

DRIFT DIVE REPORT 2022

A summary of drift dive surveys conducted by the Fish & Game West Coast Region during the 2021-2022 season.

Baylee Kersten, Fish & Game Officer, April 2022





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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 2021 and March 2022, incorporating Fish & Game staff from the West Coast and Nelson-Marlborough Regions 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 Mokihinui River (South and North Branches), the Waitahu River (Gannons Bridge), Larry's Creek (Upper) and the Karamea River (upstream of Crow, downstream of Crow and 'The Bend') were dived. In general, trout abundance was above long-term averages due to the presence of high numbers of small trout. 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. Continue monitoring of Larry's Creek and Waitahu River to build a better understanding of trout numbers in areas with high angler pressure. Continue to assist with neighbouring regions drift dive programmes on a reciprocal basis to obtain numbers where necessary. 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 Karamea and Mokihinui Rivers are dived to monitor the impact of perceived high angler usage within designated backcountry fishery's and to align with the current backcountry angler survey in the area.
- 5) The Waitahu 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 20 December 2021 resulted in a count of 78 small/km, 57 medium/km and 8 large/km. Numbers of small and medium fish were about average while numbers of medium and large fish were above average. The total count was the second highest count recorded but well down on the record count obtained in February 2016.

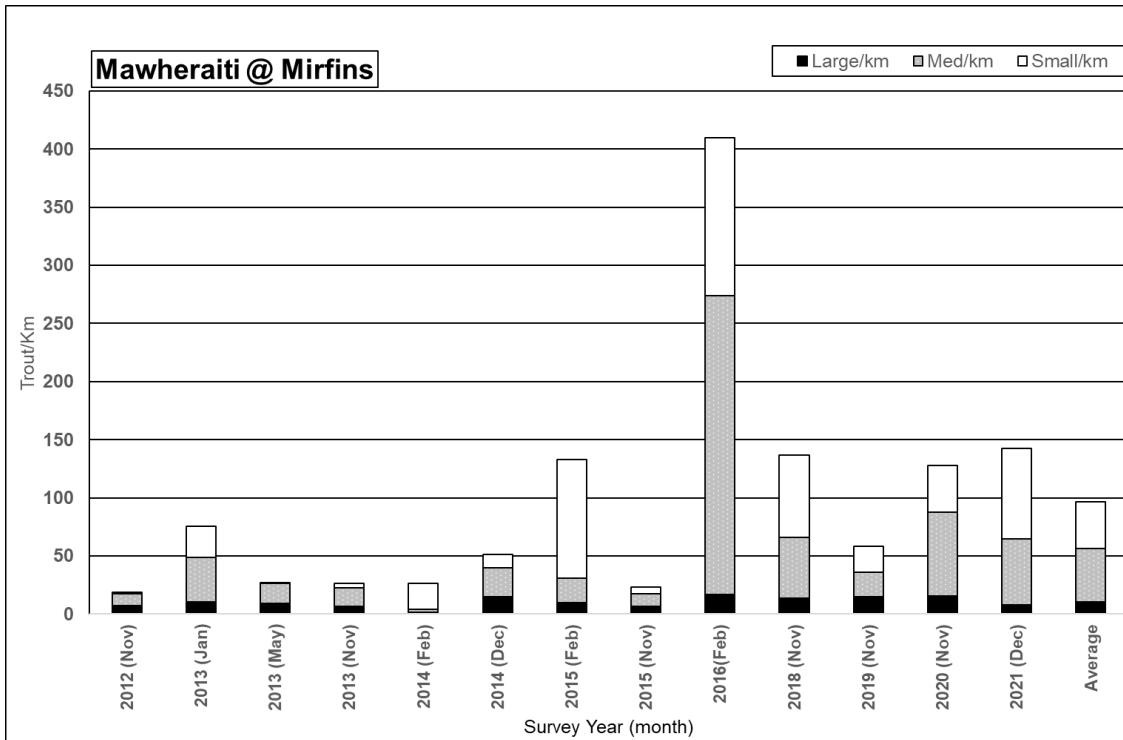


Fig 1. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2021.

Mawheraiti River (SH7 Bridge)

This season the dive at the SH7 bridge on 20 December 2021 resulted in a count of 86 small/km, 71 medium/km and 27 large/km. Numbers of small and large fish were about average, while numbers of medium were slightly below average. River conditions were slightly high following rain regularly in December likely reducing the count.

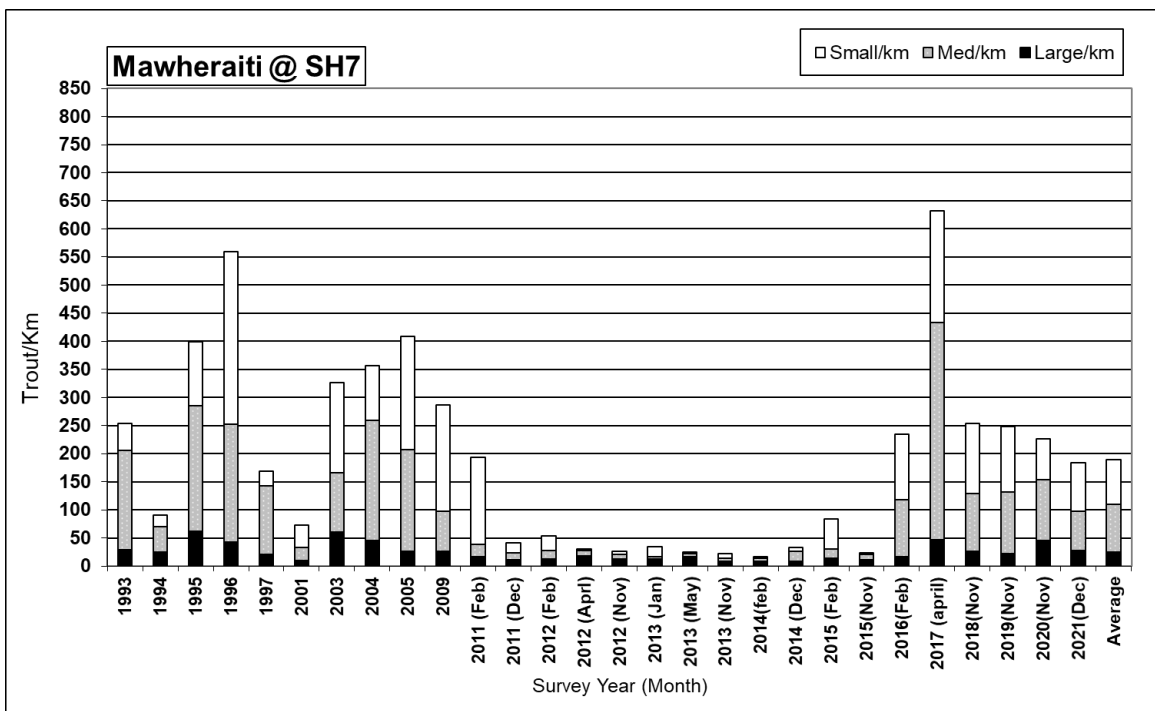


Fig 2. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River SH7 Bridge site 1993-2021.

Inangahua River (Blacks Point site)

This season the dive at Black's Point on 19 January 2022 resulted in a count of 346 small/km, 85 medium/km and 26 large/km. Numbers of small and large fish were above average, but mediums were slightly below average. The count was well up on previous years and similar to historic counts. Timing of this count and river conditions is believed to greatly influence the count.

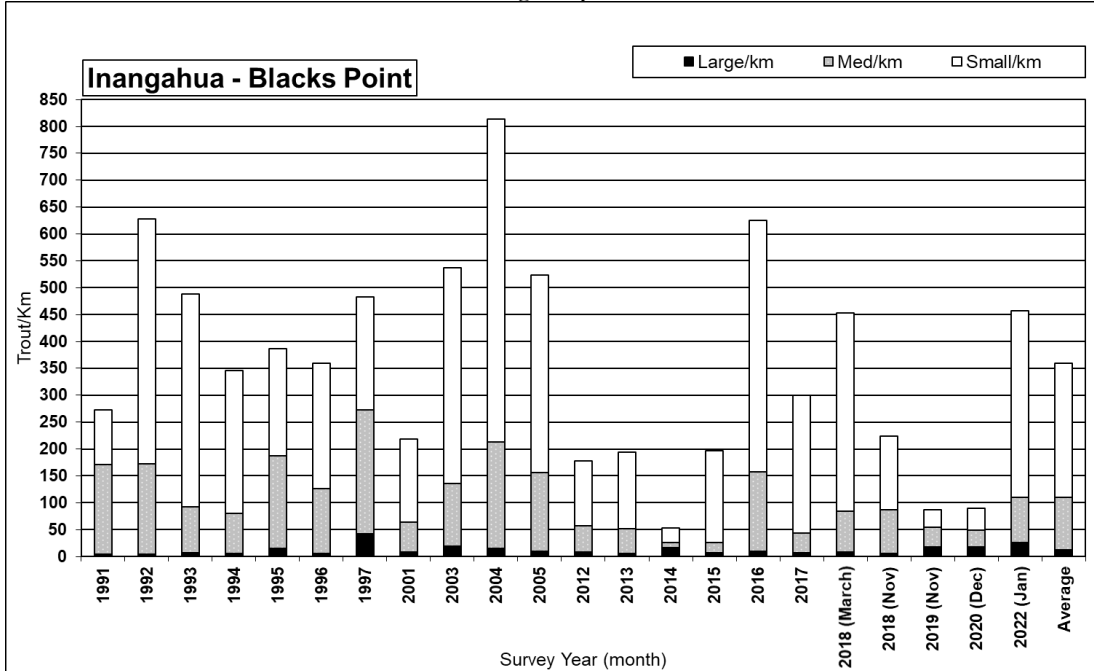


Fig 3. Number of Brown Trout recorded during drift dive surveys at the Inangahua River, Blacks Point site 1991-2022.

Grey River (Hospital Flat)

This season the dive at Hospital Flat on 19 January 2022 resulted in a count of 38 small trout/km, 5 medium trout/km and 18 large trout/km. Number of fish were above average and that was largely due to elevated levels of small fish.

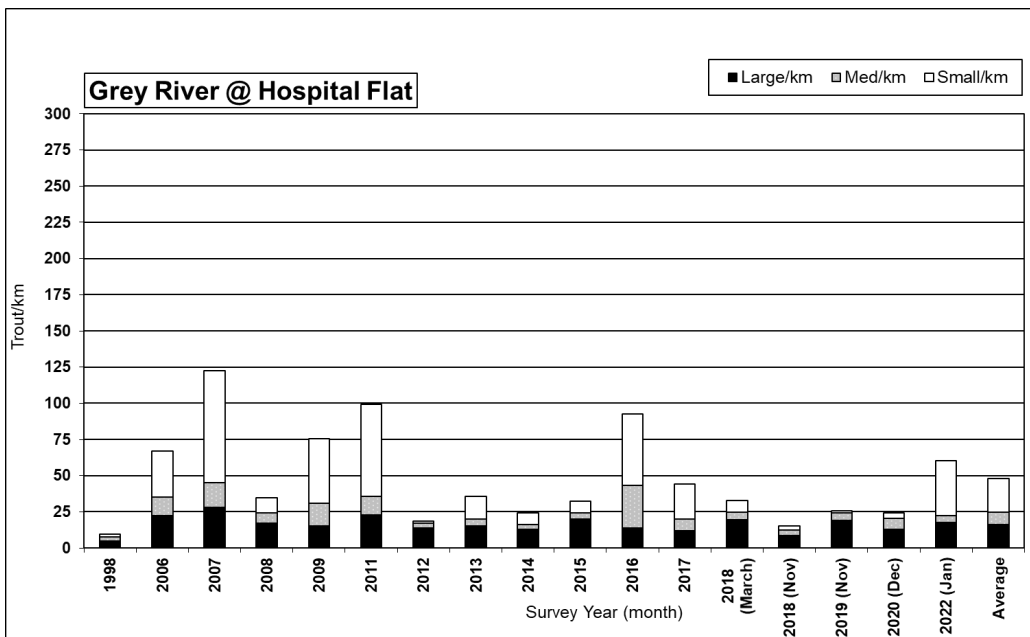


Fig 4. Number of Brown Trout recorded during drift dive surveys at the Upper Grey River, Hospital Flat 1991-2022.

Grey River (Waipuna site)

This season the dive at Waipuna on 19 January 2022 resulted in a count of 124 small/km, 50 medium/km and 16 large/km. Number of fish were above average and that was largely due to elevated levels of small fish.

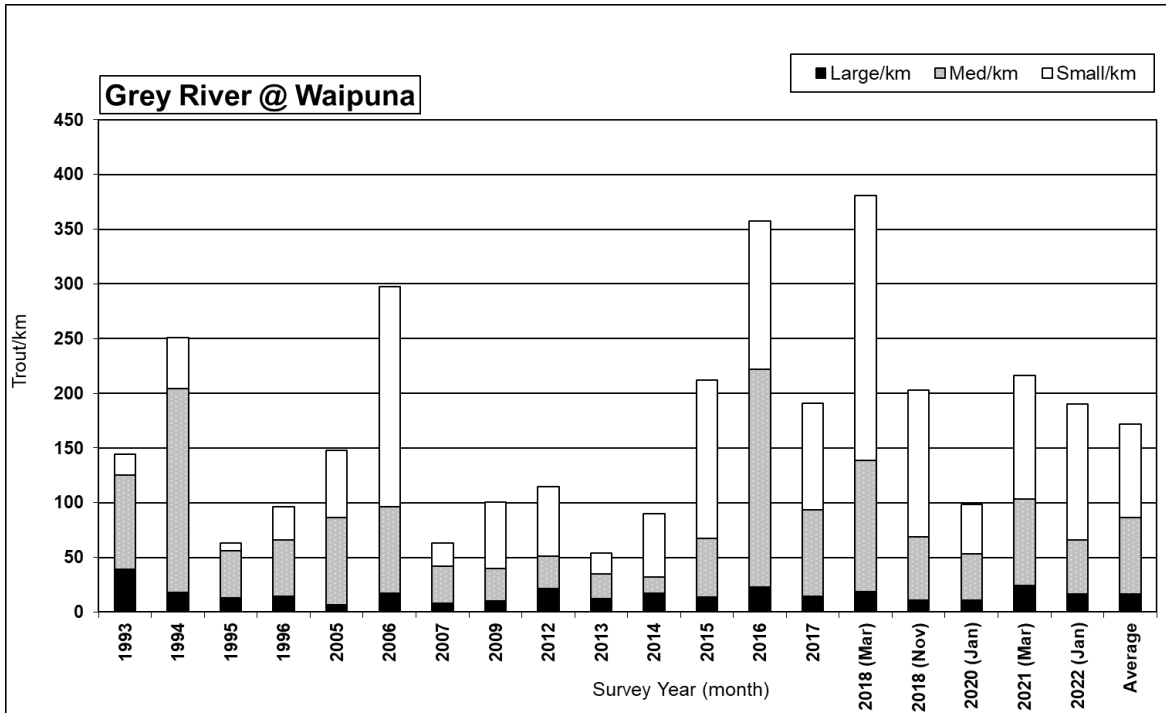


Fig 5. Number of Brown Trout recorded during drift dive surveys at the Grey River, Waipuna 1993-2021.

Larry's Creek

This season the dive at Upper Larry's Creek on 25 January 2022 resulted in a count of 47 small/km, 16 medium/km and 11 large/km. Numbers of small and medium fish were well above average while numbers of large fish were average.

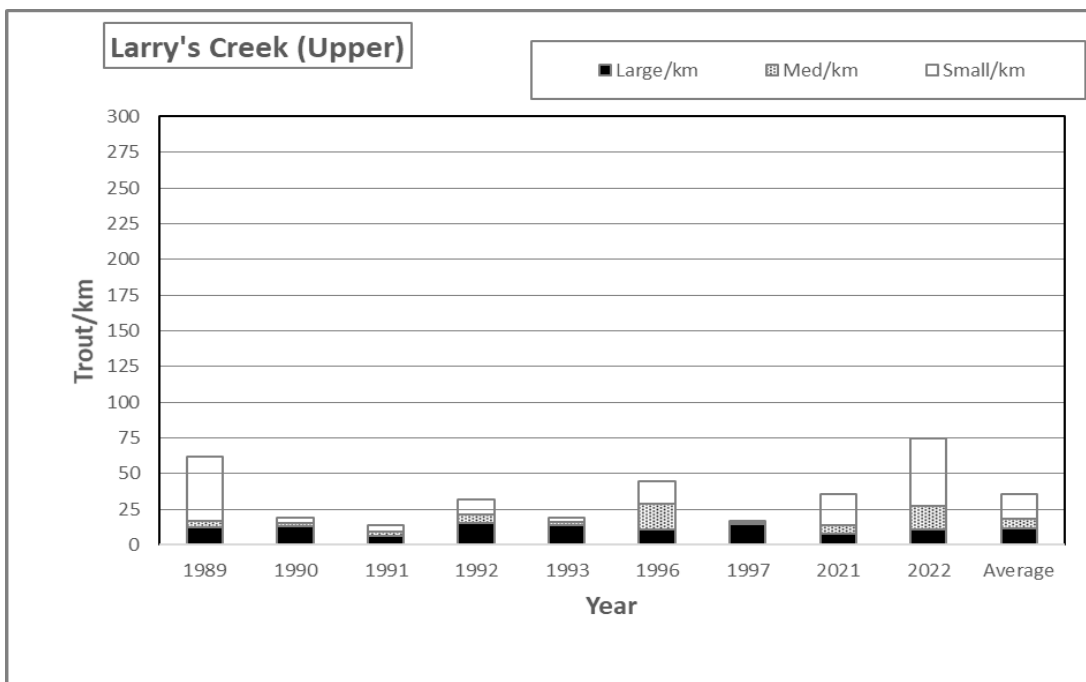


Fig 6. Number of Brown Trout recorded during drift dive surveys at Larry's Creek, upper site 1989 - 2022.

Waitahu River (Gannons Bridge)

This season the dive at the Waitahu River on 25 January 2022 resulted in a count of 115 small/km, 14 medium/km and 5 large/km. Numbers of small fish were above average while the number of large and medium fish were slightly below average.

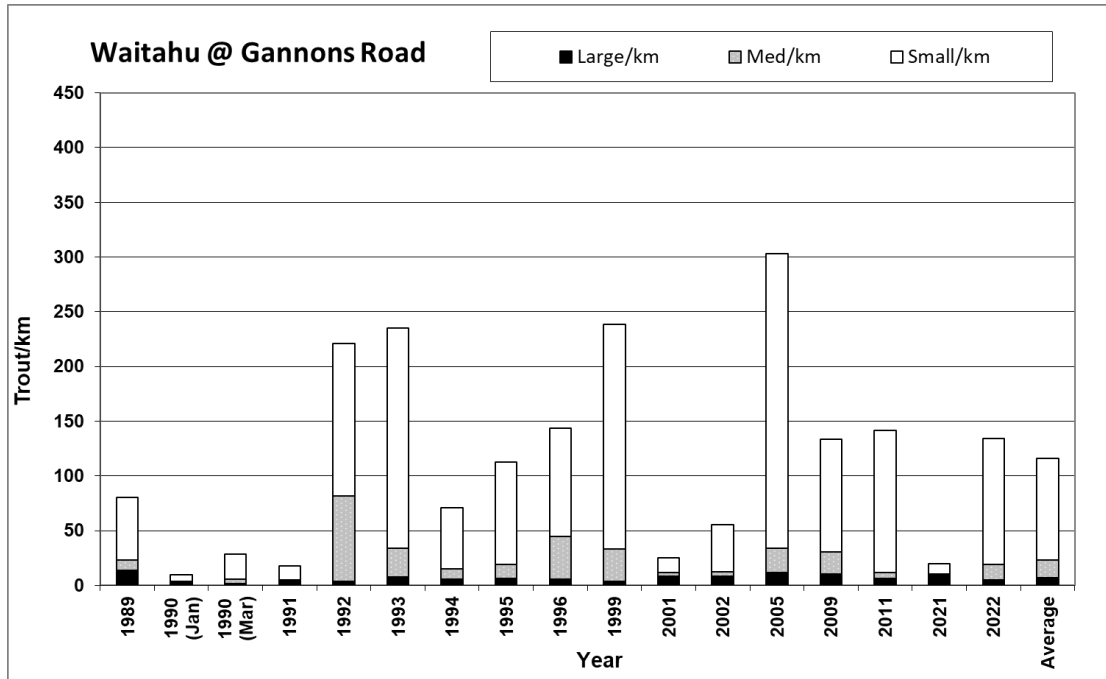


Fig 7. Number of Brown Trout recorded during drift dive surveys at the Waitahu River, Gannons Bridge 1989 - 2022.

Mokihinui River: (South Branch site)

This season the dive at the Mokihinui South Branch on 3 March 2022 resulted in a count of 2 small/km, 7 medium/km and 47 large/km. Numbers of large fish were above average but there was very few medium and small fish.

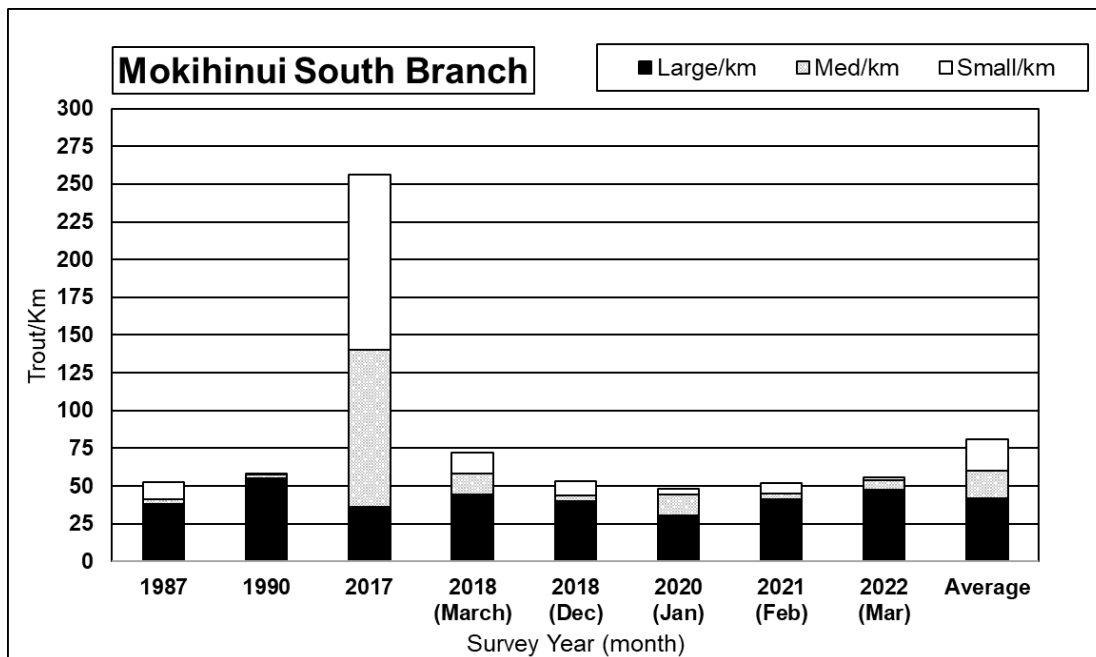


Fig 8. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, South Branch 1987 - 2022.

Mokihinui River (Below Gorge)

This season the dive at the Mokihinui North Branch site below the gorge on 3 March 2022 resulted in a count of 5 small/km, 9 medium/km and 22 large/km. Numbers of fish were slightly below average and that was due to a lack of small trout which is similar to previous years.

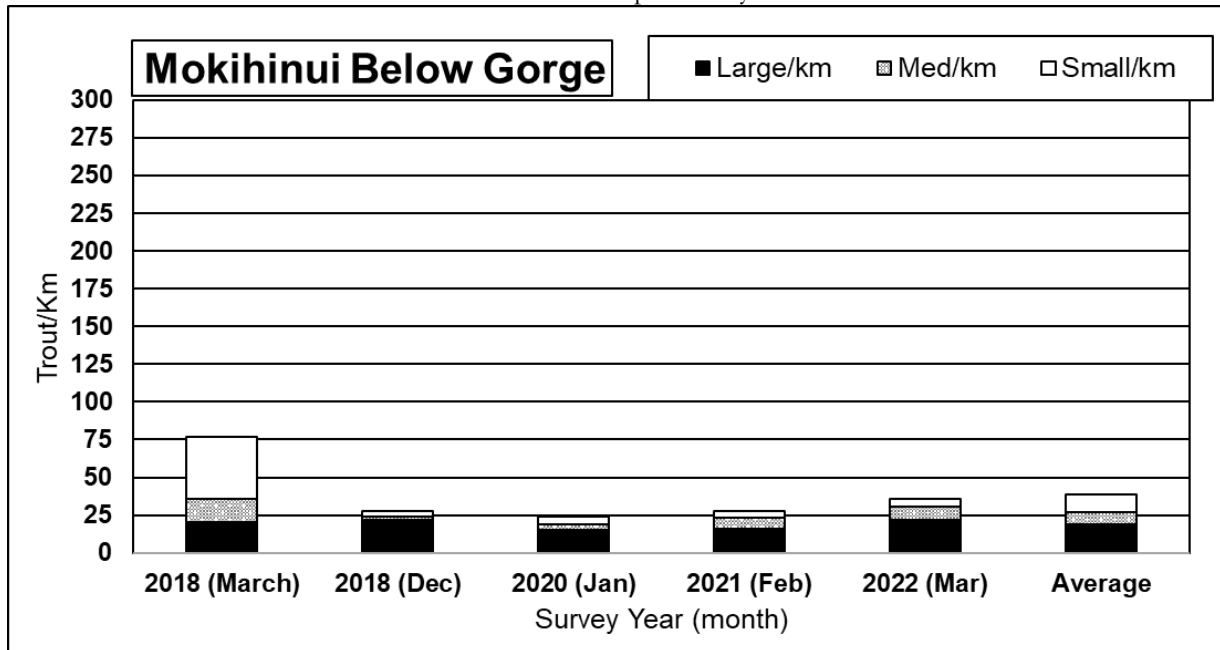


Fig 9. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, North Branch below gorge 2018 -2022.

Karamea River (Upstream of Crow)

This season the dive at the Karamea River upstream of the Crow on 8 March 2022 resulted in a count of 14 small/km, 19 medium/km and 44 large/km. Numbers of fish were below average, in particular small fish.

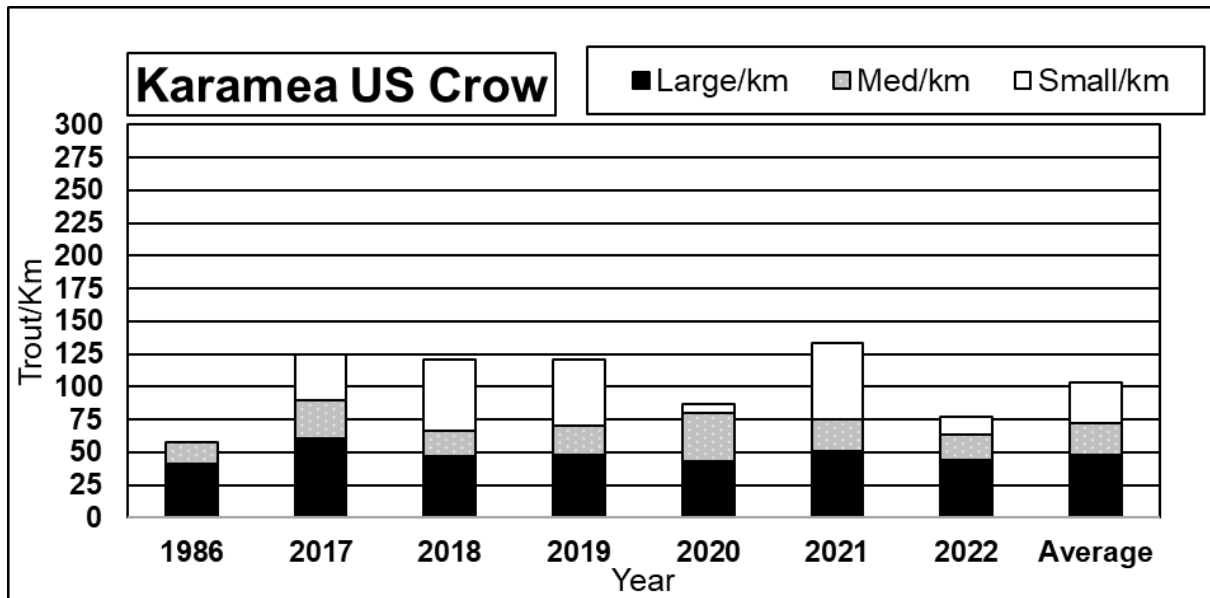


Fig 10. Number of Brown Trout recorded during drift dive surveys at the Karamea River, upstream of Crow 1986- 2022.

Karamea River (Downstream of Crow)

This season the dive at the Karamea River downstream of the Crow on 8 March 2022 resulted in a count of 5 small/km, 10 medium/km and 25 large/km. Numbers of fish were below average largely due to a lack of medium and small trout.

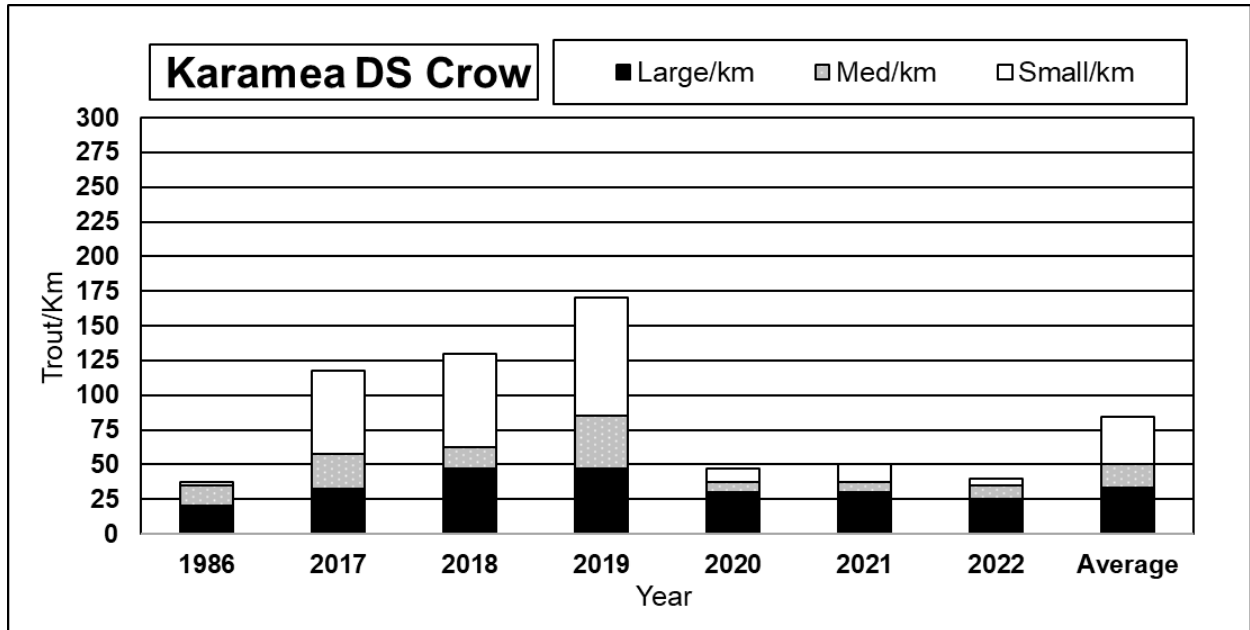


Fig 11. Number of Brown Trout recorded during drift dive surveys at the Karamea River, downstream of Crow 1986 - 2022.

Karamea River (Karamea Bend)

This season the dive at the Karamea Bend on 8 March 2022 resulted in a count of 16 small/km, 8 medium/km and 21 large/km. This year's count was an improvement on last years but still below average.

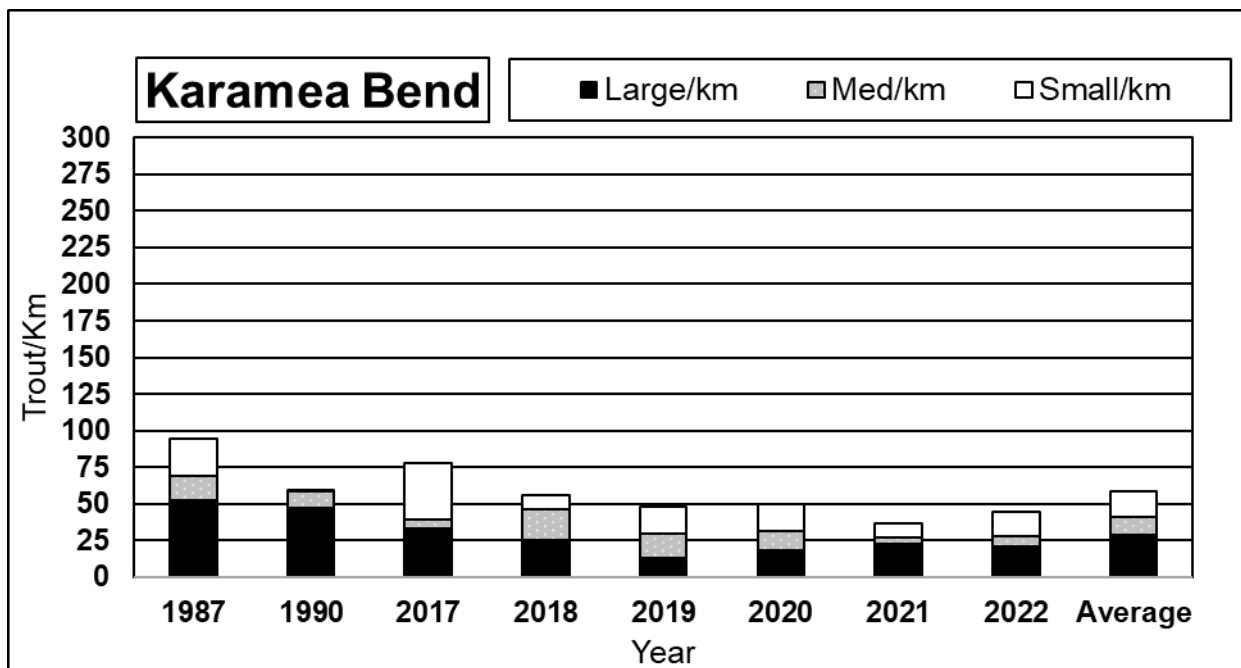


Fig 12. Number of Brown Trout recorded during drift dive surveys at the Karamea River, bend 1987-2022.

Discussion

Mawheraiti/Inangahua

Fish abundance in the Mawheraiti River continues to remain relatively steady with counts being similar to recent years and around the average count. While the SH7 site was down on recent years, following high amounts of rain through December count conditions were not favourable and likely reduced the count given the deep holes often exceed visibility in this section. Mirfins dive site count improved this season, with small fish being main contributing factor. The research project in the Mawheraiti catchment indicated that 2020-21 was a good recruitment year, both dives supported this with above average numbers of small trout at both sites.

The above average count on the Inangahua river is likely a reflection of the timing of the count. It being counted in January during a low flow period where 180 trout were observed hanging off just one small stream junction. Although its likely that a good spawned occurred in 2020-21 as observed in the Mawheraiti, and it help boost the high number of small trout observed. The count was completed prior to the February floods and its likely the fishery took a toll given the magnitude of the two floods. The count should aim to be completed in similar conditions each year to take away the variable of time/flow conditions influencing the count.

Upper Grey River

The number of fish observed at Hospital Flat was up on previous years largely due to the presence of small trout. This being a continued trend of good recruitment following the 2019 beech mast and a stable winter/spring in 2020. Large trout numbers have also bounced back after last year, as it recovers from the 2019 beech mast and the high angling pressure it experienced. The fishery has been well rested over the pass season with very few anglers observed.

Grey River at Waipuna

The number of fish at Waipuna were above average although down on last year's count. An experienced dive team completed the dive in optimal river conditions therefore it is believed an accurate count was achieved. There was a lack of medium trout, which are known to be most vulnerable to flooding and given the winter and spring we experienced potentially it took a toll on the medium size class being a larger river. The medium size trout impatricular were observed shoaling up in the low flow conditions and therefore if a large school moves out of the count site it could influence the count also.

Karamea/Mokihinui

Dives completed on the Karamea were all below average despite angler pressure believed to be very little. The dive was completed in March, post the big February flood when the Karamea exceeded 1,000m³/s. The Karamea bend site did show improvement on last year's count which is pleasing to see. Being a slow section of the river it likely wasn't impacted as badly by the flood or maybe even increased in fish numbers as fish were washed down. There doesn't appear to be any correlation with angling pressure and fish observed during drift dives.

The dive completed in the South Branch of the Mokihinui was up on previous years with high numbers of large trout present. The North Branch site was similar, being up on previous years with high numbers of large fish. Both sites lacked small trout, although numbers observed haven't been high in previous dives other than in 2017 and 2018. The North Branch site has experienced a large slip into the river just below the get-in location, changing some of the habitat and making dive conditions less favourable.

Larrys/Waitahu

Larrys and Waitahu followed the same trend as other dive sites in the Reefton area with high numbers of small trout observed. The dives were carried out during a low flow period in January and the flood in February likely greatly impacted on these rivers also. The number of large trout were either around or blow average in the two rivers. With angler pressure below normal levels, it's likely the low flows may have encouraged fish to drop downstream into the Inangahua.

General

Staff from the West Coast and Nelson/Marlborough Fish & Game Regions, the West Coast Regional Council and local volunteers assisted with the dives. Having the support of other Fish & Game Regions is important to ensure diver numbers are adequate and experienced divers are used. This season West Coast staff participated in dives on the Motueka River to assist the Nelson/Marlborough Region.

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.
- Continue monitoring of Larry's Creek and Waitahu River to build a better understanding of trout numbers in areas with high angler pressure.
- Continue to assist with neighbouring regions drift dive programmes on a reciprocal basis to obtain numbers where necessary.
- That council receives this report.

Acknowledgements

To the following staff and volunteers who helped with the dives a big thank you: Rhys Barrier, Lawson Davey, Jacob Lucas, Dan Scoltock, Taylor Blyth, Luken Bisley, Mason Court, Glen Lovelock, James Kennedy, Jacob Kelly, Harvey Rubbo.

Also, thanks Helicharter Karamea, and Helicharter Nelson for providing helicopter transport into the Mokihinui and Karamea catchments respectively.

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 2021/2022

RIVER	LOCALITY	YEAR	DATE	GRID REF	DIST (km)	WIDTH (m)	Vis (m)	LARGE	MEDIUM	SMALL	TOTAL	# DIVERS
Grey R	Hospital Flat	2022	19/01/2022	Start E1521141 N5299847 Fin E1520016 N5298842	2	20	10.3	35	10	76	121	6
Grey R	Waipuna	2022	19/01/2022	Start E1498593 N5311779 Fin E1496253 N5313181	3	40	8.6	50	149	371	570	7
Inangahua R	Blacks Point	2022	19/01/2022	179/962-176/973	1.7	18	6	44	144	589	777	5
Karamea R	US Crow	2022	08/03/2022	Start E1554557 N5428127 Fin @ Crow confluence	1	30	11	44	19	14	77	6
Karamea R	DS Crow	2022	08/03/2022	Start @ Crow confluence Fin E1555605 N5429054	0.4	30	11	10	4	2	16	6
Karamea R	Bend	2022	08/03/2022	Start E1558116 N5433366 Fin E1558748 N5435193	1.9	50	10	38	14	30	82	6
Larry's Creek	Upper	2022	25/01/2022	230/075-214/082	1.7	12	15	19	28	80	127	4
Mawheraiti R	SH7 Bridge	2021	20/12/2021	Start E1494260 N5327375 Fin E1493355 E5326175	1.7	20	4.2	46	120	147	313	6
Mawheraiti R	Mirfins Bridge	2021	20/12/2021	Start E1490645 N5319445 Fin E1490000 N5318080	1.3	20	4.2	10	74	101	185	6
Mokihinui R	Sth Branch	2022	3/03/2022	Start E1533262 N5393839 Fin E1533651 N5395618	2	30	9+	92	13	4	109	6
Mokihinui R	Below Gorge	2022	3/03/2022	Start E1535207 N5402217 Fin E1533534 N5401613	2.3	25	7	50	21	11	82	6
Waitahu	Gannons	2022	25/01/2022	Start E N Fin @ Gannons bridge	1.6	18	9	8	23	184	215	4