

DRIFT DIVE REPORT 2020

A summary of drift dive survey conducted by Fish & Game West Coast Region during the 2019-2020 season.

Glen Newton, Fish & Game Officer, March 2020





DRIFT DIVE SURVEYS REPORT 2020

A summary of drift dives conducted by Fish & Game West Coast in the spring and summer of 2019/2020. Glen Newton, Fish & Game Officer, March 2020.

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 2019 and March 2020, incorporating Fish & Game staff from the West Coast, Canterbury and Nelson-Marlborough Regions and local volunteers. The Mawheraiti River (SH7 and Mirfins Bridge), the Inangahua River (Blacks Point), the Grey River (Waipuna, McVicars and Hospital Flat), the Mokihinui River (South and North Branches) 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 low 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 fish practices. Specifically:

- 1) The Mawheraiti River and the Inangahua River are dived to monitor the impact of catchment development.
- 2) The Grey River at Hospital Flat is 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 is 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.

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 25 November 2019 resulted in a count of 22 small/km, 22 medium/km and 15 large/km. Numbers of small and medium fish were below average and well down on the record count obtained in February 2016 although the number of large fish was average.

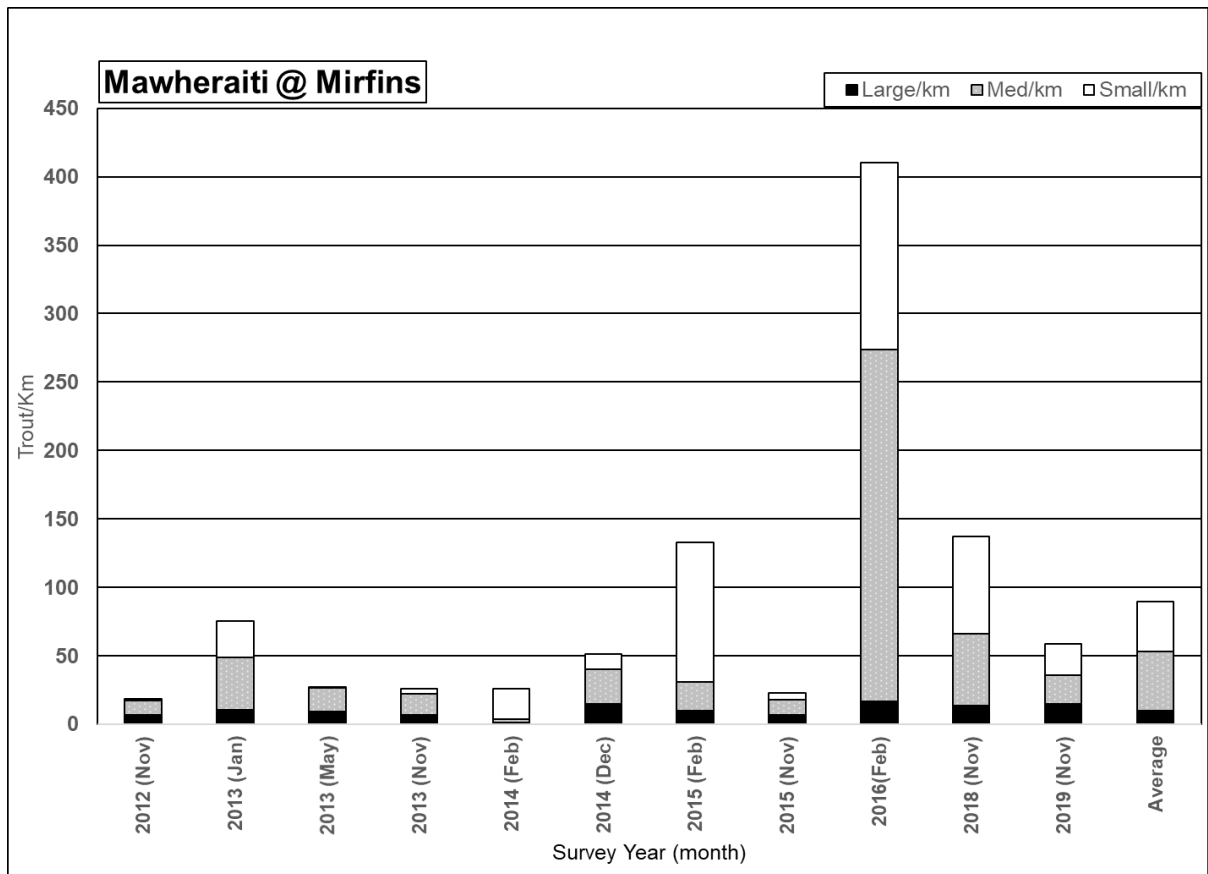


Fig 1. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2019.

Mawheraiti River (SH7 Bridge)

This season the dive at the SH7 bridge on 25 November 2019 resulted in a count of 117 small/km, 109 medium/km and 22 large/km. Numbers of fish were about average and very similar to last season but well down on the record count obtained in April 2017. There appears to be a continued improvement in numbers from 2016 after the record low numbers recorded 2011-2015.

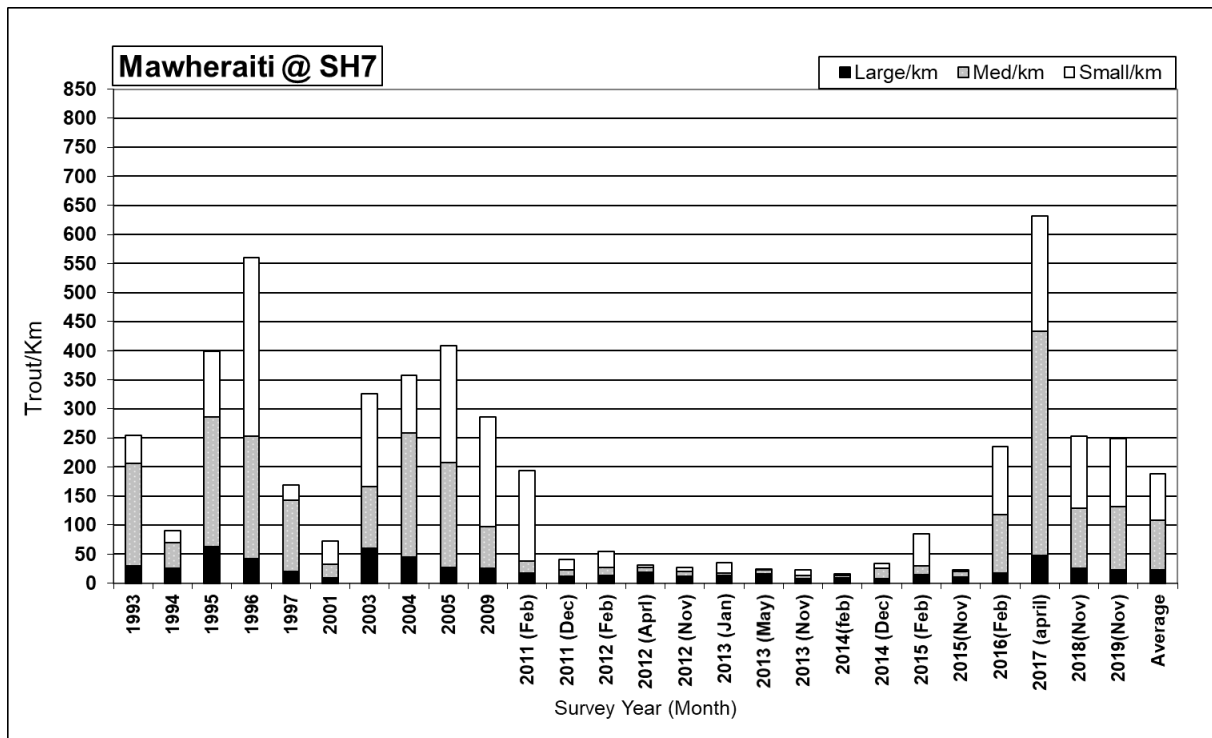


Fig 2. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River SH7 Bridge site 1993-2019.

Inangahua River (Blacks Point site)

This season the dive at Black's Point on 28 November 2019 resulted in a count of 32 small/km, 36 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 observed.

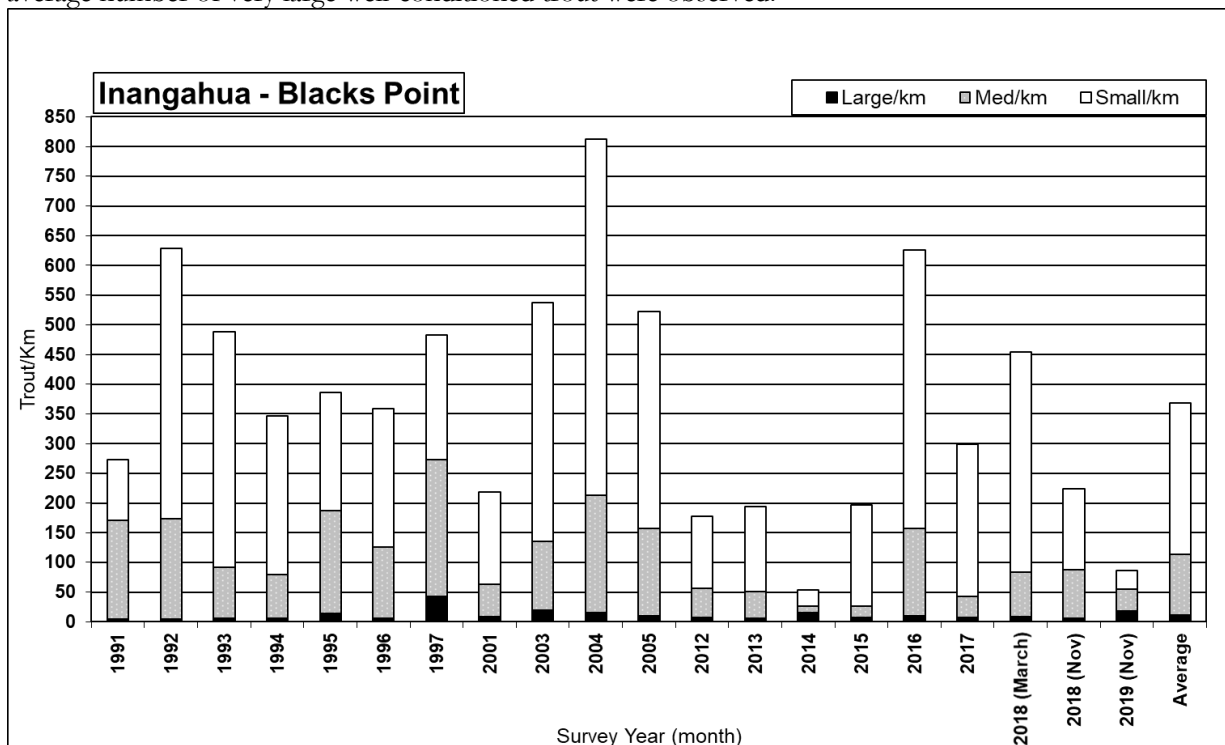


Fig 3. Number of Brown Trout recorded during drift dive surveys at the Inangahua River, Blacks Point site 1991-2019.

Grey River (Hospital Flat)

This season the dive at Hospital Flat on 28 November 2019 resulted in a count of 2 small trout/km, 5 medium trout/km and 19 large trout/km. Numbers of small and medium fish were below average, but an above average number of very large well-conditioned trout were observed.

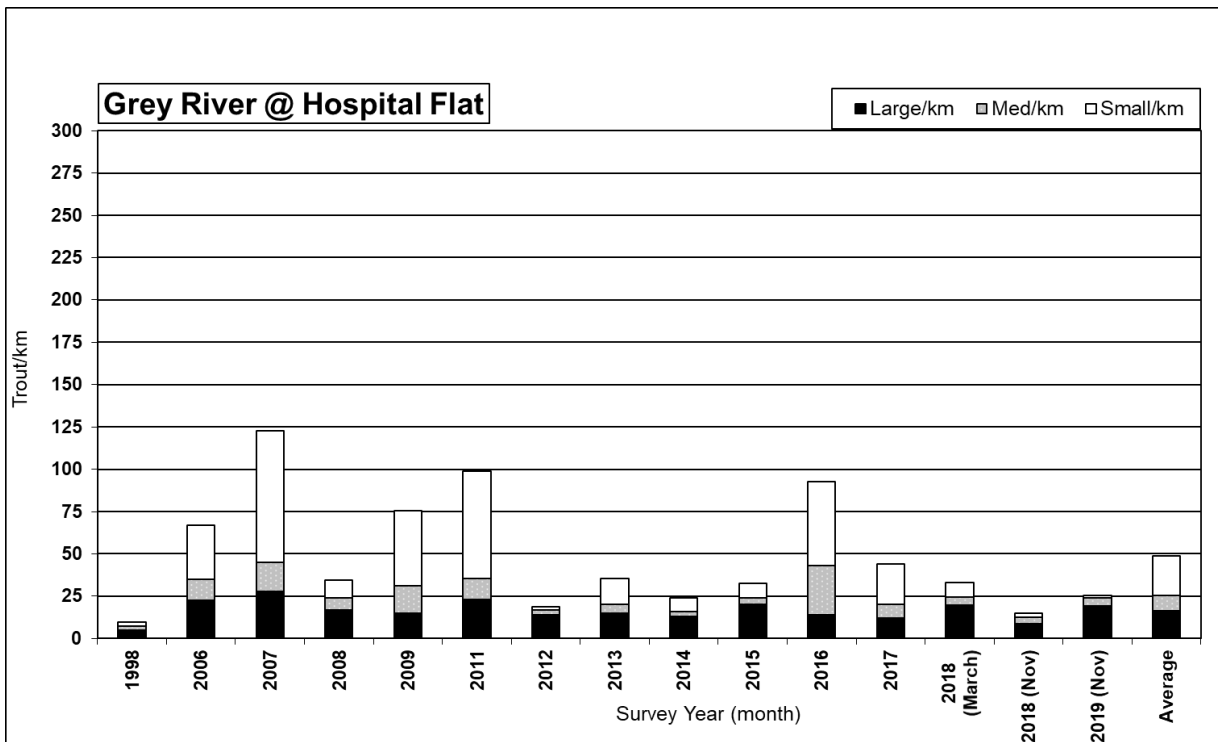


Fig 4. Number of Brown Trout recorded during drift dive surveys at the Upper Grey River, Hospital Flat 1991-2019.

Grey River (Waipuna site)

This season the dive at Waipuna on 17 January 2020 resulted in a count of 45 small/km, 43 medium/km and 11 large/km. Numbers of fish were below average.

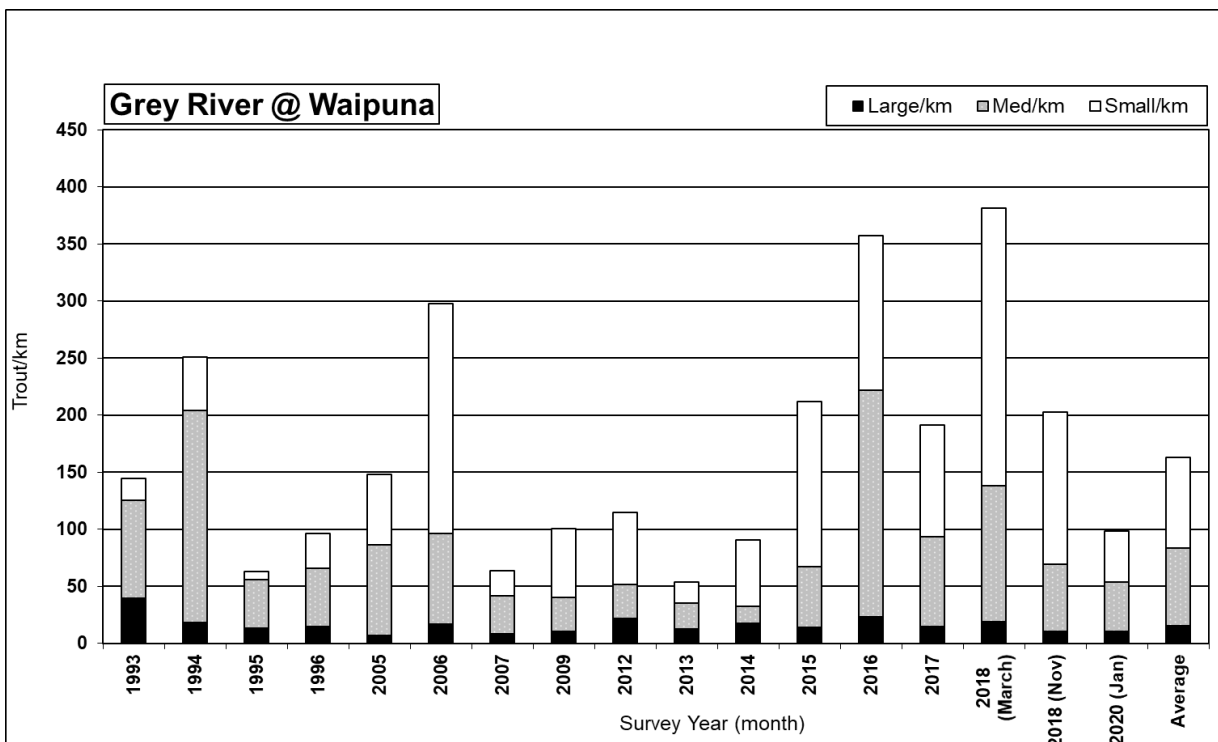


Fig 5. Number of Brown Trout recorded during drift dive surveys at the Grey River, Waipuna 1993-2020.

Grey River (new McVicars site)

This season a new dive was undertaken at McVicars (Roger Fleming’s property) on 17 January 2020 and resulted in a count of 4 small/km, 4 medium/km and 12 large/km. Water clarity was poor and numbers of fish low.

Mokihinui River: (South Branch site)

This season the dive at the Mokihinui South Branch on 16 January 2020 resulted in a count of 4 small/km, 14 medium/km and 30 large/km. Numbers of fish were about average and very similar to that recorded in 1987.

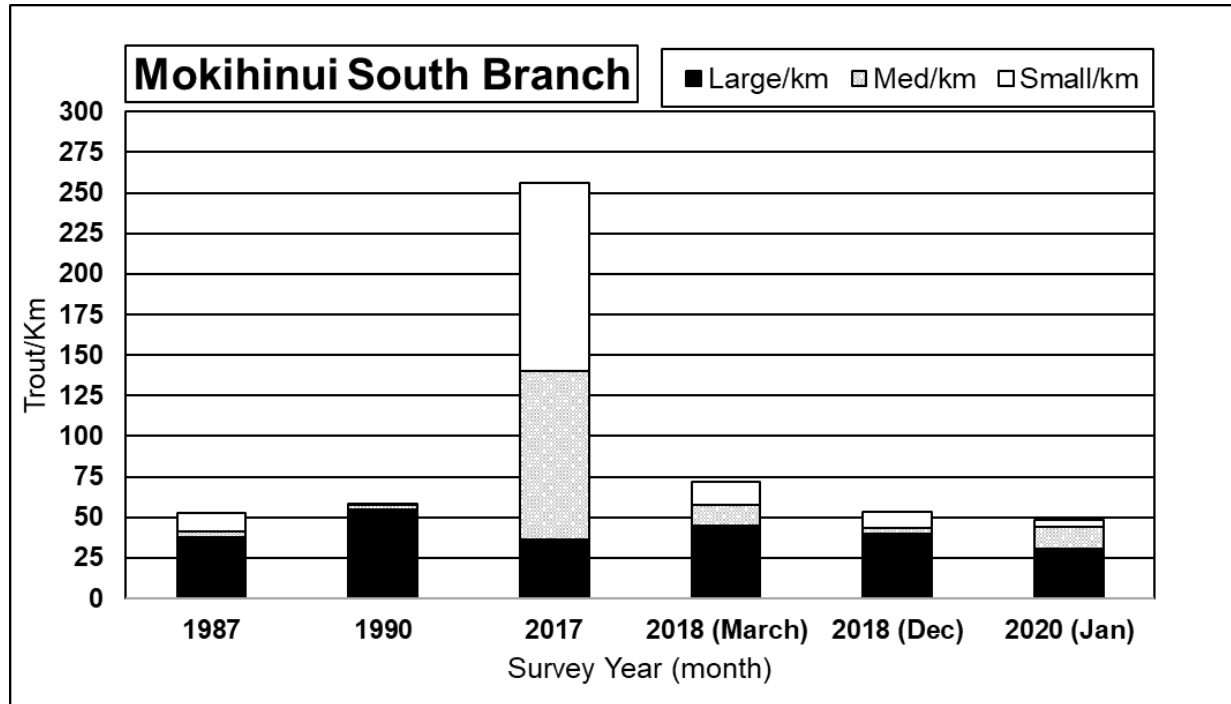


Fig 6. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, South Branch 1987 - 2018.

Mokihinui River (Below Gorge)

This season the dive at the Mokihinui North Branch site below the gorge on 16 January 2020 resulted in a count of 5 small/km, 4 medium/km and 15 large/km. Numbers of fish were marginally down on the count done in December 2018.

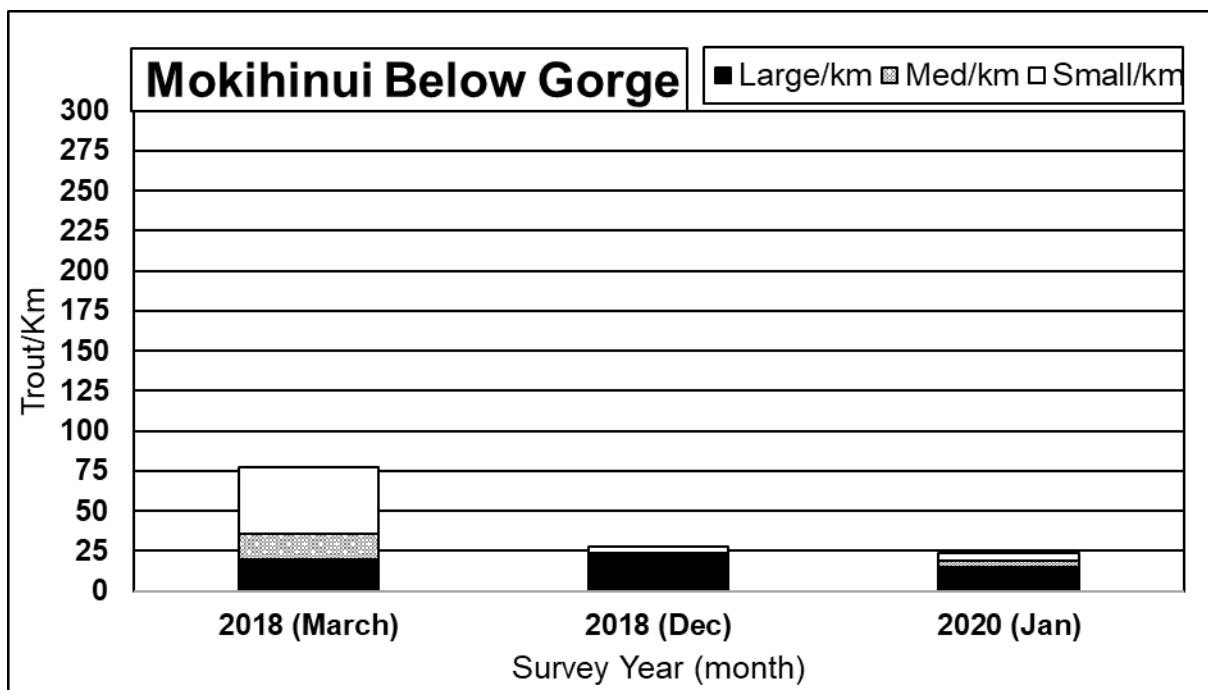


Fig 7. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, North Branch below gorge 2018.

Karamea River (Upstream of Crow)

This season the dive at the Karamea River upstream of the Crow on 13 March 2020 resulted in a count of 7 small/km, 37 medium/km and 43 large/km. Numbers of fish were very similar to last season except for lower numbers of small fish.

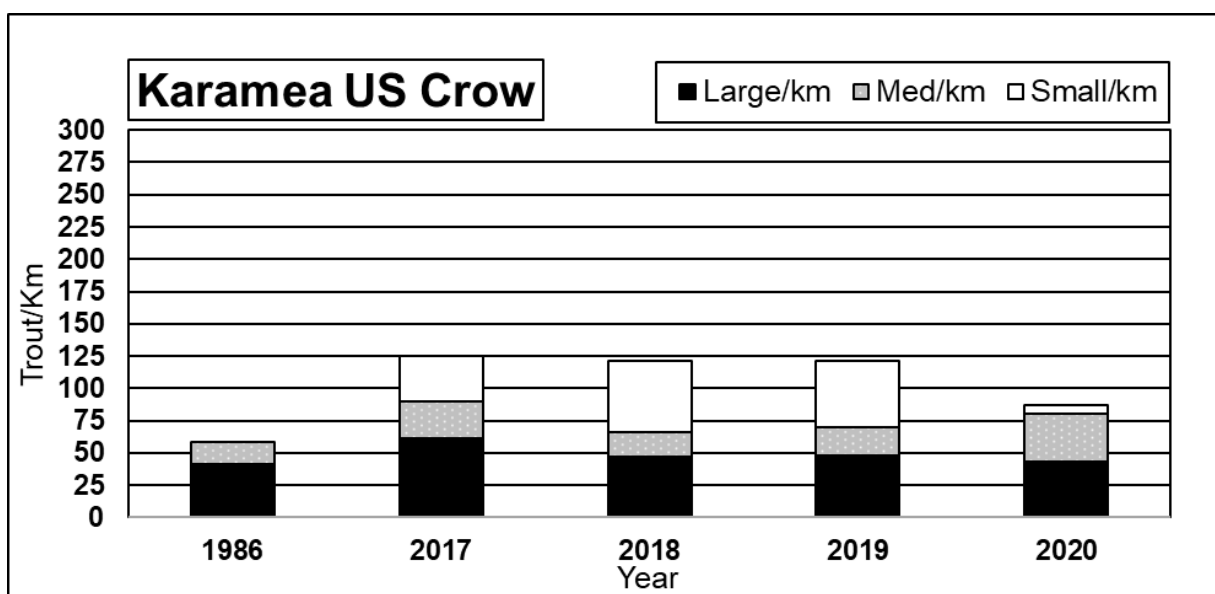


Fig 8. Number of Brown Trout recorded during drift dive surveys at the Karamea River, upstream of Crow 1986- 2020.

Karamea River (Downstream of Crow)

This season the dive at the Karamea River downstream of the Crow on 13 March 2020 resulted in a count of 10 small/km, 8 medium/km and 30 large/km. Numbers of fish were lower than recorded last season particularly for small and medium fish.

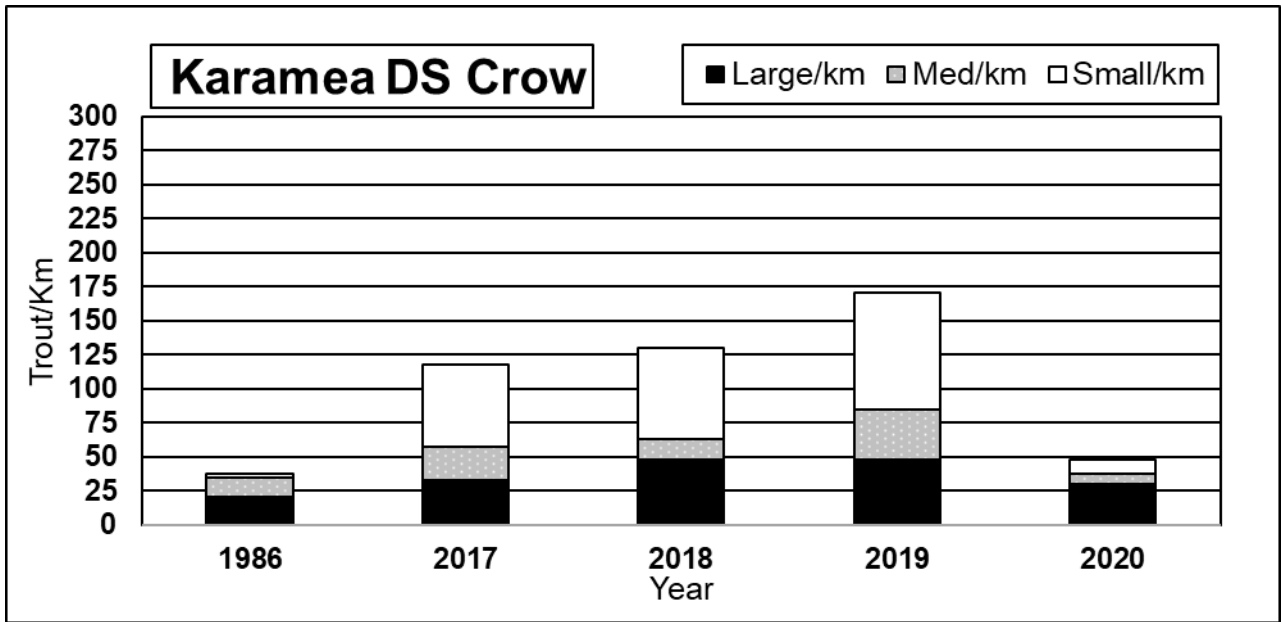


Fig 9. Number of Brown Trout recorded during drift dive surveys at the Karamea River, downstream of Crow 1986 - 2020.

Karamea River (Karamea Bend)

This season the dive at the Karamea Bend on 13 March 2020 resulted in a count of 19 small/km, 13 medium/km and 18 large/km. This site has slowly declined in numbers, particularly large fish, since counts began although over the last three years the counts appear to have stabilised.

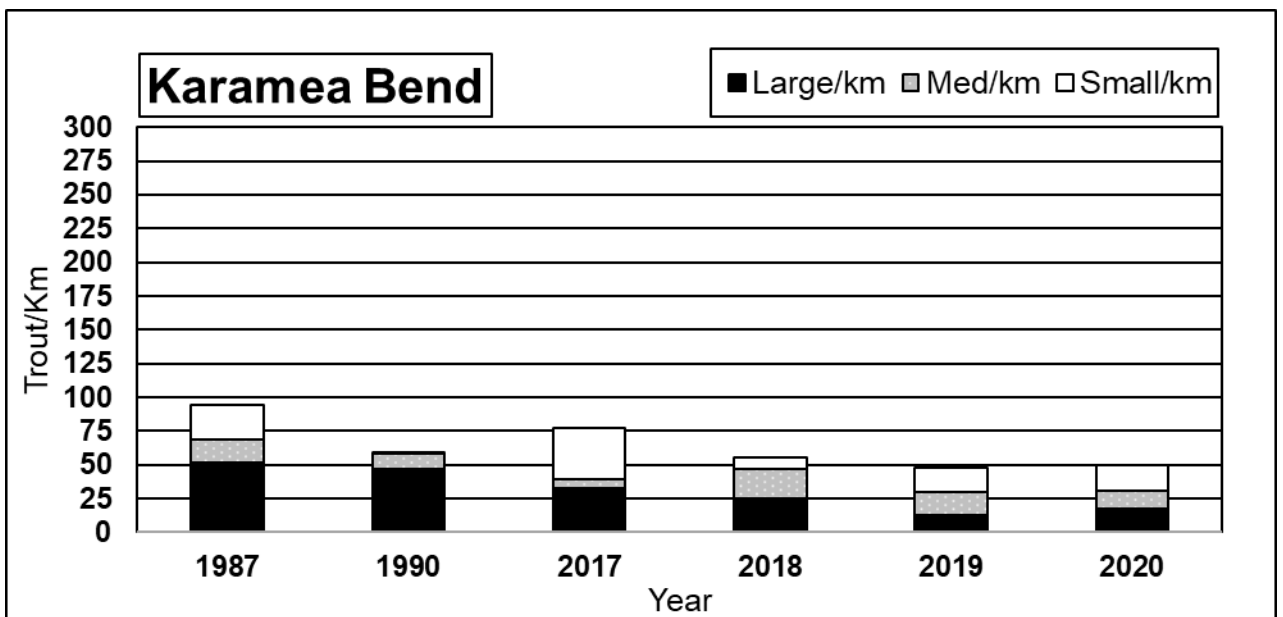


Fig 10. Number of Brown Trout recorded during drift dive surveys at the Karamea River, bend 1987-2020.

Discussion

Mawheraiti/Inangahua

Fish abundance in the Mawheraiti River continues to fluctuate following the poor 2011-2015 period. While the SH7 site has improved and appears to have stabilised the Mirfin site declined again this season with low fish numbers recorded. Research has begun to gain a better knowledge and 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. The higher number of larger fish, in some cases extremely large well-conditioned fish, was the result of the mega beech mast event recorded in 2019. The resulting high numbers of rodents resulted in an abundance of food for the local trout population.

Upper Grey River

Above average numbers of extremely large well-conditioned fish were observed at Hospital Flat in the Upper Grey River, again the result of the mega beech mast event recorded in 2019. This was in contrast to the poorly conditioned fish observed last season. This coupled with the site becoming increasingly utilised, particularly during beech mast events means fish are potentially under increased angler pressure (Unwin 2016). Monitoring in the Upper Grey Catchment would allow a better understanding of this perceived high angler pressure.

Grey River at McVicars

This site was dived for the first time this season. The site is known to be popular with anglers and it was hoped that it would give a good comparison to the Upper Grey and Waipuna Sites. Unfortunately, the site had poor water quality and sedimentation issues, the result of a large slip creating instability upstream, particularly after rainfall events. Numbers of fish seen were low and the site will need to stabilize before it would be worth diving again.

Grey River at Waipuna

The number of fish at Waipuna were below average. This was likely the result four relatively inexperienced dive team members attempting a challenging dive and struggling to maintain good technique throughout the dive. One diver had to pull out of the dive as a result of gear failure meaning the remaining divers struggled to cover the river. In future having an experienced dive team and low river levels (likely later in the season) will help improve accuracy of the count on this river.

Karamea/Mokihinui

Dives completed upstream and downstream of the Crow River confluence in the Karamea River resulted in similar numbers of trout to that observed in 2019 although numbers of small fish were down. Further downstream at the Karamea Bend, trout numbers appear to have stabilised following a period of slow decline at this site.

The dive completed in the South Branch of the Mokihinui provided similar numbers of trout overall compared to last year although numbers of large fish were down. The dive was completed in the North Branch site for just the third time, but the results were much like the South Branch site with similar trout numbers to last year but lower numbers of large fish being recorded.

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. Consideration should be given to the benefit of continuing the counts in these fisheries. Resources may be better spent monitoring trout in more easily accessible catchments that we know have high angler usage and aren't currently monitored ie. the Waitahu and Larry's Creek.

General

Staff from the West Coast, Canterbury 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 number are adequate and experienced divers used. This season West Coast staff participated in dives of the Motueka 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.
- Reinstate monitoring of Larry's Creek and Waitahu River to gain 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

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 2019/2020

RIVER	LOCALITY	YEAR	DATE	GRID REF	DIST (km)	WIDTH (m)	Vis (m)	LARGE	MEDIUM	SMALL	TOTAL	# DIVERS
Grey R	Hospital Flat	2019	28/11/2019	211/998 - 200/988	2	20	7	38	10	3	51	5
Grey R	McVicars	2020	17/01/2020	136/080 - 131/096	1.7	30	5	21	7	6	34	7
Grey R	Waipuna	2020	17/01/2020	985/117 - 962/131	3	40	6.5	32	128	135	295	7
Inangahua R	Blacks Point	2019	28/11/2019	179/962-176/973	1.7	18	6	31	62	54	147	5
Karamea R	US Crow	2020	13/03/2020	647/899-655/903	1	30	8	43	37	7	87	6
Karamea R	DS Crow	2020	13/03/2020	655/904-656/908	0.4	30	8	12	3	4	19	6
Karamea R	Bend	2020	13/03/2020	681/951-688/967	1.9	50	8	33	24	35	92	6
Mawheraiti R	SH7 Bridge	2019	25/11/2019	043/892-033/879	1.7	20	4.1	38	186	199	423	5
Mawheraiti R	Mirfins Bridge	2019	25/11/2019	005/809-987/796	1.3	20	4.1	19	28	29	76	5
Mokihinui R	Sth Branch	2020	16/01/2020	433/555-436/570	2	30	9.5	59	27	8	94	6
Mokihinui R	Below Gorge	2020	16/01/2020	453/639-435/633	2.3	25	9.5	35	9	11	55	6