FISHERIES REPORT

2016-2017

A summary of the 2016-17 fishing season, produced for elected Councilors and licence holders of Nelson Marlborough Fish & Game region.

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Summary of the Season

Welcome to the 2016-2017 Fisheries Report for Nelson Marlborough Fish & Game Region.

For Nelson Marlborough Fish & Game, as statutory managers of the freshwater sports fish resource, it has been a diverse and eventful 12 months, with some significant milestones and achievements. After a huge amount of work, the Wilhelmus hatchery has come to fruition and is now supplying the region's rivers with trout and salmon. Another key initiative has been the introduction of designated backcountry fisheries, There has also been youth fish out events, a busy schedule of monitoring work, as well as important core work in both Marlborough and Tasman regarding maintaining and enhancing the quality and standards of freshwater habitats.

Fishing was generally pretty good, with the Wairau and Motueka once again providing excellent sport for anglers. Lake Argyle, too, was impressive for its fish numbers as revealed in a record trout count in our drift dive, and to which local anglers, to their credit, immediately responded too. With the turbulent spring weather, many rivers remained high throughout October/November and trout fishing was tough early on, particularly for fishing guides who sought out remaining fishable rivers with some degree of angler crowding. While rainfall was consistent, flood events remained low to moderate and served to keep rivers full and aquifers topped up, with low mortality of medium to large fish. However based on drift dive observations and electric fishing results, spring flood events did appear to have a significant effect on 'young of the year' juvenile trout recruitment in smaller spawning tributaries in many catchments, including the Motueka and Wairau catchments.

Staff have continued to spend considerable effort and expense on the Marlborough Second Generation Plan review (particularly new water permits applied for since the plan was notified), and the TDC River works Global Consent (however an agreement has been reached here and staff have been pleased with a higher level of consultation, and modification of some practices). Plan Change 52 has not been pursued, effort has instead gone into understanding summer low flow conditions within this river, in order to better inform the 2019 review for all water permits within this part of the Motueka Catchment.

It is encouraging to report that our region has been successful in gaining approval for 20k funding from the national FG research fund for furthering the collaborative Didymo research program we are involved with including NMIT/NIWA/Cawthron. We have also gained national approval of the use of 15k funding for the construction of a Marlborough fish out pond to further engage with junior anglers in Marlborough.

At the time of writing, licence sales were down by -2.6% in comparison to the previous season (total full season equivalent sales for this season was 3593 compared to 3687 the previous year), with the majority of this decrease coming in a reduction in sales of Whole Season Adult and Local Area licences, however this was partly alleviated by an increase purchase of Non-Resident licences.

ISSUES OF CONCERN

Angler crowding is a burgeoning issue for this region, as it is with several other South Island regions. The concern has been highlighted strongly in the media through avenues such as the Fish & Game magazine, and there is a strengthening resolve by kiwi anglers, who are fed up with the status quo, for Fish & Game to put in controls limiting angler usage, particularly on backcountry rivers.

While New Zealand Rivers are becoming increasingly pressured by foreign anglers, there are some concerns about the aging demographic of our resident licence holders, as well as lapsing participation.

INTRODUCTION

Climate change induced floods are increasing in frequency and magnitude, and where necessary Fish & Game need to be ready and prepared to attempt to rebuild severely damaged fisheries through hatchery released fish that have been grown using locally sourced genetics.

Added to this, growing political pressure for water abstraction to fuel agricultural growth appears to be leading to poor implementation of the National Policy Statement for Freshwater Management by rural dominated local authorities such as Tasman and Marlborough Unitary Authorities.

LOOKING AHEAD

The next 12 months will again provide interesting times for staff as fisheries managers. There will be considerable effort spent on the Marlborough Environment Plan – a 'once in a decade' opportunity to set adequate instream water quality and quantity standards for trout fisheries.

Fish releases of brown and rainbow trout, as well as salmon, will continue to occur in a number of waterways in order to try and enhance or repair fisheries. Rivers such as the Riuwaka and Branch will feature, however there will be some new projects that come to light elsewhere. Junior fishing development will be bolstered by releases of fish into local waters such as the Taylor and Waimea Rivers, in order to provide the 'next step' for young anglers who attend Kids Fish Out events.

Backcountry fisheries management will continue to feature, which will involve gathering angler feedback on existing backcountry fisheries, with the potential that more rivers will be considered for backcountry designation. In light of this, staff will attend the National Fish & Game staff conference – with one of the undertakings to try and form a consensus national view on best options for addressing over-crowding of our rivers.

In the following pages you will find detailed information on many aspects of our work in the past year, including species monitoring, back country fisheries management, fish liberations, RMA activity, youth participation, compliance and more.

Wairau Catchment

Monitoring within the Wairau catchment consisted mainly of drift dives, with 5 sites on the Wairau (including two sites on the upper Wairau), Branch/Leatham, Taylor River and Spring Creek. Of note was the order of magnitude rise in trout, particularly rainbows, in the Argyle Canal, and a healthy population of catchable fish in the Taylor River junior fishery - no doubt assisted by the release of 50 adult brown trout.

WAIRAU RIVER

Five sites on the Wairau were dived this season, including two sites in the Upper Wairau. These were carried out in order to get some current baseline data in anticipation that this stretch of river will be designated as a backcountry fishery for the 2017/18 fishing season.

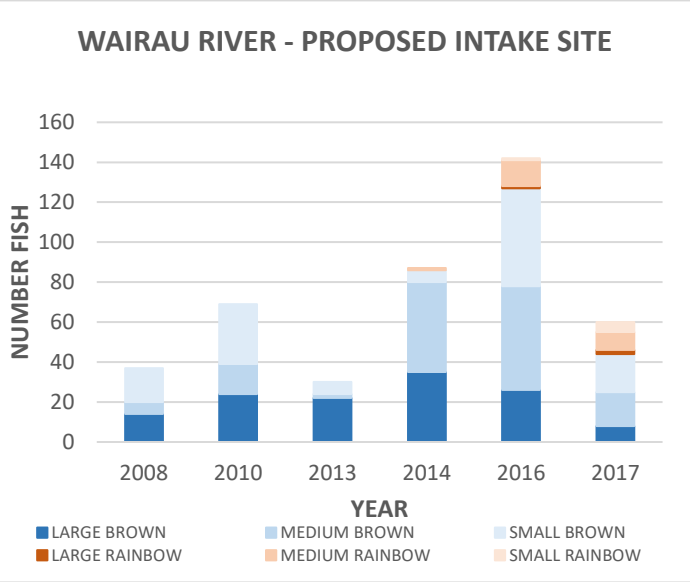


Figure 1. Wairau River drift dive counts – Proposed intake site

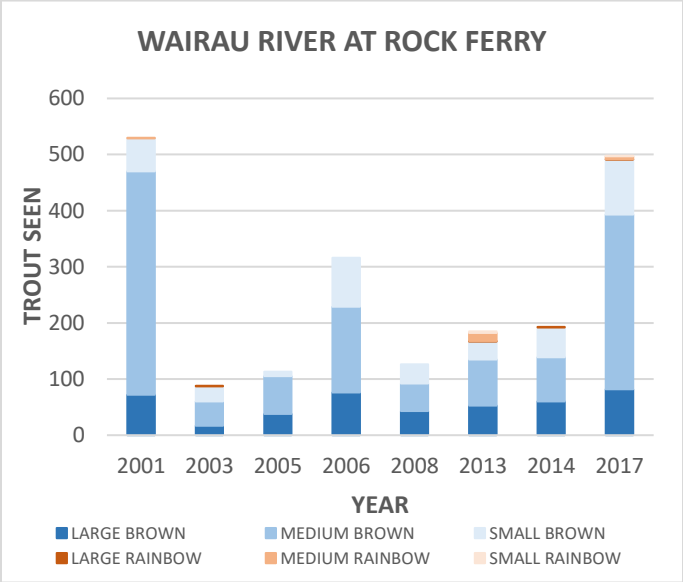


Figure 2. Drift dive results – Wairau River at Rock Ferry

Figure 1 shows a notable and unexpected decrease in fish for this reach, however the count may not have been as accurate as hoped with a boisterous river flow meaning it was difficult to stay in line and divers moving too quick. Additionally, high river flows present for much of summer, may have displaced fish downstream to lower gradient sections of the river with more suitable flow velocities. The Rock Ferry site (Figure 2) showed a huge increase in medium sized brown trout, with 311 counted over a 1400m length, which was to be expected after the stable spring conditions both years prior proving beneficial for juvenile recruitment. Interestingly, the expected rise in rainbow trout at both these sites did not eventuate. It would have been thought that rainbow population, particularly at the intake site, would have gained strength being close to the Branch River where many of the main-stem rainbows have migrated from.

SPECIES MANAGEMENT

Two new sites were dived this year above SH1 in order to get better information in regards to the Marlborough Environment Plan hearing (Selmes Road to Hillocks Road and Hillocks Road to SH1). Again, fish numbers were high here, particularly medium browns (see picture below), which reflects feedback from local anglers also.

The Selmes Road site was a long dive of 2800 m and held a population of 150 large, 666 medium and 33 small browns plus a scattering of rainbows (10 large, 8 medium, 4 small). Four adult salmon were seen for this site also. The lower dive to SH1 Bridge was 1700m in length and had 59 large, 206 medium and 26 small plus a few rainbows. Again, these figures reiterate the importance of previous season's stable spring weather for juvenile recruitment. Unfortunately 2016 spring conditions were poor in the Wairau catchment due to numerous high flow events, so future counts of mediums will likely decrease significantly.

Ben Sowry with a medium Wairau fish.

Drift dives were carried out on two upper Wairau sites in order to get some baseline data if this section of the river is designated as a backcountry river in the future (figures 3 and 4). This section of the Upper Wairau has been a cause of concern in recent years due to the number of angler complaints resulting from over pressure, and the effect this is having on fish behavior and condition, as well as overall angler experience. Both sites were comparable with previous years however, with the notable exception being the detection of one large rainbow, the first time a rainbow has been found in this upper reach.

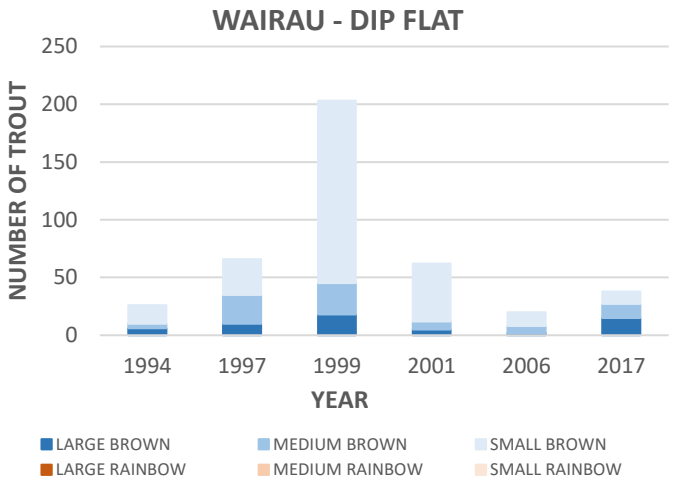


Figure 3. Wairau River drift dive counts – Dip Flat

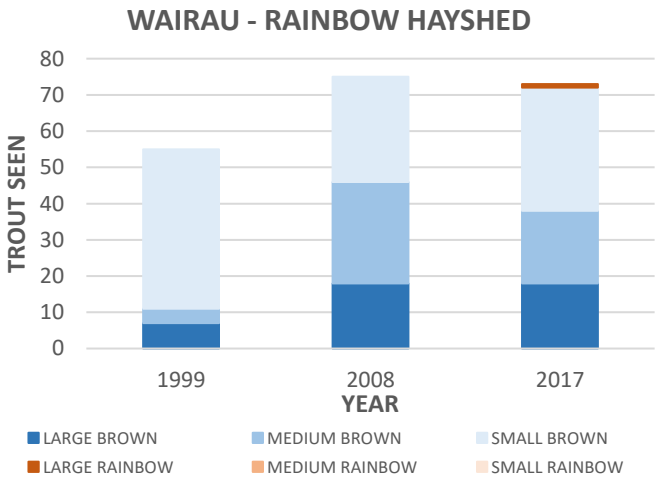


Figure 4. Drift dive results – Wairau River at Rainbow Hayshed

BRANCH CATCHMENT

It was with some anticipation that the Branch/Leatham was dived due to the unprecedented numbers of juvenile rainbow trout seen in 2016, however the expected rise in medium rainbows in the Branch did not occur, although

reasonable numbers of small rainbows were seen at the lower site below the confluence – see Figure 6. Instead, it appeared that many of last years' small rainbows had vacated the Branch and found their way into Lake Argyle via the weir intake, or went over the weir into the Wairau River.

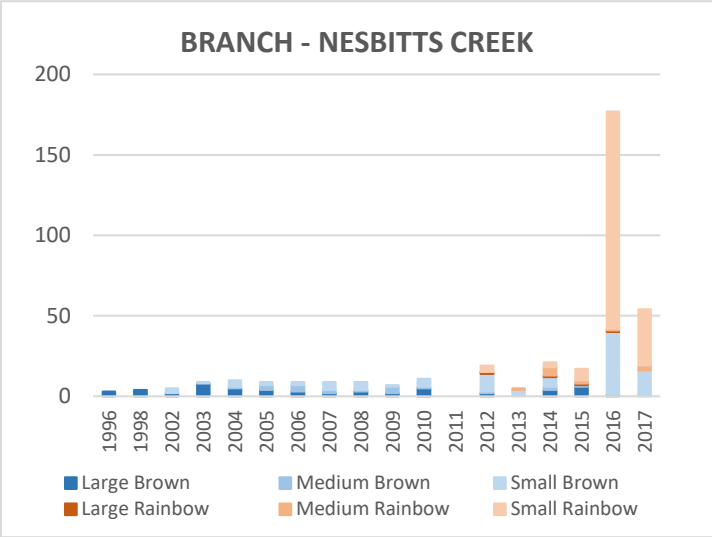


Figure 5. Branch at Nesbitts Creek – drift dive results.

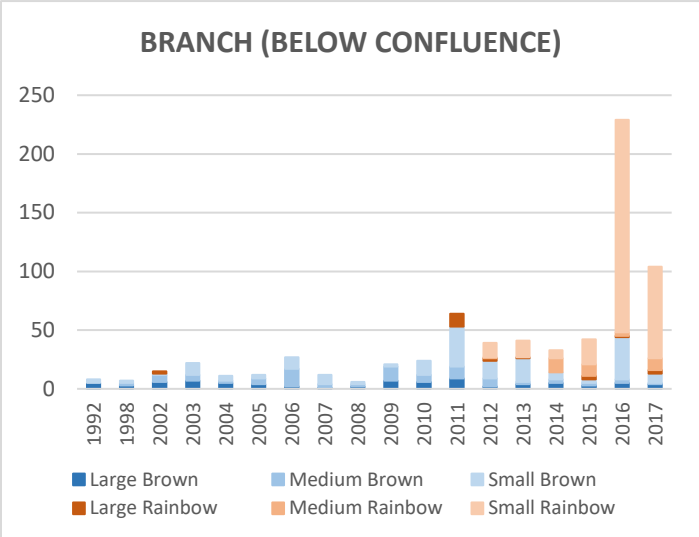
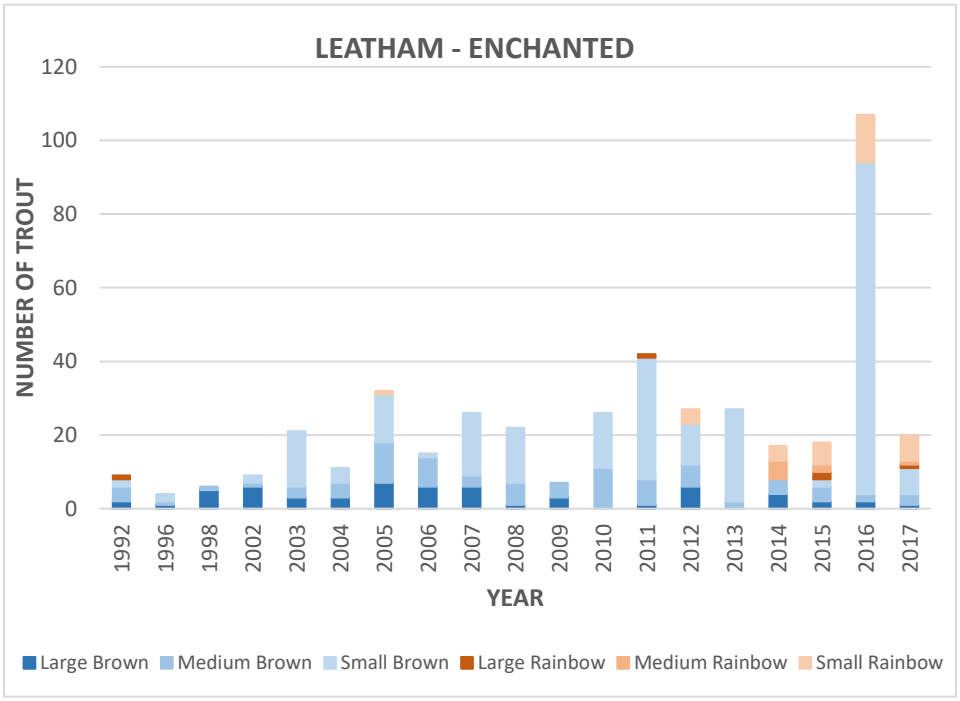


Figure 6. Drift dive results – Branch below Leatham confluence.

It is somewhat worrying to note that, in the past two years, only 2 large fish have been counted in the Branch River at Nesbitts Creek (figure 5). This year, no large fish were residing in this stretch, although the river had undergone a major reconfiguration from flooding events (as had the Leatham), and much of the traditional holding water has, for the time, being lost to infilling.



The expected rise of medium browns in the Leatham also did not occur, which was hoped for after record numbers of small browns were counted in 2016. Again this is probably attributed to downstream migration where a significant rise in medium browns occurred in Argyle canal. Hopefully the release of 400 adult rainbows twice per year for the next 2 years will help to address this (figure 7).

Figure 7. Results from the Leatham drift dive 1992-2017.

As mentioned, the staggering rise of fish numbers in Argyle canal has been a real highlight for the year. Staff, when carrying out the dive, were faced with 'wall upon wall of fish', and had to be very quick on the counter in order to determine numbers over the 2 kilometre dive.

It didn't take anglers long to cotton on to the fishing here, which staff enthusiastically promoted via news print and online media, and it was common to see good numbers of anglers, including families, fishing with success at the lake.

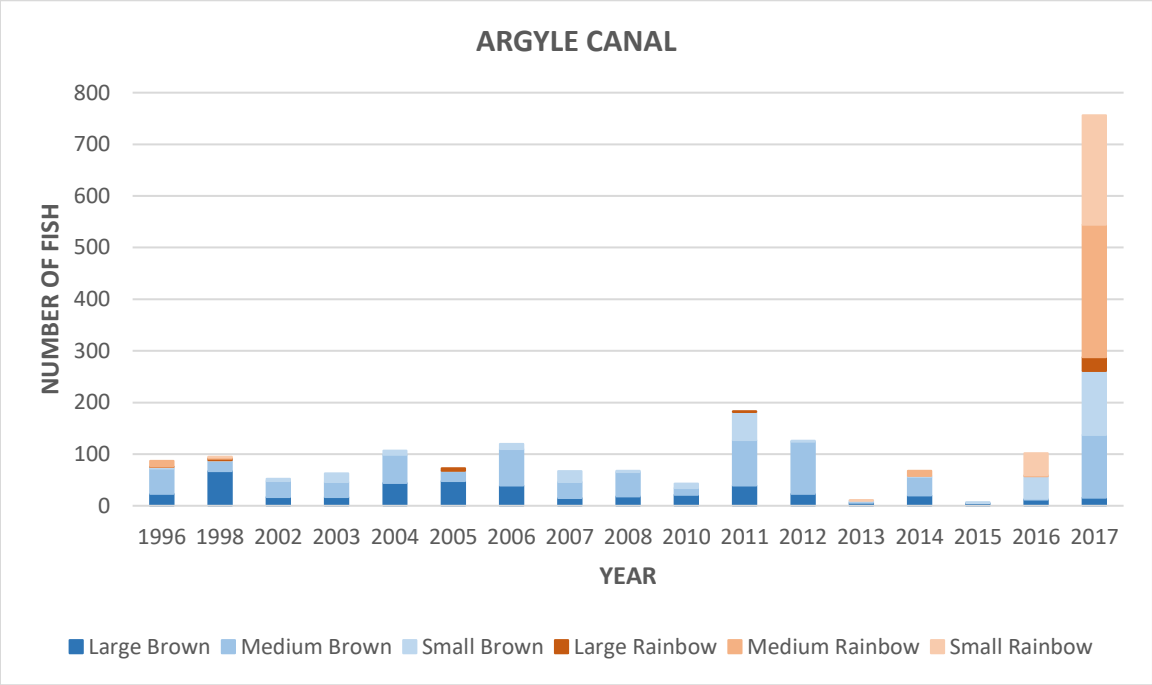


Figure 8. This year showed an order of magnitude increase in small and medium fish in the Argyle canal.

As can be seen from figure 8, 420 catchable (medium-large) trout were seen this year, with a rough split of two thirds rainbows and one third browns.

TAYLOR RIVER | SPRING CREEK

A drift dive of both the Taylor River and Spring Creek was carried out by three divers on 10 January 2017. It had been 20 years between dives for the Taylor River, which is now designated as a junior fishery and it was therefore important to get some current data on this stretch of river, particularly after a release of 50 1kg brown trout was carried out in December.

A significant rise in fish numbers was noted, probably assisted by the successful release of the brown trout – see picture. Over the course of the dive 19 large, 34 medium and 9 small trout were seen, well up on the 1997 count – see Figure 9. A further 3 large and 5 medium were seen in the 100m below the get out point. Interestingly, no rainbows were seen from a previous Kids Fish Out release, although there were recent reports of superb rainbow trout caught near the original release site.

Staff were delighted to see a junior angler with a fishing rod near the Opawa Loop confluence who was pretty pleased with the fishing, indicating he'd recently caught four large brown trout.

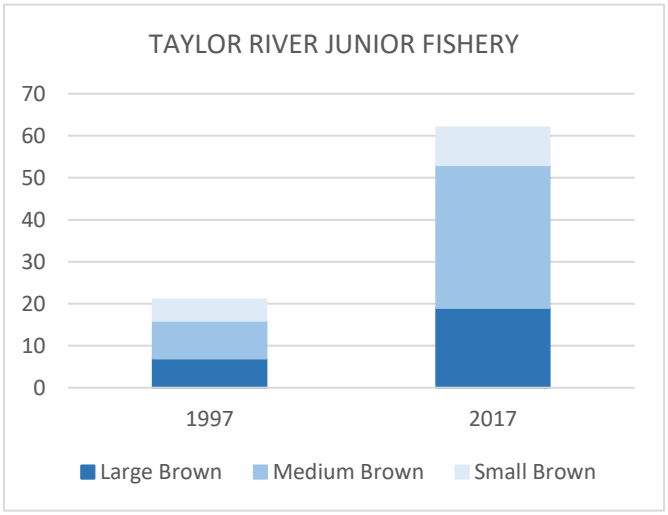


Figure 9. Taylor River – drift dive results.

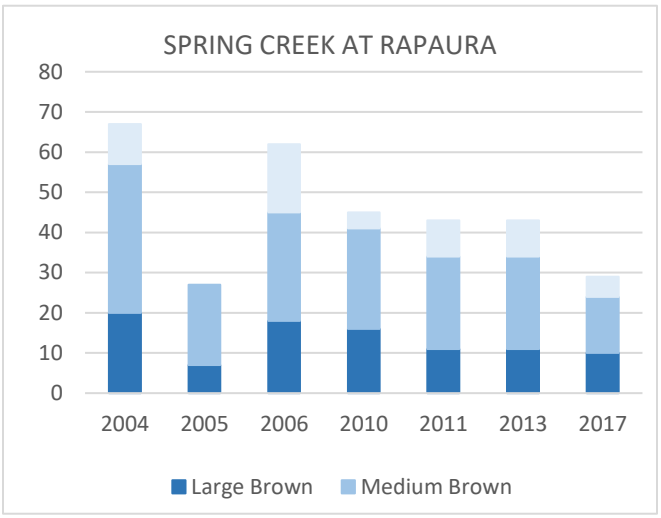


Figure 10. Drift dive results – Spring Creek at Rapaura.

Spring Creek was down this year on medium sized fish but steady on small and large trout (figure 10). The river itself looked like it had seen better days. It was infilled with sediment, had large amounts of weed, littered with human rubbish, and as a result the large fish residing there were lacking condition.

SPAWNING SURVEYS

The Onamalutu River was investigated on July 7th 2016 from the scenic reserve bridge to Nutmeg Creek confluence. One definite redd and several possible redds were located, along with one pair of brown trout holding over the definite redd. Spawning gravel quantity was patchy, with average gravel health recorded (some sedimentation present). The lower Onamalutu is ephemeral in summer, so connectivity issues may exist.

A spawning gravel enhancement trial in Stump Creek (tributary of Spring Creek), was inspected. Disappointingly, no evidence of spawning activity or redd construction was noted, although the landowner had noted several large fish feeding in the vicinity of the trial. It is recommended we monitor this site again next season for any spawning activity given the enhancement trial.

SPECIES MANAGEMENT

FUTURE WORK

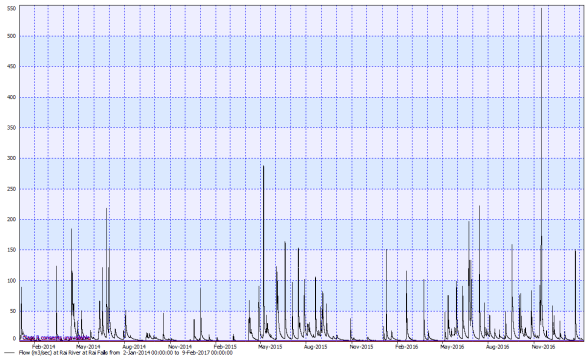
The Wairau River is currently in good shape, and based on angler use data, our river of highest importance for the Nelson Marlborough Fish & Game region. With this in mind, we are looking to carry out rainbow fishery enhancements in a number of tributaries, potentially including the Waihopai, Onamalutu and Waikakaho. The successful enhancement of the Branch rainbow fishery, does not appear to be negatively affecting the brown trout population structure, and it is therefore considered unlikely that limited releases of juvenile rainbows within a few lower Wairau tributaries will do anything but enhance the existing angling options within this outstanding fishery.

RISING RAINBOWS ARGYLE CANAL	UPPER WAIRAU WEESANG PAAKA	BRANCH BEAUTY BLAIR DANIEL
		

Pelorus Catchment

This year the usual rivers such as the Rai, Pelorus and Opouri were again drift dived. The Kaituna was dived for a second time, and the Tinline was a new river added to the schedule this year. This area experienced a major flood event on November 15, with few rivers getting off lightly.

Kaituna River flood. .



Rai River flood, the highest in several years.

KAITUNA |RAI | PELORUS

The Kaituna was dived for the second time on January 13, after the big November rain event, which long time farmers the Newton's said was a phenomenal deluge and one of the biggest floods they had ever experienced. Predictably, this had a major impact on fish numbers, which were halved in comparison to the season before – see figure 11. Staff were surprised by this result, as it was though due to the low gradient of the river, fish survival would be higher. However it may be the case that many fish are push outwards and are stranded when floodwaters recede.

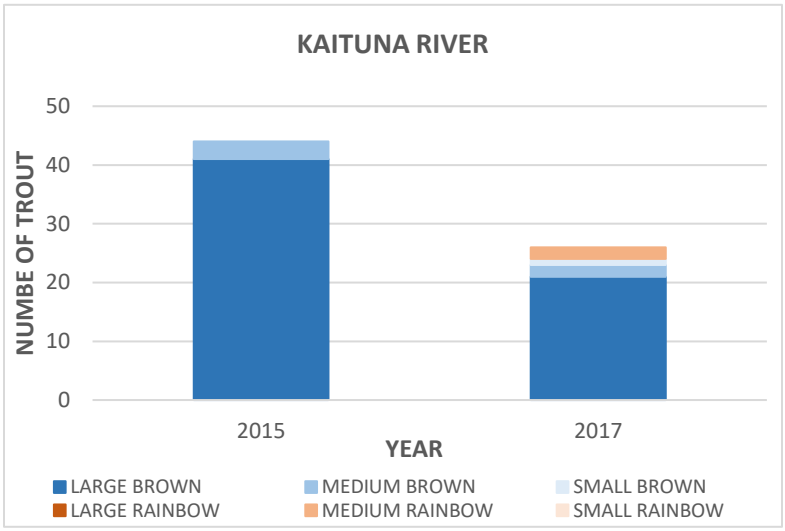
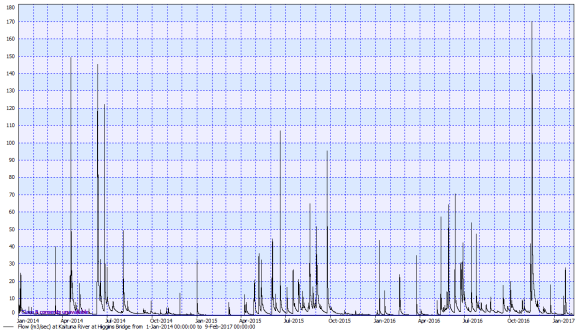


Figure 11. Kaituna River – drift dive results.



A good outcome was also gained for a spawning tributary of the Kaituna – proactive consultation over a resource consent for a State Highway crossing improvement of the Waikaihu stream, resulted in the successful reinstatement of fish passage for adult brown trout which was marginal prior to repair works due to a > 1m drop in height due to bridge exit water scouring – see before and after pictures below.

BEFORE

AFTER

The Pelorus and Rai Rivers were dived on February 10 using five divers. Both rivers showed relatively clean substrate from the November flood. It must be noted here that counts of small fish (young of the year/yearling) can be unreliable due to their liking to reside in very shallow riffles which are difficult to count.

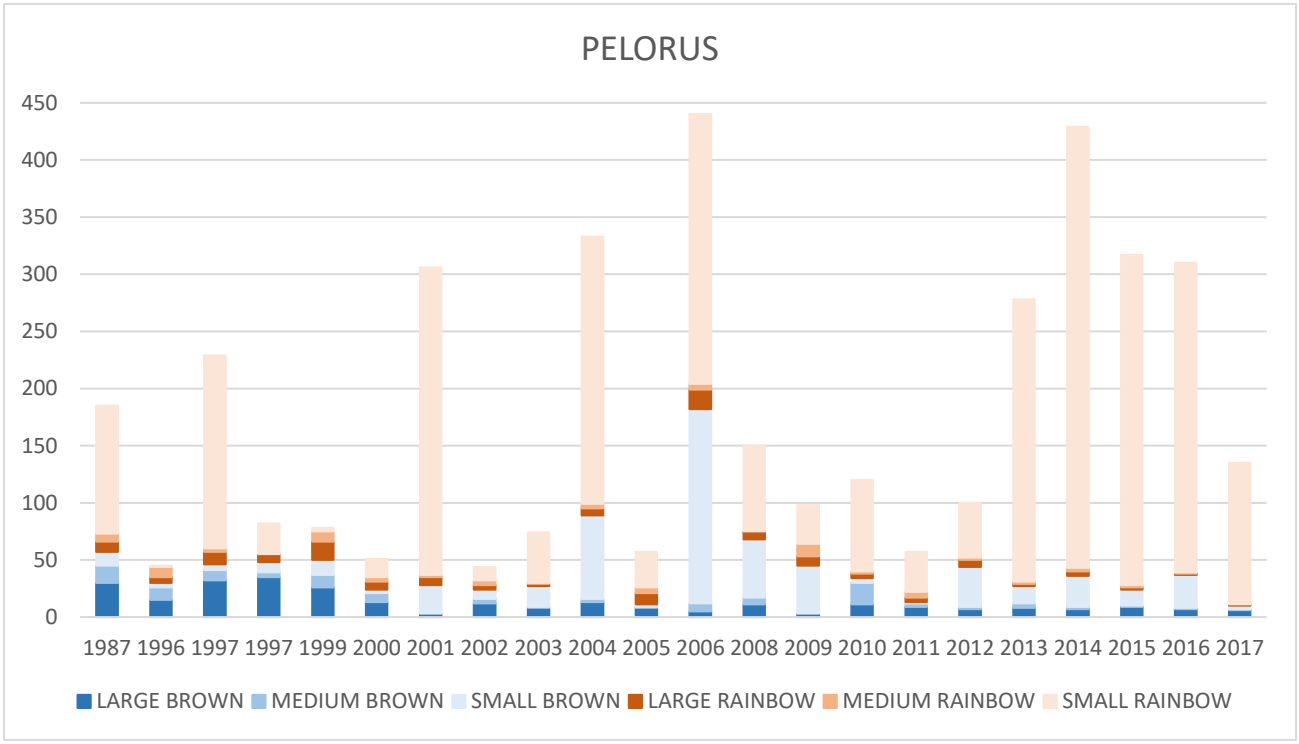


Figure 12. Pelorus River – drift dive results.

Of the two rivers, the Rai was in better shape, with a decent population of medium browns and the highest on record count of 'young of the year' rainbows – see figure 13. Experience tells us that there is a very high mortality rate with these, and they are unlikely to flourish into more small/medium trout in the coming two years. Figure 12 shows that, again, the Pelorus is suffering, with a total of only 8 'catchable' medium and large browns/rainbows in this stretch.

Fish & Game is looking into a number of releases of rainbow trout yearlings into the Tinline (a tributary of the Pelorus), and possibly in locations further upstream in the headwaters. The Tinline was historically an important spawning tributary of the Pelorus, however the run has petered out, as has been proven with winter foot counts and electric fishing surveys.

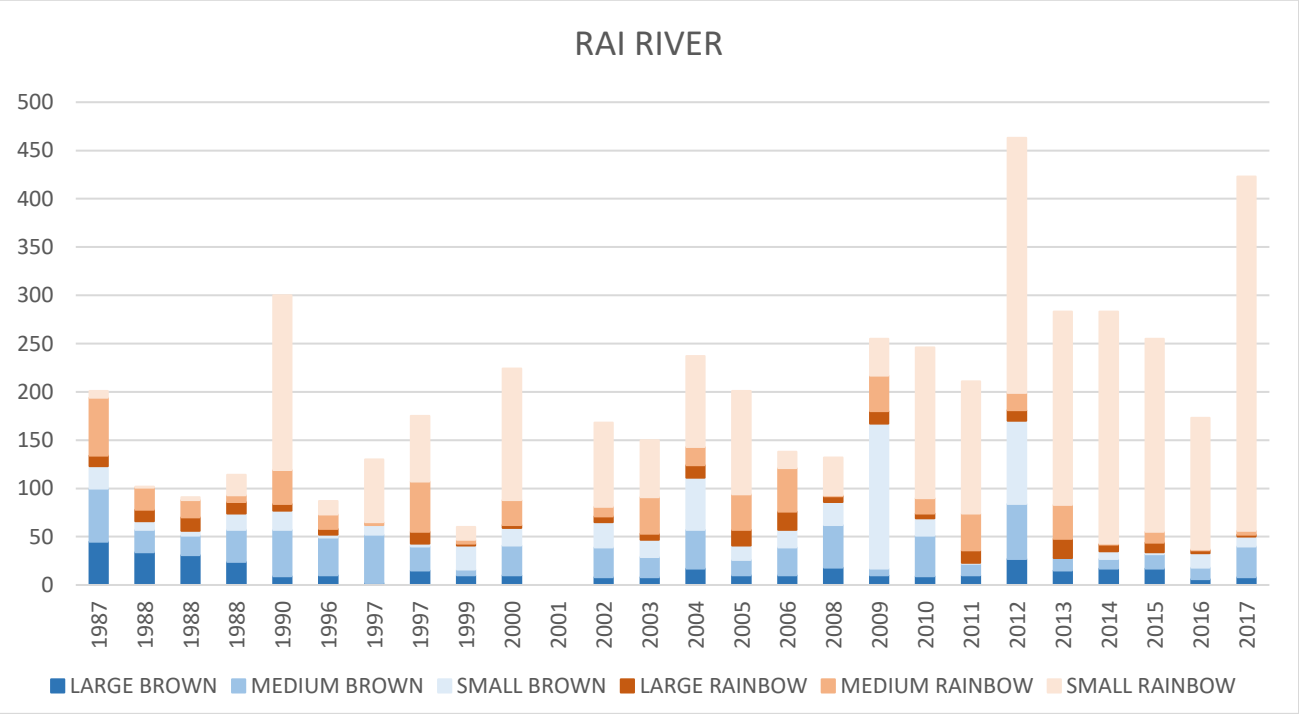


Figure 13. Rai River – drift dive results.

TINLINE | OPOURI

The Opouri River showed signs of excessive nitrate levels, with a prolonged stable flow period leading to 80-90% coverage of black algae similar in appearance to cyanobacteria, as well as filamentous algae. It was apparent that a large pre-Christmas flood was late enough in the year not to have an adverse impact on juvenile recruitment, as record numbers of juvenile rainbows were seen, however numbers of catchable brown and rainbow trout were fewer.

Jet boats were one method of transport in the Rai area after the deluge.

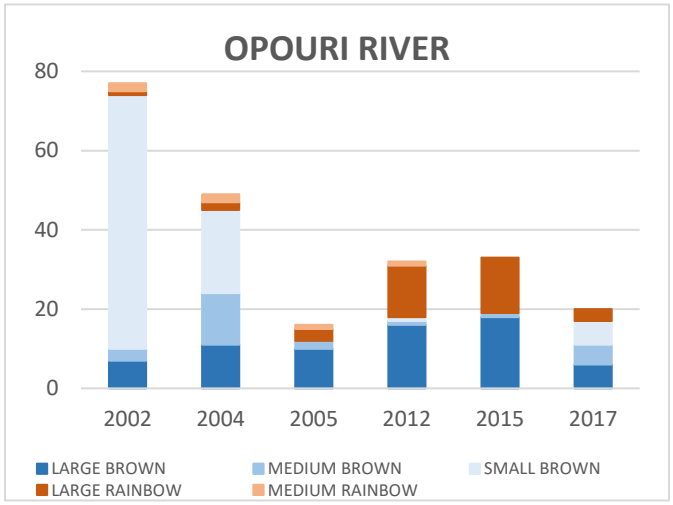


Figure 14. Opouri trout counts – excluding small rainbows

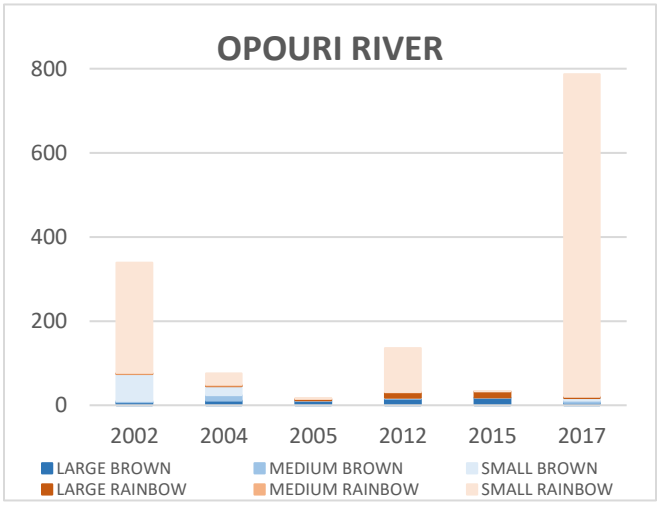


Figure 15. Opouri trout counts – including small rainbows

As it can be seen in figures 14 and 15, there was an abundance of small rainbows (767) in the Opouri, mainly all young of the year (it was necessary to remove the small rainbow trout out of figure 15 in order to properly read the graph). Numbers large rainbow and brown trout were also noticeably lower.

The Tinline was dived this year in order to get baseline data of the trout population in the event that future releases take place. The Tinline was once a fishery in its own right and an important spawning stream for rainbows, however we believe only a very limited amount of spawning now takes place. The trout population is easy to report on here as zero trout were seen throughout the 1200 m dive, despite its excellent water quality, and much of it through what we consider prime trout habitat.

RIPARIAN ENHANCEMENT - BRYANTS STREAM

Our riparian enhancement project at Bryant Stream continues this year, with weed control as well as further native plantings downstream of the ford, assisted by the Nelson Anglers club. This is a long term habitat protection project which will take many years to bear fruit, in terms of potentially expanding existing spawning water area.

Riuwaka Catchment

There have been significant efforts focused on the Riuwaka River this year in the form of trout releases and the pre and post release monitoring that has taken place (see section on Fish Releases for more information on release). The river couldn't be dived pre-Christmas due to insufficient clarity from the South Branch slip (pictured right), that colored up the river for months. Future releases will also include release of smaller yearling fish as well as adults, to investigate what sized fish best remain within the catchment.

Drift dive results at Moss Bush indicate fewer trout in this reach compared with last year – see figure 16. It is the opinion of staff that last year many fish in the lower reaches moved up into the area around Moss Bush due a sediment leak making conditions unsuitable. The upper part of the Moss Bush dive had very good numbers of fish, however only 1 fish was seen below a known small silty tributary. Insect life in this upper site below the confluence was flourishing, as there had been a period of stable weather which meant the South Branch slip had stabilized.

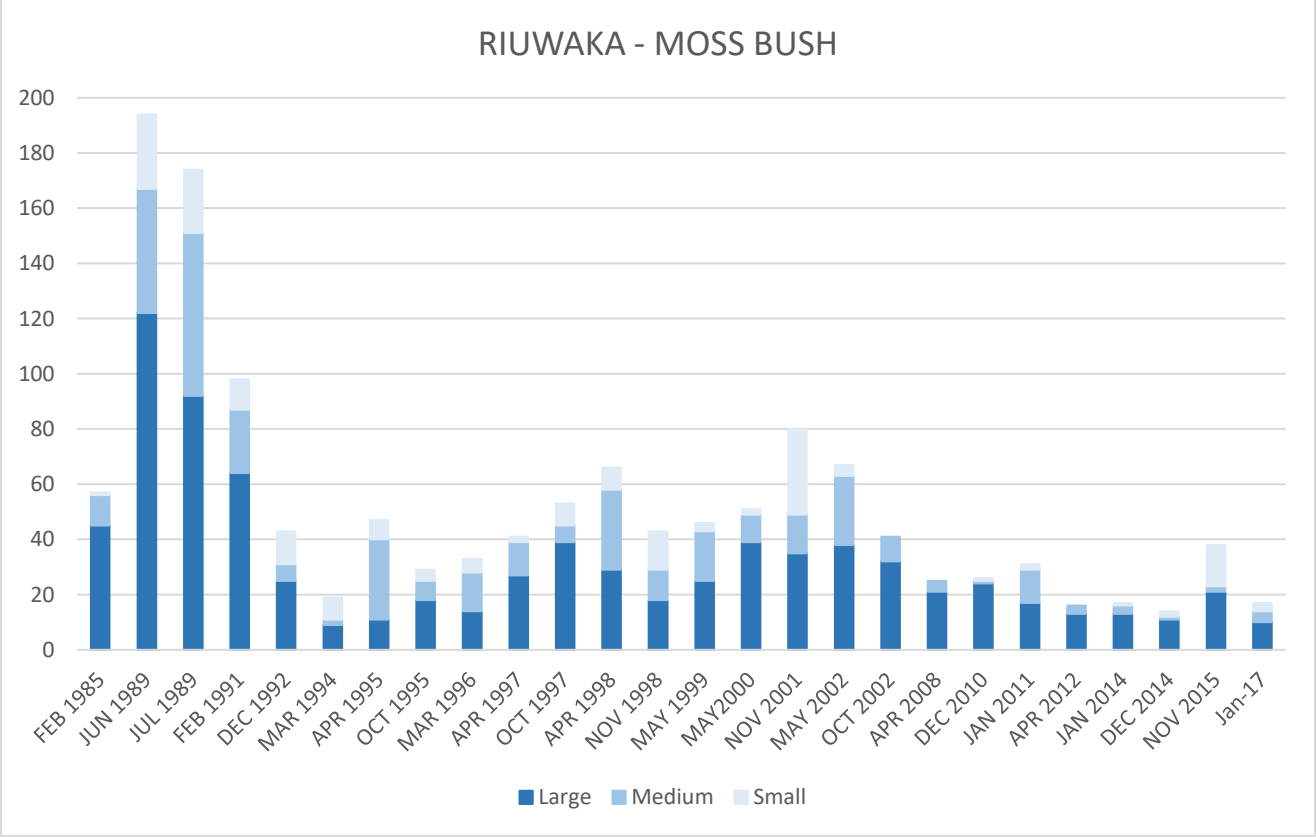


Figure 16. Drift dive results for the Riuwaka River at Moss Bush 1985-2017.

The Dehra Doon site again made for poor reading with only 2 large and 2 medium fish seen – see figure 17. This has been a shame as the lower reaches were showing signs of recovering prior to the 2015-16 dive

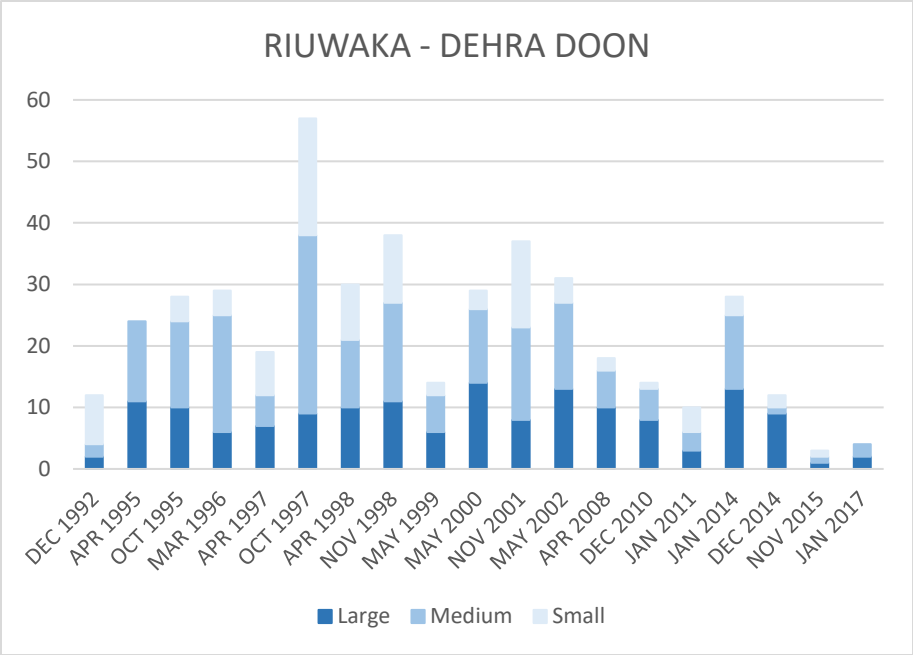


Figure 17. Drift dive results for the Riuwaka River at Dehra Doon 1992-2017.

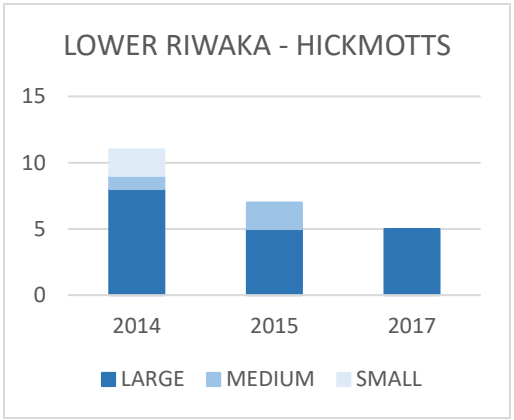
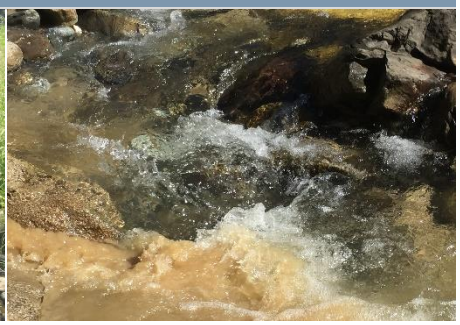


Figure 18. Drift dive results at Hickmotts.

Figure 18 shows that trout numbers remain relatively stable in the reach below the SH bridge, although they still make for poor reading. It is hoped a programme of trout releases in this area will restore the population, however there are still major issues with the habitat in the lower river, which is mostly rock lined and devoid of overhead cover.

SPAWNING SURVEYS

Several visits to the Riuwaka North and South branch in June 2016 failed to locate any spawning fish. A follow-up electric fish on February 7th, 2017 located 4 brown trout fingerlings within the North Branch (out of 177m2 surveyed), and 6 (out of 200m2 surveyed) in the South Branch at the ford. By way of comparison, the Rainy River has historically produced around 90 juveniles per 200m2, and most Wairau North bank tributaries around 30 per 200 m2, so Riuwaka recruitment is currently very low which is why releases of yearling and adult Rainy fish are presently being trialed. The predominance of main-stem only spawning within the Riuwaka makes recruitment success very vulnerable to high flow events.

BROWN TROUT RELEASE RIUWAKA RIVER	ELECTRIC FISHING NORTH BRANCH	CONVERGENCE OF WATERS SOUTH BRANCH SLIP
		

Motueka Catchment

This season the Baton, Pearse, Motupiko, Motueka and Upper Motueka Rivers were dived as part of our annual monitoring. The Motueka catchment had a fairly boisterous spring and summer period, which saw frequent and prolonged flood events. The flood events, however would only be considered low to moderate, however the frequency and duration would have had some impact on the juvenile trout recruitment in many of the Western tributaries.

MOTUEKA RIVER

The Motueka River is currently in good shape, and arguably our river of second highest importance for the Nelson Marlborough Fish & Game region.

Feedback was generally pretty good from the fishing this year. Periodic flooding meant flows remained high in spring and early summer, however there was still good fishing to be had when conditions allowed. The high flows and lower than average temperatures meant algal growth was minimal, which made for sharp water clarity and excellent wading. Reports from a number of regular anglers reflect the results of the drift dive data, which show high numbers of medium sized fish, however there appeared to be less 2kg+ fish bought to the net. Regular spring flood events appeared to have a slight impact on small fish, with the effects of this to be more likely seen next year.

The longest running drift dive site is at Woodstock which had the highest numbers of medium fish since the late 1980's, when the Motueka was at its best for recent times – see figure 19. Numbers of large fish in this reach was also fairly good when compared to more recent dive results. The Motueka River Lodge site is the lowest downstream monitored site, and as can be seen from figure 19, numbers were stable this year. Figures 21 to 24 show the other Motueka sites, which all show a higher abundance of medium and large fish,

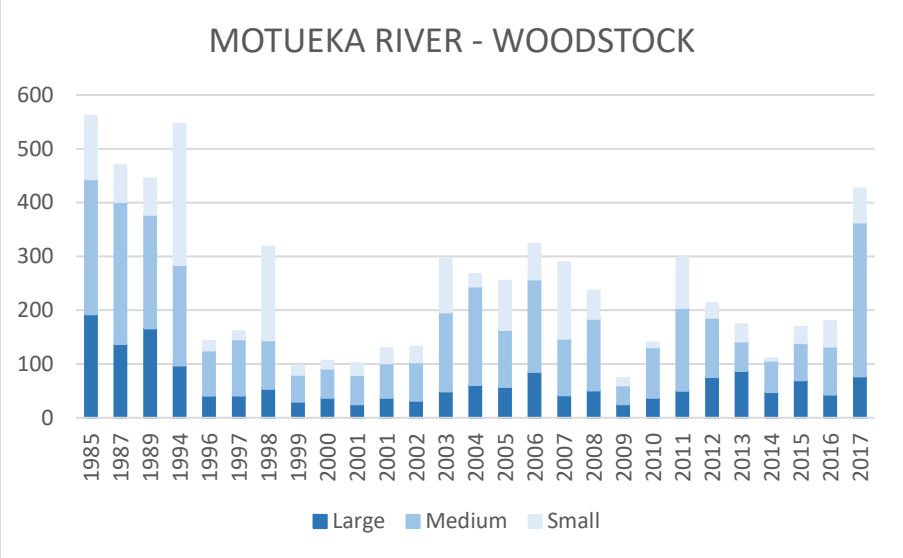


Figure19. Drift dive results for the Motueka River at Woodstock 1985-2017.

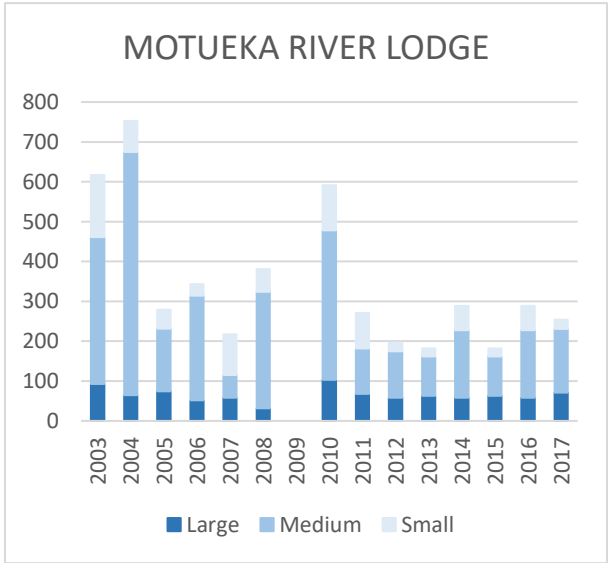
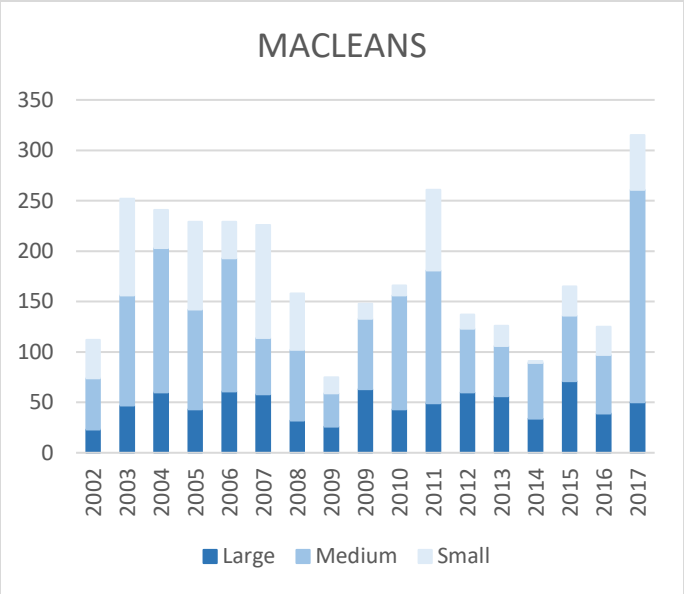
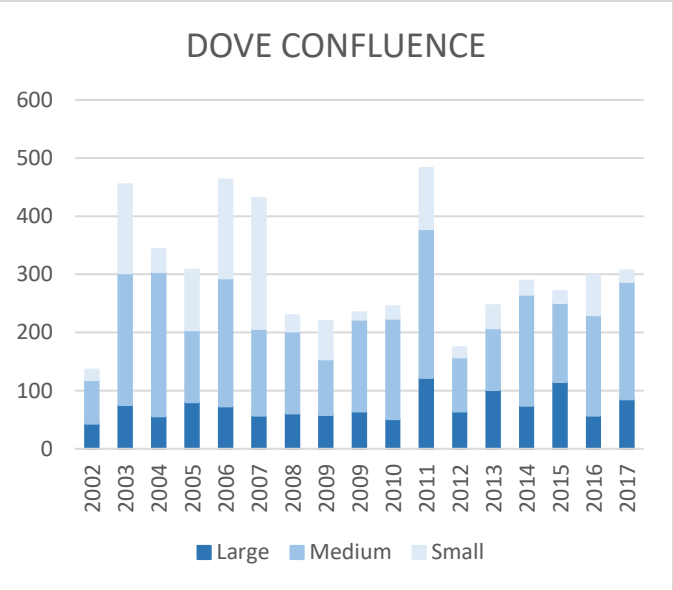
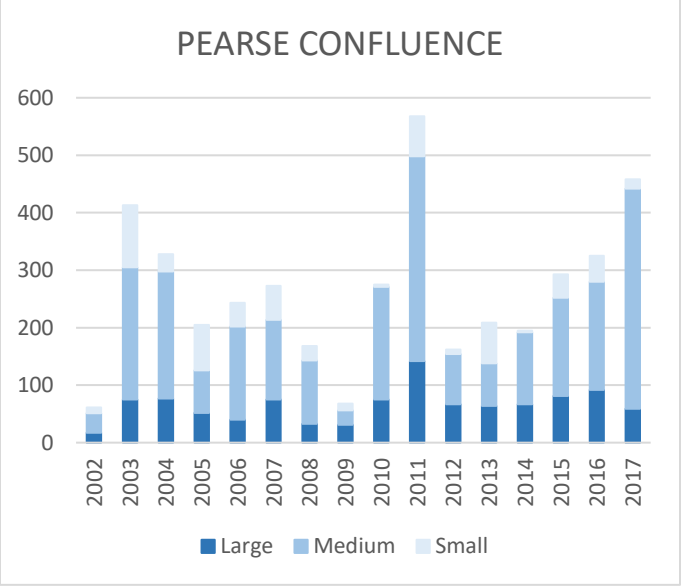
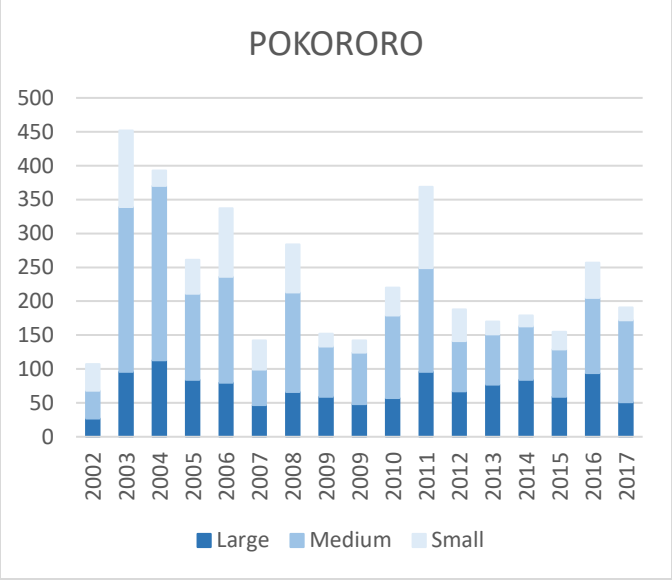


Figure 20. Motueka River Lodge drift dive results.









Figures 21 to 24. Drift dive results for the Motueka River sites

The combined totals of trout in each size range was calculated for the past 7 years and can be seen in figure 25. Additionally, the number of catchable (large/medium) trout - the ones anglers are most interested in, was added and the number of trout/km was calculated. It can be seen from this seasons monitoring that almost 1400 medium/large fish were counted over the 5 sites, with an average of approximately 280 trout/kilometre.

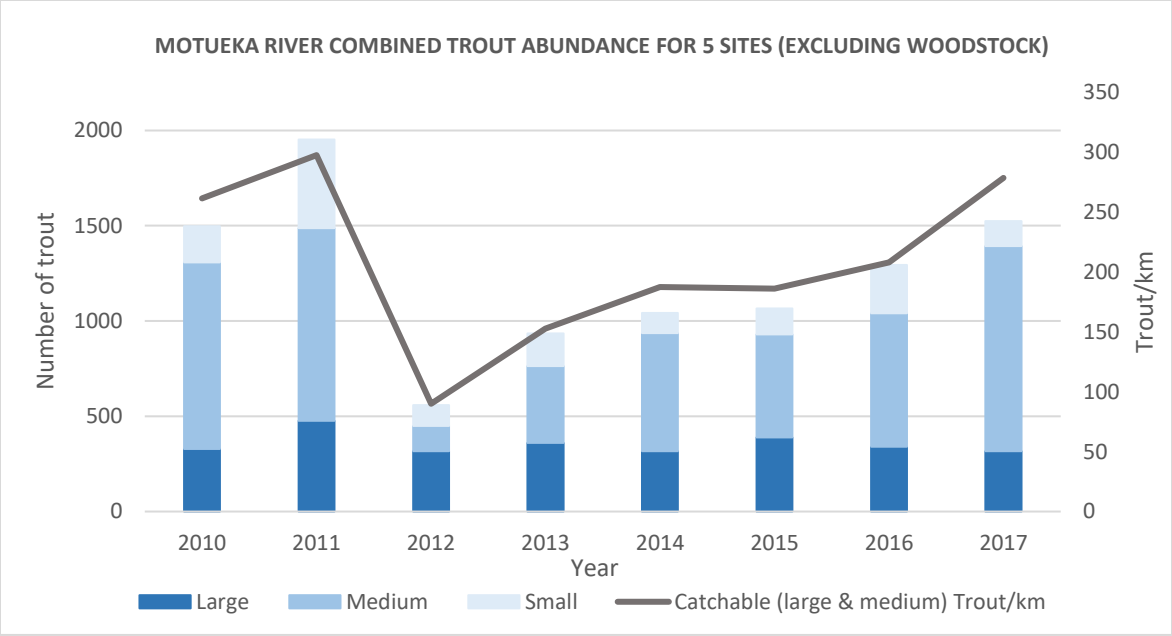


Figure 25. Combined trout abundance for Motueka River (5 sites excluding Woodstock).

BATON RIVER

The Baton River was dived on February 17 at two sites: above the concrete bridge near the Motueka confluence, and above Stoney Creek, revealing an increase in catchable (medium/large) trout at both sites – see figures 26 and 27. Despite recent logging in the lower river, there was no evidence of sediment impacts due to harvesting and macroinvertebrate abundance was high at both sites. The Baton results appear to be validating the observation of a general overall improvement of the Motueka fishery. The fact that the Motueka ran high for a lot of the early part of the fishing season, meant a higher than usual amount of angler effort was directed at smaller tributaries such as the Baton, but this appears to have had little impact on the population structure of the trout fishery within the Baton.

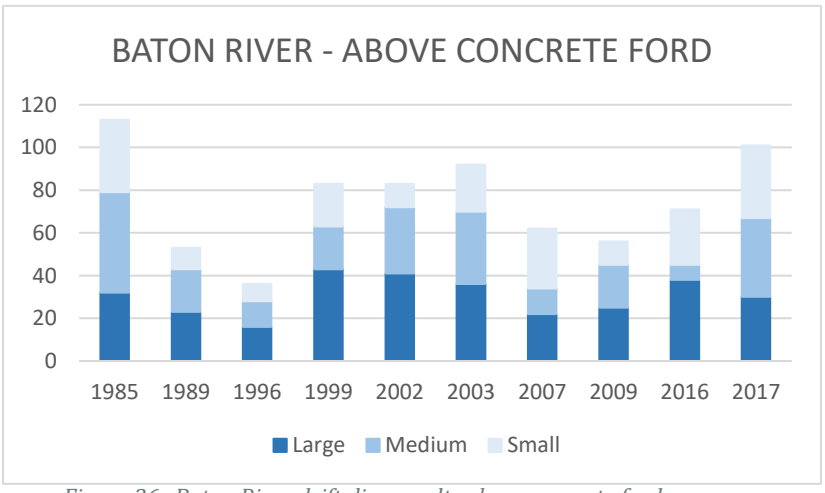


Figure 26. Baton River drift dive results above concrete ford.

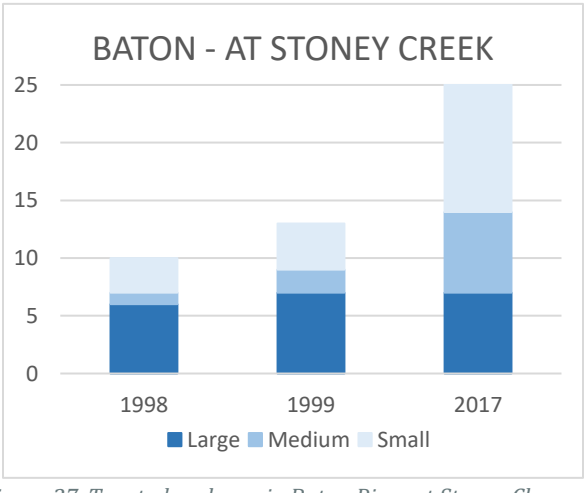


Figure 27. Trout abundance in Baton River at Stoney Ck.

SPECIES MANAGEMENT

PEARSE RIVER

The Pearse was dived for the first time in nearly two decades on October 20. Fish numbers have been pretty stable since 1994, with 11 large and 3 medium trout seen on this dive, however no small fish were sighted – see figure 28.

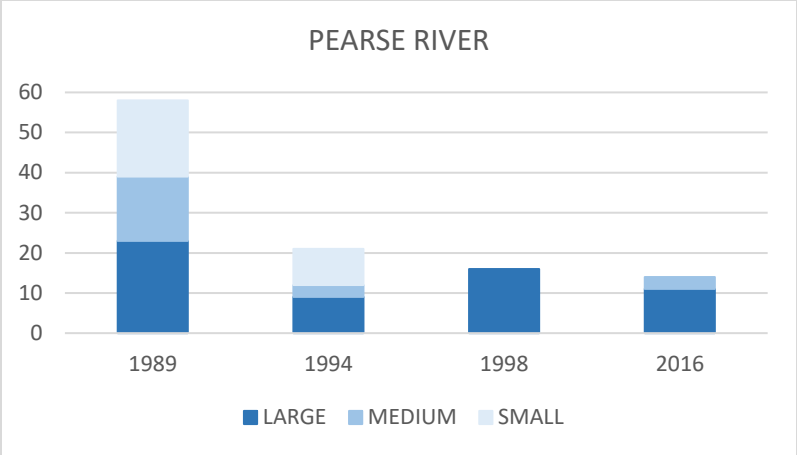


Figure 28. Pearse River trout counts 1989-2016.

UPPER MOTUEKA RIVER

The Upper Motueka was dived at two sites: at Golden Downs and at Glenrae. The Glenrae site was the best count for two decades, with 34 medium/large fish seen as well as 69 small trout – see figure 29. This is considered largely be due to successful spawning from the two previous years, as well as higher flows and cooler water temperatures for the time of year in which the dive took place. Often the Glenrae dive is a grovel with low flows and warm water, which attributes to the usually low trout abundance, however due to the high Spring rainfall the flows remained excellent, and in fact, continued for the summer, meaning fish were able to survive for longer in this reach. These conditions would have also been good for the out migration of young of the year trout coming down from spawning tributaries upstream. Staff believe that in normal low summer flows, high water temperature would cause juvenile fish to stress (with potentially fatal consequences), when they are caught in the upper Motueka on their downstream migration.

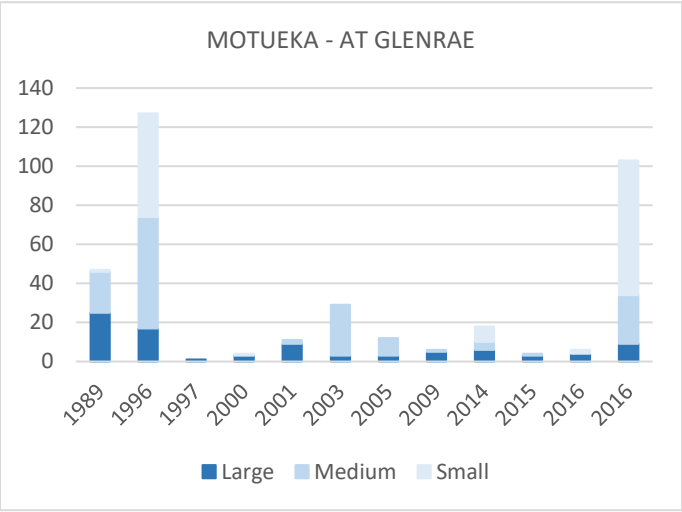


Figure 29. Upper Motueka drift dive results – at Glenrae.

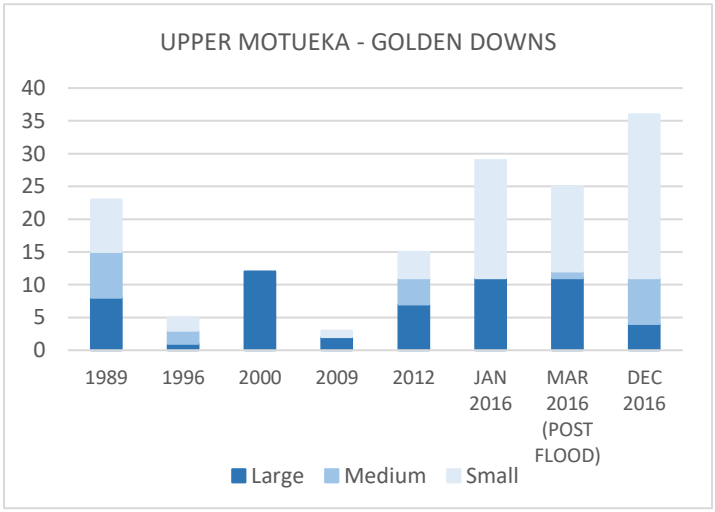


Figure 30. Trout abundance in Motueka River at Golden Downs.

The Upper Motueka at Golden Downs was down on large fish but had higher than usual numbers of medium and small fish – surprising considering the turbulent spring – testament by the ever changing riverbed, and there was a noticeable loss of good holding water (figure 30). In places the river was quite braided and shallow (created by seeding willows forming islands and splitting the main braid) - good small fish habitat and maybe a reason for higher juvenile abundance is likely attributable to the stable spring flow period observed in 2015, as the small fish counted in these drift dives are generally yearling fish (young of the year tend to not migrate out of their natal streams until March/April high flow events).

MOTUPIKO RIVER

Anecdotal reports from fishing guides indicate the Motupiko above Korere fished well this season, with good numbers of adults and juveniles present – see figure 32. This corresponds well with our two drift dives sites, with higher than normal numbers of small/medium fish, however our dives indicated fewer large trout. The Rainy and Motupiko more than likely escaped many of the larger flood events that the Western tributaries experienced, however flows and temperatures remained suitable for fish of all sizes to remain in. It was disappointing to see the lack of large fish in the much modified lower dive site above Quinny's Bush, with only 1 large fish seen (figure 31).

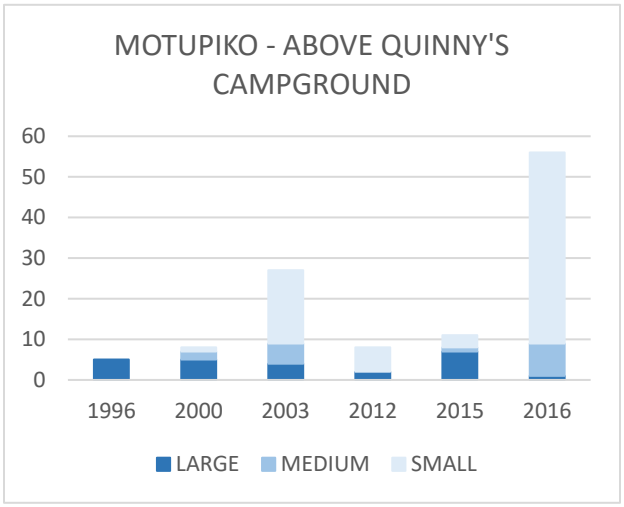


Figure 31. Motupiko drift dive results above Quinny's.

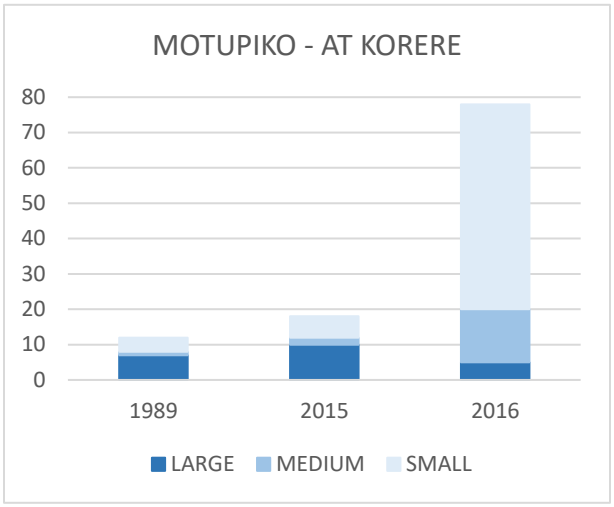


Figure 32. Motupiko at Korere.

As with the Upper Motueka, observed increases in small fish within the Motupiko could possibly be attributable to a) stable spring low flow periods in 2015, followed by b) higher than normal flow levels/cool temperatures over the following 2016/17 summer period. It is likely we may observe a sharp drop in small fish numbers within these fisheries during next summer's drift diving results as the higher than normal flows this spring/summer, while beneficial to yearling aged fish, will have been detrimental to young of the year survival during the critical fry emergence phase.

SPAWNING SURVEYS

Foot counts and electric fishing surveys were carried out on a number of Motueka tributaries, including the Tadmor, Stanley Brook and Dove Rivers.

SPECIES MANAGEMENT

The **Tadmor River** was investigated on June 17th 2016 at 3 separate locations by R Barrier. The first site investigated was in the upper river from the Lookout Range walking track crossing (old track no longer getting much use), to the Ellis Stream confluence, a distance of around 0.9 km. No redds or trout were observed and the substrate was less than ideal for spawning with only some suitable gravel areas interspersed with lots of bedrock/large substrate/sand. The Ellis Stream itself also had substrate too large to be suitable for spawning.

The second site investigated was a stretch of the Tadmor from the Tui Road Bridge to 700 metres upstream where the river meets a tall cliff. One redd, and one adult brown trout were observed during this survey, with a picture of the redd shown on the far-right of the photograph. It is likely this redd was from a resident Tadmor fish given the deep pool presence and lack of any other fish/redds.

Figure 33. Trout redd on the Tadmor

The third site investigated within the Tadmor was from the Bush-end Rd Bridge to the mudstone bedrock section of the Tadmor, a distance of around 1.5 km. While substantial areas of very good sized cleaned gravels existed below the bedrock section, it was disappointing to encounter zero spawning fish and only one possible redd. Discussion with sluice box gold mining hobbyists, and a local landowner revealed it had been a number of years since any of them had seen adult fish within this WCO protected spawning water which if correct is of great concern, and may be related to our concerns over river management and summer low flows downstream within the Motueka above the Wangapeka confluence. It is recommended that some summer time electric fishing and possibly water temperature data collection also be undertaken within this WCO protected spawning waterbody. A potential future release of 'ready to spawn' brown trout from the Wilhelmus facility (Rainy genetics) could also be considered, released at the ford next to the piggery shed 1300 m above the bridge where the best quality cleanest gravels exist (landowner access permission from David Meade would be required).

A 4th site was investigated July 6th 2016 after discussion with Lloyd Faulkner revealed he used to regularly see spawning brown trout within the Tadmor at the old Forest Service Headquarters. Landowner Nigel Warnes was contacted for access permission (03 5224241), and a survey was undertaken. Despite plenty of good gravel, and these historic accounts, no adult fish or redds were located. A summer electric fishing program, combined with data-logger information is recommended here.

The Tadmor was electric fished on February 7th 2017 near Bushend Rd Bridge – zero juvenile brown trout were located despite good instream habitat conditions.

The **Stanley Brook** was surveyed on July 6th 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. A summer electric fishing and data-logger information gathering program is recommended. It is possible this waterway now gets too low/warm to support salmonids over the summer period.

SPECIES MANAGEMENT

The Stanley Brook was electric fished on February 7th 2017, with one brown trout yearling only being captured, and two adult fish noted in a pool.

The **Dove River** was surveyed on July 6th 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 gets too low/hot over the summer months, an electric fishing and data-logger information gathering program is recommended.

The Dove was 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.

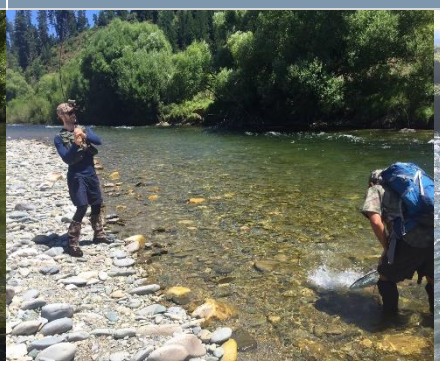
RIPARIAN ENHANCEMENT – HINETAI SPRING

Hinetai Hops have commenced at riparian planting project to enhance water quality in Hinetai Spring. The spring is an important waterway in the Motueka River as it contributes cooler water into the Upper Motueka when water temperatures rise over summer. Morgan Puklowski, a NMIT aquaculture student on work experience, provided assistance with their planting efforts.

The project is an ambitious one, with ~2km of plantings to be achieved each side of the spring, and Hinetai Hops should be congratulated with their efforts here.

FATHER & SON
MOTUEKA RIVER

SUMMER ACTION
MARCUS & WEESANG



AUTUMN HOOK-UP
NICK MOLINEAUX

Waimea/Nelson Rivers

WAIMEA CATCHMENT

The Waimea River has a muddled history of trout counts utilizing many different sites, mainly due to the effects of low flows making 1km plus dives sites difficult, and therefore there is no graph data for this river. On trout numbers in the Waimea River, there were reasonable numbers of large and good numbers of mediums at the Bryant's Lane site, however disappointing numbers downstream from here.

While the top few pools on the Waimea River were clear, the lower site had poor visibility due to a Downer quarry trucks crossing upstream and the counts are not reliable. On that note, the Manager took water clarity samples, which were found to be in breach of their consent conditions (i.e., this did not comply with a maximum 20% loss of clarity 200m downstream of the ford). A complaint was lodged with TDC, and from now on they will be made to install and use a temporary culvert.

The Lee figures again make for disappointing reading with only 1 large fish seen, despite excellent water available (see figure 34). The Wairoa trout figures were steady, however it was disappointing to see a lack of large fish after counting high numbers of mediums the previous year – see figure 35.

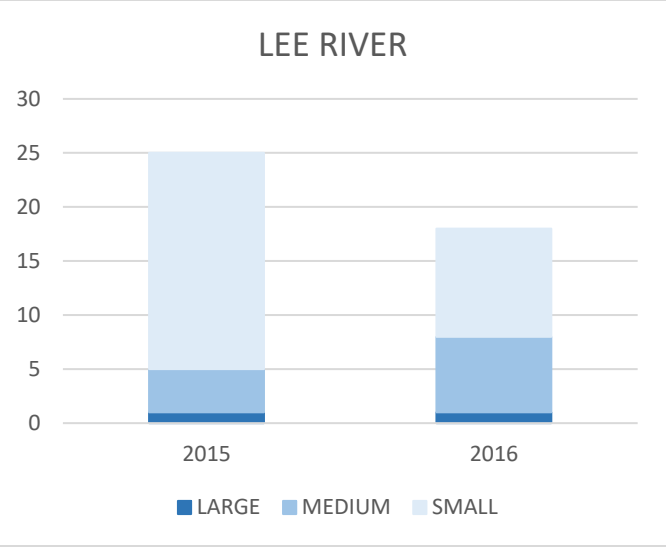


Figure 34. Lee River drift dive results

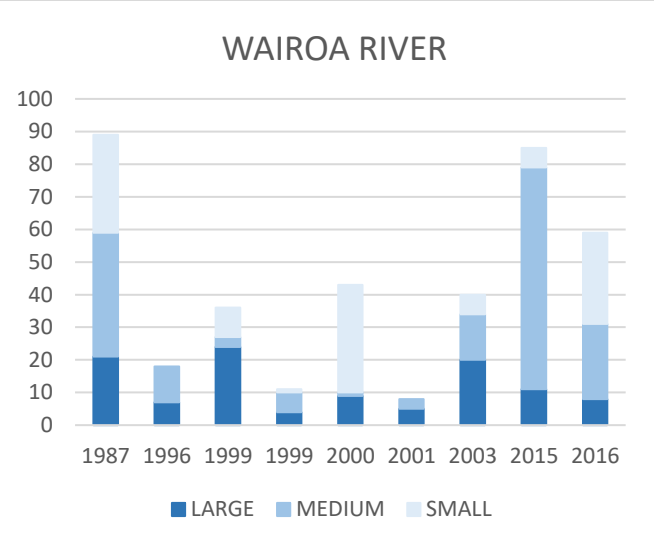


Figure 35. Wairoa River drift dive results

MAITAI RIVER

The Maitai again made for dissapointing reading, the only shining light being solid numbers of juveniles counted on the reach above Pole Ford Bridge. Whether these survive and remain in the systemn is yet to be seen, however evidence suggests that this will not be the case. Only 1 medium was seen and 0 large fish for this reach.

SPAWNING SURVEYS

The Wai-iti River was inspected on 8 June 2016. Visual inspection in the top end of the Wai-iti at Hiwipango (Wai-iti Pines Rd junction with Stock Road) revealed the substrate to be too sandy, so a 0.7 km survey was undertaken instead lower down in the Wai-iti from the Pigeon Valley Rd bridge downstream to the Pigeon Creek confluence (dry at the

time of this visit). Despite the presence of excellent spawning gravels, zero adult trout or Redds were encountered. Historic hard engineering riprap practices, combined with over abstraction of water during the summer months, may possibly have resulted in a summer environment now hostile to brown trout. Summer electric fishing and a data logger installation at the Pigeon Valley Bridge would be worthwhile within this catchment.

Very low numbers of brown trout juveniles (3 over 280m2) were located within the 88 Valley Stream electric fished on 3 February 2017.

Buller Catchment

The Buller was dived at two sites this year, with the Buller outlet included, which was last dived over a decade ago. As with the Anatoki, the outlet was included to gain some current data on fish stocks in relation to didymo coverage, which was at the request of NIWA's Philip Jellyman who is currently looking at this relationship nationwide.

As expected, the outlet dive had very high densities of didymo, with little in the way of larger invertebrates present (mayflies etc). The trout population in this reach consisted of just 4 large fish, however there were 38 medium and a good population of smalls with 87 counted on the short dive – see figure 36. Before didymo, this was a prolific stretch of water, with one of the highest trout biomass recordings in New Zealand. A local fishing guide, who fished the Buller a great deal, believes however, that the Buller was in decline prior to the arrival of didymo, which by looking at the data appears correct (shown by a dramatic reduction bwteen 1996 and 2002, prior to the arrival of didymo in 2005).

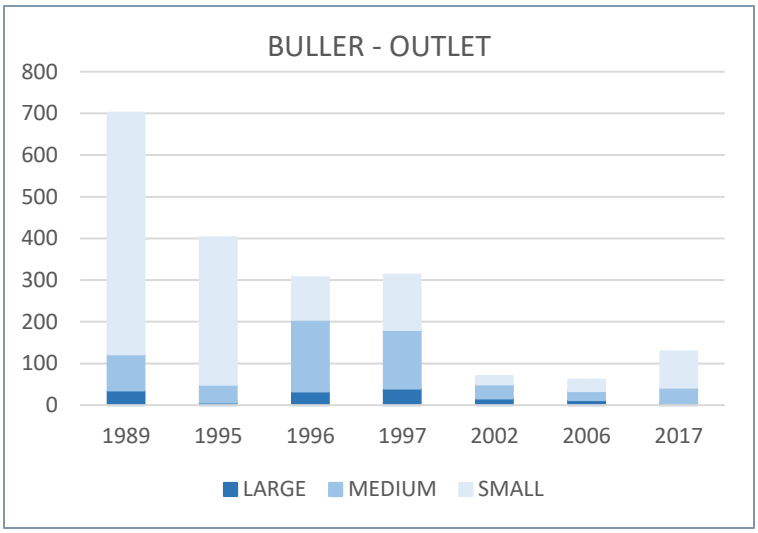


Figure 36. Buller River at Outlet: drift dive results

However there is still hope for the Buller, as shown by the drift dive results from the Kawatiri dive site, which has built on last years' increase to now show a solid population of trout in all sizes – see figure 37. Notably, there are significantly more small fish, which has climbed from 19 fish to 79 fish this year, however it must be recognised that small fish counts have more margin for error due to the difficulty of counting these fish. What is pleasing to see is that it appears the trajectory of medium/large fish is trending upwards too from record lows in 2014 of only 4 large and 6 mediums, to 15 large and 31 mediums this year.

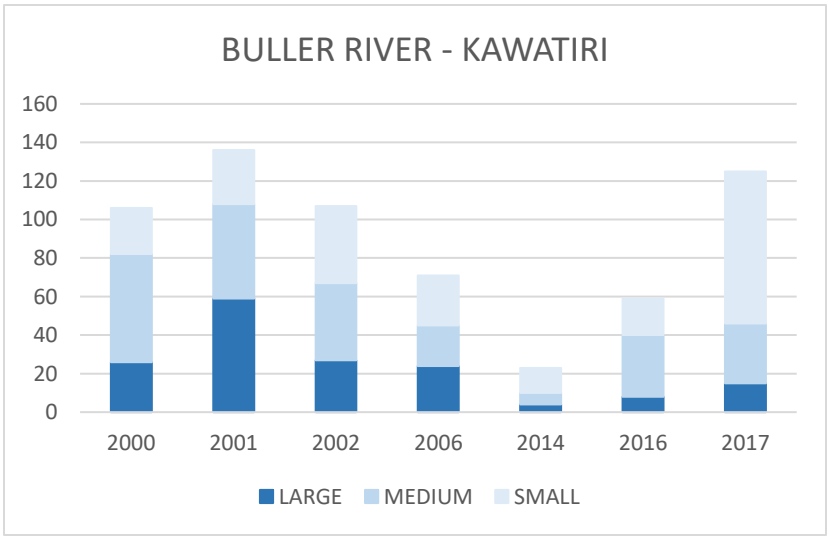


Figure 37. Buller River at Kawatiri: drift dive results

Didymo coverage in the past two seasons has significantly reduced. Initially the effects from Cyclone Winston removed much of the algae, which has thankfully been slow to recover. It's difficult to say if this may be contributing to the rise in trout population, but may be one of the factors.

Golden Bay

This year the Takaka, Anatoki, Waingaro and Waikoropupu Springs were dived. The Waingaro had not been dived for many years, and it was the first formal drift dive on Waikorupupu Springs.

Angler feedback from several Golden Bay anglers informed us that the trout population was at a low point in Golden Bay rivers, with suggestions that seals, floods and didymo have had a real impact on the lower Takaka and Pupu Springs. Drift dives were carried out on the Takaka on January 17 and on Pupu Springs on February 17, and it could be fair to say that angler feedback was consistent with our counts, which hit an all-time low in the Takaka (figure 38), and was practically zero in Waikoropupu River.

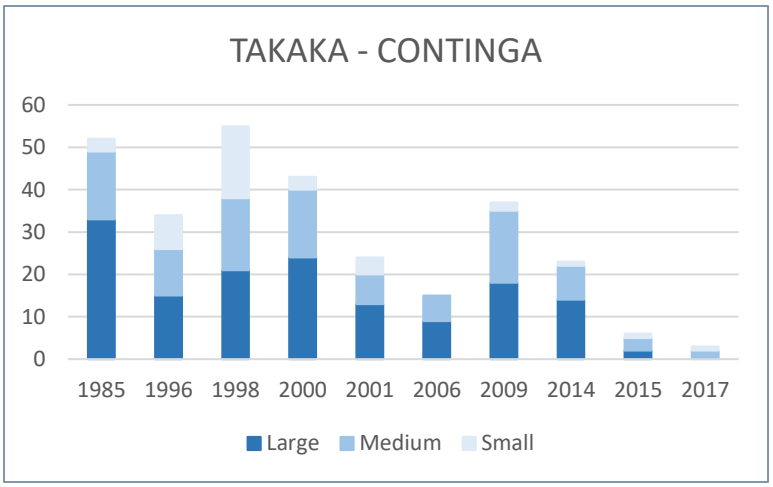


Figure 38. Takaka River drift dive results – at Kotinga

Whilst this was the first dive in the Springs, the manager had been on 2 informal dives in the past and had been staggered by the numbers and size of the resident fish in this river. Only 1 small trout was seen for the Pupu Springs dive, which has some of the purest water in the country.

The Anatoki also does not make for good reading, and as with the Takaka and Waikorupupu Rivers, the population has collapsed, with the lowest count since records began in 1996 – see figure 39. There has been heightened interest in this river due to the didymo research that is currently underway by Keith Nolan (NMIT) and Cathy Kilroy (NIWA), so it's important to have a continuation of an annual trout census in this reach – see section on didymo for more information. Didymo coverage was around 50-60%, which was not as bad as the previous year due to regular scouring from flood events. The shining light in the Golden Bay fishery this year was the Waingaro (only dived on one other occasion in 1996), which had a solid population of fish, including good numbers of medium/small trout, despite regular flood events – see figure 40).

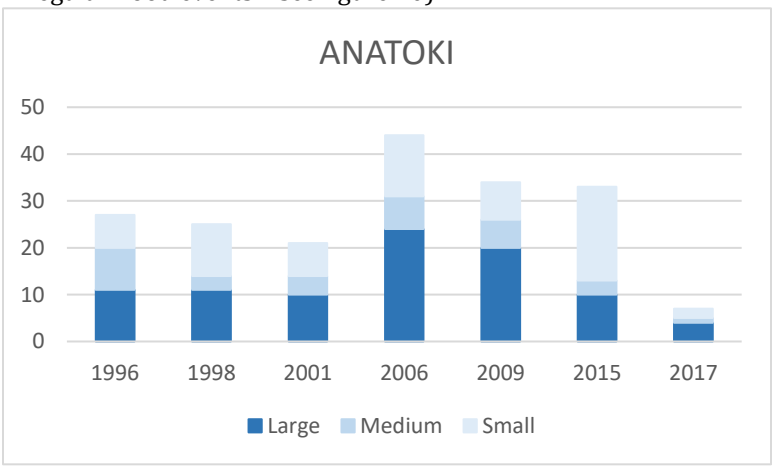


Figure 39. Anatoki River drift dive results

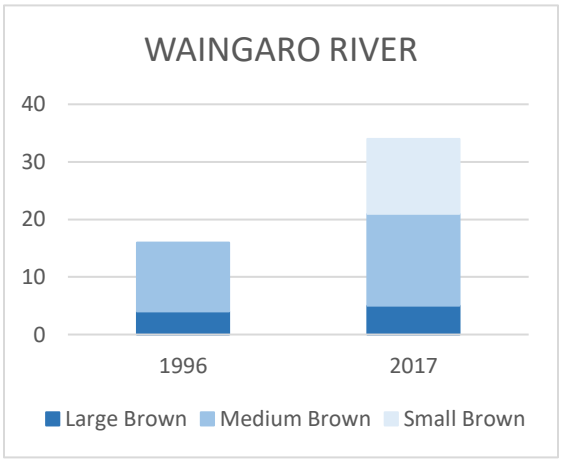


Figure 40. Waingaro River drift dive results

Salmon

SALMON MONITORING

There was some initial concern after the Kaikoura earthquake that salmon would not be able to navigate through the altered river valley, and restrict upstream migration. A number of dam walls, high velocity water barriers and canons were a product of the earthquake, however reports suggest these eroded away to form a more natural river corridor by the time the migration commenced.

The Kaikoura earthquake had a huge effect on the Clarence River which was initially a concern to Fish & Game.

On the whole the salmon fishing this year was poor, and the run was later than normal. This was the case for other East Coast rivers also which experienced a poor run. The West Coast, on the other hand, enjoyed some good fishing.

Aerial salmon monitoring was carried out on 8 May 2017 by Vaughan Lynn and Jim Anderson using a Eurocopter – see Table 1. The fishing was reflected in this years' counts with fewer salmon counted in all catchments this year, as shown in figure 41. The Clarence and Acheron catchment still had reasonable numbers with 567 salmon counted and confirms there were no major obstructions to the fish on their upstream migration.

Table 1 Results:2017 aerial surveys

	Live fish	Dead fish	Total fish
Wairau River Aerial	55	1	**56**
Rainbow River Aerial	109	3	**112**
Clarence River Aerial	565	2	**567**

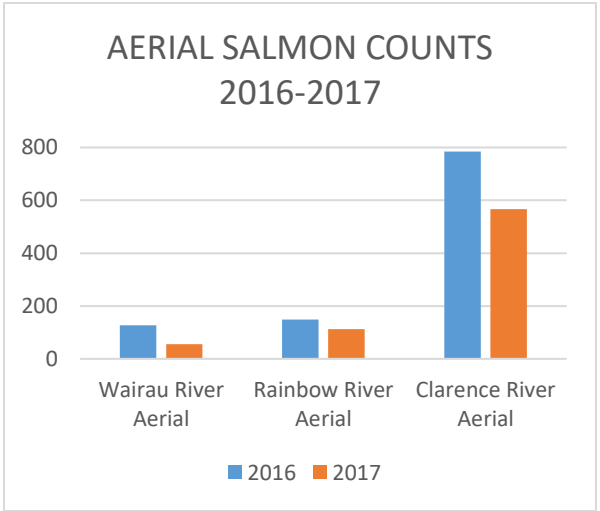


Figure 41. Aerial salmon counts for 2016 & 2017.

SPECIES MANAGEMENT

SALMON RESEARCH

Fish and Game staff have been assisting external organisations (Cawthron & NMIT) with two salmon research projects both of which are primarily looking at farmed salmon but F&G are able to piggy back on these projects by supplying samples from wild fish and therefore able to gain some valuable information.

The first project has involved collecting DNA skin samples from wild salmon for Cawthron which as a result of MBIE funding is researching the genetic variation of salmon within aquatic operations (both marine & freshwater) to determine genetic bottle necks. By supplying DNA samples from wild fish (primarily the Wairau in this region - although other regions are also supply samples from other rivers) we are able to "piggyback" on the project and get wild salmon analysed. Taking samples is relatively easy and has been able to be done in conjunction with other work and will give us specific information regarding the Wairau salmon fishery genetics.

In the second project, otoliths from wild fish are also being supplied to NMIT who are studying the levels of crystalline vaterite formation in otoliths of salmon which is believed to cause hearing impairment. Last year NMIT carried out a pilot research project in which the initial evaluation of farmed Chinook salmon indicated significant variation between different farms, rearing environments and genetic sources of the salmon. This year NMIT is trying to determine the prevalence of the vaterite otolith occurrence in wild fish and thereby set the benchmark for Chinook salmon in New Zealand. While this project is largely being undertaken on behalf of the aquaculture industry it does have implications for fish restocking programs and subsequent survival of released fish.

SALMON SPAWNING
RAINBOW CATCHMENT

AERIAL SURVEY
RAINBOW RIVER

AERIAL SURVEY
CLARENCE CATCHMENT

Fish releases

This season was an important one, for it was the first to see the Wilhelmus hatchery come to fruition. A number of trout and salmon releases were carried out in the Taylor and Riuwaka Rivers, as well as Challies Island Kids Fish Out ponds. Trustpower also contracted Nelson Marlborough Fish & Game to facilitate a release of 400 rainbow trout, which were grown and delivered by North Canterbury Fish & Game.

In the coming years, staff will endeavour to carry out a programme of targeting monitoring (drift diving. e fish, foot surveys) where fisheries enhancement releases have taken place.

RIUWAKA RIVER ENHANCEMENT PROJECT

The Riuwaka has been one of the key enhancement projects for staff this year. The Riuwaka was chosen as a suitable site due to its low population of resident fish and ongoing issues with juvenile trout recruitment. The river was in its day known as a great brown trout fishery with an exceptional trout biomass, but has suffered in recent years from a mix of severe flooding, and unsympathetic council erosion control and engineering works.

The release took place on March 15 and the fish arrived in excellent condition, so much so that some were slashing at mayflies within minutes of release. Unfortunately the South Branch was highly discolored from the South Branch slip, so no fish were released there as was planned. 50 trout were released above the SH bridge, with the hope that they would re-populate the lower end of the river. 75 trout were released into the North Branch – sixty of them in one pool and the remainder in small groups at other locations. The remaining 25 trout were released in the main-stem at Foley's Creek, however the river at this point was still suffering from excess sediment.

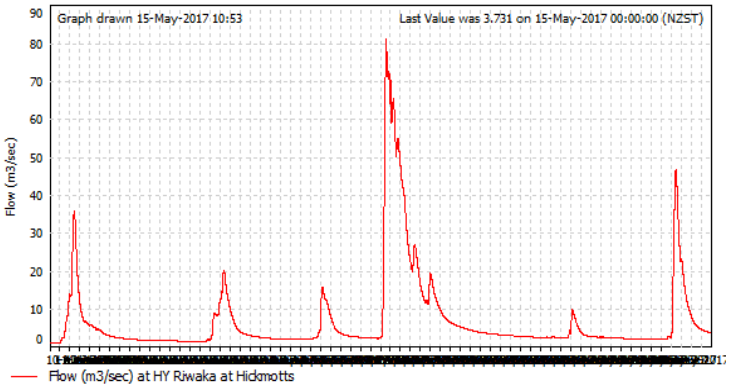
Staff carried out a drift dive of the entire North Branch two days after the release, and despite 75 fish released only 3 fish were counted. Somewhat intrigued by this, staff dived the entire river from the confluence to the mouth one week after release and located 60/150 fish, most of these downstream of the SH bridge, and including a group of 40 fish. Interestingly, staff walked this section of the river earlier that day and only saw 5 tagged fish there, thus a group of 40 had moved in there a few hours later. It can be deduced from these findings that the vast majority of the fish have remained within a large group and are utilizing the estuary area, including mudflats, and are moving in and out with the tide. The 20 fish that were found upstream of the SH bridge appeared to have taken to the river well, and were co-habituating well with the resident trout, some even occupying the prime location in some pools.

To date staff have been made aware of just one tagged fish being caught, which took place below the main road bridge, close to the mouth. It was pleasing to hear that the fish was in good condition, and was even showing typical Motueka characteristics, being difficult to catch and requiring multiple fly changes. Several other fish sightings have been reported in the middle reaches. Foot surveys will be undertaken within the North and South Branches of the Riuwaka in mid-June this year to determine whether many of the release fish have migrated back upstream for spawning purposes.

SPECIES MANAGEMENT

The Riuwaka experienced a large flood event some weeks after the release (see graph on the right), and it is unknown how this affected the tagged trout.

Future releases will also include release of smaller yearling fish as well as adults, to investigate what sized fish best remain within the catchment. Adult releases will continue for at least another two years, however fish will be released in smaller groups for future liberations and seine nets utilised where possible to prevent fish from immediately migrating downstream.



TAYLOR RIVER RELEASE

Two releases into the Taylor River junior fishery were carried out in December and April, the former using 50 1kg brown trout from the Wilhelmus hatchery, and the latter 50 1-2kg rainbows from North Canterbury. The fish were in excellent condition on release and seemed to have adapted well to the river, with a number of released brown trout seen on a drift dive carried out on January 10. On speaking with a young angler during the dive, he was chuffed with his success rate on the Taylor, having landed a number of brown trout, including it appeared some from the December release of browns. It appears the rainbow trout have also adapted well, and Fish & Game have received positive feedback from a number of happy families who have caught some of these fish.

TRUSTPOWER BRANCH RELEASE

Trustpower have this year contracted Nelson Marlborough Fish & Game to facilitate and deliver the Branch/Leatham trout releases, as part of their mitigation for the effect the Arygle power scheme has had on the trout population upstream of the weir. On April 21, 380 1-2kg rainbow trout were released into the Branch/Leatham at 6 different sites. IN the Branch River 100 fish were released at the Misery confluence, 50 at Siberia, 50 at Silverstream and 60 at Nesbitts. In the Leatham River 60 fish were released at lower Gordons and 60 at Barbers Stream.

The day went very well, with the monsoon bucket system working flawlessly to deliver the fish, and all fish appearing to be in good condition on release. In fact, a number of fish were caught by anglers after the release with the anglers commenting that the fish were still in good condition, although the fly of choice was once which most closely resembled processed fish pellets!

WAIMEA PARK (CHALLIES ISLAND) FISH OUT PONDS

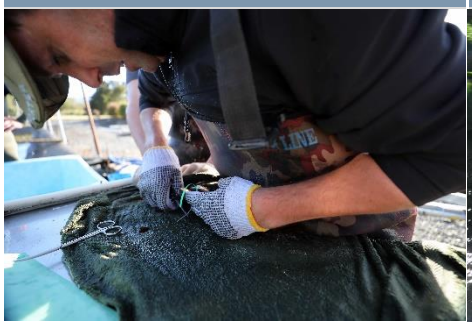
Approximately 450 salmon were released over 3 different days for Kids Fish Out events at Challies Island. These fish were grown at the Wilhelmus hatchery, and after some early difficulties on the first trip with ~30 fish deaths, provided

some very good fishing to junior anglers. Additionally, 130 browns were released in April in time for more events, however these fish have been much harder to catch than the salmon and rainbow trout.

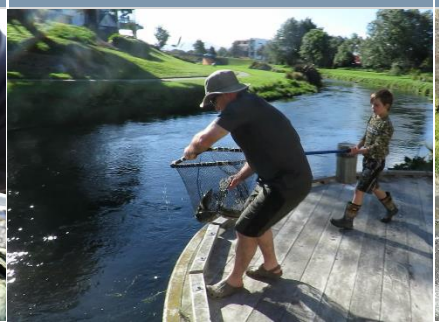
UPCOMING RELEASES

SITE	*TROUT RELEASED*	*COMMENTS*
Tadmor River	Brown trout - 60 tagged adults	Tagged ripe fish will be released in here in order to see whether the historic spawning run for this catchment can be 're-started', as instream habitat conditions appear good albeit with sometimes high summer temperatures.
Dove River	Brown trout – 40 tagged adults	Tagged ripe fish will be released in here in order to see whether the historic spawning run for this catchment can be 're-started'.
Tinline River	Rainbow trout – 500, 130g adipose clipped juveniles	This river was once a fishery in its own right and now has a very low population, despite excellent habitat, presumably due to ongoing severe flood events.
Waikakaho River	Rainbow trout – 500, 130g adipose clipped juveniles	Juvenile rainbows will be released here in order to try and diversify the lower Wairau fishery, and provide something for the Marlborough Anglers Club to support.
Riuwaka River	Brown trout – 30-50 tagged adults	A further release of ripe fish into the North Branch prior to spawning, and distributed in smaller groups.
Riuwaka River	Brown trout – 1000, 130g adipose clipped juveniles	A dual approach to the enhancement programme to bypass the issues with loss of young of the year fish. Juvenile fish should remain fairly close to the release site for some time.
Upper Pelorus	Rainbow trout - 300-500, 130g adipose clipped juveniles	Utilising funds from the non-resident licence fee, this is hoped to be enhanced in the upper reaches to try and restore this fishery.
Waimea River	Brown trout – 100 adults	Release to coincide with the December school holidays, and post Kids Fish Out events in order to provide the next step for junior anglers and families.
Branch/Leatham	Rainbow trout – 800 adults released per annum	Release funded by Trustpower as part of their mitigation for the Argyle Power scheme

FISH TAGGING
WILHELMUS HATCHERY



BROWN TROUT RELEASE
TAYLOR RIVER



TRUST POWER RELEASE
BRANCH RIVER

Designated Backcountry Fisheries

The 2016-17 season saw the introduction of backcountry designation to the Nelson Marlborough region. After a significant consultation period with other regions, fishing guides, D.O.C and others, the Travers and Goulter Rivers were designated as backcountry fisheries. This, in the main, requires any angler to purchase a full season licence and apply online for a free backcountry endorsement, and thus be eligible to be surveyed on their experience.

TRAVERS/GOULTER BACKCUNTRY FISHERIES

It takes a significant amount of time and resources to designate a river as a backcountry fishery. There is a good deal of signage that has to be installed at angler access points and huts. For example, the Travers backcountry fishery required 10 signs to be installed and the Goulter 5 signs. There is a need to ramp up media coverage of the new regulation via the fishing supplement, and online avenues. Staff also visited all licence agents to inform them of the backcountry designations, whereby pamphlets were also designed and delivered to licence agents who issued them on purchase of a licence.

There is also a requirement to enforce the new regulations. Staff made two visits to the Goulter River – one on Opening Day where everyone held backcountry licences, and our team of voluntary rangers had a reasonable presence on the Travers. A new incentive system was implemented for voluntary rangers to encourage them to peruse the new backcountry fisheries. For this a $20 petrol voucher is gifted for each licence check on backcountry fisheries, and a $10 voucher for all non-resident licence checks on other rivers. All in all, there was a high compliance rate, with just a couple of warnings issued to anglers who were unaware of the new regulation

Surveying anglers who applied for a backcountry endorsement is an important part of the process and also takes considerable staff time. A joint West- Coast/Nelson-Marlborough survey has been sent to 1500 anglers who applied for a backcountry endorsement, which questions the angler on a number of important aspects including angler encounters, quality of the fishing, and angler days to name a few. At the time of writing the survey has just been sent out and the results will be available in due course.

FUTURE DESIGNATIONS

The original wish list from a Guides meeting held in 2015 included a request from Guides to consider the following waters for designation: Travers, Sabine, D'Urville, Upper Wairau (above locked gate), Goulter, Matakitaki (above Windfall Flat), Upper Aorere, Branch/Leatham, Karamea, Mohkinui, and possibly Wangapeka (above the Rolling confluence). Rather than consult with all resident anglers, following this meeting the Nelson-Marlborough Fish & Game Council resolved to start designating some of these waterways in order to obtain better information on angler encounter rates and satisfaction within these sensitive fisheries. The Nelson/Marlborough Fish and Game Council also subsequently resolved that consideration be given to all Nelson/Marlborough fisheries closed in winter to potentially be considered as eligible for back country fishery status.

To date, 2 back country fisheries have been designated by West Coast Fish & Game – the Karamea and Mokihinui. These rivers were drift dived this summer to provide baseline information as part of the designation process, which Nelson Marlborough Fish & Game assisted with in both staff hours and some helicopter time. Within our own region, the Travers and Goulter Rivers were designated and signposted, after a baseline heli-dive in both these systems the previous summer had been undertaken. Increased compliance effort has been attempted within both these fisheries. The time and resources required to monitor fisheries, install signage, and carry out compliance means we can only

afford to designate a maximum of 1 or 2 rivers within our region each year, utilizing our additional non-resident licence fee income for this purpose. A baseline survey has been undertaken within the Upper Wairau this summer, and it is proposed to now designate this fishery from the locked gate upstream. It is important to proceed at a cautious rate with back country designation as: 1) other solutions to overcrowding may well be developed in the next few years e.g. Tier 1 & 2 fisheries, with capped usage in Tier 1 through a tag based system such as that used in some overseas fisheries; 2) fisheries need to actually fit what is classically deemed to be a "Back Country" river; and 3) designation is not a tool to control crowding, it is merely a tool to gain better information on the extent of crowding.

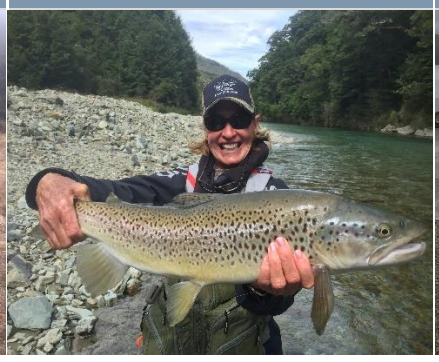
Backcountry rivers within Nelson/Marlborough are best categorized through considering the 'wish list' in light of our statutory Sports Fish & Game Management Plan, National Angler Survey use data, and also our historic research on crowding information produced by Carl Walrond for this region. The Walrond work, although 20 years old, rates our rivers as follows in regards to angler avoidance rate and thus crowding issues:

Highest rate of avoidance 20 years ago was: Travers 7.5%, Buller 7.2%, Sabine 5.9%, Wairau 5.2%, Karamea 5.1%, D'Urville 4.9%, Wangapeka 3.9%. For comparison purposes, the Greenstone 20 years ago scored 4.8%. Angler pressure has obviously changed a lot over the last 20 years, particularly in rivers such as the Goulter (then 1.8%), Mokihinui 0.7%, Matakitaki 0.3%, and Upper Aorere 0.2%.

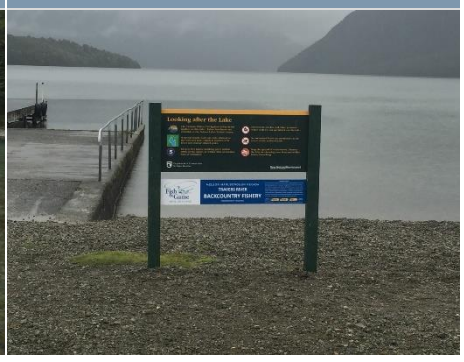
A logical selection process for designation is to consider the above data, alongside the wish list, and then look at our statutory sports Fish & Game management plan. Rivers should ideally fall into 'remote' classification, although 'natural' could be considered if the river is ranked as having national recreational significance. For example the Wairau is classified as 'natural' in our SFGMP, but falls out as nationally significant for recreation. Under this approach the Sabine and D'Urville would be the next rivers to consider for back country designation in coming years. Interestingly the Wangapeka and Maruia would also technically be eligible, but not the Matakitaki or Aorere.

BACKCOUNTRY SIGNAGE
TRAVERS VALLEY

GOULTER BROWN
MARGIE KAAT



BOAT RAMP DISPLAY
LAKE ROTOITI



Water Temperature Monitoring

As a result of the Tasman District Councils Plan Change 52 decision which saw an additional 90 l/s allocated in the newly created "Glenrae Zone" (between Tapawera & the Wangapeka confluence), Fish and Game carried out water temperature monitoring during the 2016/17 summer in the upper Motueka catchment. In Fish and Game's opinion there was a lack of flow and other information to base the additional allocation decision upon and inadequate river low flow protection. The aim is also to gather information so that more informed decisions can be made during the 2019 Bona fide review process.

Staff deployed 12 Onset Hobo pendant water temperature data loggers over the summer months (between December and April) at various locations to monitor water temperatures in the upper Motueka and its tributaries.

Unfortunately equipment malfunctions meant that the datalogger deployed in the lower Tadmor didn't result in any data being gathered and a flood in mid-January covered the Woodstock logger in sand. This "dampened" or lessened the daily temperature fluctuations. The other eight loggers however produced some good data although **it must be noted that the 2016/17 summer was an extremely unusual one, in that it was a wet summer which meant river flows never really got very low and nor did we get the usual extended periods of hot temperatures.** As a result water temperatures recorded were lower than what would normally be expected.

MOTUPIKO

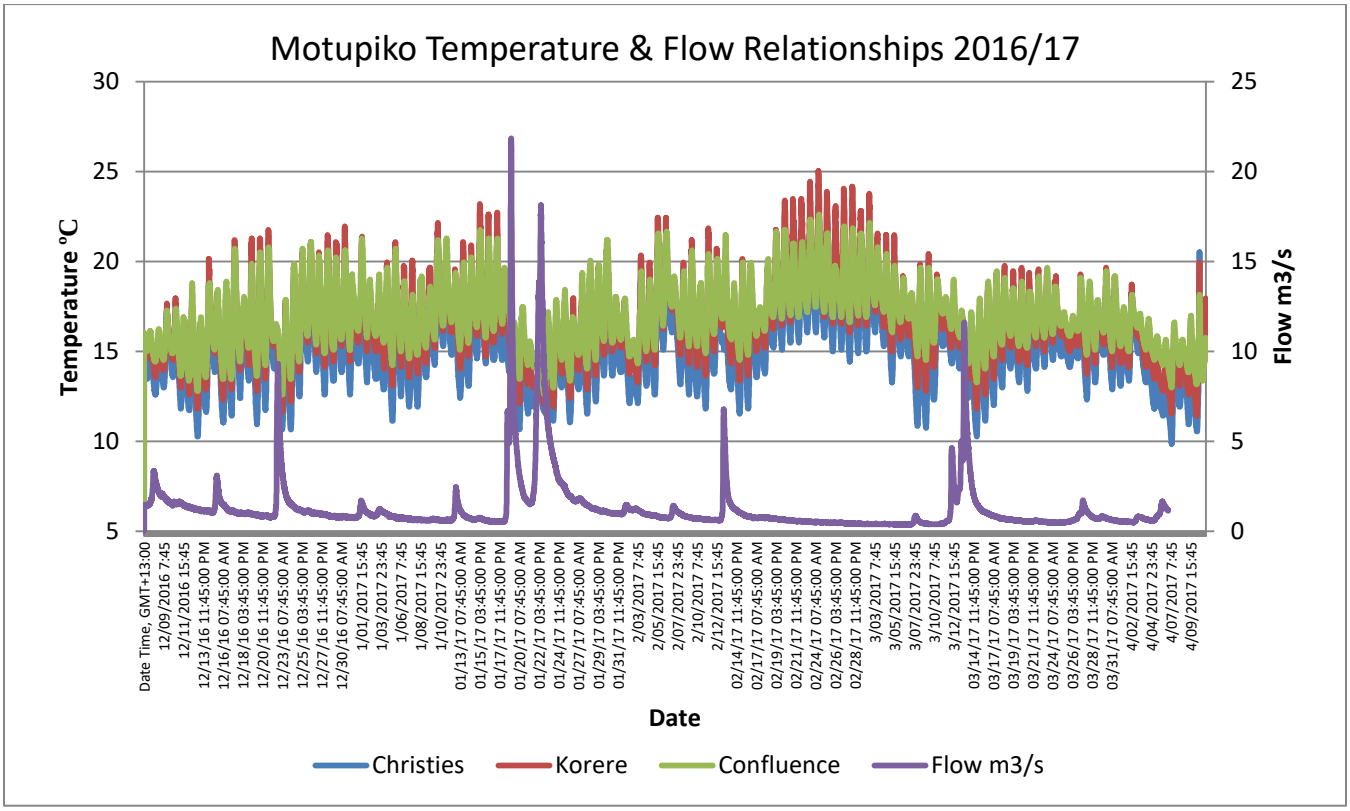


Figure 42. Motupiko temperature and flow relationships 2016-17

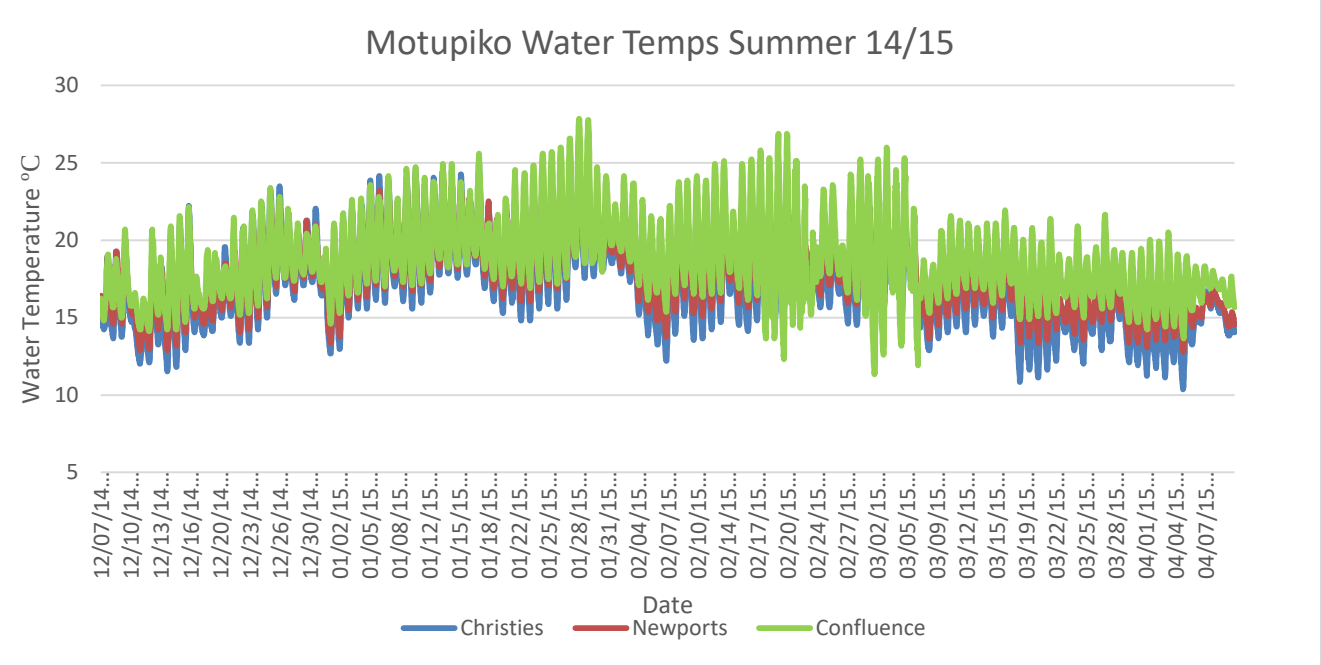


Figure 43. Motupiko water temperatures 2014-15

As can be seen from the above graphs (figures 42 and 43), during the 2016/17 summer the maximum water temperature reached in the Motupiko just above the confluence with the Motueka was 22.6 ºC whereas in 2014/15 the maximum temperature recorded at the same location was 27.8 ºC. River flow/discharge (purple line) has also be graphed in 2016/17 which shows it has a significant effect at cooling temperatures when freshes occur.

UPPER MOTUEKA

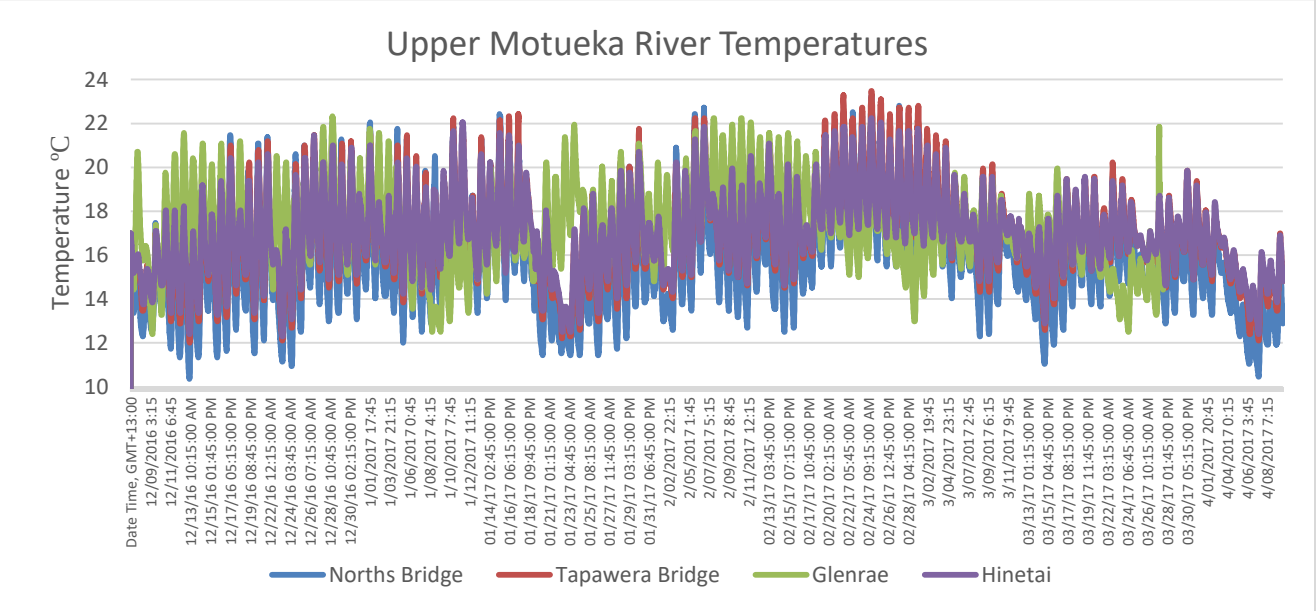


Figure 44. Upper Motueka water temperatures 2016/17

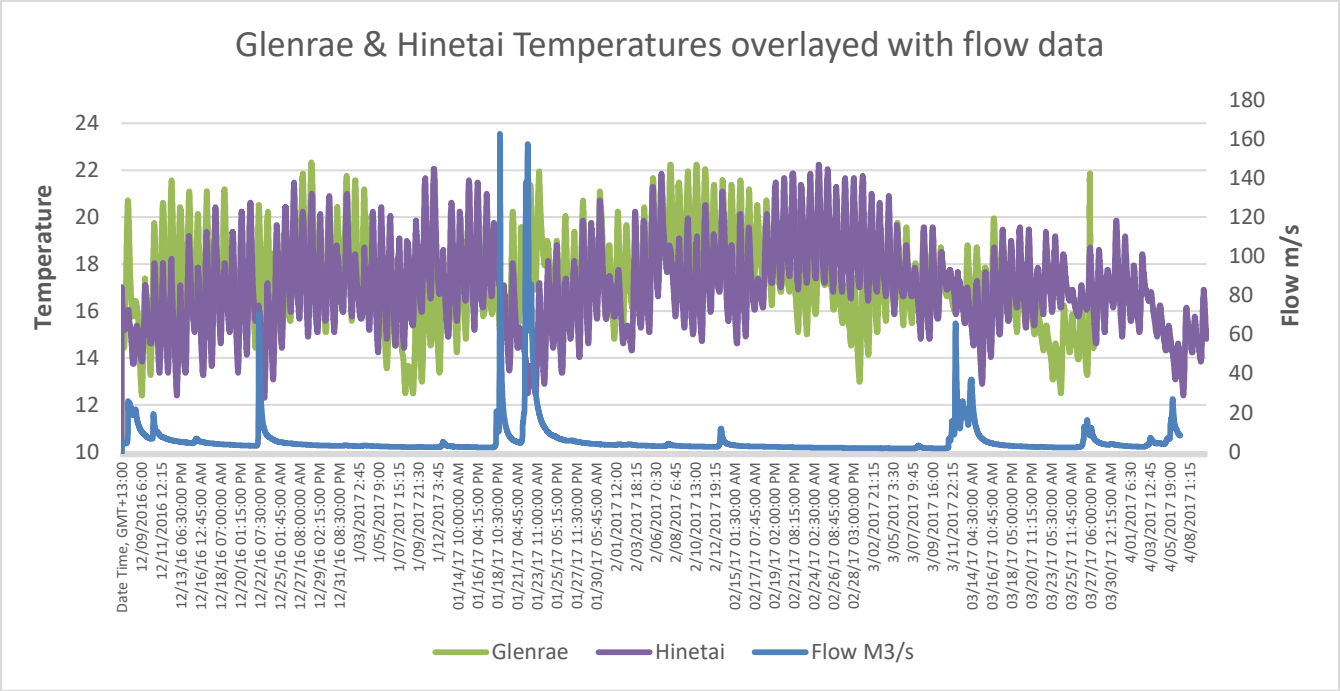


Figure 45. Glenrae and Hinetai water temperatures, overlayed with flow data

As can be seen above (figures 44 and 45), the highest water temperature during the 2016/17 summer (23.4 ºC) was recorded at the Tapawera Bridge which is not surprising as this is in a "losing reach" where river water is generally being "lost to ground" compared with further down the river at Glenrae & Hinetai which is in a "gaining reach" whereby ground water recharge is more prevalent. It is interesting to note that despite these two loggers being less than 1km apart, there is quite a difference in water temperatures at times. The temperature variations between the sites also are not constant which probably can be explained by changes in groundwater levels and recharge rates. It is believed that the Hinetai site receives more groundwater recharge (which is likely to keep the temperature more constant and cooler during hot periods) than the Glenrae site, which may "gain" or "lose" water depending on river flows and ground water levels. Given river flows and no doubt ground water levels were higher this year compared with normal summers, it is anticipated in a normal year there will be bigger differences between the two sites.

The Glenrae site was dived in January 2016 and again in December 2016. As anticipated significantly more trout were counted in December 2016 compared with the January dive that was carried out earlier in the year. In fact the results were that best they have been since 1996 and in staff opinion due largely to the good survival rate of fry during spring 2015, followed by higher than normal summer flows in 2016/17 and no doubt also cooler water temperatures as a result of these higher flows.

12 temperature loggers were deployed within the Motueka catchment, with the aim to collect water temperature data in the midst of current TDC policy changes, notably Plan Change 52, as well as validating suitability for future fish releases. Key data collection sites included the Motupiko, Upper Motueka and Tadmor Rivers, the former two important for Plan Change 52, and the latter for future fish releases.

HABITAT PROTECTION

RMA

As always Resource Management processes took a considerable amount of senior staff time this season, particularly Marlborough resource consents and Tasman Plan Change 52. 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 have continued to prioritize effort and expense on the Marlborough Second Generation Plan review (particularly new water permits applied for since the plan was notified), and the TDC River works Global Consent (however an agreement has been reached here and staff have been pleased with a higher level of consultation, and modification of some practices). Plan Change 52 has not been pursued; effort has instead gone into understanding summer low flow conditions within this river, in order to better inform the 2019 review for all water permits within this part of the Motueka Catchment.

MARLBOROUGH ENVIRONMENT PLAN REVIEW

Funding from the national legal fund was utilized to employ an independent hydrology consultant to calculate mean annual low flows for the rivers of interest in relation to the Marlborough Environment Plan review process, hearings for which begin November 2017. Perception Planning were also engaged via the legal fund to produce a 200 page Fish & Game submission on the notified Marlborough Environment Plan. The largest issue of concern within the present plan relate 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 hearing evidence on the Marlborough environment Plan, with expert input from our national planner Peter Wilson.

PLAN CHANGE 52

As a result of Tasman District Councils poor process in relation to Plan Change 52 (i.e. not adequately assessing and providing for instream river low flows above Wangapeka confluence), consideration was given for a declaration to the environment court of an illegal plan change. However in the end it was considered a better use of our limited resources to try and address this issue during the 2019 consent review for the catchment, giving us time to gather information on summer instream temperatures, as detailed earlier in this report, to better inform the consent review process. The scope of this 2019 review is critical – currently TDC have indicated they will review the flow relative to the water quality provisions of the NPSFWM, hopefully temperature will be considered as a water quality aspect and therefore the relationship with minimum flows for the system.

TDC RIVERWORKS UPDATE

There have been signs of improved practice within TDC, 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). We are still yet to get anywhere on the Riuwaka, however staff hope to pursue improvements here with TDC this winter, with proactive planting of dwarf willow at the waterline in key areas to hopefully be trialed. A detailed report on the best

way to manage the remaining willow below the State Highway bridge has also been provided to TDC, however we have had no response on this to date (although the willows have not been removed as TDC had originally signaled to us).

WAIMEA RIVER CROSSINGS

During routine drift diving it was noted the lower Waimea water quality declined significantly at our lowest site (to the point the dive had to be abandoned). Subsequent investigations revealed the Downer river hauler truck crossing to be the source of this sediment, with wheel washes not working to mitigate sedimentation. As a result the TDC ecologist Trevor James undertook some benthic sediment measurements and confirmed out concerns around sedimentation issues arising from the truck crossing. The final outcome was that Downer will be required to install a temporary culvert for truck crossings when their consent is renewed late 2017, and the existing crossings have now ceased.

Junior Fishing Development

WAIMEA RIVER PARK EDUCATIONAL FISHERY

The junior fisheries have again proved popular with more than 400 children participating in the guided fish out days at the Waimea River Park Educational Fishery which is run in conjunction with the Sports Fishing for Youth Charitable Trust. In addition to the organised events, this year for the first time the ponds were open to child & junior licence holders over the Christmas Holidays after the spring/early summer organised events were held. This proved to be very well received and popular with a number of families taking the opportunity to take their kids fishing in the evenings after work or on weekends during the summer holidays.

This year North Canterbury were unable to supply rainbows at the start of the season, however fortunately Pieter Wilhelmus had the salmon up to size which while they behave differently to the rainbows they proved to be a hit with those attending the events with fish ranging in weight between 1-1.5kg. Overall success rate during events was similar to previous years - although on average the salmon have proved to be slightly harder and taken a bit longer to catch than the rainbows. Despite quite a bit of fishing pressure over the summer a number of salmon remained uncaught in the ponds and provided opportunities during the May events. In late April 2017, 129 brown trout were released into the ponds (as unfortunately no rainbows or salmon were available). During the May events approximately 50% of fish caught were browns with the other 50% being salmon that remained from releases in December. After the events held in May the ponds have again been opened to child and junior licence holders through until the end of August. It will be interesting to see the feedback, as it is anticipated the fishing over the winter months will be relatively hard and fish condition is unlikely to be as good as earlier in the year as a number of the fish are likely to spawn over the winter.

A short email survey in late February was sent those on our F&G database who have previously attended a Take A Kid Fishing Event at the Waimea River Park Educational Fishery. Of the 256 emails sent out, unfortunately only 41 responded however the results are very encouraging. Of those who responded, 61% hadn't held a fishing licence previously. However after attending one or more Take a Kids Fishing events, 71% of respondents had since purchased a fishing licence, with 32% of respondents families purchasing a licence. After attending an event at the Waimea River Park Education Fishery 85% of respondents considered that either the child or family may purchase a fishing licence within the next 5 years. These responses are very encouraging and validate the cost and effort spent assisting the Sports Fishing For Youth Trust Charitable Trust with running the Waimea River Park Educational Fishery.

TAYLOR JUNIOR FISHERY

Unfortunately a planned Kids Fish out Event on Marlborough on the Taylor River had to be cancelled due to a fish kill immediately after release. This turned out to be due to a slug of de-oxygenated water moving through release site – unfortunately the exact location of the source or cause was never determined. Subsequently a release of 50 1kg brown trout into the Taylor River junior fishery was carried out on December 15, in time for school holidays. The 1kg fish were in excellent condition on release and seemed to have adapted well to the river, with a number of these fish seen on a drift dive carried out on January 10. On the 21 April, 50 rainbow from North Canterbury (brought up at the same time as the Trust Power release) were released in the Taylor. Staff have received a number or reports of both rainbows and browns being caught by juniors in the Taylor, with feedback generally being very positive.

Licence Sales

Overall licence sales (full licence equivalents or LEQ's) were down 2.6% compared to the previous season, with 3591 LEQ's sold at the time of writing, however remain steady over the course of the past five seasons – see figure 46.

Notable changes in this years' sales were an increase in Non-Resident Whole Season licences (partially due to the backcountry designation of the Travers and Goulter Rivers), however this was offset by a decline in Local Area licences (with 73 less sold than last year) and Whole Season Adult (91 fewer) - see Table 2.

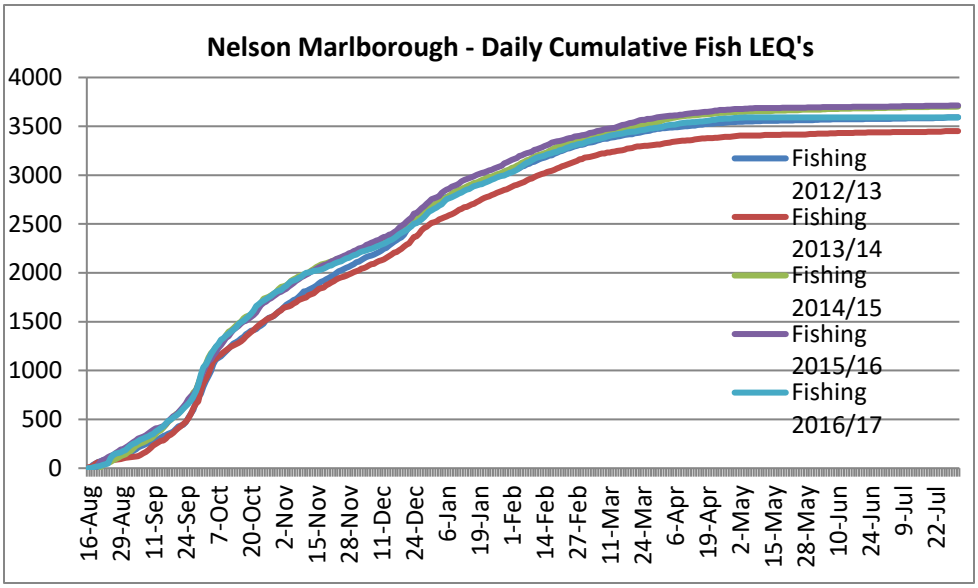


Figure 46. LEQ sales for Nelson Marlborough Fish & Game over the past four seasons.

*Table *. Number of licences sold 2015-16 & 2016/17*

Licence Category	2015/16	2016/17
Whole Season Adult	1474	1383
Non-Resident Whole Season	605	685
Family	654	649
Loyal Senior	213	194
Local Area	210	137
9 Day	33	20
3 Day	103	98
1 Day	1700	1767
Junior	142	128
TOTAL LEQ (Full Licence Equivalent)	**3687**	**3593**

Figure 47 shows that the number of Non Resident Day Licences sold reduced, while there was an increase in Whole Season licences sold. The extra income generated from Non-Resident licence sales for the 2016-17 season is ~$21,000.

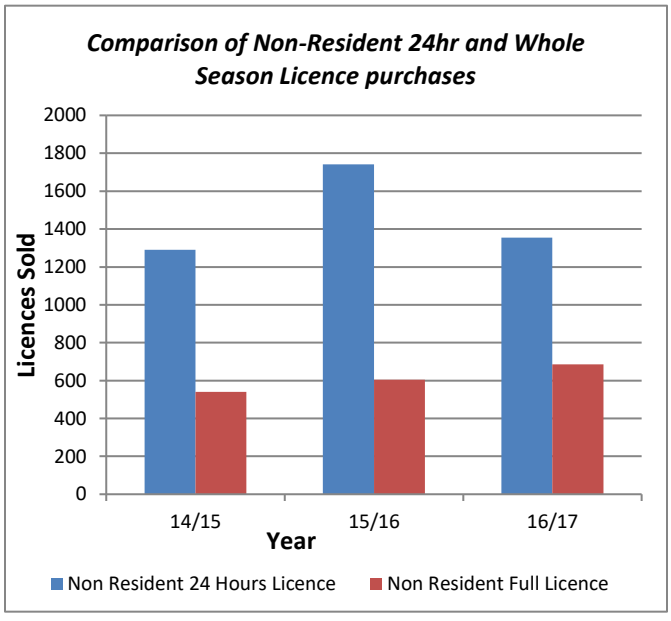


Figure 48. Comparison of Non-Resident 24hr and Whole Season Licence purchases.

Extra revenue from the increase in Non-Resident Whole Season licences equates to $13,000, but factoring in annual fluctuations in tourism numbers and what would be earned with purchase of day licences, it would be a fair assumption that designating the Goulter and Travers Rivers added an additional $5,000-$10,000.

Compliance

Four people were caught fishing without a licence (FWL) in Nelson Marlborough for the 2016-17 season, all of them detected by honorary rangers. All of the offenders were offered reparation for FWL, which they accepted, and were asked to pay $500. One offender who was FWL also provided false details, and once tracked down, had to pay the heftier figure of $1200.

Top Shots From 2016-17

MOTUEKA RIVER ACTION
MARCUS & WEESANG

ANGLING SOLITUDE
BULLER OUTLET

SPIN ANGLERS AT KIDS PONDS
RHYS & WEESANG

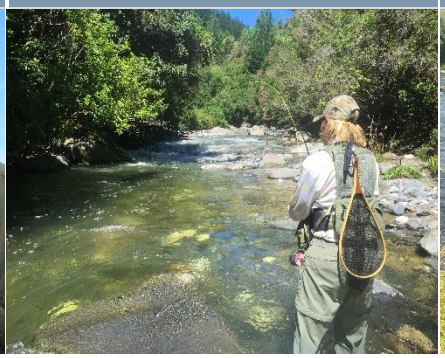
SUMMER TROUT TUCKER
CICADA IMITATIONS

BRANCH RELEASE
WILLIE SAGE

SPIN FISHING LEGEND
GEOFF IRVINE

WAIRAU BROWN
BEN SOWRY

RIWAKA HOOK-UP
MARGIE KAAT



MOTUEKA RIVER
BLAIR DANIEL

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