2024-25 Sea-Run Salmon Management

Central South Island and North Canterbury regions

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Executive Summary

Anglers are required to obtain a sea-run salmon licence to be able to fish for sea-run salmon in the Central South Island and North Canterbury Fish & Game regions. This licence allowed anglers to harvest a season bag limit of two salmon, and anglers were required to record the details of harvested salmon on their season bag limit card. North Canterbury and Central South Island Fish & Game issued 10,253 sea-run salmon licence endorsements in the 2024-25 season, a decrease of 1,369 on the previous season. By the deadline, Fish & Game received 1,441 voluntary season bag card returns. The remainder of harvest by anglers that hadn't returned their information was then estimated by phone survey.

During the 2023-24 sea-run salmon season, anglers harvested an estimated 175 salmon in the North Canterbury and Central South Island Fish & Game regions, a marked decrease on the previous season. The combined live spawning estimate for the Rakaia, Rangitata and Waimakariri rivers (three indicator rivers) was 900 salmon and places the status of the fishery in the 'severe' management band (0 – 1200). This corresponds to a season bag limit of one salmon for the 2025-26 season, in accordance with the management strategy.

The total salmon run for an individual river is calculated by adding the total spawning estimate for that season to the total estimated harvest for that season. The total run for the Rakaia River was 684 salmon, The total run for the Rangitata River was 128 salmon, and the total run for the Waimakariri River was estimated to be 243 salmon. The combined total wild run for the three indicator rivers in the 2024/25 season was 1057 salmon.

Prior to the introduction of the management strategy, the proportion of the salmon run escaping anglers and reaching the spawning grounds had been low. This season, the three rivers achieved 89% (Rakaia), 73% (Rangitata) and 87%(Waimakariri) of the run reaching the spawning grounds, which is considered successful in terms of the original goal of the strategy however populations are at a level where further restrictions may need to be considered to avoid the fundamental extinction of species.

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1.0 Sea-run salmon licence

In order to fish for sea-run salmon in the Central South Island and North Canterbury Fish & Game regions, anglers must obtain a sea-run salmon licence[1] which includes a bag limit card for recording fish harvest details. The 2024-25 season was the fourth season in which a licence was required to fish for sea-run salmon. With the high proportion of licence holders that did not go fishing for sea-run salmon in the 2023-24 season (Sanders Garrick, 2024), a decrease in licence sales was expected for the 2024-25 season.

By the conclusion of the 2024-25 season, a total of **10,253** licences had been issued, a decrease of 1,369 on the previous season (Table 1.1). Of these, 40.6% percent of licences were issued in Central South Island and 50.9% in North Canterbury. This constituted 91.5% of all licences sold in New Zealand. The remaining 9% of licences were sold predominantly to other South Island regions (Otago [3.7%], Nelson/Marlborough [2%], Southland [1.3%], and West Coast [0.5%]). All North Island regions combined comprised only 1% of all licence sales. These proportions were similar to the previous season, with only a small increase in the proportion of licences sold in Central South Island, and a corresponding decrease in all other regions (Figure 1.1).

Table 1.1. Number of sea-run salmon licences issued each year since its introduction in the 2021-22 season across South Island regions and combined North Island regions.

Licence Region	*2021-22*	*2022-23*	*2023-24*	*2024-25*
Nelson/Marlborough	567	437	280	200
West Coast	120	93	64	47
North Canterbury	5,081	6,385	5,899	5,222
Central South Island	2,603	4,882	4,542	4,163
Otago	655	625	512	382
Southland	216	257	193	135
All North Island regions	196	180	132	104
Total	9,438	12,859	11,622	10,253

[1] For the purposes of this report, from here on sea-run salmon licences will simply be referred to as ‘licences’.

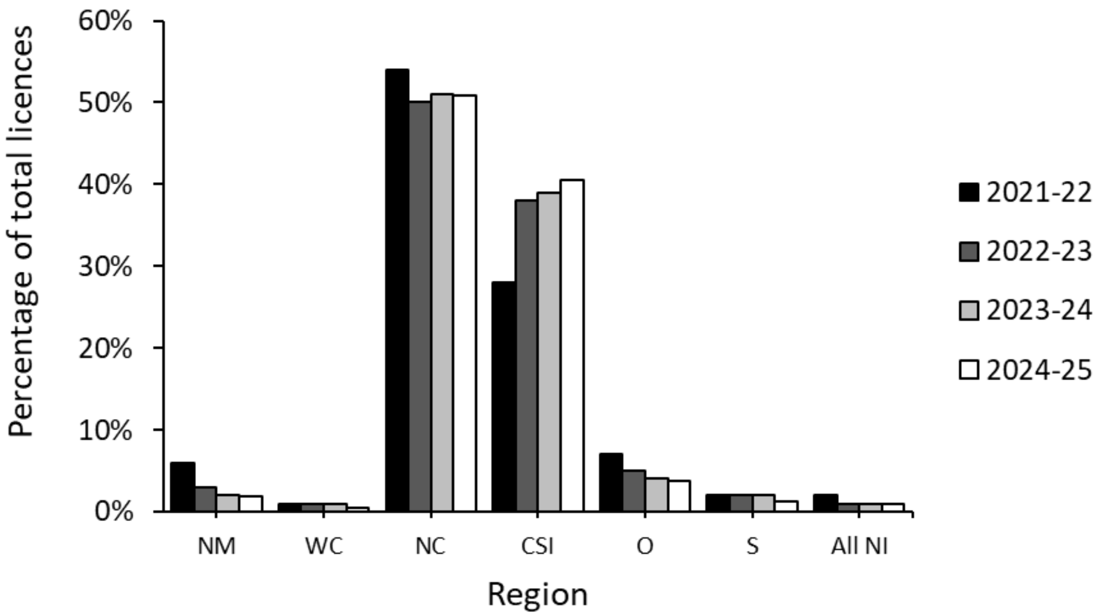

Figure 1.1. Percentage of total sea-run salmon licences issued by each South Island region (N/M=Nelson/Marlborough, WC=West Coast, NC=North Canterbury, CSI=Central South Island, O=Otago, S=Southland) and combined North Island regions (All NI).

Whole season Adults held the largest proportion of licences (44.6%), followed by Family (28.9%) and Loyal Seniors (12.7%) (Table 1.2). The slight reduction in total licence sales compared to the 2023-24 season was reflected in a decrease across all whole-season licence types, though proportions remained largely unchanged (within 1%) from the previous season (Figure 1.2).

Table 1.2. Comparison of number of sea-run salmon licences issued in the 2021-22, 2022-23 and 2023-24 seasons across whole season licence types.

Licence type	*2021-22*	*2022-23*	*2023-24*	*2024-25*
Adult	4,560	6,021	5,253	4,568
Family	2,841	3,976	3,442	2,968
Loyal Senior	1,321	1,495	1,402	1,300
Junior	307	560	575	530
Child	165	370	347	319
Local Area	222	352	318	303
Non-Resident	22	59	285	265
Day (in error)	0	26	0	0
Total	9,438	12,859	11,622	10,253

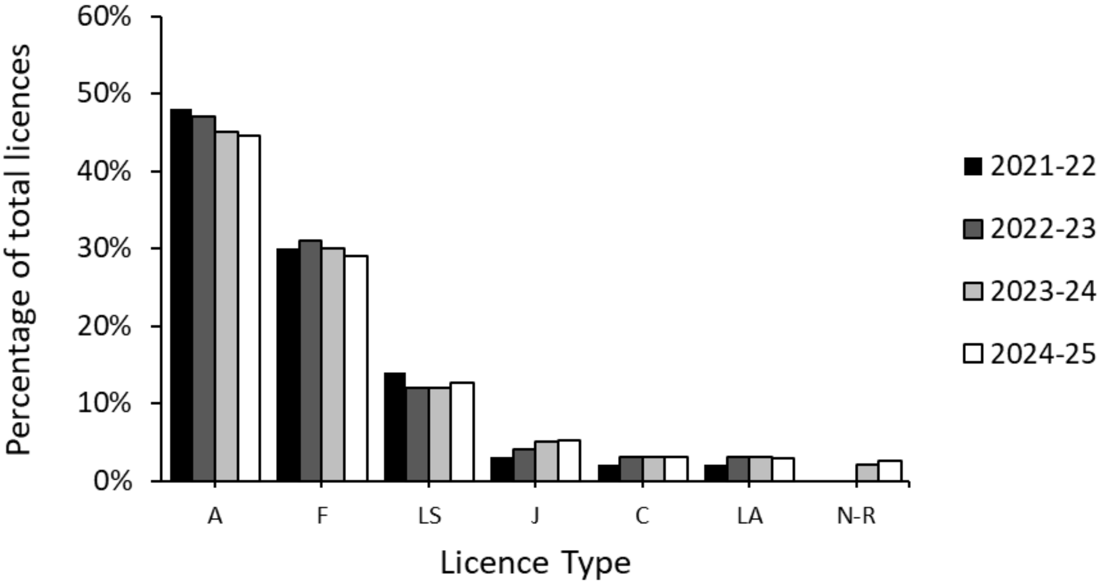

Figure 1.2. Percentage of total sea-run salmon licences issued by whole season licence type (A=Adult, F=Family, LS=Loyal Senior, J=Junior, C=Child, LA=Local Area, N-R=Non-resident). Sea-run salmon licences issued to day licence holders in error are not shown.

Fifty-four percent of anglers who purchased a 2024-25 sea-run salmon licence also purchased a sea-run salmon licence during the 2023-24 season. This constitutes just over 5,500 anglers. Of those, around 4,100 also purchased a sea-run salmon licence during the 2022-23 season. An additional 700 anglers ‘reactivated’ and purchased their sea-run salmon licence during the 2022-23 season and the 2024-25 season, but not during the 2023-24 season. The approximate 4,000 anglers who have consistently purchased a sea-run salmon licence each year indicates a “core” group of sea-run salmon anglers which is similar to sea-run salmon angling recorded during harvest surveys prior to the introduction of the season bag limit (NCFG & CSIFG, 2021).

2.0 Sea-run Salmon Harvest

2.1 Introduction

Fish & Game manages sea-run salmon in the North Canterbury and Central South Island regions using a seasonal bag limit. Anglers who purchase a licence to fish for salmon receive a bag limit card, which they are required to fill out immediately upon harvest of a salmon. Details listed on the card include the date and location of harvest and the sex and length of the fish. The information gathered during this survey is used to assess the health of the sea-run salmon fishery in the central eastern portion of the South Island of New Zealand, and help guide management actions in accordance with the adaptive management plan (Webb & Terry 2020).

2.2 Methods

Anglers are asked to return their bag cards following the close of season on 1 May. A random subset of anglers who did not return their bag cards were contacted during the months of May and June to ascertain the unreported harvest rate. Total harvest is estimated by calculating the mean harvest per angler, and extrapolating that number across the number of anglers who help sea-run salmon licences. Because the harvest rate is substantially different between those who voluntarily return their bag cards and those who do not, harvest from voluntary bag card returns is not extrapolated to anglers who did not return their card. Additionally, the harvest rate is substantially different between anglers who have reported salmon harvest in previous years and anglers who have not previously reported harvesting salmon. As such, we used a stratified sampling scheme to produce more accurate harvest estimates. For more detailed information on the salmon harvest survey methodology, please see report by H. Sanders Garrick (2025).

2.3 Results

2.3.1 Voluntary Card Returns

Before the 15 May cut off, we received 1,441 valid bag card returns. An additional 43 returns were received following the cut off, resulting in 1,484 total voluntary returns. Of those, 56.5% reported that they did not fish for sea-run salmon during the 2024-25 season. Nearly 40% (590 anglers) reported that they fished for sea-run salmon but did not harvest any salmon. Only 56 anglers (3.8%) reported that they harvested salmon (Figure 2.1).

2.3.2 Phone Surveys

We surveyed 814 anglers in total: 102 anglers from the known success stratum and 712 from the no known success stratum. Of the anglers surveyed, 562 (69.0%) did not go fishing, 240 (29.5%) went fishing but did not harvest salmon, and 12 (1.5%) successfully harvested salmon (Figure 2.1). Only 2 anglers (0.2%) reported successfully harvesting their limit of 2 salmon. The mean number of salmon harvested by those who went fishing was 0.06 fish/active angler (± 0.017).

Anglers who returned their bag cards voluntarily had a mean harvest rate of 0.11 fish/active angler (± 0.014), while the mean harvest of those who were surveyed during phone interviews was 0.08 fish/active angler (± 0.023). Catch rates were statistically distinct between the two groups ($F_{1,896} = 3.9$, $p = 0.048$; Figure 2.2). Therefore, we did not extrapolate data from voluntary returns to non-respondents.

Amongst anglers with known success, 76.4% of those surveyed actively participated in the 2024-25 salmon season, with an average harvest of 0.12 fish/active angler (± 0.04). Amongst anglers with no known success, 24.4% of those surveyed actively participated in the 2024-25 salmon season, with an average harvest of 0.03 fish/active angler (± 0.02). The two strata were statistically distinct ($F_{1,250} = 6.0$, $p = 0.015$; Figure 2.3).

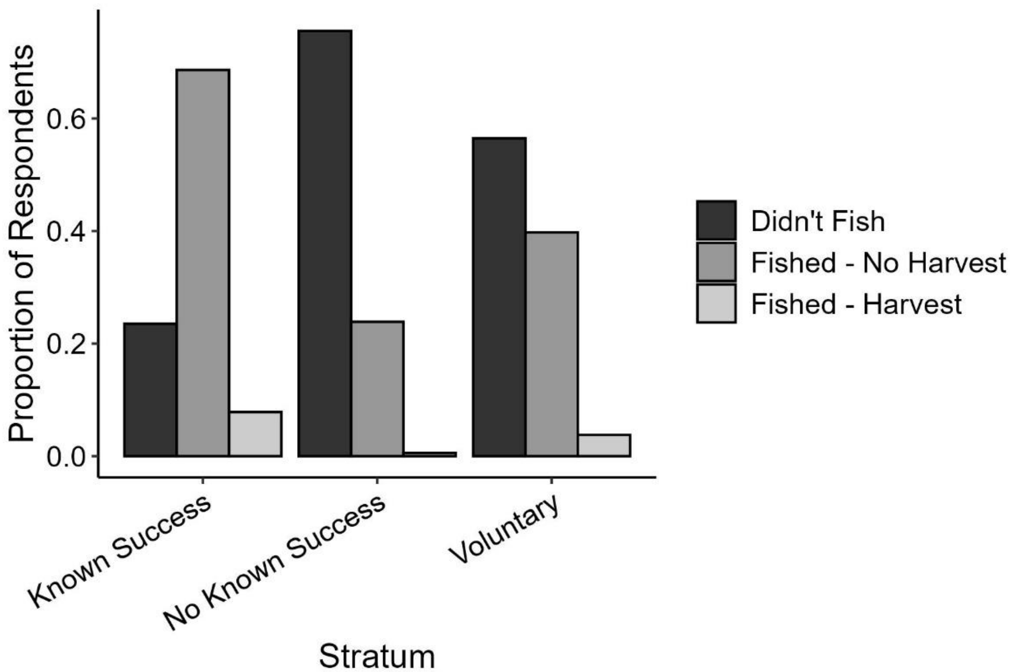

Figure 2.1. The proportion of respondents who didn't fish, fished but didn't harvest, and both fished for and harvested sea-run salmon in the North Canterbury and Central South Island regions of Fish & Game by survey stratum during the 2024-25 season.

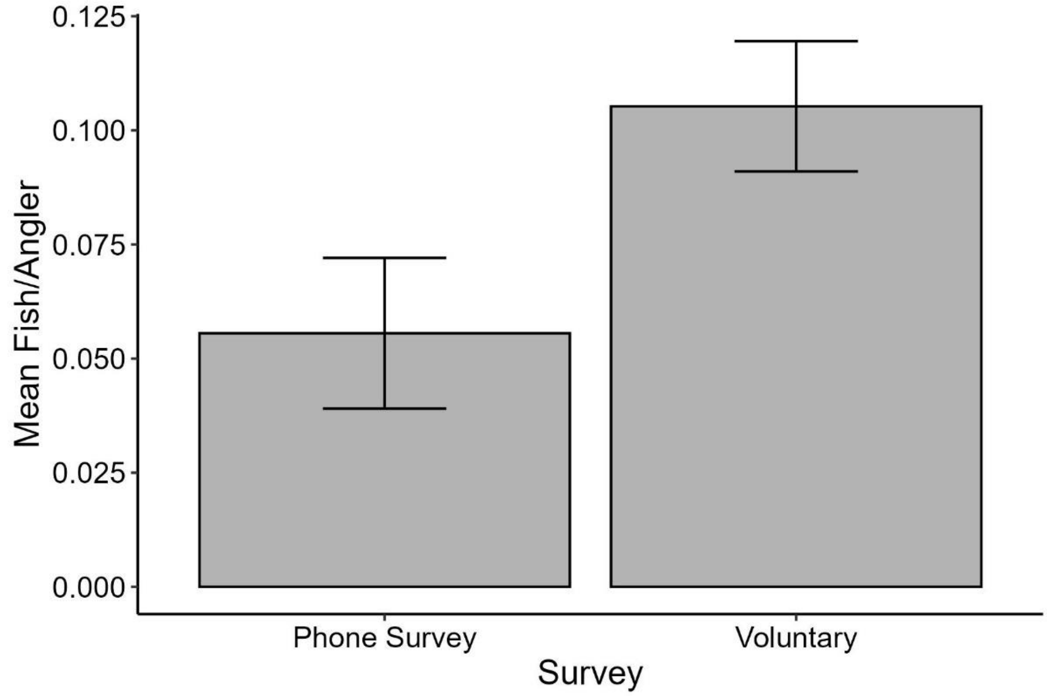

Figure 2.2. Mean harvest of sea-run salmon by survey type for active anglers in the North Canterbury and Central South Island regions of Fish & Game during the 2024-25 season. Error bars represent standard error.

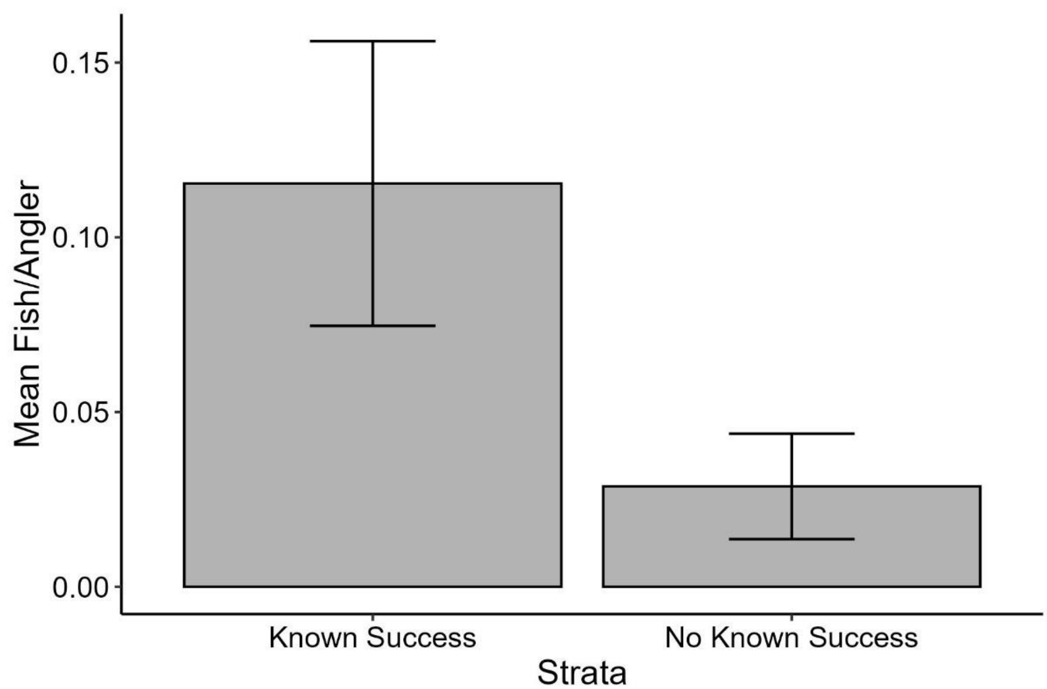

Figure 2.3. Mean harvest of sea-run salmon by phone survey stratum for active anglers in the North Canterbury and Central South Island regions of Fish & Game during the 2024-25 season. Error bars represent standard error.

2.3.3 Estimated Harvest

Voluntary respondents reported a total harvest of 68 salmon. Estimated harvest was 48.8 (± 33.8) salmon for the known harvest stratum and 57.7 (± 59.4) salmon for the no known harvest stratum. Total estimated harvest was 174.5 (± 42.3) salmon (Figure 2.4).

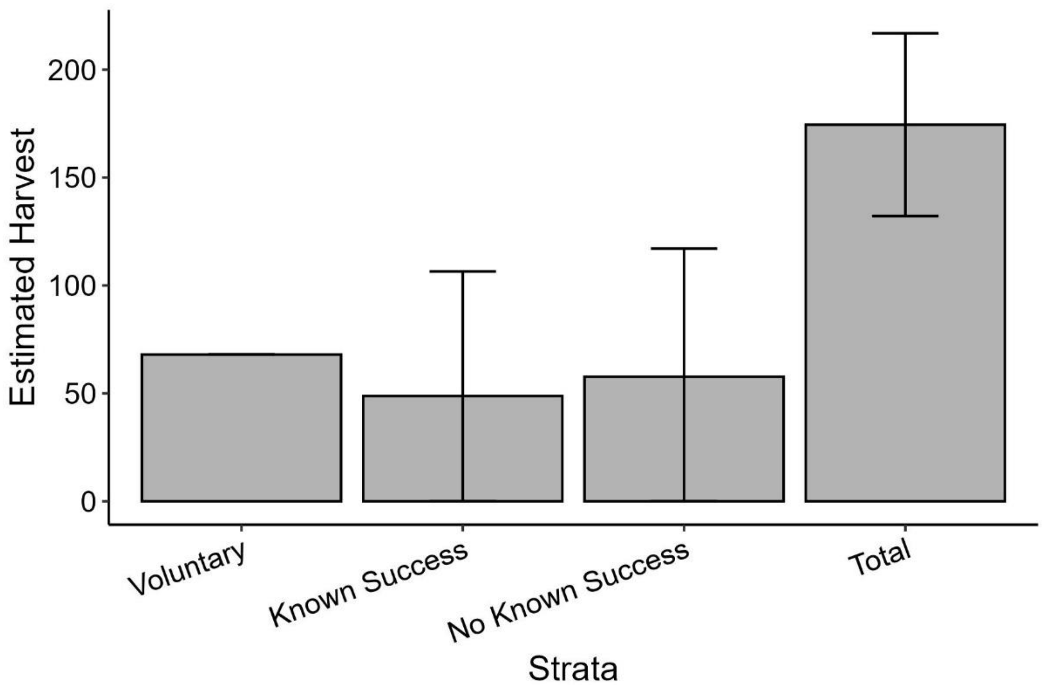

Figure 2.4. The estimated salmon harvest and 95% confidence interval on the estimate for each survey stratum, North Canterbury and Central South Island regions of Fish & Game, 2024-25 season.

2.3.4 Harvest by River

More than 90% of the reported salmon harvest occurred on the Rakaia, Rangitata, Waimakariri, and Waitaki rivers (Table 2.1). Angler effort was greatest on the Waimakariri, followed by the Rakaia. The Rangitata and Waitaki rivers had equal reported angler effort.

Harvest varied substantially by river, both within and between survey strata (Figure 2.5). Total estimated harvest was greatest for the Rakaia River (76.9 ± 55.9 salmon), followed by the Rangitata River (34.5 ± 42.0 salmon), the Waimakariri River (30.8 ± 14.4 salmon), and the Waitaki River (20.8 ± 14.6 salmon), respectively. Estimated harvest on each of the four major rivers has decreased substantially relative to the 2023-24 season.

Table 2.1. The reported harvest, estimated harvest (with 95% confidence interval), and reported number of active anglers by survey stratum for the 2024-25 sea-run salmon season in North Canterbury and Central South Island Regions of Fish & Game, broken down by each of the four major sea-run salmon fisheries.

Reported Harvest					
	All Rivers	Rakaia	Rangitata	Waimakariri	Waitaki
Voluntary	68	26	6	20	10
Known Success	9	3	1	2	2
No Known Success	5	3	2	0	0
Total	82	32	9	22	12

Estimated Harvest					
	All Rivers	Rakaia	Rangitata	Waimakariri	Waitaki
Known Success	48.8 ± 33.8	16.3 ± 17.5	5.4 ± 10.6	10.8 ± 14.4	10.8 ± 14.6
No Known Success	57.7 ± 59.4	34.6 ± 38.4	23.1 ± 31.4	NA	NA
Total	174.5 ± 42.3	76.9 ± 55.9	34.5 ± 42.0	30.8 ± 14.4	20.8 ± 14.6

Active Anglers Surveyed					
	All Rivers	Rakaia	Rangitata	Waimakariri	Waitaki
Voluntary	646	196	64	311	67
Known Success	78	22	16	13	18
No Known Success	174	54	29	71	24
Total	898	272	109	395	109

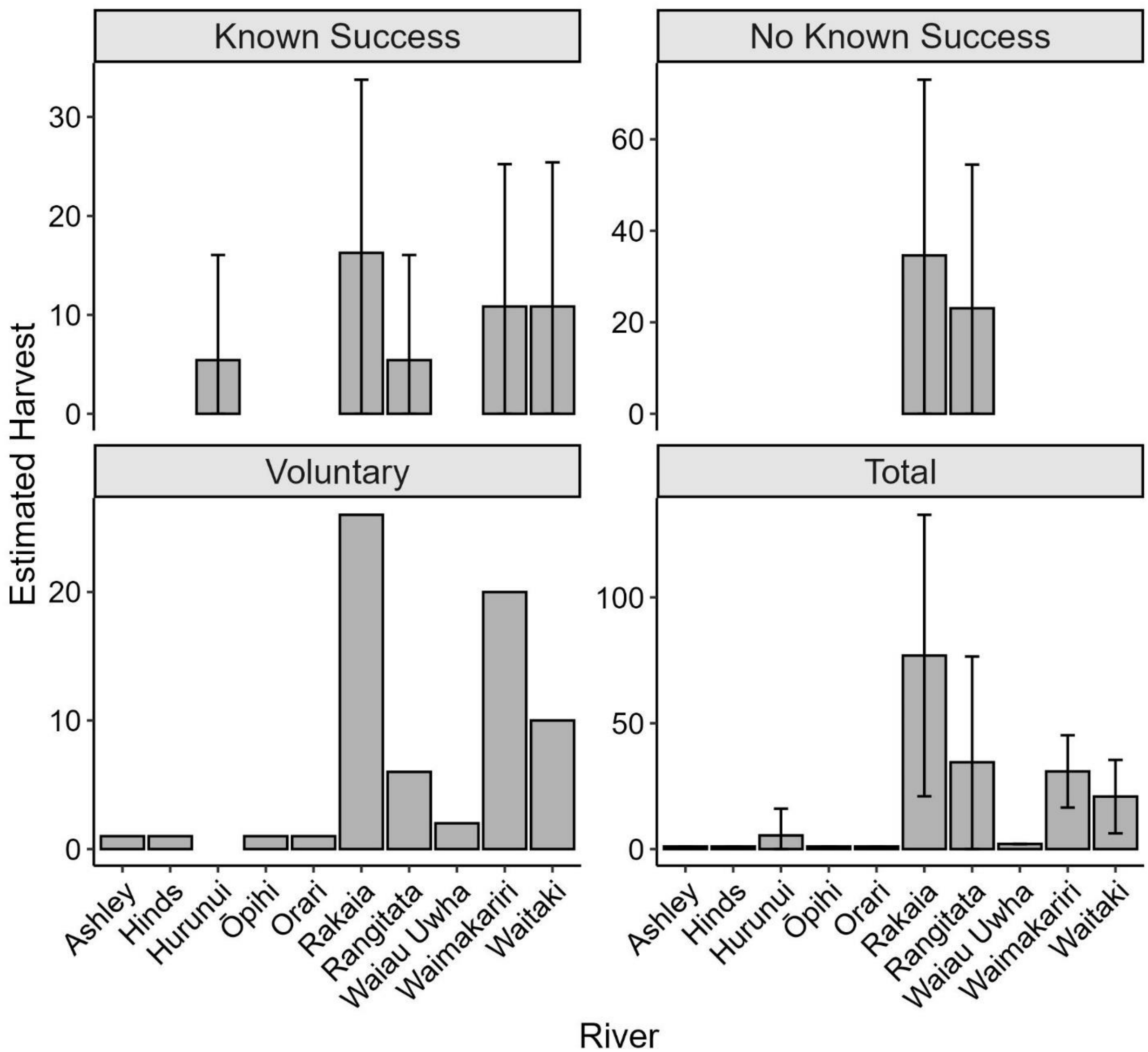

Figure 2.5. Estimated sea-run salmon harvest in the North Canterbury and Central South Island regions of Fish & Game during the 2024-25 fishing season by river for each survey stratum.

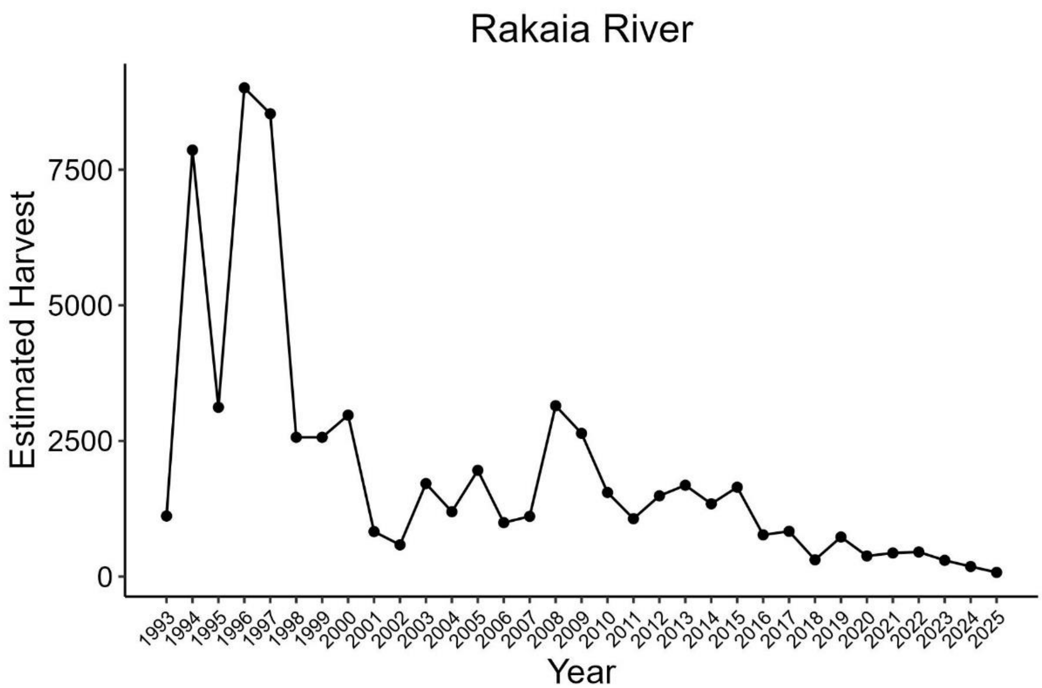

Figure 2.6. Estimated sea-run salmon harvest in the Rakaia River Catchment, 1993-2025.

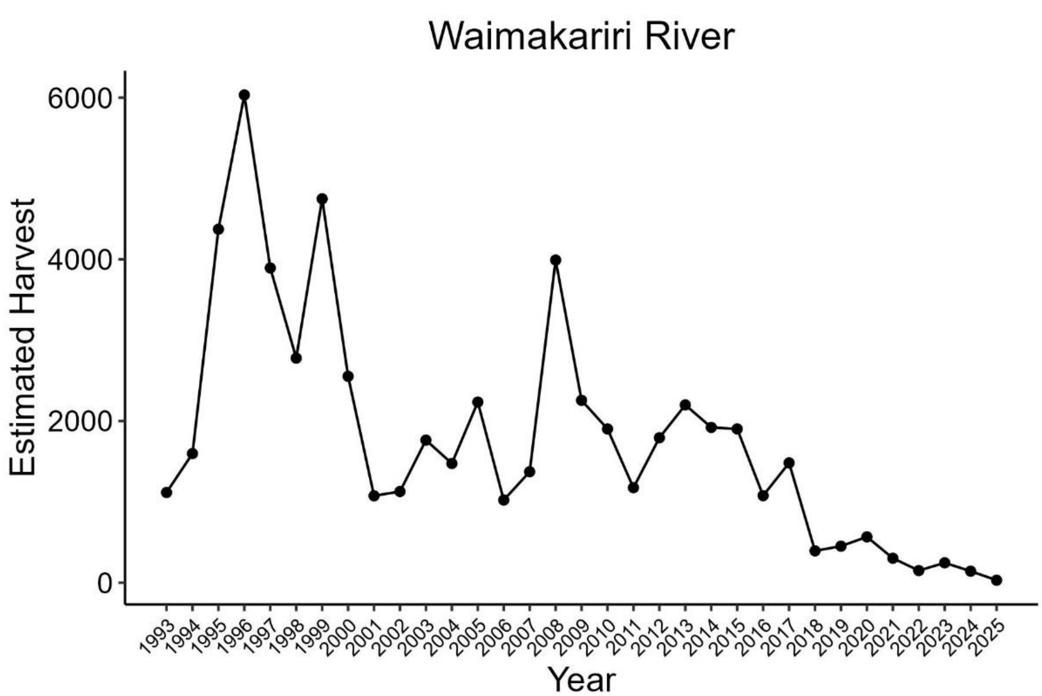

Figure 2.7. Estimated sea-run salmon harvest in the Waimakariri River Catchment, 1993-2025.

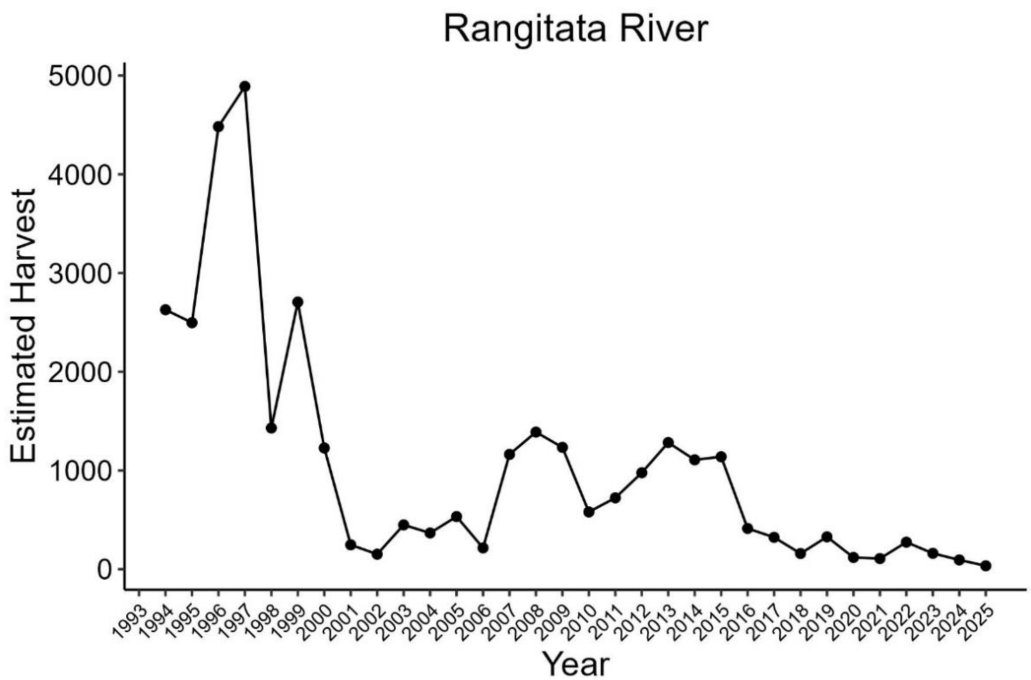

Figure 2.8. Estimated sea-run salmon harvest in the Rangitata River Catchment, 1993-2025.

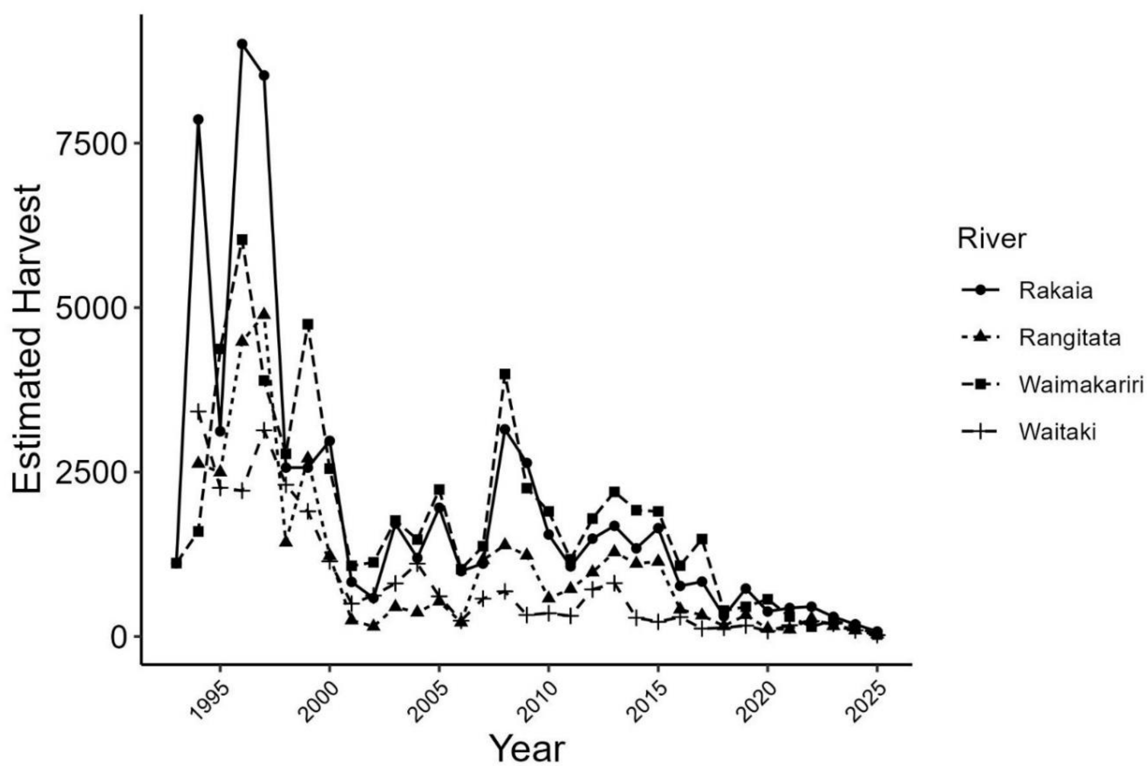

Figure 2.9. Estimated sea-run salmon harvest across the four major salmon fisheries in the North Canterbury and Central South Island regions of Fish & Game, 1993-2025.

2.3.5 Date of Harvest

The majority of salmon were harvested during February (29.5%), followed by March (26.9%), and April (23.1%). Ten percent of reported harvest occurred before the first of the year (Figure 2.10). Timing of harvest varied by river (Figure 2.11). In the Rakaia catchment, harvest ramped up steadily to a February peak and then tapered off through April. In the Rangitata catchment, nearly 90% of harvest occurred between January and February. Harvest in the Waimakariri catchment peaked in March at 55%, with 8% of harvest occurring between March and April. Nearly all of the reported catch in the Waitaki catchment occurred during April (75%). Peak harvest was earlier this season than during the 2023-24 season.

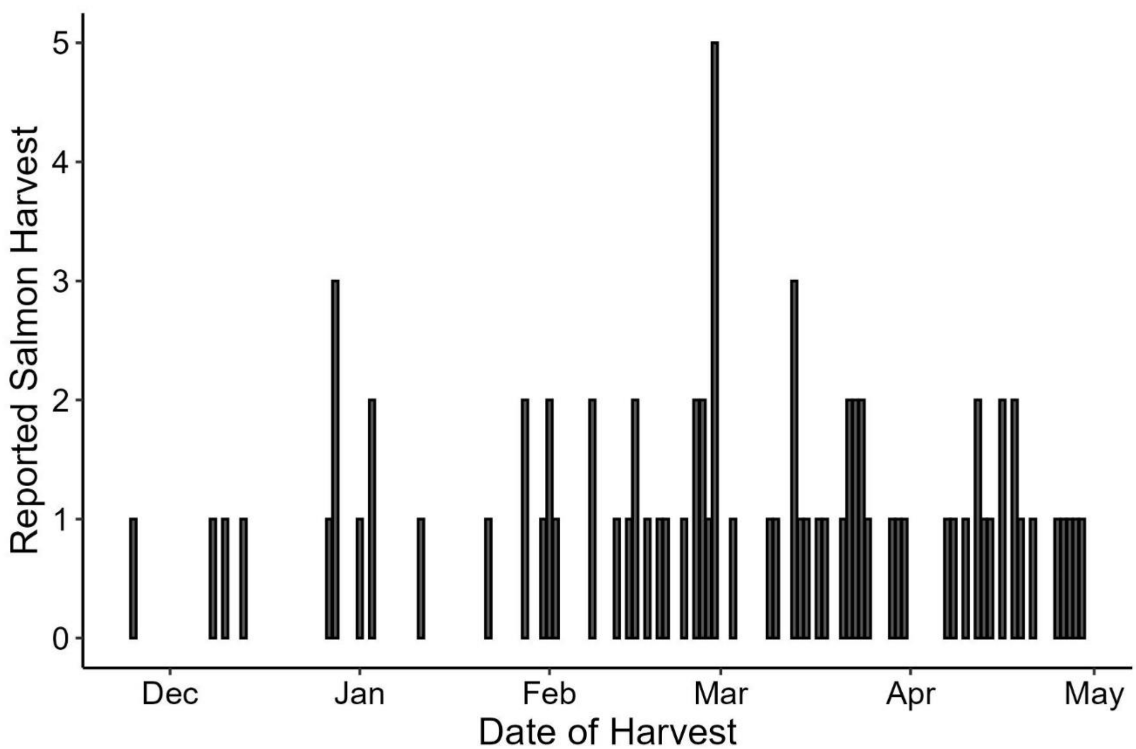

Figure 2.10. Date of harvest for all sea-run salmon harvested during the 2024-25 fishing season in North Canterbury and Central South Island Regions of Fish & Game, as reported by anglers.

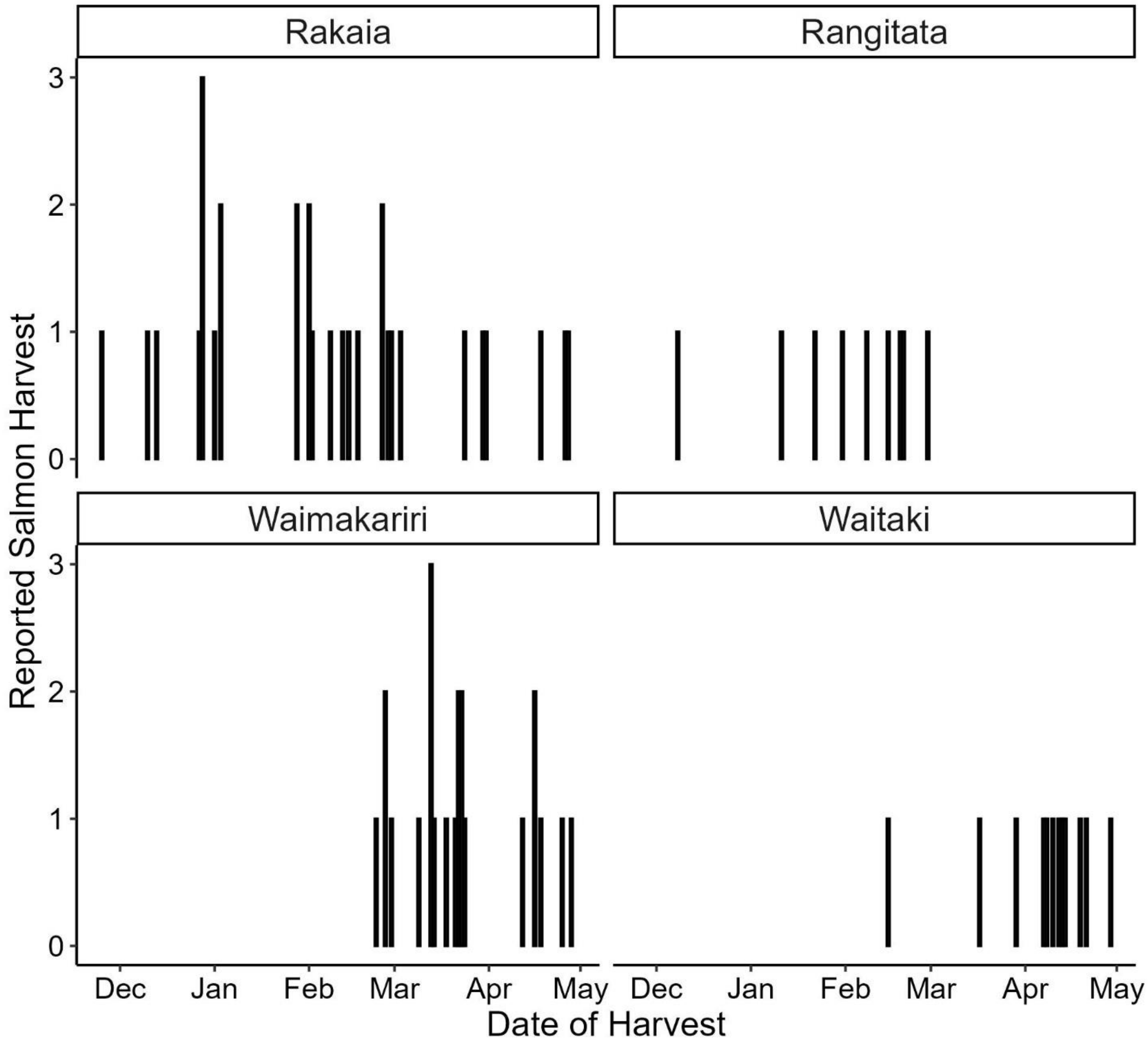

Figure 2.11. Date of harvest for sea-run salmon harvested during the 2024-25 fishing season on the four major sea-run salmon fisheries in North Canterbury and Central South Island Regions of Fish & Game, as reported by anglers.

2.3.6 Spatial Distribution of Catch

A valid river reach of catch was reported for 38 harvested salmon. Similar to the 2023-24 season, harvest appears to have been relatively evenly spread across the reaches of the major sea-run salmon rivers (Table 2.2). However, due to the small sample size it is difficult to report spatial distribution of catch with any certainty.

Table 2.2. Percent of reported sea-run salmon harvest by reach for 4 major salmon fisheries in the North Canterbury and Central South Island regions of Fish & Game during the 2024-25 season, as reported by anglers.

North Canterbury

River	Reach	Description	Harvest (%)
Rakaia	1	Mouth and tidal reaches	15.6
	2	Above tidal reaches to SH1	18.8
	3	SH1 to gorge bridge	9.4
	4	Above gorge bridge	15.6
	5	Not specified by angler	40.6
Waimakariri	1	Mouth and tidal reaches	18.2
	2	Above tidal reaches to SH1	22.7
	3	SH1 to gorge bridge	0
	4	Above gorge bridge	0
	5	Not specified by angler	59.1

Central South Island

River	Reach	Description	Harvest (%)
Rangitata	1	Mouth and lagoon	22.2
	2	Above lagoon to SH1	0
	3	SH1 to Arundel Bridge	0
	4	Arundel to bottom of gorge	22.2
	5	Gorge and above	11.1
	6	Not specified by angler	44.5
Waitaki	1	Mouth and lagoon	0
	2	Above lagoon to SH1	25.0
	3	SH1 to Stonewall	8.3
	4	Above Stonewall	0
	5	Not specified by angler	66.7

2.3.7 Size of Salmon

On average, the size of salmon harvested was similar between all four of the major sea-run salmon fisheries ($F_{3, 51} = 0.4$, $p = 0.73$). For each river, the average length of harvested salmon was larger than the reported average length from the 2023-24 season, except for the Rangitata which was similar to the 2023-24 season.

Table 2.3. Mean, maximum, and 1st-3rd quartile length (cm) of sea-run salmon harvested during the 2024-25 fishing season in North Canterbury and Central South Island Regions of Fish & Game, as reported by anglers. Values are provided for all fish reported, and by river for the four major sea-run salmon fisheries.

Length (cm)	All Rivers	Rakaia	Rangitata	Waimakariri	Waitaki

N	60	25	5	17	8
Mean	65.6	65.1	63.4	64.1	67.9
Maximum	92.0	75.0	83.0	75.0	77.0
Most Common	62 - 70	62 - 70	60 - 62	64 - 69	67 - 72

2.3.8 Fin Clips

Out of the 82 reported fish, only 2 fin clipped fish were reported – one in the Rangitata and one in the Waitaki (Table 2.4). No fin clipped fish were reported on any North Canterbury rivers.

Table 2.4. The number of fin clipped sea-run salmon harvested during the 2024-25 fishing season in North Canterbury and Central South Island Regions of Fish & Game, as reported by anglers. Values are provided for all fish reported by survey stratum, and by river for the four major sea-run salmon fisheries.

	Rakaia	Rangitata	Waimakariri	Waitaki
Voluntary	0	0	0	1
Known Success	0	0	0	0
No Known Success	0	1	0	0
Total	0	1	0	1

2.4 Discussion

Estimated harvest has declined substantially relative to the 2023-24 season. This is the third consecutive year we have observed a decline in the number of salmon harvested. On each of the four major salmon fishing rivers, the estimated harvest was less than half the previous season estimate. While harvest was reported on rivers where harvest was not detected during the 2023-24 season, the total harvest estimate constitutes a 66% reduction from the estimate from 2023-24. While there was a 12% reduction of sea-run salmon bag card holders compared to the previous season, participation rates did not change relative to previous years, indicating a reduction in angler success and not angler effort.

We caution against using the size estimates presented in this report to draw conclusions about the true size or age structure of the salmon population, as the season bag limit and very low populations could change behaviour around catch and release fishing to extend their fishing season or until a suitably large salmon is caught. It is possible that many anglers release smaller salmon, biasing the size estimates to be larger than the true average. Similarly, date of harvest can be affected in the same way so angler catch may not represent the true timing of a run. Thus, both of these metrics should be regarded carefully. Reports of fin clips should also be used with caution when estimating harvest of hatchery-origin fish as this data relies on anglers correctly identifying such fish. There has been minimal education for salmon anglers on how to identify a fin clipped fish; those new to salmon angling or those who have not been previously involved with fin-clipping may not be aware of the practice.

In addition to biasing salmon size and the timing of harvest, catch and release fishing encouraged by the seasonal bag limit may reduce harvest relative to predictions developed before the introduction of the bag. Specifically, while many anglers may have delayed harvesting their second fish in order to prolong their season, some may also have foregone harvesting a second salmon in order to fish up until the last day of season. Therefore, predictions of harvest under a bag limit developed using data collected before the introduction of a seasonal bag are likely conservative estimates.

Salmon suffer negative physiological impacts from handling and exposure to higher ambient temperatures that can lead to death, even when the fish are released. Estimates of mortality caused by catch and release fishing vary by fish treatment and environmental factors, (Raby et al. 2015). While NC & CSI Fish & Game have introduced regulations to help improve fish treatment during catch and release fishing, it will be critical to develop more robust methods to assess catch and release fishing in order to adequately estimate angling related mortality not accounted for in the harvest estimate.

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3.0 Sea-run salmon escapement

3.1 Introduction

Central South Island and North Canterbury Fish & Game regions have been conducting monitoring of sea-run salmon returns since 1993. Salmon entering rivers to spawn are either harvested by anglers (and therefore removed from the spawning population) or avoid anglers and continue upriver to spawn (escapement). Over the decades a steady decline in escapement has been observed, particularly in the late 90s and early 00s. This information has previously been used alongside angler harvest in setting daily bag limits.

Following further declines in population the mid-late 2010s, the Adaptive Management Strategy (Webb & Terry, 2020) was developed and resulted in the adoption of a season bag limit for sea-run salmon in the Central South Island and North Canterbury regions at the start of the 2021-22 season. This system continues to be adopted by both Councils. The main aim of the season bag limit was to increase the proportion of the run that escaped to the headwaters and spawned, For example before the season bag limit historic escapement proportions[2] reached as low as 35% in the Rakaia River, 54% in the Rangitata River, and 33% in the Waimakariri River.

The season bag limit for each season is determined using the ‘Threshold Management Strategy’, which depends on the previous three season’s escapement estimates for the three ‘indicator’ rivers (Rakaia River, Rangitata River, and Waimakariri River). All seasons since the introduction of the season bag limit have had a season bag limit of two salmon and in general resulted in a marked decline in the total proportion of the total run estimate being harvested by anglers on the Rakaia and Waimakariri rivers compared to pre-season bag harvest rates. Harvest proportions on the Rangitata River have not dropped as dramatically but have achieved some of the lowest harvest proportions since 1993. The season bag limit for the 2024-25 season remained at two salmon. The expectation was that the harvest proportion for this season remained similarly low compared to previous years with no season bag limit.

3.2 Methods

3.2.1 Three indicator rivers

Historically, the ‘area under the curve’ (AUC) has been used to calculate estimated escapement. The AUC method estimates total escapement based upon multiple periodic spawning counts and the residency time (RT) of the spawning fish (English et al., 1992). This method was used on all main sea-run salmon rivers from when counts began in 1993 through to 2013. Between 2013 and 2020, the AUC method continued to be used in Rangitata River estimates. However, financial constraints in the North Canterbury region meant multiple spawning counts could not take place on the main sea-run salmon rivers (including Rakaia and Waimakariri rivers), and the AUC method could not be used. Instead, between 2013 and 2020, the ‘peak count’ method was used to estimating escapement on North Canterbury rivers. This method was developed using previous seasons’ data and, while not as accurate as AUC methodology, allowed a spawning

[2] The percentage of total estimated run of salmon harvested by anglers throughout the season.

estimate to be made based off a single count at the time of peak spawning. The resumption of multiple aerial counts in 2021 in the North Canterbury region allowed for the resumption of the AUC method for all rivers.

Five aerial counts were carried out on designated spawning streams in the Rakaia, Rangitata and Waimakariri rivers in 2025 (Table 3.1). Aerial counts follow standardised methods developed by NIWA (Unwin, 1994) on the same known spawning streams each year to maintain consistency. Staff flew over each of the spawning streams, counting all visible salmon in the waterway from the designated starting point. Dead salmon are also counted in the first aerial count. Some streams (e.g., Bush Stream Inner) require staff to do foot counts as it is not possible to count from the air due to vegetation. While a tributary to the Rakaia River, Mellish Stream is counted at the same time as the Rangitata River counts as it lies within the Central South Island region. Three counts of the stream and surrounding lake edge are conducted. Due to its unique nature, Mellish Stream estimates cannot be made using AUC, and instead ‘peak count’ methodology is used to estimate spawning numbers (as was used for North Canterbury spawning streams mentioned above).

Table 3.1. List of designated spawning streams in the Rakaia, Rangitata and Waimakariri catchments counted via aerial survey used in escapement estimates.

Catchment		
Rakaia River	*Rangitata River*	*Waimakariri River*
Double Hill Flats	Deep Creek	Bealey Spring
Double Hill Stream	Deep Stream	Bush Stream (inner and outer)
Glenariffe Stream	Black Mountain Stream	Cass Hill Stream
Goat Hill Stream	Potts Fan	Cora Lynn Stream
Hydra Waters	Brabazon Fan	Lower Casey Stream
Manuka Point Stream	Erewhon Stream	One Tree Swamp
Mellish Stream		Sawmill Stream
Wilberforce Swamp		Thompson Stream
		Turkey Flat Stream
		Winding Creek

Once all aerial counts were completed, escapement estimates were made for each spawning stream using the Salmon AUC programme in Matlab (Version 1.0, NIWA). For each river catchment, estimates for each stream were added together to give the total escapement estimate.

3.2.3 Total run size and harvest/escapement proportions

Escapement estimates are added to harvest estimates to calculate a total estimated run size, i.e., how many salmon were estimated to be in the whole season’s spawning run, regardless of whether they were harvested by anglers or made it to the spawning streams. Expanding on this, the harvest proportion can be calculated for each river by dividing the estimated harvest by the estimated total run. Conversely, the “escapement proportion”, i.e., the proportion of the run that successfully made it to the spawning streams, can be calculated in the same way by dividing the population index by the total estimated run.

3.3 Results

3.3.1 Rakaia River

The escapement estimate for the Rakaia River in the 2024-25 season is **608** salmon. For individual stream estimates, refer to Appendix Table 7.1. This is lower than the 2023-24 season estimate (878 salmon) and is the lowest count on the Rakaia since counts started in 1993. However, not all individual streams had their lowest recorded spawning estimates within this total. Adding harvest, the total estimated run size for the Rakaia River is **684** salmon (Figure 3.1). The estimated escapement proportion is **89%** which is a six percent change from the previous season, and the highest escapement proportion since recording began in 1993. (Figure 3.2).

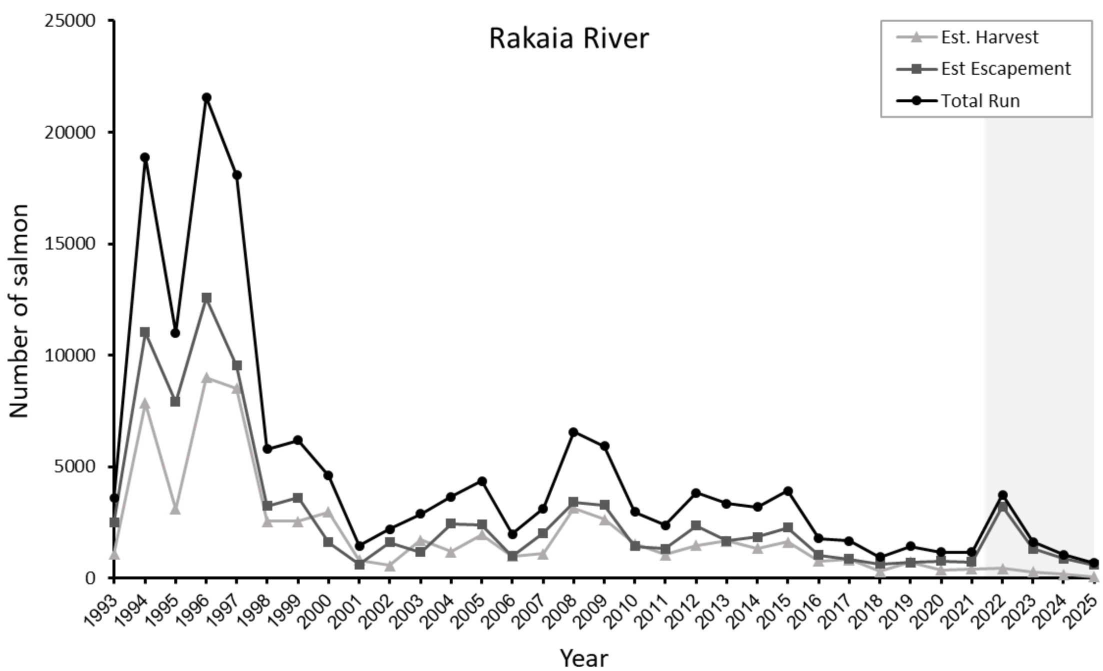

Figure 3.1. Estimated sea-run salmon escapement, angler harvest and total run on the Rakaia River, 1993-2025. Grey shaded area indicates years in which the sea-run season bag limit system was in place.

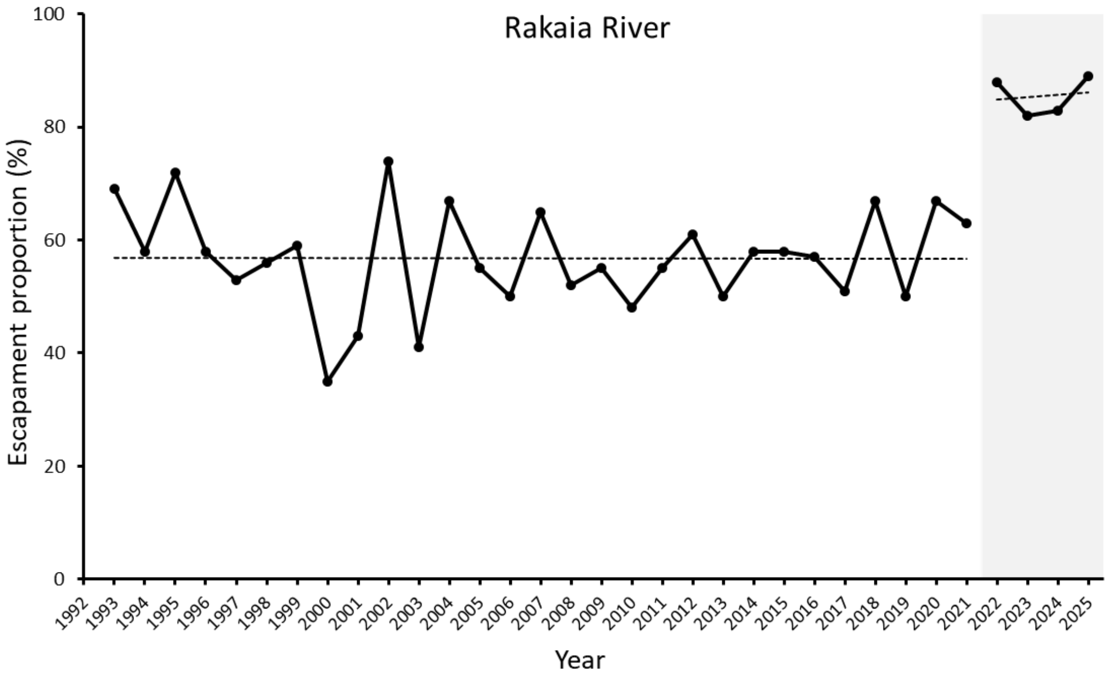

Figure 3.2. Escapement proportion of the total run on the Rakaia River, 1993-2025. Grey shaded area indicates years in which the season bag limit system was in place. Black dotted lines indicate the linear trends for pre- and post- season bag limit introduction in the 2021-22 season.

3.3.2 Rangitata River

The escapement estimate for the Rangitata River in the 2024-25 season is **79** salmon, the lowest estimate on record since monitoring began in 1993 (Figure 3.3). For individual stream estimates, refer to Appendix Table 7.2. This is 168 fewer salmon than the previous record low, which was observed in 2023-24. Adding harvest, the total run for the Rangitata River in 2024-25 is estimated at **128** sea-run salmon. Of this run, 73% successfully reached the spawning grounds (Figure 3.4).

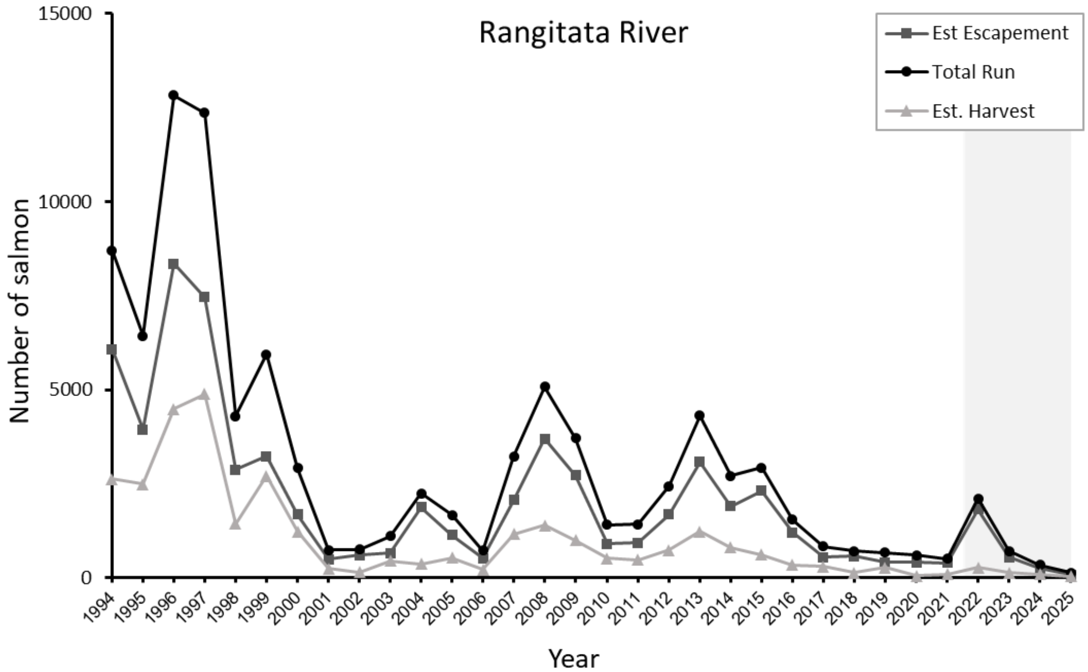

Figure 3.3. Estimated sea-run salmon escapement, angler harvest and total run on the Rangitata River, 1993-2025. Grey shaded area indicates years in which the sea-run season bag limit system was in place.

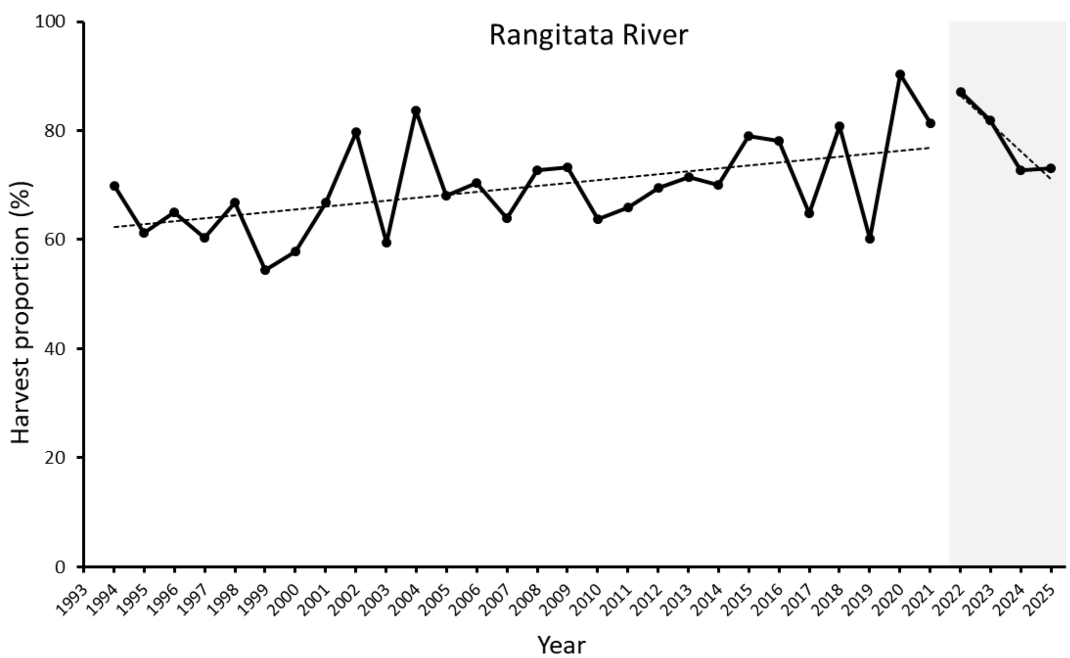

Figure 3.4. Escapement proportion of the total run on the Rangitata River, 1994-2025. Grey shaded area indicates years in which the season bag limit system was in place. Black dotted lines indicate the linear trends for pre- and post- season bag limit introduction.

3.3.2.1 McKinnon's Hatchery returns

In the 2024-25 season, one Mckinnon's-origin fin-clipped salmon was reported to have been caught by an angler in the Rangitata River and nine hatchery origin salmon returned to the hatchery. Surveys and salmon sampling work on the upper Rangitata River spawning grounds did not find any fin-clipped salmon in the spawning grounds. It is estimated that eight of these returned fish are from the 2022 release of 81,000 fin clipped juveniles.

3.3.3 Waimakariri River

The escapement estimate for the Waimakariri River in the 2024-25 season is **213** salmon (see Appendix, Table 7.3 for individual stream estimates). This run is smaller than the 2023-24 season and is the smallest escapement recorded since 1993. However, not all of the individual spawning streams had their smallest spawning estimates within this total. Adding harvest, the total estimated run size for the Waimakariri River is **243** salmon (Figure 3.5). The estimated escapement proportion is **88%,** eighteen percent higher than the previous season and the highest escapement proportion since recording began in 1993 (Figure 3.6).

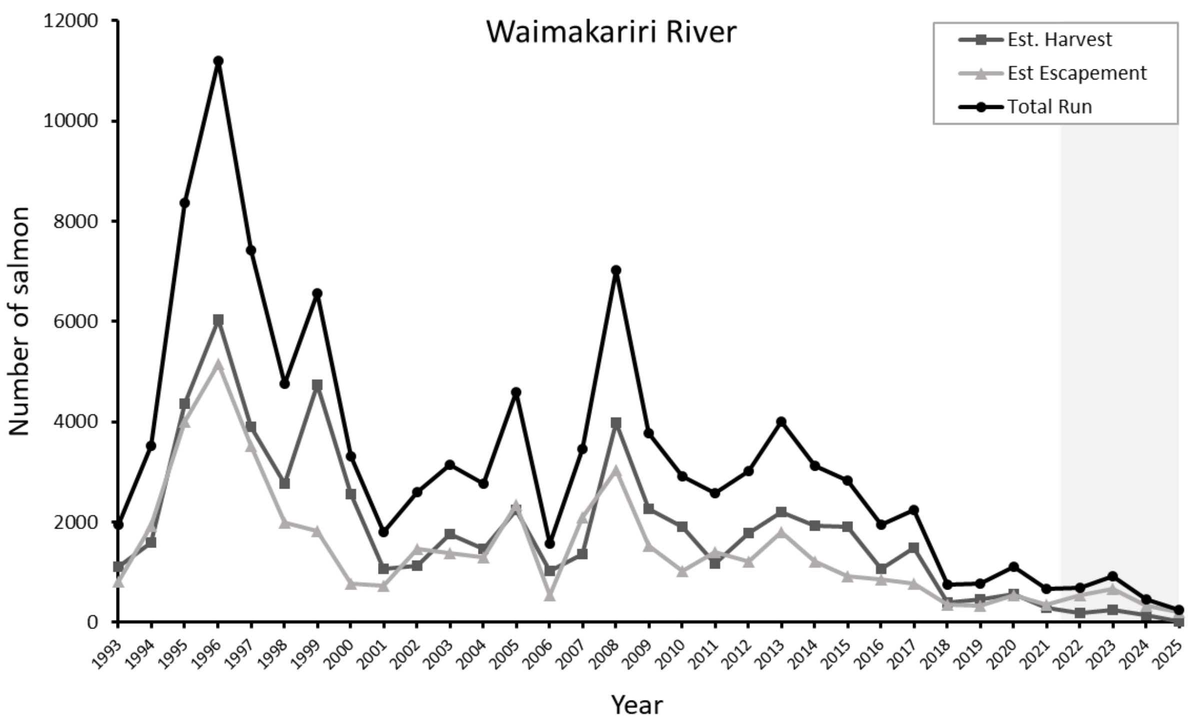

Figure 3.5. Estimated sea-run salmon escapement, angler harvest and total run on the Waimakariri River, 1993-2025. Grey shaded area indicates years in which the sea-run season bag limit system was in place.

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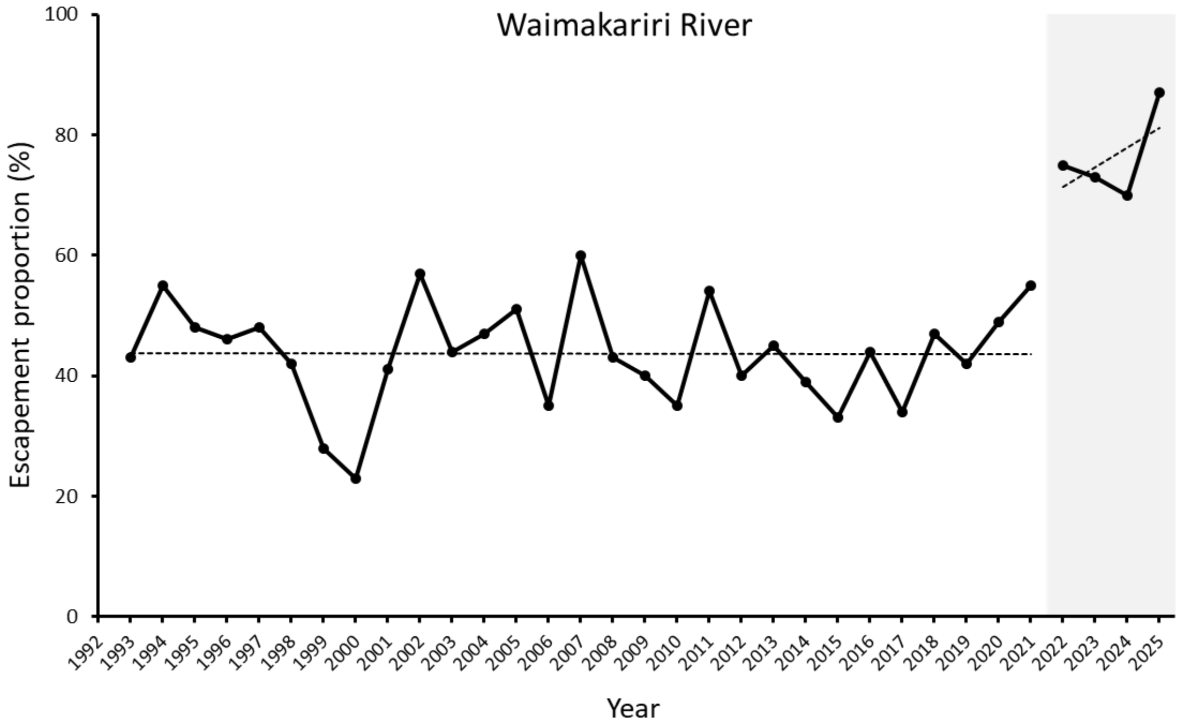

Figure 3.6. Escapement proportion of the total run on the Waimakariri River, 1993-2025. Grey shaded area indicates years in which the season bag limit system was in place. Black dotted lines indicate the linear trends for pre- and post- season bag limit introduction in the 2021-22 season.

4.0 Adaptive management

4.1 Introduction

Approximately three-quarters of all South Island sea-run salmon caught by anglers are taken from the Waimakariri, Rakaia and Rangitata rivers. Based on these rivers' contributions to the South Island East Coast sea-run salmon fishery, their shared population trends, and their on-going population monitoring programmes, in 2020 the CSIFG and NCFG Councils adopted a joint Threshold Management Strategy across the three rivers for setting sea-run salmon fishing regulations in the two regions. The strategy aimed to manage angler catch to ensure adequate sea-run salmon spawn each year and to work towards providing a healthier wild recreational sports fishery.

If practicable in the future, monitoring to the required standard in other CSIFG and NCFG salmon fisheries (in particular the Waitaki River), will enable further salmon runs to be added to the sea-run salmon management strategy.

The strategy targets the spawning population size of wild salmon since it is from the spawning population in any year that the next generation of adult returns are generated. Annual spawning population monitoring results are also the earliest available measure of the salmon population.

Using spawning population size as the guide for harvest management ensures decisions are made on the most up-to-date information.

4.1 Methods

When CSIFG and NCFG Councils were considering how to rebuild the sea-run salmon fishery, priority was assigned to identifying a minimum acceptable spawning population size for the combined annual spawning estimates for the Waimakariri, Rakaia and Rangitata fisheries.

Four spawning population bands were identified that would characterise the health of the spawning populations with the upper band being the level at which the fishery would be considered ‘healthy’ and where minimum harvest conditions would apply. The second and third bands would be subject to increasing restrictions on harvest to help prevent the fishery falling below the third band. The fourth band would have maximum harvest restrictions without closing the fishery and this level has been determined to be just below the sum of the lowest recorded spawning population sizes in each of the rivers over the long-term monitoring record.

Following identification of spawning population targets CSI and NC regions considered how angler harvest would be managed to achieve spawning targets. At that time both regions had a one fish daily bag limit and a range of detailed season length and area conditions. Introduction of a season bag limit was recommended by scientific advisors as the favoured method to reduce harvest and rebuild spawning numbers. A season bag limit offered a simple and consistent method to achieve staged population targets. The simplicity came from the need to change only the size of the bag limit to reach a target rather than a range of different season, area and timing conditions. Consistency would be achieved from its equal application to all salmon anglers fishing all rivers.

Using the 26-year record of harvest and spawning population sizes that existed in 2020, significant modelling of the impact of different season bag limits on population sizes was completed. Overall, the scenario that assigned a 5% reduction in harvest to the healthy band, 20% reduction to the moderate band and 40% reduction to the low band had the least impact on anglers of the scenarios modelled and generated significant long-term increases in spawning, angling, and total run population sizes. Reductions in harvest of 5%. 20% and 40% could be achieved with season bag limits of 10, 4 and 2 fish respectively (Table 4.1). In the severe band (less than 1,200 spawning salmon), while the fishery may not be closed, restrictions would be more severe e.g., a one-fish season bag limit, and possible introductions of a shorter season length and closed area restrictions.

Table 4.1. Current Threshold Management Strategy combined escapement bands for the Rakaia, Rangitata and Waimakariri rivers and the season bag conditions triggered from these.

Management band	*Combined escapement*	*Season bag applied*
Healthy	Greater than 7,800	10
Moderate	5,101 to 7,800	4
Low	1,200 to 5,100	2
Severe	Less than 1,200	1

In the situation where the spawning population declined through a threshold from a stronger population band to a lower population band, the management strategy provided for immediate increase in restriction in harvest by reduction of the season bag limit for the following fishing season. This enables Fish & Game to cautiously manage harvest ahead of a possible multi-year declining population trend.

In the opposite situation, where the spawning population rises above a threshold and into a heathier population band, the management strategy requires the spawning population to remain in a higher band for a minimum of three years before the season bag is changed to allow for increased harvest. The delay in relaxing the season bag limit is to ensure that the spawning population increase is a true reflection of a stronger population trend that is able to sustain higher harvest and not a single-year anomaly where allowing increased harvest would be detrimental. Increasing harvest on the strength of a single year's increase in the spawning population could lead to yoyoing of the population in reaction to annual changes in harvest conditions.

4.2 Results

The 2024-25 combined Waimakariri, Rakaia and Rangitata rivers wild salmon spawning count was **900** salmon and now places the status of the fishery in the severe management band (Figure 4.1), dropping down from the low band. This is consistent with estimates made at both regions' May 2025 Council meetings for setting the season bag limit in the 2025 Angler's Notice.

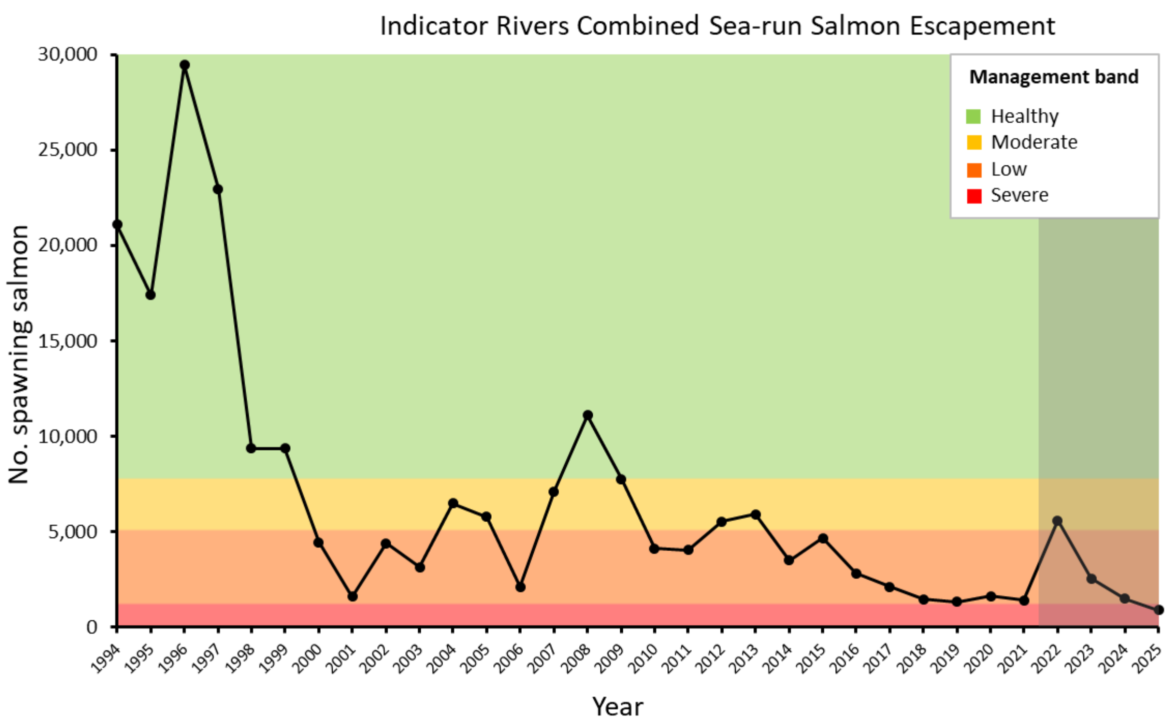

Figure 4.1. Combined estimated escapement across the three indicator rivers (Rakaia, Rangitata, Waimakariri) used for threshold management in comparison to the management band thresholds, 1993-2025. Grey shaded area indicates years where season bag limit system was in place.

5.0 Discussion

Monitoring of wild salmon in the Waimakariri, Rakaia and Rangitata rivers provides a record of annual angler catch, spawning population size, total run size and trends across the last 30 years. These fisheries, plus the Waitaki across its shorter period of record, show very similar population trends, either increasing or decreasing together on an annual basis and they all share the current critically low state. Similar trends in previous years can also be seen in salmon spawning rivers of the other Fish & Game regions; salmon spawning estimates in 2024 on the Wairau River headwaters in Nelson/Marlborough region were the lowest since 2008, and salmon were also of similar size and condition to Canterbury salmon in the same season (Nelson/Marlborough Fish & Game, 2024).

The similarity in trends across the four rivers and particularly for the Waimakariri, Rakaia, and Rangitata rivers for their longer periods of record, indicate the significance of the reduction in salmon numbers that occurred around 1998 to 2001. The trends also show the absence of improvement since that time and strongly suggests that salmon survival in these rivers is very likely controlled by common influences when salmon are in a common environment. This provides strong support for continuing consistent management and consideration of them as one harvest management unit.

The implementation of the season bag limit (SBL) appears to have contributed to higher escapement proportions than the historical average on both the Rakaia and Waimakariri rivers in 2024-25. Average escapement proportions on the Rakaia River increased from 57% pre-SBL to 86% post-SBL, while on the Waimakariri River increased from 44% pre-SBL to 76.5% post SBL. Prior to introduction of the SBL, escapement proportions had only reached above 70% on two occasions for the Rakaia River (1995 and 2002) and had never reached above 60% of the total run on the Waimakariri River since recording began in 1993. For the Rangitata River, however, escapement proportions have historically been much higher than the Rakaia and Waimakariri rivers. The escapement proportion post-bag limit introduction is only six percent higher than the long-term average before the introduction of the season bag limit (83% vs 77% previously). This suggests that the season bag limit may be reaching the limit of effectiveness on escapement proportions in the Rangitata River. Further management measures may be required if any further increase in the escapement proportion of the total run is to be achieved. Overall, the higher escapement proportions seen again this season on all three rivers suggest that the season bag limit for sea-run salmon is a valuable management tool that Fish & Game can utilise when other environmental and non-environmental factors fall outside of Fish & Game’s statutory management capabilities.

While the Threshold Management Strategy requires the spawning population to remain in a higher band for a minimum of three years before the season bag is increased, the move to the severe band means there now needs to be three seasons in the low, moderate or healthy population bands before an increase would be made to the season bag limit.

5.1 Future management

The 2024-25 season marks a full three-year salmon life cycle since the implementation of the sea-run salmon season bag limit. Data collected over this period will be used to assess whether additional harvest restrictions should be considered if sea-run salmon populations remain at critically low levels. In response to the ongoing risk of further decline, more measures may need to be taken in addition to the season bag limits in order to maintain higher escapement proportions to work towards the long-term recovery of the Canterbury sea-run salmon population.

While there are likely a number of contributing factors behind the decline in the sea-run salmon population, changing marine environmental conditions could be a key factor and similar trends in decreasing population declines and salmon size has been seen in Alaskan Chinook salmon populations (Siegel, McPhee & Adkinson, 2017). A Northern USA study modelling future survival in relation to SSTs also showed “populations rapidly declined in response to increasing sea surface temperatures and other factors across diverse model assumptions and climate scenarios” (Crozier & *et al*, 2021). Long term trends in sea surface temperature (SST) have seen higher rates of increase in SSTs on the east coast compared to other areas of the South Island, most notably south of Banks Peninsula immediately off the coast of the Rakaia and Rangitata rivers, between 1981 and 2017 (Sutton & Bowen, 2019). Assuming these trends have continued, it is likely the declines in the east coast salmon population seen in recent years could be a consequence of these environmental changes. Further research is recommended to determine if the decline in east coast salmon observed in recent years could be a consequence of these environmental changes.

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7.0 Appendix

*Table 7.1 Total population indices of the Rakaia River tributaries calculated using AUC. *Mellish Stream estimates made using Peak Count method.*

Rakaia River	
Spawning stream	*Spawning estimate*
Double Hill Flats	33
Double Hill Stream	103
Glenariffe Stream	36
Goat Hill Stream	17
Hydra Waters	224
Manuka Point Stream	86
*Mellish Stream**	102
Wilberforce Swamp	7
Total	608

*Table 7.2. Total spawning populations/escapement in the Rangitata River as estimated using AUC method. *Other includes Black Mountain Stream, Potts Fan, Brabazon Fan & Erewhon Stream*

Rangitata River	
Spawning stream	*Spawning estimate*
Deep Stream	41
Deep Creek	33
*Other**	5
Total	79

*Table 7.3. Total population indices of the Waimakariri River tributaries calculated using AUC. *Poulter streams include Lower Casey Stream, Bush Stream (inner and outer) and Thompson Stream. **Upper Waimakariri streams include Bealey Spring, Sawmill Stream and Turkey Flat Stream.*

Waimakariri River	
Spawning stream	*Spawning estimate*
Cass Hill Stream	112
Cora Lynn Stream	16
One Tree Swamp	26
*Poulter River**	40
*Upper Waimakariri***	4
Winding Creek	15
Total	213