

Fishery Data Series No. 91-30

**Thorne River Steelhead Creel and Recreation Survey,
1989-1990**

by

**Glenn M. Freeman
and
Stephen H. Hoffman**

August 1991

Alaska Department of Fish and Game

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ABSTRACT

The second of a two-season angler and recreational user survey was conducted on the Thorne River in Southeast Alaska from October 23, 1989 through June 3, 1990. Anglers expended an estimated 3,070 (standard error = 559) hours to catch 253 (standard error = 69) steelhead *Oncorhynchus mykiss*, with a harvest of 111 (standard error = 46) fish and 142 (standard error = 51) fish (56%) released. By comparison, an estimated 160 (standard error = 60) steelhead were caught during the 1988-89 season. Peak steelhead catch per unit of effort (CPUE) occurred in late November 1989 and mid-April 1990. Recreational users generally preferred no change to existing fishing regulations, did not consider harvests excessive, and did not see what they considered to be an excessive number of people. Many did favor steelhead enhancement and regulating boat use on the river.

KEY WORDS: Southeast Alaska, Prince of Wales Island, Thorne River, steelhead, *Oncorhynchus mykiss*, creel survey, harvest, effort, sport fishing, recreational user, angler survey.

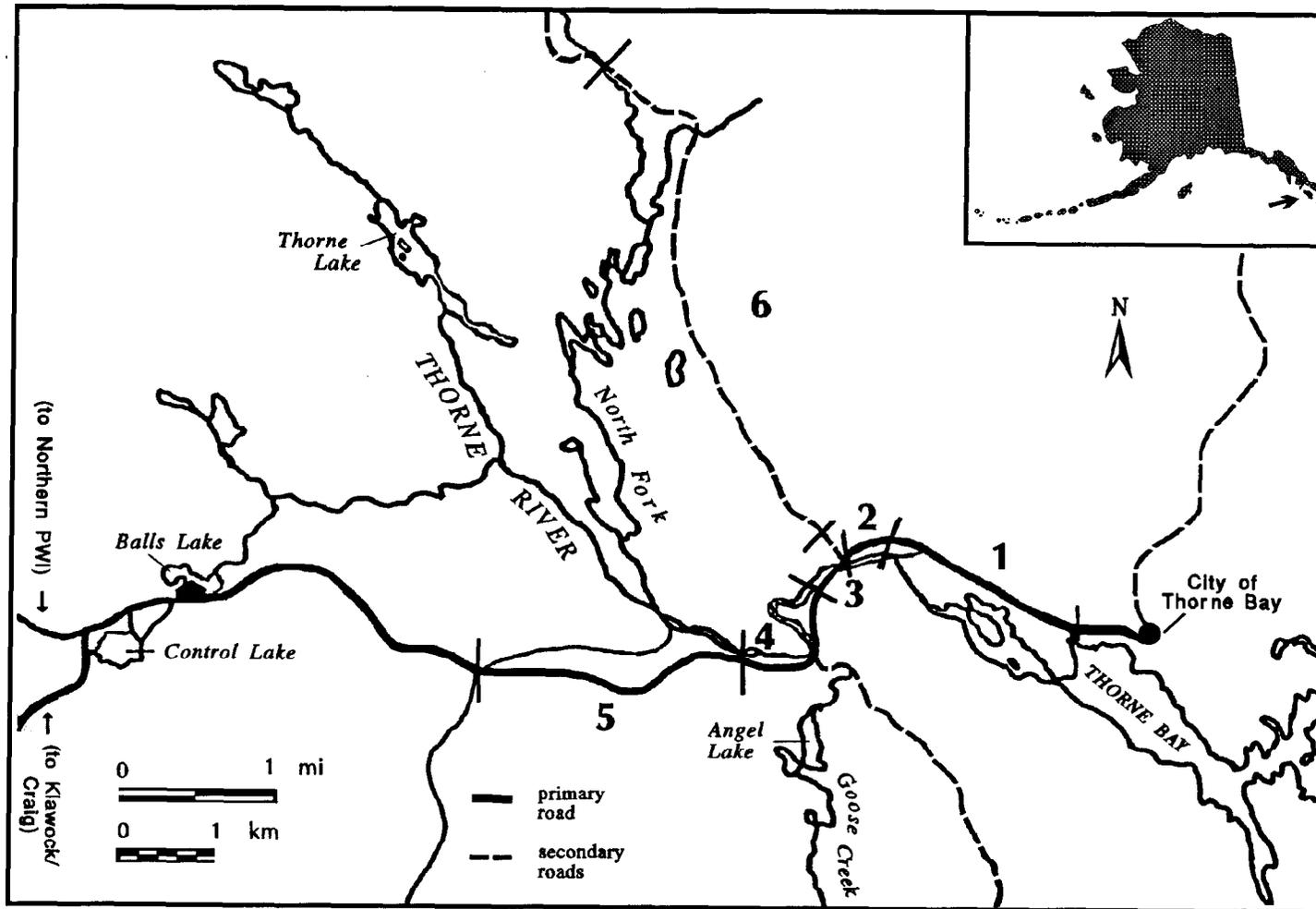


Figure 1. Angler/recreational user survey area along the Thorne River, eastern Prince of Wales Island, Alaska, 1989-90. Access areas 1 through 6 indicated by bold numbers on map.

INTRODUCTION

Thorne River is the largest stream system on Prince of Wales Island (PWI) in Southeast Alaska, and it supports a popular steelhead *Oncorhynchus mykiss* fishery. Wild fall- and spring-run steelhead are present in the Thorne River from October to June. No enhancement of the wild steelhead population in Thorne River has occurred. Additional endemic fishes to the Thorne River which contribute to the sport fishery include coho *O. kisutch*, sockeye *O. nerka*, pink *O. gorbuscha*, and chum *O. keta* salmon; cutthroat *O. clarki* and rainbow *O. mykiss* trout; and Dolly Varden char *Salvelinus malma*. The river flows into Thorne Bay on eastern PWI just southwest of the city of Thorne Bay (Figure 1).

The main stem and north fork of the Thorne River total about 48 km in length, with an average stream width of about 46 m. Public access to the Thorne River is available along the island road system and by boat from Thorne Bay. Roadside access to the river is available at numerous locations along one primary and several secondary roads which were constructed under the direction of the U.S. Forest Service (USFS). The expanded road system has opened former wilderness areas that were rarely fished to exploitation by anglers. Approximately 14 km of the main stem and north fork are accessible within a 30-minute walk from the road system. Substantial reaches along the lower river are within a few hundred meters of a road.

The economy of Thorne Bay (population 614) is based on the timber industry, which is provided by the Tongass National Forest and managed by the USFS. Excluding Thorne Bay, the nearest community to Thorne River along the PWI road system is Klawock (population 897), located some 48 km southwest.

In 1988, the Alaska Department of Fish and Game (ADFG) and the USFS Thorne Bay Ranger District began a survey of public use along Thorne River (Freeman and Hoffman 1990). Both agencies identified this stream as a key PWI river system about which angler and recreational user information was needed. Thorne River was again sampled during the 1989-90 season because of its popularity with the general public, its easy roadside access, its increased use by commercial guides/outfitters, and our belief that the 1988-89 on-site creel survey underestimated the typical steelhead catch in this system. Heavy road construction during the spring and a 2-month freeze-up of the river from early January to early March 1989 limited access by anglers.

The research objectives for 1990 were to estimate:

1. angler effort and harvest of steelhead on the Thorne River between October 23, 1989 and June 3, 1990;
2. age composition, and length and weight at age for steelhead harvested from the Thorne River between October 23, 1989 and June 3, 1990;
3. harvest of species other than steelhead on the Thorne River between October 23, 1989 and June 3, 1990; and
4. angler/recreational use patterns on the Thorne River steelhead fisheries.

METHODS

Creel Survey

A direct expansion creel survey was conducted along the Thorne River from October 23, 1989 through June 3, 1990. The river was divided into six access areas for sampling and estimation purposes (Figure 1). These six areas include all known areas along the main stem and north fork which provide access to the river by a walk of one-half hour or less, and most boat and canoe access points. The 1989-1990 steelhead fishing season was stratified into 16 seasonal (14-day, or biweek) strata. Days within biweekly strata were stratified as weekdays, or weekend and holidays.

During 9 of the 16 seasonal strata (biweeks 1 and 7-14), days were also divided into early- and late-day strata of equal length, and during each day selected for sampling, 2 of the 6 access areas were randomly selected for either early- or late-day sampling. During biweeks 2-6, days were not divided into early- and late-day strata (due to limited daylight), and 2 randomly selected areas were sampled during 2 contiguous periods during the day. During biweeks 15 and 16, days were divided into 5 periods, and 2 periods and areas were randomly selected for sampling; this later scheme (which was more costly to field) was used to provide an estimate of variance for sampling periods within days.

In the process of scheduling sampling periods, 2 contiguous weekdays were randomly selected for "non-sampling" each week to provide time off for staff. The remaining 3 weekdays per week, and all Saturdays and Sundays, were sampled.

During each sampling period a technician stationed at a preassigned access area interviewed anglers as they completed their trip (generally as they returned to their vehicle). The number of exiting anglers who were not interviewed during a sampling period was also recorded. Data collected during each interview included target species, guided or unguided trip, residency status, terminal gear type used, time fished to the nearest half-hour, and number of fish of each species caught or kept. For the purposes of this study, a resident was one who was presently domiciled on Prince of Wales Island. Anglers who released a steelhead were asked whether the adipose fin of that fish was present.

Angler-hours of effort in the h th stratum of the fishery is estimated by:

$$\hat{E}_h = R_h \left[\frac{\hat{E}_{h..}}{I_h} \right] \quad (1)$$

$$\hat{E}_{h..} = \sum_{i=1}^{n_h} \hat{E}_{hi.} \quad (2)$$

$$\hat{E}_{hi.} = O_i \bar{e}_{hi.} \quad (3)$$

$$\bar{e}_{hi.} = \frac{\sum_{j=1}^{o_i} e_{hij}}{O_i} \quad (4)$$

$$r_{h.} = \sum_{i=1}^{n_h} r_{hi} \quad (5)$$

where R_h is hours available for fishing in stratum h , n_h number of samples collected in stratum h , r_{hi} number of hours sampled in sample i stratum h (r_{hi} varied and was treated as a random variable in biweeks 1-14), O_i is number of anglers counted in sample i , o_i is number of anglers interviewed in sample i , and e_{hij} is effort (hours) of the j th angler interviewed in sample i stratum h .

During biweeks 1-14, variance of effort estimate is (after Lehmann 1975, p. 330):

$$\hat{V}_h(\hat{E}_h) = R_h^2 \hat{V}\left[\frac{\hat{E}_{h..}}{r_{h.}}\right] \quad (6)$$

where the variance of the effort rate estimate ($e_{h..}/r_{h.}$) is (after Jessen 1978, p. 128, omitting the finite population correction factor):

$$\hat{V}\left[\frac{\hat{E}_{h..}}{r_{h.}}\right] = \left[\frac{\bar{E}_{h..}}{\bar{r}_{h.}}\right]^2 \left\{ \left[\frac{s_e^2}{\bar{E}_{h..}^2}\right] + \left[\frac{s_r^2}{\bar{r}_{h.}^2}\right] - \left[\frac{2\text{COV}_h(E, r)}{\bar{E}_{h..}\bar{r}_{h.}}\right] \right\} \quad (7)$$

where

$$\bar{E}_{h..} = \frac{\hat{E}_{h..}}{n_h} \quad (8)$$

$$\bar{r}_{h.} = \frac{r_{h.}}{n_h} \quad (9)$$

and s_e^2 is an estimate of the effort component of the effort rate, obtained by using a modified two-stage sampling approach estimator (Cochran 1977):

$$s_e^2 = \left[\frac{R_h - r_{h.}}{R_h}\right] \left[\frac{s_{B_e}^2}{n_h}\right] + \left[\frac{r_{h.}}{R_h n_h}\right] \left[\frac{s_{w_e}^2}{n_h}\right] \quad (10)$$

and

$$s_{B_e}^2 = \frac{\sum_{i=1}^{n_h} (\bar{E}_{hi.} - \bar{E}_{h..})^2}{n_h - 1} \quad (11)$$

$$s_{w_e}^2 = \sum_{i=1}^{n_h} \left\{ \left[\frac{(O_i - o_i)}{O_i}\right] [O_i^2] \left[\frac{1}{o_i}\right] \left[\frac{\sum_{j=1}^{o_i} (e_{hij} - \bar{e}_{hi.})^2}{(o_i - 1)}\right] \right\} \quad (12)$$

$$s_r^2 = \left[\frac{(R_h - r_h)}{R_h} \right] \left[\frac{1}{n_h} \right] \left[\frac{\sum_{i=1}^{n_h} (r_{hi} - \bar{r}_h)^2}{(n_h - 1)} \right] \quad (13)$$

$$\text{cov}(E, r) = \left[\frac{(R_h - r_h)}{R_h} \right] \left[\frac{1}{n_h} \right] \left[\frac{\sum_{i=1}^{n_h} (\hat{E}_{hi} - \bar{E}_{h..}) (r_{hi} - \bar{r}_h)}{n_h - 1} \right] \quad (14)$$

This approach for variance estimation is valid for a stratified simple random sampling design with one stage of sample selection. Our use of this approach is not entirely correct, in that selection of time to sample, within a unique combination of stratum definitions, was not a simple random process. As such, the location to sample within access location stratum represents a second stage of sampling. Due to the complexities of the sample allocation process and due to the limitations of sampling density, we were not able to estimate the variance for the second stage (i.e., by using squared differences between sample means and means by location and/or sample period).

During biweeks 15-16, r_h (equation 1) was constant, and variance was estimated using standard formula for a three-stage sampling scheme (Cochran 1977) with days as primary units, periods within days as secondary units, and anglers within periods as tertiary units. While this sampling scheme also ignores variation for locations within days, periods within day variability is estimated.

Effort for the season (and their variances) are the sums across strata ΣE_h and $\Sigma V[E_h]$. Harvest and catch are estimated similarly by substituting the corresponding statistics in place of the effort statistics into equations 1-14 above.

Approximate 95% confidence intervals (CI) were obtained for harvest and effort estimates by assuming normality. Accordingly CI limits were obtained as follows:

$$\hat{H} \pm 2 (\hat{V}(\hat{H}))^{1/2} \quad (15)$$

The lower limit of the CI was set equal to either the value obtained by equation 15 or to the actual number of fish observed in the sampled harvest, whichever was greater. Since harvest and effort estimates were not expected to be exactly normal, these CI limits are only approximate. In particular, we expected the upper limits to be non-conservative (i.e., the upper tail coverage was less than the stated alpha level, or 0.025) because of the assumed upper tail skew to these type of statistics.

Harvested steelhead were sampled by the technician as they were encountered during interviews. Ten scales were collected from an area two scale rows above the lateral line, on a diagonal line from the posterior end of the dorsal fin to the anterior end of the anal fin, and were mounted on gum cards. The scales were subsequently pressed onto acetate slides and read for age (single reading by two independent readers). Age classes are reported using the methods of Narver and Withler (1977); e.g., a fish aged 3.2S1 is 6 years of age, spent three winters in fresh water before migrating to sea, resided there 2 years before returning to spawn, and spent an additional year at sea after that spawning. Weight was measured to the nearest pound, with weights of eviscerated and whole fish distinguished. Lengths of fish (mid-eye to the fork of tail) were measured to the nearest millimeter.

Terminal gear types used by anglers were classified into four categories: spinners, flies, bait, and artificials. The percentage use of each gear type was calculated from all anglers encountered who were targeting on steelhead.

Recreational User Survey

Anglers and other recreational users encountered during the creel survey were asked a series of ten questions developed by the USFS which related to their recreational experiences and opinions (Appendix A1). All recreational users encountered were asked whether they had been previously interviewed during this program, to avoid duplication through repeat sampling.

A more detailed questionnaire, also developed by the USFS, was distributed with a postage-paid, pre-addressed envelope to two categories of individuals. Each person interviewed along the Thorne River (approximately 200) was given one questionnaire, and each post-office boxholder at Thorne Bay (approximately 250) was mailed one questionnaire. The more detailed survey was distributed to provide public users an opportunity to elaborate on their use of and opinions concerning the Thorne River. Thorne Bay postal customers were surveyed to increase the total number of completed responses received. Questionnaires were not otherwise distributed to those who had previously received one.

RESULTS

Creel Survey

Sport anglers fished an estimated 3,675 (SE = 529) angler-hours along the Thorne River from October 23, 1989 through June 3, 1990 (Table 1). Estimates of standard error for effort, catch, and harvest are negatively biased, since we could not assess all sources of variation. Steelhead was the primary target species, with an estimated 84% of the total effort, or 3,070 (SE = 559) angler-hours, during that period. The remainder of the sport fishing effort (estimated 16%, or 605 angler-hours, SE = 162) was for trout or Dolly Varden. No anglers targeting on salmon were encountered during the study period.

The peak steelhead fishing effort occurred between March 26 and May 20, 1990, when an estimated 63% (1,940 angler-hours, SE = 471) of the season's steelhead effort transpired (Table 2, Figure 2). Heavy snow and ice cover from February 12 through March 11 rendered Area 6 inaccessible, so the area was dropped from the survey during this period; Area 6 was dropped from the survey schedule after May 6 because steelhead angling effort in this area was virtually absent.

The estimated steelhead harvest through the study period was 111 (SE = 46) fish (Table 1). An estimated 142 (SE = 51) steelhead, or 56% of the total catch, were released during the same period. No hatchery steelhead (adipose fin-clipped) were encountered. Peak estimates for number of steelhead caught occurred in mid-April, late November and mid-May, respectively (Figure 3). Catch and harvest estimates for the other species caught in the Thorne River sport fishery during the study period were: 1,195 cutthroat trout (378 kept); 17 rainbow trout (all kept); and 690 Dolly Varden (231 kept) (Table 1). Peak cutthroat trout and Dolly Varden catches occurred from mid-April through early May.

Table 1. Total sport fishing effort, harvest, and release estimates on the Thorne River from October 23, 1989 through June 3, 1990.

	Estimate	SE ^a	95% CI ^b
Angler hours	3,675	529	2,617 - 4,733
Steelhead hours	3,070	559	1,952 - 4,188
Other trout/Dolly Varden hours	605	162	281 - 929
Steelhead kept	111	46	19 - 203
Steelhead released	142	51	40 - 244
Cutthroat trout kept	378	153	72 - 684
Cutthroat trout released	817	297	223 - 1,411
Rainbow trout kept	17	16	1 - 49
Rainbow trout released	0	0	0 - 0
Dolly Varden kept	231	160	13 - 551
Dolly Varden released	459	266	31 - 991

^a Standard error (approximate).

^b Confidence interval (approximate).

Table 2. Anglers sampled and estimated steelhead sport fishing effort, harvest, and release by 14-day periods, Thorne River, 1989-90.

Biweekly period	Anglers sampled ^a	Estimated effort			Estimated catch					
		Hours	SE ^b	CI ^c	Kept	SE ^b	CI ^c	Released	SE ^b	CI ^c
10/23-11/05	1/1	83	81	5-245	17	16	1-49	0	0	0
11/06-11/19	2/2	45	43	4-131	0	0	0	0	0	0
11/20-12/03	6/9	201	164	16-528	28	27	2-82	28	27	2-82
12/04-12/17	2/2	48	35	5-118	0	0	0	8	7	1-23
12/18-12/31	6/6	203	106	17-416	0	0	0	12	112	1-36
01/01-01/14	2/2	20	19	2-57	0	0	0	0	0	0
01/15-01/28	1/1	50	49	2-148	0	0	0	0	0	0
01/29-02/11	0/0	0	0	0	0	0	0	0	0	0
02/12-02/25	0/0	0	0	0	0	0	0	0	0	0
02/26-03/11	10/11	139	91	13-321	0	0	0	0	0	0
03/12-03/25	10/10	251	159	17-569	13	13	1-38	0	0	0
03/26-04/08	20/20	470	151	168-772	15	15	1-45	15	14	1-43
04/09-04/22	12/12	408	221	29-850	13	13	1-39	54	30	4-113
04/23-05/06	20/32	537	229	79-994	0	0	0	0	0	0
05/07-05/20	9/22	525	312	21-1,149	25	24	1-73	25	24	1-73
05/21-06/03	2/2	90	88	4-266	0	0	0	0	0	0
TOTALS	103/132	3070	559	1,952-4,188	111	46	19-203	142	51	40-244

^a Steelhead anglers/all anglers.

^b Standard error.

^c 95% Confidence interval (approximate).

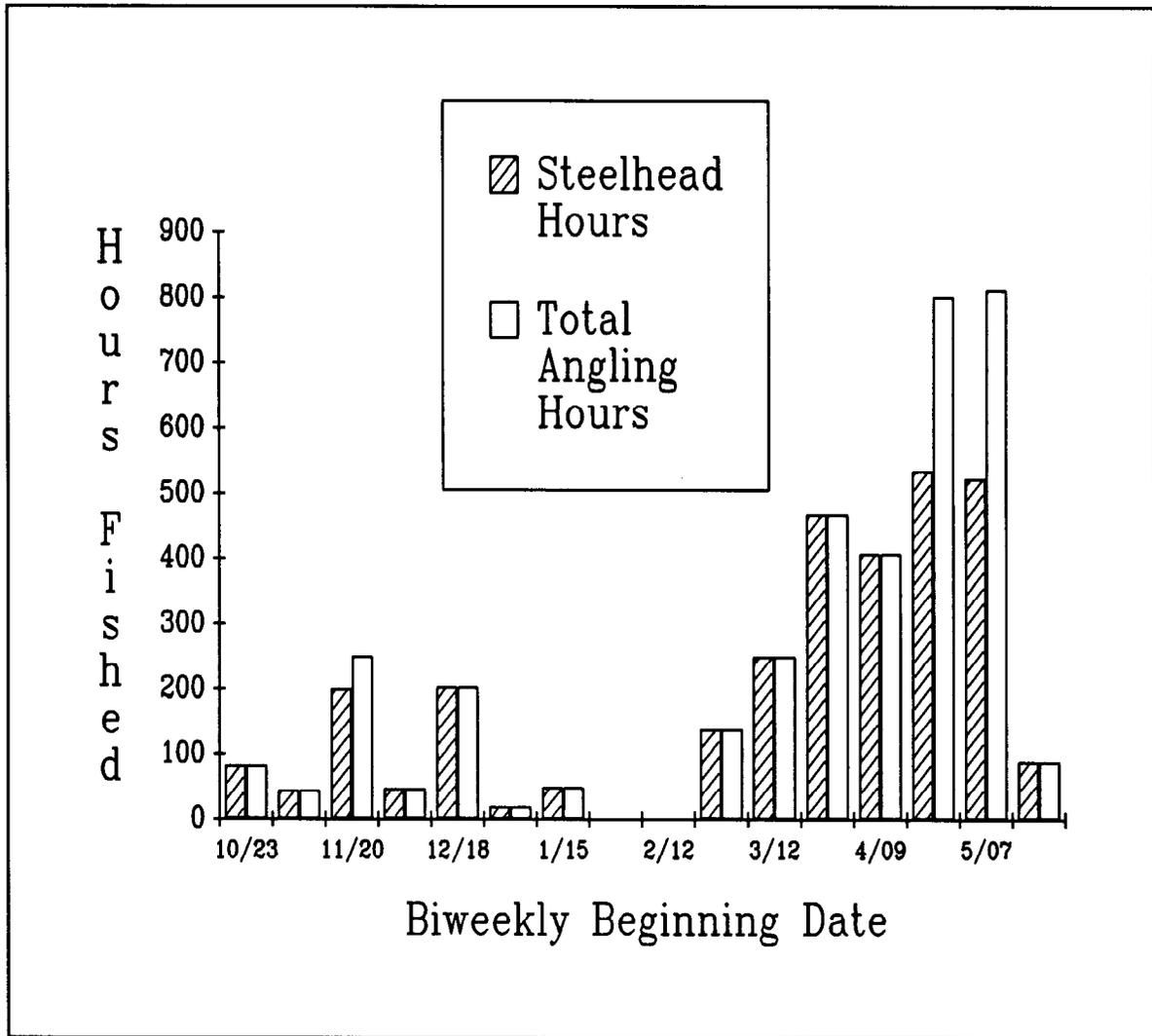


Figure 2. Estimated total biweekly sport fishing effort on the Thorne River, Prince of Wales Island, Alaska, October 23, 1989 to June 3, 1990.

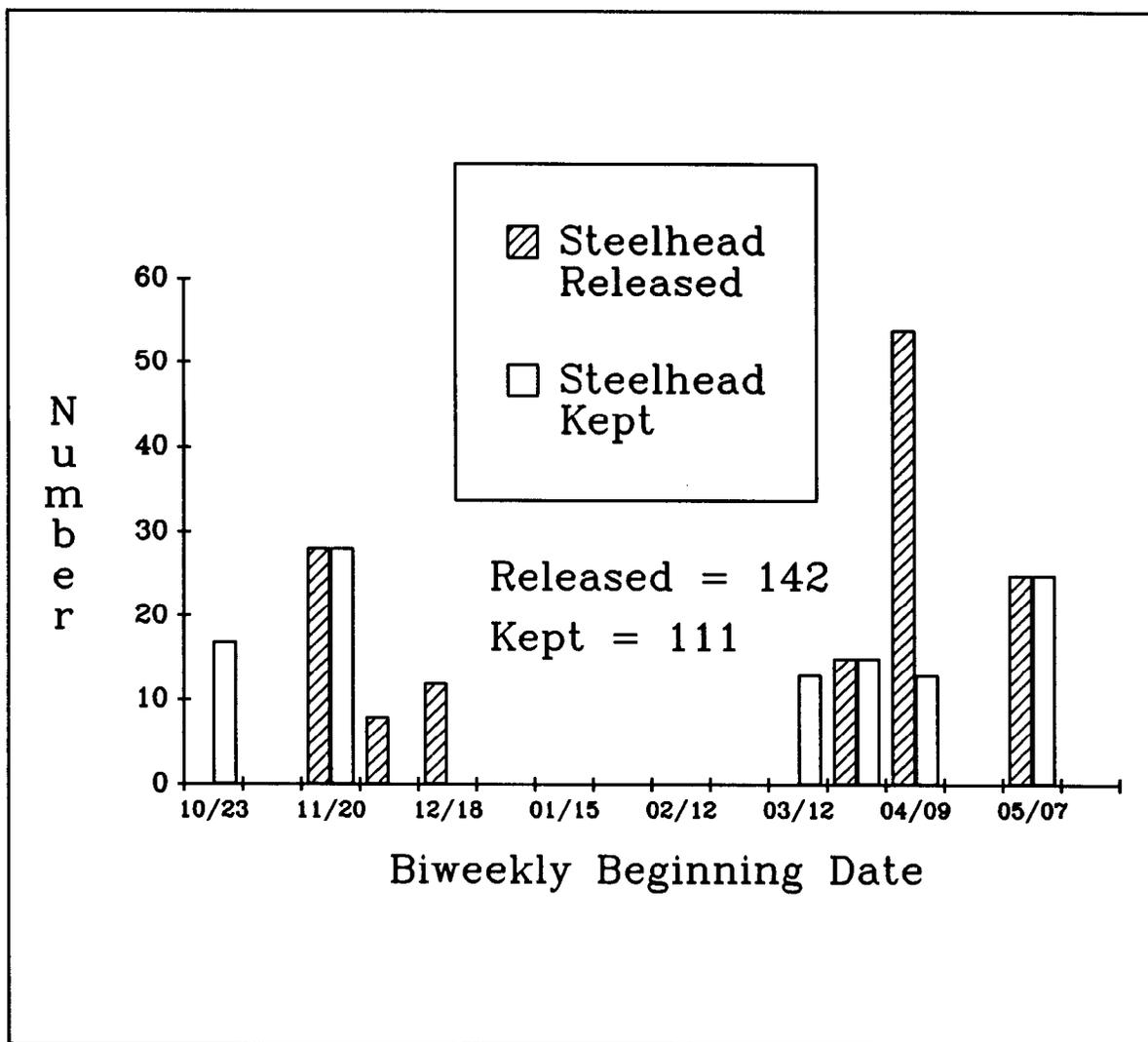


Figure 3. Estimated steelhead catch on the Thorne River, Prince of Wales Island, Alaska, October 23, 1989 to June 3, 1990.

Biweekly catch per unit of effort (CPUE) estimates for steelhead ranged from 0 to 0.28 fish per hour fished, with an overall rate of 0.08 fish per hour, or 12.1 angler-hours per fish (Figure 4). The highest CPUE estimates were in late November and mid-April.

Residents constituted 83% of steelhead anglers interviewed and 81% of all anglers interviewed. Eighty percent of the nonresident anglers interviewed targeted on steelhead.

Terminal gear types used by the steelhead anglers interviewed, in descending order of use, were bait (61%), artificial lures (21%), spinners (10%), and flies (8%).

A total of 16 adult steelhead were sampled through the season; 8 age classes were represented in the fish sampled, including four repeat spawners (Table 3). Steelhead weight ranged from 2.3 to 5.9 kg. The average weight of uncleaned fish was 4.4 kg (9.7 lb.). Cleaned steelhead averaged 2.8 kg (6.2 lb.), with a standard deviation (SD) of 0.9. Sampled steelhead ranged from 550 to 800 mm in length, with a mean length of 670 mm (Table 3).

Recreational User Survey

Of 87 recreational users (including anglers) interviewed during the on-site survey, 55% were residents of Thorne Bay, and 15% each resided in other PWI communities, other Alaskan communities not on PWI, and other states (Appendix A1). Most recreational users had visited the Thorne River five or fewer times since October 1989, though 9% said they had visited the river 20 to 40 times. Most people interviewed were in parties of two to three, and parties larger than four to six people were not encountered. Nearly 75% of those interviewed spent 3 hours or less on the river during that visit.

Over 75% of the recreational users interviewed had seen fewer than three other people during their visit, though some reported seeing as many as 25 people. The responses for an acceptable number of people to see without feeling crowded were mixed, primarily from zero to six. Two-thirds of those interviewed felt that fishing pressure was not excessive.

Two-thirds of the recreational users interviewed supported improved recreation facilities on the river, and preferred options were mixed. Half of the respondents preferred no change to existing steelhead fishing regulations, and support for changes was mixed among the options by the other half who responded. Most of those interviewed supported steelhead enhancement.

Response rates for the mail-in surveys were approximately 13% (25) for those interviewed on site (Appendix A2), and 15% (38) for Thorne Bay post-office boxholders (Appendix A3). Of both groups surveyed, most respondents were unretired PWI residents who visited the Thorne River and other PWI streams to fish and planned to return to the Thorne River. No respondents to this mail-in survey indicated that they were professionally guided. Respondents said they visited the Thorne River one to five to over 50 times annually, with responses evenly mixed among the options.

Half of the recreational users and 40% of the postal respondents felt some additional recreational controls or regulations were needed to manage the Thorne

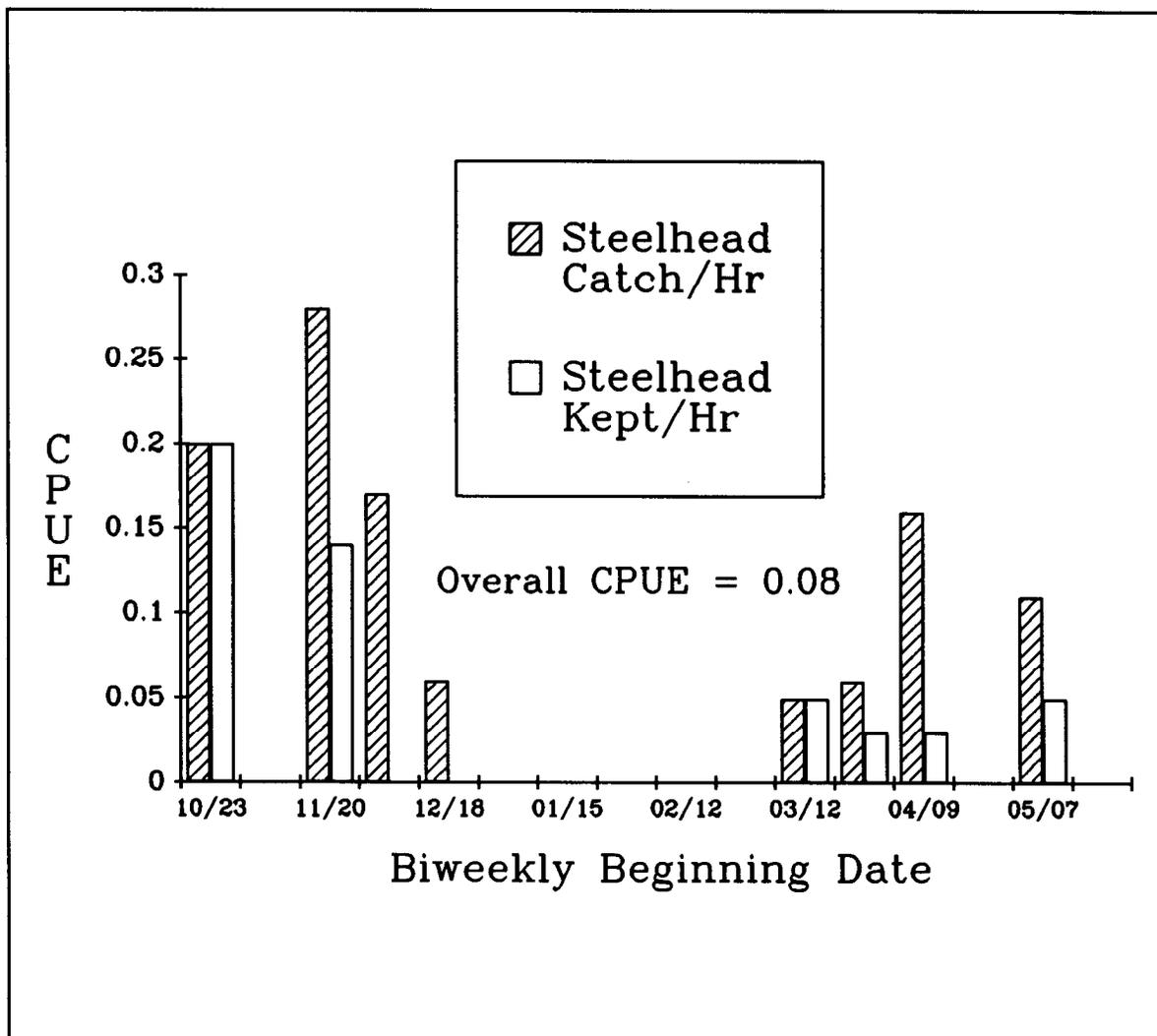


Figure 4. Estimated biweekly steelhead catch per unit effort (CPUE) on the Thorne River, Prince of Wales Island, Alaska, October 23, 1989 to June 3, 1990.

Table 3. Age, length, and weight of steelhead sampled from the Thorne River sport fishery, 1989-90.

Age ^a	Number of fish	Weight (kg) ^b			Length (mm) ^c		
		Mean	SD ^d	Range	Mean	SD ^d	Range
2.1S1	1	2.3 (1)	0.0		605 (1)	0	
2.2	2				595 (2)	64	550-640
2.3	1	5.0 (1)	0.0		730 (1)	0	
3.1S1	2	5.5 (1)	0.0		656 (2)	98	586-725
3.2	5	3.5 (3)	1.0	2.3-4.1	643 (5)	43	595-695
3.2S1	1	5.9 (1)	0.0		800 (1)	0	
3.3	3	5.9 (1)	0.0		757 (3)	35	725-795
4.2	1		0.0		600 (1)	0	
TOTAL	16	4.4 (8)	1.5	2.3-5.9	670	78	550-800

^a Age notation of Narver and Withler (1977).

^b Uncleaned weight, sample size in parentheses.

^c Mid-eye to fork of tail, sample size in parentheses.

^d Standard deviation.

River. Recommended optional controls or regulations included: disallowing commercial drift and jet boats; regulating boat use on the river, including above 8-1/2 Mile Hole; and regulating commercial outfitter guides.

About half of the recreational user and postal respondents supported sport fishing regulation changes. Regulation changes preferred by recreational users, in descending order of popularity were as follows: punchcard-season limit, catch and release only, barbless hooks, and no bait. Thorne Bay postal respondents preferred regulation changes in the following descending order of popularity: catch and release only, punchcard-season limit, barbless hooks, and no bait.

Areas considered a slight problem or worse by at least half of the recreational user respondents (Appendix A2, Part II) included: too few garbage cans, litter along the banks and river, motorized boats on the river, too many people on the river, and people being inconsiderate. At least half of the Thorne Bay postal survey respondents (Appendix A3, Part II) considered areas a slight problem or worse as follows: too few garbage cans, litter along the banks and river, and too many people on the river.

DISCUSSION

Seasonal steelhead effort and catch estimates were higher but not significantly different from our 1988-89 study (Freeman and Hoffman 1990). Estimates for the 1989-90 season were: 3,070 steelhead angler-hours (2,331 in 1988-89); 111 steelhead kept (67 in 1988-89); 142 fish released (93 in 1988-89); and overall CPUE of 0.08 steelhead per angler-hour (0.07 in 1988-89). Estimates for the fall fishery (through December 31) were: 93 fish were taken in fall 1989 (26 in fall 1988) and CPUE was 0.16 steelhead per hour (0.06 in fall 1988). The ratio of number of steelhead kept to the number released in 1989-90 (1:1.3) was similar to the ratio estimated for 1988-89 (1:1.4). Anglers targeting on trout or Dolly Varden were encountered during only 3 of the 16 biweekly periods surveyed in 1989-90, compared to 6 of the 18 biweekly periods in 1988-89.

Steelhead angling patterns changed little between years. Steelhead effort began in late September or early October, was nearly absent in January and February, picked up again by early March, and ended in June. Space for vehicle parking limited angler access in fall 1988 and increased after the completion of road construction in 1989. We believe that increased road access during fall 1989, particularly in Areas 3, 4, and 5, contributed to increased angler use of these areas.

Based on the results of the Alaska Statewide Sport Fisheries Harvest Report, steelhead harvest on the Sweetwater-Thorne River system was 218 fish in calendar year 1988 (Mills 1989) and 211 fish in 1989 (Mills 1990). Estimated steelhead harvests during the two years of this study (111 fish in 1989-90 and 67 fish in 1988-89) were lower, but the differences were probably not statistically significant. Although statewide survey estimates represent harvests from a larger area, we have assumed that more steelhead were harvested from the Thorne River than the Sweetwater system. Hatchery and Logjam Creeks are two streams in the Sweetwater system that are potential sources of additional steelhead harvests.

Responses to the on-site and mail-in questionnaires during this study were comparable to those obtained in the 1988-89 recreational surveys. Recreational users on the Thorne River generally preferred no change to existing fishing

regulations, did not consider harvests excessive, and did not see what they considered to be an excessive number of people. Litter was a commonly identified problem. About half of the respondents identified a need for boating regulations on the Thorne River, particularly involving commercial operators and motor boats. Steelhead enhancement utilizing native fish stocks was quite popular. The idea of steelhead sport fishing regulation changes was supported by about half of the respondents.

ACKNOWLEDGMENTS

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APPENDIX A



Appendix A1. Results of on-site survey of recreation users on the Thorne River, Prince of Wales Island, Alaska, 1989-90^a.

1. WHAT COMMUNITY ARE YOU FROM?

A. Thorne Bay (48)	B. Klawock (4)	C. Craig (6)
D. Coffman Cove (0)	E. Ketchikan (6)	
F. Other (23), includes: Hollis (1); Hydaburg (2); Other in Alaska (7); Washington (5); California (2); New Mexico (2); Colorado (2); Wyoming (1); Montana (1)		

2. HOW MANY TIMES DURING THE STEELHEAD SEASON HAVE YOU VISITED THE THORNE RIVER?

A. 0 - 5 (66)	B. 5 - 20 (13)	C. 20 - 40 (8)
D. 40 - 75 (0)	E. Over 75 (0)	

3. HOW MANY PEOPLE ARE IN YOUR PARTY?

A. 1 (16)	B. 2 - 3 (55)	C. 4 - 6 (16)
D. 8 - 10 (0)	D. More than 10 (0)	

4. HOW MUCH TIME DID YOU SPEND ON THE RIVER DURING THIS VISIT?

A. 1 Hour (21)	B. 2 Hours (30)	C. 3 Hours (13)
D. 4 - 6 Hours (15)	E. 8 - 10 Hours (2)	F. Other (6)

5. HOW MANY PEOPLE DID YOU SEE DURING THIS VISIT?

A. None (39)	B. 1 - 3 (28)	C. 4 - 6 (9)
D. 7 - 9 (5)	E. 10 - 15 (3)	F. 16 - 25 (2)
G. Other (1): Too many		

6. WHAT IS AN ACCEPTABLE AMOUNT OF PEOPLE TO SEE WITHOUT FEELING CROWDED?

A. 0 (19)	B. 1 (6)	C. 2 (24)
D. 3 - 4 (16)	E. 5 - 6 (12)	F. 7 - 10 (3)
G. Other (4), includes: Don't know (4)		
No response (3)		

7. HOW DO YOU PERCEIVE THE FISHING PRESSURE ON THE RIVER?

A. Too much pressure (16)	B. Right amount of pressure (45)
C. Can handle more users (6)	D. Didn't notice (17)
No response (3)	

8. WOULD YOU SUPPORT IMPROVED RECREATION FACILITIES ON THE RIVER^b?

A. Boat launch (22)	B. Improve existing trails (30)
C. Increase access sites (26)	D. Camping facilities (21)
E. Improved parking (20)	F. Other (27): No

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9. WOULD YOU SUPPORT STEELHEAD FISHING REGULATIONS INCLUDING^b:
- | | |
|-------------------------------|--------------------------------|
| A. Catch/release only (21) | B. No bait (12) |
| C. Barbless hook (18) | D. Punchcard-season limit (17) |
| E. No change to existing (42) | |
10. DO YOU SUPPORT STEELHEAD ENHANCEMENT? (NATIVE STOCK)
- | | |
|-----------------|-----------|
| A. Yes (77) | B. No (7) |
| No response (3) | |

-
- ^a Number of responses for each possible answer are shown in parentheses.
Number of different respondents (n) = 87.
- ^b Multiple responses per interview tabulated.

8. WHAT TYPE OF CONTROLS SHOULD BE INITIATED^b?
- A. Limit commercial outfitter guides (11)
 - B. Impose new fishing regulations (7)
 - C. Limit number of access sites (4)
 - D. Restrict camping in access sites (4)
 - E. Other (7) including: No drift or power boats, Limit motor use, Limit boating to lower river, Prohibit motor boats, Fine for littering, Provide trash disposal, Increase fish stocking (1 each)
 - No response (6)
9. HOW MANY PEOPLE WERE IN YOUR PARTY VISITING THE RIVER?
- A. 0 (0)
 - B. 1 (8)
 - C. 2 (10)
 - D. 3 - 4 (5)
 - E. 5 - 6 (2)
 - F. Other (0)
10. WHAT IS AN ACCEPTABLE AMOUNT OF PEOPLE TO SEE WITHOUT FEELING CROWDED?
- A. 0 (1)
 - B. 1 (2)
 - C. 2 (4)
 - D. 3 - 4 (11)
 - E. 5 - 6 (5)
 - F. 7 - 10 (0)
 - G. Other (2) including: Unspecified (2)
11. WOULD YOU SUPPORT FISHING REGULATIONS INCLUDING^b:
- A. Catch/release only (4)
 - B. No bait (2)
 - C. Barbless hooks (3)
 - D. Punchcard-season limit (8)
 - E. No change to existing regulations (13)
 - F. Other (2): Single hooks only, \$5.00 Steelhead stamp (1 each)
12. DURING YOUR VISIT ON THE THORNE RIVER DID YOU CAMP ON NATIONAL FOREST LANDS?
- A. Yes (6)
 - B. No (19)
- If Yes, did you stay in: tents? (3); or camper/van? (2)
- Where did you camp? Thorne River, Gravelly Park, Near bridge, Luck Lake (1 each)
13. IF YOU WERE A VISITING RECREATIONIST, DID YOU RESIDE IN A NEIGHBORING COMMUNITY?
- A. Yes (5)
 - B. No (7)
- If Yes, where? Thorne Bay (4); Craig (1)
- No response (13)

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PART II

Information about problems you may have experienced during your river trip would be helpful to river managers. To what extent did you find each of the following to be a problem during your trip?

- 1 - not a problem
- 2 - slight problem
- 3 - moderate problem
- 4 - serious problem
- 5 - very serious problem
- NR- no response

	1	2	3	4	5	NR
1. Too few garbage cans	(6)	(3)	(1)	(6)	(8)	(1)
2. Erosion of stream banks	(11)	(8)	(3)	(0)	(1)	(2)
3. Litter in river	(5)	(4)	(6)	(7)	(2)	(1)
4. Litter on banks	(3)	(2)	(7)	(5)	(5)	(3)
5. Obstructions in river (logs,etc)	(16)	(5)	(1)	(0)	(1)	(2)
6. Vandalism	(15)	(6)	(1)	(1)	(0)	(2)
7. Water pollution	(13)	(7)	(2)	(0)	(0)	(3)
8. Off-road vehicles in river area	(17)	(4)	(1)	(0)	(1)	(2)
9. People being inconsiderate .	(12)	(5)	(6)	(1)	(0)	(1)
10. Inadequate maintenance on existing trails	(15)	(2)	(5)	(0)	(2)	(1)
11. Too few developed trails . .	(15)	(3)	(2)	(1)	(2)	(2)
12. Too many people on the river	(10)	(8)	(4)	(0)	(2)	(1)
13. Insect bites	(17)	(5)	(1)	(0)	(0)	(2)
14. Motorized boats on the river	(11)	(3)	(1)	(1)	(6)	(3)
15. Airplanes flying overhead . .	(16)	(4)	(2)	(0)	(0)	(3)
16. Too few rules and regulations	(11)	(4)	(5)	(0)	(1)	(4)
17. Too many rules and regulations	(19)	(2)	(0)	(0)	(0)	(4)
18. Trees and branches overhanging the river	(18)	(5)	(0)	(0)	(0)	(2)
19. People playing loud radios .	(19)	(2)	(1)	(0)	(0)	(3)
20. Insufficient information about things to do and see in the area	(12)	(2)	(4)	(1)	(3)	(3)
21. Too few commercial establishments	(19)	(2)	(1)	(1)	(0)	(2)
22. Inadequate toilet facilities at put-in and take-out points .	(14)	(4)	(2)	(1)	(1)	(3)
23. Too few toilet facilities along river between put-in and take-out points	(14)	(4)	(2)	(2)	(0)	(3)
24. Not enough law enforcement .	(15)	(2)	(2)	(4)	(1)	(1)
25. Too much law enforcement . .	(20)	(1)	(0)	(0)	(1)	(3)
26. People fishing	(15)	(6)	(1)	(0)	(1)	(2)

-continued-

Appendix A2. (Page 6 of 6).

	1	2	3	4	5	NR
27. Roads within sight of a river	(18)	(1)	(2)	(2)	(0)	(2)
28. Too many signs along the river	(20)	(2)	(1)	(0)	(0)	(2)
29. People being rowdy	(20)	(2)	(0)	(0)	(1)	(2)
30. Someone in your group receiving an injury	(23)	(0)	(0)	(0)	(0)	(2)
31. Human body waste	(18)	(3)	(1)	(1)	(1)	(1)
32. Damage to or loss of personal property	(20)	(3)	(0)	(0)	(0)	(2)
33. Navigation problems due to low water levels	(16)	(4)	(1)	(0)	(0)	(4)
34. Navigation problems due to high water levels	(17)	(2)	(2)	(0)	(0)	(4)
35. Nuisance wildlife	(17)	(5)	(0)	(1)	(0)	(2)
36. Poor quality campsites	(15)	(2)	(4)	(1)	(1)	(2)
37. Campsites occupied by others	(16)	(3)	(2)	(1)	(0)	(3)
38. Campsite locations not clearly identified	(18)	(2)	(1)	(2)	(1)	(1)
39. Other things (specify) Occasionally too many fishermen; Need police to patrol estuary during summer coho & duck seasons to curb rowdy youth in skiffs; Stinking pink salmon; Litter at major fishing holes; No coho; Establish 3-day maximum on camping in one spot; Single hooks only; Cans along highway from Thorne Bay to Craig; Encourage catch & release steelhead fishing as on Vancouver Island; Ban outboard motors and jet boats; Don't commercialize the river (1 each)						

^a Number of responses for each possible answer in parentheses, n = 25.

^b Multiple responses per interview tabulated.

8. WHAT TYPE OF CONTROLS SHOULD BE INITIATED^b?
- A. Limit commercial outfitter guides (18)
 - B. Impose new fishing regulations (3)
 - C. Limit number of access sites (3)
 - D. Restrict camping in access sites (6)
 - E. Other (10) including: More animal-proof garbage cans with frequent pick-ups (2); No jet boats, Fines for littering, Determine capacity of river and implement appropriate action, Catch and release (steelhead only), Regular Fish & Wildlife Protection patrols, OK longer stays in camping areas, Keep government out, No guiding (1 each)
No response (10)
9. HOW MANY PEOPLE WERE IN YOUR PARTY VISITING THE RIVER?
- A. 0 (0)
 - B. 1 (5)
 - C. 2 (19)
 - D. 3 - 4 (11)
 - E. 5 - 6 (3)
 - F. Other (0)
10. WHAT IS AN ACCEPTABLE AMOUNT OF PEOPLE TO SEE WITHOUT FEELING CROWDED?
- A. 0 (3)
 - B. 1 (5)
 - C. 2 (7)
 - D. 3 - 4 (5)
 - E. 5 - 6 (7)
 - F. 7 - 10 (4)
 - G. Other (3) including: Unspecified (2); Doesn't matter (1)
No response (4)
11. WOULD YOU SUPPORT FISHING REGULATIONS INCLUDING^b:
- A. Catch/release only (12)
 - B. No bait (1)
 - C. Barbless hooks (7)
 - D. Punchcard-season limit (8)
 - E. No change to existing regulations (21)
 - F. Other (2): Catch and release for steelhead only, Barbless hooks on catch and release only (1 each)
12. DURING YOUR VISIT ON THE THORNE RIVER DID YOU CAMP ON NATIONAL FOREST LANDS?
- A. Yes (2)
 - B. No (36)
- If Yes, did you stay in: tents? (1); or camper/van? (1)
- Where did you camp? Near Thorne River bridge (1)
13. IF YOU WERE A VISITING RECREATIONIST, DID YOU RESIDE IN A NEIGHBORING COMMUNITY?
- A. Yes (5)
 - B. No (7)
- If Yes, where? Thorne Bay (4); Craig (1)
No response (26)

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20. SHOULD BOATING BE REGULATED ABOVE 8-1/2 MILE HOLE?
A. Yes (19) B. No (10) No response (9)
If Yes, how? No motor boats (10); Canoes only, Drift boats only (2 each);
Daily quota, Reservations, No jet boats over 25 hp, No boats, Kayaks only
(1 each)
21. SHOULD A BOAT RAMP BE DEVELOPED ON THE RIVER?
A. Yes (14) B. No (20) No response (4)
22. IF A BOAT LAUNCH WERE DEVELOPED, WHERE SHOULD IT BE PLACED?
A. Estuary to Gravelly Creek (2)
B. Gravelly Creek to Thorne River bridge (2)
C. Thorne River bridge to Goose Creek (6)
D. Goose Creek to 8-1/2 Mile Hole (9)
No response (19)
23. DO YOU EXPECT TO VISIT THE THORNE RIVER AGAIN?
A. Yes (32) B. No (0) C. Maybe (1)
No response (5)
24. HAVE YOU USED OTHER RIVERS ON PRINCE OF WALES ISLAND^b?
A. Yes (20) B. No (10) No response (8)
If Yes, which ones? Staney (13); Sarkar (5); Eagle, Harris (3 each);
Klawock, Logjam, Karta (2 each); "108," Goose, Sal, Shaheen, Ratz,
Hatchery, Naukati, North Thorne, Control Creek (1 each)
25. ARE YOU RETIRED?
A. Yes (2) B. No (30) No response (6)
-

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PART II

Information about problems you may have experienced during your river trip would be helpful to river managers. To what extent did you find each of the following to be a problem during your trip?

- 1 - not a problem
- 2 - slight problem
- 3 - moderate problem
- 4 - serious problem
- 5 - very serious problem
- NR- no response

	1	2	3	4	5	NR
1. Too few garbage cans	(14)	(4)	(10)	(1)	(6)	(3)
2. Erosion of stream banks.	(23)	(8)	(2)	(1)	(1)	(3)
3. Litter in river	(10)	(10)	(8)	(3)	(5)	(2)
4. Litter on banks	(4)	(5)	(11)	(6)	(8)	(4)
5. Obstructions in river (logs,etc)	(27)	(5)	(3)	(0)	(0)	(3)
6. Vandalism	(20)	(3)	(6)	(3)	(1)	(5)
7. Water pollution	(23)	(8)	(2)	(1)	(2)	(2)
8. Off-road vehicles in river area	(26)	(5)	(4)	(0)	(1)	(2)
9. People being inconsiderate . . .	(19)	(7)	(8)	(0)	(2)	(2)
10. Inadequate maintenance on existing trails	(26)	(4)	(3)	(2)	(1)	(2)
11. Too few developed trails . . .	(26)	(0)	(5)	(3)	(2)	(2)
12. Too many people on the river	(11)	(16)	(6)	(1)	(2)	(2)
13. Insect bites	(18)	(6)	(3)	(4)	(4)	(3)
14. Motorized boats on the river	(22)	(5)	(5)	(1)	(2)	(3)
15. Airplanes flying overhead . . .	(30)	(3)	(2)	(0)	(1)	(2)
16. Too few rules and regulations	(27)	(5)	(2)	(0)	(1)	(3)
17. Too many rules and regulations	(26)	(3)	(1)	(2)	(2)	(4)
18. Trees and branches overhanging the river	(28)	(4)	(3)	(1)	(0)	(2)
19. People playing loud radios . . .	(29)	(2)	(3)	(1)	(1)	(2)
20. Insufficient information about things to do and see in the area	(26)	(5)	(2)	(1)	(2)	(2)
21. Too few commercial establishments	(28)	(5)	(1)	(0)	(2)	(2)
22. Inadequate toilet facilities at put-in and take-out points . . .	(26)	(3)	(3)	(0)	(3)	(3)
23. Too few toilet facilities along river between put-in and take-out points	(27)	(3)	(1)	(0)	(4)	(3)
24. Not enough law enforcement . . .	(22)	(1)	(4)	(6)	(2)	(3)
25. Too much law enforcement . . .	(30)	(0)	(3)	(1)	(2)	(2)
26. People fishing	(21)	(10)	(3)	(2)	(0)	(2)

-continued-

	1	2	3	4	5	NR
27. Roads within sight of a river	(29)	(4)	(2)	(0)	(1)	(2)
28. Too many signs along the river	(36)	(0)	(0)	(0)	(0)	(2)
29. People being rowdy	(29)	(4)	(2)	(0)	(1)	(2)
30. Someone in your group receiving an injury	(35)	(1)	(0)	(0)	(0)	(2)
31. Human body waste	(30)	(1)	(2)	(0)	(3)	(2)
32. Damage to or loss of personal property	(32)	(2)	(0)	(1)	(1)	(2)
33. Navigation problems due to low water levels	(30)	(2)	(2)	(1)	(1)	(2)
34. Navigation problems due to high water levels	(34)	(1)	(0)	(0)	(1)	(2)
35. Nuisance wildlife	(32)	(4)	(0)	(0)	(0)	(2)
36. Poor quality campsites	(28)	(1)	(3)	(1)	(2)	(3)
37. Campsites occupied by others	(28)	(1)	(3)	(0)	(1)	(5)
38. Campsite locations not clearly identified	(27)	(2)	(2)	(1)	(2)	(4)
39. Other things (specify) No guides (4); Dump and sort yard in Thorne Bay pose serious noise and pollution problems; Remain low key; Non-commercial; Keep river unadvertised; Catch-and-release only; No camping within 200' of the river; Limit of 3 fish; Need more informational signs; Leave it alone; Need turn- outs at 7 mile, 8-1/2 mile, and Falls Creek areas; Plow access turn-outs in winter; No jet boats; No large drift boats; Rafting only; Swimming only (1 each)						

^a Number of responses for each possible answer in parentheses, n = 38.

^b Multiple responses per interview tabulated.

