



# Investigation of the Mawheraiti River Brown Trout Fishery 2024

*Results from sports fish spawning surveys, electric fishing, drift dives and environmental data collected between May 2023 - April 2024 from the Mawheraiti River Brown Trout Fishery*

West Coast Fish & Game Region

*Baylee Kersten, Fish & Game Officer, August 2024*



*Trout captured electric fishing Rough and Creek, Mawheraiti Catchment in January 2023.*

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## **Summary**

*Fish & Game is carrying out research on the Mawheraiti River brown trout fishery in attempt to better understand the fluctuations observed in the fishery. From five years of data collection, greater understanding of the roles different streams play on the fishery and the influence of flooding is being obtained. Lastly environmental data collected has reiterated findings of previous work, with the Mawheraiti River temperature often exceeding desirable levels in summer. Looking at data collected over the last five years in the Mawheraiti catchment, 2023-24 recruitment year productivity was below average. Staff recommendations are that: The council receives this report. The Mawheraiti trout recruitment research programme continues. Continue to work closely with WCRC and encourage them to proactively protect the Mawheraiti River trout habitat considering their duty to do so under Section 7(h) of the Resource Management Act 1991.*

## **Introduction**

The Mawheraiti River has been identified as a location requiring research. The Mawheraiti River is a river that requires attention as the brown trout population has undergone significant decreases and increases over the years showed by drift diving and angler reports. To ensure the fishery is correctly managed and protected it is essential we understand these fluctuations and try to mitigate the significant drops in the brown trout population.

The Mawheraiti or Little Grey River is a tributary of the Grey River. Its catchment incorporates tributaries from the inland mountainous flanks of the Paparoa Ranges and from the rolling hills of the Reefton and Ikamatua areas. The Mawheraiti River joins the Grey River near the township of Ikamatua.

The Mawheraiti River fishery is identified as 'regionally significant' in its rural reaches (FGWC, 2024) and receives between 50 & 480 angling days each season (Stoffels, Unwin M, 2023). The Mawheraiti River has long been regarded by anglers as a nursery for the greater Grey River fishery and this is confirmed by the large number of small and medium size brown trout that have been observed in drift dive surveys.

This report is intended to provide an overview on the information gathered and reviewed for the work plan project 1115 – Sports Fishery Research in the past year and build on former reports where relevant. The information gathered is also intended to inform resource consent processing.

## Methods

In 2019, Mawheraiti River tributaries were identified as potential spawning streams and spawning counts were carried out when possible, during the spawning season. Three suitable streams following conformation of significant spawning activity from the counts were chosen to be research streams. The three streams represented a mixture of land uses and stream types. Electric fishing is carried out on the research streams three times between November and May. Temperature loggers were installed into two of the study streams. West Coast Regional Council (WCRC) has aided in the collection of additional environmental data to allow potential identification of correlations between spawning/recruitment success and environmental impacts. Lastly annual drift dives were completed on the Mawheraiti as done so intermittently since 1993.

## Results

### Spawning Surveys

During the 2023 spawning period three spawning surveys were carried out on the Mawheraiti research streams. Only one trout was observed in each creek during spawning counts, being the lowest spawning counts observed for all three streams. Spawning peaked this season in mid-July for two sites while the last site, Rough and Tumble Creek, highest count was in early-June.

*Table 1: Highest spawning survey count in the Mawheraiti Research streams between 2019 - 2023.*

Date	Research Site	Brown Trout	Length surveyed (km)	Trout/km
09/06/23	Rough & Tumble Creek	1	1.6	0.63
22/06/22	Rough & Tumble Creek	7	1.6	4.38
26/05/21	Rough & Tumble Creek	17	1.6	10.63
09/06/20	Rough & Tumble Creek	10	1.6	6.25
20/05/19	Rough & Tumble Creek	25	6	4.17
11/07/23	O'Malley Creek	1	1.7	0.59
27/05/22	O'Malley Creek	12	1.7	7.06
26/05/21	O'Malley Creek	4	1.7	2.35
09/06/20	O'Malley Creek	22	1.7	12.94
04/06/19	O'Malley Creek	10	1	10.00
11/07/23	Adamstown Creek	1	1.6	0.63
27/05/22	Adamstown Creek	15	1.6	9.38
17/06/21	Adamstown Creek	7	1.6	4.38
09/06/20	Adamstown Creek	7	1.6	4.38
04/06/19	Adamstown Creek	4	1.6	2.50

### Electric Fishing

Electric fishing of three research sites this recruitment year observed below average levels of recruitment. Please note the data in graphs below only display the number trout from that year's spawn observed during each survey, not the total number of trout in the stream. O'Malley Creek started with a

well below average count but like other years, despite fluctuating first counts, the second and third counts were near to average (Figure 1). Adamstown Creek had below average counts, on both its first and second count but by its third count in April numbers were above average. (Figure 2). Rough and Tumble Creek counts were below average, especially in November, but similar to the other creeks, trout were retained over the favourable summer bringing the final count closer to average (Figure 3). This season's recruitment had similar growth rates to previous years.

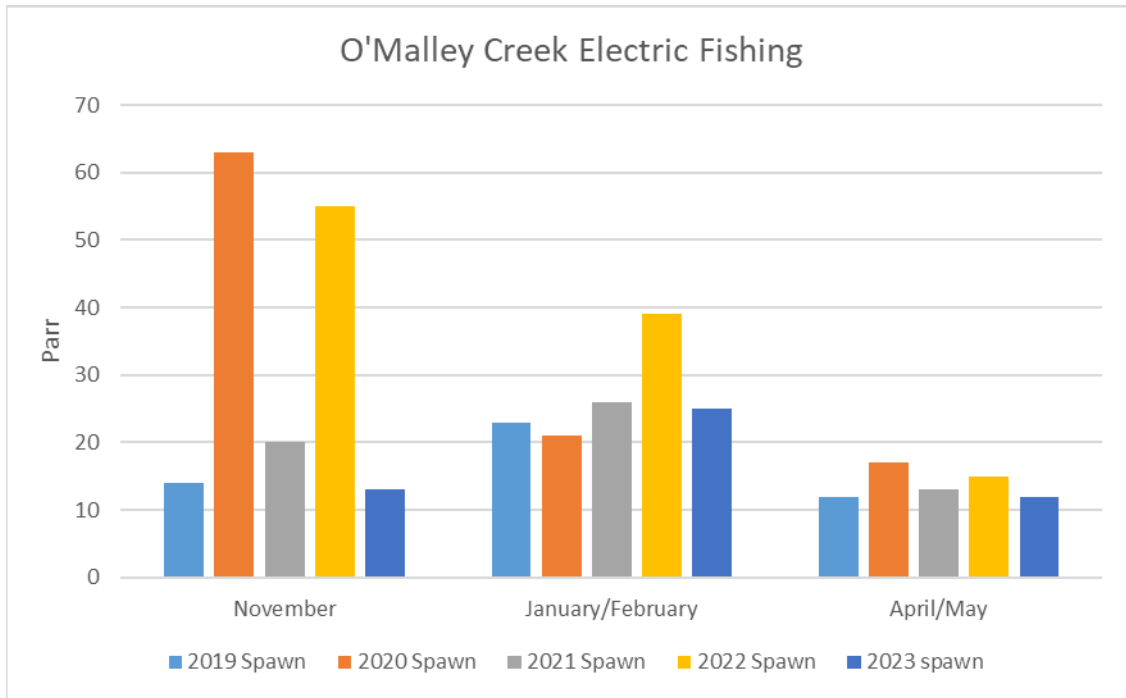


Figure 1: The number of brown trout parr captured from that season's spawn electric fishing in O'Malley Creek 2019-2024.

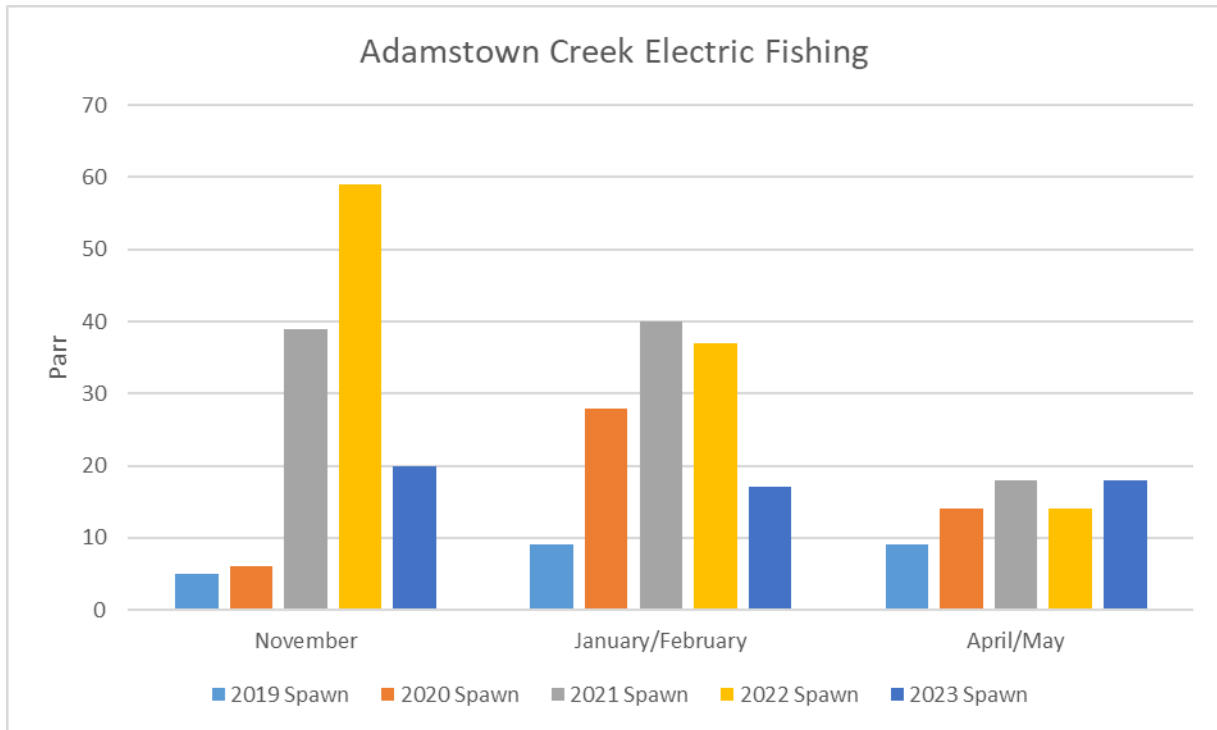


Figure 2: The number of brown trout parr captured from that season's spawn electric fishing in Adamstown Creek 2019-2024.

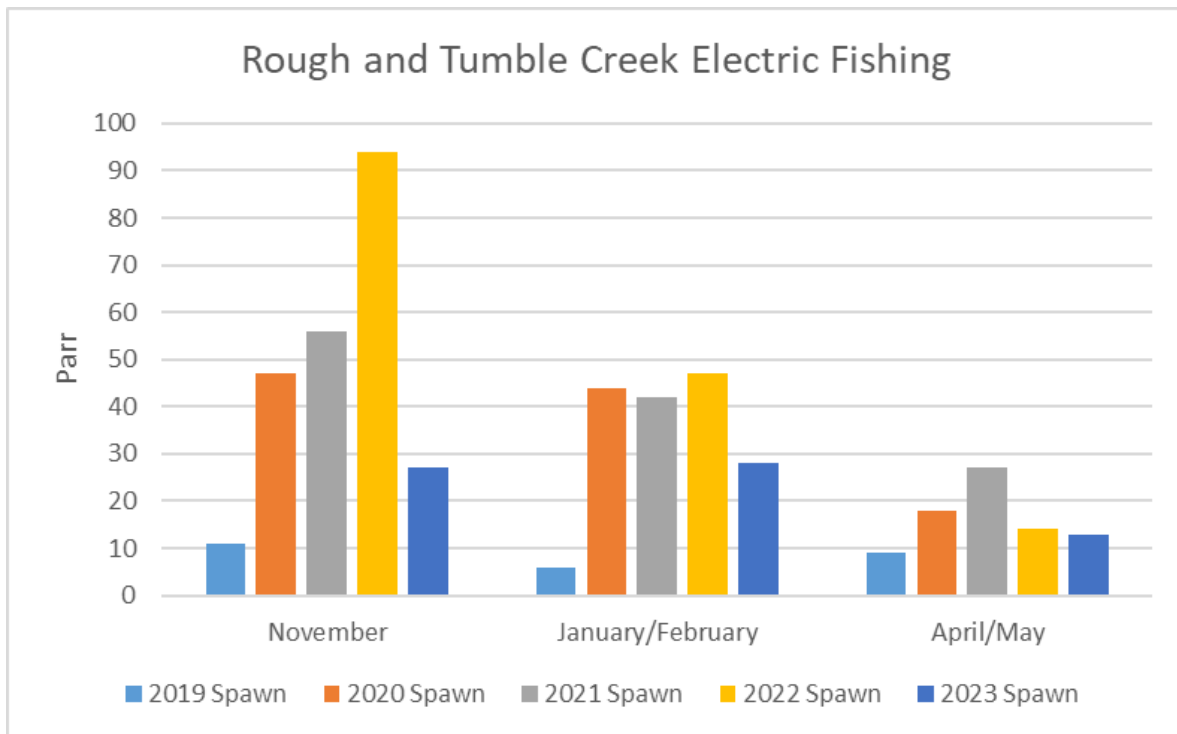


Figure 3: The number of brown trout parr captured from that season's spawn electric fishing in Rough and Tumble Creek 2019-2024.

## Drift Dives

This season the dive at Mirfin’s Bridge was completed twice, on 14 December 2023 and the 23 April 2024. The first dive resulted in a count of 83 small/km, 39 medium/km and 9 large/km. An above average count, due high numbers of small fish, with both medium and large numbers slightly below average. The second count was much higher, with a count of 101 small/km, 145 medium/km and 24 large/km. All three size classes were more than double their long-term average, with it being the second highest count completed. This season a successful dive was completed SH7 bridge on 23 April 2024 following two previous attempts that were insufficient due to clarity issues. This dive resulted in a count of 77 small/km, 115 medium/km and 22 large/km. Numbers of small and medium were above average while large trout numbers were average.

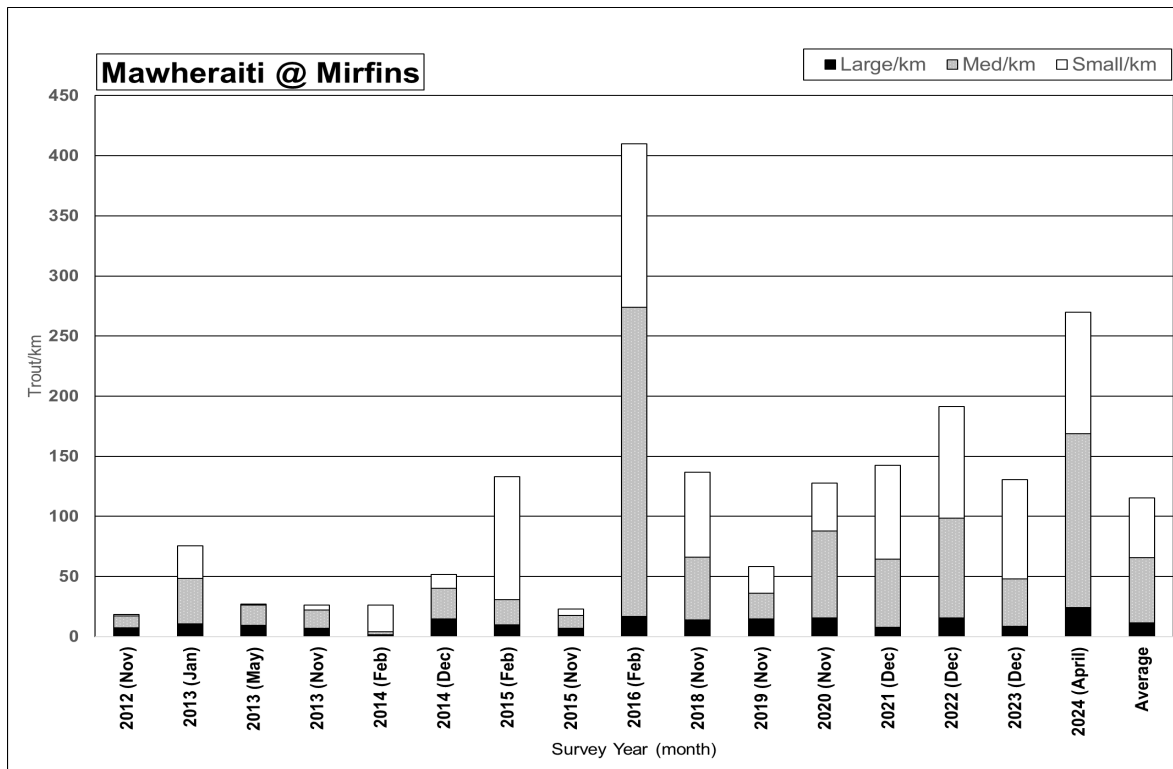


Figure 4: Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2024.

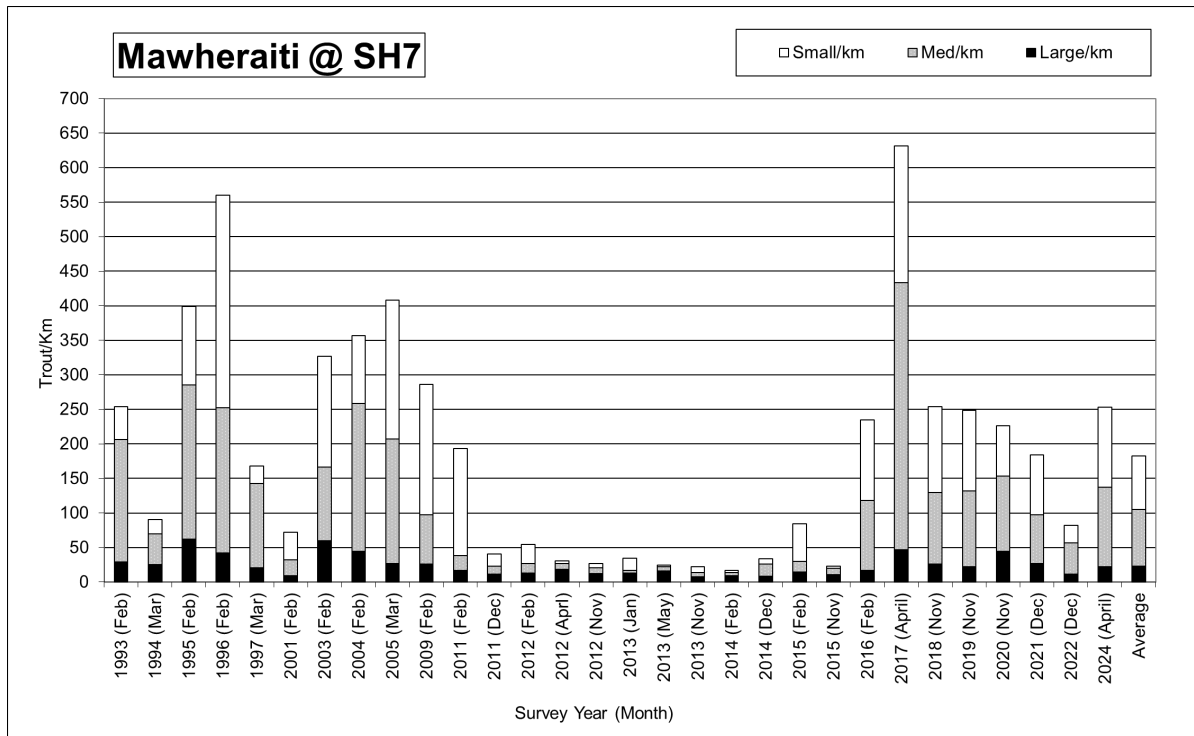


Figure 5: Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2024.

### Environmental Data

Cawthron’s paper *Water Quality Guidelines To Protect Trout Fishery Values* recommends that temperature does not exceed 19°C to avoid brown trout behavioural disturbances (Hay, Hayes, Young 2006). The Mawheraiti at Maimai exceeding 19 °C 56 days this season with the hottest temperature recorded being 25.2 °C (Figure 6). The downstream temperature site at Atarau exceeding 19 °C 75 times with a peak 25.6 on 12<sup>th</sup> of January.

Research streams temperatures were also recorded either directly or by obtaining data of a stream nearby with similar characteristics. Rough and Tumble Creek (using Stoney Creek data) peaked at 22.8 °C meanwhile Adamstown Creek recorded the highest temperature of 24.8 °C. Adamstown, like the Mawheraiti, exceeded 19°C regularly, totalling 68 times for the summer, and had daily fluctuations of up to 10°C. O’Malley Creek ran much cooler staying below 19°C, likely a reflection of its dense riparian cover (Figure 7).

The Mawheraiti exceed ten times the median flow 18 days from August 2023 to April 2024. WCRC reported that there is a three-month gap from May 2023 to July 2023 due to major site works and their backup sensor being faulty. A review of neighbouring monitoring sites indicates that there was eight days where flow would of exceed ten times the median flow in this period but overall, none of these floods were significantly large. Of the 26 days that exceeded ten times the median flow, 19 were during winter or spring – when trout recruitment is most vulnerable (Figure 8). Flood frequency compared to the previous four years was considered average, being up seven days on last year. The largest flood occurred on 23<sup>rd</sup> September 2023 with a flow of 271m<sup>3</sup>/s, which is slightly up on last year but only half the size of the floods experienced in the years prior. Flow events that exceed 10 times the median flow

has been shown in most rivers to disturb a substantial portion of the substrate. Therefore, flows above this magnitude also have the potential to displace or kill trout, especially juveniles. (Holmes, Gabrielsson, Matthaei, Closs 2017).

The median turbidity for the Mawheraiti was calculated from the continuous logger at the Atarau Bridge as 1.2 NTU. This is more than double the recommended level of 0.5 NTU (Hay, Hayes, Young 2006).

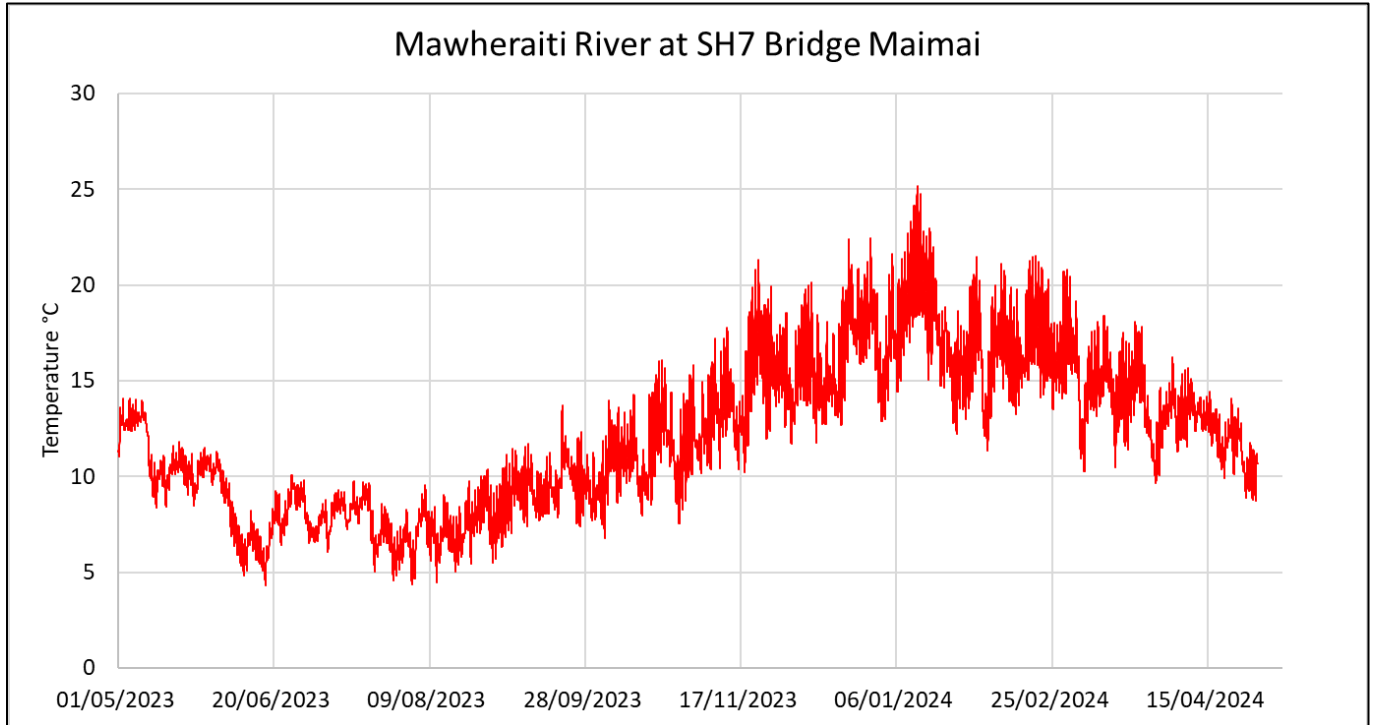


Figure 6: Temperature of Mawheraiti River at SH7 Bridge Maimai May 2023 - April 2024.



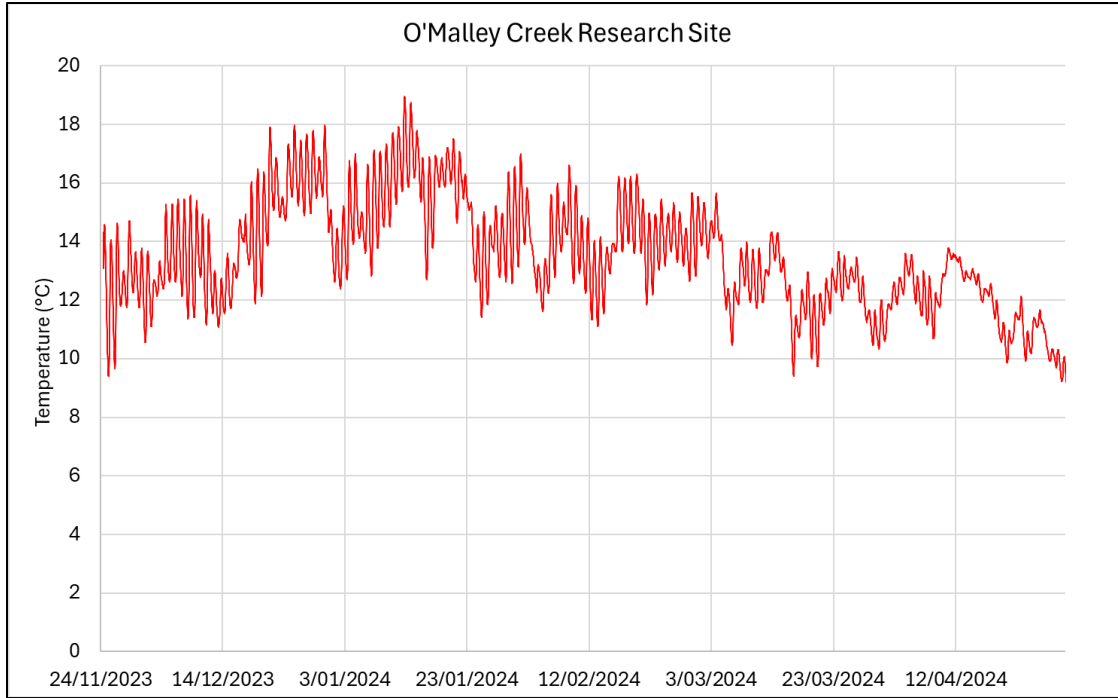


Figure 7: Temperature of O'Malley Creek at the research site between November 2023 - April 2024.

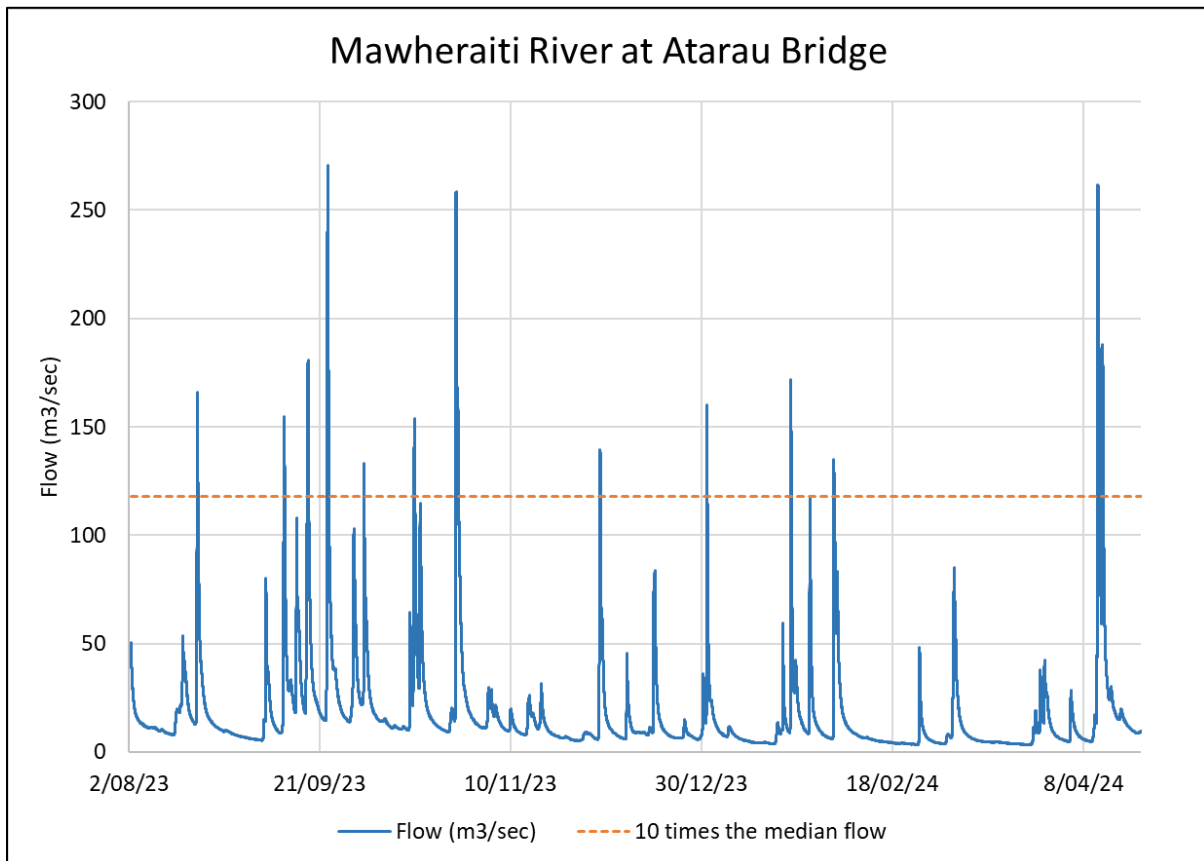


Figure 8: Flow of the Mawheraiti River at Atarau Bridge August 2023 - April 2024.

## Discussion

The year from May 2023 to April 2024 was a favourable one, with no significant floods or prolonged periods of fine weather over summer. Despite favourable conditions, a lack of spawning adults combined with frequent flooding in spring while fry is emerging resulted in the research streams yielding below average levels of recruitment. Low numbers were observed in November but by April, electric fishing counts began to reflect to average levels. The favourable summer likely reduced migration as creeks maintained moderate flows with regular rainfall providing additional habitat and reduced intraspecific competition. Although the parr experienced improved growing conditions over the summer monitoring period relative to recent years, the low numbers encountered in November likely resulted in overall recruitment success being down. It is expected we will see below average numbers of small trout during 2024/25 drift dives of Mawheraiti River.

Despite a more favourable summer due to El Niño conditions, environmental data continues to raise concern with many variables either at or below the recommended levels. Notably this year the Mawheraiti at Atarau exceeding 19 °C 75 days this summer is a serious concern. At 19°C trout have been shown to reduce feeding, which means that for over two and a half months during the summer period in the Mawheraiti trout feeding activity was likely limited (Hay, Hayes, Young 2006). This both impedes angling and applies significant stress to the fishery when trout should be gaining condition as they prepare for their next spawn.

## Recommendations

- The council receives this report.
- The Mawheraiti trout recruitment research programme continues.
- Continue to work closely with WCRC and encourage them to proactively protect the Mawheraiti River trout habitat considering their duty to do so under Section 7(h) of the Resource Management Act 1991.

## References

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Stoffels R, Unwin M (2023). Angler usage of lake and river fisheries managed by Fish & Game New Zealand: results from the 2021/22 National Angling Survey. NIWA Client Report 2023189CH. 124 p.

Appendix 1: Location of research sites in the Mawheraiti Catchment.

