abandoned.*

Our electric fishing survey of the North & South Branch was undertaken in December with record fairly typical results in the North Branch (0.036 trout/m<sup>2</sup>) and a record high count in the South Branch (0.15 trout/m<sup>2</sup>). As a reference, though, the Rainy River frequently scores between 0.5-1.0 trout/m<sup>2</sup> (i.e., 100-200 trout per 200m<sup>2</sup>). A further survey was carried out at the Woolshed site where zero trout were counted over 200m<sup>2</sup>.



Results from electric fishing surveys in the Riuwaka (North & South Branches)

Year	Location	Area Sampled (m <sup>2</sup> )	No. of juvenile trout	No. Trout (per m <sup>2</sup> )	Comments
12/2009	South Branch	200	5	0.025	1 LF eel, 1 upland bully
4/2011	South Branch	190	3	0.015	7 Koaro, 6 LF eel, 1 upland bully
3/2012	South Branch	140	5	0.035	9 Koaro, 8 LF eel
12/2012	South Branch	244	16	0.065	9 Koaro, 6 LF eel, 7 koura, 3 upland bully
2/2015	South Branch	191	11	0.057	15 Koaro, 5 LF eel. Stable Spring
12/2015	South Branch	200	6	0.030	11 Koaro, 10 LF eel.
2/2017	South Branch	200	6	0.03	2 Koaro, 8 LF eel
12/2017	South Branch	200	30	0.15	1 Koaro, 2 koura, 15+ LF eel
4/2011	North Branch	230	0	0.000	25 Koaro, 1 LF eel
12/2012	North Branch	184	19	0.103	13 Koaro, 3 koura
2/2014	North Branch	157	0	0.000	11 Koaro, 16 LF eel, 10 year return flood
12/2015	North Branch	120	5	0.042	3 Koaro, 1 SF eel, 1 LF eel,
2/2017	North Branch	177	4	0.023	2 Koaro, 12 LF eel
12/2017	North Branch	168	6	0.036	2 Koaro, 7 LF eel

Interestingly, despite poor clarity in the preceding summer due to ongoing sedimentation leaching from a slip within native forest in the South Branch, spawning at the South Branch ford was the highest on record. This may have been due to a localized increase in suitable fine gravel spawning material emanating originally from the upstream slip, which was obviously sufficiently sediment free this far down the catchment to allow successful egg incubation. Notably the upper electric fishing site much closer to the slip had no salmonids present. Caution needs to be used when interpreting Riuwaka electric fishing results however as a very small stream length is surveyed, and site specific variability in redd position choice each year may well be the overriding driver of observed juvenile salmonid numbers in each monitoring site. Trend analysis is not possible without a much greater coverage of electric fishing sites, but what is possible is comparing an average site density over the monitoring period, with what is generally observed within similar sized sites in the Rainy, to get a comparative idea of relative spawning/rearing productivity of the Riuwaka.

When the 14 sampling sites in the above table are averaged out for the sampling period, on average ~ 8 juvenile brown trout have been observed per 200m<sup>2</sup> of monitoring site – this is an order of magnitude less than the Rainy Benchmark (~100/200m<sup>2</sup>), and less than a 3<sup>rd</sup> of the normal Wairau north bank tributary results (~30) also. From a fishery management perspective it gives good insight as to why few yearlings are observed when drift diving the Riuwaka, and means releases of fin-clipped yearling browns may well be very successful in partially restoring this fishery. It is unlikely releases will completely restore this once great fishery however due to the



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substandard habitat conditions that now exist within the lower river due to flood engineering works along with Cyclone Gita damage.

The monitoring dataset also gives us useful information on the native fish species and abundance within monitoring sites which is useful information for assessing relative impact (if any) of fish restocking initiatives on the native fishery. It is recommended that the Riuwaka electric fishing monitoring continue into the future.



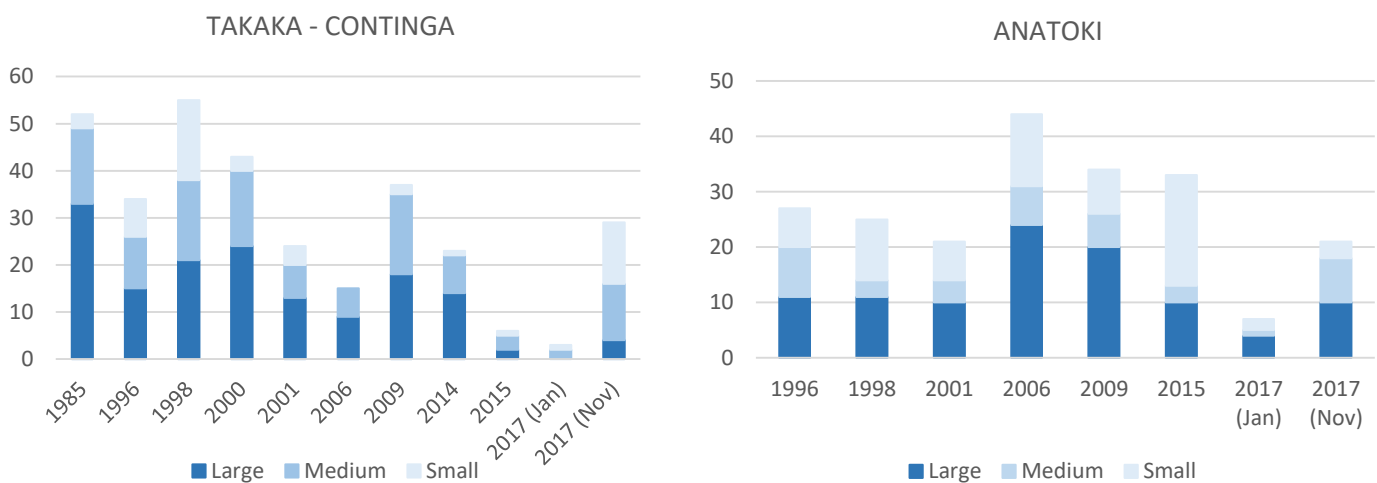


## GOLDEN BAY

Golden Bay fisheries have seen some tough times in recent years, owing to a mix of reasons. Seals, didymo, high intensity flood events, and summer low flows have all taken their toll, with the exception of just a few locations that have managed to avoid some of these impacts.

There was added interest this year as staff dived the Takaka and Anatoki rivers due to a release of 160 trout into both these waterways. Feedback from anglers in the early season indicated that most trout did not remain in the area, and the fact that the tags parted from the fish after a few months meant it would be difficult to count these in the November dive.

Regardless, after record low counts recorded last season, increases were recorded at both the Takaka and Anatoki dive sites, hopefully indicating this fisheries are on the road to recovery once again.



Interestingly, a staff member from the Pupu King Salmon farm called on another matter and struck up a conversation about trout. This worker, who had been there for 15 years and is a keen angler, believed unequivocally that the demise of the Pupu and lower Takaka could be attributed to seals, which formerly plagued their farm until sufficient barriers were put in place to stop them entering (and why the seals then turned their attention to the trout in the Pupu rather than the easier meals at the farm). A drought in the Takaka a number of years ago was another factor which caused a decline in the resident trout population from which the river has still not fully recovered. In the face of all of this, though, it appears some decent sea run trout are still entering into the system as observed during the whitebait season, and also from the recent arrival of a number of huge 30 pound hen brown trout that had just turned up for spawning.

## LEE | WAIROA

From a number of angler accounts the Wairoa provided 'better than normal' fishing this year, particularly in the upper reach around the forks, and was without doubt helped by a release of 95 large brown trout undertaken in December. Staff and voluntary ranger Jack Gauld carried out a number of informal monitoring visits with mixed

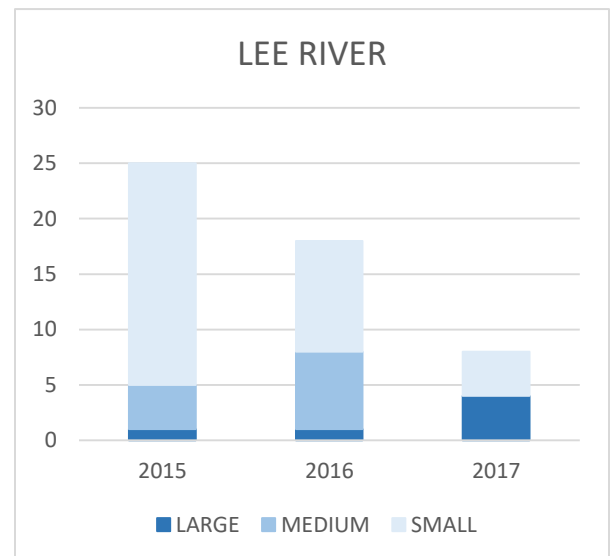
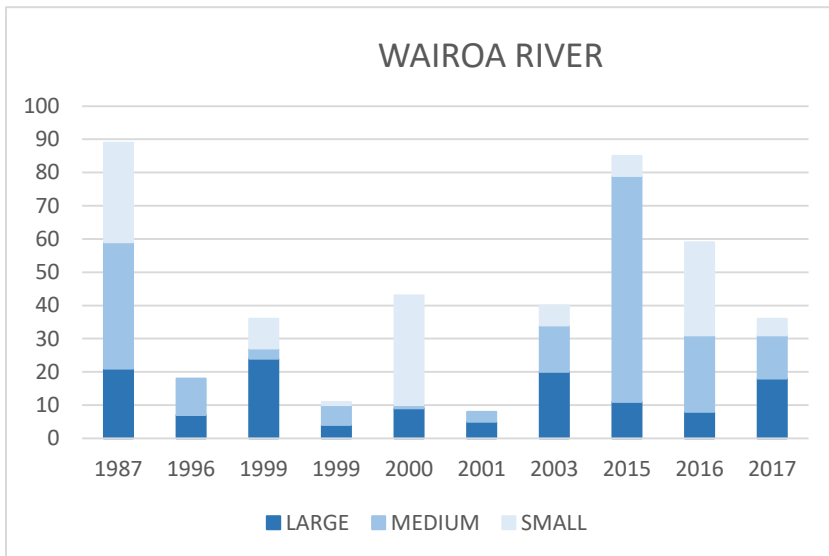


results, meaning the released fish remained highly mobile (potentially indicating there is insufficient food within this system, as is the case with the Tinline), spreading upstream and downstream and no reliable data has been gathered. One month after release Jack caught 6 tagged fish and saw 60 other tagged fish, yet when the area was revisited soon after just a few fish were seen. Unfortunately we ran out of time to dive the river post release.

*Left: Some of the fish were very large, this one 5.2kgs*

Still, even prior to the release the Wairoa dive produced a fairly agreeable number of fish with 18 large and 13 medium fish counted. The Lee, on the other hand, was typically poor with 3 of the 4 large fish spotted in one deep pool. On this dive a distinct lack of invertebrates was noted.

For these dives, which were carried out in December, lack of spring rains meant water temperature was far higher than what would be expected for this time of year.



The Waimea River was dived in November, and similar to the 2015 and 2013 dives undertaken during low flows, the river was reduced to a series of pools with minimal connectivity in between. However despite this, reasonable numbers of fish were seen with 16 large, 17 mediums seen and 9 small, which may be benefiting from the abundant smelt population.

## CYCLONE GITA

Cyclone Gita arrived on the 3<sup>rd</sup> of February and brought with it a short but highly intense rainfall event, which in the most affected areas equated to 200mm over a 24 hour period, and around 100mm in just two hours which was when the main damage was done. This event had a devastating effect on the mid-lower Riuwaka, as it did on some lower Motueka trout spawning streams such as the Brooklyn, Rocky River and Shaggery.

Trout from the Riuwaka were found to be stranded in adjacent orchards and even a report of dead fish on the side of SH60. The only saving grace for the Riuwaka was the fact that the worst hit area was in the lower catchment, leaving the upper catchment (including the entire North & South Branch) more intact.

Pleasingly, staff subsequently received reports from a number of anglers who have indicated there is still a fair to middling population of trout around Moss Bush and the South Branch, which will be important to re-establish the wild population of fish. 1000-1300 adipose clipped yearlings (100g) were planned for release into the river this winter, but this is now on hold due to Iwi concerns.



*Right: The lower Riuwaka post Cyclone Gita.*

While the Riuwaka was hardest hit by the storm, the Motueka catchment and Golden Bay Rivers also saw the ravages of Gita. Incredible debris flows poured logs and sediment into the Motueka and tore away tarmac, culverts and bridges. The Rocky River confluence took on shades of Kaiteriteri Beach, such was the amount of golden Separation Point granite that had been deposited and had buried car sized boulders which were a feature of this location. The Motueka Valley below Stanley Brook was off limits for visitors and anglers for a number of weeks. Still, despite the carnage, the resilient nature of this river shone through, and was made apparent from drift dive counts as well as angler reports which many said the fishing to be outstanding. While two of the lower dives were unable to be undertaken due to insufficient water clarity, the three upper sites have showed excellent numbers and, in fact, resembled days of old when the Motueka had a national reputation for one of the highest abundance rates of trout per kilometre.

In Golden Bay the devastation was most evident in the Takaka catchment, specifically the Upper Takaka where the bridge to the Cobb was washed out. The Anatoki and Waingaro typically receive some annual belter flood events, and staff expect a decent survival rate in these rivers.



*Right: Anatoki River at peak flood*



Fish & Game will face future challenges in fishery management from events of these scale which are increasing in the grip of global warming. Having a hatchery to be able to re-build damaged fisheries will be a key asset to the region. Additionally future plantation forest planning to 'minimize post-harvest risk windows', is now being examined nationally within New Zealand.

*Left: The bridge to the Cobb Reservoir was damaged by Gita*

## SALMON

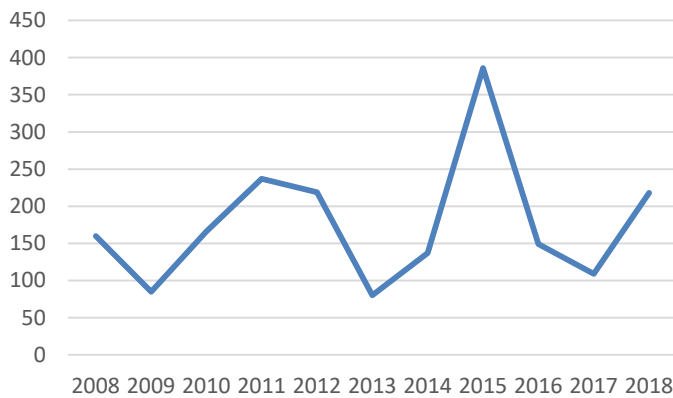
Aerial salmon counts were undertaken in the Wairau, Rainbow and Clarence catchments on 3<sup>rd</sup> May, using Willie Sage from Tasman Helicopters. It was difficult to know what to expect this year as angler feedback had indicated a very poor season, yet the Wairau remained in flood for a good deal of the typical salmon season (January-March), so fish may have moved up through the system under the radar.

An initial count was done on April 19 by councilors Blackmore, Cudby and Cash with a total of 122 salmon counted from the Rainbow/Wairau confluence to the top of the Rainbow side stream. Two weeks later during what is typically considered the peak salmon run, the aerial survey produced a count of 218 salmon (of which just 3 were dead) – roughly 100 more. This count was the 4<sup>th</sup> highest since records began, yet the gloss was taken off by a poor count in the main stem Wairau – just 24 fish, and compounded further from a record low count in the Clarence with just 46 fish, mainly in the Alma (as a comparison the average count for the past three aerial surveys in the Clarence catchment has been 631).

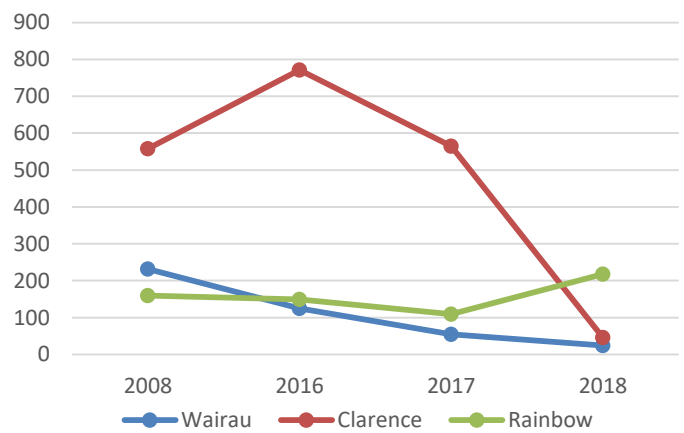
*Right: A pod of 60 salmon in the Rainbow side stream*



RAINBOW SALMON COUNT 2008-2018



AERIAL SALMON COUNTS



Staff remain perplexed as to why the salmon run in the Clarence was so poor. The entire Acheron could not be counted due to poor water clarity – a result of unstable slips in the headwaters, so potentially there may have been pods of fish undetected in the Acheron, yet no fish were observed at the confluence of the (clear) Clarence and Acheron where there is usually some recorded. It may have been the case that the salmon run was later – this from observing a lack of redds in the Alma, and the fact that all the fish looked very fresh. It could be for a host of other reasons too, such as the mysteries of salmon.

*Left: The confluence of the Acheron and Clarence Rivers*



The Kaikoura earthquake may have caused some further unknown complications (however the salmon run last year did not seem to be affected by this at all). What is certain though was the poor runs evident in the East Coast salmon fisheries further South, and the Clarence may have been a casualty from similar circumstances. The Wairau may 'sit outside the box' here in terms of its differences from these rivers, being smaller, warmer, clearer and further North. The ocean ranging fish off the southern east coast rivers may congregate off the coast and be subjected to issues such as food limitations, bi-catch from trawling, or a host of other factors.

An aerial survey was also conducted in the upper Clarence upstream of Tennyson, however no fish were observed here. The heads of three dead fish were also taken for otolith readings and DNA sampling. It was hoped that 10-15 fish would be taken from the Clarence catchment for analyses, however no dead fish were seen.

*Right: Lawson Davey with salmon for otolith and DNA analysis*



As mentioned, angler feedback indicated it was a poor salmon season, but some who persevered eventually succeeded in beaching a fish or two. Here Ben Sowry revels in the sweet taste of success on the Wairau – although this fish was hard won after many hard hours of casting, and with several hooked and lost.

*Left: Ben Sowry on his beloved Wairau*



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## Resource Management Advocacy

As always Resource Management processes took a considerable amount of senior staff time this season, particularly Marlborough resource consents and the start of Marlborough Environment Plan hearings. Resource Management advocacy, while not valued or understood well by many licence holders, remains one of our key avenues to achieve improved Local Authority management and protection of the 'natural capital' that supports the fish and gamebird resource.

Staff continue to prioritize effort and expense on the Marlborough second generation plan review with national assistance from Peter Wilson (national fish and game planner). Submissions on all new water permits applied for within the Rai/Pelorus, Kaituna, and Wairau catchments since the plan was notified have also been lodged, to ensure consistency with our submission on the plan, around minimum flows and water allocation within these catchments.

### MARLBOROUGH ENVIRONMENT PLAN REVIEW

The largest issue of concern within the present plan relates to the proposed allocation of a lot more water out of trout fisheries of interest to Fish & Game, with inadequate assessment or provision for flows to protect instream values. Related to this allocation of new water, are the likely flow-on effects of more intensive land-use arising from new water, and likely increased nitrate leaching rates in catchments such as the Rai and Kaituna Rivers, which are already above levels deemed to be healthy for aquatic ecosystem management. This issue will be traversed in some detail during our October 2018 hearing evidence on the Marlborough environment Plan, with expert input from our national planner Peter Wilson, and likely use of Cawthron ecological expertise, along with some hydrological expertise, and advice from an economist around reducing security of supply issues for irrigators. A tour of these catchments was undertaken with Peter Wilson as background familiarization prior to hearings kicking off. So far, the manager and Peter Wilson have appeared at three separate hearing segments. An introductory hearing was attended at which evidence was presented outlining Fish & Games role and values it was seeking better protection of through the MeP, along with planning and legal evidence. Secondly evidence on indigenous native biodiversity was attended. Thirdly the hearing on the plan Open Space chapter was attended, in which Peter Wilson sought clarification on the present plan rules around public access and the process for stopping unformed legal roads. The most significant chunk of work on water allocation and flows is yet to come in October.

### MARLBOROUGH RESOURCE CONSENTS

Close to 10 resource consent applications (both renewals and new water applications) have had submissions lodged seeking 10 year terms only, and much higher cut-offs (for new water), to ensure consistency with our MeP submission on these matters. This has created a degree of 'push-back' from applicants and their consultants, and MDC's hydrologist, with a view Fish & Game is being unreasonable. Our response to this view has been that had MDC properly provided for the ecological needs within these rivers as outlined within their own Cawthron advice, prior to notifying the MeP, we would not have had to submit. Most applicants so far have agreed these matters are best addressed through the MeP hearings process, and so have agreed to what we sought in our submissions as an interim holding pattern until the matter has been properly addressed.

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## NELSON CITY COUNCIL FRESHWATER PLAN DEVELOPMENT

The manager has been attending stakeholder working groups on development of the Nelson City Freshwater Plan provisions. There has been a need to advocate for inclusion of trout fishery values due to the view of some urban stakeholders that introduced fish such as trout are in conflict with other values such as native fish, so therefore should not be protected/provided for by the plan. Additionally, a letter was sent to all Nelson City Councillors and the mayor, outlining the present legal status of trout under the RMA to bring the Council up to speed on this matter. The NCC freshwater plan will formally open for public submission late 2018. Fish & Game will be required to submit to retain the present protections for salmonids within the plan. Given these views, the manager has also attended various other NCC planning processes including their development of a regional biodiversity strategy.

## TASMAN DISTRICT COUNCIL PLANNING

The next significant area of planning work within Tasman will relate to the 2019 review of resource consents within the Upper Motueka catchment water management zones. Issues raised during the Plan Change 52 process remain, however staff are currently attempting to tease out the relationship of low flows, relative to high summer water temperatures in terms of the critical limiting factors at work in this fishery. A December 2017 drift dive at GlenRae saw a high number of brown trout present, whereas the same site dived a few months later after very hot conditions, saw a large reduction, with remaining fish present only near thermal refugia (deep pools/Hinetai Spring etc). A concurrent increase in fish numbers within the lower Wangapeka, indicated that for this summer at least, the Motueka fishery at this location appears to have a degree of seasonal migratory behaviour in response to high water temperature avoidance. These results underscore the huge importance of getting river engineering flood damage repair works to create structural habitat such as deep pools, through the use of rock groynes and large tree willow species.

The national Fish & Game planner Peter Wilson also wrote and spoke to a brief submission of support for the Waikoropupu water conservation order on behalf of Nelson Marlborough Fish & Game. Our engagement with the concurrent TDC FLAG process for this catchment also remains in place.

## TDC RIVERWORKS UPDATE

Progress is slowly being made towards improved practice within TDC River Engineering Department, with different approaches now being employed within the Motupiko and Waimea rivers (use of groynes and proactive willow planting, in the place of rock riprap). Set-backs were encountered in relation to erosion repair works within the Dove however, where TDC Engineering had resorted back to the use of rock riprap repair works only, with no provision for habitat considerations. After a number of heated exchanges, Council staff finally agreed to incorporate some willow and small stub-groynes within rock repair works. The largest challenge facing the Dove catchment however (once highly used for spawning), is very low summer flows along with high water temperatures, now the top of the catchment is entirely plantation forestry. Any erosion control works which create deep pools within this system will therefore assist in providing thermal refugia for salmonids and native fish during low summer flow conditions, which are now hostile to most fish species within large parts of this system.

We are still yet to get anywhere on the Riuwaka following some habitat improvement agreements from a community landowner meeting hosted by TDC, and following the extensive damage to the lower river from Cyclone Gita, it is unlikely much will occur here in the coming year. We will instead focus on increasing

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recruitment within the mid-upper river through yearling releases (unless this has to cease due to lwi concerns here), as electric fishing monitoring clearly shows there is insufficient wild recruitment levels within this catchment.

## PROACTIVE

Agreement for legal access protection via a subdivision up the Riuwaka South Branch was gained from TDC. Engagement with Tasman District Council over cyclone Gita damage also occurred, with a photo-essay presented to NM Fish and Game Council over damage sustained. Damage within the Upper Takaka, lower-mid Riuwaka, lower-mid Brooklyn, Shaggery, Herring Stream and Greenhill areas was extensive and significant sand deposits will now be moving through the lower Motueka fishery. Drift dives next summer within the Riuwaka and lower Motueka should provide interesting data on the extent of damage within this system. Damage occurred within mature native forest (Upper Takaka), pasture, regenerating native, mature plantation forestry and non-mature pines. The Shaggery catchment got particularly badly hit as pines tree growth stages were within the 5 year significant risk window for erosion (2-7 years post-harvest). It is the staff view however, that such was the intensity of this event, that even if pine plantations were removed from the Shaggery now – it would be at least 200 years until major damage reduced as a very large number of slips also occurred within regenerating native some of it 50+ years old. The manager is of the view that best area for Fish & Game to put its limited advocacy time into in order to try and address this type of damage from extreme rainfall intensity, is to invest in climate change mitigation advocacy (<https://www.noted.co.nz/currently/environment/climate-change-nz-needs-to-plant-more-trees-but-what-kind-where/>). The separation point granite forestry zones are already strictly controlled by specific management plans and controls in relation to this geology, but when events such as Cyclone Gita arrive, no planning rules in the world will be sufficient to stop the extensive damage experienced. Post-harvest re-forestation tree species planted on some steep separation point granite sites may also be reviewed in future by Tasman District Council due to consenting requirements for some of these sites now the NES for Forestry has come into effect.

In relation to climate change mitigation advocacy, the manager recently attended a Beef & Lamb NZ teleconference on their draft Environmental Plan, and pushed the industry to get proactive and future focused in relation to getting our agricultural soils to start storing carbon. This represents a major marketing tool for Beef and Lamb NZ, as well as an excellent opportunity for New Zealand to ultimately transition towards a carbon neutral economy (see the following links: <https://www.stuff.co.nz/business/farming/103756758/Ecologist-calls-for-changes-to-improve-soil-health> | <https://www.stuff.co.nz/business/farming/103728804/Tremendous-opportunity-for-New-Zealand-farmers-to-be-world-leaders>). Globally around 1/3 of the present CO<sup>2</sup> within the atmosphere has been derived from misuse of the world's agricultural soils. Agricultural soils hold 3x more carbon than the atmosphere and 4x more carbon than the world's terrestrial vegetation and so represent the largest global carbon sink by far under human influence (we cannot influence oceanic storage). Globally, soil scientists have estimated that agricultural and plantation forest soils have the ability to store 50-75% of the world's current emissions, and could easily pull back atmospheric concentrations of CO<sup>2</sup> to 350ppm, the level needed to stabilise the global climate (globally we are now past 400 ppm). Adoption of the right farming systems globally that result in soil carbon capture would achieve this. Liaison and dialogue with Beef and Lamb NZ on this matter continues.



# Compliance

It's been a busy year on the compliance front, with staff and voluntary rangers achieving a good number of licence checks on a wide variety of fisheries, and a higher than normal amount of non-compliant activity. With a target aim to catch up with 10% of licence holders, this meant that 375 (approx. 3750 LEQ's) licence checks were required, and this was easily achieved with at least 459 checks.

A total of 20 offences were detected by rangers: 7 for not holding a backcountry endorsement, 5 for fishing without a licence (all offered reparation), and 7 others for a variety of offences (i.e., trolling with 2 rods, fishing in junior only fishery) of which most were issued warnings. This works out to be ~5% non-compliance rate – higher than expected though this now includes low level offences such as not holding a backcountry endorsement for which warnings are issued.

Having the fuel voucher incentive worked very well, which markedly increased our compliance efforts on backcountry designated fisheries. A total of 96 anglers were checked on our four backcountry fisheries (including guides), of which 42 were non-resident. In regards to guides it is difficult to know what to do here for without the guides the % of non-resident anglers using these rivers would be higher, however they wouldn't probably be there without the guide on their own accord therefore guides remain included. The following is a summary of the compliance for the 2017-18 fishing season:

Total licence checks	459	
Total on designated backcountry rivers	96/459	21%
Total non-resident anglers on ALL rivers	158/459	35%
Total non-resident on backcountry rivers	42/96	44%
Total non-compliant	20/459	4.5%

## REPARATION & THE CONSERVATION (INFRINGEMENT SYSTEM) BILL

Until recently many Fish and Game Councils operated a reparation system for the least serious offending. Fish & Game has now suspended the use of reparation once it became aware of the recent decision by the Supreme Court - Osborne Rockhouse vs Worksafe New Zealand [2017] NZSC 175 [23 November 2017]. This has meant Fish & Game's system which dealt with most minor offences is now not legally an option for the organisation to continue with and its use has been suspended.

The introduction of an infringement notice system is the only available system to fill the gap now operating within Fish & Game between warnings for the least serious offending and prosecutions for the most serious instances. Recently the Conservation (Infringement System) Bill came before Parliament.

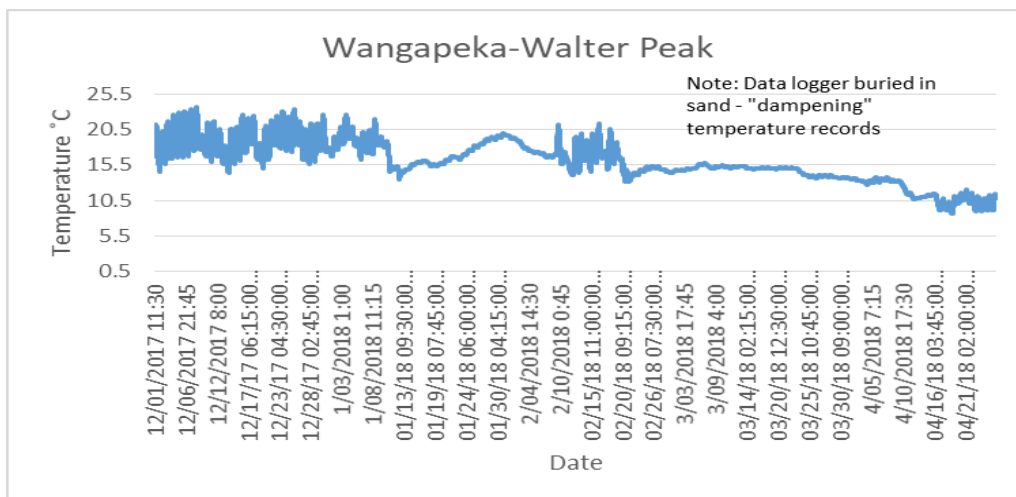
This is a Bill to introduce an infringement system for DOC to deal with lower level offences in an efficient manner, and enable those matters to be resolved out of Court. Fish & Game have lobbied to be included in this system, which would be beneficial to our organisation for a number of reasons. Fish & Game, along with honorary rangers and members of angling clubs made submissions on the Bill, asking that Fish & Game be given the powers do adopt the new Conservation Infringement System.

# Temperature Data in the Motueka Catchment

Fish and Game again carried out water temperature monitoring during the 2017/18 summer in the upper Motueka catchment, with staff deploying 12 Onset Hobo pendant water temperature data loggers in the upper Motueka Catchment and tributaries between late November 2017 and late April 2018.



Unfortunately the data logger and chain that was located downstream of the Tapawera Bridge was missing (assumed tampered with) when staff went to retrieve it, so no data is available for the 2017/18 summer at that location. The data logger located in the Lower Wangapeka was hit by a slip and covered in sand twice, which as can be seen from the graph below “dampened” or lessened the daily temperature fluctuations - although temperatures in December indicate water temperatures in the Wangapeka were lower than the mainstem of the Motueka.

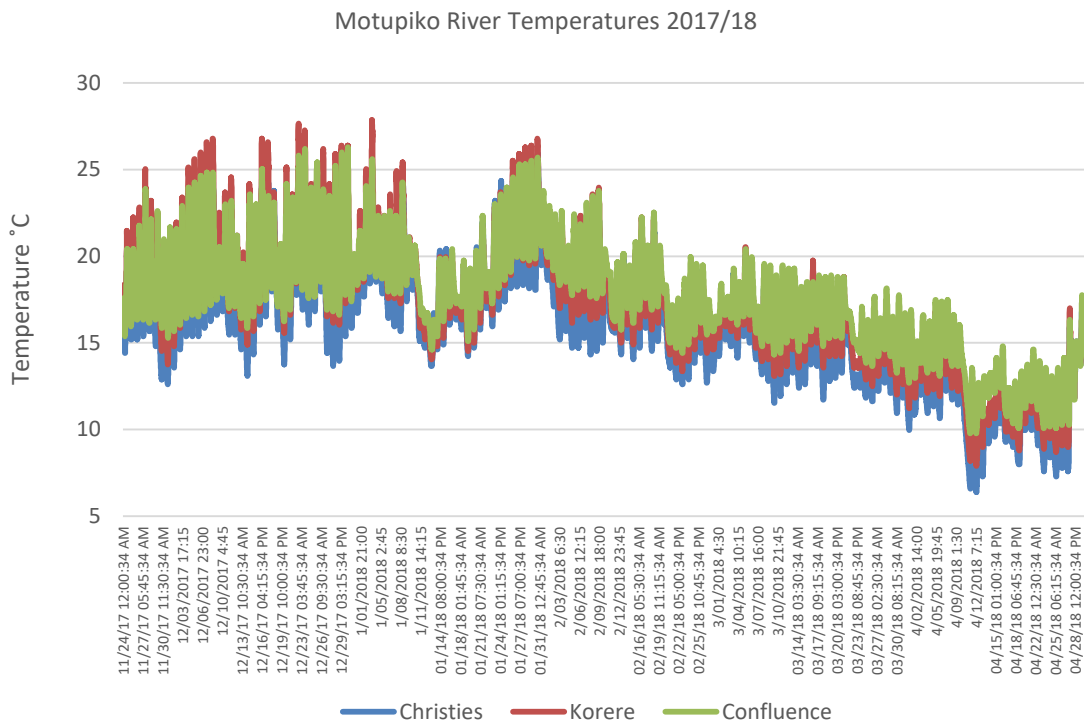


The remaining loggers however produced some good data. Like the previous summer, the 2017/18 summer was again an extremely unusual one. While late winter and spring was extremely wet, conditions changed

dramatically with 8-9 weeks without rain and hot “February like conditions” prior to Christmas. Signs were looking ominous for a long hot summer, with water restrictions and drought conditions in place prior to Christmas 2017. However things changed dramatically in early January with the first of several severe storm events which saw river levels running high almost for all of January, February and much of March 2018! In this time the region was hit by two ex-tropical cyclones Fehi & Gita – with Gita in particular causing a lot of damage in the Lower Motueka, Riwaka and Golden Bay Rivers. The 2017/18 summer however was quite a bit warmer than the 2016/17 summer.

### MOTUPIKO

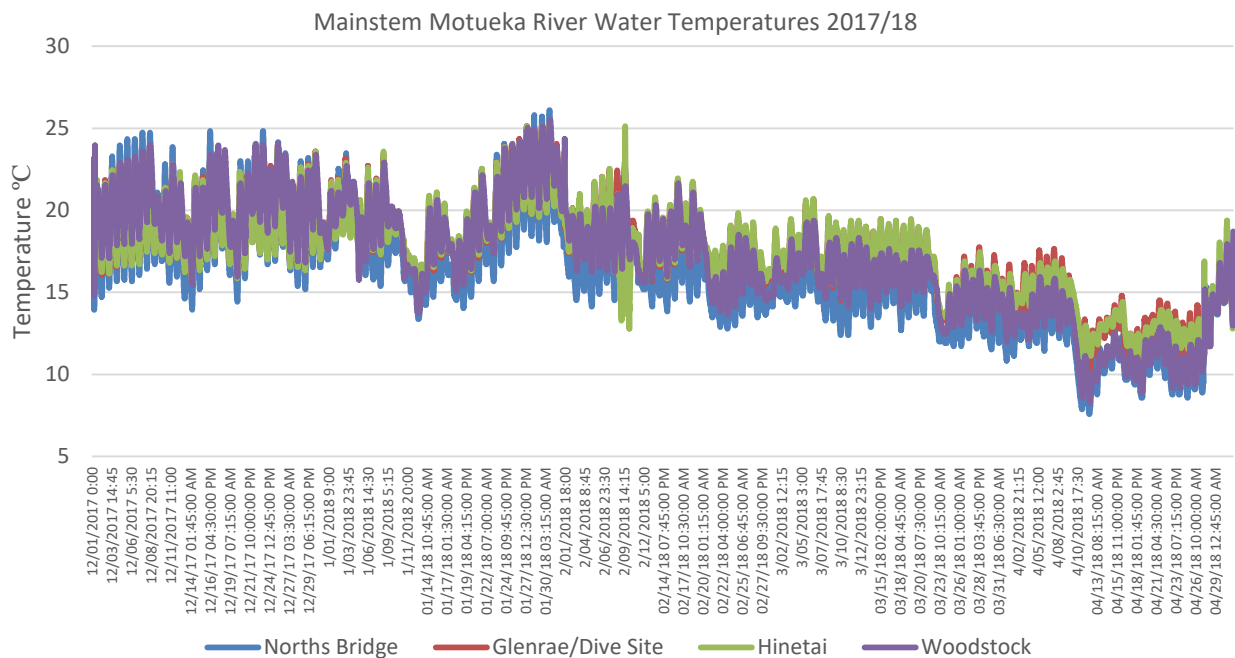
As can be seen from the graph below, during the 2017/18 summer, water temperatures in the Motupiko were warmest in late November through until early January, with another brief warm period in late January. Maximum water temperatures recorded were 25.90 °C at Christies on the 30<sup>th</sup> of January 2018. On the 3rd of January 2018 temperatures reached a peak of 27.8 °C at the Korere Bridge (while Christies was 24.35°C and the confluence 25.31°C). Maximum temperature reached upstream of the Motupiko/Motueka River confluence was 26.29°C on the 30<sup>th</sup> of December 2017 (the temperature was the same at Korere however 3°C cooler upstream at Christies).



Given brown trout thermal tolerances, it is likely water temperatures in the Motupiko particularly in the middle “Korere” reach of the Motupiko are likely to be having a detrimental effect on trout behaviour, growth and ultimately survival. Unlike normal years where usually river flows decline and river temperatures increase in February & March, during the 2017/2018 summer water temperatures were generally hotter in December and declined in February & March.

## UPPER MOTUEKA

As can be seen from the graph below water temperatures in the mainstem of the Motueka from late November to the end of December frequently exceeded 20 °C – often approaching 25 °C. There was also a week in late January which saw elevated water temperatures where water temperatures exceeded 25 °C at all four monitored sites on the mainstem of the Motueka, with North’s Rd Bridge site reaching a maximum of 26.097 °C and Woodstock reaching 25.416 °C on the 30/1/2018. This correlated with a few reports from anglers of dead fish being observed – fortunately only low numbers involved but indicates fish were becoming stressed. However for much of January, February & March water flows were higher than usual with water temperatures cooler than the period prior to Christmas. Water temperatures across the four sites averaged 17.725 °C for the December – early April period – which was 1.4 °C warmer than the same period during the 2016/17 summer.



Unlike previous years, little variation was recorded between the Glenrae site and the Hinetai site data this year. The reason for this is unknown although likely to be a reflection of ground/surface water interactions. Although additional water has been allocation in this reach (90l/s) it may have had some influence on the results prior to Christmas – but subsequent to Christmas unlikely given how wet it was and the fact little irrigation would have taken place after Christmas. The table below also shows the maximum recorded temperatures for the mainstem Motueka sites, as well as the average temperature for each site (Dec-April period). As can be seen, both the Glenrae & Hinetai sites were very similar this year with less variation compared to the Norths and Woodstock sites which would indicate groundwater influences. Of some concern is the fact that the average temperature at Woodstock for December was 20.28 °C. Staff were starting to receive reports of fish deaths (low numbers fortunately) in late December and late January.

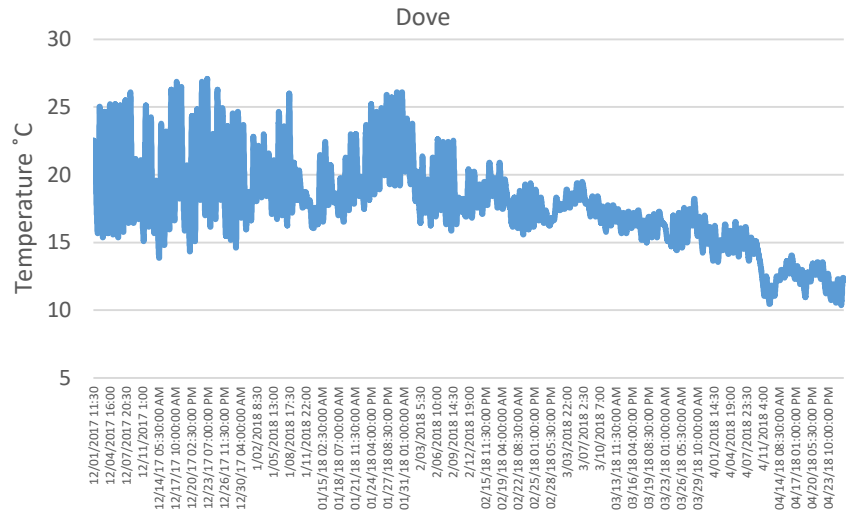
	Norths	Glenrae	Hinetai	Woodstock
Max Temps	26.10	25.32	25.31	25.51
Avg (Dec-April)	16.91	18.04	18.05	17.92
Dec Average	19.10	19.38	19.24	20.38



The Glenrae site was dived on the 23 November 2017 with 15 large, 13 medium and 22 small brown trout counted. The site was again dived on the 9<sup>th</sup> of February 2018, however only 8 large, 5 medium and 16 small trout were counted. It is likely that the reduction in numbers was a consequence of the water temperatures and flows in December.

### DOVE RIVER

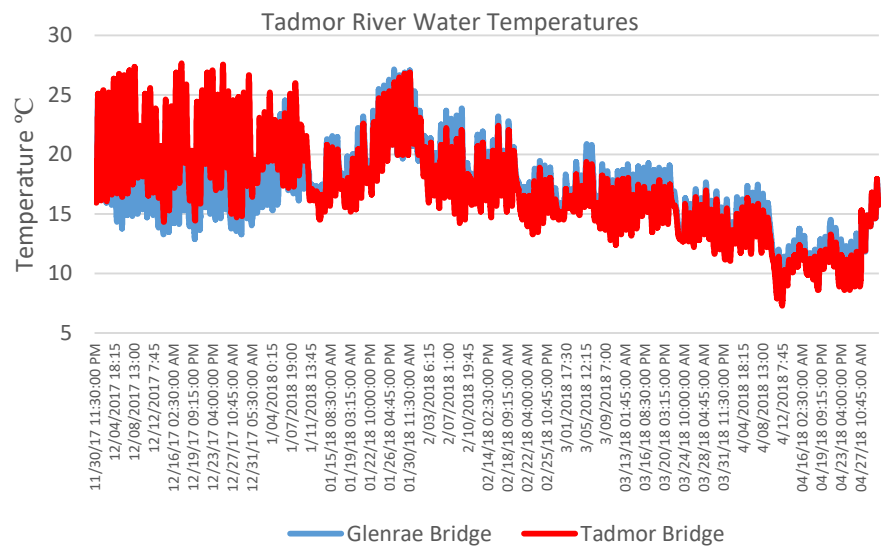
The Dove River displayed similar results to the other monitored sites, with elevated temperatures in December and late January, with a peak temperature of 27.07 °C on the 23/12/2017. Like the Wangapeka site, the datalogger was subsequently covered in sand (as a consequence of the floods) but the results showing more of an average temperature rather than the full extent of the daily fluctuations.



### TADMOR RIVER

Like the Motupiko, water temperatures in the Tadmor River exceeded 25°C frequently during December and late January. Maximum water temperatures reached 27.66°C at the Tadmor Bridge on the 17/12/2017, whereas the maximum temperature at Glenrae was half a degree less with a maximum of 27.17°C on the 27/1/2018.

Of interest to note is that the Glenrae site was on average a degree cooler than the Tadmor Bridge site prior to New Year, however this altered with the Glenrae site on average being a degree warmer after New Year. While the exact reason(s) for this is unknown, it potentially could be linked with the Hope Diversion and/or groundwater interactions.



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## R3 – Recruitment, Retention & Reactivation

Fish & Game are strengthening engagement in their R3 efforts nationally as there appears to be a serious crisis in the making which, as it looks, is set to weaken Fish & Game as an organisation going forward. That is, with an ageing angler base and low numbers of young and new anglers getting into the sport there appears to be a lack of people to pass the baton on to in order to sustain the organization holistically and financially, particularly within the North Island.

So what is R3?

*“R3 stands for **recruitment, retention, and reactivation** and R3 activities seek to create new participants or increase participation rates of current or lapsed outdoor recreationists.” (U.S Fish & Wildlife Service)*

The NZ F&G Council sees this as a priority, and have now engaged a national R3 coordinator to facilitate and monitor R3 activities between regions. Here in Nelson Marlborough we have, in fact, been very good to date applying R3 principles and have had some good wins on the R3 front. This has been made possible by focused efforts on junior fishing development initiatives such as Challies Island, and the Wilhelmus hatchery allowing us to carry out releases of catchable large trout into enclosed waterways as well as rivers. The hatchery is the key component for our R3 efforts here, as we need the ability to offer licence holders (new, lapsed and current) something new in return for their licence purchase. The following is a brief summary of some of our R3 activities over the past season:

### JUNIOR FISHING DEVELOPMENT

Challies Island has been a hive of piscatorial activity this season, with at least 14 organised kids fishing events, as well as extended periods in between events when the ponds were opened up to the public. This all equated to approximately 400 kids attending these events, and hundreds of visitations from families and juniors in their own time.

From a Fish & Game point of view, allowing families to fish the ponds unassisted is highly valuable as they are more likely to develop into lifetime anglers in the future. The question is what happens in the next step, as the bridge between the Challies Island experience and that of catching trout in the wild, is often a large one. Fish & Game need to focus efforts on bridging this gap by providing close to town and/or easier enclosed waterways fishing where punters have a reasonable chance of catching a fish. Lake Argyle has been a boon in this respect, as has the Taylor River and perhaps Spring Creek in time.

Recruitment aside, Challies Island has also seen high patronage by charitable groups over the years: valuable positive PR in the wake of increasing anti trout sentiments.



Plans are also afoot for a Marlborough youth fish out pond with funding secured for its construction hopefully in late 2018, pending resource consent requirements. Additionally, agreement has been obtained from Tasman

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District Council for the development of an adult fish out pond adjacent to the present junior ponds within the Waimea River Park, another exciting R3 development initiative moving forward.

### LAKE ARGYLE FISHING PROMOTIONS

The Lake Argyle fishery has been an eye opener for Fish & Game staff this season. Incidentally this began last season when we dived the headrace and counted nearly 800 trout, mostly rainbows (many of which had arrived via the intake as a result of Trustpower upstream releases into the Branch). Subsequent media releases highlighting high trout numbers saw a surge in angler effort here. In order to capitalize on the Argyle revival, this season we ran a tagged fishing completion, where 200 tagged fish were released into the lake and lower canal and the offer of a \$500 Henderson's voucher for anyone catching the lucky fish.

It would be fair to say that this promotion has been highly successful on a number of fronts. In the days following the newspaper and Facebook releases, we not only saw a vast increase in angler effort at the lake, but also a spike in licence purchases with 110 additional purchases that we believe were directly as a result of the promotion, and of which 30 were **lapsed** licence holders and 24 were **new** licence holders. These were only from **locals** with an address in the area where the release took place. Furthermore, during the period when we were promoting the Argyle releases we sold 42 junior licences, of which 29 were new and 4 were lapsed licence holders.



*Right: David Sulser with a tagged fish*

We will continue to focus our efforts on Lake Argyle as we see it as one of our regions jewels, not so much in terms of scenery and wild fishing experience, but in terms of its high angler patronage, recruiting and retaining new and lapsed anglers, and good catch rates. In essence we would like to create our own version of "Twizel": popular to local anglers all year around, continually stocked with large hard fighting rainbows, and with annual tag competitions or "trophy fish" promotions to keep interest levels high.

### LAPSED LICENCE HOLDER GIVEAWAYS

As an experiment, this year we targeted 100 lapsed licence holders from the region (those that had not purchased a licence in the 2016-17 season), offering them a free day licence for the 2017-18 season to see if this would encourage them to re-engage in fishing. Fifty were sent a letter and magazine, and 50 were sent an email.

Only four responded in the affirmative taking up the offer of a free licence, yet 14 then went on to purchase a whole season licence after the letter went out. We continued to keep all the lapsed licence holders personally informed of fish releases around the region and monitored their licence status after each letter/email:

- after the 2<sup>nd</sup> contact 5 more licences bought
- after the 3<sup>rd</sup> contact 3 more licences bought
- after the 4<sup>th</sup> contact 11 more licences bought, making a total of 33/100 lapsed licence holders reactivated.

### INCREASED MEDIA ATTENTION

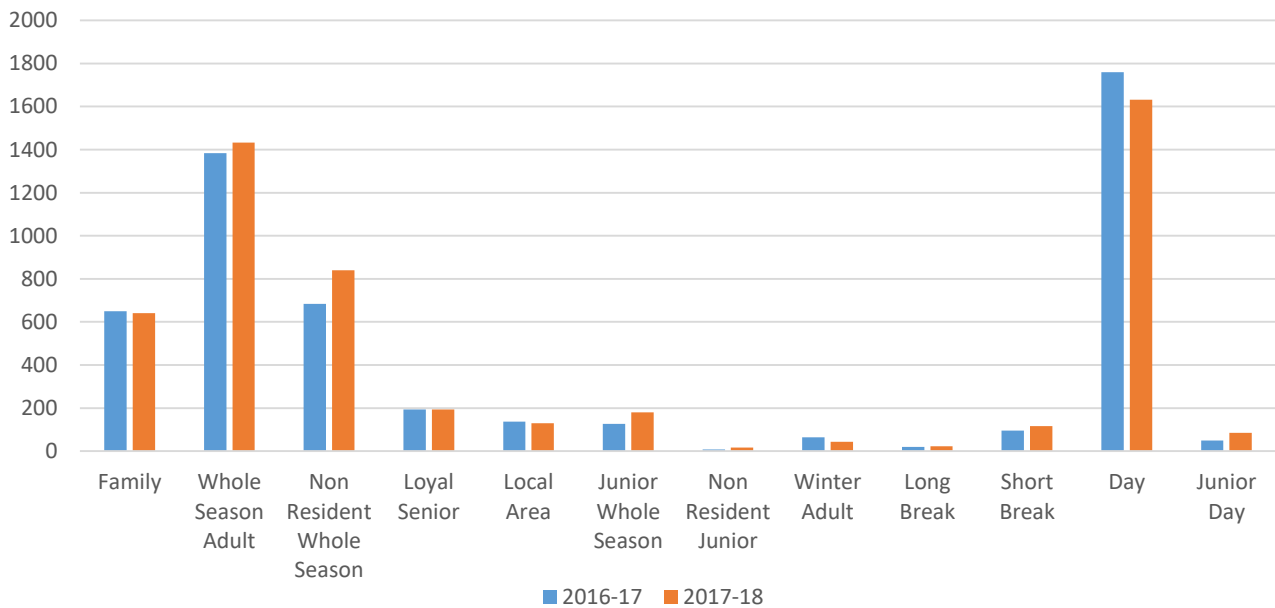
With all the good work that is going on in regards to fish releases and junior fishing development, clearly, the key is then to tell people about it. We have increased our media releases here in order to promote these incentives, with good results. Facebook, too, has been a key means of informing the public and we have seen excellent traction via this channel, with 6000 plus views on our latest Lake Argyle updates.

# Licence sales

Fish & Game licence sales increased this year, which staff believe was due to a mix of increased participation as a result of fish releases/promotions; introducing two new backcountry fisheries (requiring purchase of whole season licence); and general increase in tourism across the board. The following is a summary of licence sales by category in the past two seasons:

LICENCE CATEGORY	2016-17	2017-18	Comments
Family	649	640	Steady
Whole Season Adult	1383	1433	50 up
Non Resident Whole Season	684	840	Partly caused by two new designated rivers, estimated to be extra ~10-15K in revenue
Loyal Senior	194	193	Steady
Local Area	137	129	Steady
Junior Whole Season	127	180	Large increase: Argyle fishing promo, Taylor River & Challies Island
Non Resident Junior	8	16	
Winter Adult	64	43	See what happens this year with winter fishing promotion.
Long Break	20	22	
Short Break	96	116	
Day	1759	1632	Lower due to new b/c designated rivers meaning whole season licences required
Junior Day	49	85	Argyle/Taylor River/KFO ponds?
<b>TOTAL</b>	<b>5170</b>	<b>5329</b>	<b>Increase of 159 licence sales across the board - all categories</b>
<b>LEQ'S</b>	<b>3585</b>	<b>3754</b>	<b>Increase in 169 LEQ's (Whole Season Licence Equivalent)</b>
<b>INCOME</b>	<b>\$474,100</b>	<b>\$508,700</b>	<b>Increase revenue of \$34,600</b>

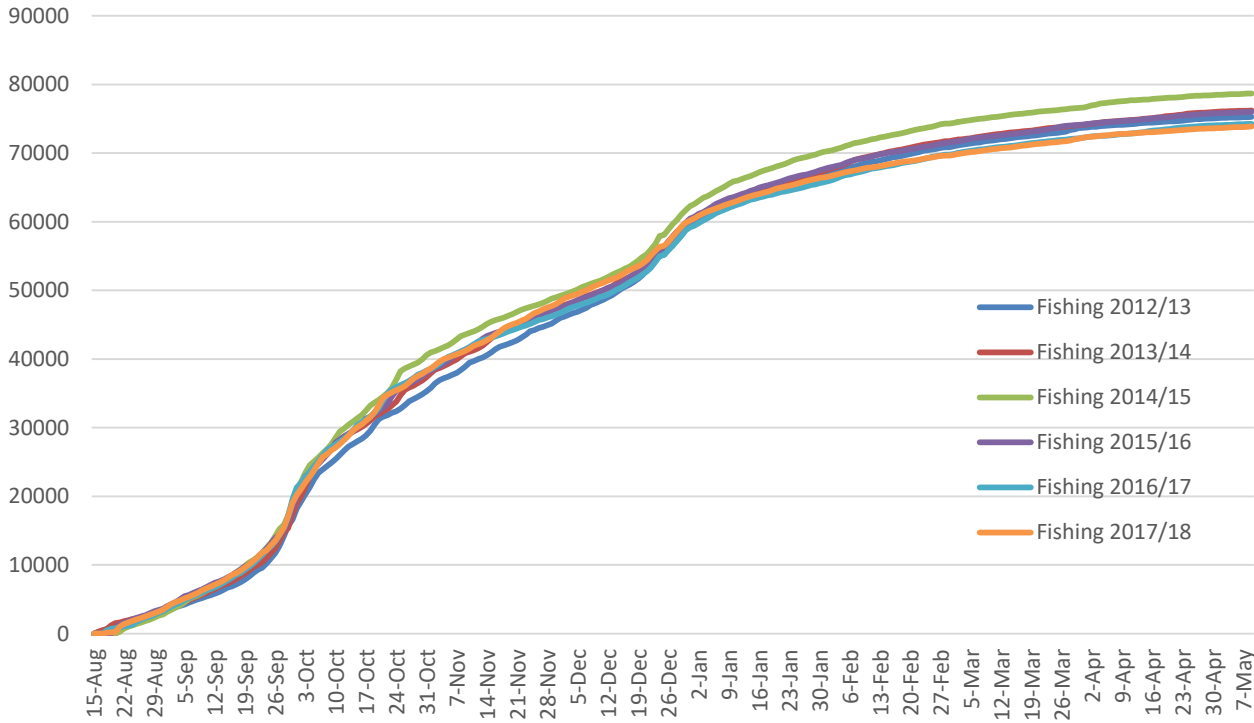
LICENCE SALES BY CATEGORY FOR THE PAST 2 SEASONS



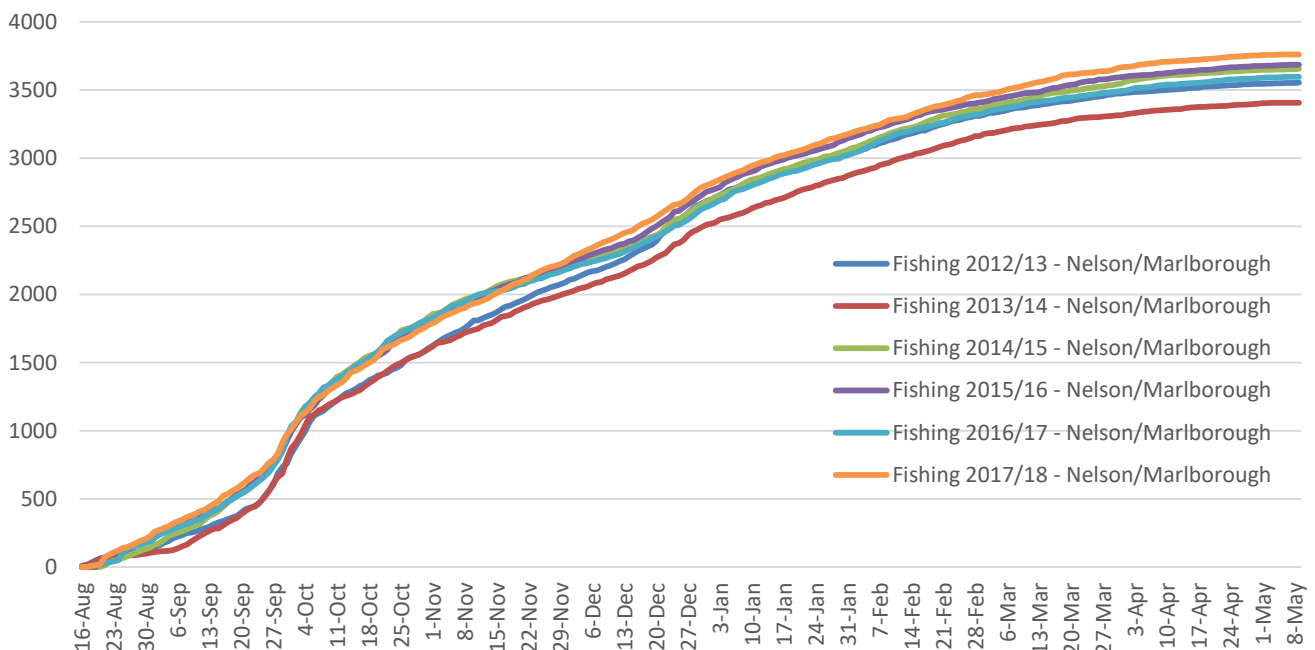


Nationally, licence sales were down, and, in fact, the lowest since 2012-13. This mainly arose out of losses from most North Island regions. Nelson Marlborough bucked the trend (as did all other South Island regions bar North Canterbury), thanks to our R3 efforts and was one of the country's standout regions, up 4.8%.

National Licence Sales (LEQ's)



Nelson Marlborough Licence Sales (LEQ's)

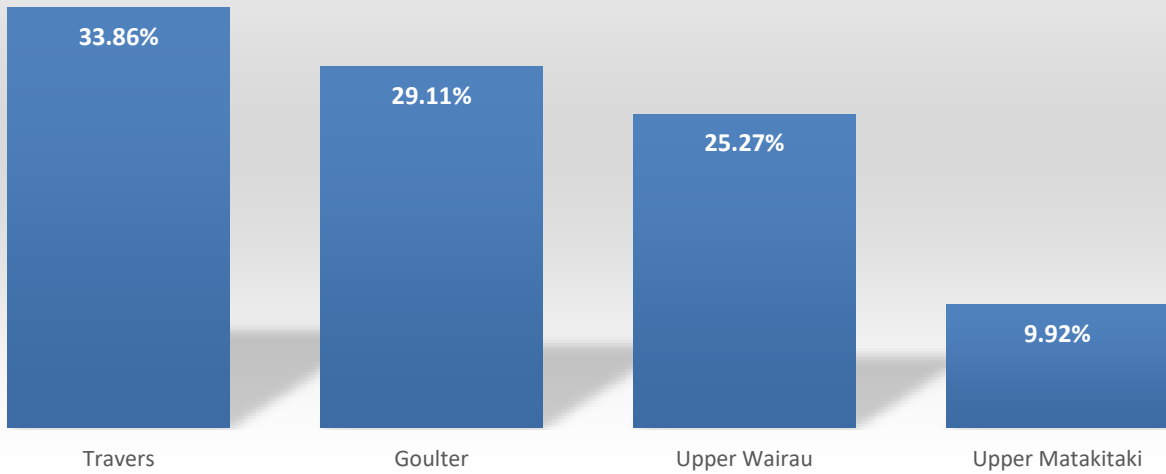


## APPENDIX 1 - COMMENTS ON UPPER WAIRAU BEAT SYSTEM FROM BACKCOUNTRY USER SURVEY

In support
Great idea but not everyone is respecting it.
Works out ok, but very varied lengths on beats
Great system
It's good
Yes most of them are only half a day
All good, apart from the Owen River Lodge guides who fish more than one beat on a day!
Make more beats downstream??
It all was a good experience with no problems
Seems popular.
Good
It is a good improvement. Permission to use the road should be more user friendly
Good idea
The system seems good at face value. I think the concept is good. I guess its really only worthwhile for the period when the gate is open at 6 mile creek, as it was locked when we were there. I only fished it though for three days, so its hard to give any real feedback.
System seems to work well on fishing 2 days i was stopped twice by f and g officer
I think it an excellent development - my experience on 1 day was compromised because even though I was on the beat another fisherman came in approx 500m in front of me!!
I feel beat systems are a good fair system if anglers respect them and adhere to them
All good, a very enjoyable day.
Had a great time.
Seems the same as always
Good system given the nature of the river in this section
I like it; it is a positive innovation
I think that it is excellent
Please extend beat system downstream.
I think the beat system is perfect! Very good solution to allow anglers to fish undisturbed. The beats have been measured properly, but they tend to be quite short, I have fished 4 of them and cleared them in about 6 hrs each. The beats are not well sign posted, makes it difficult to see them from the road and from the river i.e. Irishman's flat the sign post is up in the flat while the river is well below and the sign is hidden behind a bunch of trees. It is very hard to see it and stop fishing there.
Was good

Negative comments
Pity the guides don't use it.
Non residents especially Europeans camping out of their vehicles along the beat system.
A waste of time when it is only voluntary. Especially when guides from Owen Rv Lodge didn't honour the voluntary system and regularly jumped in ahead of other anglers.
it is not going to achieve much
Beat system doesn't work
Sounds complicated, havent done it
Not real a fan of the beat system
Saw no sign of it and don't think it's necessary but would like to see guides being restricted by it
The beats are too varied in their length! Some beats are only 2km long?
Don't do it, it's a slippery slope and recreational fishers should not have to bend to legitimize guiding operations using a public resource
Some beats are too long and some are short. This was impacted more by the devastating September 2017 flood that trashed the entire river.
I've heard a few complaints that people are still abusing the system and beat jumping also being told its voluntary so you can't do much about it. I stay well away from because of these problems/reasons
It appeared that from local anecdotal evidence the guides were not adhering to the beat system

### % DAYS NEGATIVELY IMPACTED BY OTHER ANGLERS FOR RESIDENTS



### % DAYS NEGATIVELY IMPACTED BY OTHER ANGLERS FOR NON-RESIDENTS

