

DRIFT DIVE REPORT 2021

A summary of drift dive survey conducted by Fish & Game West Coast Region during the 2020-2021 season.

Glen Newton, Fish & Game Officer, March 2021





DRIFT DIVE SURVEYS REPORT 2021

A summary of drift dives conducted by Fish & Game West Coast in the spring and summer of 2020/2021. Glen Newton, Fish & Game Officer, March 2021.

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 November 2020 and March 2021, 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 comparable to long-term averages although lower numbers were recorded at sites monitored early in the season. It is recommended that further work be done to understand factors influencing trout numbers in the Mawheraiti River and Upper Grey Rivers.

Introduction

Drift diving is commonly used to monitor trout abundance in clear, small to medium sized rivers throughout the 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 10 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 26 November 2020 resulted in a count of 40 small/km, 72 medium/km and 15 large/km. Numbers of small fish were about average while numbers of medium and large fish were above average. The count was well down on the record count obtained in February 2016 although a significant increase from last season's count.

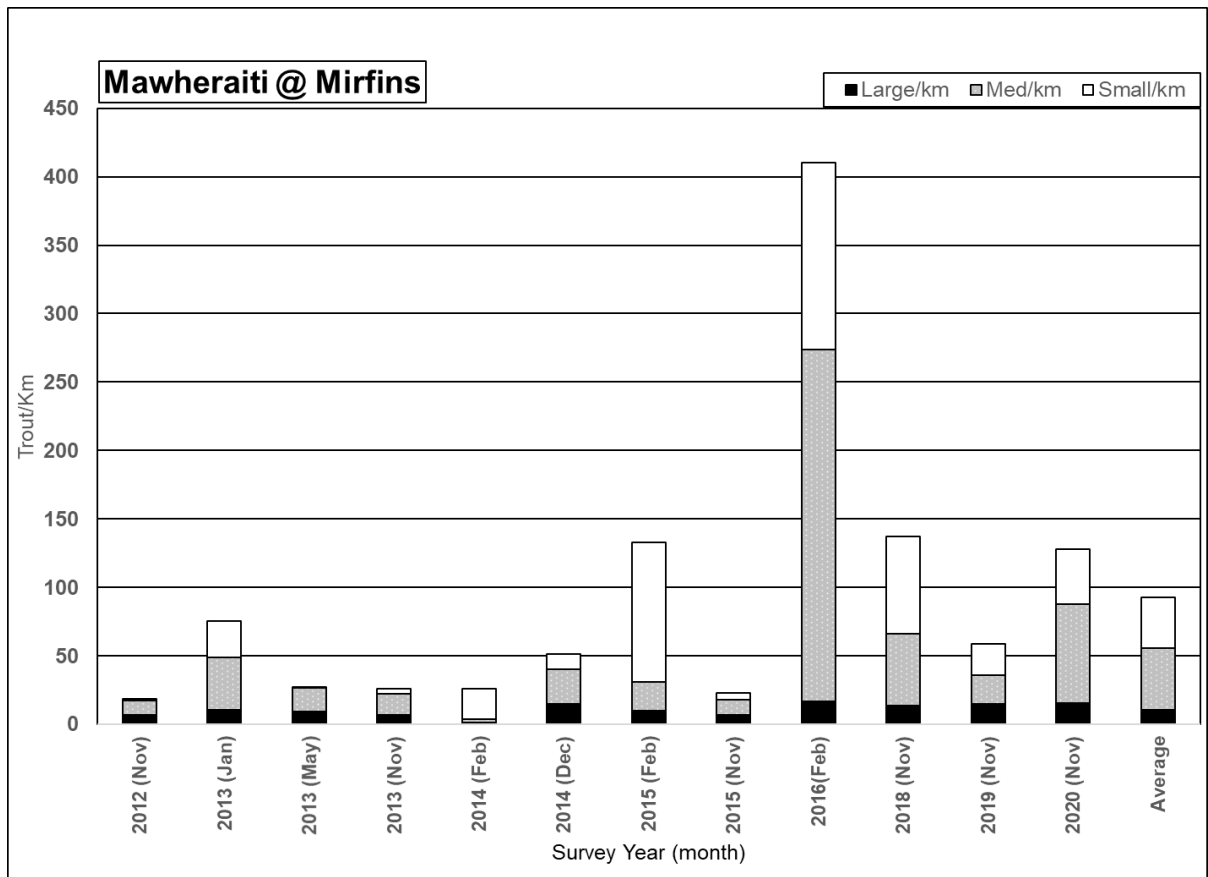


Figure 1. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2020.

Mawheraiti River (SH7 Bridge)

This season the dive at the SH7 bridge on 26 November 2020 resulted in a count of 73 small/km, 109 medium/km and 45 large/km. Numbers of small fish were about average although down on last season while numbers of medium and large fish were above average. Of note were the number of well-conditioned larger fish seen. There appears to be a stabilisation in numbers post 2016 after the record low numbers recorded 2011-2015.

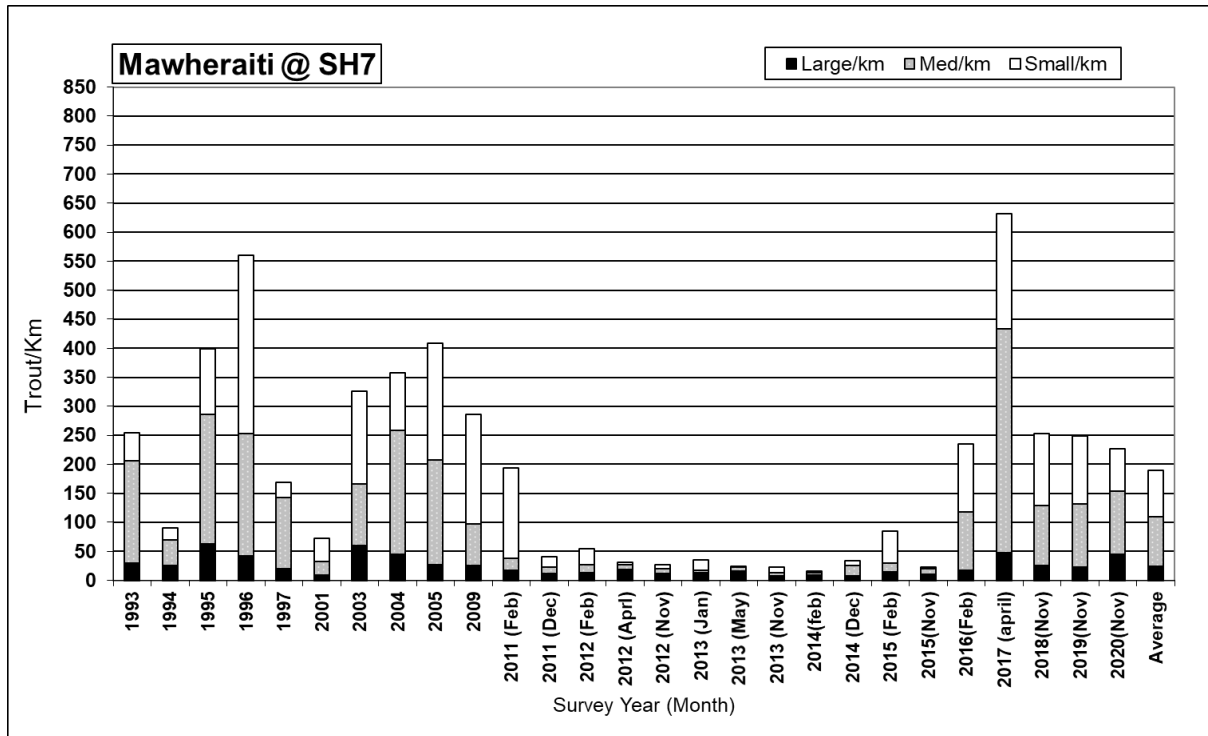


Figure 2. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River SH7 Bridge site 1993-2020.

Inangahua River (Blacks Point site)

This season the dive at Black's Point on 2 December 2020 resulted in a count of 40 small/km, 31 medium/km and 18 large/km. Numbers of small and medium fish were well below average, but an above average number of very large well-conditioned trout were still present following last season's beech mast event.

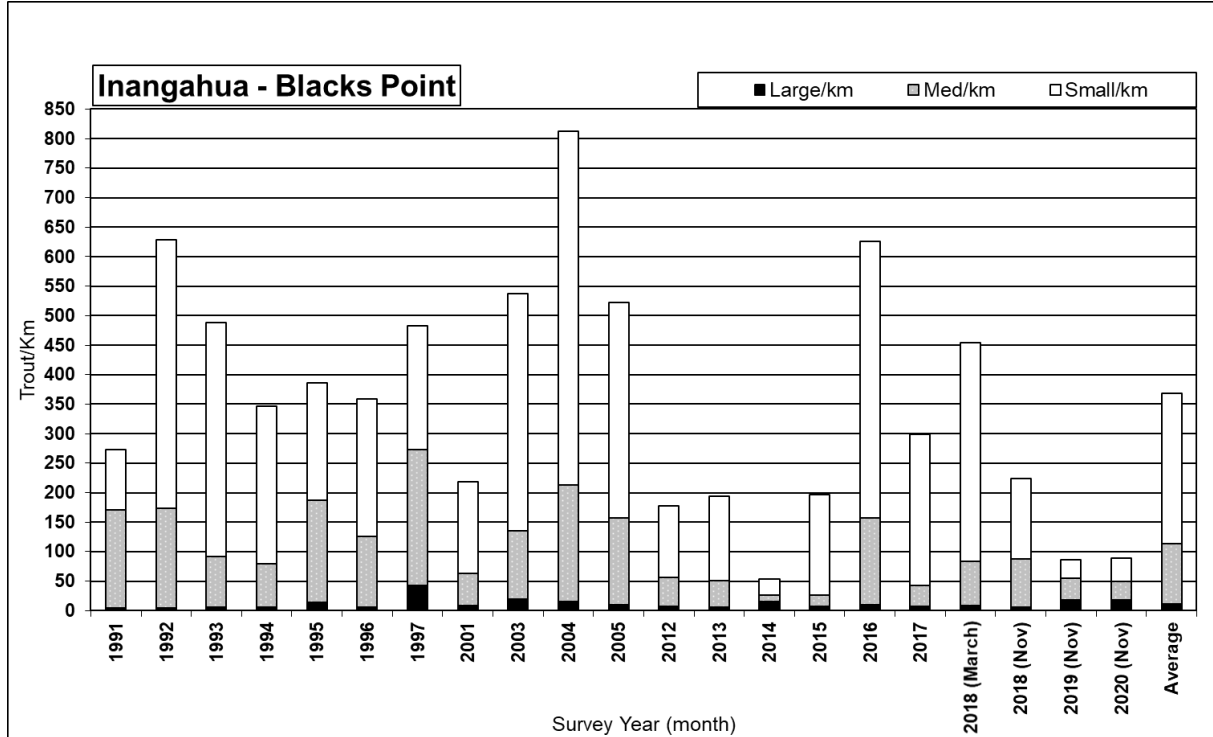


Figure 3. Number of Brown Trout recorded during drift dive surveys at the Inangahua River, Blacks Point site 1991-2020.

Grey River (Hospital Flat)

This season the dive at Hospital Flat on 2 December 2020 resulted in a count of 4 small trout/km, 8 medium trout/km and 13 large trout/km. Number of fish were below average and compared to last season there was a decline in the number of large fish.

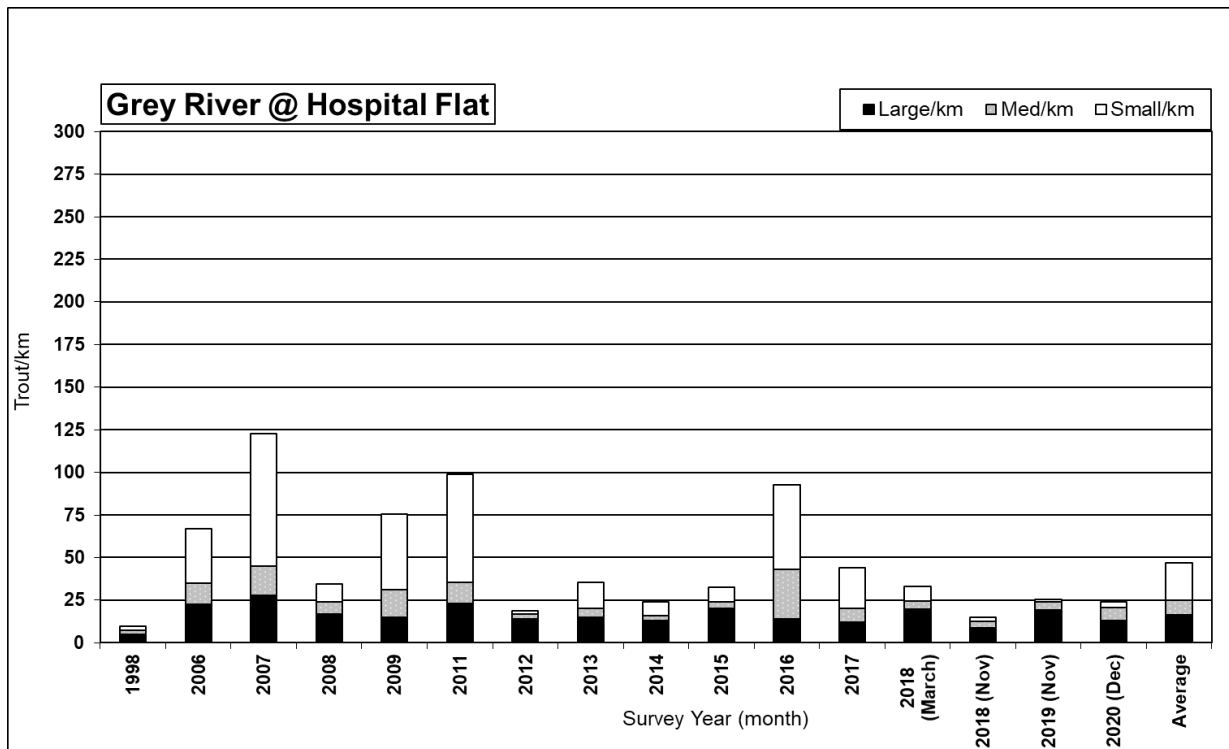


Figure 4. Number of Brown Trout recorded during drift dive surveys at the Upper Grey River, Hospital Flat 1991-2020.

Grey River (Waipuna site)

This season the dive at Waipuna on 23 March 2021 resulted in a count of 113 small/km, 79 medium/km and 24 large/km. Numbers of fish were above average across all size classes.

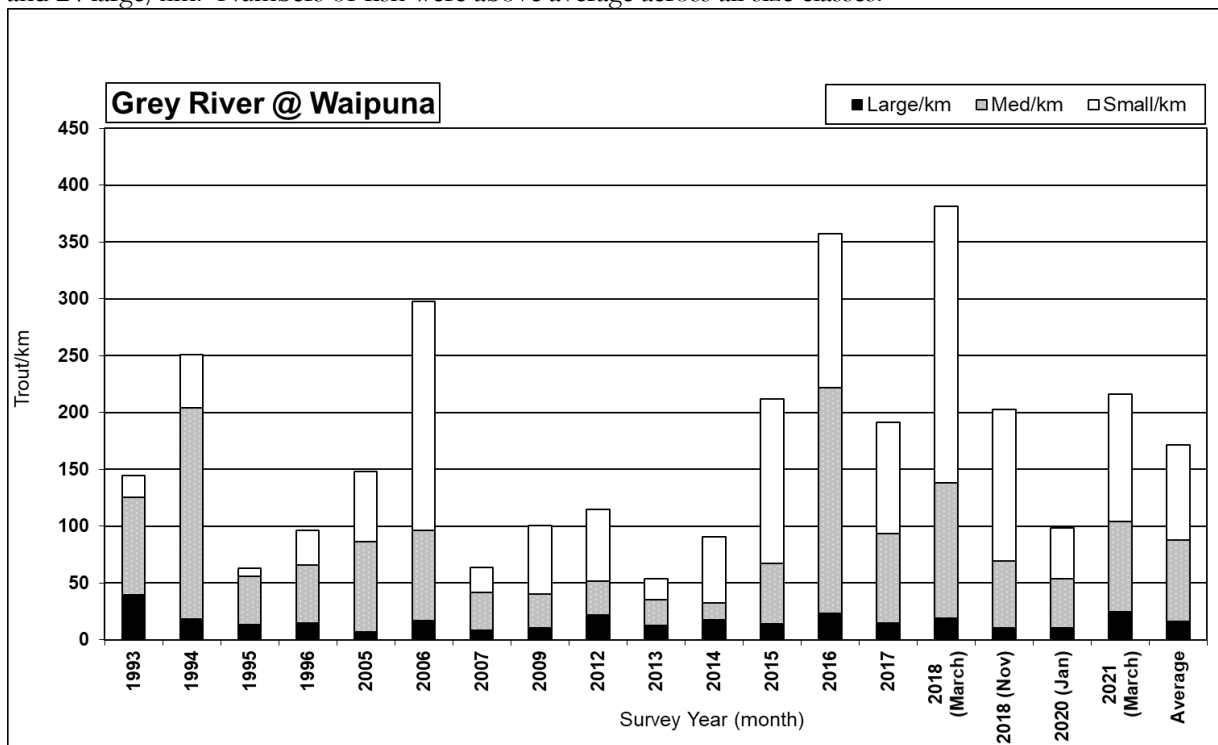


Figure 5. Number of Brown Trout recorded during drift dive surveys at the Grey River, Waipuna 1993-2021.

Larry's Creek

This season the dive at Upper Larry's Creek on 14 January 2021 resulted in a count of 22 small/km, 6 medium/km and 8 large/km. Numbers of small fish were above average while numbers of large fish were below average.

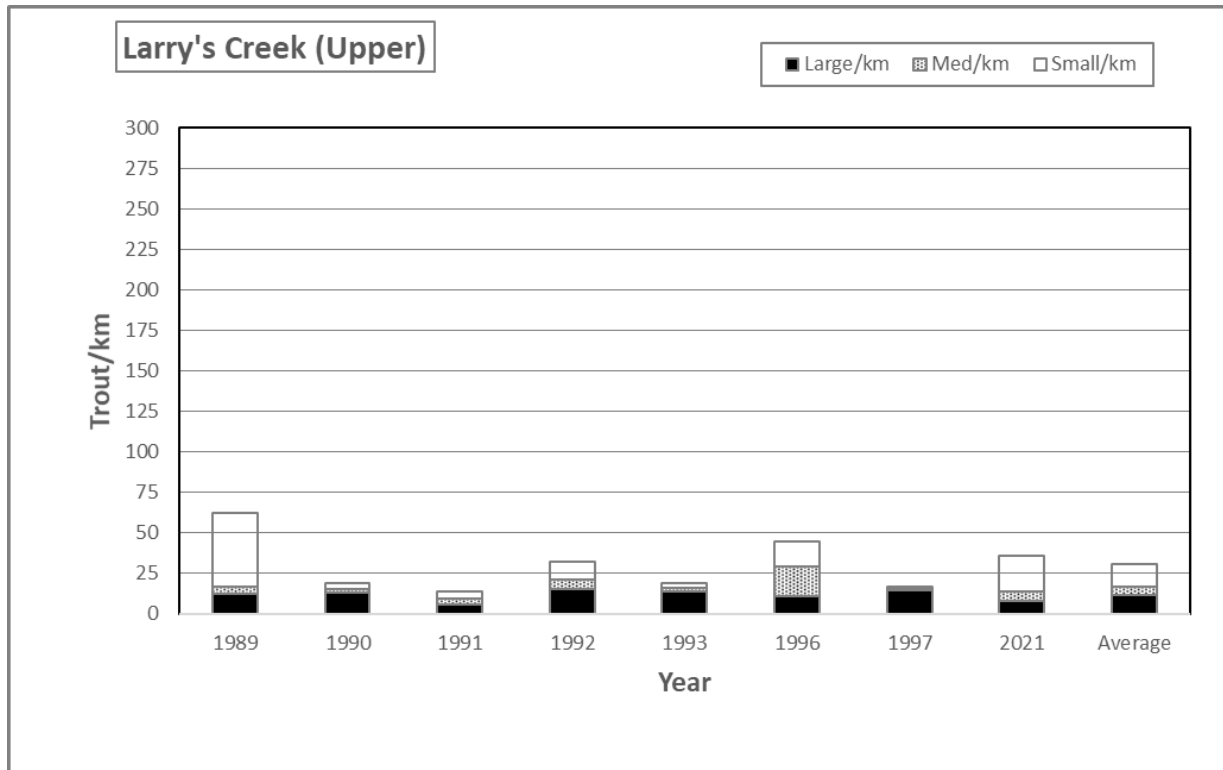


Figure 6. Number of Brown Trout recorded during drift dive surveys at Larry's Creek, Upper 1989-2021.

Waitahu River (Gannons Bridge)

This season the dive at the Waitahu River on 14 January 2021 resulted in a count of 9 small/km, 1 medium/km and 9 large/km. Numbers of small and medium fish were well below average although the number of large fish were above average.

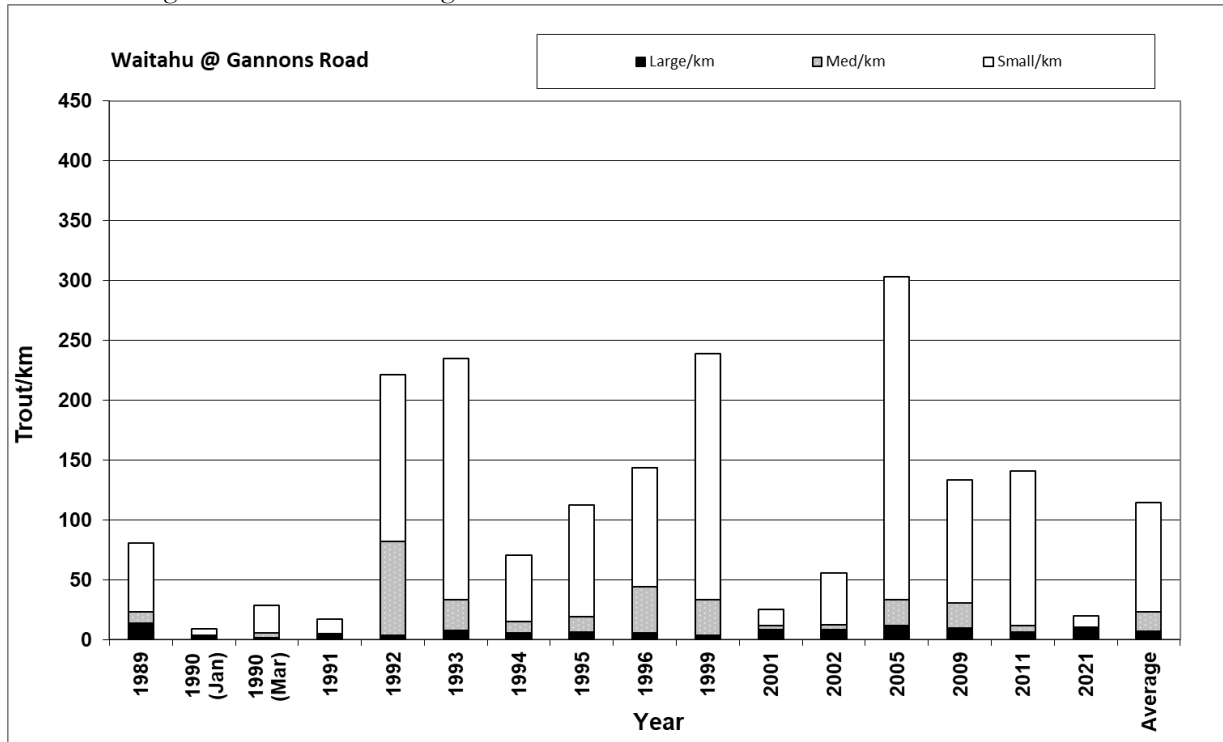


Figure 7. Number of Brown Trout recorded during drift dive surveys at the Waitahu River, Gannons, 1989-2021.

Mokihinui River: (South Branch site)

This season the dive at the Mokihinui South Branch on 3 February 2021 resulted in a count of 7 small/km, 4 medium/km and 41 large/km. Numbers of fish were about average and the number of large fish very similar to that recorded historically.

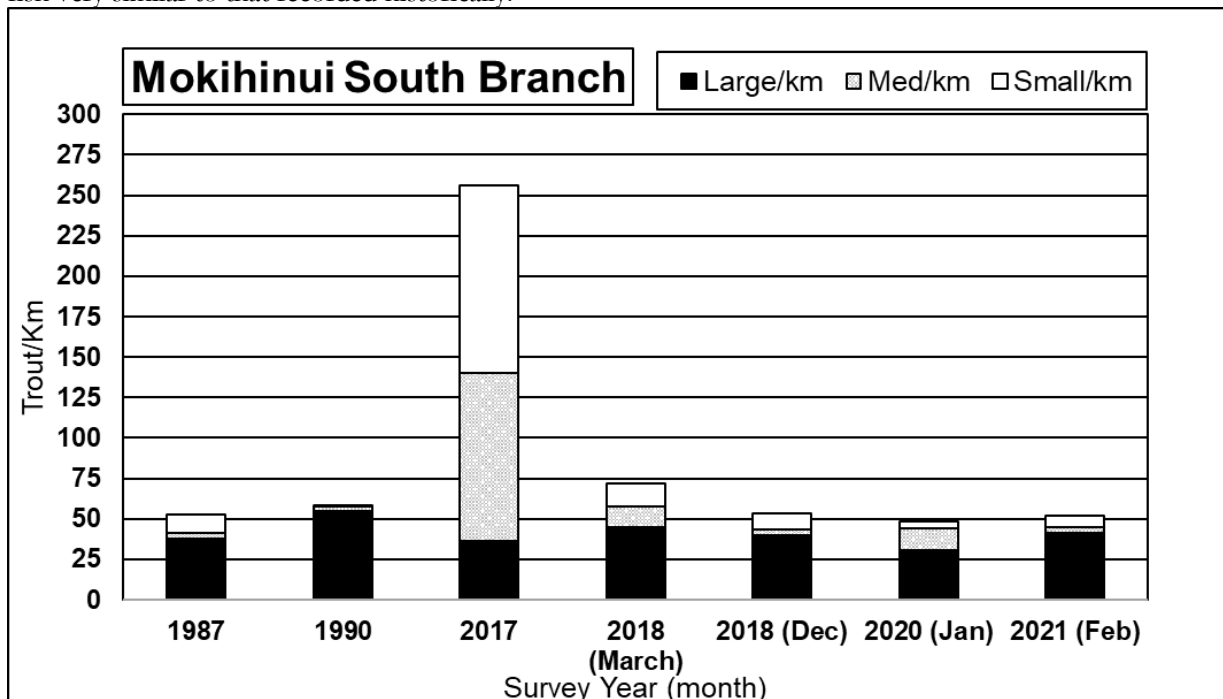


Figure 8. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, South Branch 1987 - 2021.

Mokihinui River (Below Gorge)

This season the dive at the Mokihinui North Branch site below the gorge on 3 February 2021 resulted in a count of 4 small/km, 8 medium/km and 16 large/km. Numbers of fish were similar to the count done in December 2018 and marginally above last years count.

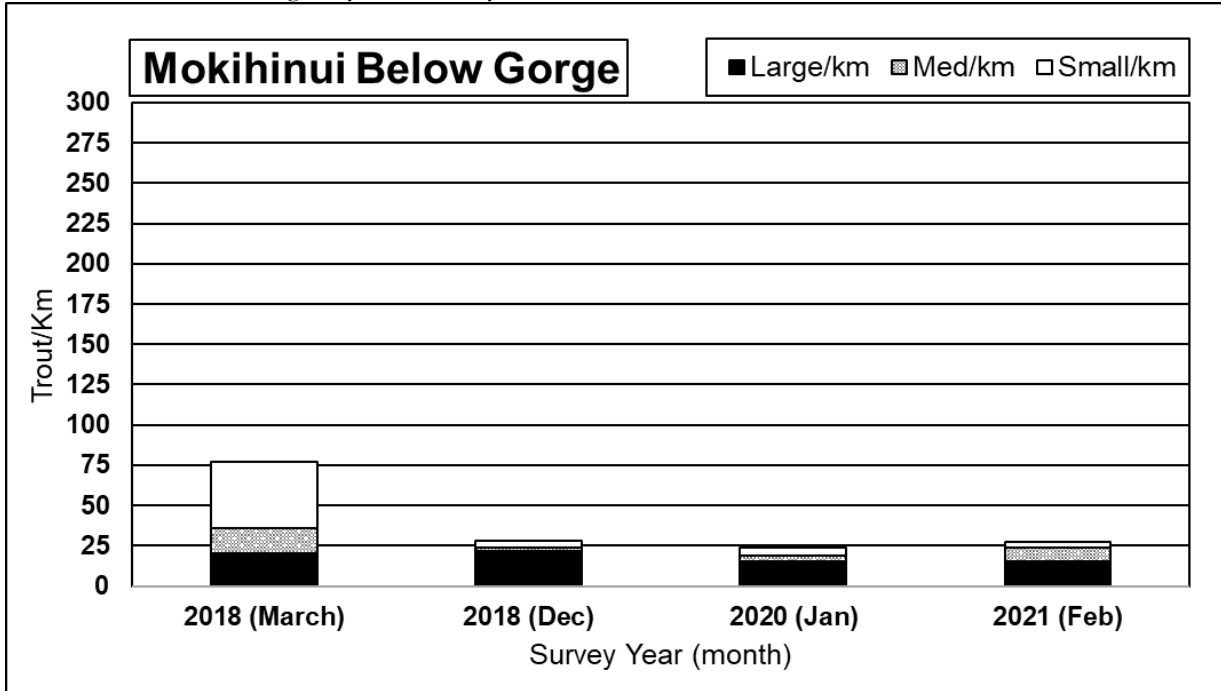


Figure 9. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, North Branch below gorge 2018 -2021.

Karamea River (Upstream of Crow)

This season the dive at the Karamea River upstream of the Crow on 19 February 2021 resulted in a count of 58 small/km, 24 medium/km and 51 large/km. Numbers of fish were above last season and very similar to 2017, 2018 and 2019.

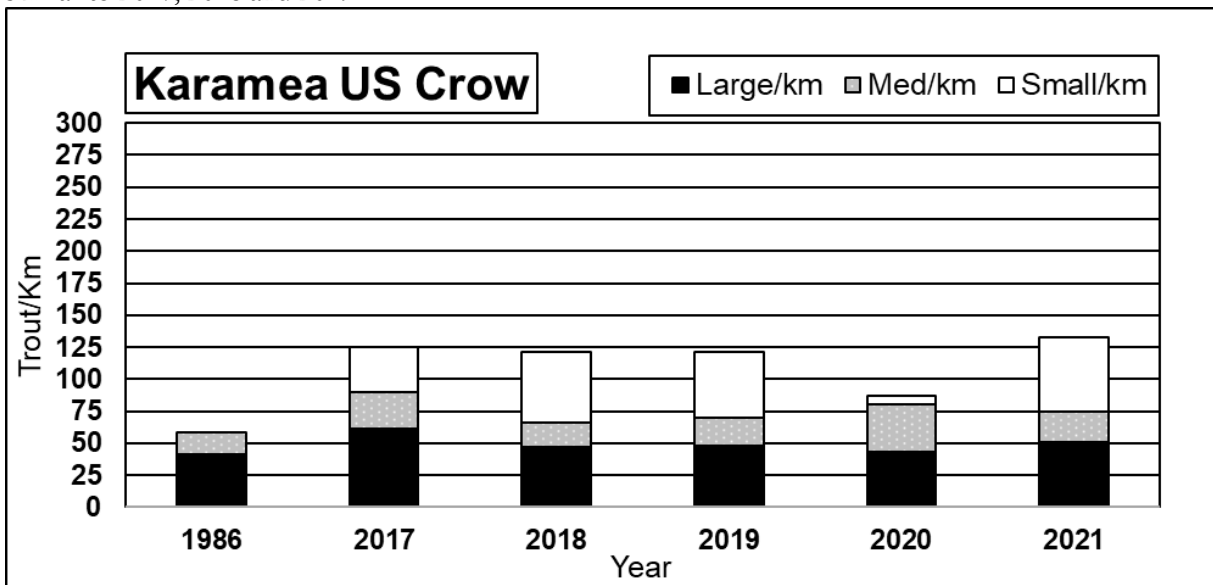


Figure 10. Number of Brown Trout recorded during drift dive surveys at the Karamea River, upstream of Crow 1986- 2021.

Karamea River (Downstream of Crow)

This season the dive at the Karamea River downstream of the Crow on 19 February 2021 resulted in a count of 13 small/km, 8 medium/km and 30 large/km. Numbers of fish were very similar to those recorded last season.

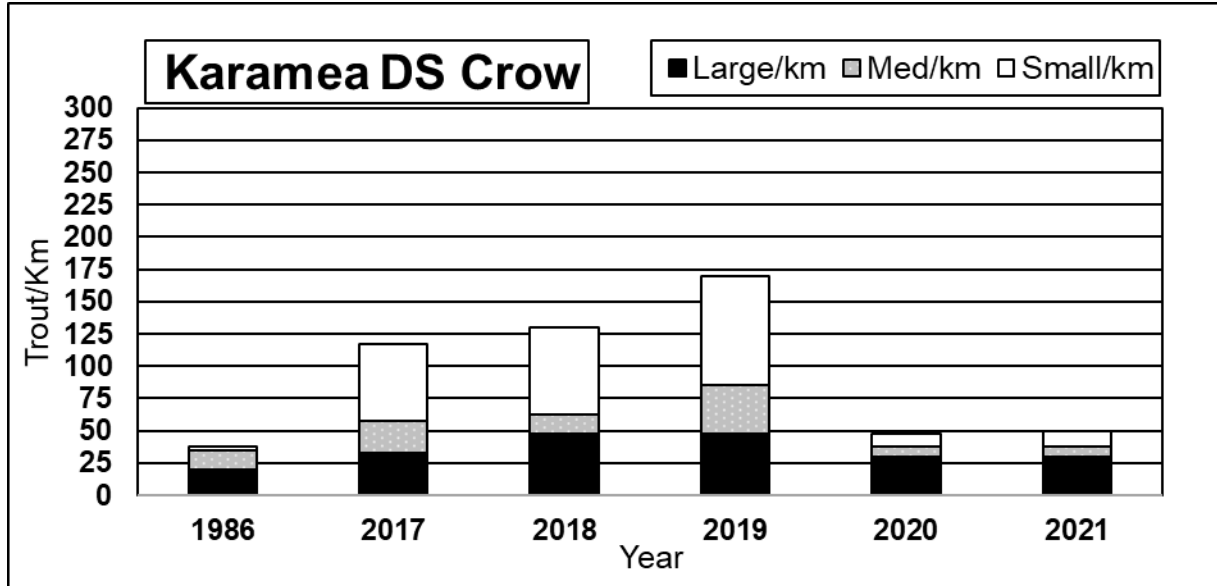


Figure 11. Number of Brown Trout recorded during drift dive surveys at the Karamea River, downstream of Crow 1986 - 2021.

Karamea River (Karamea Bend)

This season the dive at the Karamea Bend on 19 February 2021 resulted in a count of 9 small/km, 4 medium/km and 23 large/km. This site has slowly declined in numbers, particularly large fish, since counts began although the last two seasons counts show an improvement.

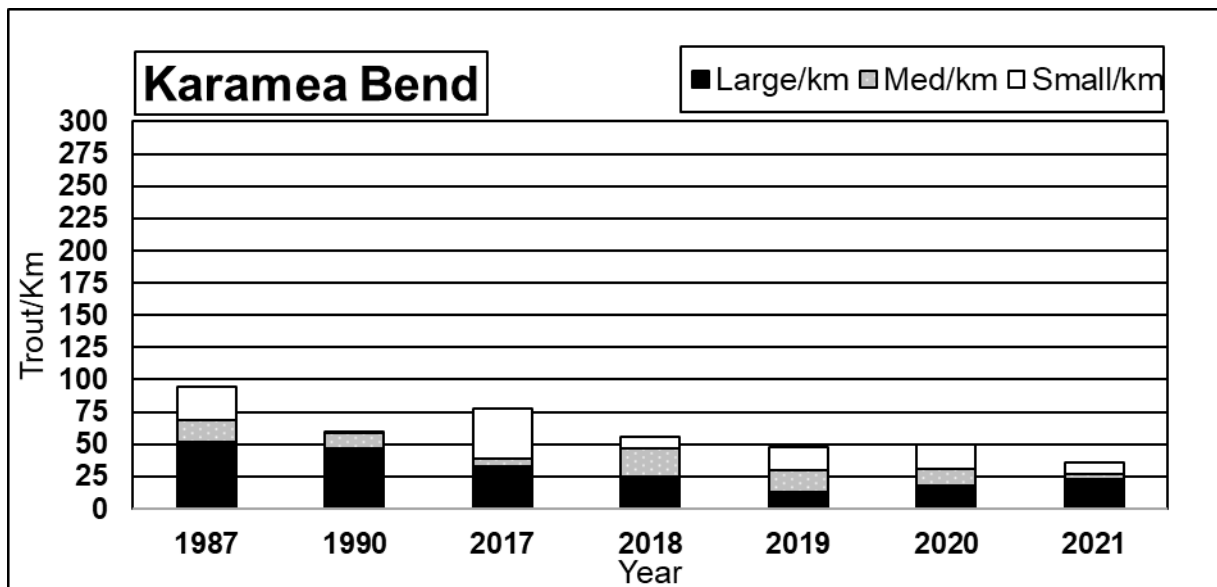


Figure 12. Number of Brown Trout recorded during drift dive surveys at the Karamea River, bend 1987-2021.

Discussion

Mawheraiti/Inangahua

Fish abundance in the Mawheraiti River seems to have stabilised (with some small fluctuations) following the poor 2011-2015 period. Both sites were average to above average this season across all size classes showing a healthy fishery at present. Research continues to give us a better understanding of the factors influencing recruitment and fish dispersal in this sensitive fishery.

The low number of small and medium fish recorded at Blacks Point this season is likely the result of completing the count early in the season. The river had good flow, was cold, and oxygen levels likely to be high therefore fish were likely to be spread out in the catchment. A number of larger fish remained in the catchment following the 2019 beech mast. The nature of this section had changed considerably this season with rock works undertaken for the reinstatement of the Reefton Power Scheme.

Upper Grey River

The number of large fish observed at Hospital Flat in the Upper Grey River has declined following the 2019 beech mast event. This is in contrast to the Inangahua count and could potentially be linked the site being more heavily utilised by anglers in the last two seasons post beech mast. Monitoring in the Upper Grey Catchment this season has shown continued steady occupancy by anglers even in the absence of Non-residents.

Grey River at Waipuna

The number of fish at Waipuna were above average and significantly up on last year's count. This was likely the result of an experienced dive team operating in optimal river conditions ie a low water level of 22.6 cumecs and good visibility of 8.5m. In 2020 a relatively inexperienced team attempted this challenging dive in higher water levels of 30.8 cumecs and lower visibility of 6.5m. An experienced dive team and low river levels (likely later in the season) is needed to maintain an accurate count on this river.

Karamea/Mokihinui

Dives completed upstream of the Crow River confluence in the Karamea River resulted in higher numbers of trout than observed in 2020, particularly smaller fish showing successful recruitment occurred. Numbers downstream of the Crow confluence appear stable although down on the 2017-19 period. Further downstream at the Karamea Bend, trout numbers appear to have stabilised following a period of slow decline at this site, particularly larger fish.

The dive completed in the South Branch of the Mokihinui was up on last season returning to average levels, particularly for larger fish. The dive was completed in the North Branch site for just the fourth time, results were much like last year.

Overall, there appears to be little evidence to suggest perceived high angler usage is impacting on trout numbers within the designated backcountry fisheries. While there is fluctuation across the sites and by year most sites still have similar trout numbers to those observed when they were first dived 1986-87. Continued diving in these fisheries may eventually show trends but a fish catchability study similar to that undertaken by Young and Hayes (2004) may give a better indication of perceived changes in the fishery.

Larrys/Waitahu

This season sites historically dived in the Larrys and Waitahu catchments were monitored in response to high angler use identified and quantified by trail camera monitoring (Baylee Kersten pers. comm). These sites are readily accessible and have much higher occupancy rates compared to the Karamea/Mokihinui BC Fisheries and should continue to be dived for a minimum of three years to gain a better understand of fish numbers comparative to historic levels.

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 used. This season West Coast staff participated in dives of the Motueka and Wairau rivers 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

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References

- Young, RG and Hayes, J (2004). Angling Pressure and Trout Catchability: Behavioral Observations of Brown Trout in Two New Zealand Backcountry Rivers. *North American Journal of Fisheries Management* 24(4):1203-1213
- 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 2020/2021

RIVER	LOCALITY	YEAR	DATE	GRID REF	DIST (km)	WIDTH (m)	Vis (m)	LARGE	MEDIUM	SMALL	TOTAL	# DIVERS
Grey R	Hospital Flat	2020	2/12 /2020	Start E1521141 N5299847 Fin E1520016 N5298842	2	20	5.7	26	15	7	48	6
Grey R	Waipuna	2021	23/3/2020	Start E1498593 N5311779 Fin E1496253 N5313181	3	40	8.5	73	238	338	649	8
Inangahua R	Blacks Point	2020	2/12/2020	179/962-176/973	1.7	18	4.3	31	53	68	152	6
Karamea R	US Crow	2021	19/02/2021	Start E1554557 N5428127 Fin @ Crow confluence	1	30	12	51	24	58	133	6
Karamea R	DS Crow	2021	19/02/2021	Start @ Crow confluence Fin E1555605 N5429054	0.4	30	12	12	3	5	20	6
Karamea R	Bend	2021	19/02/2021	Start E1558116 N5433366 Fin E1558748 N5435193	1.9	50	12	42	8	17	67	6
Larry's Creek	Upper	2021	14/01/2021	230/075-214/082	1.7	12	19	13	10	38	61	4
Mawheraiti R	SH7 Bridge	2020	26/11/2020	Start E1494260 N5327375 Fin E1493355 E5326175	1.7	20	4.5	76	185	124	385	5
Mawheraiti R	Mirfins Bridge	2020	26/11/2020	Start E1490645 N5319445 Fin E1490000 N5318080	1.3	20	4.5	20	94	52	166	5
Mokihinui R	Sth Branch	2021	3/02/2021	Start E1533262 N5393839 Fin E1533651 N5395618	2	30	9+	80	8	13	101	6
Mokihinui R	Below Gorge	2021	3/02/2021	Start E1535207 N5402217 Fin E1533534 N5401613	2.3	25	8+	36	18	9	63	6
Waitahu	Gannons	2021	14/01/2020	Start E N Fin @ Gannons bridge	1.6	18	13.4	15	2	15	32	4