

Fisheries Environmental Report No. 50

**The relative value of
Southland rivers to
New Zealand anglers**

**Fisheries Research Division
Ministry of Agriculture and Fisheries
Wellington**

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The relative value of
Southland rivers
to New Zealand anglers

by

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PREFACE

The rivers and streams of New Zealand, many of which support salmon or trout fisheries, are the subject of frequent water management decisions. Some of these decisions result in significant alterations to existing fish habitat, thereby reducing angling opportunities. Any case presented by fisheries interests to either the regional water board or the National Water and Soil Conservation Authority (NWASCA), in support of a particular river, will obviously be strengthened by the inclusion of information about the angling experience afforded by that river. As hydro-electric, irrigation, and other river developments place increasing demands on the remaining freshwater resource, the need for up to date information on current angling usage has become acute. Specifically, there is a need for comparative data about the relative importance and highly valued aspects of the angling experience offered by a particular river. Such information will enable water managers to take into account the angling value of a river in a regional or national context, rather than in isolation as tends to happen at present.

In 1979, Fisheries Research Division (FRD) of the Ministry of Agriculture and Fisheries (MAF), with the New Zealand acclimatisation societies, began a postal survey of anglers in all acclimatisation districts with significant sales of fishing licences. The survey had four major objectives:

1. To collect, directly from the adult angling population of New Zealand, quantitative and comparative information on every river supporting a significant sports fishery.
2. To identify those attributes which characterise rivers of importance.

3. To determine from this information rivers which constitute fisheries of national, regional, and local importance.
4. To obtain a data base for future work.

Lake fisheries were deliberately excluded from the survey because it was considered impractical to design a single questionnaire capable of coping adequately with the full range of lake and river fisheries.

A questionnaire booklet, containing a list of rivers within a given acclimatisation district, was mailed to anglers in each society. Anglers were asked to identify rivers which they had fished over 3-5 years and to assess for each river its importance to them (on a 1-5 scale) and the relative importance of seven listed qualities (distance from home, access, area of fishable water, scenic beauty, feelings of peace and solitude, catch rate, and size of fish) in determining why they fished that river. Information was also requested on average number of visits, stretch of water fished, fishing method used, and any associated recreational activity.

Of more than 10 700 anglers contacted, about 4000 completed their booklets, which provided over 20 500 individual assessments of more than 800 rivers and streams throughout the country. The present series of reports uses these assessments to identify, in each acclimatisation society district, rivers which are regionally and locally important. Nationally important angling rivers have already been identified by Teirney, Unwin, Rowe, McDowall, and Graynoth (1982), but are also discussed in this series. Because of the sheer volume of data collected, and the amount of detailed information contained within the data, a full analysis of every river was not possible and for some rivers only the raw data are presented.

1. INTRODUCTION

The Southland Acclimatisation Society district covers an area of 1 187 000 ha. in the southern-most part of the South Island (Fig. 1). To the east, the Mataura River and Garvie Mountains form the boundary between the Southland and Otago Acclimatisation Society districts. The Southern Lakes Wildlife Conservancy (SLWC) is to the north and west. The boundary with SLWC follows the Eyre and Thompson Mountains, south and west of Lake Wakatipu, and the Livingstone Mountains, east of Lake Te Anau; it then crosses the outlets of Lakes Manapouri and Monowai and turns south to reach Foveaux Strait at Te Waewae Bay.

Southland is dominated by four major river systems. The Mataura and Oreti Rivers arise in tussock and bush covered hills and mountains in the northern part of the district, and the Aparima River drains the Takitimu Mountains in the west. The Waiau River has its source in the headwater tributaries of Lakes Te Anau and Manapouri, in the SLWC. From the Lake Manapouri outlet, the Waiau flows south across the Southland downs and low lying plains to the southern coast. Rainfall is generally evenly distributed throughout the year; though during winter snow may lie for several weeks in inland areas. Closer to the coast, where annual rainfall is between 900 and 1300 mm, showers are more frequent, and flooding in the major catchments is fairly common (Wards 1976). In the most recent instance (1984) disastrous flooding in the Oreti, Aparima, and Waiau catchments inundated several suburbs of Invercargill and the townships of Otautau and Tuatapere.

The policy of draining wetlands on the Southland Plain has promoted agricultural production, and an increase in stock numbers has occurred

every year since 1950 (Wards 1976). Conditions on the plain are also suitable for growing wheat, oats, and barley, which enables Southland to contribute a substantial proportion of the total New Zealand harvest of these crops (N.Z. Department of Statistics 1981). Further inland, subdivision of large Department of Lands and Survey sheep stations for farm settlement schemes has brought in sown pastures on a large scale, and sheep and cattle production has risen substantially. These changes have commonly been accompanied by destabilisation of both stream channels and flow regimes, a source of major concern to acclimatisation society personnel, who are responsible for maintaining fish habitat, fish stocks, and fisheries throughout the district. Evidence of the adverse impact these land management practices are having on fish habitat was compiled recently by the society into a comprehensive document to promote negotiations between the land, water, and fisheries managers (Southland Acclimatisation Society 1981a).

Various effluents are discharged into Southland rivers, and, in several instances, legal action has been taken by the acclimatisation society. Sewage effluent from the townships of Gore, Mataura, and Wyndham is discharged into the Mataura River, as is effluent from the Southland Frozen Meat Co. and N.Z. Paper Mills, both located at Mataura. Long-term problems associated with run-off and effluent from the Ohai coal mine are finally being resolved (R.R. Sutton pers. comm.). Proposals to investigate the potential for mining major lignite deposits in the Southland district appear likely to proceed soon. Of six lignite deposits identified in Southland by Hooper, McKenzie, and Natusch (1983), three have been selected for further study; two of these are in the Waihopai catchment and the other is near Waituna Lagoon. In response to these preliminary investigations, FRD and the Southland and

Otago societies have submitted a joint application for funds to assess the impact of lignite development on fisheries in both districts.

Apart from the diversion of Mataura water, via a weir at Mataura, for power generation to supply the freezing works and paper mill, hydro electricity is generated at two other locations in the Southland district. At Lake Monowai the level was controlled in 1925; this raised the lake and left areas of drowned tree stumps which still remain. Water is delivered, via the river channel, canal, and then pipeline, to a powerhouse on the Waiau River banks. On the Waiau, a weir constructed just downstream of the Mararoa River-Waiiau River confluence diverts water back into Lake Manapouri, where it is used to generate power to supply the Bluff aluminium smelter.

Thirty-two potential schemes have been identified from a survey of hydro-electric development possibilities in Southland (Duffill Watts & King Ltd. 1983). Of the five schemes "most likely to be developed in the near future", four are in the Southland district. These proposed schemes, which involve the Mararoa, Waiau, and Borland Burn-Monowai Rivers, all have serious implications for the fisheries supported by these rivers and are of major concern to the society (R.R. Sutton pers. comm.).

Brown trout were introduced to the district in 1870, and they are the most important angling species in Southland; being the only salmonid in most rivers. Rainbow trout are established in the Waiau system, where they formed up to 50% of the catch from the mainstem between 1962 and 1967 and about 20% of the catch in the headwater tributaries (Graynoth and Skrzynski 1974). During the 1978/79 season, a creel census survey and angling diary scheme conducted on the Mararoa

showed similar percentage compositions of browns and rainbows in the catch (Sutherland 1979). Atlantic salmon, which are established in Lake Te Anau, are occasionally caught in the Waiau.

The city of Invercargill is the main population centre in Southland, and, with the suburbs between Makarewa and Woodend and Otatara, it supports a population of 53 868. Linked by rail to Invercargill are the larger towns of Gore (9185), Bluff (2720), Mataura (2345), Winton (2035), and Riverton (1479) (N.Z. Department of Statistics 1982). Throughout the plains there is an extensive network of roads, which link several smaller communities such as Otautau, Tuatapere, and Lumsden and service the needs of the more isolated rural population.

Adult whole season fishing licence sales have increased in Southland since the mid 1970s, and 6808 licences were sold during the 1978/79 season. More than 17% of the adult male population own a whole season fishing licence; so angling is a very popular recreational pastime in Southland (Teirney *et al.* 1982). In July 1980, survey questionnaires (in the form of small booklets) were mailed to 1016 anglers selected at random from the 1978/79 adult whole season licence holders. An example of the booklet is included as Appendix 1.

From the responses, estimates were made of the angling usage of the major river fisheries. The analysis was complicated by a fairly high non-response rate and by the existence of several groups of licence holders with different fishing habits. Details of the method of estimating angler usage are given in Appendix II.

A space was provided at the end of each booklet for anglers to enter details of additional rivers they fished. Thus, anglers who held licences in other districts also provided information on Southland's

rivers and streams. Data for those rivers for which there were sufficient responses from outside anglers have been incorporated into this report.

In addition to the above analysis (which was conducted for all acclimatisation society districts surveyed), the relationship between anglers' preferred fishing methods and the range of rivers they fished was also analysed in detail. This analysis was conducted on the Southland data for three reasons. Firstly, the Southland data base was large enough (over 1500 individual assessments of Southland rivers by over 400 anglers) to examine in detail. Secondly, a preliminary inspection of the data showed that Southland anglers used a wide range of angling methods, and it suggested that some significant trends might exist. Thirdly, the Southland data were not complicated by the presence of quinnat salmon fisheries (which tended, in districts such as North Canterbury, to distort the range of angling methods used by introducing a strong bias towards spinners).

Three separate groups of anglers were identified in the Southland district. One group consisted of those anglers who, over all the rivers they fished, used only artificial spinners and/or live bait. The second represented those who used only artificial flies (dry flies, wet flies, and nymphs). The third consisted of anglers who used methods in both categories. For each group, the range of rivers fished and, where appropriate, the ratings given to individual rivers were investigated.

2. RESULTS

Two measures of importance were used to assess the relative value of Southland's rivers and streams to anglers. In the first the raw data were tabulated to show the number of respondents who fished each river. Both the number of respondents who fished a river and the total number of visits were taken as an indication of the relative use made of the river. Individual rivers were then selected for further analysis if they were fished by 10 or more respondents.

The second was based on individual angler's ratings, on a 1-5 scale, of the importance of each river they fished, and it took into account the whole angling experience. Histograms showing the percentage-frequency distribution of the 1-5 ratings were made for each river (Appendix III). A grade between 1 and 5 was then assigned to each river on the basis of these histograms. Grade 1 indicated that the river was generally not highly valued by anglers who fished there; grade 5 indicated that the river was generally very highly valued. Histograms were made for all rivers with 10 or more respondents, but grades were assigned only to those rivers with 15 or more responses. Although this method provided an objective basis for allocating gradings, the final choices were necessarily partly subjective.

Southland rivers which were fished by more than one respondent are listed in Table 1, which shows the number of respondents who fished each river and the number of visits they made annually. For rivers which were fished by 15 or more respondents, the average number of visits per respondent and the importance grade are also given. The fact that data were provided by only single respondents on several of Southland's rivers (including Nokomai River, Eyre Creek, Murray Creek, Weydon Burn,

TABLE 1. Measures of angler use and importance grade, or value, of Southland rivers and streams.

River	No. of respondents	% of respondents	No. of visits	Visits per respondent	Importance grade*
Mataura †	303	73.7	3 556	11.7	5
Otamita	34	8.3	117	3.4	3
Waimea	23	5.6	95	4.1	2
Tomogalak	13	3.2	49	3.8	3
Brightwater	9	2.2	73	- ‡	-
Oreti	239	58.2	2 864	12.0	4
Waikiwi	21	5.1	131	6.2	2
Makarewa	94	22.9	641	6.8	3
Hedgehope	32	7.8	126	3.9	2
Dunsdale	45	10.9	193	4.3	3
Otapiri	54	13.1	337	6.2	4
Lora	25	6.1	134	5.4	3
Dipton	3	0.7	25	-	-
Irthing	16	3.9	44	2.8	3
Acton	10	2.4	19	-	-
Cromel	13	3.2	23	-	-
Waimatuku	32	7.8	253	7.9	3
Aparima	146	35.5	1 461	10.0	4
Pourakino	19	4.6	115	6.1	3
Otautau	2	0.5	9	-	-
Hamilton Burn	26	6.3	90	3.5	3
Waiau §	158	38.4	988	6.3	4
Orauea (Orawia)	27	6.6	137	5.1	2
"Bluebottle"	7	1.7	33	-	-
Lill Burn	18	4.4	99	5.5	3
Wairaki	24	5.8	90	3.8	3
Monowai	24	5.8	106	4.4	3
Borland Burn	33	8.0	73	2.2	3
Mararoa	68	6.5	246	3.6	4
Whitestone	29	7.1	62	2.1	4
Flaxy	4	1.0	8	-	-

* 1 = not highly valued, 5 = very highly valued.

† Otago respondents not included.

‡ Too few responses to analyse.

§ SLWC respondents not included.

Omutu Creek, Braxton Burn, Waimeamea River, and Rowallan Burn) is not necessarily indicative of their value from a fisheries viewpoint. For instance, Eyre Creek, in addition to providing spawning and rearing habitat, and despite suffering a loss of water in the lower reaches during droughts, augments low summer flows in the Mataura headwaters; Murray Creek and Weydon Burn, both tributaries of the Oreti, support good spawning habitat and modest populations of fairly large trout; and the north branch of Braxton Burn is a valuable part of Hamilton Burn in the headwaters of the Aparima system (R.R. Sutton pers. comm.).

Estimates of usage for the major Southland rivers are given in Table 2. In general, the most highly valued rivers were also the most heavily fished. The four major rivers (Mataura, Oreti, Aparima, and Waiau) each attracted over 10 000 visits annually; the Makarewa was the next most visited river. The fact that the largest rivers received the most angling effort suggests that anglers value fisheries in large rivers. This result is consistent with those from the seven other acclimatisation society districts for which the survey data have been analysed. On an individual catchment basis, the Oreti and its tributaries accounted for 37% of the angling effort recorded by respondents; the Mataura, 32%; the Waiau, 15%; and the Aparima, 14%. The other 2% of the effort was distributed among several smaller coastal streams.

To analyse why some rivers were more highly valued than others, the anglers' assessments of seven factors (listed in the questionnaire), which contribute to the angling experience on each river, were considered. As with importance grades, each factor was assigned a grade between 1 and 5, based on the frequency-distribution histograms of anglers' ratings for each river (Appendix III). Again, assigning

TABLE 2. Estimates of angler use and importance grade, or value, of 23 Southland rivers. (All estimates are rounded to two significant figures.)

River	No. of anglers	No. of visits	Importance grade*
Mataura †	3 500	42 000	5
Oreti	2 800	34 000	4
Waiau ‡	1 800	12 000	4
Aparima	1 700	17 000	4
Makarewa	1 100	7 500	3
Mararoa	790	2 900	4
Otapiri	620	3 900	4
Dunstable	520	2 200	3
Otamita	390	1 400	3
Borland Burn	380	850	3
Waimatuku	370	2 900	3
Hedgehope	370	1 500	2
Whitestone	340	720	4
Orauea	310	1 600	2
Hamilton Burn	300	1 000	3
Lora	290	1 600	3
Monowai	280	1 200	3
Wairaki	280	1 000	3
Waimea	270	1 100	2
Waikiwi	240	1 500	2
Pourakino	220	1 300	3
Lill Burn	210	1 100	3
Irthing	190	510	3

* 1 = not highly valued, 5 = very highly valued.

† Otago anglers not included.

‡ SLWC anglers not included.

individual grades was partly subjective. Only those rivers with 15 or more respondents were assigned grades for the seven factors.

The results of this analysis are summarised in Table 3. The rivers have been ordered according to the angler's assessment of distance from home rather than geographically, because several trends in the data are more readily discussed in terms of distance from home or travelling time. Access was positively correlated with distance; the more remote rivers generally had the poorest ratings for access. Scenic beauty, and to a lesser extent solitude, were inversely correlated with distance. High scenic beauty ratings were strongly associated with bush-clad catchments on rivers such as the Dunsdale, Mararoa, Borland Burn, and Whitestone. Size of fish was rated highest for the more remote rivers, particularly those in the Waiiau catchment. The Monowai, Borland Burn, upper Mararoa, and Whitestone are regarded as trophy fisheries by the Southland Acclimatisation Society (R.R. Sutton pers. comm.).

Artificial spinners, live bait, and dry flies were all popular with Southland anglers; wet flies and nymphs were used by comparatively few respondents (Table 4). Artificial spinners were particularly popular on the four mainstem rivers and on lowland tributaries such as the Makarewa. Live bait was also popular on these rivers, whereas dry flies were most commonly used on the headwater tributaries, particularly in the Oreti and Waiiau catchments.

A total of 407 respondents provided enough data to enable their preferred fishing methods to be determined for all the rivers they fished. Of these, 209 (51.3%) used only spinners and/or live bait, 62 (15.2%) used only artificial flies, and 136 (33.4%) used a combination of the above methods. The latter two groups, which represented all anglers who used artificial flies of some type on at least one Southland

TABLE 3. Assessment by anglers of seven factors (listed in the questionnaire) which contribute to the angling experience provided by 23 Southland rivers.

River	Distance	Access	Area fishable	Scenic beauty	Solitude	Catch rate	Size of fish
Oreti	●●●●●	●●●●●	●●●●	●●●	●●●●	●●●	●●
Makarewa	●●●●●	●●●●	●●●	●●	●●●	●●	●●
Hedgehope	●●●●	●●●	●●●	●●●	●●●●	●●	●●
Waimatuku	●●●●	●●●●	●●●●	●●	●●●	●●●	●●
Mataura	●●●●	●●●●●	●●●●●	●●●	●●●●	●●●●	●●●
Otapiri	●●●	●●●●●	●●●	●●●●	●●●●	●●●	●●
Lora	●●●	●●●●●	●●●	●●●	●●●●	●●●	●●
Dunsdale	●●●	●●●	●●●	●●●●	●●●●	●●●	●●
Otamita	●●●	●●●●	●●●	●●●	●●●●	●●	●●
Waimea	●●●	●●●●	●●●	●●	●●●	●●	●●●
Aparima	●●●	●●●●	●●●●	●●●	●●●	●●●	●●●
Orauea	●●●	●●●	●●●	●●	●●●	●●●	●●
Pourakino	●●●	●●	●●●	●●●●●	●●●●●	●●●	●●●
Hamilton Burn	●●	●●●	●●●	●●●	●●●	●●●	●●●
Wairaki	●●	●●●	●●●	●●●●●	●●●●●	●●●	●●●●
Lill Burn	●	●●●●	●●●	●●●	●●●●	●●●	●●●
Waiiau	●	●●●	●●●	●●●●	●●●●	●●●	●●●
Irthing	●	●●●	●●●	●●●	●●●●	●●	●●●
Mararoa	●	●●●	●●●	●●●●	●●●●●	●●●	●●●●
Borland Burn	●	●●	●●●	●●●●●	●●●●●	●●	●●●●
Monowai	●	●●●	●●	●●●●●	●●●●●	●●●	●●●●
Whitestone	●	●●	●●●●	●●●●	●●●●	●●	●●●●

Grade	●	●●●●●
Distance:	remote	close
Access:	difficult	easy
Area fishable:	restricted	extensive
Scenic beauty:	low	high
Solitude:	low	high
Catch rate:	low	high
Size of fish:	small	large

TABLE 4. Preferred angling methods used on 23 Southland rivers.

River	Dry fly	Wet fly	Nymph	Live bait	Spinner
Mataura	●●	●●	●	●●●	●●●
Otamita	●●●	●●	●	●●●	●●
Waimea	●●●	●●	●	●●●	●
Oreti *	●●	●●	●	●●●	●●●●
Waikiwi	●●	●	●	●●●	●●●
Makarewa	●●	●	●	●●●	●●●
Hedgehope	●●	●	●	●●	●●●
Dunstable	●●●	●●	●●	●●	●●
Otapiri	●●●	●●	●●	●●	●●
Lora	●●●●	●	●●	●●	●●
Irthing	●●●	●	●	●●●	●●
Waimatuka	●●●	●	●	●●	●●
Aparima *	●●	●●	●	●●	●●●●
Porakino	●	●	-	●●	●●●●
Hamilton Burn *	●●●	●●	●●	●	●●
Waiau	●●	●●	●	●●●	●●●●
Orauea	●●●	●	●	●●●	●●
Lill Burn	●●●	●	●●	●●	●●●
Wairaki *	●●●	●●	●●	●●	●●
Monowai	●●●●	●●	●●	●	●●●
Borland Burn †	●●●●	●	●●●	●	●●●
Mararoa *	●●●	●●	●●	●	●●●
Whitestone †	●●●●	●●	●●	●	●

* Artificial bait only restrictions apply to sections of the river.

† Artificial bait only (acclimatisation society regulations).

Percent of respondents using each method:

- < 5%
- 5-20%
- 21-40%
- 41-60%
- 61-80%
- 81-100%

river, generally had similar characteristics and were treated as one group for most of our analysis. The 62 artificial fly anglers differed from the rest in only one respect; they were about 10 years older, with a modal age of 45-49 (compared with 35-39 for the other respondents).

The major difference between anglers who used artificial flies and those who did not was the number of rivers they fished (Table 5). Anglers who used spinners or live bait fished, on average, between two and three rivers each; only 8% fished more than five rivers. Anglers who used artificial flies fished, on average, nearly five rivers each, and 28% fished more than five rivers. The difference between the two groups of anglers is further reflected in Table 6. Essentially, anglers using spinners or live bait concentrated their efforts on the four mainstem rivers (Mataura, Oreti, Aparima, and Waiiau). Artificial fly anglers were more wide-ranging in their activity; they fished the four main rivers (particularly the headwaters of the Mataura and Oreti) and their headwater tributaries. Because of this, artificial fly anglers contributed a disproportionate share of the total angling effort recorded by respondents. Although representing just under half (48.6%) of the respondents, they accounted for 58.7% of the effort. These anglers tended to catch larger fish than anglers using spinners or live bait, but in all other respects both groups of anglers provided similar assessments of the Southland rivers.

Although reaches were not specifically defined for each river, anglers indicated that the middle reaches of Southland rivers were generally the most popular (Table 7). Anglers usually did not combine fishing Southland rivers with many recreational pursuits other than picnicking and enjoying the scenery; though camping was popular in the more remote parts of the Waiiau catchment (Table 8).

TABLE 5. Number of rivers fished by Southland anglers using only spinners and/or live bait (207 respondents) and those using artificial flies (198 respondents).

No. of rivers	Anglers using only spinners and/or live bait	Anglers using artificial flies
1	67 (32.4%)	30 (15.2%)
2	57 (27.5%)	19 (9.6%)
3	29 (14.0%)	35 (17.7%)
4	22 (10.6%)	34 (17.2%)
5	16 (7.7%)	24 (12.1%)
6	7 (3.4%)	12 (6.1%)
7	3 (1.4%)	11 (5.6%)
8	4 (1.9%)	7 (3.5%)
9		5 (2.5%)
10	2 (1.0%)	4 (2.0%)
11		1 (0.5%)
12		7 (3.5%)
13		2 (1.0%)
14		
15		2 (1.0%)
16		2 (1.0%)
17		2 (1.0%)
18		1 (0.5%)
Total anglers	207	198
Average No. of rivers per angler	2.7	4.8

TABLE 6. Angling effort (visits per year) expended by two groups of survey respondents on Southland rivers. (The percentage of the total effort contributed by each group is shown in parentheses.)

	Anglers using only spinners and/or live bait (n = 207)	Anglers using artificial flies (n = 198)	All respondents (n = 407)
Mataura-Oreti-Aparima-Waiiau	4 238 (48.3%)	4 537 (51.7%)	8 775
Other Southland rivers	744 (22.5%)	2 556 (77.5%)	3 300
All Southland rivers	4 982 (41.3%)	7 093 (58.7%)	12 075

TABLE 7. Popularity of individual reaches of 23 Southland rivers.

River	Headwaters	Middle reaches	Lower reaches
Mataura *	●●	●●●●	●●
Otamita	●	●●●	●●●
Waimea	●	●●●●	●●●
Oreti *	●●	●●●●	●●●
Waikiwi	●	●●●	●●●●
Makarewa *	●	●●●●	●●
Hedgehope	●●	●●●●	●●
Dunstable	●●●	●●●●	●
Otapiri	●●●	●●●●	●
Lora	●●●	●●●●	●
Irthing	●	●●●	●●●●
Waimatuku	●	●●●●	●●●
Aparima *	●	●●●●	●●
Pourakino	●	●●●	●●●
Hamilton Burn	●●●	●●●●	●●
Waiau	●●	●●●●	●●
Orauea	●	●●●●	●●●
Lill Burn	●●	●●●	●●●●
Wairaki	●●	●●●	●●●●
Monowai	●●●●	●●●	●
Borland Burn	●●	●●●	●●●
Mararoa	●●●	●●●●	●●●
Whitestone	●●	●●●	●●

* Winter fishing allowed in lower reaches.

Percent of respondents fishing each reach:

- 5-20%
- 21-40%
- 41-60%
- 61-80%
- 81-100%

TABLE 8. Participation in other recreational activities associated with angling on 23 Southland rivers.

River	Enjoying the scenery	Picnicking	Swimming	Canoeing	Camping	Tramping	Shooting
Mataura	●●●●	●●●●●	●	-	●●	-	-
Otamita	●●●●●	●●●	-	-	-	-	-
Waimea	●●●	●●●	-	-	-	-	-
Oreti	●●●	●●●●	●●	-	●	-	-
Waikiwi	●	●●	-	-	-	-	●
Makarewa	●	●●●	-	-	-	-	-
Hedgehope	●●●	●●●	-	-	-	-	-
Dunsdale	●●●●●	●●●●●	●●	-	●	-	-
Otapiri	●●●●	●●●●	-	-	-	-	-
Lora	●●●	●●●●	-	-	-	-	-
Irthing	●●●●●	●●●●	●●	-	●●	-	-
Waimatuku	●●	●●●	-	-	-	-	●
Aparima	●●●	●●●●●	●●	-	●	-	-
Pourakino	●●●●●	●●●●●	●	●	●	●●	●
Hamilton Burn	●●	●●	-	-	-	-	-
Waiau	●●●●●	●●●●	-	-	●●●	-	●
Orauea	●●●	●●	-	-	●	-	-
Lill Burn	●●●	●●●	-	-	●●●	-	-
Wairaki	●●●	●●●	●	-	●●	-	●
Monowai	●●●●●	●●●●	-	-	●●●●	●	●
Borland Burn	●●●●●	●●	-	-	●●	●●●	●●
Mararoa	●●●●	●●●	-	-	●●●	-	-
Whitestone	●●●●	●●●●	●	-	●	-	●

Percent of respondents participating in each activity:

-	<10%
●	10-19%
●●	20-29%
●●●	30-39%
●●●●	40-49%
●●●●●	>50%

3. CHARACTERISTICS OF 23 SOUTHLAND RIVERS

The following summarises the survey results in relation to each of the 23 Southland rivers in Table 2. For rivers with sufficient responses, the data were further broken down according to the individual reaches fished, to obtain comparative information between different sections of each river. Many anglers also provided written comments, which have been included, as received, for those rivers which elicited more than two or three comments. The rivers are dealt with in geographical order from east to west, and the tributary streams are listed in order of increasing distance upstream.

3.1 Mataura catchment

The Mataura forms the boundary between the Otago and Southland districts, and it was fished extensively by respondents from both areas. Data provided by Otago respondents were presented in the Otago regional report (Richardson, Unwin, and Teirney 1984). That report also included a detailed discussion of the data on the east bank Mataura tributaries, the Mokoreta, Mimiha, Waikaka, and Waikaia Rivers, which are in the Otago district. For this report we have used all the available data for the Mataura; this included data supplied by respondents from outside the Otago-Southland area.

The Mataura has an international reputation as one of the finest brown trout fisheries in the world (Graynoth and Skrzynski 1974); a reputation which has been endorsed by overseas anglers who were recently surveyed by the Southland society (Sutherland 1982). There is little doubt of the Mataura's popularity with New Zealand adult anglers; those from the Southland and Otago districts alone make over 72 000 fishing