

DRIFT DIVE REPORT 2023

A summary of drift dive surveys conducted by Fish & Game West Coast Region during the 2022-2023 season.

Baylee Kersten, Fish & Game Officer, April 2023





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Summary

Drift dives have been conducted in the West Coast Fish & Game Region since 1985. The purpose of these surveys is to quantify trout abundance in a particular stretch of river. Where dives have occurred in past years, comparisons can be made. This season the dives were conducted between December 2022 and February 2023, incorporating Fish & Game staff from the West Coast Region alongside local volunteers and West Coast Regional Council staff. The Mawheraiti River (SH7 and Mirfins Bridge), the Inangahua River (Blacks Point), the Grey River (Waipuna and Hospital Flat), the Waitahu River (Gannons Bridge), Larry's Creek (Upper) and the Rough River (Upstream from Mill) were dived. In general, trout abundance was below long-term averages with some sites greatly impacted from flooding. It is recommended to: Continue the drift dive programme as a tool for gathering long term data on West Coast trout abundance. Continue to gain a better understanding of the Mawheraiti River by continuing the recruitment and fish dispersal study to help future management of this sensitive fishery. That council receives this report.

Introduction

Drift diving is commonly used to monitor trout abundance in clear, small to medium sized rivers throughout New Zealand. The West Coast Fish & Game Region's database of drift-dive results dates back to 1985 when MAF conducted a series of dives for their "100 Rivers" survey. Since then, Fish & Game staff have undertaken up to 12 dives per year when river conditions have been favourable.

There is now a large dataset that enables comparison at sites which have been dived multiple times over several years. The data provides a 'spot' count of trout abundance on a particular stretch of a river. The West Coast Region performs dives in relation to specific threats or management information needs and sites are not randomised. Therefore, results in this report should not be used to describe catchment level or regional level observations. The data and findings of the surveys are intended for internal management purposes only.

The majority of West Coast rivers are dived specifically for brown trout (*Salmo trutta*) and unless specifically stated, brown trout are the species referred to as 'trout' or 'fish' in this report. Dive sites are between 1 and 3 km in length. This distance is considered the longest possible to avoid fatigue whilst being long enough to give an estimate of the actual population for that stretch of river.

This season drift dives were undertaken to build on existing long-term datasets and to assess the abundance and distribution of fish in rivers with perceived threats from development or unsustainable fishing practices. Specifically:

- 1) The Mawheraiti River and the Inangahua River were dived to monitor the impact of catchment development.
- 2) The Grey River at Hospital Flat was dived to monitor the impact of perceived high angler usage on a highly valued section of river near the Grey River Water Conservation Order.

- 3) The Grey River at Waipuna was dived to monitor the middle reaches of one of the West Coast's most fished river catchments.
- 4) The Waitahu River, Rough River and Larry's Creek were dived to monitor the impact of high angler usage observed within the Reefton Area.

Method

A team of divers wearing wetsuits, bootees, flippers, gloves, masks and snorkels drift downstream from a designated start point and count any trout that they pass before a designated end point is reached. To ensure accurate counts the following rules are observed:

- 1) A designated lead diver monitors and instructs the divers to maintain a straight line across the river.
- 2) Only trout that pass directly underneath, or to a predetermined side of a diver, are recorded.
- 3) Where large schools of fish move rapidly back upstream divers communicate to clarify the number, size class and who has counted them.

Before a dive is undertaken water clarity is measured by recording the distance in metres a 200mm black disc can be observed horizontally through the water column. Good water clarity is required for accurate counts therefore diving is not undertaken if visibility is less than 4m. More divers are required if water clarity is low to ensure adequate coverage, ideally visual contact can be maintained between divers.

Trout are divided into three size groups;

Large: Trout over 450mm in length.

Medium: Trout less than 450mm and greater than 150mm in length.

Small: Trout less than 150mm in length.

Fish numbers are recorded by each diver, with the team leader collecting the information from each diver periodically throughout the dive and/or on completion of the dive.

Results

Mawheraiti River (Mirfins Bridge)

This season the dive at Mirfin's Bridge on 8 December 2022 resulted in a count of 93 small/km, 83 medium/km and 15 large/km. Numbers in all three size classes were above average. The total count was the second highest count recorded but well down on the record count obtained in February 2016.

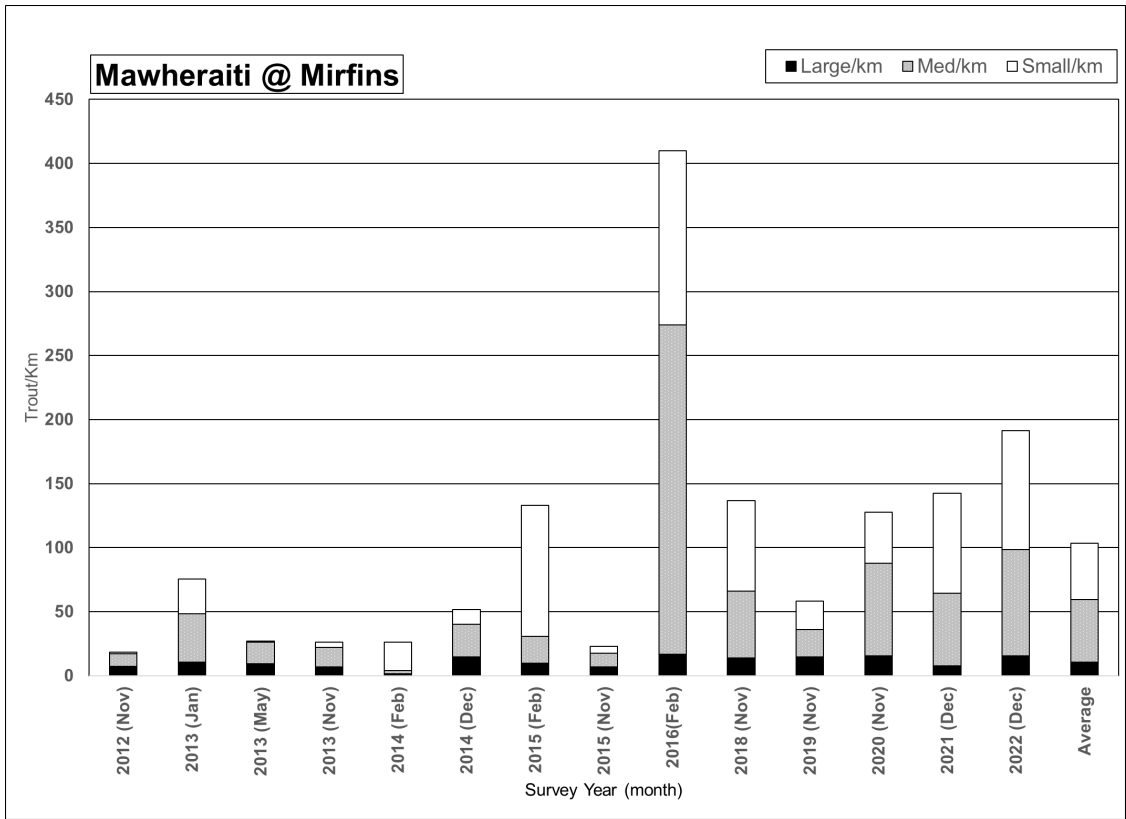


Fig 1. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2022.

Mawheraiti River (SH7 Bridge)

This season the dive at the SH7 bridge on 8 December 2022 resulted in a count of 25 small/km, 45 medium/km and 12 large/km. Numbers in all three size classes were well below average.

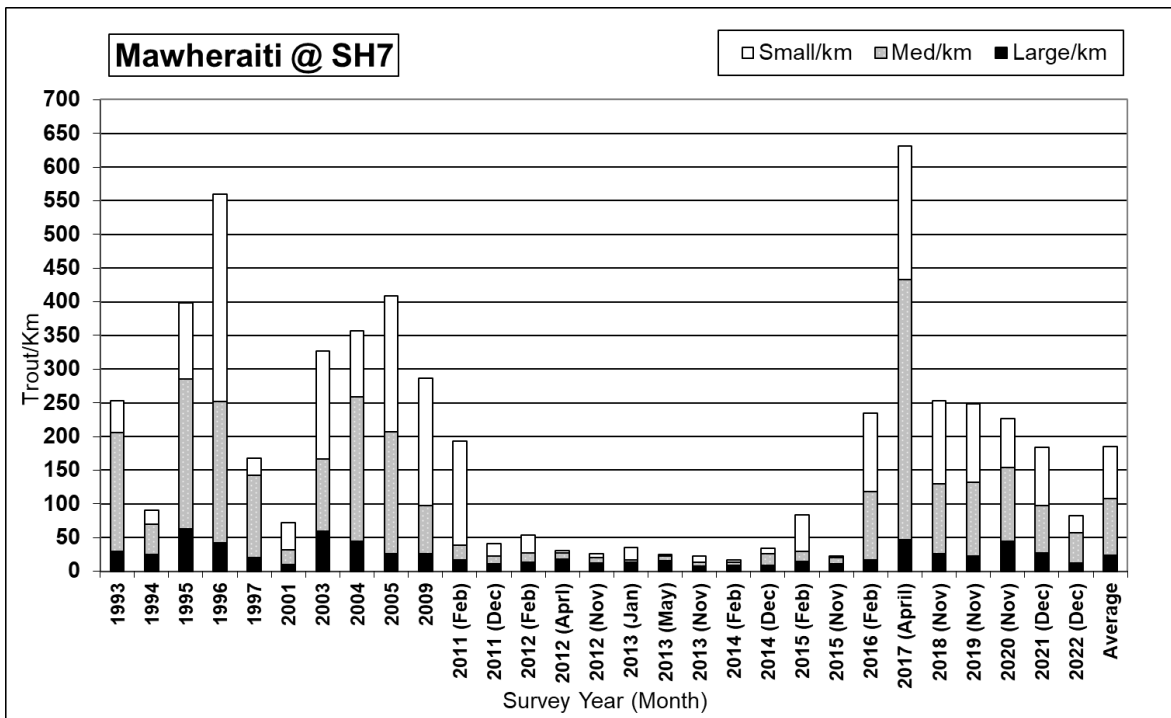


Fig 2. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River SH7 Bridge site 1993-2022.

Inangahua River (Blacks Point site)

This season the dive site at Black's Point was dived twice. First count on 8 December 2022 resulted in a count of 41 small/km, 21 medium/km and 6 large/km. The second count was completed on 21 February 2023 resulted in a count of 104 small/km, 79 medium/km and 12 large/km. Numbers of fish in all size classes were well below average, but the second count almost three times as many fish were counted resulting in a count much closer to the long-term average. Timing of this count and river conditions is believed to greatly influence the count.

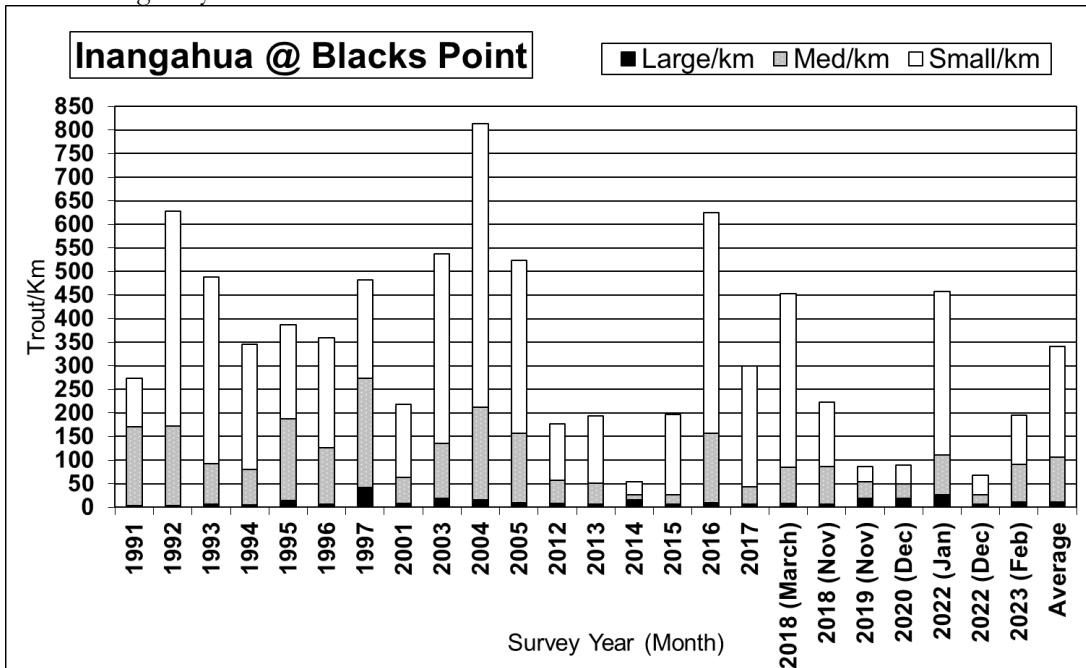


Fig 3. Number of Brown Trout recorded during drift dive surveys at the Inangahua River, Blacks Point site 1991-2023.

Grey River (Hospital Flat)

This season the dive at Hospital Flat on 20 January 2023 resulted in a count of 22 small trout/km, 8 medium trout/km and 15 large trout/km. Number of fish in each size class were all average.

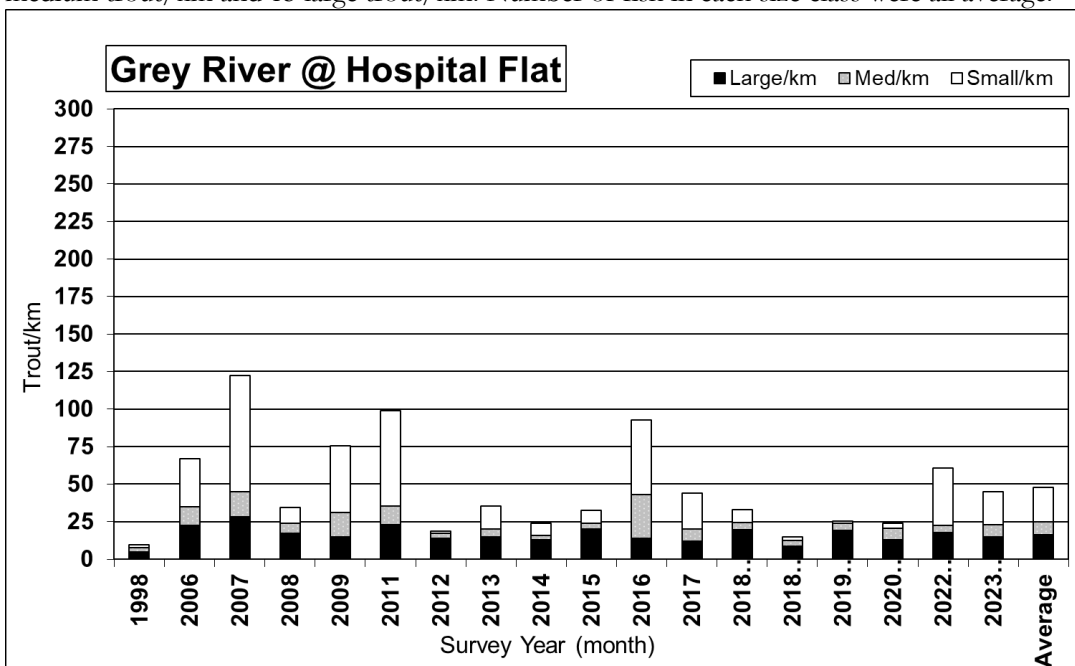


Fig 4. Number of Brown Trout recorded during drift dive surveys at the Upper Grey River, Hospital Flat 1991-2023.

Grey River (Waipuna site)

This season the dive at Waipuna on 20 January 2023 resulted in a count of 39 small/km, 85 medium/km and 27 large/km. Number of fish were below average and that was due to reduced numbers of small fish.

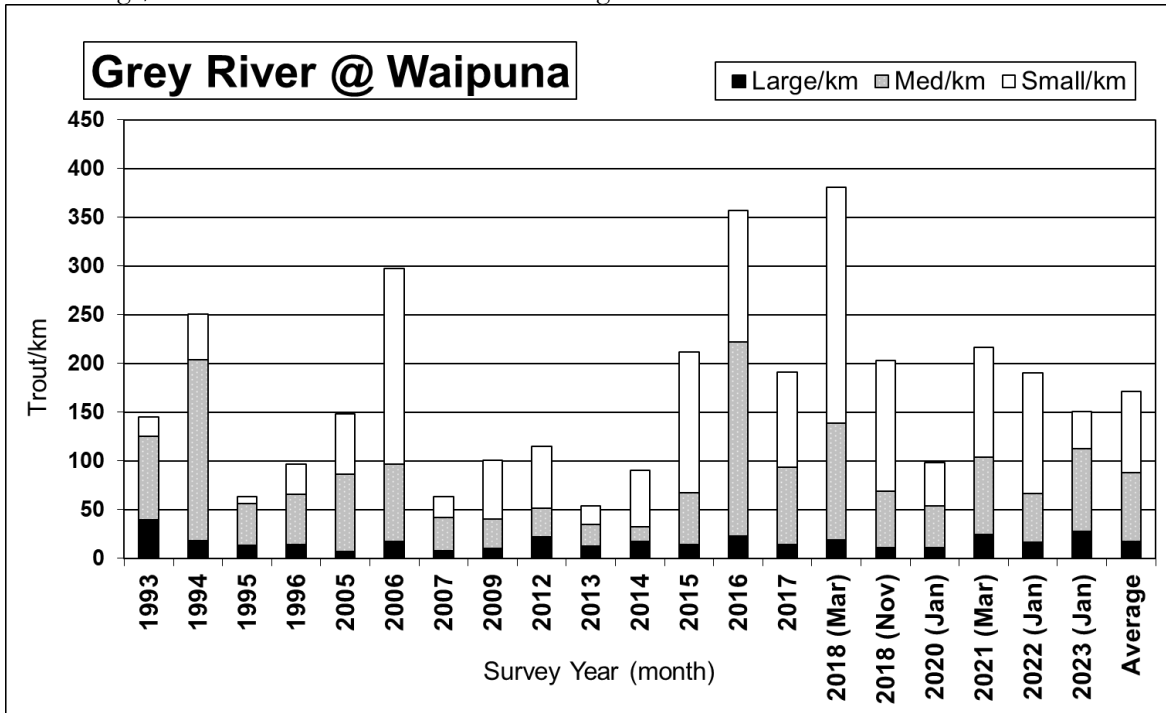


Fig 5. Number of Brown Trout recorded during drift dive surveys at the Grey River, Waipuna 1993-2023.

Larry's Creek

This season the dive at Upper Larry's Creek on 13 February 2023 resulted in a count of 5 small/km, 5 medium/km and 8 large/km. Numbers of fish all size classes were below average.

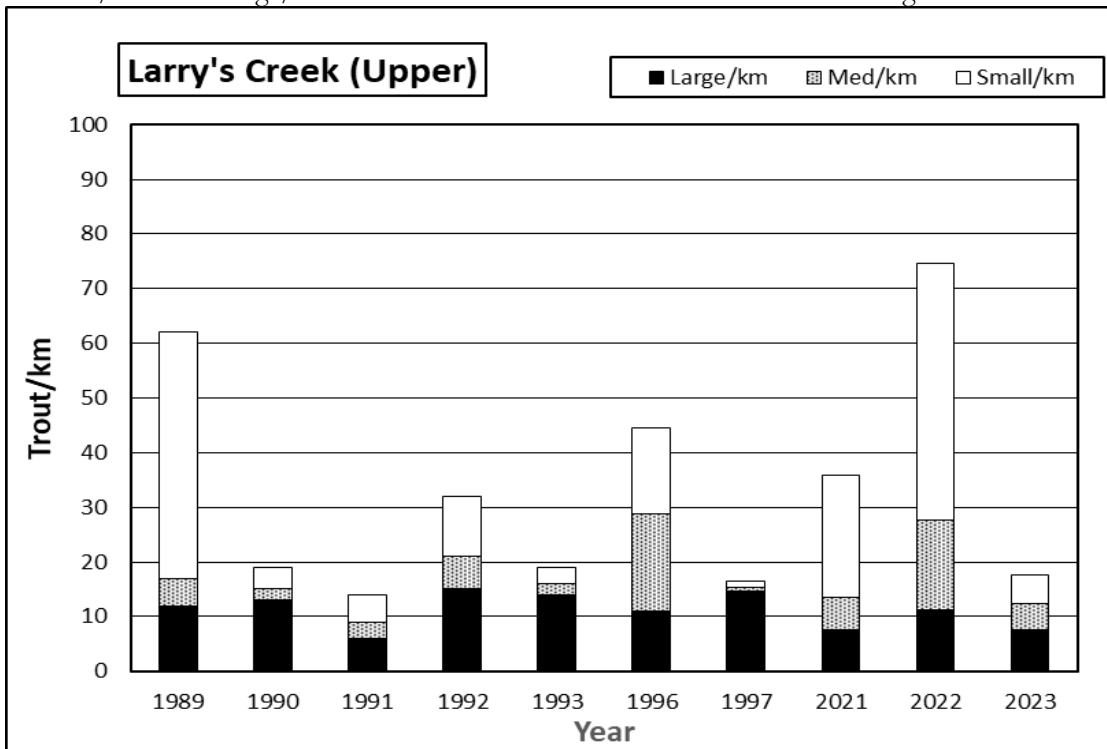


Fig 6. Number of Brown Trout recorded during drift dive surveys at Larry's Creek, upper site 1989 - 2023.

Waitahu River

This season the dive at the Waitahu River on 13 February 2023 resulted in a count of 41 small/km, 18 medium/km and 11 large/km. Numbers of large fish was well above average while the number of medium fish were slightly below average and small fish well below average.

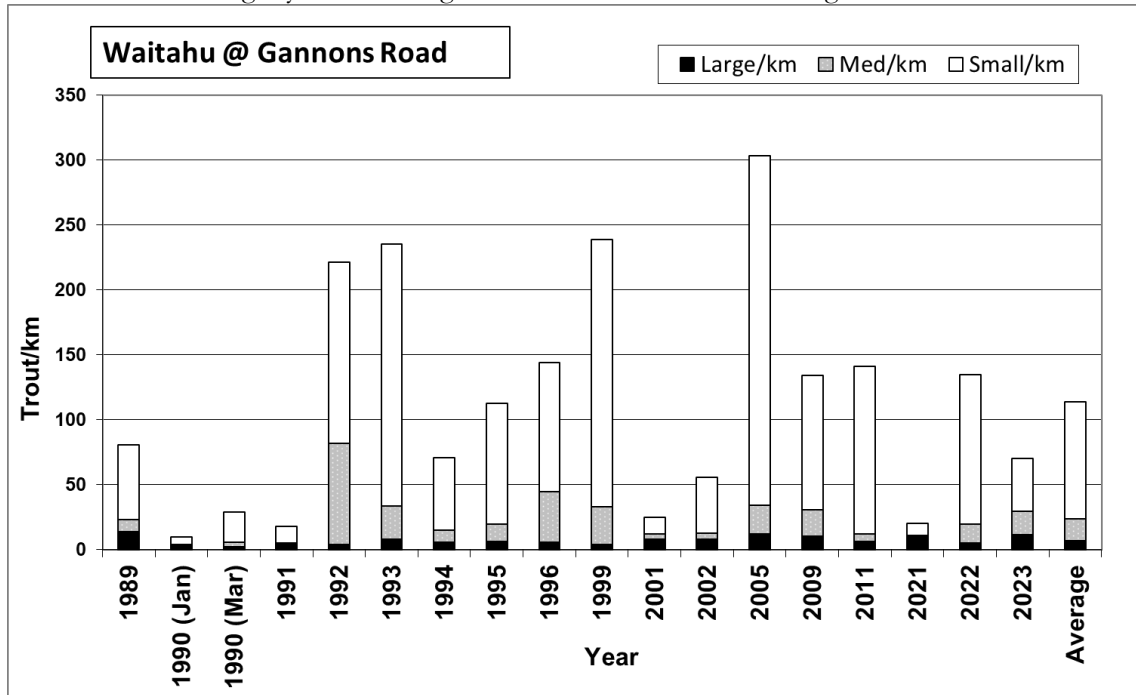


Fig 7. Number of Brown Trout recorded during drift dive surveys at the Waitahu River, Gannons Bridge 1989 - 2023.

Rough River

This season the dive at the Rough River on 21 February 2023 resulted in a count of 26 small/km, 8 medium/km and 13 large/km. Numbers of large fish were average while the numbers of small and medium fish were above average.

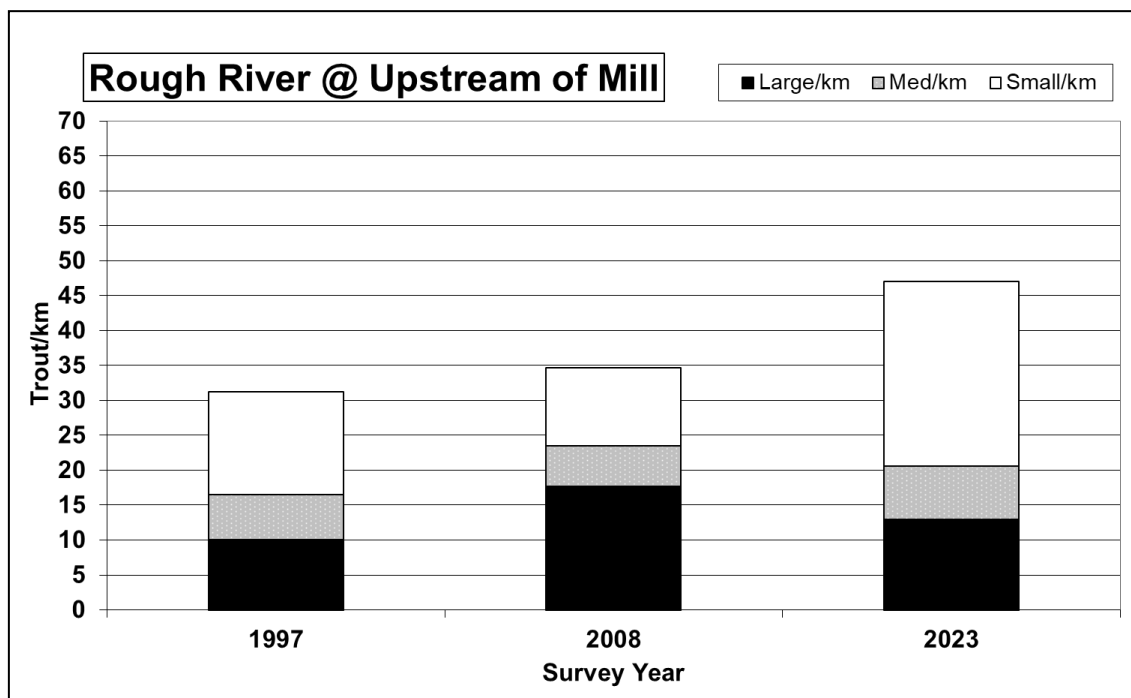


Fig 8. Number of Brown Trout recorded during drift dive surveys at the Rough River, upstream from the old sawmill site 1997 - 2023.

Discussion

The dives completed on the Mawheraiti River varied greatly. While the SH7 site was well down on recent years, the Mirfins Bridge site had its second highest count on record. It's believed the SH7 site has been greatly impacted by earth works. Stop bank work has disturbed a good portion of the dive site and as a result the section dived likely does not reflect trout numbers in the wider river system in its current state. The Mirfins dive site count again improved this season, with all three size classes present in above average numbers. The research project in the Mawheraiti catchment indicated that 2021-22 was a good recruitment year, therefore the good numbers of trout observed at Mirfins Bridge was expected.

The rivers in the Reefton area (Larry's, Waitahu, and Inangahua) all came in below average, which was contributed to the flooding experienced in February 2022. There was significant change to the riverbed, especially in Larry's Creek and a reduced insect community was observed when diving. The Inangahua River being dived twice confirmed that the timing of the count great influences the count. Going forward staff should aim to complete the dive in similar conditions and time each year to reduce the impacts of external variables on the count.

The Grey River dives confirmed that the February floods largely missed the Grey River catchment with both dives on the Grey River resulting in counts near to their long-term averages. With the upper Grey being again popular this season with return of non-resident anglers and guiding activity, continued focus should be given to area. The nearby Rough River, dived for the first time in 15 years resulted in above average count largely due to small fish numbers being up. With the West Coast again experiencing a dry summer, it likely influences trout distribution and dive conditions reducing comparability of dives.

Staff Recommendations

- Continue the drift dive programme as a tool for gathering long term data on West Coast trout abundance.
- Continue to gain a better understanding of the Mawheraiti River by continuing the recruitment and fish dispersal study to help future management of this sensitive fishery.
- That council receives this report.

Acknowledgements

To the following staff and volunteers who helped with the dives a big thank you: Dean Kelly, Dan Scoltock, Emily Rutherford-Jones, Taylor Blyth, Luken Bisley, Janae Fitzgerald.

References

Unwin, M.J. (2016). Angler usage of lake and river fisheries managed by Fish & Game New Zealand: Results from the 2014/15 National Angling Survey.

Appendix 1: Raw data from drift dive sites dived in 2022/2023

RIVER	LOCALITY	YEAR	DATE	GRID REF	DIST (km)	WIDTH (m)	Vis (m)	LARGE	MEDIUM	SMALL	TOTAL	# DIVERS
Grey R	Hospital Flat	2023	20/01/2023	320/621-308/614	2	20	9	30	15	43	88	7
Grey R	Waipuna	2023	20/01/2023	085/735-064/748	3	40	7.2	82	255	116	453	7
Inangahua R	Blacks Point	2022	08/12/2022	179/962-176/973	1.7	18	4.5	10	36	69	115	5
Inangahua R	Blacks Point	2023	21/02/2023	179/962-176/973	1.7	18	4.8	20	135	176	331	5
Larry's Creek	Upper	2023	13/12/2023	230/075-214/082	1.7	12	15	13	8	9	30	5
Mawheraiti R	SH7 Bridge	2022	08/12/2022	043/892-033/878	1.7	20	4	20	77	43	140	6
Mawheraiti R	Mirfins Bridge	2022	08/12/2022	005/809-987/796	1.3	20	4	20	108	121	249	6
Rough R	Upstream of Mill	2023	21/02/2023	230/075-214/082	1.7	20	6.7	22	13	45	80	5
Waitahu	Gannons	2023	13/02/2023	205/023-192/027	1.6	18	9.4	18	29	65	112	5