

DRIFT DIVE REPORT 2019

A summary of drift dive survey conducted by Fish & Game West Coast Region during the s 2018-2019 season.

Glen Newton, Fish & Game Officer, March 2019





DRIFT DIVE SURVEYS REPORT 2019

A summary of drift dives conducted by Fish & Game West Coast in the spring and summer of 2018/2019. Glen Newton, Fish & Game Officer, March 2019.

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 2018 and January 2019, 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 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 15 November 2018 resulted in a count of 71 small/km, 52 medium/km and 14 large/km. Numbers of fish were above average but well down on the record count obtained in February 2016.

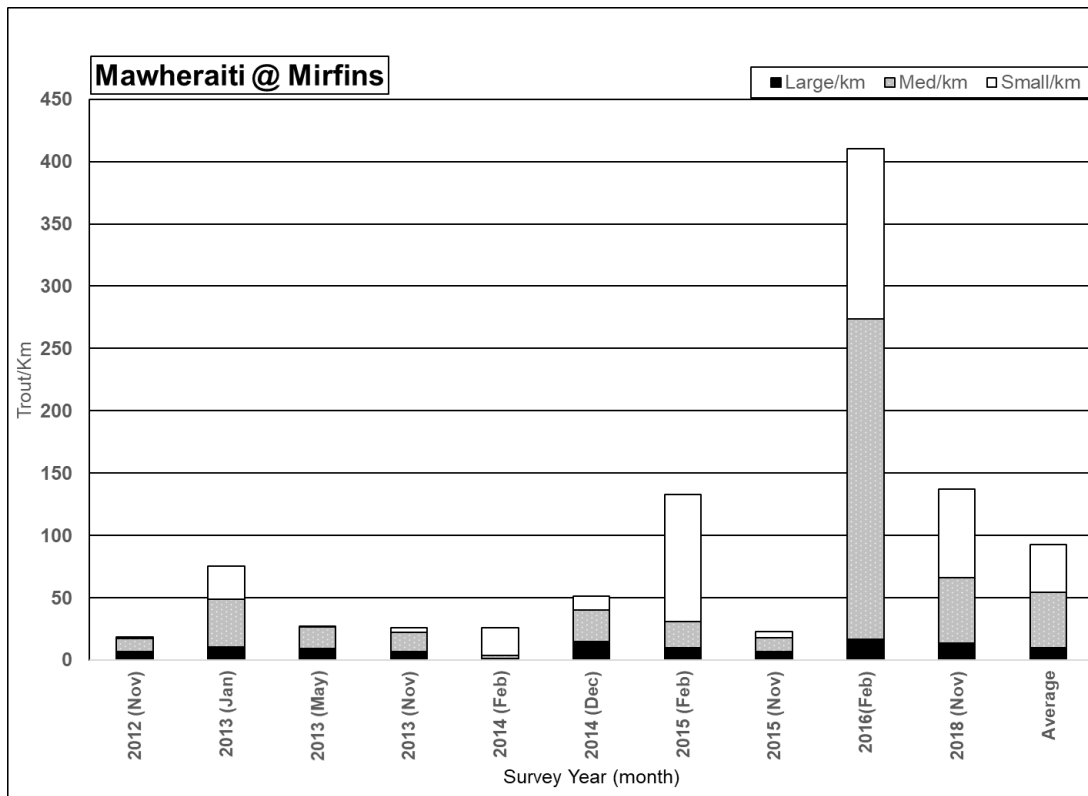


Fig 1. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River Mirfins Bridge site 2012-2018.

Mawheraiti River (SH7 Bridge)

This season the dive at the SH7 bridge on 15 November 2018 resulted in a count of 124 small/km, 104 medium/km and 26 large/km. Numbers of fish were above average 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.

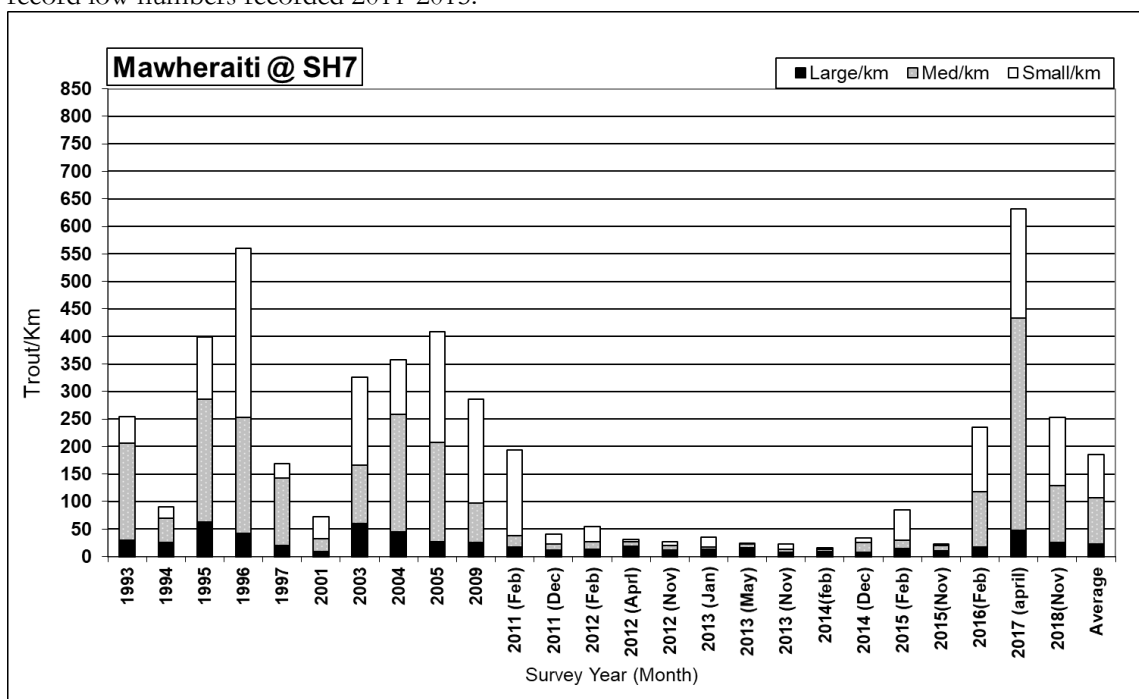


Fig 2. Number of Brown Trout recorded during drift dive surveys at the Mawheraiti River SH7 Bridge site 1993-2018.

Inangahua River (Blacks Point site)

This season the dive at Black's Point on 15 November 2018 resulted in a count of 136 small/km, 81 medium/km and 6 large/km. Numbers of fish were below average particularly for small fish.

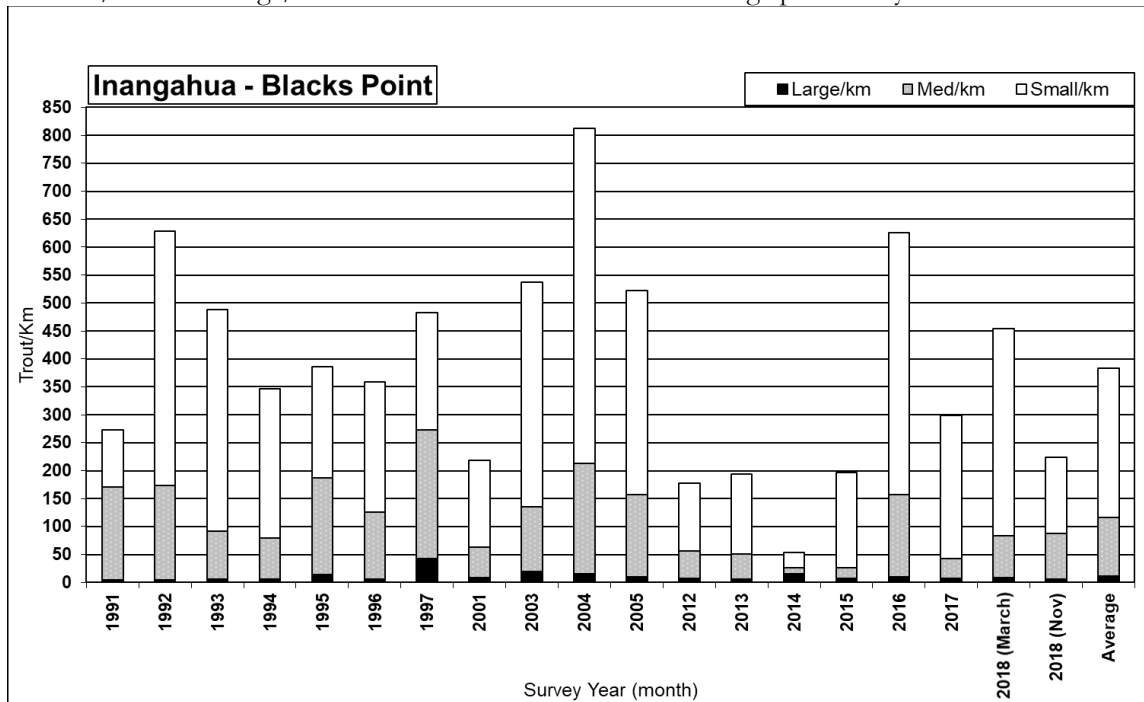


Fig 3. Number of Brown Trout recorded during drift dive surveys at the Inangahua River, Blacks Point site 1991-2018.

Grey River (Hospital Flat)

This season the dive at Hospital Flat on 28 November 2018 resulted in a count of 3 small trout/km, 4 medium trout/km and 9 large trout/km. Numbers of fish were below average and the lowest recorded since the 1998 count.

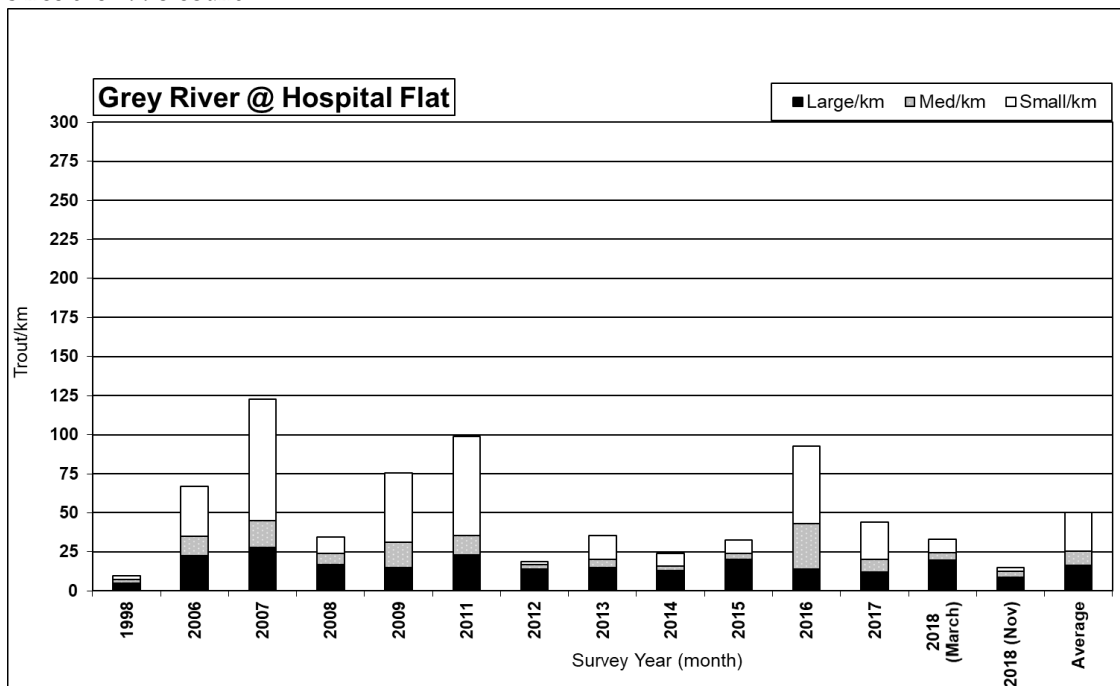


Fig 4. Number of Brown Trout recorded during drift dive surveys at the Upper Grey River, Hospital Flat 1991-2018.

Grey River (Waipuna site)

This season the dive at Waipuna on 28 November 2018 resulted in a count of 134 small/km, 58 medium/km and 11 large/km. Numbers of fish were above average with good numbers of small fish present.

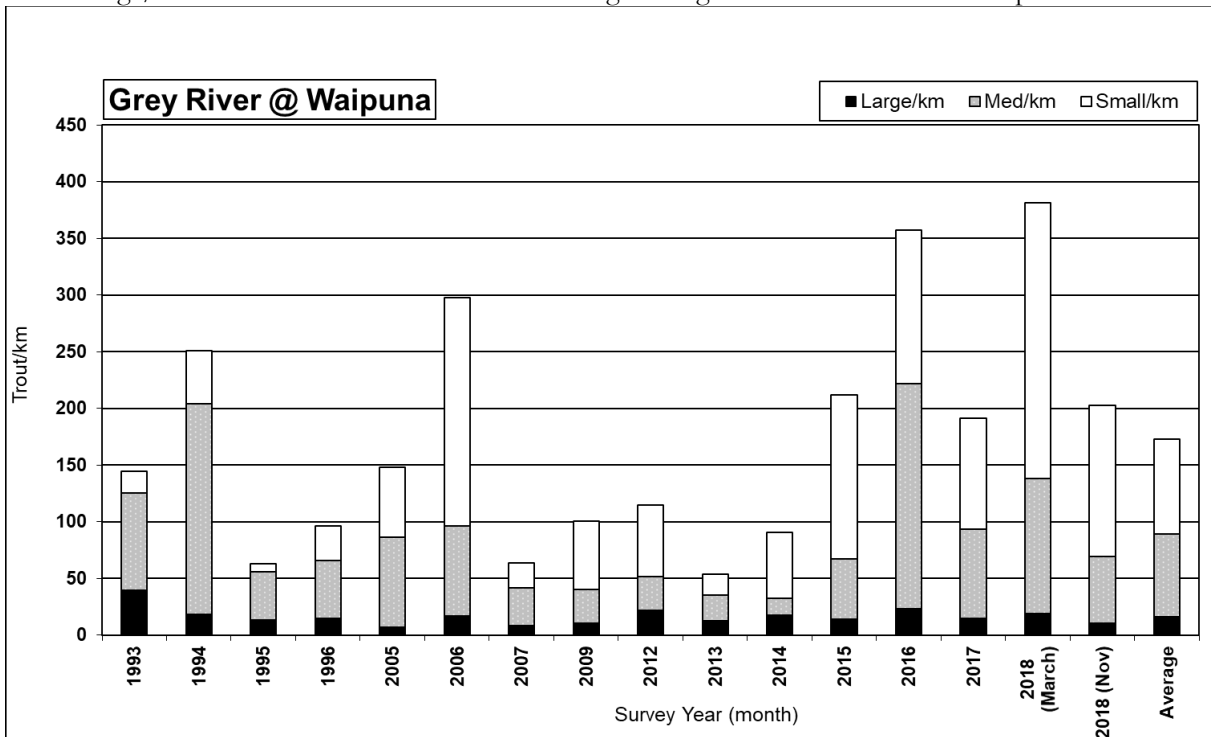


Fig 5. Number of Brown Trout recorded during drift dive surveys at the Grey River, Waipuna 1993-2018.

Mokihinui River: (South Branch site)

This season the dive at the Mokihinui South Branch on 12 December 2018 resulted in a count of 10 small/km, 4 medium/km and 40 large/km. Numbers of large fish were about average and very similar to that recorded in 1987.

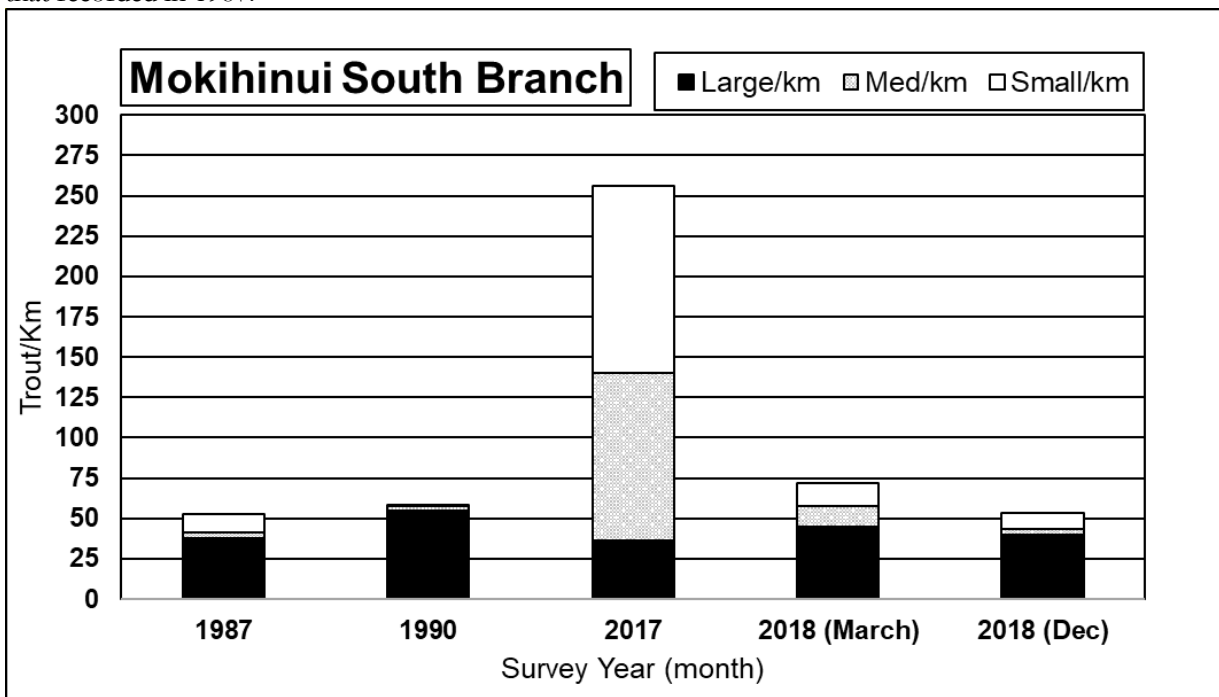


Fig 6. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, South Branch 1987 - 2018.

Mokihinui River (Below Gorge)

This season the dive at the Mokihinui North Branch site below the gorge on 12 December 2018 resulted in a count of 4 small/km, 2 medium/km and 22 large/km. Numbers of small and medium fish were down on the count done earlier in the year, but large fish had increased.

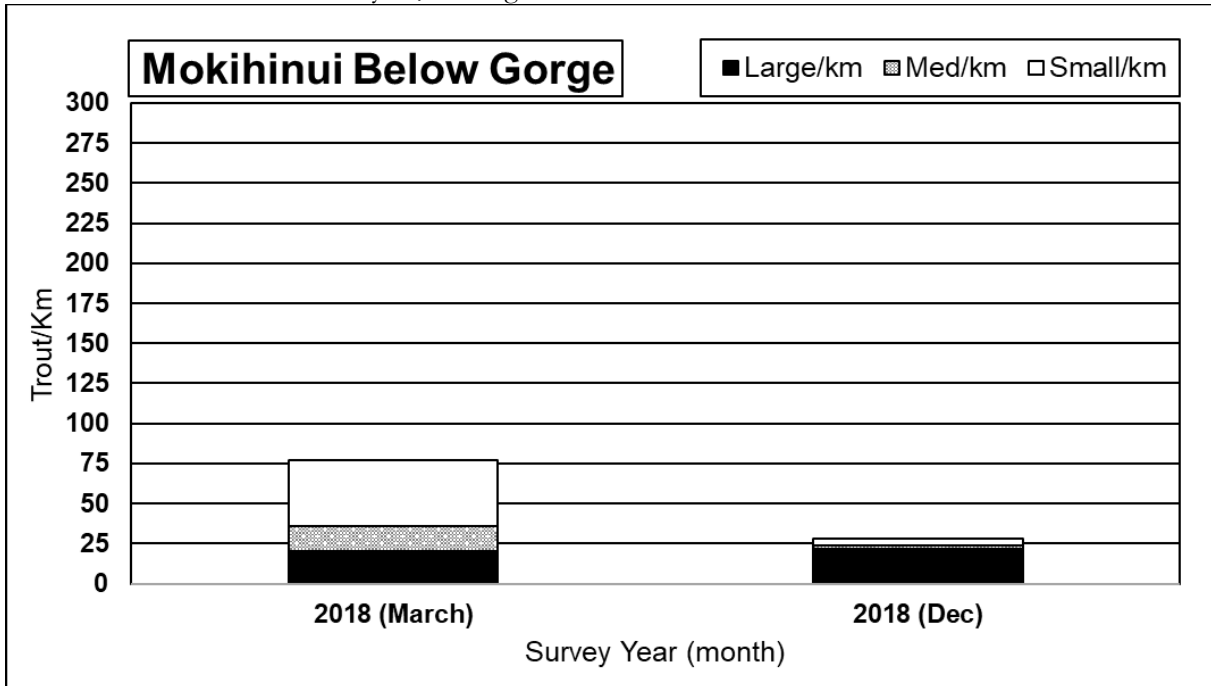


Fig 7. Number of Brown Trout recorded during drift dive surveys at the Mokihinui River, North Branch below gorge 2018.

Karamea River (Upstream of Crow)

This season the dive at the Karamea River upstream of the Crow on 29 January 2019 resulted in a count of 51 small/km, 22 medium/km and 48 large/km. Numbers of fish were very similar to last season.

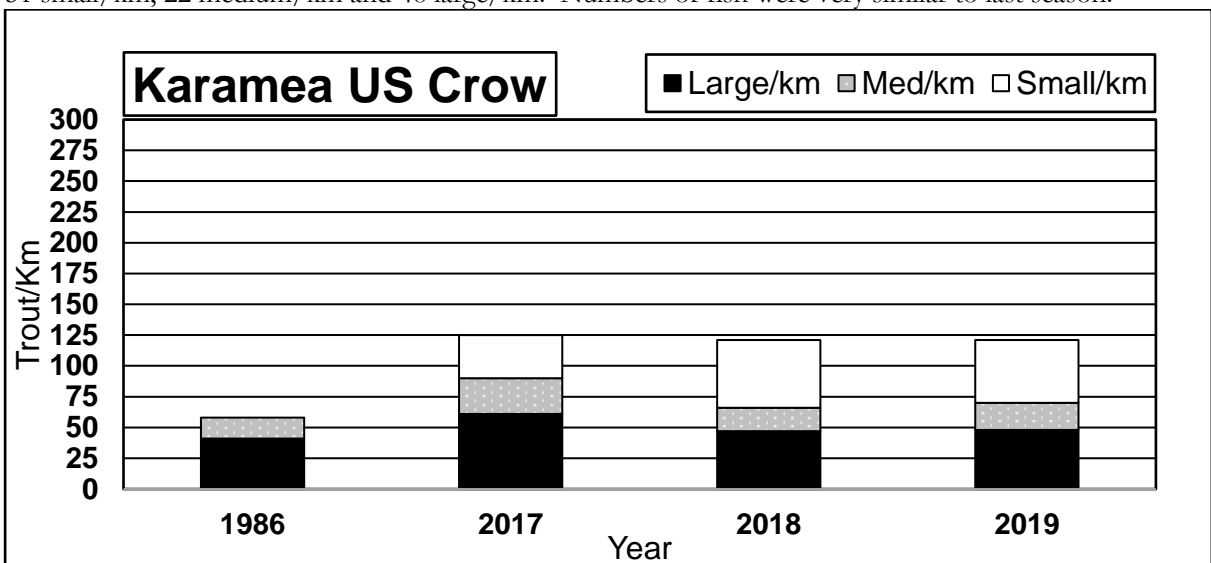


Fig 8. Number of Brown Trout recorded during drift dive surveys at the Karamea River, upstream of Crow 1986- 2019.

Karamea River (Downstream of Crow)

This season the dive at the Karamea River downstream of the Crow on 29 January 2019 resulted in a count of 85 small/km, 38 medium/km and 48 large/km. Numbers of fish were the highest recorded to date.

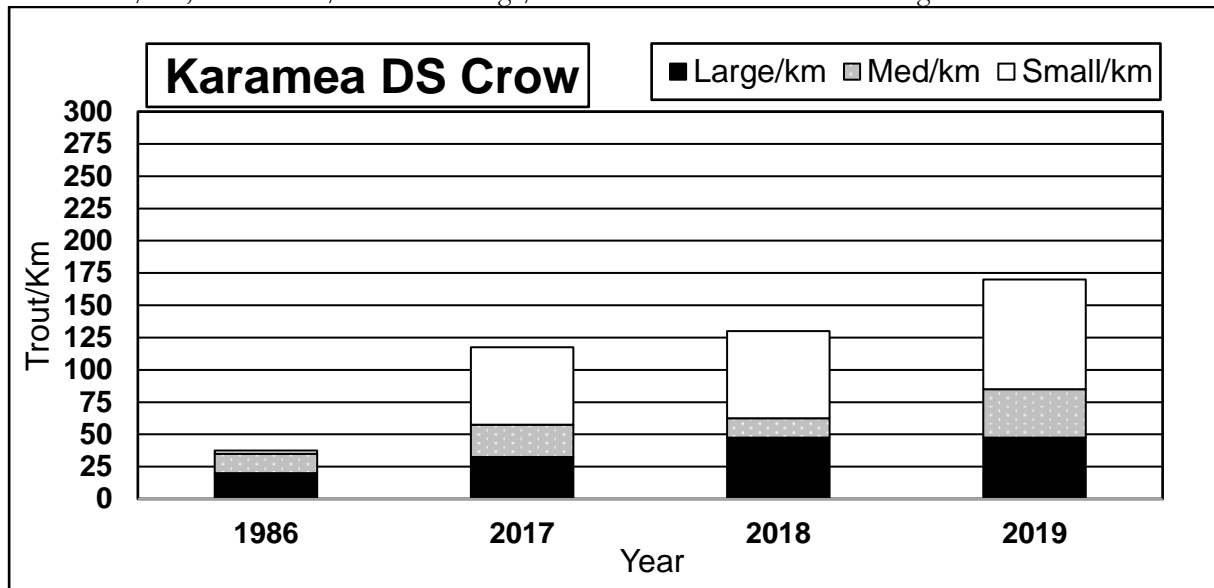


Fig 9. Number of Brown Trout recorded during drift dive surveys at the Karamea River, downstream of Crow 1986 - 2019.

Karamea River (Karamea Bend)

This season the dive at the Karamea Bend on 29 January 2019 resulted in a count of 18 small/km, 17 medium/km and 13 large/km. This site has steadily declined in numbers, particularly large fish, since counts began.

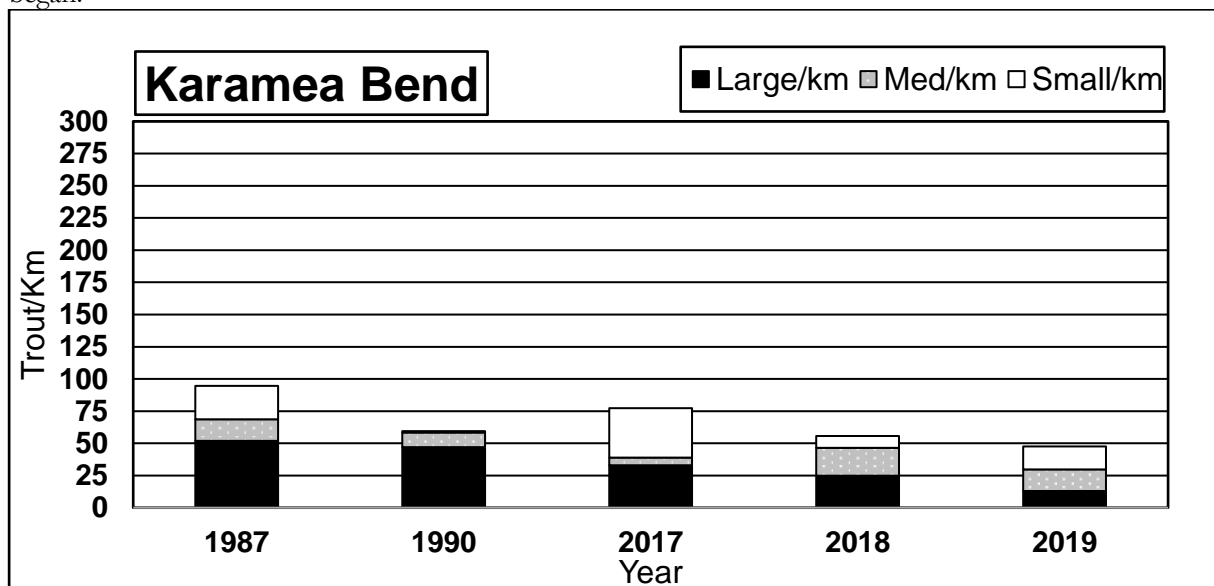


Fig 10. Number of Brown Trout recorded during drift dive surveys at the Karamea River, bend 1987-2019.

Discussion

Mawheraiti/Inangahua

The improvement in fish abundance in the Mawheraiti River following the poor 2011-2015 period is a positive sign. This is mostly attributable to increased small fish abundance suggesting there has been improved spawning since 2016. Gaining a better knowledge and understanding of factors influencing recruitment and fish dispersal would be beneficial to helping manage this sensitive fishery.

The low number of fish, particularly small 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. Later in a hot season with low flows and warm water, fish will move out of side streams/upper reaches, down to the mid reaches where they seek refuge in deeper, cooler pools. Blacks Point has several deep pools in which fish can congregate later in the season increasing counts undertaken then. Also, completing the count in November compared to March means juveniles from the previous spawning season are less likely to be seen and some large fish may be still holding in spawning streams, protecting reeds and/or predated on young.

Upper Grey River

Low numbers of poorly conditioned fish were observed at Hospital Flat in the Upper Grey River. Several factors could be contributing to this result. Early in the season fish are likely to be in poor condition if they have migrated significant distances to reach spawning grounds. Flood disturbance in recent years also appears to have impacted on food availability limiting the sites carrying capacity. Warm summers can lead to fish congregating in deep pools and this coupled with the site becoming increasingly well-known means fish are potentially under increased angler pressure (Unwin 2016). Monitoring in the Upper Grey Catchment would allow a better understanding of this perceived angler pressure.

Grey River at Waipuna

Overall number of fish at Waipuna were above average, particularly small fish, although well down on the count done earlier in the year. This is of no surprise given it's a section of deep pools in which trout seek refuge following a hot summer. Given the latest count was completed in November trout are still likely to be well spread-out, including juveniles and large trout who could still be in smaller side streams (very similar to Blacks Point discussion).

Karamea/Mokihinui

Dives completed upstream and downstream of the Crow River confluence in the Karamea River resulted in very similar or slightly higher trout numbers to that observed in 2018. Further downstream at the Karamea Bend site, trout numbers continue to drop from previous dives of this site. Habitat may have changed in this area as the pools are slow moving with large areas of fine silt, and in general appear to be of low productivity in fishery terms. Anglers have said that this section had fished well in the past.

The dive completed in the South Branch of the Mokihinui provided far fewer small and medium sized trout than last year meaning results were more like that observed in 1987 and 1990. The lack of small fish could be partly due to the count being completed early in the season but also the low river flows since early winter. Low river flows reduce habitat and therefore increase predation on small trout by both large trout and other predators. The dive was completed in the North Branch site for just the second time, but results were like the South Branch site with low numbers of small/medium 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. Only the Karamea Bend site has shown continued decline and this maybe attributable to decline in habitat rather than angler pressure.

General

Staff from the West Coast, Canterbury and Nelson Marlborough Fish & Game Regions and local volunteers assisted with the dives. Having the support of other Fish & Game Regions is important to ensure diver numbers are adequate. 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 assist with neighbouring regions drift dive programmes on a reciprocal basis to obtain numbers where necessary.

- Continue to gain a better understanding of the Mawheraiti River by undertaking a recruitment and fish dispersal study to help future management of this sensitive fishery.
- Undertake monitoring of the Upper Grey Catchment to gain better understanding of perceived high angler pressure.
- 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, Vaughan Lynn, Scott Pearson, Arthur Perkins, Riley Perkins, Kerry Gordon, John Hughes and Cody Fairhall.

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 2018/2019

RIVER	LOCALITY	YEAR	DATE	GRID REF	DIST (km)	WIDTH (m)	Vis (m)	LARGE	MEDIUM	SMALL	TOTAL	# DIVERS
Grey R	Hospital Flat	2018	28/11/2018	211/998 - 200/988	2	20	7	17	8	5	30	6
Grey R	Waipuna	2018	28/11/2018	985/117 - 962/131	3	40	6.5	32	175	401	608	8
Inangahua R	Blacks Point	2018	15/11/2018	179/962-176/973	1.7	18	5.9	10	138	232	380	5
Karamea R	US Crow	2019	29/01/2019	647/899-655/903	1	30	8.8	48	22	51	121	6
Karamea R	DS Crow	2019	29/01/2019	655/904-656/908	0.4	30	8.8	19	15	34	68	6
Karamea R	Bend	2019	29/01/2019	681/951-688/967	1.9	50	8.8	24	31	33	88	6
Mawheraiti R	SH7 Bridge	2018	15/11/2018	043/892-033/879	1.7	20	4	44	176	211	431	5
Mawheraiti R	Mirfins Bridge	2018	15/11/2018	005/809-987/796	1.3	20	4.2	18	68	92	178	5
Mokihinui R	Sth Branch	2018	12/12/2018	433/555-436/570	2	30	8	78	7	19	104	6
Mokihinui R	Below Gorge	2018	12/12/2018	453/639-435/633	2.3	25	7.5	50	5	9	64	6