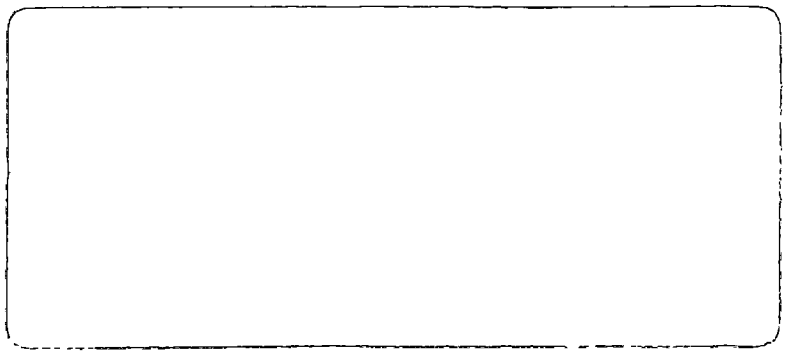

SCOTT RESOURCE SERVICES

Biological/Fisheries Resource Consultants
Mission, B.C.

Funding for this Study was Provided by the Skagit Environmental Endowment Commission

ASSESSMENT OF THE 1992

SKAGIT RIVER SPORT FISHERY

Prepared for

British Columbia Environment, Lands and Parks
Fish and Wildlife Management
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Regional Fisheries Report No. LM232

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Summary

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An on-site survey of the Canadian Skagit and Sumallo Rivers sport fisheries was conducted during the summer and fall of 1992. The primary objective was to replicate a survey first conducted in 1986 and subsequently replicated in 1990 to monitor changes in angler effort and success. In all three surveys, information on angler characteristics and social carrying capacity was also collected.

From July 1 to October 31, 1992, total angler effort was estimated at 19,554 hours. Overall, angler use in the 1992 season increased 59% from 1990. At the lower Skagit River effort was up by more than 50% from 1986 or 1990. A 160% increase in July 1992 effort due to unusually favourable early season angling conditions accounted for 45% of the seasonal increase at the lower Skagit; August 1992 effort was more than double 1990. At the upper Skagit River, 1992 effort increased by 46% from 1990 but was only 6% higher than in 1986. The increase in effort between July 1990 and July 1992 (888 hours) accounted for 89% of the increase between the seasons (993 hours). Angler effort and the number of interviews obtained at the Sumallo River were low and parameter estimates from this area should be regarded with caution.

Angler success for rainbow trout (0.69 fish per hour) increased from both of the previous two surveys (1986: 0.43 fish per hour; 1990: 0.36 fish per hour). The significant increase in catch rates in all areas can probably be attributed to reduced harvest in the reservoir since 1990 and undepleted fish abundance in the river due to the newly implemented catch and release regulation.

The 1992 estimated catch of 14,786 rainbow trout increased significantly from 1990 (5,305 trout) and 1986 (5,605 trout). The rainbow catch at the lower Skagit (12,286) was about triple that estimated for both 1990 (3,925) and 1986 (4,301). At the upper Skagit, the estimated catch of 2,183 rainbow trout increased by more than 80% from 1990 or 1986. A similar increase in estimated catch was evident at the Sumallo River, although the magnitude of the catch was small (317 fish) compared to the Skagit River areas.

While the catch of rainbow trout increased substantially, the estimated catch of Dolly Varden char (140 fish) only increased moderately from 1990 (106) and 1986 (115 fish).

Anglers interviewed in 1992 collectively exhibited similar demographic characteristics to 1986 and 1990. However, more than 70% of the anglers had first fished the Skagit since 1986 and 48% fished the Skagit for the first time in 1992. Use levels in 1992 in all three areas were within social carrying capacity. While the quality of the fishing experience at the lower Skagit River was still high, the upper Skagit may be approaching a use level where the quality of the fishing experience will begin to decline due to crowding.

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Funding for this study was provided by the Skagit Environmental Endowment Commission.

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Ross Neuman reviewed the draft manuscript and provided helpful suggestions.

Special thanks is extended to all the Skagit River anglers who provided information during the course of the survey.

1.0 INTRODUCTION

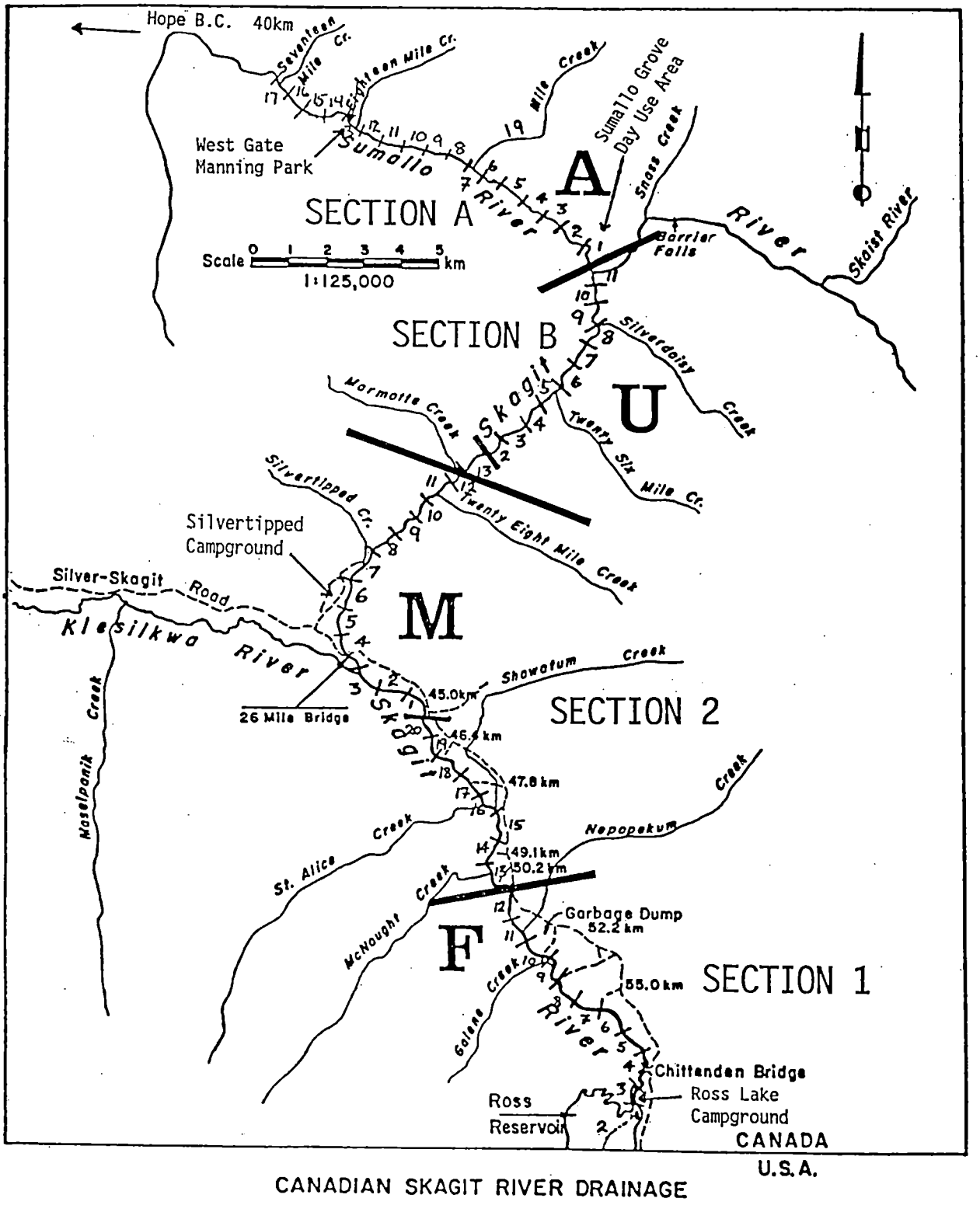
1.1 Background

Ross Reservoir and the Canadian Skagit River, located approximately 40 km south east of Hope, B.C., (Figure 1) support popular recreational fisheries for rainbow trout (*Oncorhynchus mykiss*) and to lesser extent Dolly Varden char (*Salvelinus malma*), brook trout (*S. fontinalis*) and cutthroat trout (*O. clarki*). Studies (Griffith and Greiner 1983; Griffith 1984) strongly suggest that presently the sport fishery in the Skagit River in Canada is largely supported by a migratory stock of rainbow trout. The fish enter the Skagit River during the spring spawning period, then return to Ross Reservoir (primarily in the United States) at variable rates throughout the summer and early fall (Scott and Peterson 1986; Neuman and Scott in prep.). Additionally, the migratory rainbow trout stock spawning in the Skagit River contributes substantially to the Ross Reservoir fishery. Earlier investigations indicated that almost half of the rainbow trout fry production in the Ross Reservoir watershed came from the Skagit River (Seattle City Light 1974).

In 1985, the British Columbia Ministry of Environment (now British Columbia Environment, Lands and Parks; BCELP) and the Washington State Department of Wildlife (WDW; responsible for sport fishery management of the American portion of Ross Reservoir) began joint studies of the sport fisheries and fish stocks in this important international drainage. The information collected was used to develop joint management plans for the river and reservoir (Neuman 1988). The management plan for the Skagit River identified the need to regularly monitor the fishery to evaluate management strategies, respond to increasing use, and detect the effects of reservoir harvest on the river fishery.

This survey (1992) was conducted to determine the effects that recent changes to the angling regulations on the reservoir are having on the river sport fishery. Recent studies indicated the reservoir is overfished and, as a consequence, fish stocks in the river are depressed (Johnston 1989). In 1990 restrictive angling regulations (Appendix 1) were introduced on both the Canadian and American portions of the reservoir to reduce harvest and restore stocks. The effects of these regulations on reservoir fish stocks are being monitored by WDW. The new regulations have drastically reduced angler catch and harvest. Fish stocks are expected to increase in both the river and reservoir. As well, beginning this season (1992) a total catch and release angling regulation was implemented on the Skagit River to further reduce harvest.

Surveys of the Canadian Skagit River sport fisheries have been conducted in 1985, 1986 and 1990 (Scott and Peterson 1986; Scott and Lewynsky 1987; Scott et al 1991). The 1985 overview survey provided rough estimates of effort and catch and defined angler use



CANADIAN SKAGIT RIVER DRAINAGE

Figure 1. Survey sections (Section 1, Section A, etc) and catch location index (F13, M10, etc) used during the 1992 Skagit River angler survey.

patterns. This information was used to develop a statistical design for more rigorous sampling to increase the precision and accuracy of parameter estimates (Lewynsky 1986). The 1986 and 1990 surveys were conducted using the Lewynsky (1986) balanced sampling design. The design yielded precise estimates of effort, catch rates and catch that were used to measure changes in major fishery characteristics. Overall, angler use in the 1990 season was similar to the comparable time period in 1986 (Scott et al 1991). However, comparisons of temporal and spatial distribution of angler catch rates showed almost uniform lower success in 1990.

The 1992 survey was conducted by the same operational and analytical methods that were used in the 1986 and 1990 surveys. This report presents results from the 1992 survey and compares them to the earlier surveys.

1.2 Historical Angler Use Surveys

Results of previous investigations of angler effort and catch at the Skagit River were summarized by Scott and Peterson (1986). Essentially, only anecdotal information was reported for the Skagit River prior to 1970. From 1971 to 1973, consultants engaged by Seattle City Light in conjunction with BCELP conducted creel surveys of the Skagit River. These surveys provided baseline data on angler numbers and distribution, catch by species, catch rates and demographic characteristics of the anglers. Statistically reliable estimates of total angler effort and catch were not calculated. However, in 1971 the total catch was thought to approximate 4,000 fish (Seattle City Light 1972). The baseline survey in 1985 estimated angler effort at 16,548 hours (4,142 days) with an estimated rainbow trout catch of 3,579 fish, of which 2,307 (65%) were harvested (Scott and Peterson 1986). Estimates from the 1985 survey are not reliably comparable to the 1986 and 1990 surveys because they were conducted by different methods.

1.3 Objectives

The primary objective of the 1992 survey was to replicate previous surveys conducted using the Lewynsky (1986) design (in 1986 and 1990) to produce parameter estimates that would be reliably comparable between the three years. Consistent with 1986 and 1990, the survey was conducted to provide the following types of information:

- estimate of angler effort in hours and days;
- spatial and temporal distribution of angler effort;
- estimate of angler catch;
- spatial and temporal distribution of angler catch;

- estimate of angler success in both catch per hour and per day;
- spatial and temporal distribution of angler success;
- frequency distribution of angler catch, i.e. percentage of anglers that caught 0 fish, 1 fish, 2 fish, etc.;
- an angler profile (age distribution, residence location, amount of new use, amount of repeat use);
- information on angling methods including success by gear type and compliance with angling regulations;
- angler opinions and attitudes, e.g. regarding use levels, regulations, fishing experience attributes, other recreational uses of the river, etc.

2.0 METHODS

2.1 Survey Design and Operation

The 1992 survey design and operation was consistent with that described for the 1990 survey (Scott et al 1991).

The operational requirements of the surveys were based on specifications outlined by Lewynsky (1986) and included in Appendix 2 of Scott and Lewynsky (1987). Operational procedures and sampling schedules were followed with rigorous sampling protocol.

As in 1986 and 1990, the survey area included the Skagit River from Ross Reservoir to the Sumallo River confluence and the Sumallo River for 15 kilometres upstream.

2.2 Survey Information Collected

Anglers in both areas were asked to volunteer the same information. The following primary effort and catch information was recorded for each interview:

- time of interview;
- location of the angler at the time of interview (Figure 1);
- time the angler started fishing (to the nearest 5 minutes);
- whether the angler had finished fishing for the day;
- time fished on the preceding day (to the nearest 0.5 hours);
- fishing method;
- number of anglers per vehicle;
- number of fish of each species caught and released.

Information on weather and water conditions that may have affected fishing success was recorded on each survey day.

The following angler profile information was recorded the first time an angler was interviewed (i.e. profile information was not recorded multiple times for the same angler during repeat interviews):

- angler age category was estimated;
- angler residence location;
- whether the angler a fish and game club member.

Additionally, anglers were asked when was the first year they had fished the Skagit River. If they had fished the Skagit River prior to 1992 they were asked questions about their fishing experience including:

- to rate the quality of their fishing experience at the Skagit or Sumallo Rivers;
- to identify any negative aspects of the fishing experience;
- if they were aware of the current special regulations for the Skagit River (Appendix 1). If they answered yes, the angler was asked if he/she agreed with the regulations;
- how many anglers they expected to encounter at this site;
- how many anglers they had encountered at this site by the time of the interview;
- for an opinion on the number of anglers they encounter while fishing the Skagit River (too few; just right; too many; no opinion).

Counts of anglers and vehicles were recorded on a Count Tally Sheet (Appendix 2). Information collected during interviews was recorded on an Angler Interview Form (Appendix 3).

Additionally, copies of the current B.C. Sport Fishing Regulations Synopsis were offered and provided to anglers.

2.3 Survey Data Management and Analysis

To ensure accurate data collection, workers examined completed data sheets to verify and validate all records (i.e. for illegible entries, erroneous codes, incomplete entries, etc.) at the completion of each field day. The field records were again examined and verified when received by the Project Manager, who collated them by monthly blocks for subsequent computer entry.

Data summary and statistical analysis were conducted consistent with the 1986 and 1990 surveys and according to the prescribed estimation procedure in the survey design (Appendix 7 in Scott and Lewynsky 1987). Variance of the estimates was calculated following the procedure outlined in Appendix 8 of Scott and Lewynsky (1987).

3.0 RESULTS

3.1 Angling Conditions

At the initiation of the survey (July 1) the Skagit River was receding after spring freshet. Water levels were generally medium during July and the river was unusually fishable early in the month. Water levels in July 1992 were lower than for that month in either 1986 or 1990.

Water levels were low during August through October and the river was easily accessed throughout for the rest of the season.

The B.C. Parks Branch had barricades up for the first five days of the survey in the lower Skagit area preventing angler and survey technician access to all side roads except for Whitworth Meadow. The barriers were removed on July 11, and normal access was restored. Consistent with 1990, there was still no camping in undeveloped areas.

The B.C. Forest Service prevented the survey technician and anglers from entering the lower Skagit area on August 3 due to a small forest fire. The missed shifts were surveyed on August 31 to maintain completeness of the sampling. The situation may have caused a surge in effort at the upper Skagit since a number anglers turned back from the lower Skagit area apparently carried on to the upper Skagit.

3.2 Angler Effort and Catch Characteristics at the Lower Skagit River

3.2.1 Estimated Total Angler Effort

A total of 695 anglers was interviewed during the course of the survey. Of these, 568 (82%) of the interviews occurred in the Lower Skagit area. Anglers fished an estimated 15,082 hours (2,823 days) between July 1 and October 31, 1992, at the lower Skagit River (Table 1).

The standard error for angler hours was estimated at 14,720 to 15,444 hours, or +/- 2.4% of the estimated total, indicating excellent precision of the estimate. The 95% confidence limit would be roughly twice the standard error or about +/- 5% of the estimated total effort. The estimate of angler days is without confidence intervals and should be regarded with caution.

Table 1. Estimated angler effort in the lower Skagit River trout fishery, July 1 through October 31, 1992.

Month	River Section	Day Type	Angler Hours	Standard Error	Mean Hours Fished per Day	Total Angler Days
July	1	Midweek	1,342	(54)	7.66	175
		Weekend	1,098	(66)	5.60	196
		Total	2,440	(85)	6.26	390
	2	Midweek	1,409	(157)	6.30	224
		Weekend	1,495	(101)	6.39	234
		Total	2,904	(187)	6.35	457
	Month Total		5,344	(205)	6.28	851
August	1	Midweek	1,783	(219)	4.92	362
		Weekend	1,048	(88)	4.94	212
		Total	2,831	(236)	4.93	574
	2	Midweek	2,407	(136)	3.54	680
		Weekend	1,925	(65)	4.11	468
		Total	4,332	(151)	3.87	1,118
	Month Total		7,163	(280)	4.72	1,518
September	1	Midweek	483	(29)	5.41	89
		Weekend	657	(16)	5.90	111
		Total	1,140	(33)	5.75	198
	2	Midweek	210	(32)	7.08	30
		Weekend	630	(71)	3.80	166
		Total	840	(78)	3.98	211
	Month Total		1,980	(85)	5.43	364
October	1	Midweek	231	(37)	3.44	67
		Weekend	250	(42)	4.67	54
		Total	481	(56)	4.28	112
	2	Midweek	60	(10)	4.67	13
		Weekend	54	(10)	2.96	18
		Total	114	(15)	2.96	38
	Month Total		595	(58)	4.16	143
Season	1	Midweek	3,839	(231)	5.72	671
		Weekend	3,054	(119)	5.32	574
		Total	6,893	(259)	5.45	1,264
	2	Midweek	4,085	(211)	5.04	811
		Weekend	4,104	(140)	4.86	844
		Total	8,189	(253)	4.92	1,664
	Season Total		15,082	(362)	5.34	2,823

3.2.2 Temporal and Spatial Distribution of Angler Effort

In 1992, angler effort at the lower Skagit River was highest during August (47% of the season total), followed by July (35%) and September (13%; Figure 2). Angler effort in October (4%) was substantially less than in the first three months of the season.

In the opening month of the 1992 season, angling effort in Section 2 of the lower Skagit was only marginally higher than in Section 1. However, by August, during the peak of the fishery, angler effort increased to more than 50% higher in Section 2. During September and particularly October, the highest concentration of angler effort shifted back to Section 1 (Table 1).

Overall, the highest average number of anglers per count at lower Skagit angling sites occurred in the vicinity of F20 (45.5 kilometre Walk In) followed by M7 (Silvertipped Campsite area; Figure 3). The next most heavily fished area was in the vicinity of F10 and F11 (Garbage Dump) where effort levels were similar to 1990 (an average of about 1.5 anglers/count). Anglers were also regularly counted near Chittenden Bridge (F4). In all other sites the mean number of anglers per count was less than 1.

At the lower Skagit angler effort was oriented toward weekends and highest effort was during midday (Appendix 4). During July and August, angler effort persisted throughout the entire daylight period and a substantial amount of angling effort occurred during midweek. In September and October, most observations of anglers were on weekends.

In all months in 1992, there was at least some angler effort during the early morning time blocks.

3.2.3 Estimated Total Catch

The estimated total catch of rainbow trout in the lower Skagit River between July 1 and October 31, 1992 was 12,286 fish (Table 2). The greatest percentage of lower Skagit rainbow trout was caught in the month of August (50%), followed by July (39%; Figure 4). The monthly catch dropped considerably in September (8%) and even further in October (2%).

During July and August the estimated total catch in Section 2 greatly exceeded the estimated catch in Section 1 (Table 2). During the following two months this relation reversed and the catch in Section 1 exceeded that of Section 2 at an increasing rate. In October no anglers reported catching fish from Section 2.

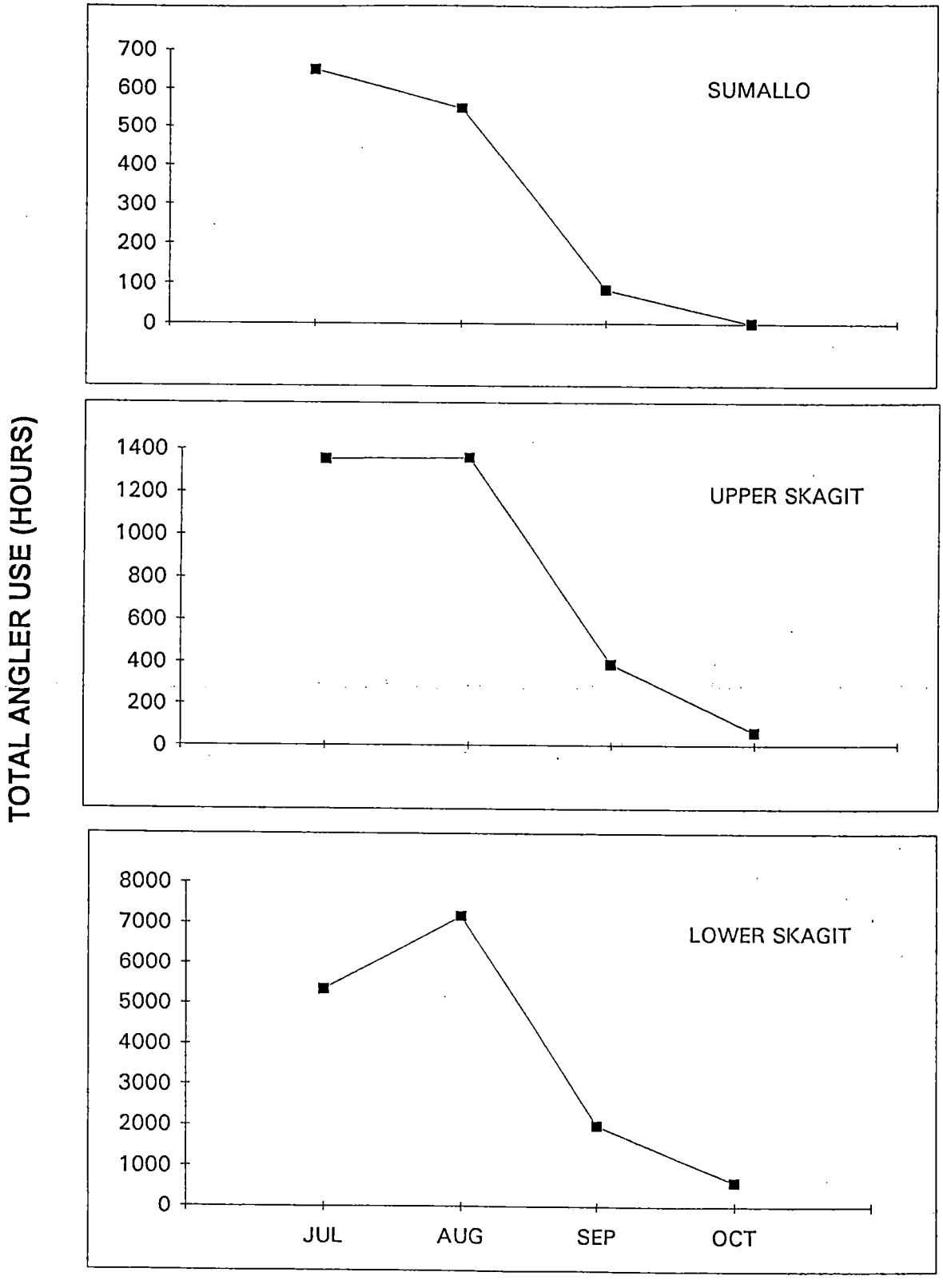


Figure 2. Monthly distribution of angling effort in the Skagit River trout fishery, July 1 through October 31, 1992.

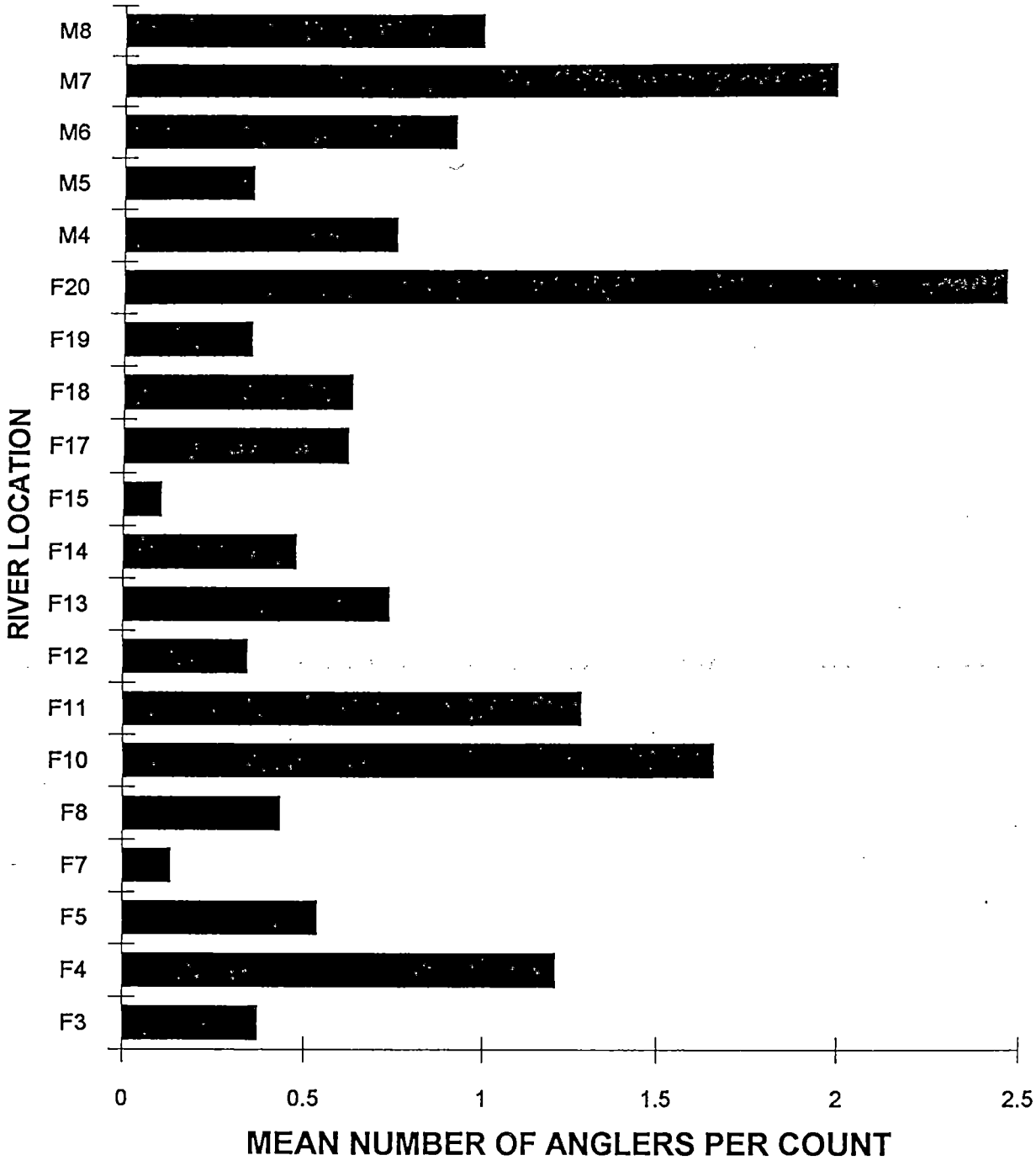


Figure 3. Distribution of angler effort among catch location sites during the lower Skagit River trout fishery, July 1 through October 31, 1992.

Table 2. Estimates of rainbow trout captured (released) in the lower Skagit River, trout fishery July 1 through October 31, 1992.

Month	River Section	Day Type	Rainbow Trout Catch Released	Standard Error
July	1	Midweek	1,091	(170)
		Weekend	805	(106)
		Total	1,896	(201)
	2	Midweek	1,271	(329)
		Weekend	1,668	(405)
		Total	2,939	(522)
	Month Total		4,835	(559)
August	1	Midweek	1,402	(241)
		Weekend	722	(97)
		Total	2,124	(260)
	2	Midweek	3,128	(1,899)
		Weekend	895	(156)
		Total	4,023	(1,905)
	Month Total		6,146	(1,923)
September	1	Midweek	130	(14)
		Weekend	458	(71)
		Total	588	(72)
	2	Midweek	148	(23)
		Weekend	300	(136)
		Total	448	(138)
	Month Total		1,036	(155)
October	1	Midweek	203	(105)
		Weekend	66	(13)
		Total	268	(106)
	2	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Month Total		268	(106)
Season	1	Midweek	2,827	(314)
		Weekend	2,050	(161)
		Total	4,876	(353)
	2	Midweek	4,547	(1,927)
		Weekend	2,862	(455)
		Total	7,410	(1,980)
	Season Total		12,286	(2,011)

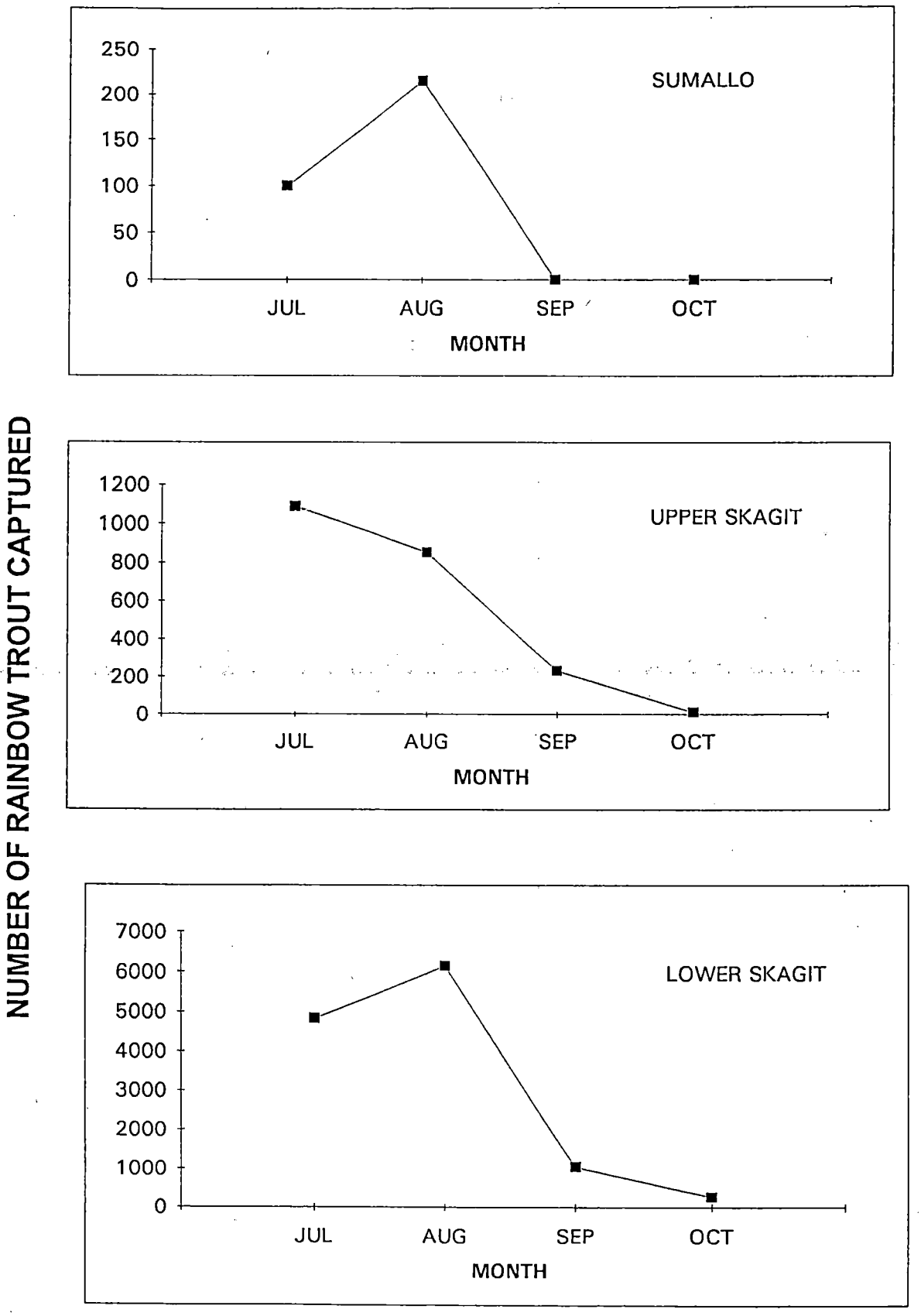


Figure 4. Monthly distribution of the estimated rainbow trout catch in the Skagit River trout fishery, July 1 through October 31, 1992.

Distribution of recorded total catch among catch location sites is shown in Figure 5. The highest number of fish was caught at the Garbage Dump (F10), followed by F4 (Chittenden Bridge area). Otherwise, the catch was well distributed throughout the lower Skagit River.

The estimated total catch of Dolly Varden char in the lower Skagit was 82 fish (Table 3). The greatest number of captures (57%) occurred during August and July (22%). Only 14 Dolly Varden were estimated caught in September and October.

There were no captures of brook or cutthroat trout reported.

3.2.4 Angler Success

Estimated monthly catch rates for rainbow trout declined gradually from July to October in the Lower Skagit trout fishery (Table 4; Figure 6). The highest success rate (in July) was 0.83 fish/hour. The lowest monthly catch rate in October (0.42 fish/hour) was about half that estimated for July.

In July, angler success for rainbow trout in Section 2 was slightly higher than in Section 1, while in August and September catch rates were similar in both sections. All fish captured in October were reported in Section 1 (Table 4).

Over the 1992 season, the highest average angler success rate in the lower Skagit was at F6 (2.0 trout/hour; Figure 7), followed by F20 and M6. Relatively few fish were caught at F6 (Figure 5), and the high catch rate reflected good catch success by a small number of anglers. The catch rates at F20 and M6 were based on information from a good sample of anglers and indicates good overall success in these areas. Similar to F6, high catch rates at M12 and F16/F17 were influenced by low sample size of anglers. Catch rates in excess of 0.5 fish/hour or better were common at a number of sites throughout the river.

Angler success for rainbow trout by fly angling (0.79 fish per hour; Table 5) was greater than for lure angling (0.31 fish per hour).

Almost 60% of the anglers at the lower Skagit River had caught at least one fish by the time of their interview (Figure 8). Catches of up to 6 rainbow trout were fairly common. The highest recorded catch was 25 rainbow trout.

Estimated catch rates for Dolly Varden were low throughout the season at the lower Skagit River (Table 6).

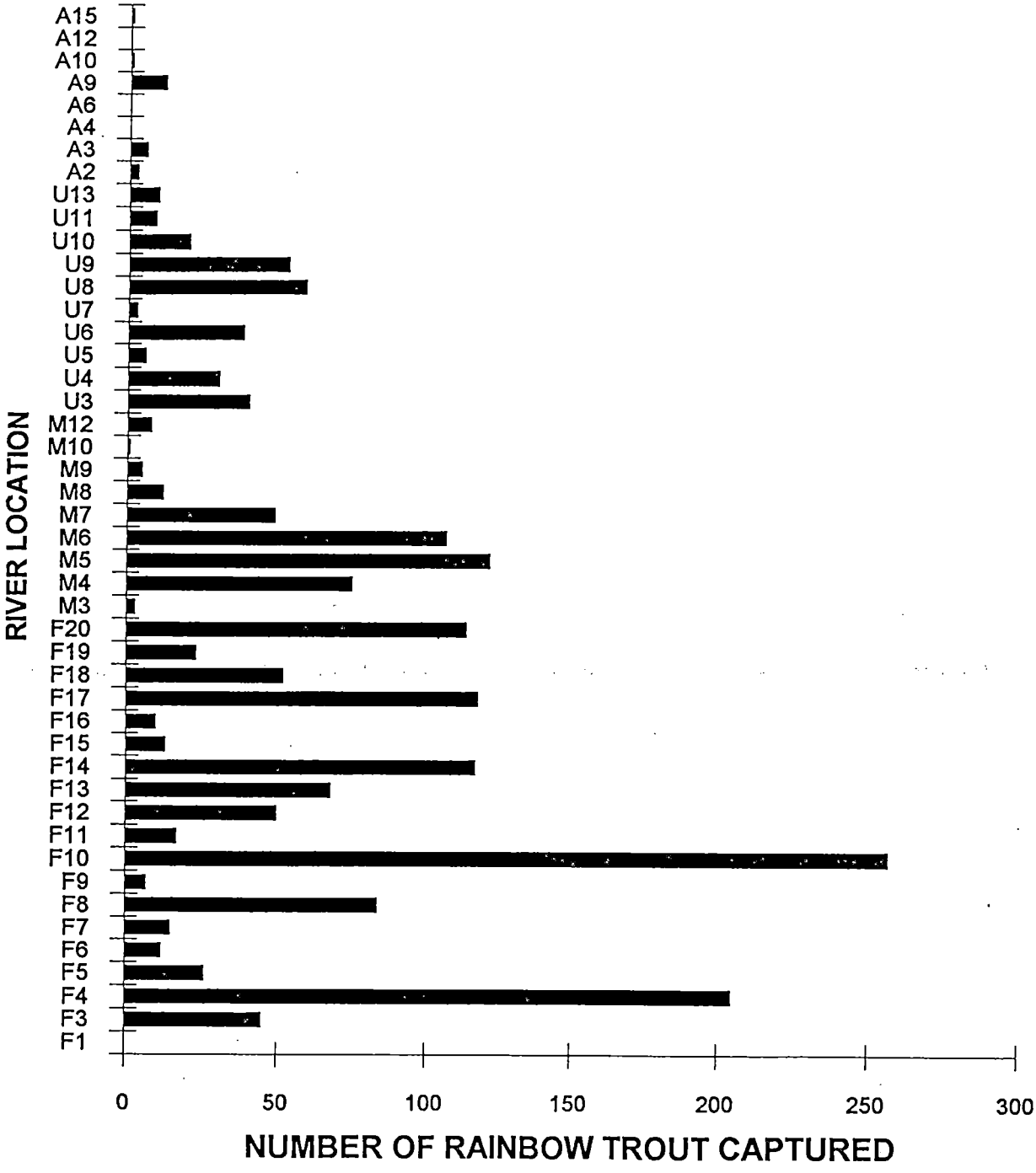


Figure 5. Distribution of the rainbow trout catch among catch location sites as reported by anglers in the Skagit River trout fishery, July 1 through October 31, 1992.

Table 3. Estimates of Dolly Varden captured (released) in the lower Skagit River, trout fishery July 1 through October 31, 1992.

Month	River Section	Day Type	Dolly Varden Catch Released	Standard Error
July	1	Midweek	0	0
		Weekend	8	0
		Total	8	0
	2	Midweek	0	0
		Weekend	10	1
		Total	10	(1)
	Month Total		18	(1)
August	1	Midweek	0	0
		Weekend	13	1
		Total	13	(1)
	2	Midweek	0	0
		Weekend	37	2
		Total	37	(2)
	Month Total		50	(2)
September	1	Midweek	0	0
		Weekend	7	0
		Total	7	0
	2	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Month Total		7	0
October	1	Midweek	7	1
		Weekend	0	0
		Total	7	(1)
	2	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Month Total		7	(1)
Season	1	Midweek	7	(1)
		Weekend	27	(1)
		Total	34	(2)
	2	Midweek	0	0
		Weekend	48	(2)
		Total	48	(2)
	Season Total		82	(3)

Table 4. Estimated mean catch per angler hour for rainbow trout in the lower Skagit River trout fishery July 1 through October 31, 1992.

Month	River Section	Day Type	Rainbow Trout Catch per hour Released	Standard Error
July	1	Midweek	0.8132	(0.1225)
		Weekend	0.7330	(0.0859)
		Mean	0.7587	(0.0976)
	2	Midweek	0.9021	(0.2091)
		Weekend	1.1159	(0.2599)
		Mean	1.0278	(0.2390)
	Month Mean		0.8280	(0.1340)
August	1	Midweek	0.7863	(0.0939)
		Weekend	0.6884	(0.0722)
		Mean	0.7242	(0.0801)
	2	Midweek	1.2996	(0.7843)
		Weekend	0.4648	(0.0797)
		Mean	0.8096	(0.3707)
	Month Mean		0.7414	(0.1385)
September	1	Midweek	0.2699	(0.0235)
		Weekend	0.6967	(0.1064)
		Mean	0.5666	(0.0811)
	2	Midweek	0.7062	(0.0000)
		Weekend	0.4760	(0.2071)
		Mean	0.4888	(0.1956)
	Month Mean		0.5526	(0.1017)
October	1	Midweek	0.8777	(0.4269)
		Weekend	0.2618	(0.0282)
		Mean	0.4571	(0.1546)
	2	Midweek	0.0000	(0.0000)
		Weekend	0.0000	(0.0000)
		Mean	0.0000	(0.0000)
	Month Mean		0.4164	(0.1408)
Season	1	Midweek	0.7175	(0.1196)
		Weekend	0.6651	(0.0792)
		Mean	0.6827	(0.0927)
	2	Midweek	1.0815	(0.4706)
		Weekend	0.6938	(0.1727)
		Mean	0.8274	(0.2753)
	Season Mean		0.7128	(0.1307)

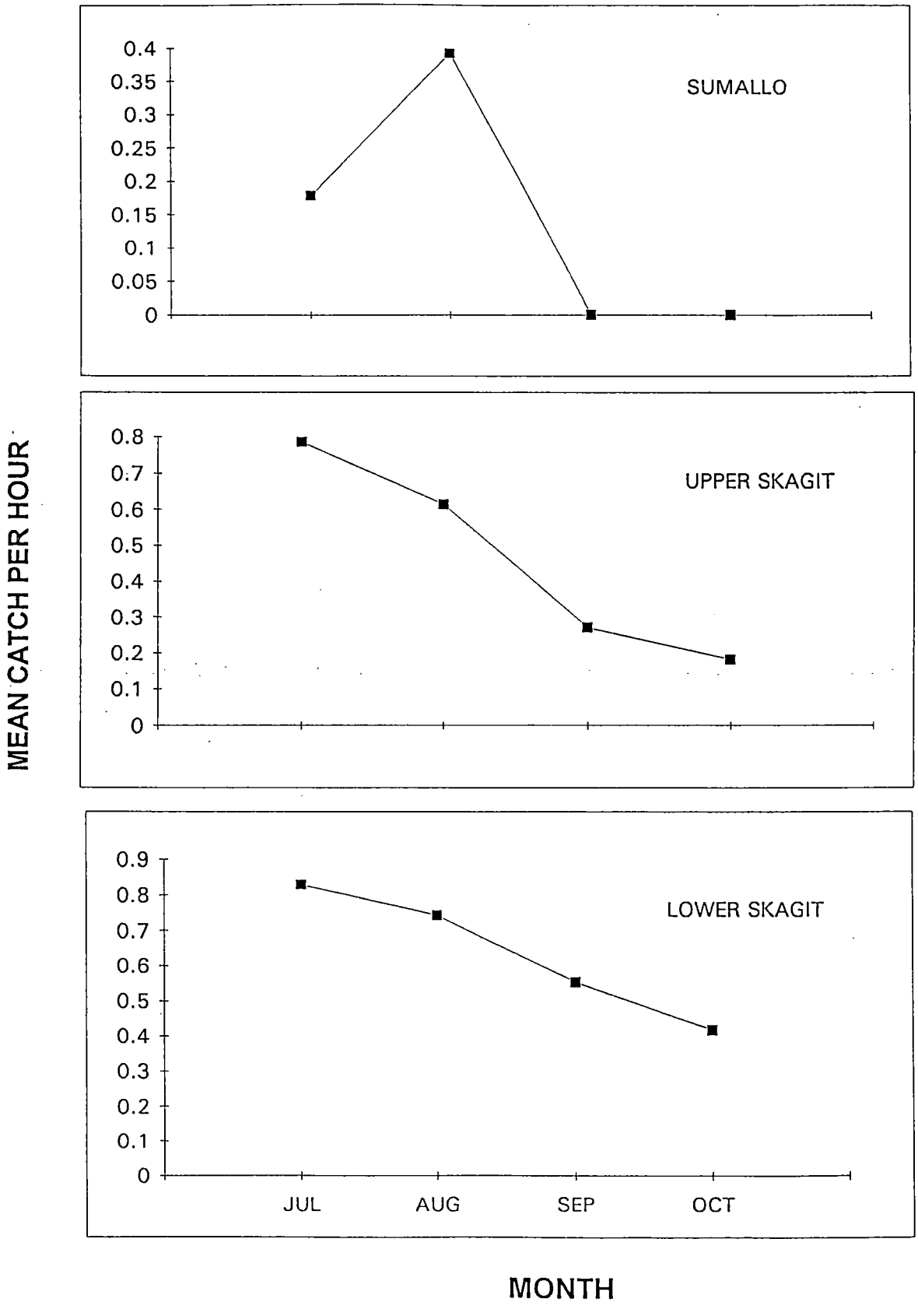


Figure 6. Temporal distribution of angler success in the Skagit River trout fishery, July 1 through October 31, 1992.

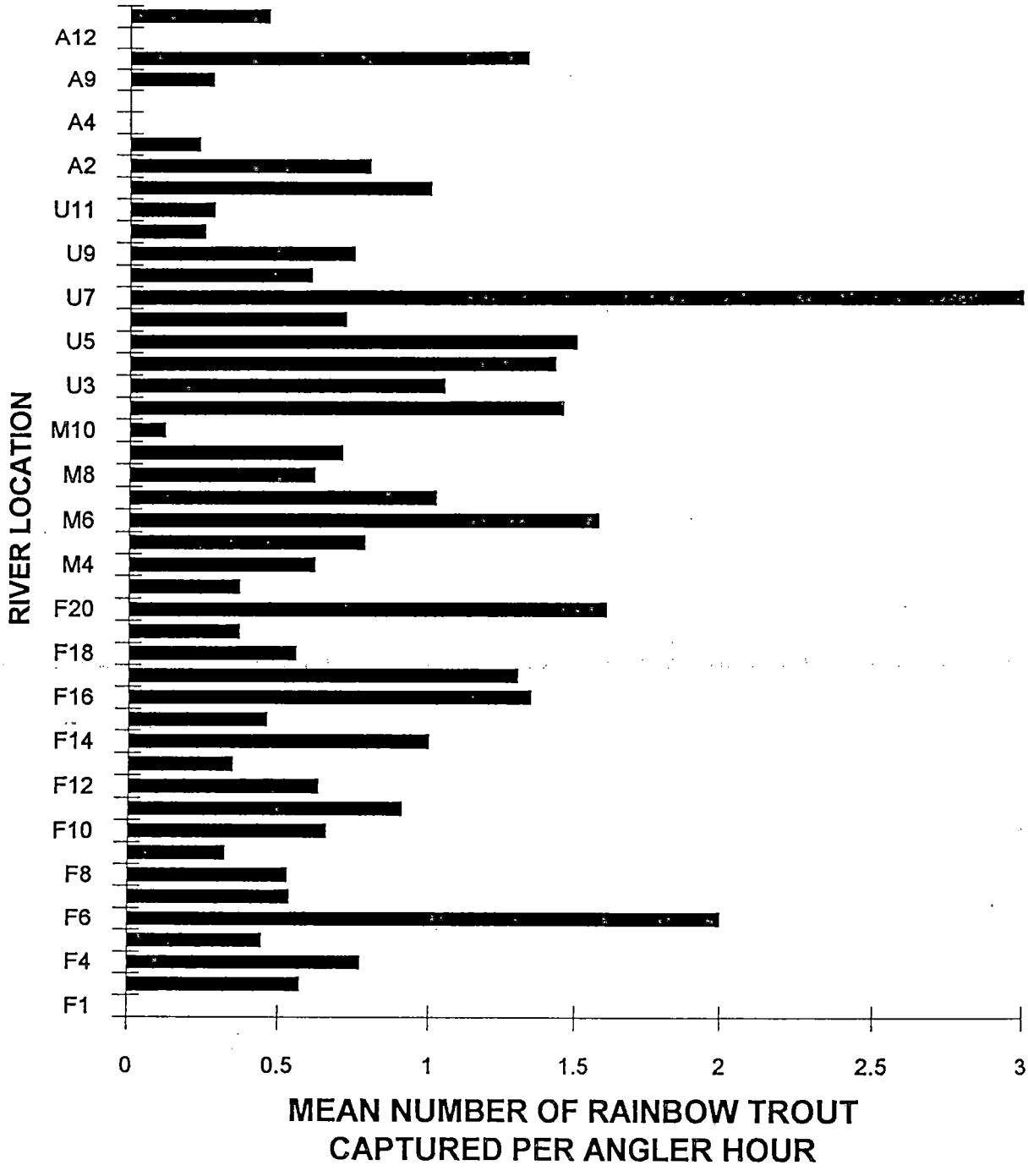


Figure 7. Distribution of angler catch success for rainbow trout among catch location sites in the Skagit River trout fishery, July 1 through October 31, 1992.

Table 5. Hours fished and estimated catch rates by gear type in the Skagit River trout fishery, July 1 through October 31, 1992.

	LURES			BAIT			FLY		
REGION	HOURS FISHED	CATCH PER HOUR		HOURS FISHED	CATCH PER HOUR		HOURS FISHED	CATCH PER HOUR	
		RT	DV		RT	DV		RT	DV
Lower Skagit	1,619	0.305	0.025	128	0.211	0.000	13,335	0.787	0.004
Upper Skagit	651	0.238	0.000	39	0.000	0.000	2,476	0.779	0.016
Sumallo	934	0.189	0.000	0	0.000	0.000	372	0.436	0.000
Total River	3,204	0.271	0.016	167	0.167	0.000	16,183	0.782	0.008
% of Total	16.4			0.8			82.8		

Notes: DV = Dolly Varden
RT = rainbow trout

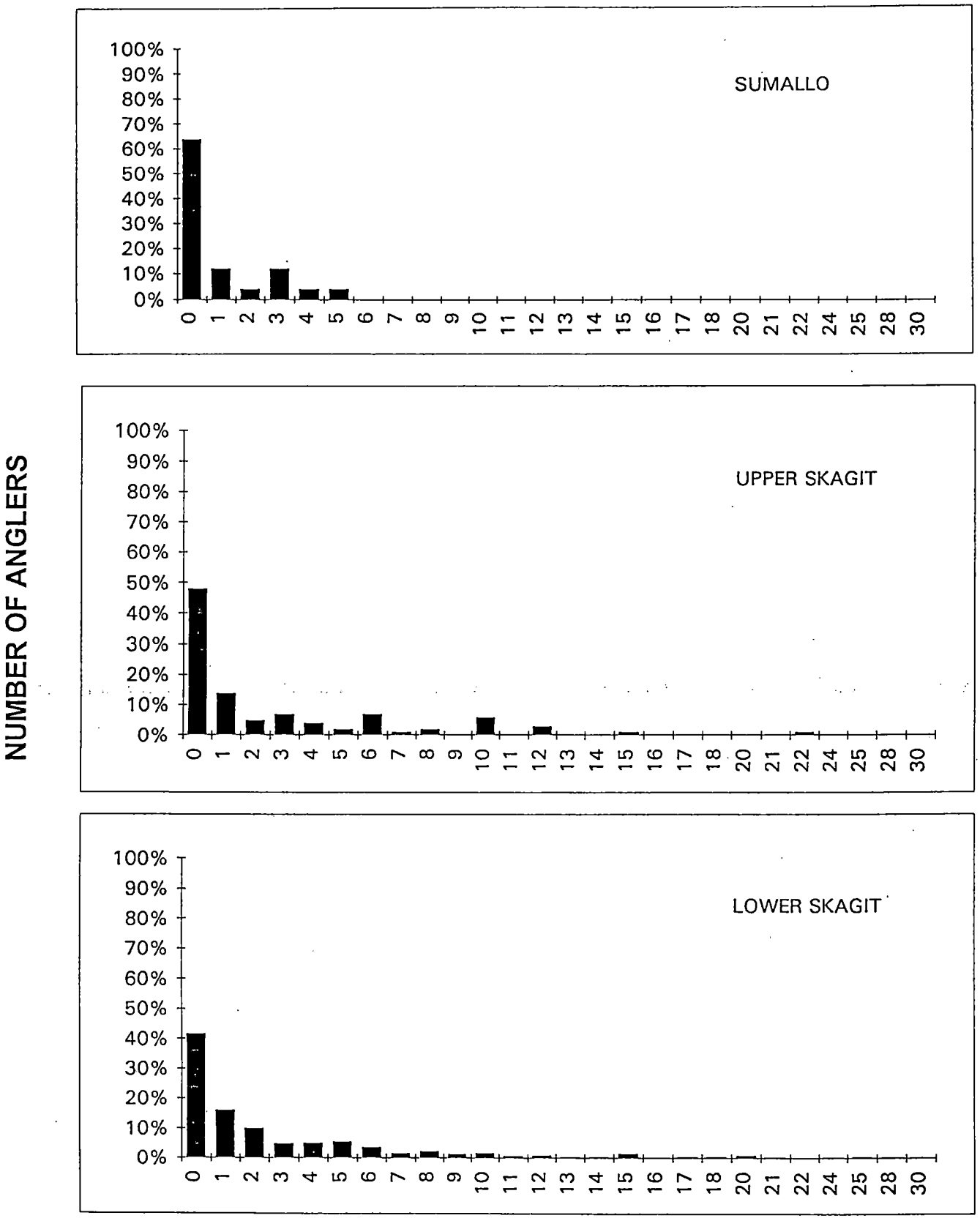


Figure 8. Percent frequency distribution of the number of anglers catching 0, 1, 2 or more rainbow trout during the Skagit River trout fishery, July 1 through October 31, 1992.

Table 6. Estimated mean catch per angler hour for Dolly Varden in the lower Skagit River trout fishery, July 1 through October 31, 1992.

Month	River Section	Day Type	Dolly Varden Catch per hour Released	Standard Error
July	1	Midweek	0.0000	(0.0000)
		Weekend	0.0070	(0.0000)
		Mean	0.0048	(0.0000)
	2	Midweek	0.0000	(0.0000)
		Weekend	0.0070	(0.0000)
		Mean	0.0041	(0.0000)
	Month Mean		0.0046	(0.0000)
August	1	Midweek	0.0000	(0.0000)
		Weekend	0.0122	(0.0000)
		Mean	0.0077	(0.0000)
	2	Midweek	0.0000	(0.0000)
		Weekend	0.0194	(0.0007)
		Mean	0.0114	(0.0004)
	Month Mean		0.0084	(0.0001)
September	1	Midweek	0.0000	(0.0000)
		Weekend	0.0104	(0.0000)
		Mean	0.0072	(0.0000)
	2	Midweek	0.0000	(0.0000)
		Weekend	0.0000	(0.0000)
		Mean	0.0000	(0.0000)
	Month Mean		0.0059	(0.0000)
October	1	Midweek	0.0293	(0.0021)
		Weekend	0.0000	(0.0000)
		Mean	0.0093	(0.0007)
	2	Midweek	0.0000	(0.0000)
		Weekend	0.0000	(0.0000)
		Mean	0.0000	(0.0000)
	Month Mean		0.0085	(0.0006)
Season	1	Midweek	0.0025	(0.0002)
		Weekend	0.0090	(0.0000)
		Mean	0.0068	(0.0001)
	2	Midweek	0.0000	(0.0000)
		Weekend	0.0094	(0.0003)
		Mean	0.0062	(0.0002)
	Season Mean		0.0067	(0.0001)

3.3 Angler Effort and Catch Characteristics at the Upper Skagit and Sumallo Rivers

3.3.1 Estimated Total Angler Effort

Anglers fished an estimated 4,472 hours (1,152 days) between July 1 and October 31, 1992 at the upper Skagit and Sumallo Rivers (Table 7). The standard error for angler hours was estimated at 4,358 to 4,586 hours or +/- 2.5% of the estimated total, indicating excellent precision of the estimate. The 95% confidence interval is roughly twice the standard error (+/- 5% of estimated effort).

Anglers at the upper Skagit River fished an estimated 3,166 hours (776 days) between July 1 and October 31. The standard error for angler hours was estimated at 3079 to 3253 hours or +/- 2.7% of the estimated total.

Sumallo River anglers fished an estimated 1,306 hours (251 days) between July 1 and October 31. The standard error for angler hours was estimated at 1,232 to 1,380 hours or +/- 5.7% of the estimated total.

3.3.2 Temporal and Spatial Distribution of Angler Effort

Angler effort at the Sumallo River was highest during July (50% of season effort) and declined thereafter (Table 7; Figure 2). At the upper Skagit angler effort was highest and almost identical in July (43% of season effort) and August (43% of season effort). By early September, angler effort had declined dramatically in both the Sumallo and upper Skagit areas. Only three anglers were interviewed at the upper Skagit during October; no anglers were encountered on the Sumallo river during October.

Angler effort at both the upper Skagit and Sumallo River areas was heavily weighted toward weekends (Appendix 4). Angler effort in both areas was highest during mid day.

3.3.3 Estimated Total Catch and Harvest

The estimated total catch of rainbow trout at the upper Skagit and Sumallo Rivers was 2,500 fish (Table 8). Approximately 48% of the estimated total catch occurred in July, followed closely by August (43%). A small portion of the season catch occurred in September (9%) and October (<1%).

An estimated 2,183 trout or 87% of the combined catch of the upper Skagit and Sumallo Rivers came from the upper Skagit River (Table 8). At the upper Skagit River 50% of the season catch occurred in July (Figure 4), followed by August (43%) and September (9%).

Table 7. Estimated angler effort in the Sumallo and upper Skagit River trout fishery July 1 through October 31, 1992.

Month	River Section	Day Type	Angler Hours	Standard Error	Mean Hours Fished per Day	Total Angler Days
July	Sumallo	Midweek	88	(13)	1.39	63
		Weekend	562	(54)	10.67	53
		Total	650	(56)	7.19	90
	Upper Skagit	Midweek	616	(15)	3.18	194
		Weekend	738	(49)	4.70	157
		Total	1,354	(51)	4.12	328
	Month Total		2,004	(76)	4.55	441
August	Sumallo	Midweek	180	(22)	1.35	133
		Weekend	370	(41)	5.50	67
		Total	550	(47)	4.28	129
	Upper Skagit	Midweek	500	(19)	1.57	318
		Weekend	860	(55)	4.51	191
		Total	1,360	(59)	3.94	345
	Month Total		1,910	(75)	4.04	473
September	Sumallo	Midweek	84	(12)	8.62	10
		Weekend	23	(6)	1.54	15
		Total	107	(14)	4.37	24
	Upper Skagit	Midweek	294	(33)	8.62	34
		Weekend	95	(14)	1.54	61
		Total	389	(36)	3.31	117
	Month Total		495	(39)	3.31	150
October	Sumallo	Midweek	0	0	0.00	0
		Weekend	0	0	0.00	0
		Total	0	0	0.00	0
	Upper Skagit	Midweek	0	0	0.00	0
		Weekend	63	(12)	7.36	9
		Total	63	(12)	7.36	9
	Month Total		63	(12)	7.36	9
Season	Sumallo	Midweek	352	(29)	1.37	258
		Weekend	954	(69)	7.02	136
		Total	1,306	(74)	5.21	251
	Upper Skagit	Midweek	1,410	(41)	3.11	453
		Weekend	1,756	(76)	4.46	393
		Total	3,166	(87)	4.08	776
	Season Total		4,472	(114)	3.88	1,152

Table 8. Estimates of rainbow trout captured (released) in the Sumallo and upper Skagit River trout fishery July 1 through October 31, 1992.

Month	River Section	Day Type	Rainbow Trout Catch Released	Standard Error
July	Sumallo	Midweek	21	(7)
		Weekend	79	(10)
		Total	100	(12)
	Upper Skagit	Midweek	580	(226)
		Weekend	508	(85)
		Total	1,089	(241)
	Month Total		1,189	(242)
August	Sumallo	Midweek	80	(38)
		Weekend	136	(30)
		Total	216	(49)
	Upper Skagit	Midweek	333	(339)
		Weekend	518	(91)
		Total	851	(351)
	Month Total		1,068	(355)
September	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	222	(94)
		Weekend	10	(3)
		Total	232	(94)
	Month Total		232	(94)
October	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	0	0
		Weekend	11	(2)
		Total	11	(2)
	Month Total		11	(2)
Season	Sumallo	Midweek	101	(39)
		Weekend	216	(32)
		Total	317	(50)
	Upper Skagit	Midweek	1,135	(418)
		Weekend	1,048	(125)
		Total	2,183	(436)
	Season Total		2,500	(439)

The greatest numbers of rainbow trout caught at the upper Skagit River came from the vicinities of U8, U9 (Silverdaisy Creek) and U3, U4 and U6 (Twentysix Mile Creek; Figures 1 and 5).

An estimated 317 trout or 13% of the combined catch of the upper Skagit and Sumallo Rivers came from the Sumallo River (Table 8). The highest monthly rainbow catch from the Sumallo River occurred in August (68%) followed by July (32%). No fish were reported caught from the Sumallo River during September or October, 1992. The greatest number of trout were caught at A9 (Figures 1 and 5).

A total of 58 Dolly Varden was estimated caught from the upper Skagit River during July (53%) and September (47%; Table 9). No Dolly Varden were reported caught from the Sumallo River.

In 1992 there was no recorded catch of brook trout or cutthroat trout from the upper Skagit or Sumallo Rivers.

3.3.4 Angler Success

Highest combined catch success rates for rainbow trout at the upper Skagit and Sumallo Rivers occurred in July (0.70 fish per hour), followed by August (0.55 fish per hour), September (0.30 fish per hour) and October (.19 fish per hour; Table 10; Figure 6). The monthly distribution of angler success in these river sections approximated the monthly distribution of catch (Figure 6; Figure 4).

At the upper Skagit, the highest catch success for rainbow trout occurred in July (0.79 fish per hour), followed by August (0.61 fish per hour) and September (0.30 fish per hour; Table 10). The highest catch rate per fishing site (approximately 3.0 fish per hour) was recorded at U7 (between Silverdaisy and Twentysix Mile Creeks; Figures 1 and 7), followed by U4 and U5 (approximately 1.5 fish per hour).

At the upper Skagit River, approximately one half of the anglers interviewed reported catching at least one rainbow trout (Figure 8). Most successful anglers caught up to 6 trout, although catches of up to 22 were recorded.

At the upper Skagit, fly fishermen were far more successful than anglers using lures (Table 5).

The highest success rate at the Sumallo River occurred in August (0.39 fish per hour; Table 10), followed by July (0.18 fish per hour). No fish were reported caught from the Sumallo River during September or October. The highest catch rates for rainbow trout were at the A10 angling site (1.5 fish per hour; Figure 7). The high catch rate at A10 resulted from good success from a small amount of angler effort.

Table 9. Estimates of Dolly Varden captured (released) in the Sumallo and upper Skagit River trout fishery, July 1 through October 31, 1992.

Month	River Section	Day Type	Dolly Varden Catch Released	Standard Error
July	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	31	2
		Weekend	0	0
		Total	31	(2)
	Month Total		31	(2)
August	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Month Total		0	0
September	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	17	2
		Weekend	10	3
		Total	27	(4)
	Month Total		27	(4)
October	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Month Total		0	0
Season	Sumallo	Midweek	0	0
		Weekend	0	0
		Total	0	0
	Upper Skagit	Midweek	48	(3)
		Weekend	10	(3)
		Total	58	(4)
	Season Total		58	(4)

Table 10. Estimated mean catch per angler hour for rainbow trout in the Sumallo and upper Skagit River trout fishery July 1 through October 31, 1992.

Month	River Section	Day Type	Rainbow Trout Catch per hour Released	Standard Error
July	Sumallo	Midweek	0.2398	(0.0680)
		Weekend	0.1412	(0.0125)
		Mean	0.1782	(0.0333)
	Upper Skagit	Midweek	0.9421	(0.3654)
		Weekend	0.6888	(0.1059)
		Mean	0.7851	(0.2045)
	Monthly Mean		0.7014	(0.1809)
August	Sumallo	Midweek	0.4444	(0.2029)
		Weekend	0.3688	(0.0707)
		Mean	0.3910	(0.1096)
	Upper Skagit	Midweek	0.6667	(0.6777)
		Weekend	0.6024	(0.0980)
		Mean	0.6149	(0.2111)
	Monthly Mean		0.5493	(0.1813)
September	Sumallo	Midweek	0.0000	(0.0000)
		Weekend	0.0000	(0.0000)
		Mean	0.0000	(0.0000)
	Upper Skagit	Midweek	0.7536	(0.3058)
		Weekend	0.1081	(0.0313)
		Mean	0.2695	(0.1000)
	Monthly Mean		0.2695	(0.1000)
October	Sumallo	Midweek	0.0000	(0.0000)
		Weekend	0.0000	(0.0000)
		Mean	0.0000	(0.0000)
	Upper Skagit	Midweek	0.0000	(0.0000)
		Weekend	0.1812	(0.0083)
		Mean	0.1812	(0.0083)
	Monthly Mean		0.1812	(0.0083)
Season	Sumallo	Midweek	0.3677	(0.1523)
		Weekend	0.3018	(0.0536)
		Mean	0.3229	(0.0852)
	Upper Skagit		0.8532	(0.4475)
		Midweek	0.5812	(0.0922)
		Weekend	0.6585	(0.1932)
		Mean		
	Season Mean		0.5924	(0.1719)

At the Sumallo River, almost 40% of interviewed anglers reported catching one or more fish (Figure 8). Most of the successful anglers caught only one or two rainbow trout and the maximum reported catch was 5 fish.

3.4 Characteristics, Opinions and Attitudes of Skagit River Anglers During 1992

3.4.1 Angler Profile

Forty-five percent of Skagit River anglers were adults 31 to 45 years of age (Table 11; Figure 9). One third of the anglers were estimated to be 16 to 30 years old. The remaining anglers who were interviewed were either over age 45 (17%) or less than age 16 (6%).

Among the four river sections, the greatest percentage of fishermen over age 45 was at the upper Skagit River (18%), and the greatest percentage of children (estimated to be under age 16) was at the Sumallo River (17%).

Table 11. Age distribution of anglers interviewed in the Skagit River trout fishery, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
Age	n	%	n	%	n	%	n	%
Under 16	21	5.2	8	8.5	4	17.4	33	6.3
16 - 30	125	30.9	33	35.1	11	47.8	169	32.4
30 - 45	185	45.7	42	44.7	7	30.4	234	44.8
Over 45	74	18.3	11	11.7	1	4.3	86	16.5
N	405		94		23		522	

Overall, 89% of the anglers gave the Lower Mainland as their place of residence (Figure 10; Table 12). The remaining categories were (in order of frequency) Washington state (6%), B.C. locations outside of the Lower Mainland (3%), other Canadian provinces (1%) U.S. states other than Washington (1%) and other countries (<1%).

All areas had a similar proportion of anglers from the Lower Mainland (87% to 89%). Anglers from Washington state were only encountered in the lower Skagit River area.

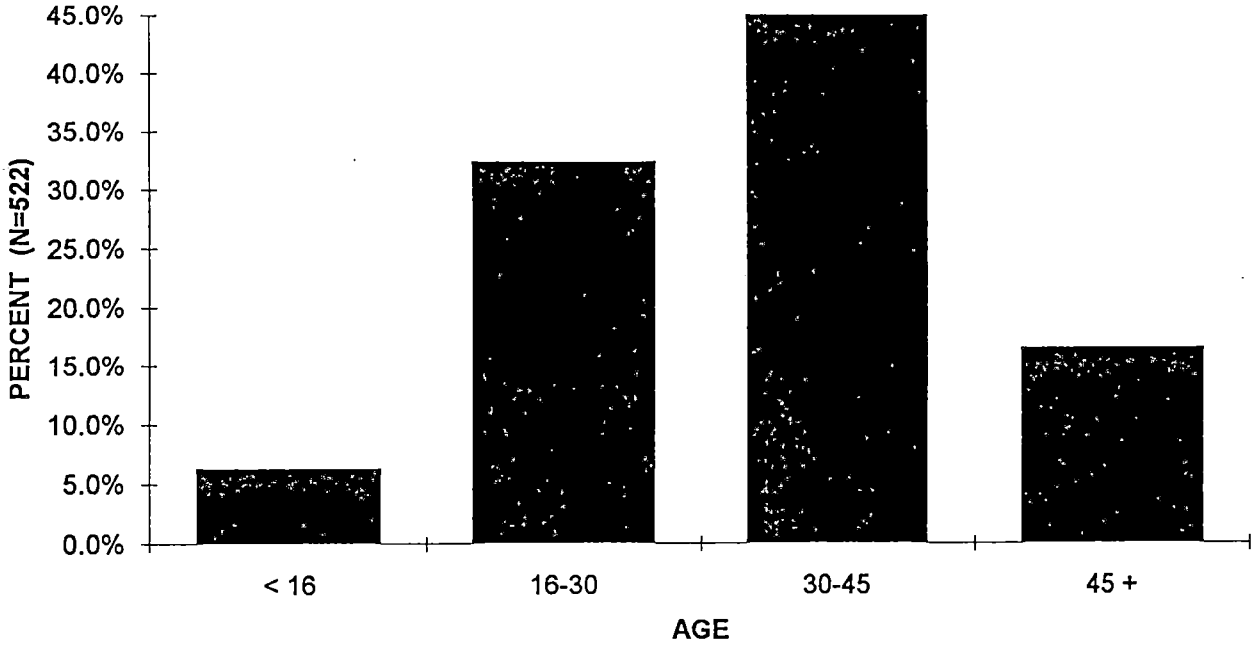


Figure 9 Frequency distribution of estimated angler age categories in the Skagit River trout fishery, July 1 through October 1992.

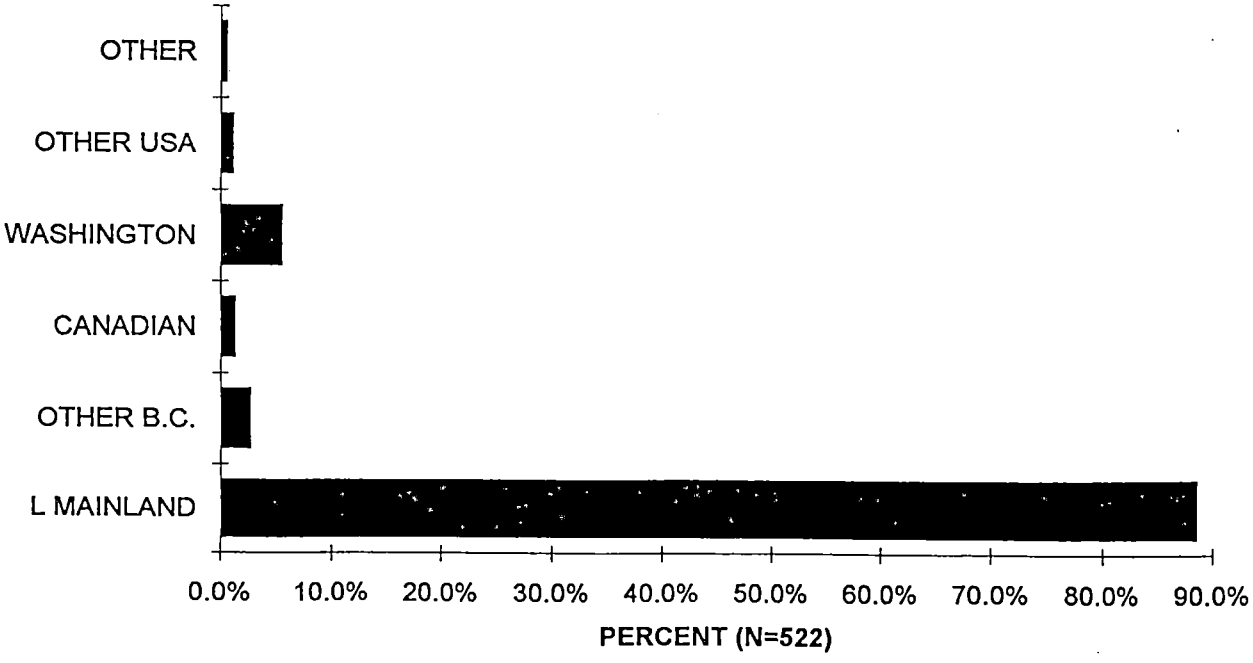


Figure 10 Percent frequency distribution of residence of anglers interviewed in the Skagit River trout fishery, July 1 through October 31, 1992.

Table 12. Residence of anglers interviewed during the Skagit River trout fishery, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
Origin*	n	%	n	%	n	%	n	%
L	361	89.1	82	87.2	20	87.0	463	88.7
B	6	1.5	5	5.3	3	13.0	14	2.7
C	4	1.0	3	3.2	0	0.0	7	1.3
W	29	7.2	0	0.0	0	0.0	29	5.6
U	4	1.0	2	2.1	0	0.0	6	1.1
S	1	0.2	2	2.1	0	0.0	3	0.6
N	405		94		23		522	

* (L) Lower Mainland of British Columbia; (B) other British Columbia; (C) other Canadian; (W) Washington State; (U) other American; (S) other than Canadian or American

The predominant gear type in all areas was fly (83% of total hours of effort), followed by lures (16%; Table 5). Illegal bait use was below 1% of total effort in all areas. At the lower Skagit, 88% of effort was by fly, and 11% of effort was by lure. At the upper Skagit River, 78% of effort was by fly, while the Sumallo River had only 18% fly angling. Seventy-two percent of the effort at Sumallo River was by lure anglers.

In all areas of the river, the most frequent year that anglers reported as their first year angling the Skagit was 1992. Overall, 48% of the anglers interviewed fished the Skagit River for the first time in 1992 (Table 13; Figure 11). The section with the lowest percentage of 1992 first time reports was the lower Skagit (47%). Over half of the upper Skagit and Sumallo sections interviews reported 1992 as their first year of angling the river. Of note, over 75% of the anglers interviewed at the upper Skagit fished it for the first time in the past four seasons (since 1989).

Twenty-eight percent of interviewed anglers on the lower Skagit River had been interviewed previously in the survey (Table 14). The proportion of previously interviewed anglers at the upper Skagit (8%) and Sumallo (8%) areas were similar.

Only 19% of anglers were fish and game club members. The highest proportion was at the upper Skagit River (29%), followed by the lower Skagit (18%) and Sumallo (4%) Rivers.

Table 13. First year of use by anglers in the Skagit River trout fishery, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
	n	%	n	%	n	%	n	%
before 1970	16	4.0	4	4.3	0	0.0	20	3.9
1970 - 1974	16	4.0	3	3.3	2	8.7	21	4.1
1975 - 1979	19	4.7	5	5.4	0	0.0	24	4.7
1980 - 1984	39	9.7	4	4.3	3	13.0	46	8.9
1985	7	1.7	1	1.1	0	0.0	8	1.6
1986	18	4.5	2	2.2	0	0.0	20	3.9
1987	24	6.0	2	2.2	1	4.3	27	5.2
1988	18	4.5	2	2.2	2	8.7	22	4.3
1989	22	5.5	8	8.7	3	13.0	33	6.4
1990	15	3.7	3	3.3	0	0.0	18	3.5
1991	18	4.5	10	10.9	0	0.0	28	5.4
1992	189	47.1	48	52.2	12	52.2	249	48.3
TOTAL	401		92		23		516	

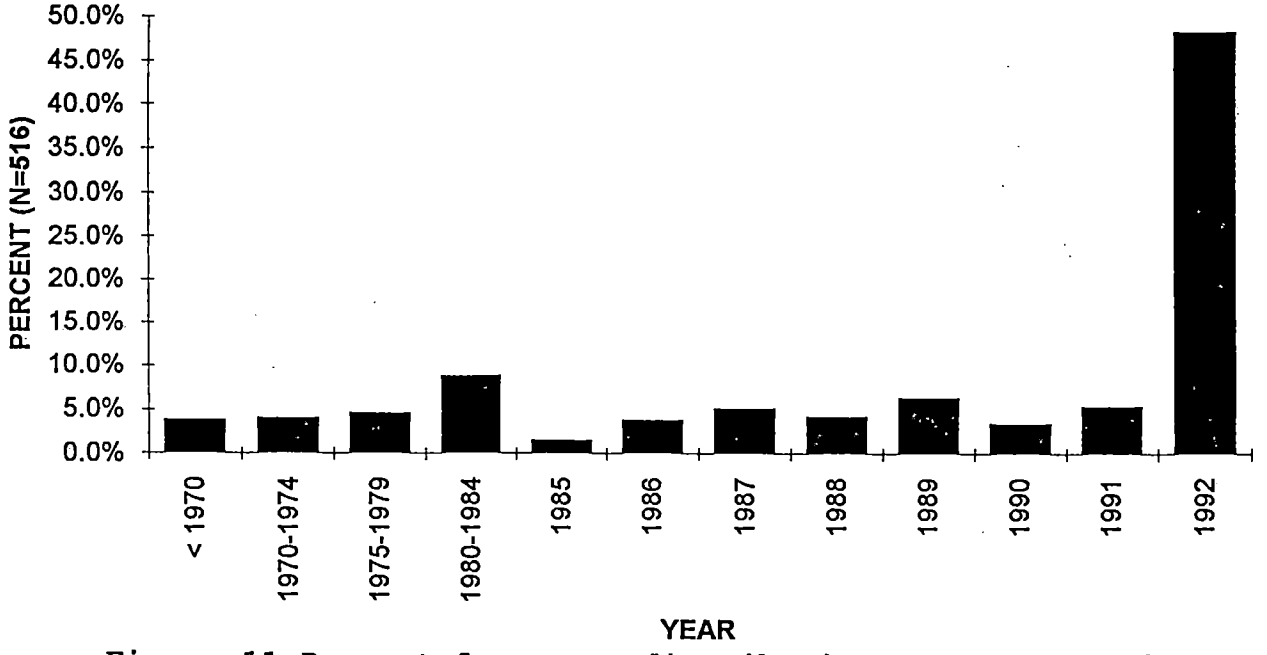


Figure 11 Percent frequency distribution of reported first year of fishing the Skagit River trout fishery, July 1 through October 31, 1992.

Table 14. Percent frequency of first time and repeat interviews in the Skagit River angler survey, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
	n	%	n	%	n	%	n	%
First time	409	72.0	94	92.2	23	92.0	526	75.7
Repeat	159	28.0	8	7.8	2	8.0	169	24.3
TOTAL	568		102		25		695	

3.4.2 Angler Opinions and Attitudes

The level of awareness of angling regulations was similar among anglers at the lower Skagit (70%) and Sumallo (70%) sections (Table 15). A slightly higher percentage of anglers who fished the upper Skagit were aware of all the current special regulations (81%). The poor awareness in all areas was largely due to many anglers not knowing that the season ends October 31. A higher percentage of anglers in all areas was aware of all the other special regulations (catch and release, barbless hooks and the bait restriction).

Table 15. Percent of anglers knowledgeable of the special regulations at the Skagit River, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
AWARE	n	%	n	%	n	%	n	%
Yes	282	70.0	76	80.9	16	69.6	374	71.9
No	121	30.0	18	19.1	7	30.4	146	28.1
N	403		94		23		520	

Of those anglers who were aware of the current special regulations most also agreed with them (Table 16). The lowest percentage of anglers in agreement with the regulations was at the Sumallo River, although the sample size is small.

Over ninety percent of the regulation aware anglers interviewed at the upper and lower Skagit areas supported the catch and release regulation, compared to only 80% of the anglers at the Sumallo River. There was strong agreement with the single barbless hook and bait restriction. However, a number of anglers questioned the need to close the season on October 31 (Appendix 5).

Table 16. Percent of anglers aware of the special regulations at the Skagit River that agreed with them, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
	n	%	n	%	n	%	n	%
CATCH & RELEASE								
Agree	279	91.5	75	94.9	12	80.0	366	91.7
Disagree	26	8.5	4	5.1	3	20.0	33	8.3
n	305		79		15		399	
BARBLESS HOOK								
Agree	289	97.0	78	98.7	13	81.3	380	96.7
Disagree	9	3.0	1	1.3	3	18.8	13	3.3
n	298		79		16		393	
NO BAIT								
Agree	290	97.0	76	96.2	13	81.3	379	96.2
Disagree	9	3.0	3	3.8	3	18.8	15	3.8
n	299		79		16		394	
LENGTH OF SEASON								
Agree	215	85.0	69	88.5	14	87.5	298	85.9
Disagree	38	15.0	9	11.5	2	12.5	49	14.1
n	253		78		16		347	

The majority of anglers (77%) rated the quality of their fishing experience as good to excellent (Table 17, Figure 12). The other 23% either felt they had fair (16%), poor (7%) or terrible (<1%) experiences. A higher percentage of lower Skagit anglers rated their fishing experience as good or excellent compared to the upper Skagit or Sumallo Rivers. A significant percentage (15%) of the upper Skagit anglers rated their fishing experience as poor or terrible.

Table 17. Perceived quality of fishing experience as rated by anglers interviewed in the Skagit River trout fishery, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
RATING	n	%	n	%	n	%	n	%
Excellent	86	41.3	12	26.1	0	0.0	98	37.0
Good	84	40.4	14	30.4	7	63.6	105	39.6
Fair	24	11.5	13	28.3	4	36.4	41	15.5
Poor	14	6.7	5	10.8	0	0.0	19	7.2
Terrible	0	0.0	2	4.3	0	0.0	2	0.8
TOTAL	208		46		11		265	

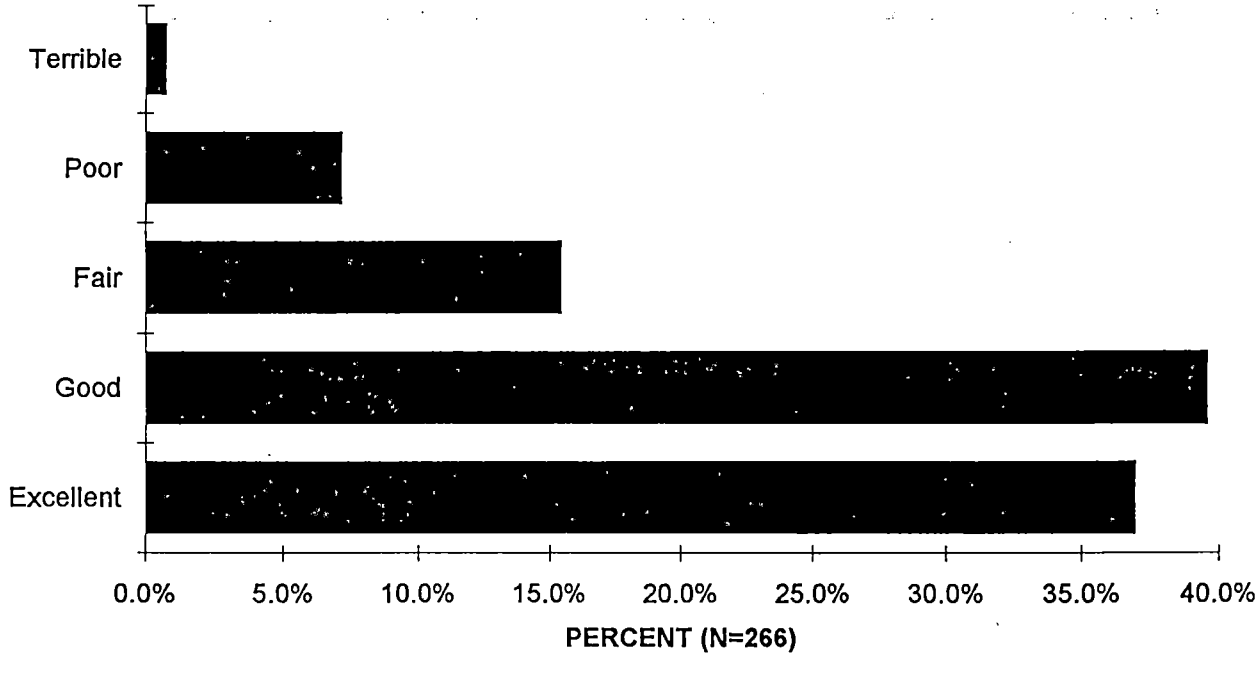


Figure 12. Percent frequency distribution of perceived quality of fishing experience as rated by anglers during the Skagit River trout fishery, July 1 through October 31, 1992.

When asked "What, if anything, is the one thing you dislike about fishing the Skagit River?", the largest proportion of responses was in the "no opinion" category (46%; Table 18; Figure 13). The most frequent complaint was about the catch & release regulation (31% of responses), followed by crowding (12%), litter (4%), mosquitos (4%) and poor success (2%). The lowest frequency of complaints (1%) concerned anglers with poor ethics. No anglers during the 1992 survey complained of small fish size.

Table 18. Perceived negative factors of the angling experience at the Skagit River, July 1 through October 31, 1992.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
ATTRIBUTE	n	%	n	%	n	%	n	%
No opinion	92	44.2	27	57.4	4	36.4	123	46.2
Catch & Release	68	32.7	11	23.4	4	36.4	83	31.2
Crowded	27	13.0	2	4.3	2	18.2	31	11.7
Litter	9	4.3	2	4.3	0	0.0	11	4.1
Mosquitos	7	3.4	3	6.4	0	0.0	10	3.8
Poor success	5	2.4	0	0.0	1	9.1	6	2.3
Poor ethics	0	0.0	2	4.3	0	0.0	2	0.8
N	208		47		11		266	

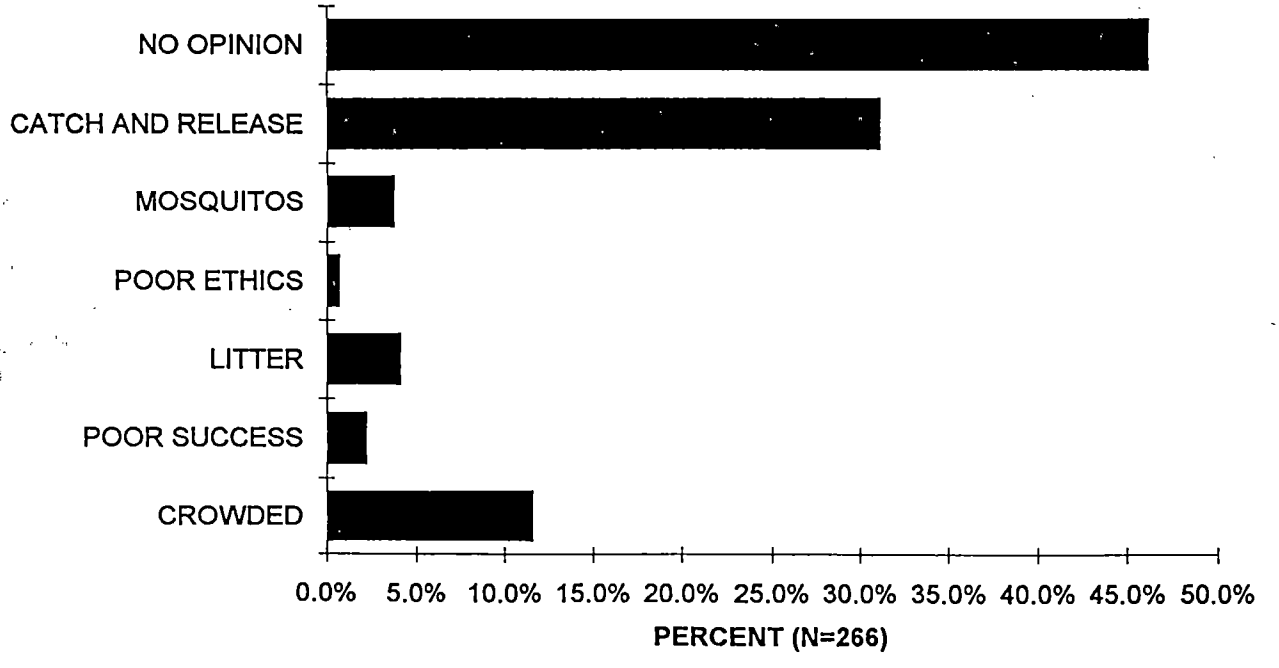


Figure 13. Percent frequency distribution of perceived negative aspects of the angling experience reported by anglers at the Skagit River, July 1 through October 31, 1992.

In both the Skagit River areas anglers expected they would encounter higher numbers of other anglers than anglers interviewed at the Sumallo River (Figure 14). Encounters of 10 or more different anglers were expected at some lower and upper Skagit fishing sites with moderate frequency, while anglers fishing the Sumallo never expected to encounter more than 6 other anglers.

At the lower Skagit River, most anglers saw fewer other anglers than they expected and angler expectations were infrequently surpassed (Figure 14). Half the lower Skagit anglers interviewed for the first time had not encountered other anglers by the time of interview but encounters with up to 8 other anglers were common. Although some lower Skagit anglers anticipated seeing more than 10 others their expectations were seldom realized.

Encounters with up to 15 other anglers occurred at the upper Skagit and some anglers' expectations for level of use were exceeded. No angler interviewed at Sumallo River encountered more than 5 others.

Most interviewed anglers (75%) considered the angler density to be "just right", while 16% stated that there were "too many" (Table 19). Nine percent of the anglers had no opinion. A slightly higher percentage of upper and lower Skagit anglers felt there were too many others compared to anglers at the Sumallo River.

Table 19. Angler perception of use levels at the Skagit and Sumallo Rivers during the 1992 season.

	LOWER SKAGIT		UPPER SKAGIT		SUMALLO		TOTAL	
Number of Anglers	n	%	n	%	n	%	n	%
Too few	0	0.0	1	2.1	0	0.0	1	0.3
Just right	194	74.3	34	72.3	10	90.9	238	74.6
Too many	41	15.7	8	17.0	1	9.1	50	15.7
No opinion	26	10.0	4	8.5	0	0.0	30	9.4
N	261		47		11		319	

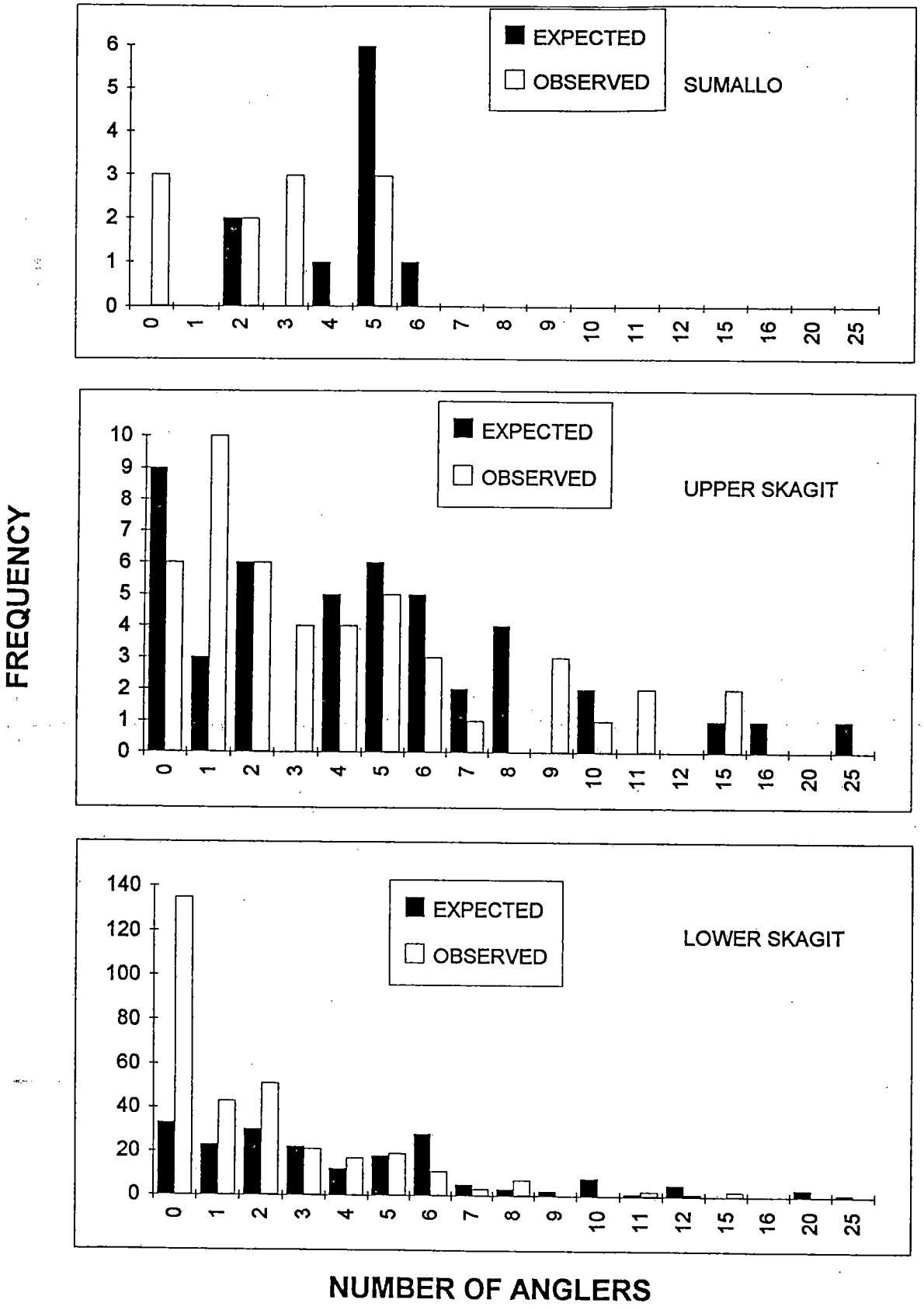


Figure 14. Frequency distribution of expected and actual encounters with other anglers reported by anglers interviewed in the Skagit River trout fishery, July 1 through October 31, 1992.

3.5 Comparisons of the 1986, 1990 and 1992 Skagit River Trout Fisheries

3.5.1 Comparison of Major Parameter Estimates

3.5.1.1 Angler Effort

Estimated total angler effort for all areas combined in 1992 markedly increased from both 1986 and 1990 (Scott and Lewynsky 1987; Scott et al 1991; Table 20). At the lower Skagit 1992 angler effort was up by over 6000 hours (68%) from 1990. In 1992, at the lower Skagit River, a large amount of angler effort was expended during early and peak season compared to 1986 and 1990 (Figure 15).

Total angler effort at the upper Skagit increased by 46% (993 hours) from 1990. The monthly distribution of effort was similar to the lower Skagit with increased effort during early and peak season compared to 1986 and 1990 (Figure 16).

Total angler effort at the Sumallo River increased by 18% (205 hours; Table 20) from 1990. Consistent with the Skagit areas, monthly distribution of effort in 1992 was also higher during early and peak season compared to 1986 and 1990 (Figure 16).

Although the increase in estimated hours of effort at the Sumallo River was small, the percentage change was quite pronounced because of the small amount of total effort.

3.5.1.2 Catch Rates

Overall angler success for rainbow trout in 1992 (0.70 fish per hour) increased substantially from that estimated for 1990 (0.36 fish per hour) or 1986 (.43 fish per hour; Table 21). In both the lower Skagit sections catch rates in July were much higher than during either of the two previous surveys (Figure 17). In August 1992, catch rates in Section 1 were similar to 1986 but higher than 1990, while in Section 2, August catch rates were higher than 1986 or 1990. Catch rates during September were similar in both sections in all three years. The estimated catch rate for October 1992 was lower than in 1990. However, the October 1990 catch rate is considered an aberration due to small sample size. In Section 1 in October 1990, an extraordinarily high catch rate resulted from a large catch (more than 100 trout) by only three anglers.

At the upper Skagit, the overall mean catch rate (.66 fish per hour) in 1992 increased from 1990 (.48 fish per hour) and 1986 (.36 fish per hour; Table 21). Catch rates in July were markedly

Table 20. Comparison of 1986, 1990 and 1992 effort and catch statistics for the Canadian Skagit River trout fishery.

				Percent Change	
	1986*	1990	1992	1986 to 1990	1990 to 1992
Total Hours Angler Effort					
All areas	12,704	12,271	19,554	-3.4	+59.4
Lower Skagit	8,922	8,971	15,082	+0.8	+68.1
Section 1	4,416	4,351	6,893	-1.5	+58.4
Section 2	4,506	4,646	8,189	+3.1	+76.3
Upper Skagit	2,987	2,173	3,166	-27.3	+45.7
Sumallo	795	1,101	1,306	+38.5	+18.6
Total Catch of Rainbow Trout					
All areas	5,605	5,305	14,786	-5.3	+178.7
Lower Skagit	4,301	3,925	12,286	-8.7	+213.0
Section 1	2,169	2,377	4,876	+9.6	+105.1
Section 2	2,132	1,548	7,410	-27.4	+378.7
Upper Skagit	1,138	1,207	2,183	+6.1	+80.9
Sumallo	166	174	317	+4.8	+82.2

* 1986 estimates are adjusted to coincide with the July 1 to October 31 survey period of 1990 and 1992.

Table 21. Comparison of 1986, 1990 and 1992 angler success statistics at the Canadian Skagit River trout fishery.

	Rainbow Trout Catch Per Hour		
	1986*	1990	1992
Seasonal Catch Per Hour			
All areas	.425	.355	.693
Lower Skagit	.461	.377	.713
Section 1	.476	.463	.683
Section 2	.451	.305	.827
Upper Skagit	.361	.482	.659
Sumallo	.166	.142	.323

* Adjusted mean catch rates for 1986 were weighted according to sample size.

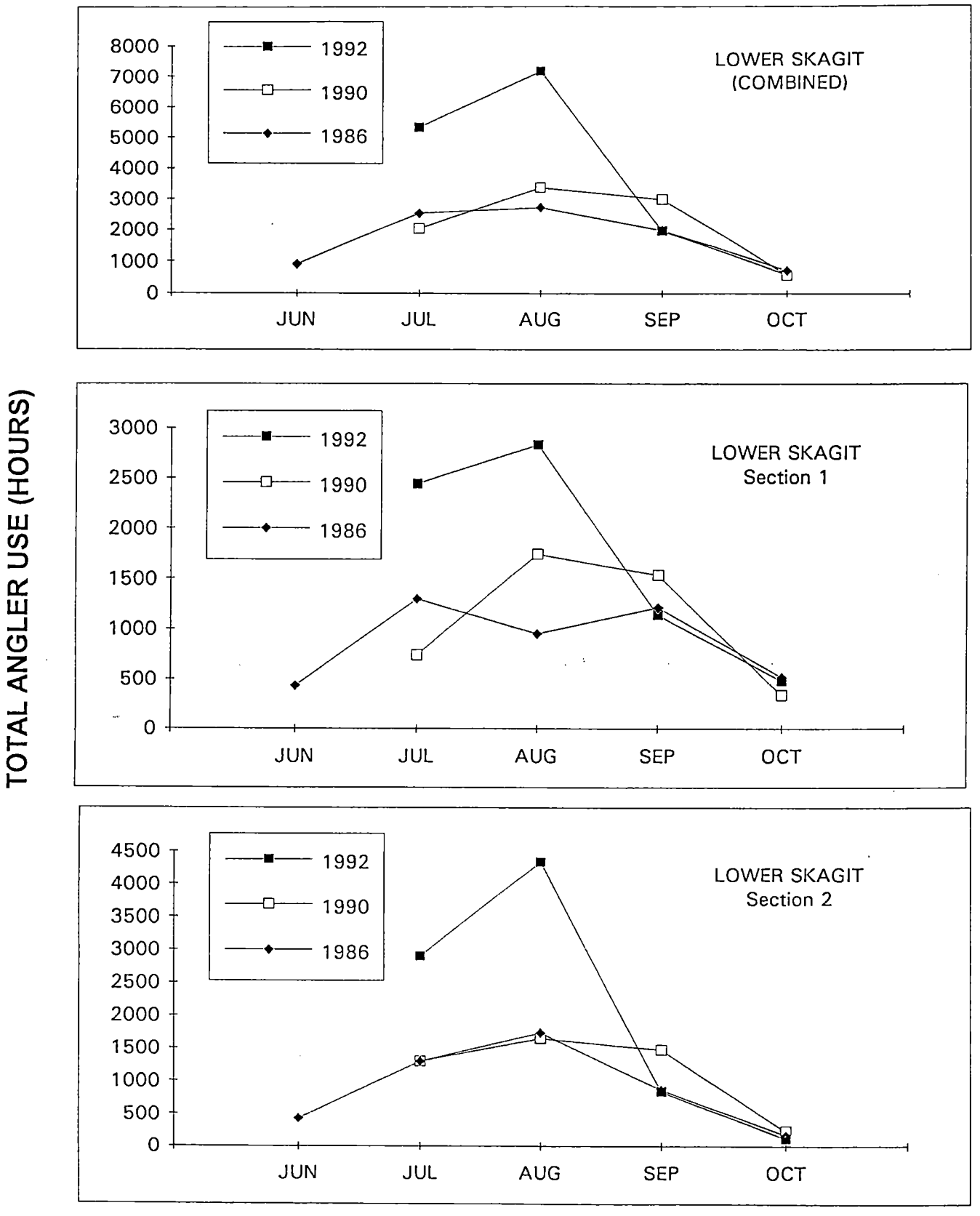


Figure 15. Comparison of monthly effort in the lower Skagit River trout fishery in 1986, 1990 and 1992.

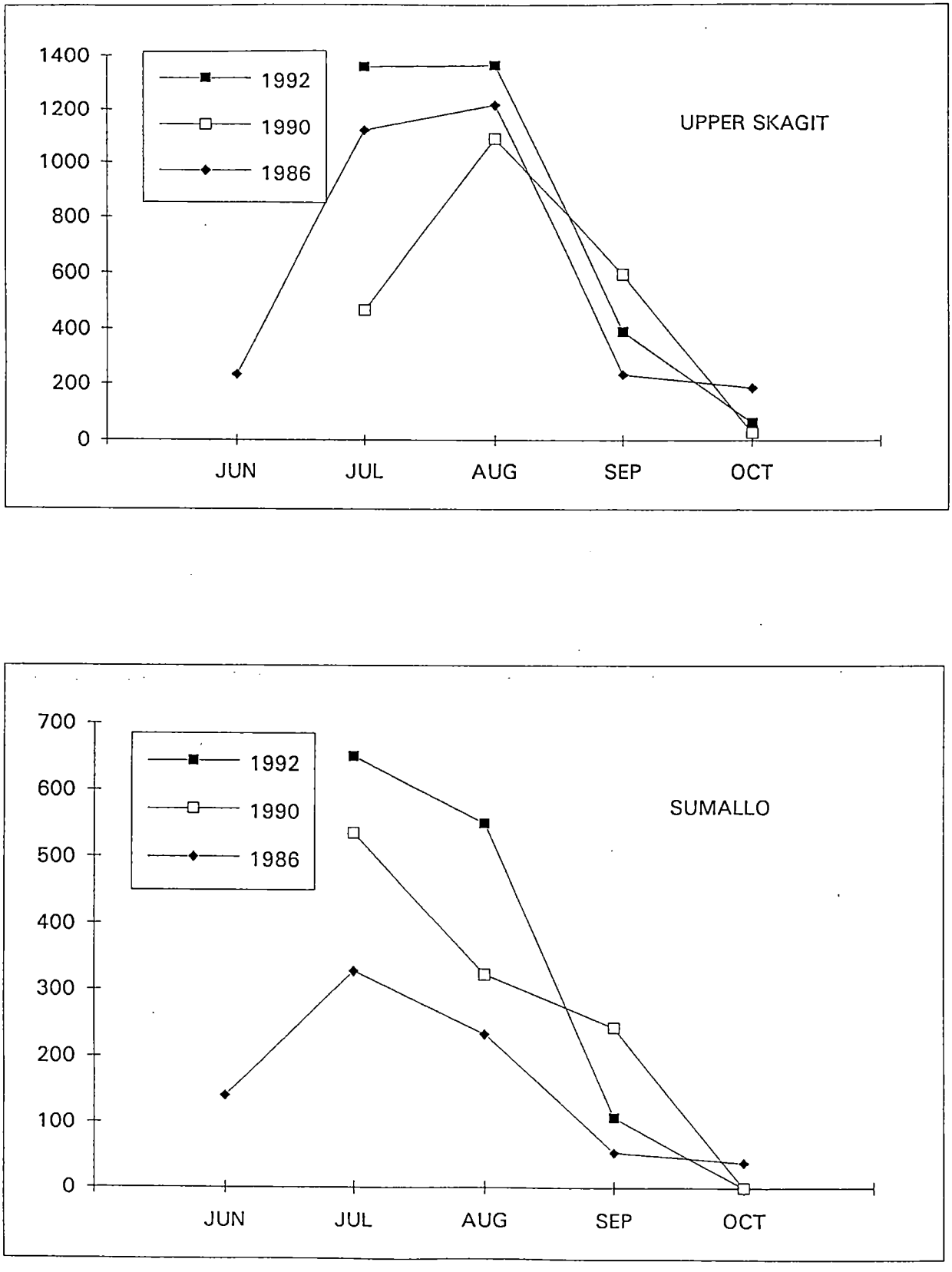


Figure 16. Comparison of monthly effort in the upper Skagit and Sumallo River trout fisheries in 1986, 1990 and 1992.

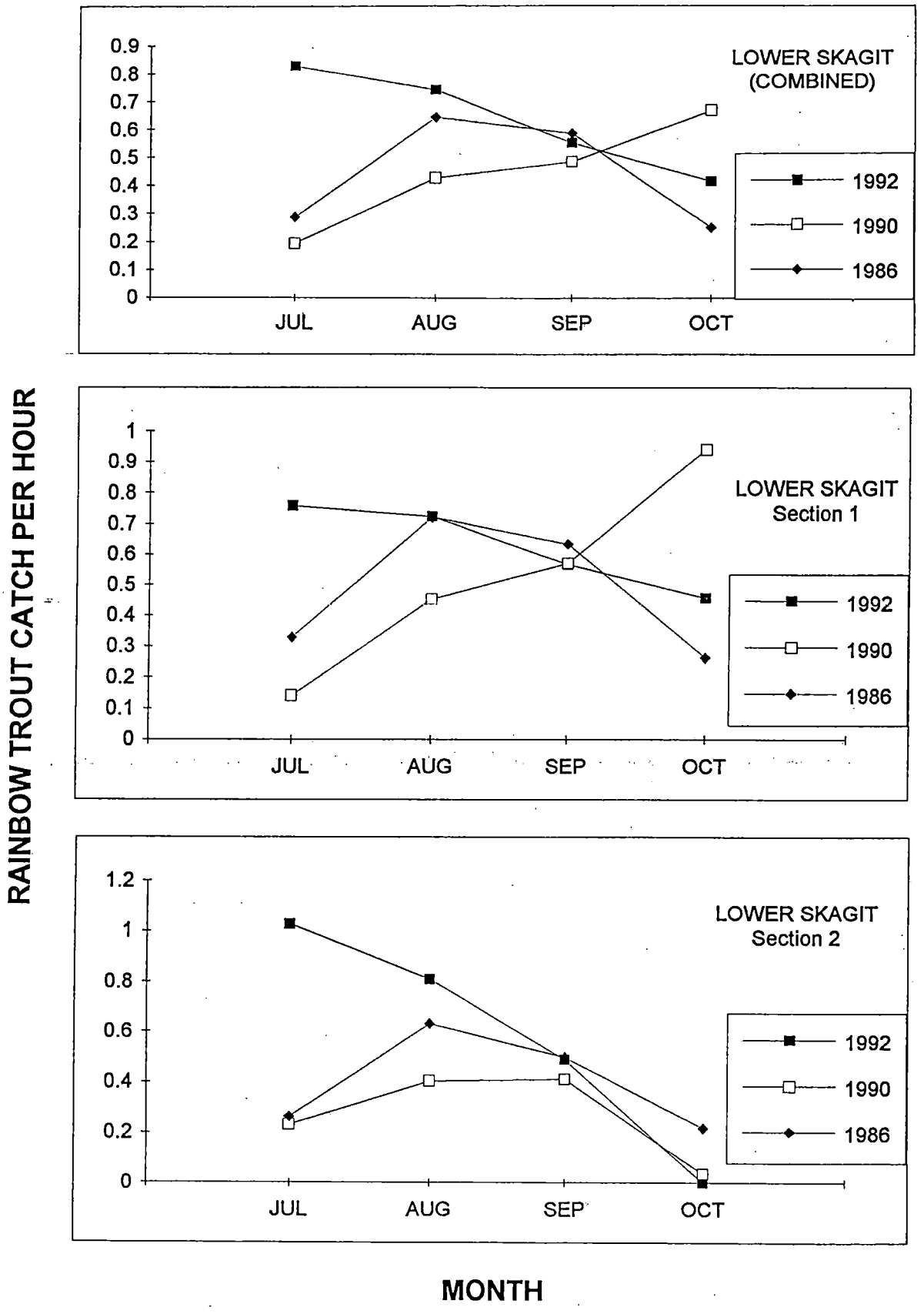


Figure 17. Comparison of monthly catch rates in the lower Skagit River trout fishery in 1986, 1990 and 1992.

higher than for that month in either 1990 or 1986. After July, the monthly distribution of catch rates resembled that of 1990 and 1986, although the mean catch rate during the peak effort month (August) increased slightly in 1990 and anglers in 1992 were more successful during late season (Figure 18).

At the Sumallo River, the mean catch rate for July 1992 was similar to 1990. However, during the peak month (August) the mean catch rate in 1992 exceeded both 1990 or 1986 (Figure 18). The catch rate for September 1992 was a result of no anglers being interviewed that month. Angler effort was very low in September 1992 and while a few anglers were counted, they fished for a very short time and when the survey technician returned from the instantaneous count to interview them, they had departed.

3.5.1.3 Estimated Catch

The 1992 estimated total catch for all areas combined increased dramatically (179%; 9481 fish) compared to 1990 and 1986 (Table 20), and the increase was distributed throughout all areas surveyed (Figures 19 and 20). The most notable increase was in Section 2 of the Skagit where the estimated total catch more than quadrupled (Table 20).

3.5.2 Comparison of Angler Characteristics

Over the three years of survey, there was little difference in the overall age distribution of anglers interviewed in the Skagit and Sumallo Rivers trout fisheries (Table 22). At the lower Skagit River there was an increased number of anglers estimated to be over 45 years of age (18%) in 1992 compared to the previous surveys. In 1992, at the upper Skagit and Sumallo sections, there was an increase in 16 to 30 year old anglers and a reduction in the number of anglers estimated to be 30 to 45 years old compared to 1990. In all years, the highest percentage of children interviewed was at the Sumallo River.

In 1992, the overall distribution of angler residences was very similar to the previous two surveys (Table 22), with a predominance of Lower Mainland origin anglers interviewed. At the lower Skagit, there was a slight increase in the percentage of anglers interviewed from Washington State and at the upper Skagit, the number of Canadians other than from B.C. declined from 1990. Percentage values from the upper Skagit and particularly the Sumallo River should be regarded with caution due to the low sample size. A few anglers in either of these areas can substantially influence percentage values.

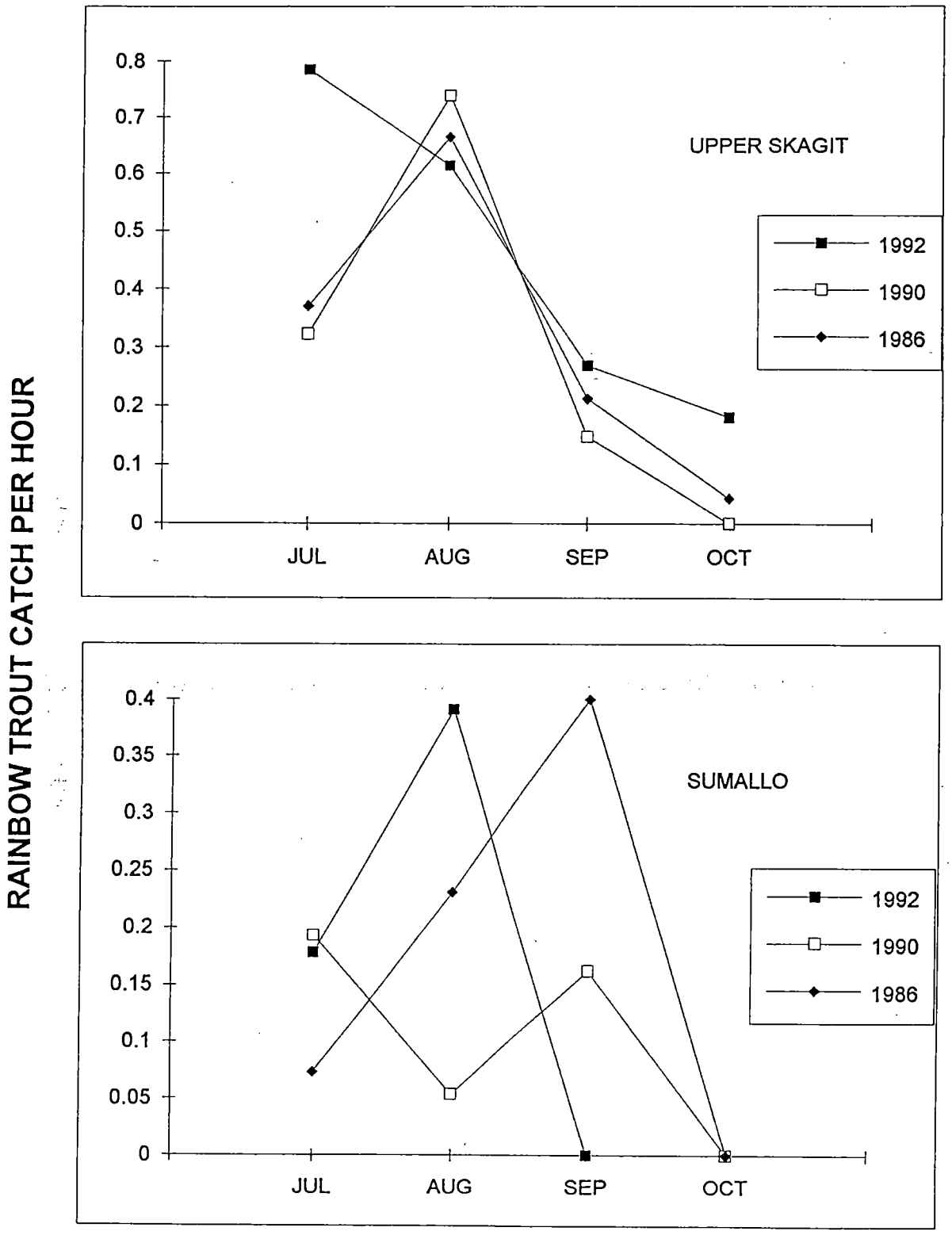
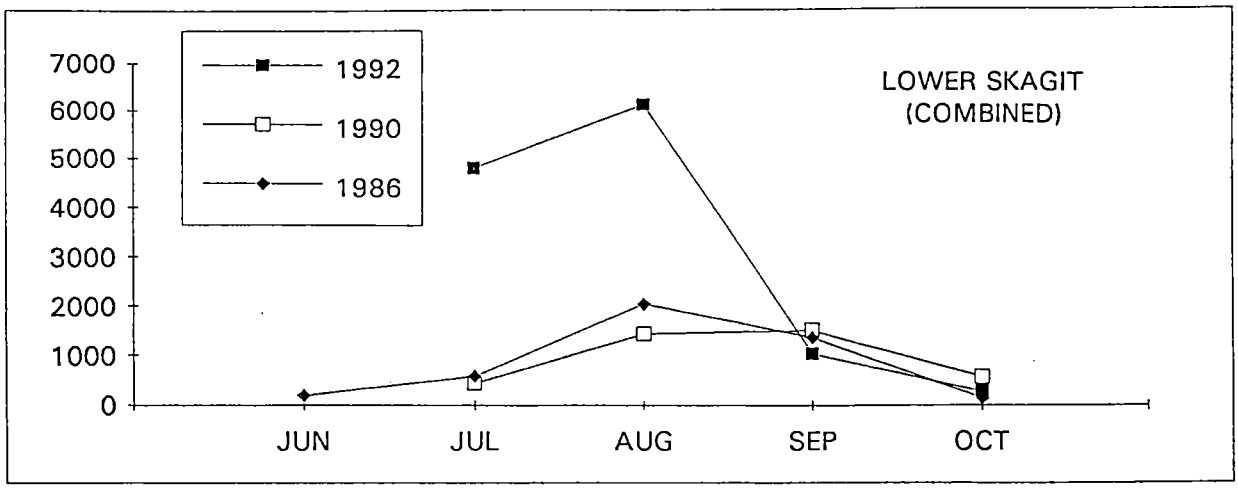
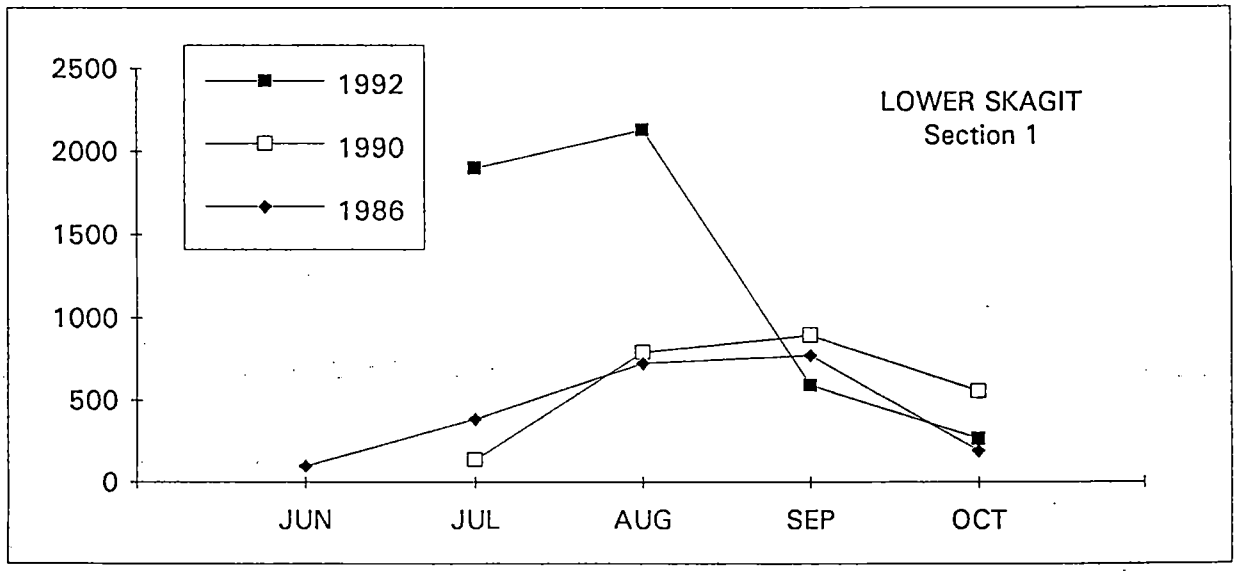
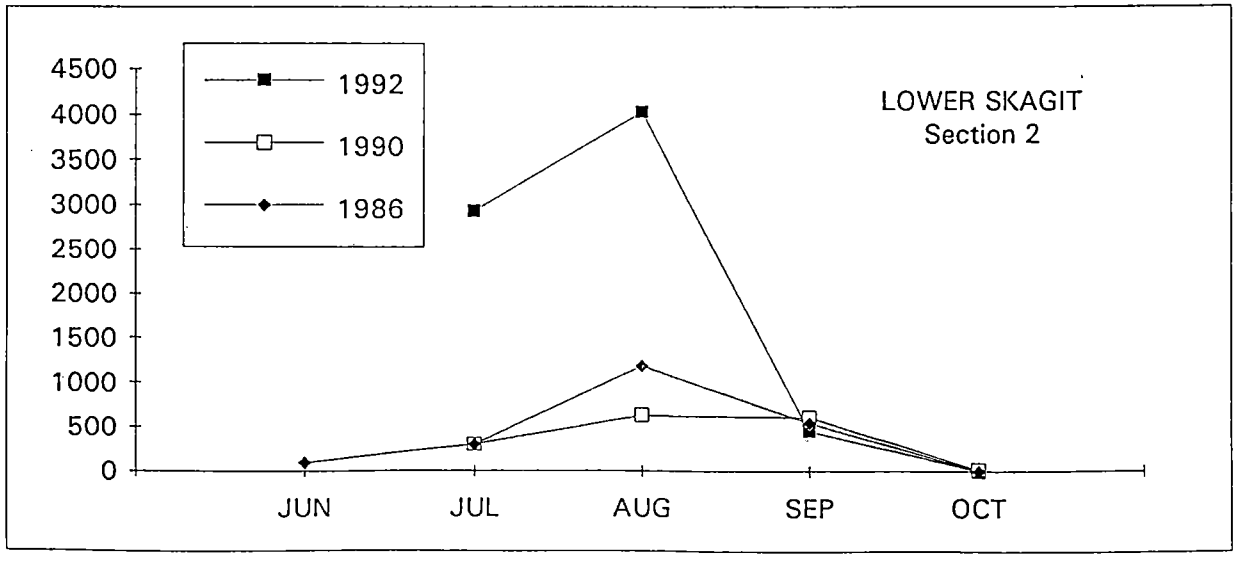


Figure 18. Comparison of monthly catch rates in the upper Skagit and Sumallo River trout fisheries in 1986, 1990 and 1992.



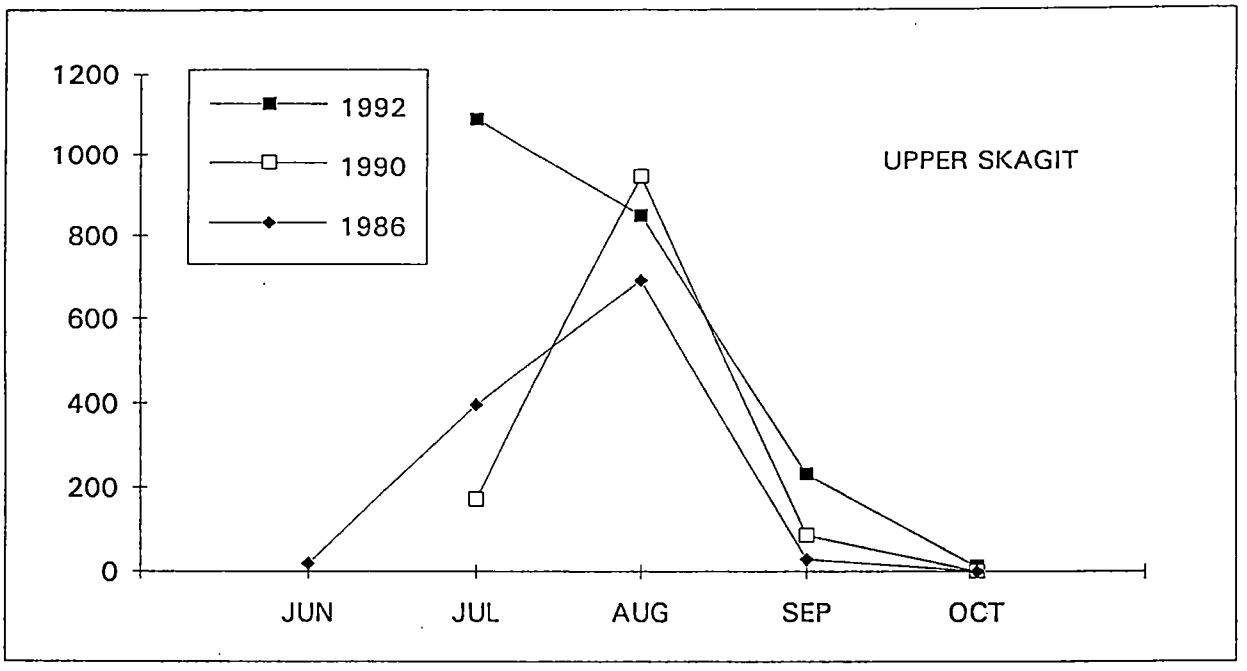


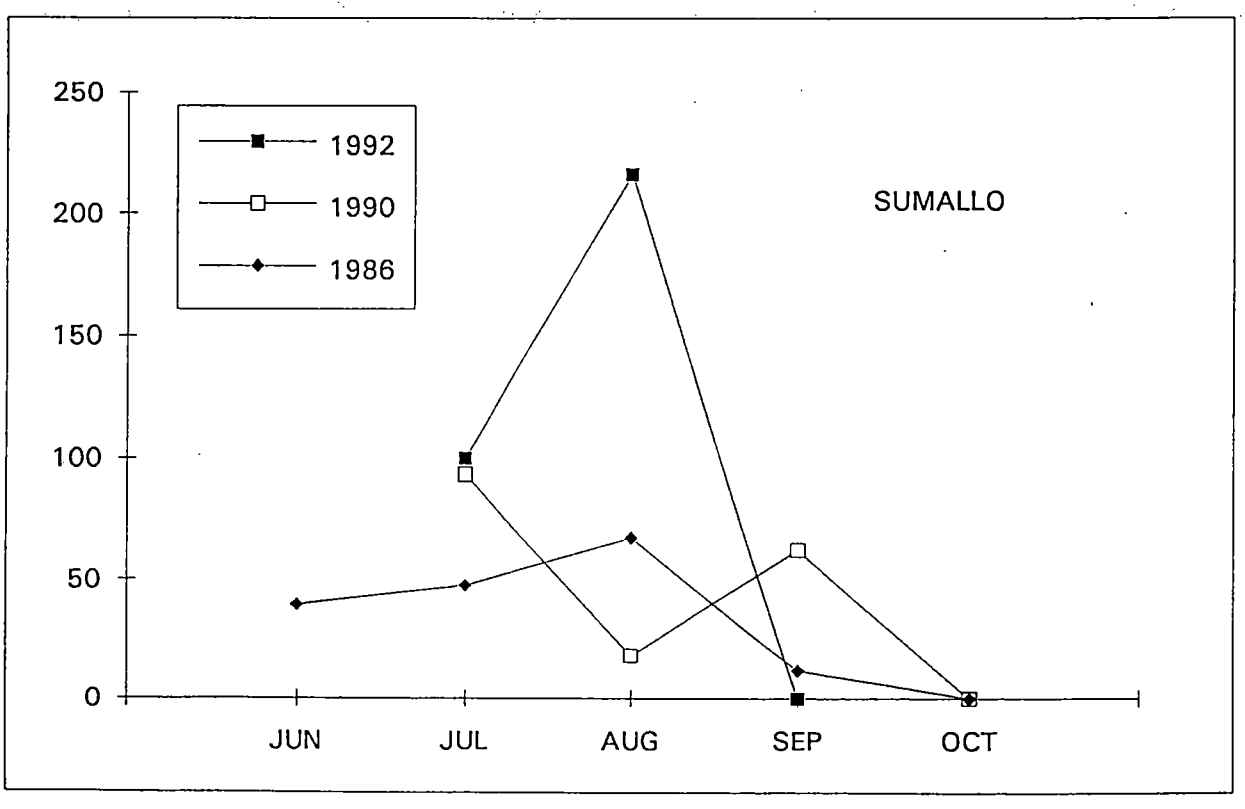


RAINBOW TROUT CATCH

MONTH

Figure 19. Comparison of monthly catch estimates in the lower Skagit River trout fishery in 1986, 1990 and 1992.





RAINBOW TROUT CATCH

MONTH

Figure 20. Comparison of monthly catch estimates in the upper Skagit and Sumallo River trout fisheries in 1986, 1990 and 1992.

Table 22. Comparison of age distribution of anglers interviewed during the Skagit River trout fishery in 1986, 1990 and 1992.

	LOWER SKAGIT			UPPER SKAGIT			SUMALLO			TOTAL		
	Percent			Percent			Percent			Percent		
Age	1986	1990	1992	1986	1990	1992	1986	1990	1992	1986	1990	1992
Under 16	5.2	4.1	5.2	1.7	10.3	8.5	11.6	23.9	17.4	5.7	8.2	6.3
16 - 30	26.3	28.5	30.9	31.7	17.7	35.1	41.3	23.9	47.8	28.6	26.4	32.4
30 - 45	56.7	56.2	45.7	35.0	52.9	44.7	30.6	41.3	30.4	52.1	53.3	44.8
Over 45	11.8	10.8	18.3	30.0	19.1	11.7	16.5	10.9	4.3	13.6	11.8	16.5
Sample Size	769	390	405	59	68	94	121	92	23	949	550	522

Table 23. Comparison of residences of anglers interviewed in the Skagit River trout fishery in 1986, 1990 and 1992.

	LOWER SKAGIT			UPPER SKAGIT			SUMALLO			TOTAL		
	Percent			Percent			Percent			Percent		
Origin*	1986	1990	1992	1986	1990	1992	1986	1990	1992	1986	1990	1992
L	93.8	88.5	89.1	89.5	73.8	87.2	66.4	81.4	87.0	90.1	85.7	88.7
B	1.5	1.9	1.5	7.0	6.6	5.3	14.0	7.1	13.0	3.4	3.7	2.7
C	1.1	3.2	1.0	3.5	11.5	3.2	10.3	8.6	0.0	2.4	5.0	1.3
W	2.5	4.0	7.2	0.0	3.3	0.0	3.4	1.4	0.0	2.8	3.6	5.6
U	0.9	1.3	1.0	0.0	0.0	2.1	4.3	1.4	0.0	1.4	1.2	1.1
S	0.3	0.8	0.2	0.0	4.9	2.1	1.7	0.0	0.0	0.5	1.2	0.6
Sample Size	752	374	405	57	61	94	116	70	23	925	505	522

* (L) Lower Mainland of British Columbia; (B) other British Columbia; (C) other Canadian; (W) Washington State; (U) other American; (S) other than Canadian or American.

For all areas combined the percentage of anglers fly fishing increased (Table 24). The overall increase was largely due to an increase in fly anglers and reduction in lure anglers in the lower Skagit area. In the upper Skagit area, the number of anglers fly fishing reduced slightly while the number of lure anglers increased from 1990. While the percentage of anglers using lures increased and the number of anglers fly fishing decreased at the Sumallo River, the sample size was small.

Table 24. Comparison of gear type used in the 1986, 1990 and 1992 Skagit River trout fishery.

	LOWER SKAGIT			UPPER SKAGIT			SUMALLO			TOTAL		
	Percent			Percent			Percent			Percent		
Gear Type	1986	1990	1992	1986	1990	1992	1986	1990	1992	1986	1990	1992
Lure	33.8	23.2	10.7	25.0	14.6	20.1	21.9	48.5	71.5	30.6	26.0	16.4
Bait	2.9	0.9	0.9	11.7	1.2	1.2	31.0	3.0	0.0	10.0	1.2	0.9
Fly	63.2	76.0	88.4	63.3	84.2	78.2	47.1	48.5	28.5	59.5	72.6	82.8
Sample Size	780	462	409	60	82	94	255	99	23	925	643	526

In both 1990 and 1992 almost half the anglers interviewed were fishing the Skagit for the first time (1990:43%; 1992:48%). Also, the proportion of first time interviews was similar in both years (1990:84%; 1992:76%). These data were not collected in 1986.

Overall, the percentage of anglers interviewed who were fish and game club members increased only marginally (Table 25). However, of note is the percentage increase in club members at the upper Skagit River.

Table 25. Comparison of the percentage of fish and game club members among the anglers interviewed during the Skagit River trout fishery in 1990 and 1992.

	PERCENTAGE	
AREA	1990	1992
Lower Skagit	16	18
Upper Skagit	16	29
Sumallo	7	4
All Areas	14	19

3.5.3 Comparison of Angler Attitudes and Opinions

Overall, the level of awareness of angling regulations in 1992 (72%) decreased compared to 1990 (97%) and 1986 (79%; Table 26). In all three seasons the highest percentage of regulation aware anglers fished at the upper Skagit River. At both the lower Skagit and the Sumallo Rivers there was a marked decrease in regulation awareness in 1992 compared to 1990. At the Sumallo River, the 70% awareness level was still an improvement over the first year of survey (1986) when only 48% of the anglers were aware of all the regulations.

Table 26. Level of awareness (percentage of anglers interviewed) of the special regulations in 1986, 1990 and 1992 in the Skagit River trout fishery.

	LOWER SKAGIT			UPPER SKAGIT			SUMALLO			TOTAL		
Aware of Regulations	1986	1990	1992	1986	1990	1992	1986	1990	1992	1986	1990	1992
Yes (Percent)	82	98	70	91	94	81	48	92	70	74	95	72

The overall level of agreement with the angling regulations showed little change from 1990 (Table 27). A slight increase in acceptance was noted at the upper Skagit and Sumallo sections. However, sample sizes were low at the upper Skagit and particularly the Sumallo sections and therefore, these percentages may not reflect the true population percentage.

Table 27. Comparison of percent of anglers aware of the special regulations at the Skagit River that agreed with all of them in 1986, 1990 and 1992.

	LOWER SKAGIT			UPPER SKAGIT			SUMALLO			TOTAL		
	Percent			Percent			Percent			Percent		
Agree	1986	1990	1992	1986	1990	1992	1986	1990	1992	1986	1990	1992
Yes	88.6	89.1	85.0	46.9	80.7	88.5	82.7	76.0	87.5	85.4	87.1	85.9
No	11.4	9.1	15.0	37.5	6.5	11.5	13.8	12.0	12.5	13.3	9.1	14.1
Sample Size	405	230	253	32	31	78	29	25	16	466	286	347

A similar percentage of the anglers in 1992 (75%) assessed the use level to be "just right" as did in 1990 (71%). Only 15% of the anglers in 1992 felt there were too many other anglers compared to 20% in 1990.

As would be expected with the increased angler effort in 1992, the number of encounters with other anglers was up in all three areas. The most pronounced change was at the upper Skagit area where anglers expected to encounter more other anglers and actually did, compared to 1990.

A significant percentage (31%) of the anglers with opinions on negative aspects of the Skagit River identified (without prompting) that the catch and release regulation detracted from their fishing experience (Table 28). While not directly comparable to the previous season because the regulation was not implemented in 1990, this percentage compares closely with the percentage of anglers interviewed in 1990 who said they would not favour a catch and release regulation (27%). Also, of note is the increased percentage of anglers who identified crowding as a negative factor and the decreased percentage who were concerned about litter.

Table 28. Comparison of perceived most negative factor of the angling experience volunteered by anglers at the Skagit River trout fishery in 1990 and 1992.

	PERCENTAGE	
ATTRIBUTE	1990	1992
No opinion	45.8	31.2
Crowded	6.3	11.7
Poor success	5.3	2.3
Poor ethics	3.2	0.8
Mosquitos	4.2	3.8
Litter	9.5	4.1
Catch & release regulation	N/A*	31.2

* N/A = Not Applicable.

4.0 DISCUSSION

4.1 Primary Parameter Estimates

Results from on-site surveys in 1986 (July 1 to October 31 period), 1990 and 1992, indicated angler use increased in all areas, but particularly at the lower Skagit River. Although the observed increase from 1990 to 1992 in the upper Skagit River was quite pronounced, estimated angler effort increased only slightly from 1986. The increase in magnitude of effort at the Sumallo River was based on a relatively small number of hours and limited number of interviews. Estimates of angler effort and catch rates at the Sumallo River should be assessed with caution.

Lower than usual water levels and good weather conditions early in the season contributed to an increase in angler effort in both the lower and upper Skagit areas. Compared to 1986 and 1990, anglers had an increased level of opportunity (fishable days) due to the favourable early season conditions. The high early season effort in 1992 shows the variable effect fishing conditions can have on the seasonal effort estimates. For example, at the upper Skagit River, the increase in effort between July 1990 and July 1992 (888 hours) accounted for 89% of the increase between the seasons (993 hours). At the lower Skagit, a 160% increase in July effort from 1990 to 1992 accounted for 45% of the estimated increase in seasonal effort.

As in 1986 and 1990, high early season angler use was evident at the Sumallo River. Angler use at the Sumallo River has consistently peaked at the beginning of summer holidays with increased traffic level along Highway 3, rather than due to a change in fishing conditions as is likely the case for the Skagit River fisheries.

Angler success followed a temporal pattern similar to the previous surveys. Catch rates were highest during July and August, then declined through the fall.

While angler catch rates were higher in 1992 than either 1986 or 1990, this is not necessarily an indication of increased stock strength. Tag and recover studies have shown Skagit River rainbow trout, particularly in upper river areas, are quite stationary prior to their emigration to Ross Reservoir (Neuman and Scott in prep.). With the no kill regulation, vulnerable fish that might have been harvested in prior years remained available for repetitive catch and release in 1992. Released fish in mid and upper river areas could potentially be caught again, both in the area they were originally stationed and during their return to the reservoir. It is suspected that the recapture rate for individual fish was probably high in 1992.

4.2 Social Aspects of the Fishery

Comparisons of angler age, residence and gear preference indicated there was little change in angler demography between 1986, 1990 and 1992. However, consistent with 1990, the frequency distribution of first time use showed a high proportion of new use in 1992 (48%; 1990 43%), and 73% of the anglers interviewed in 1992 had started fishing the Skagit River system since the survey in 1986. This indicated there has been annual recruitment to the fishery by anglers with a proportionally similar demographic makeup to that observed in 1986 and 1990. Also, consistent with 1990, the surprisingly low number of repeat interviews indicates the majority of use in 1992 was by anglers who make only one or two annual trips to the area.

Use levels in 1992 in all three major areas were still within social carrying capacity (SCC). However, in all areas the number of encounters interviewed anglers expected to have with other anglers increased from 1990, as did the number of actual encounters. This indicates that Skagit anglers' expectations for use level have changed. Since a high proportion of the anglers were relatively new in the fishery, these anglers may not be negatively affected by increased use levels since they have no preconception of a historical low use level. However, Skagit anglers who have historically fished the river and enjoyed uncrowded conditions may begin to feel dissatisfied with angler density.

The fact that 75% of the anglers interviewed at the upper Skagit River had begun fishing there since 1989 (past 4 years) suggests this fishery is gaining in popularity. This may be the explanation for a significant percentage (43%) of the upper Skagit anglers rating their fishing experience as only fair or worse. The comparatively high percentage (17%) of upper Skagit anglers that felt there were "too many" other anglers may suggest that the upper Skagit is approaching SCC, and a further increase in angler use may detract from the quality fishing experience now offered.

While the number of encounters with other anglers was acceptable, other indirect impacts such as litter can affect SCC. The frequency of such complaints is currently low, but continued monitoring of indirect impact parameters in future surveys would be useful to detect possible increases.

4.3 Management Implications

Trends in major fishery statistics since 1986 indicate some major objectives and goals stated in the Skagit River Management Plan (Neuman 1988) have been realized. With the catch and release regulation on the river BCELP has taken significant action to reduce harvest and protect and enhance the "wild" fish stocks. Legal harvest has been eliminated and fish taken illegally probably accounts for far less than the harvest goal in the management plan (1000 fish).

Angler use has increased moderately in both the Skagit River areas. However, the quality of the fishing experience has still remained high. If the trend of increasing use continues overcrowding could become a problem, particularly on the upper Skagit River. The chance of encountering other anglers on the upper Skagit is high compared to the lower Skagit because of the single access point. In addition to encounters with other anglers while actually fishing, upper Skagit anglers have a good chance of encountering others during their walk in or out. The tolerable use level at the upper Skagit could be compared to one busy access location on the lower Skagit. Therefore, the upper Skagit is far more sensitive to increased use before the quality of the fishing experience will begin to decline than in the lower Skagit fishery where anglers have a greater opportunity to disperse. In the near future, management action may be required to limit use in the upper Skagit if the quality of the fishing experience is to remain high per the objective in the management plan.

Results of the 1992 survey showed that the newly implemented catch and release regulation likely contributed to increased catch rates in all areas and the management plan goal for angler success (1 fish per hour; 3.7 fish per day) has almost been accomplished. The overall catch per hour in 1992 (0.7 fish per hour) is still low, but because the average length of an angler day has increased (5.1 hours), the 1992 daily catch rate (3.6 fish per day) is almost on target. If fish abundance continues to increase as a result of the new regulations in both the river and reservoir, it could be expected that the catch rate goal will soon be exceeded.

This second replication of the survey initiated in 1986 using the design prescribed by Lewynsky (1986) again provided precise estimates of effort, catch rates and catch. Because the 1986, 1990 and 1992 surveys were conducted by identical field and analytical methods, we believe comparisons of statistics for these seasons are very reliable.

In addition to basic angler profile information, the questions pertaining to use level expectation and observed use levels were useful to assess the effects of increasing use on social carrying capacity and should be continued in future surveys.

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APPENDICES

Appendix 1. Special angling regulations and regional angling regulations applicable to the 1992 Skagit River trout fishery.

1. Angling Closure November 1 through June 30.
2. Total daily catch quota: 0 fish
3. No bait permitted.
4. Single barbless hook.

Appendix 2. Example of the Count Tally Sheet used during the 1992 Skagit River angler survey.

1992 SKAGIT RIVER ANGLER SURVEY COUNT SHEET

NAME:_____ Codes: 1. Day Type H - Holiday
W - Weekday

WATER TEMP:_____ time_____loc_____

2. Wx S - Sunny
C - Cloud
R - Rain

Staff Gauge:_____

3. Water Level H - high
M - medium
L - low

4. Water Clarity C - clear
T - tinted
D - dirty

DATE m d	Day Type	Wx	Water Cl Lev	Sec	Site	Loc	Time 2400	Angler Count	Vehicle Count
				1	A				
				1	B				
				1	C				
				1	D				
				1	E				
				1	F				
				1	G				
				1	H				
				2	I				
				2	J				
				2	K				
				2	L				
				2	M				
				2	N				
				2	O				
				2	P				
				2	Q				
				2	R				
					MISC				

COMMENTS:

1992 SKAGIT RIVER ANGLER SURVEY INTERVIEW SHEET

Interviewer:_____ Interview Frequency: 1 in _____

Date: _____ / _____ (m / d) Day Type: Holiday Weekday

1. Location of Interview (F6,M4, etc)_____

2. Time of Interview (nearest 5 minutes)_____

3. At what time did you start fising today?_____

4. Completed trip? Yes No

5. Hours fished on immediate previous day_____

6. Gear type: Fly fishing Artificial Bait

7. How many anglers are in your vehicle?_____

8. Catch Summary

Appendix 3. Example of the Angler Interview Form used during the 1992 Skagit River angler survey.

Other: Ct Eb [ ][ ]

9. Have you been interviewed in this survey previously? Yes No

IF NO TO QUESTION 9., ASK THE FOLLOWING QUESTIONS:

10. Estimate angler age Under 16 16-30 30-45 Over 45

11. Where do you live? LM BC Can Wash USA Other

12. Are you a member of a Fish & Wildlife club? Yes No

13. When was the first time you fished the Skagit River?

1992 1991 1990 1989 1988 1987 1986 1985

1980-1984 1975-1979 1970-1974 Before 1970

14. How would you rate your fishing experience at the Skagit (or Sumallo River?

Excellent Good Fair Poor Terrible

15. What, if anything, is the one thing you dislike about fishing the Skagit River?

1.Crowded 2.Small Fish 3.Poor Catch Success Rate 4.Litter

5.Lack of Fishing Ethics 6.Camping on Gravel Bars 7. Mosquitos

8._____ 9._____ 10. No Opinion

16. Are you aware of the current regulations on the Skagit River?

Yes No

16b If yes to 16, do you agree with the current regulations?

C+R [Y][N] Barbless [Y][N] Bait Ban [Y][N] Season [Y][N]

17a What is the total number of anglers you expect to see at this fishing site today? _____

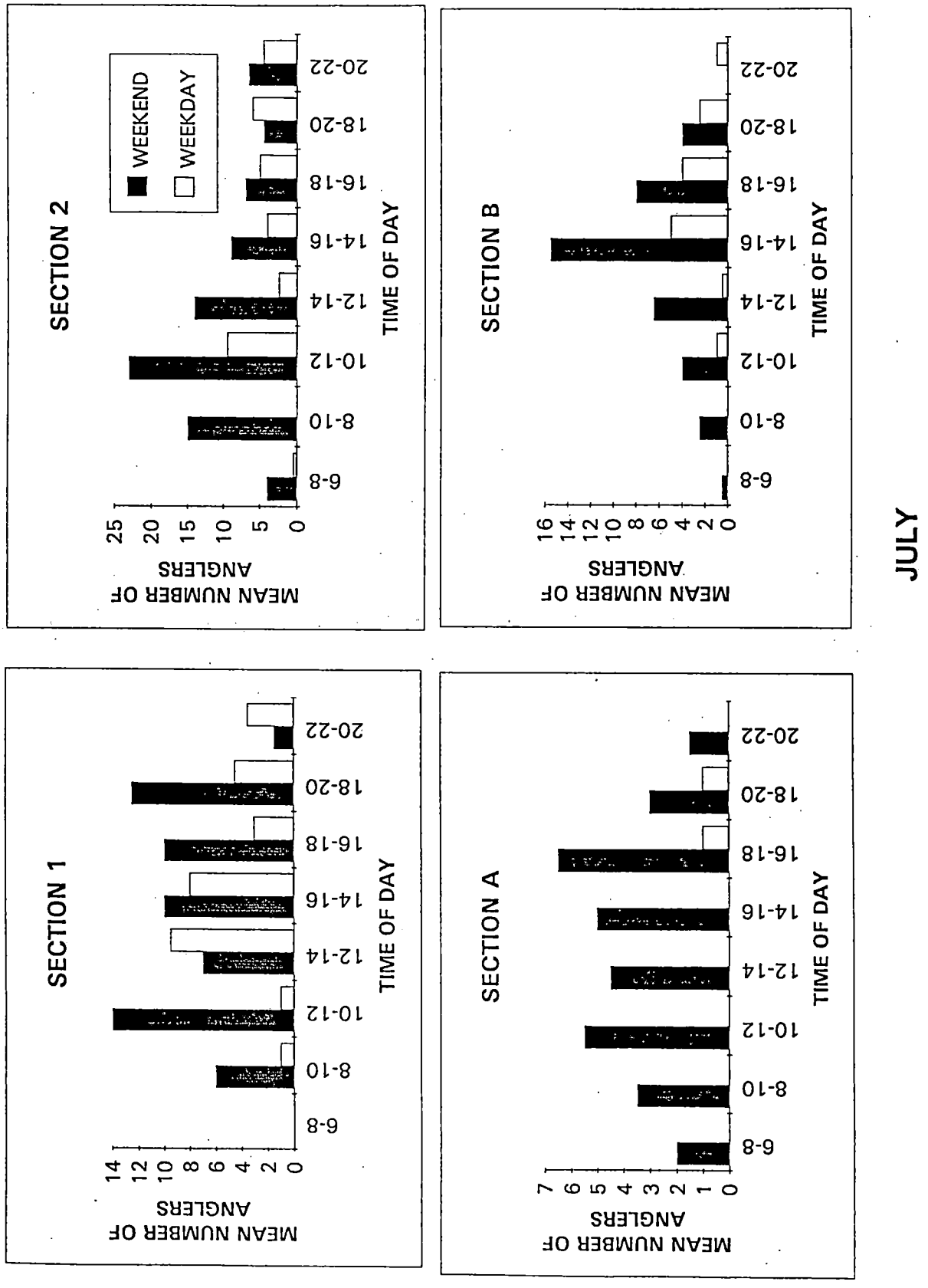
17b How many anglers have you seen at this fishing site today? _____

17c We'd like your opinion about the number of anglers you encounter while fishing the Skagit River.

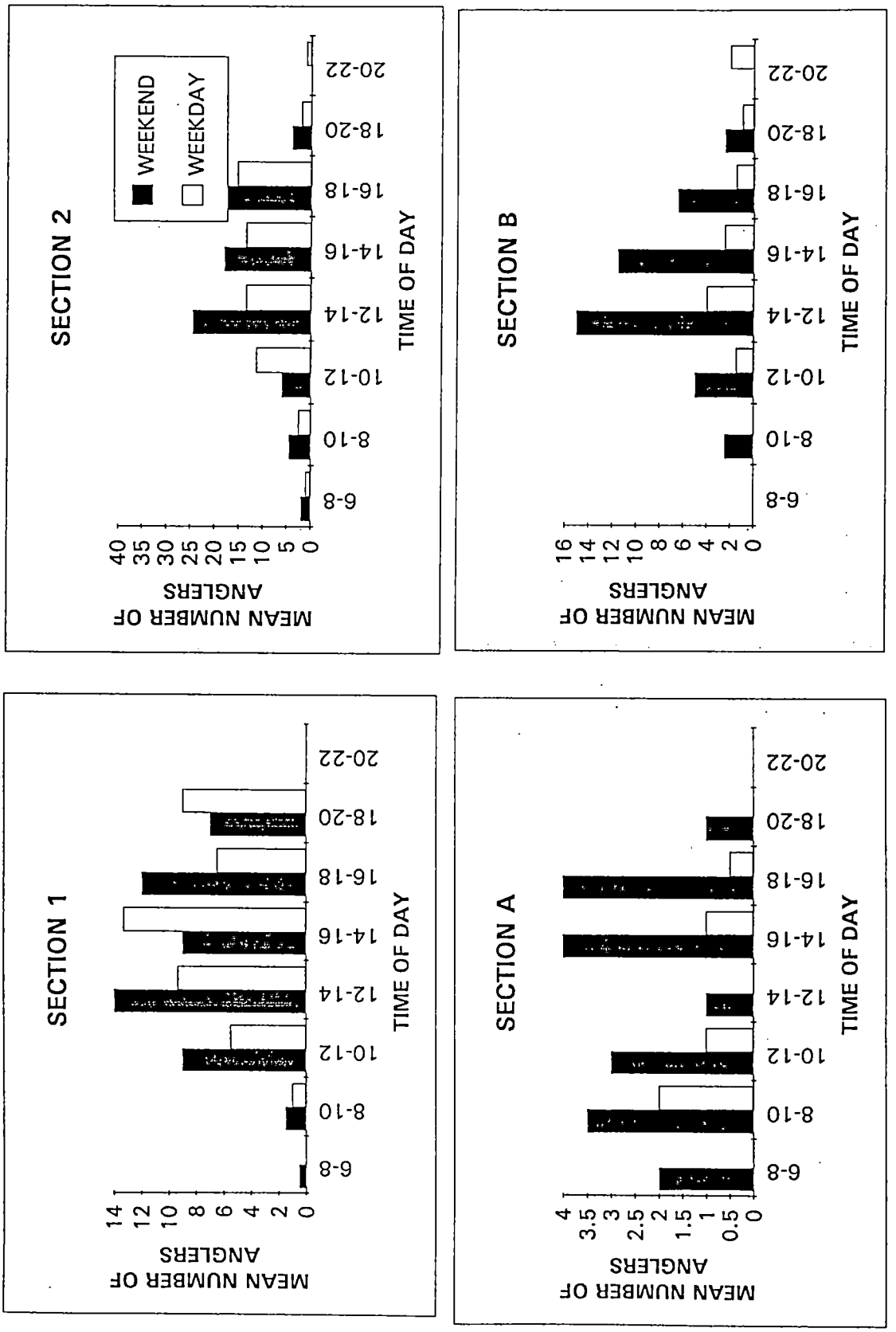
Too Few | Just Right | Too Many | Don't Know

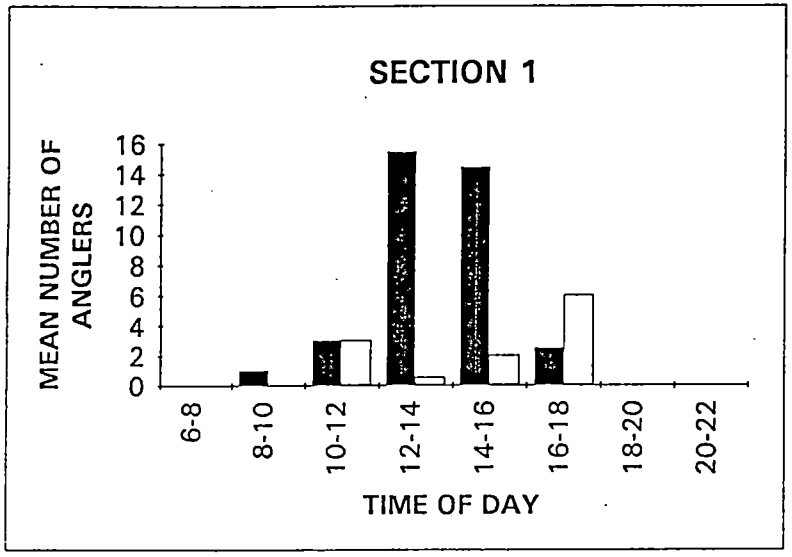
THANKYOU FOR YOUR TIME!

Appendix 4. Profile of daily angling effort for midweek and weekend days in the Skagit River trout fishery, July 1 through October 31, 1992.



Appendix 4 continued

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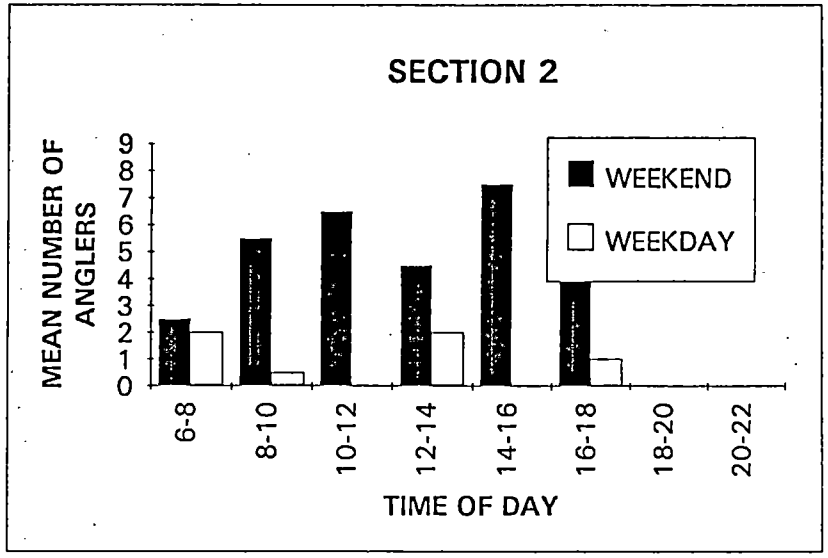
2
4
6
8
10
12
14
16
6-8
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY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MEAN NUMBER OF ANGLERS
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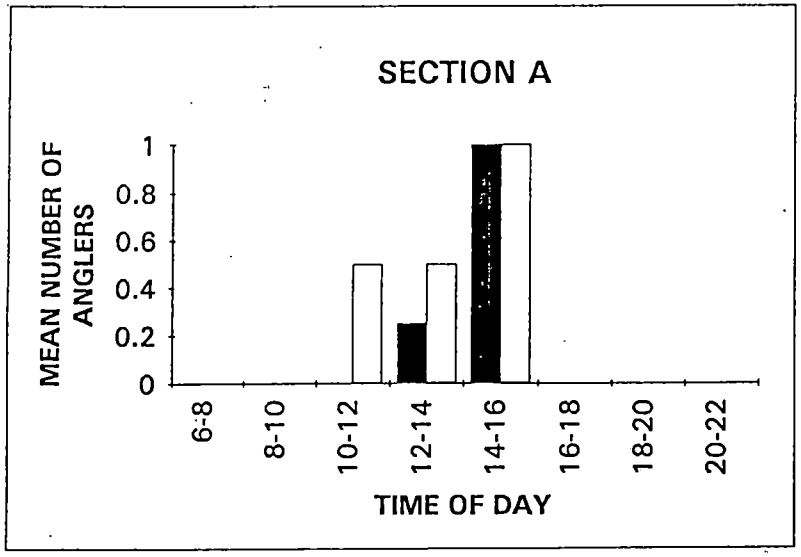
1
2
3
4
5
6
7
8
9
WEEKEND
WEEKDAY
6-8
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY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6-8
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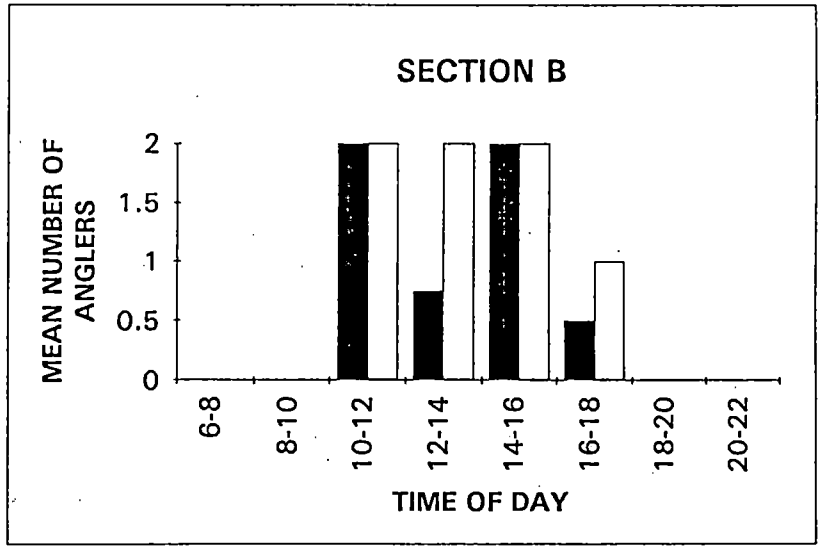
12-14
14-16
16-18
18-20
20-22
TIME OF DAY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0.5
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1.5
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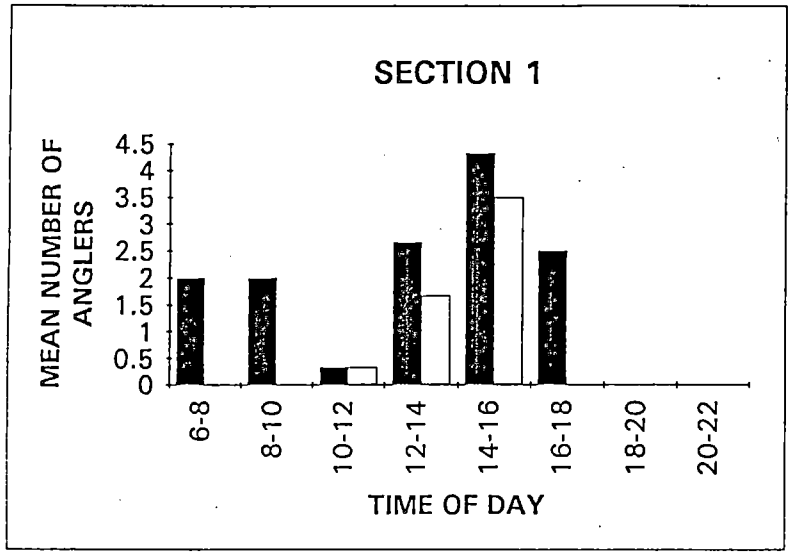
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY

SEPTEMBER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2.5
2
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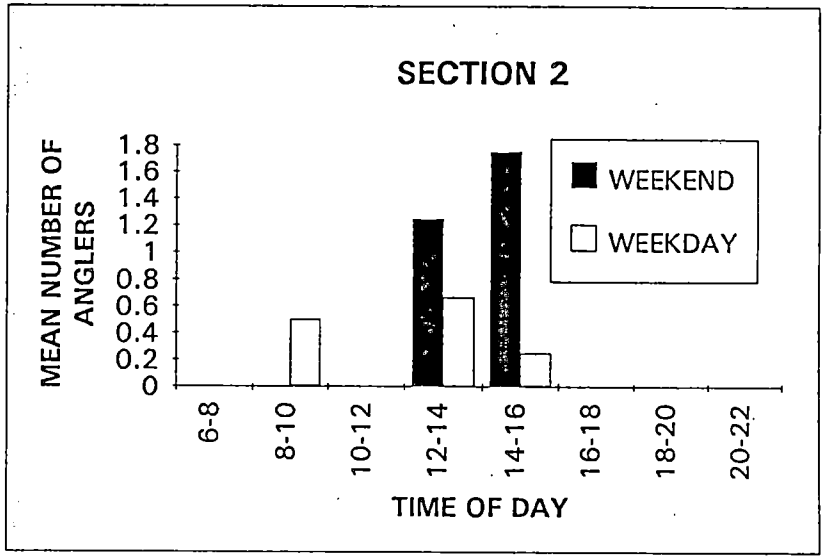
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY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0.4
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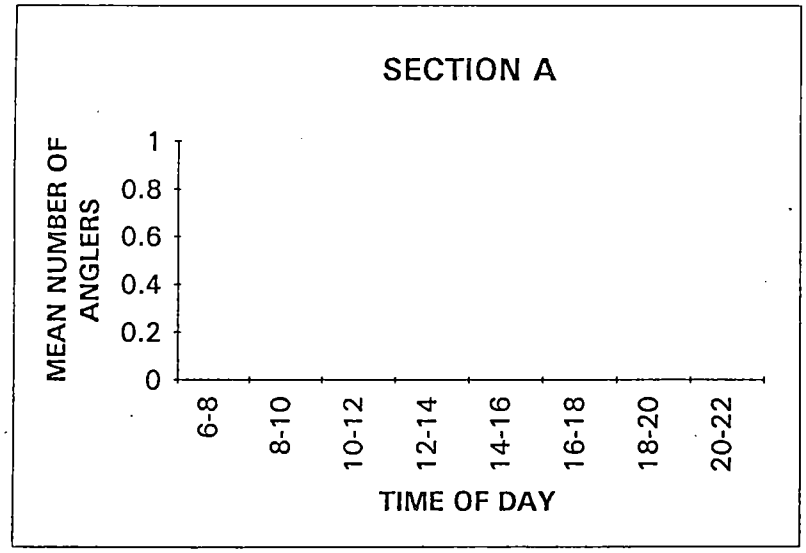
0
WEEKEND
WEEKDAY
6-8
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY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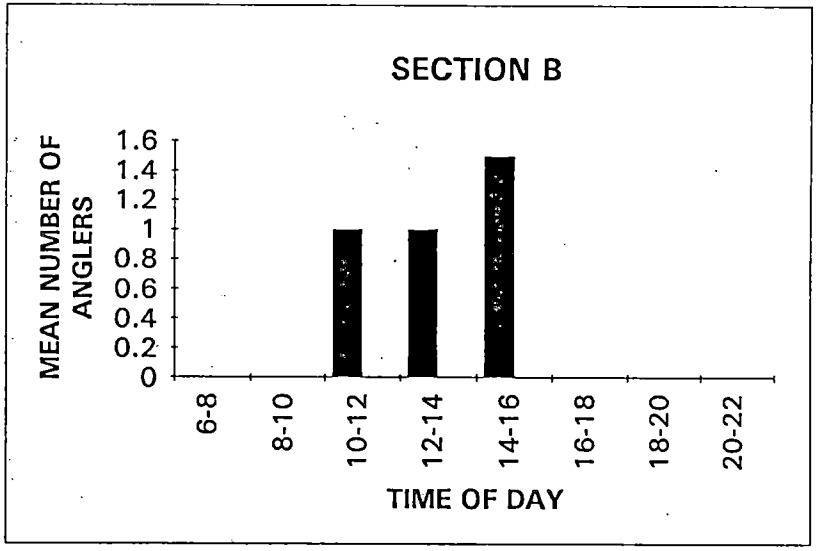
0
6-8
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY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1.2
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0.8
0.6
0.4
0.2
0
6-8
8-10
10-12
12-14
14-16
16-18
18-20
20-22
TIME OF DAY

OCTOBER

Appendix 5. General comments volunteered by anglers during the 1992 Skagit River Angler Survey (the frequency of the comment is in parenthesis).

The following eight categories of comments have been compiled primarily from the additional comments that were volunteered in interviews. Many of these additional comments were in direct response to a particular interview question, but none of them were prompted by the interviewer. The following eight broad categories of comments were identified as being relevant to the objectives of the 1992 angler survey:

1. Fish club representation.
2. General regulations.
3. Comments on angling regulations prompted by survey questions (concerning current regulations and opinion towards catch and release regulation).
4. Comments or observations on fisheries management apart from regulations.
5. Comments or observations on angler use.
6. Comments or observations on quality of angling experience.
7. Comments or observations on fish, fish behaviour or fish habitat.
8. Comments or observations concerning other recreational uses.

1. FISH CLUB REPRESENTATION

B.C. Federation of Fly Fishermen	(26)
Steelhead Society	(15)
4 Corners Fly Fishing Club	(12)
B.C. Wildlife Federation	(6)
Totem Fly Fishers	(6)
Trout Unlimited	(6)
Washington Trout	(5)
Osprey Fly Fishers	(4)
Loon's Fly Fishing Club	(2)
Nikomekl Enhancement	(2)
Pemberton Fish & Wildlife	(2)
Sierra Club	(2)
Semiahmoo Club	(3)
B.C. Fish & Wildlife	(1)
B.C. Wildlife Society	(1)
California Water Foundation	(1)
Capilano Sportsman's Club	(1)
Dogwood Fly Fishing Club	(1)
Ducks Unlimited	(1)
Fidalgo Flyfishers	(1)
Hook & Tackle Club, Calgary	(1)
Italian Fishing & Hunting Club	(1)
Lillooet Fish & Game Club	(1)
Maple Ridge Fish & Game	(1)
Match the Hatch Club	(1)

Appendix 5 (continued)

Northern Guides Association (1)
Richmond Rod & Gun Club (1)
Squamish Fish & Wildlife (1)
Toronto Hunters & Anglers (1)
Fishermen's club in Germany (1)

2. GENERAL REGULATIONS

- Asked if fishing on river was for adults only (possibly to divert attention away from possible violations) (1)

- Hard to figure out where you are on fishing regulation maps; there are no roads listed, only streams which don't help if from out of town (1)

- Regulations convoluted and complex, in some places can't tell what the regulations are for a specific stream or estuary (2)

- Agree with regulations 100% if made by people who know what they're doing (1)

- He wasn't aware of the regulations even though he said yes (2)

- Wasn't aware of any of the regulations (2)

- Can't get copy of regulation book - stores in Hope all out of them (1)

- Dislikes fishing regulations (C&R) (8)

- Fishing regulations too strict, objects to high charge for license, over-strict regulations (C&R) and designated camping only (1)

- Sees unfair trend toward exclusive fishery (by restrictive regulations and reducing access), unskilled anglers, elderly and families lose out against skilled, individual fly fishermen (1)

3. ANGLING REGULATIONS

- Should be able to keep world record sized fish (1)

- Didn't know about C&R (13)

- Angry angler, "0" quota/day is <u>not</u> a reasonable limit (2)

- Recommends a better alternative, to reduce daily limit to one, rather than a complete C&R (11)

- Notes that some fish injured by angling and should be taken. Suggests 30-50 cm limit (1)

Appendix 5 (continued)

- Agrees with C&R for a few years only, to restore stocks as necessary and/or alter catch size and limits to effect some conservation goal (14)

- Not fair that there is a kill fishery on lake, should be same regulation both areas (2)

- Pushed for C&R (1)

- C&R for rainbow only, DV should be exempt (1)

- Concern about C&R (also) bait drawback, what about kids learning to fish (1)

- Recommends restoring 2 fish limit as soon as possible (1)

- Used to be meat fisherman but changed/mellowed (1)

- Would like to keep very large fish, option should be there to kill a <u>few</u> fish. We should rely on a C&R ethic, not a strict law. (2)

- Maybe an over/under size limit would be a good alternative to C&R, eg. no kill <10" or >15" (1)

- Didn't know C&R regulation but is a C&R angler anyway (2)

- Angler is strongly opposed to C&R regulation; it seems that he just learned about new regulation today and may not come back (1)

- Concern about bleeding, dying fish. No waste if angler is free to take these fish. (2)

- Didn't know barbless hook regulation (10)

- Barbless hook may not make difference due to small hook size(1)

- Slightly different style of fishing with barbless hook but presents no great difficulties (1)

- Believes that treble hooks do not injure fish as much as single hooks (1)

- Never been able to land a fish with barbless hook, always lost any that were hooked. (1)

- Unsure on bait ban, perhaps there should be some allowance for young children who do not have angling skills (2)

- Angler didn't know season (52)

Appendix 5 (continued)

- Should make change to May 1 opening because of C&R and stonefly hatch (3)
- Limited season only while needed for restoring depleted stocks (1)
- Season doesn't matter because unfishable at other times of year (6)
- Suggestion to close earlier - October 1 (2)
- Should be a longer season especially because of C&R (25)
- Early opening (high water) could be dangerous (1)
- Not really possible to extend past November because of low water temp (1)
- Agree with season if necessary, otherwise perhaps extend season (2)
- Perhaps a month earlier opening would be better (7)
- Season not too bad, doesn't affect him in off-season because lots of steelheading and salmon (1)
- Thought it was fly fishing only (2)
- Propose fly fishing only (8)
- Artificial fly regulation recommended (1)

4. FISHERIES MANAGEMENT (apart from regulations)

- Thinks that "Wild Fish Release" sign infers that there are hatchery fish (1)
- Had not noticed regulation signs (2)
- Sign should be posted at edge of parking lot and/or on trails (5)
- Regulations on signs not current ones (1)
- Signs continually torn down (1)
- Should have education program for steelheaders on how to catch and release (1)

Appendix 5 (continued)

- Angler believes that "we are getting a bargain here" - he recommends that this extraordinary quality fishery deserves higher fees (to ensure personal "stake") stream guardian and public education (1)

- Propose higher fee for out of Canada license fees (1)

- Recommends fish & wildlife patrols (4)

- Access too handy (4)

- Long walk to fish (3)

- Access is great (1)

- Difficult/blocked access (14)

- Concern expressed about plan to block access. Unfair to families, children, elderly if they must walk a long distance, also some anglers fish until dark and a long (up to 20 min.) walk out would be very inconvenient (2)

- Disliked access (1)

- What is purpose of Ecological Reserve, especially with C&R on river. Only place litter was seen was near the Reserve (1)

- Concerned that litter consisted of lure and worm containers and that trails were unkept and unsafe (1)

- Disliked crowding (1)

- Believes that B.C. fishing much over-rated. Hatchery stocking (as in Poland) gives angler much more action (1)

- Would like to see larger variety of trout - maybe a speckled trout or brown trout (2)

- Experience might be better if river stocked (2)

- Sport fishermen don't get fair shake especially compared to commercial fishermen (1)

- Disliked log jams and rock piles necessitating walk through forest (1)

5. ANGLER USE

- C&R violations (6)

- Barbless hook violations (4)

Appendix 5 (continued)

- Bait ban violations (16)

- Comments regarding encountering too many other anglers (16)

- Comments on increasing angling pressure (4)

6. QUALITY OF ANGLING EXPERIENCE

- Excellent if it is maintained as a quality C&R fishery, whereas the presence of kill anglers is distressing. The more kill anglers around, the more effect on the quality fishery. (1)

- Best stream in region (1)

- Angler found best fishing in riffles, heavy fishing pressure around pools, runs, debris cover could have made those fish hook shy (1)

- Good and getting better with recent changes in regulations (1)

- I enjoy it, one of my better years (re catch success on Skagit) (1)

- Fishing "mediocre" in Ecological Reserve (1)

- Today's opinion is fair; sometimes fishing is better and angler would be inclined to offer a better rating (1)

- Fishing was really good until about 10 years ago (1)

- Only saw fish in afternoon not all day (1)

- Fishing not most important part of experience (1)

- Had a good time even though the fish were small (1)

- Fishing not as fast as last week (1)

- Only place for dry fly fishing and appreciates it being here; here to enjoy the experience <u>not</u> fill the freezer (1)

- Rated experience poor; no fish but nice scenery (1)

- Experience terrible and getting worse every year, dislikes lack of fish (1)

- Angler says "excellent" fishing experience because (in part) there seems to be an improving trend in fish abundance and catch rate in the last few seasons (1)

- Said catch is much less than the last time he fished the Skagit (2 weeks ago) when his total for the day was 40 fish (1)

7. FISH

- Thought 2 of the fish caught might be rainbow/cutthroat crosses (1)
- Angler stated they caught a cutbow (1)
- Thought some fish were still spawning (1)

8. RECREATION

- Comments regarding heavy traffic into/through area (all kinds of users; campers, hikers) (1)
- Disliked people in boats on the river (2)
- Objects to camping in designated sites - like a wilderness subdivision (1)
- Disliked plan to build campsites near river (1)
- Disliked camping ban near the good angling sites (5)
- Recommends enforcement of no camping or fires on the river bars (1)
- Dislikes expensive camping (1)