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EFFORT AND CATCH STATISTICS FOR THE SPORT FISHERY IN THE LOWER KANEKTOK RIVER, 1986



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ABSTRACT

A roving creel survey was conducted on the lower 32 kilometers (20 miles) of the Kanektok River from 20 June to 4 September 1986 to estimate angling effort, catch (fish landed), and harvest (fish kept). Approximately 11,900 angler-hours of sport fishing effort were expended which resulted in a total catch of 1,935 chinook salmon (*Oncorhynchus tshawytscha* Walbaum), 481 sockeye salmon (*Oncorhynchus nerka* Walbaum), 5,222 chum salmon (*Oncorhynchus keta* Walbaum), 10,337 coho salmon (*Oncorhynchus kisutch* Walbaum) 4,880 pink salmon (*Oncorhynchus gorbuscha* Walbaum), 4,292 Dolly Varden (*Salvelinus malma* Walbaum), and 2,376 rainbow trout (*Salmo gairdneri* Richardson). Most of the fishing was catch and release as sportsmen harvested only 835 chinook salmon, 34 sockeye salmon, 305 chum salmon, 1,496 coho salmon, 97 pink salmon, 493 Dolly Varden, and 55 rainbow trout. Catch and harvest rates between guided and unguided anglers were significantly different ($P \leq 0.05$). Unguided anglers tended to outfish guided anglers nearly 3 to 2. Age, sex, and size samples are summarized for the sport harvest by species.

KEY WORDS: chinook salmon, *Oncorhynchus tshawytscha*, sport harvest, sport effort, creel survey, Kanektok River.

INTRODUCTION

The Kanektok River, located south of Bethel in the Togiak National Wildlife Refuge (Figure 1), has become a sport fishery of world renown. Besides hosting an abundance of rainbow trout (*Salmo gairdneri* Richardson), Arctic grayling (*Thymallus arcticus* Pallas), and Dolly Varden (*Salvelinus malma* Walbaum), the Kanektok River also supports major runs of the five species of Pacific salmon (*Oncorhynchus* sp.). Sport fishermen utilize this resource in increasing numbers each year as the popularity of this river grows.

Of particular interest is the growing chinook salmon (*Oncorhynchus tshawytscha* Walbaum) sport fishery in the lower reach of the river. In response to concern regarding this expanding fishery, the Alaska Board of Fisheries reduced the chinook salmon bag limit from 15 to 5 fish per day in 1985. Data from statewide postal surveys (Mills 1986) show that sport harvests have declined in recent years: 1,500 fish in 1983; 900 fish in 1984; and 700 fish in 1985. However, sport effort over this same period has increased dramatically. While accurate effort estimates are lacking for the lower section of the river, estimated angler effort for the entire river climbed from 1,500 angler-days in 1983 to nearly 7,000 angler-days in 1984 (Mills 1984 and 1985). Although the sport harvest is minor in comparison to commercial (1983-1985 average of 33,318 fish) and subsistence (1983-1985 average of 2,351 fish) harvests (Francisco 1987), the increasing level of sport use and resulting conflicts with local subsistence and commercial users is a major concern.

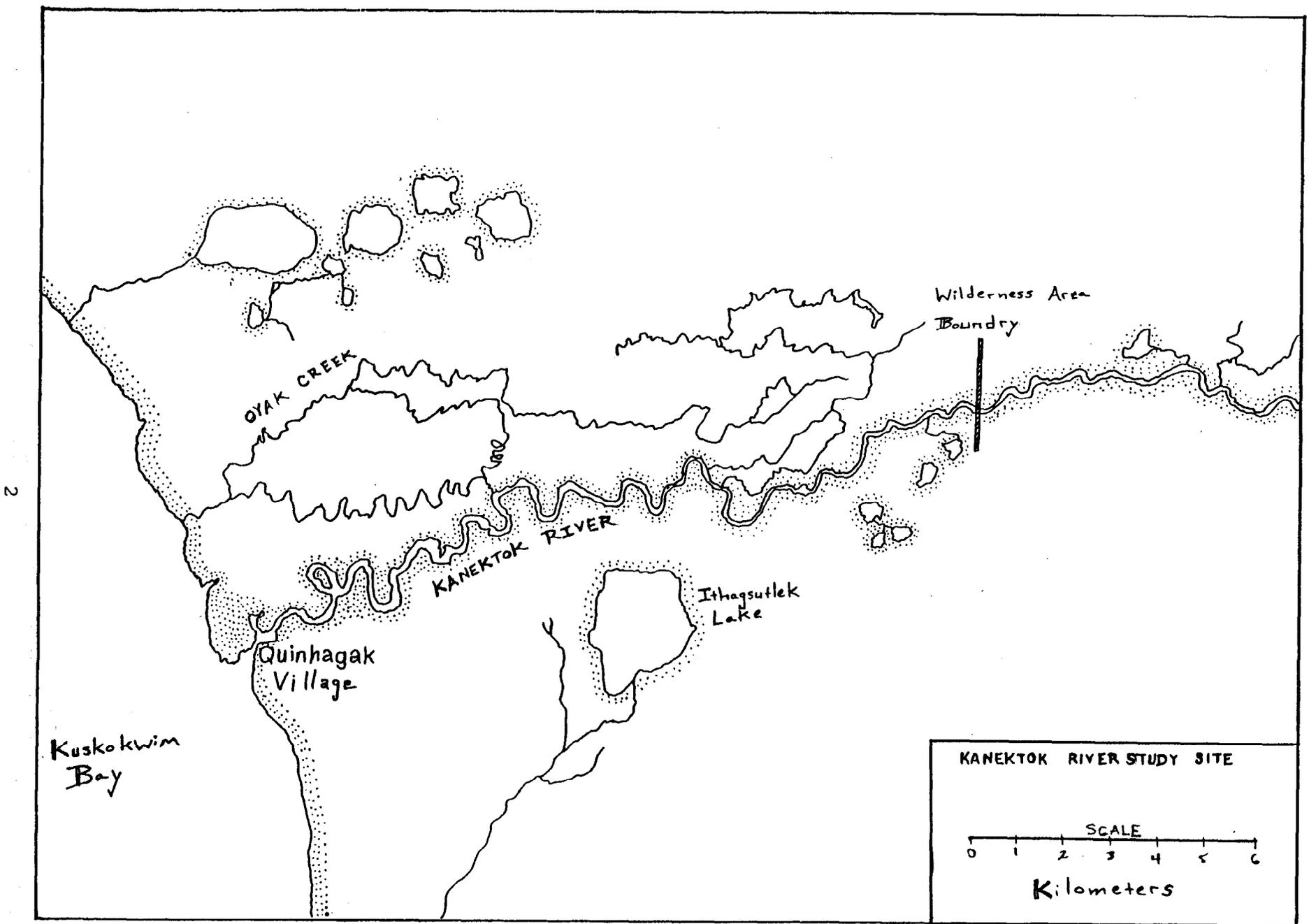


Figure 1. Lower Kanektok River creel survey study site.

In addition to the chinook salmon fishery, sport fishermen have demonstrated a growing interest in coho salmon (*Oncorhynchus kisutch* Walbaum) and rainbow trout. Mills (1986) estimates harvests in 1985 of 1,900 and 312 fish, respectively.

In 1986, the Sport Fish Division of the Alaska Department of Fish and Game (ADF&G) began a creel survey for the lower river sport fishery. The goal of this survey is to gain a better understanding of the sport fishery developing on the lower Kanektok River and to evaluate current management practices and policies related to this valuable resource. The objective of this report is to present the 1986 creel statistics for this fishery including estimates of fishing effort; catch (fish landed); harvest (fish retained); and age, sex, and size composition.

Other information is available regarding fishery resources in the Kanektok River. Estimates of commercial and subsistence harvest and spawning escapement data for Pacific salmon have been annually reported by Huttunen (1986). Information regarding the sport fishery in the upper reach of the river (contained in the Togiak National Wildlife Refuge, see Figure 1) are reported by Wagner (in press). A summary of this information is also presented in this report.

METHODS

In 1986, anglers were permitted a daily harvest of five chinook salmon (ADF&G 1986). No further regulatory restrictions were in effect.

Study Design

A roving creel survey (Neuhold and Lu 1957) using a stratified, random sampling design was used to count anglers, conduct angler interviews, and sample the sport harvest. Angler counts were used to estimate fishing effort in units of angler-hours. Angler interviews provided estimates of catch rates (fish per angler-hour).

Guided fishing accounts for the majority of the fishing effort on the Kanektok River and typically occurs between the hours of 0900 to 1800 hours (Snellgrove 1984). For the creel survey, the fishing day is divided into two time strata: one having two possible sample units and the other three. The two time strata were: (1) off hour, 0600-0900 hours and 1800-1900 hours; and (2) prime hour, 0900-1200 hours, 1200-1500 hours, and 1500-1800 hours.

The study site included 32.2 kilometers of river extending from the village of Quinhagak upstream to the wilderness boundary of the Togiak National Wildlife Refuge. Most of the fishery is concentrated in the lower 16 kilometers (Snellgrove 1984 and Alt 1986). The study site was divided into two sections, upper and lower, for which independent estimates were made.

Two temporal strata were defined on the basis of run timing and fishermen activity for the lower section; period one (20 June to 17 July) and period two (18 July to 4 September). Angler effort and harvest statistics were compiled separately for each geographic and temporal stratum.

Catch-per-unit-effort (CPUE) estimates were derived from interviews with anglers who had not completed fishing for the day, hereby referred to as incomplete trips. It is assumed that CPUE of incomplete trips provides an unbiased estimate of CPUE of completed trips.

Data Collection

Approximately 20% of the sampling effort was allocated to off-hour strata and the rest to prime-hour strata. Specific strata to be sampled were selected randomly. Additionally, a maximum of two sample units were designated each day and only one sample unit was selected when a full survey of the study area was conducted. This procedure was done independently for each strata over all periods.

Each survey started at the downstream boundary of the survey area. A coin was tossed to determine if angler counts or angler interviews were to be conducted first. For an angler count, a boat was driven through the fishery at a near constant rate of speed and all anglers actively fishing were counted. The angler count was completed within 40 to 60 minutes and was considered an instantaneous count (Neuhold and Lu 1957). It was not possible to differentiate between guided and unguided anglers.

All interviews were of individual anglers and were not party interviews. The survey clerk attempted to sample 5% to 10% of the available anglers so that the number of anglers randomly interviewed was proportional to angler effort during the sample time (Neuhold and Lu, 1957 and DiConstanzo 1956). For each angler contacted, the following information was recorded: the number of hours fished, the number of fish in the angler's possession by species, the number of fish released by species, and whether the angler was guided or not guided.

Completed trip information was collected from voluntary report forms given to interviewed anglers. The voluntary report form requested the time fishing started and ended, catch by species, and the number of fish retained. Anglers were asked to mail the postage-paid forms to the Dillingham ADF&G office.

Harvested salmon encountered during the creel survey were measured for mid-eye to fork-of-tail length to the nearest millimeter, weighed to the nearest 10 grams, and the sex of the fish recorded. Three

scales were removed from the preferred area¹ and mounted on a gummed card. The snout-to-fork length of all other species was recorded to the nearest millimeter.

Data Analyses

The mean number of anglers per count was calculated for each peak and non-peak period by:

$$\bar{X} = (1/N) \sum_{i=1}^4 N_i \bar{x}_i,$$

where;

\bar{X} = the mean number of anglers per count for a period,

\bar{x}_i = the mean number of anglers per count for stratum i ,

N = the total number of hours in a period, and

N_i = the total number of hours in stratum i .

The variance of the mean number of anglers per count was calculated as follows (Jessen 1978):

$$\hat{V}(\bar{X}) = (1/N^2) \sum_{i=1}^4 N_i^2 [s_i^2/n_i],$$

where;

N and N_i are defined as above, and

n_i = the total number of angler counts in stratum i , and

s_i^2 = the sample variance of \bar{x}_i for stratum i .

The total number of angler-hours (\hat{E}_T) in each period was estimated as follows:

$$\hat{E}_T = N\bar{X} = \sum_{i=1}^4 N_i \bar{x}_i.$$

The variance for the estimate of total angler-hours was calculated as follows:

1 The left side of the fish approximately two rows above the lateral line and on the diagonal row downward from the posterior insertion of the dorsal fin (Clutter and Whitesel 1956).

$$V(\hat{E}_T) = N^2 V(\bar{X}).$$

The total number of angler-hours for the season was estimated by summing the estimates of total angler-hours for geographic (upper and lower) and temporal (periods one and two) strata. Because these are independent estimates, the total variance is the sum of the individual variances.

Catch per unit effort for species i during a stratum was estimated by:

$$\overline{CPUE}_i = \frac{\sum_{j=1}^m c_{ij}}{\sum_{j=1}^m f_j}$$

m = the number of anglers interviewed during the stratum,

c_{ij} = the catch (either number harvested or total number caught) of species i by angler j , and

f_j = the effort (number of hours) expended by angler j .

The variance of mean effort per angler was estimated using a two-stage sample design with days representing the first-stage sample units and anglers the second-stage sample units (Von Geldern and Tomlinson 1973). On a given sample day, the number of second-stage units available was unknown. The variance of mean effort was estimated as follows (Sukhatme et al. 1984):

$$V(\bar{f}) = [1 - (d/D)] s_B^2/d + (\sum_{k=1}^D s_{Wk}^2/m)/dD,$$

where;

d = the number of days sampled during the period,

D = the number of days in the period,

s_{Wk}^2 = the sample variance of effort for anglers interviewed during day k , and

s_B^2 = the between-day variance of angler effort.

The between-day variance, s_B^2 , was estimated as follows:

$$s_B^2 = \left[\sum_{k=1}^D (\bar{f}_k - \bar{f})^2 \right] / (d-1),$$

where \bar{f}_k = the mean effort by anglers interviewed during day k .

The mean and variances of harvest or catch of a species were estimated identically to effort by substituting the corresponding harvest or catch quantities for effort (f).

The variance of $CPUE_i$ was calculated using the approximation for the variance of the quotient of two random variables (Jessen 1978):

$$\hat{V}(\overline{CPUE}_i) = (\overline{c}_i/\overline{f}_i)^2 (s_c^2/\overline{c}^2 + s_f^2/\overline{f}^2 - 2rs_c s_f/\overline{cf})$$

where;

\overline{c}_i = the mean catch of species i by anglers interviewed during a period,

\overline{f}_i = the mean number of hours fished by anglers interviewed during a period,

s_c^2 = the two-stage variance estimate for \overline{c}_i ,

s_f^2 = the two-stage variance estimate for \overline{f}_i , and

r = the correlation between the c_{ij} and f_j .

The catch (or harvest) of species i was estimated by:

$$\hat{C}_i = \hat{E}_T \overline{CPUE}_i.$$

The variance of the catch was estimated using Goodman's (1960) formula for the variance of the product of two independent random variables, which is:

$$\hat{V}(\hat{C}_i) = [\hat{E}_T^2 \hat{V}(\overline{CPUE}_i)] + [\overline{CPUE}_i^2 \hat{V}(\hat{E}_T)] - [V(\hat{E}_T) \hat{V}(\overline{CPUE}_i)].$$

Total catch and its variance were estimated for each stratum and summed to estimate the total season catch. The same procedures were followed in estimating total harvest of each species.

The assumptions necessary for these analyses were:

1. Incomplete trip angler interviews provided an unbiased estimate of completed trip angler CPUE.
2. Interviewed anglers were representative of the total angler population and anglers were interviewed in proportion to their abundance.
3. No significant fishing effort occurred between 2000 hours and 0600 hours.
4. The catch and effort are normally distributed random variables.

5. Catch rate and duration of fishing trip are independent (DiConstanzo 1956).

The age composition of chinook salmon harvested by the sport fishery was calculated from all legible scales collected during the creel survey. The proportional age composition of the chinook salmon harvest was estimated. Letting p_h equal the estimated proportion of age group h , the variance of p_h was estimated using the normal approximation to the binomial (Schaeffer et al. 1979):

$$V(\hat{p}_h) = \hat{p}_h(1-\hat{p}_h)/(n_T-1),$$

where n_T is the number of chinook salmon scales read.

Mean length at age by sex and its variance were estimated using standard normal procedures. Mean length (mm) and weight (kg) were calculated by age class for all chinook salmon sampled.

RESULTS

The creel survey was conducted on the lower Kanektok River during the period 20 June to 4 September, 1987. Angler counts by river section, date, and time period are presented in Appendix Tables 1 and 2. Daily catch rates are presented in Appendix Tables 3-6. There was insufficient data to stratify the upper river estimates by time period; therefore, the upper river data were pooled into a single time period.

Effort

Total effort was estimated to be 11,902 angler-hours (Table 1). The lower section of the study site received 70% (8,303 angler-hours) of the total effort. Interviewed anglers who had completed their fishing trip ($N = 60$) averaged 7.6 hours per trip. Variability in this estimate, however, was high (standard error = 2.4).

Catch Rate

Maximum catch and harvest rates for chinook salmon occurred in the lower section of the study site during period one (20 June-17 July) (Table 2). Catch and harvest rates for chinook salmon in the upper section were low.

Chum and coho salmon catch rates were particularly high during most periods. However, harvest rates for these species were low. The peak catch rate for any species was recorded for coho salmon in the lower section during period two (1.6504 fish per angler-hour).

Although guided and unguided effort and catch could not be estimated separately, estimates of catch and harvest rates were possible (Table 3). Daily catch rates of guided and unguided anglers were

Table 1. Estimated effort (angler-hours) by sampling period for the lower Kanektok River sport fishery, 1986.

River Section	Sampling Period ¹	Number of Interviews	Number of Days Possible	Number of Days Sampled	Anglers per Count	Effort			
						Ang-Hrs	Std Err	95 % C.	Rel Pre ²
Lower	1	216	28	26	14.1	5,076	510	4,077-6,075	19.7%
Lower	2	150	49	48	4.8	3,226	335	2,569-3,883	20.4%
Lower	Subtotal	366	77	74		8,303	610	7,106-9,499	14.4%
Upper	1 & 2	38	77	21	0.75	3,599	796	2,038-5,160	110.2%
Lower & Upper	Season Total	404	77	74		11,902	1,003	9,935-13,869	16.5%

¹ Period 1 - 6/20-7/17; Period 2 - 7/18-9/4.

² Relative precision at $\alpha = 0.05$

Table 2. Catch per angler-hour for total catch (number landed) and harvest by species, river section, and time period for the lower Kanektok River sport fishery, 1986.

Species	River Section	Sampling Period ¹	Catch		Harvest	
			Catch/Hr	Std Err	Catch/Hr	Std Err
Chinook	Lower	1	0.3008	0.0022	0.1517	0.0013
Salmon	Lower	2	0.0779	0.0024	0.0122	0.0005
	Upper	1 & 2	0.0435	0.0042	0.0073	0.0013
Sockeye	Lower	1	0.0144	0.0006	0.0052	0.0005
Salmon	Lower	2	0.0049	0.0004	0.0024	0.0004
	Upper	1 & 2	0.1088	0.0079	0.0000	0.0000
Chum	Lower	1	0.5388	0.0050	0.0405	0.0009
Salmon	Lower	2	0.1314	0.0028	0.0146	0.0008
	Upper	1 & 2	0.5731	0.0477	0.0145	0.0037
Coho	Lower	1	0.0000	0.0000	0.0000	0.0000
Salmon	Lower	2	1.6504	0.0154	0.3749	0.0054
	Upper	1 & 2	1.3928	0.0774	0.0798	0.0049
Pink	Lower	1	0.0995	0.0033	0.0131	0.0008
Salmon	Lower	2	0.8203	0.0139	0.0097	0.0005
	Upper	1 & 2	0.4860	0.0309	0.0000	0.0000
Dolly	Lower	1	0.0432	0.0021	0.0039	0.0002
Varden	Lower	2	0.3481	0.0053	0.0170	0.0004
	Upper	1 & 2	0.8197	0.0459	0.1161	0.0127
Rainbow	Lower	1	0.0366	0.0012	0.0026	0.0002
Trout	Lower	2	0.2580	0.0047	0.0049	0.0003
	Upper	1 & 2	0.3722	0.0144	0.0073	0.0008

¹ Period 1 - 6/20-7/17; Period 2 - 7/18-9/4.

Table 3. Comparative catch and harvest rates (fish per angler-hour) of chinook and coho salmon by guided and unguided anglers on the lower Kanektok River sport fishery, 1986.

Sampling Period ¹	No. Interviews		Chinook				Coho			
			Catch		Harvest		Catch		Harvest	
	Guided	Unguided	Guided	Unguided	Guided	Unguided	Guided	Unguided	Guided	Unguided
1	167	50	0.2713	0.3702	0.1270	0.2235	0.0000	0.0000	0.0000	0.0000
2	122	40	0.0495	0.1784	0.0104	0.0112	1.9488	0.9255	0.2892	0.4237
Total ²	289	40	0.1879	0.2964	0.0832	0.1417	0.7322	0.3565	0.1087	0.1632

¹ Period 1 - 6/20-7/17; Period 2 - 7/18-9/4.

² Seasonal catch and harvest rates between guided and unguided anglers were significantly different (P<0.05).

compared with a sign test (Conover 1980). Unguided anglers caught chinook salmon at a significantly greater rate ($P \leq 0.05$) than did guided anglers. Harvest rates were also higher for unguided anglers. This result is atypical for most Alaskan sport fisheries and probably is explained by the greater percentage of guided anglers using fly fishing tackle rather than more effective spinning tackle generally used by unguided anglers. Conversely, guided anglers caught coho salmon at a significantly greater rate ($P \leq 0.05$) than did unguided anglers. Seasonal catch rates of coho salmon for both guided and unguided anglers (0.7322 and 0.3565 coho/angler-hour) shows excellent fishing success. Unguided anglers harvested a larger proportion of both their chinook and coho salmon catches than did guided anglers.

Catch and Harvest

Harvest of all species was low in comparison to total catch (Table 4). Chinook salmon sustained the highest rate of retention (835 fish harvested of 1,935 fish landed, or 43.2%). Although coho salmon accounted for the largest catches (10,337 fish) and harvests (1,496 fish), the retention rate (14.5%) was lower than that for chinook salmon. Harvests of chum and sockeye salmon were extremely low (305 and 34 fish, respectively) as were retention rates (5.8% and 7.1% respectively). Retention rates for Dolly Varden char and rainbow trout were also low (11.5% and 2.3%, respectively).

Size, Sex, and Age Sampling

Males comprised 63.5% of the sampled chinook salmon ($N = 406$) (Table 5). The sample was dominated by age 1.3 fish (46.1%). Size, sex, and age data for other species of Pacific salmon are presented in Tables 6-8.

Most of the rainbow trout harvest was sampled (45 of 55 fish) for size and age data (Table 9). Ages were not discernible for many of the samples because of the large number of regenerated scales. These limited data indicate that rainbow trout recruit into the fishery at age three.

DISCUSSION

This study constitutes the first comprehensive creel survey for the lower Kanektok River sport fishery. Currently, many of the participants in the fishery are practicing voluntary catch and release. However, the harvest potential for this fishery is high as shown by the large number of fish landed. Also at question is the mortality associated with released fish.

Concurrent with this study, a creel survey was conducted upstream from the wilderness boundary by the USF&WS (Wagner in press). These two surveys provide a nearly complete picture of the sport fishery on the Kanektok River for 1986 (Table 10). Fishing effort was nearly equally distributed above and below the wilderness boundary. Catches

Table 4. Estimated total catch (fish landed) and harvest (fish retained) by species for the lower Kanektok River sport fishery, 1986.

Species	River Section	Catch				Harvest				Percent Harvest
		Number	Std Err	95% CI	Rel Pre ¹	Number	Std Err	95% CI	Rel Pre ¹	
Chinook	Upper	157	38	83-231	47.0%	26	7	12-40	55.4%	16.6%
Salmon	Lower	1,778	156	1,472-2,084	17.2%	809	78	657-961	18.8%	45.5%
	Total	1,935	161	1,620-2,250	16.3%	835	78	682-988	18.3%	43.2%
Sockeye	Upper	392	91	214-570	45.5%	0	0	0-0		0.0%
Salmon	Lower	89	8	73-105	18.3%	34	4	26-42	23.1%	38.2%
	Total	481	91	302-660	37.2%	34	4	26-42	23.1%	7.1%
Chum	Upper	2,063	486	1,110-3,016	46.2%	52	17	18-86	65.1%	2.5%
Salmon	Lower	3,159	280	2,611-3,707	17.3%	253	22	210-296	16.9%	8.0%
	Total	5,222	561	4,123-6,321	21.1%	305	28	250-360	17.9%	5.8%
Coho	Upper	5,013	1,142	2,775-7,251	44.7%	287	66	158-416	45.0%	5.7%
Salmon	Lower	5,324	556	4,235-6,413	20.5%	1209	127	960-1,458	20.6%	22.7%
	Total	10,337	1,270	7,848-12,826	24.1%	1496	143	1,216-1,776	18.7%	14.5%
Pink	Upper	1,749	402	961-2,537	45.0%	0	0	0-0		0.0%
Salmon	Lower	3,131	283	2,575-3,687	17.7%	97	9	80-114	17.5%	3.1%
	Total	4,880	492	3,916-5,844	19.8%	97	9	80-114	17.5%	2.0%
Dolly	Upper	2,950	672	1,632-4,268	44.7%	418	103	217-619	48.2%	14.2%
Varden	Lower	1,342	120	1,106-1,578	17.6%	75	6	63-87	16.3%	5.6%
	Total	4,292	683	2,953-5,631	31.2%	493	103	291-695	40.9%	11.5%
Rainbow	Upper	1,358	305	761-1,955	44.0%	26	6	13-39	48.9%	1.9%
Trout	Lower	1,018	90	842-1,194	17.3%	29	2	24-34	16.6%	2.8%
	Total	2,376	318	1,753-2,999	26.2%	55	7	41-69	24.7%	2.3%

¹ Relative precision at $\alpha = 0.05$.

Table 5. Sex, age, length (mm), and weight (kg) compositions for chinook salmon sampled¹ from the lower Kanektok River sport harvest, 1986.

	Age Class				Total
	1.2	1.3	1.4	1.5	
<u>Male</u>	78	315	88	49	531
Percent	9.4%	37.7%	10.6%	5.9%	63.5%
Avg Length	492	678	794	1,016	701
Std Error	12.9	6.9	16.5	39.9	10.5
Sample Size	38	153	43	24	258
Avg Weight	2.1	5.8	8.9	15.1	6.4
Std Error	0.2	0.2	0.6	0.9	0.3
Sample Size	38	153	43	24	258
<u>Female</u>	12	70	152	70	304
Percent	1.5%	8.4%	18.2%	8.4%	36.5%
Avg Length	566	751	862	918	837
Std Error	10.0	14.1	6.8	8.4	8.4
Sample Size	6	34	74	34	148
Avg Weight	3.2	8.0	10.4	12.1	9.9
Std Error	0.3	0.6	0.2	0.3	0.3
Sample Size	6	34	74	34	148
<u>Both Sexes</u>	90	385	241	119	835
Percent	10.8%	46.1%	28.8%	14.3%	100.0%
Avg Length	502	691	837	958	751
Std Error	11.9	6.6	8.0	18.4	8.0
Sample Size	44	187	117	58	406
Avg Weight	2.3	5.9	9.9	13.5	7.7
Std Error	0.2	0.2	0.3	0.5	0.2
Sample Size	44	187	117	58	406

¹ Sample Period: 6/20 - 9/4.

Table 6. Sex, age, length (mm), and weight (kg) compositions for chum salmon sampled¹ from the lower Kanektok River sport harvest, 1986.

	Age Class				Total
	0.3	0.4	1.3	0.5	
<u>Male</u>	33	77	9	14	133
Percent	10.7%	25.2%	3.1%	4.6%	43.5%
Avg Length	606	633	607	654	628
Std Error	10.9	4.4	8.5	11.1	4.8
Sample Size	14	33	4	6	57
Avg Weight	3.7	4.2	3.8	5.0	4.1
Std Error	0.2	0.1	0.0	0.4	0.1
Sample Size	14	27	4	4	49
<u>Female</u>	102	65	5	0	172
Percent	33.6%	21.4%	1.5%	0.0	56.5%
Avg Length	570	609	510		581
Std Error	4.2	5.9	0.0		3.9
Sample Size	44	28	2	0	74
Avg Weight	2.6	3.3	2.3		2.8
Std Error	0.1	0.2	0.0		0.1
Sample Size	36	24	2	0	62
<u>Both Sexes</u>	135	142	14	14	305
Percent	44.3%	46.6%	4.6%	4.6%	100.0%
Avg Length	579	622	575	654	603
Std Error	4.6	3.9	19.5	11.1	3.6
Sample Size	58	61	6	6	131
Avg Weight	2.9	3.75.5	3.25.0	5.0	3.4
Std Error	0.1	10.9	28.9	0.4	0.1
Sample Size	50	51	6	4	111

¹ Sample Period: 6/20 - 9/4.

Table 7. Sex, age, length (mm), and weight (kg) composition for coho salmon sampled¹ from the lower Kanektok River sport harvest, 1986.

	Age Class			Total
	1.1	2.1	2.2	
<u>Male</u>	27	765	20	812
Percent	1.8%	51.1%	1.4%	54.3%
Avg Length	564	576	613	576
Std Error	17.7	4.3	24.5	3.8
Sample Size	4	113	3	120
Avg Weight	3.2	3.0	3.8	3.1
Std Error	0.2	0.1	0.5	0.1
Sample Size	3	103	3	109
<u>Female</u>	14	670	0	684
Percent	0.9%	44.8%	0.0	45.7%
Avg Length	583	575		576
Std Error	15.9	4.0		3.8
Sample Size	2	99	0	101
Avg Weight	2.7	2.9		2.9
Std Error	0.3	0.1		0.1
Sample Size	2	89	0	91
<u>Both Sexes</u>	41	1435	20	1496
Percent	2.7%	95.9%	1.4%	100.0%
Avg Length	570	575	613	576
Std Error	13.4	3.0	24.5	2.7
Sample Size	6	212	3	221
Avg Weight	3.0	3.0	3.8	3.00
Std Error	0.2	0.1	0.5	0.5
Sample Size	5	192	3	200

¹ Sample Period: 6/20 - 9/4.

Table 8. Sex, length (mm), and weight (kg) compositions for pink salmon sampled¹ from the lower Kanektok River sport harvest, 1986.

<hr/>	
	Age
	0.1
<hr/>	
<u>Male</u>	30
Percent	31.0%
Avg Length	449
Std Error	8.0
Sample Size	18
Avg Weight	1.1
Std Error	0.1
Sample Size	18
<u>Female</u>	67
Percent	69.0%
Avg Length	453
Std Error	7.1
Sample Size	40
Avg Weight	1.3
Std Error	0.1
Sample Size	36
<u>Both Sexes</u>	97
Percent	100.0%
Avg Length	452
Std Error	5.5
Sample Size	58
Avg Weight	1.2
Std Error	0.1
Sample Size	54
<hr/>	

¹ Sample Period: 6/20 - 9/4.

Table 9. Age, length (mm), and weight (kg) for rainbow trout sampled¹
from the lower Kanektok River sport harvest, 1986.

	Age Class					No Age ²	Total
	3	4	5	7	8		
Both Sexes	9	12	9	18	6		36
Percent	16.7%	22.2%	16.7%	33.3%	11.1%		65.2%
Avg Length	337	374	388	535	575	532	510
Std Error	0.0	15.0	0.0	16.3	0.0	6.6	8.9
Sample Size	3	4	3	6	2	27	45
Avg Weight		0.5	0.3	1.7	2.3	1.7	1.6
Std Error		0.0	0.0	0.1	0.0	0.1	0.1
Sample Size		2	3	6	2	32	45

¹ Sample Period: 6/20 - 9/4.

² Unageable samples due to regenerated scales.

Table 10. Effort (angler-days)¹, catch (fish landed), and harvest (fish retained) for the entire Kanektok River sport fishery, 1986.

	Chinook Salmon		Sockeye Salmon		Chum Salmon		Coho Salmon		Pink Salmon		Dolly Varden		Rainbow Trout		
	Effort	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest		
Source: ADF&G															
River km: 0 - 30															
Study Dates:															
6/20-9/4	1,566	1,935	835	481	34	5,222	305	10,337	1,496	4,880	97	4,292	493	2,376	55
Source: USF&WS															
River km: 31 - 59															
Study Dates:															
6/30 - 9/13	1,753	408	9	873	27	1,041	11	13,707	184	4,203	12	16,238	163	7,674	15
Combined	3,319	2,343	844	1,354	61	6,263	316	24,044	1,680	9,083	109	20,530	656	10,050	70

¹ Effort for the lower river fishery was measured in angler-hours. This estimate was transformed to angler-days by dividing the estimate of effort by the average length of an angler-trip, as measured from completed trip interviews: $11,902/7.6 = 1,566$ angler-days. Effort data for the upper river was originally measured in angler-days.

and harvests in the lower river fishery consisted primarily of salmon. Conversely, catches and harvests in the upper river consisted primarily of Dolly Varden and rainbow trout although large numbers of coho salmon were also caught. While both fisheries were primarily catch and release, the lower river fishery was more consumptive. The 1986 sport harvest of chinook salmon accounted for less than 3% of the total return (Table 11). Since 1983, removal by the sport fishery on the Kanektok river annually averages approximately 2% of the total return.

Total landings of coho salmon (24,044 fish), Dolly Varden (20,530 fish), and rainbow trout (10,050 fish) were large. Although few fish were retained, the harvest potential is high. Current bag and possession limits for some species, particularly chinook salmon, coho salmon, and Dolly Varden, are liberal (ADF&G 1986). In light of the harvest potential, it would be prudent in the near future to examine bag and possession limits for all species in this fishery. Limitations should be enacted, where necessary, to ensure protection of the resource in the face of a developing fishery.

Table 11. Harvest and escapement of chinook salmon returns to the Kanektok River, 1983-1986.

Year	Commercial Harvest	Subsistence Harvest	Escapement Index ¹	Sport Harvest ²	Total Return ³	% Sport Harvest
1983	46,385	2,210	8,890	1,511	58,996	2.6%
1984	33,652	3,109	11,282	922	48,965	1.9%
1985	30,401	1,672	13,465	672	46,210	1.5%
1986	22,835	2,414	3,642	844	29,735	2.8%
Average	33,318	2,351	9,320	987	45,977	2.1%

¹ Escapement index is considered a minimum level of escapement based upon unexpanded aerial survey counts of spawners.

² For the years 1983-1985, sport harvests are based upon mail questionnaires (Mills 1984 - 1986). For 1986, sport harvest was estimated from creel surveys.

³ Total return estimates are conservative due to methods of estimating escapement described in footnote 1.

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APPENDIX TABLES

Appendix Table 1. Angler counts for the lower section of the lower Kanektok River sport fishery, 1986.

Date	WD/ WE ¹	Period				
		A	B	C	D	E
20-Jun	WD		29			2
21-Jun	WE	2	6			
22-Jun	WE					
23-Jun	WD	0				13
24-Jun	WD		21			8
25-Jun	WD		20			
26-Jun	WD		24			
27-Jun	WD			32	28	
28-Jun	WE		33	22		
29-Jun	WE		28	16		
30-Jun	WD			32	16	
01-Jul	WD				13	
02-Jul	WD	0		38		
03-Jul	WD					15
04-Jul	WD			21	17	
05-Jul	WE		17		17	
06-Jul	WE		7		14	
07-Jul	WD		0		14	
08-Jul	WD			26		
09-Jul	WD		8	11		
10-Jul	WD		17			
11-Jul	WD			6		
12-Jul	WE				20	
13-Jul	WE		3		16	
14-Jul	WD		1		5	
15-Jul	WD		0	1		
16-Jul	WD			1		
17-Jul	WD					
18-Jul	WD	0	1			
19-Jul	WE		0		12	
20-Jul	WE		2	9		
21-Jul	WD				1	
22-Jul	WD		0	7		
23-Jul	WD			0		
24-Jul	WD		0	4		

-Continued-

Appendix Table 1. Angler counts for the lower section of the lower Kanektok River sport fishery, 1986 (Continued).

Date	WD/ WE ¹	Period				
		A	B	C	D	E
25-Jul	WD			7		
26-Jul	WE		1		13	
27-Jul	WE		0			1
28-Jul	WD		3	9		
29-Jul	WD			15	12	
30-Jul	WD			5	5	
31-Jul	WD	0	0			
01-Aug	WD			1		
02-Aug	WE					2
03-Aug	WE			10	2	
04-Aug	WD		3	5		
05-Aug	WD		5	8		
06-Aug	WD			2	9	
07-Aug	WD	0				
08-Aug	WD		0		4	
09-Aug	WE		10	5		
10-Aug	WE			5	6	
11-Aug	WD		8		16	
12-Aug	WD		18		9	
13-Aug	WD				16	
14-Aug	WD		9			4
15-Aug	WD		6			12
16-Aug	WE				11	5
17-Aug	WE			2		
18-Aug	WD			2		
19-Aug	WD	0		9		
20-Aug	WD		2			
21-Aug	WD		0	8		
22-Aug	WD	0		5		
23-Aug	WE		18			
24-Aug	WE		6	10		
25-Aug	WD			5		
26-Aug	WD	0				
27-Aug	WD	0		2		
28-Aug	WD		0		1	

-Continued-

Appendix Table 1. Angler counts for the lower section of the lower Kanektok River sport fishery, 1986 (Continued).

Date	WD/ WE ¹	Period				
		A	B	C	D	E
29-Aug	WD	0				
30-Aug	WE			7	1	
31-Aug	WE			8	8	
01-Sep	WD			5		2
02-Sep	WD	0	0			
03-Sep	WD		0			6
04-Sep	WD					

¹ WD = Weekday; WE = Weekend/Holiday

Appendix Table 2. Angler counts for the upper section of the lower Kanektok River sport fishery, 1986.

Date	WD/ WE ¹	Period				
		A	B	C	D	E
20-Jun	WD					
21-Jun	WE					
22-Jun	WE					
23-Jun	WD					
24-Jun	WD					
25-Jun	WD					
26-Jun	WD		2			
27-Jun	WD					
28-Jun	WE					
29-Jun	WE					
30-Jun	WD					
01-Jul	WD					
02-Jul	WD					
03-Jul	WD					0
04-Jul	WD					
05-Jul	WE					
06-Jul	WE					
07-Jul	WD					
08-Jul	WD			9		
09-Jul	WD					
10-Jul	WD		9			
11-Jul	WD			8		
12-Jul	WE				11	
13-Jul	WE					
14-Jul	WD					
15-Jul	WD					
16-Jul	WD			7		
17-Jul	WD				2	8
18-Jul	WD					
19-Jul	WE					
20-Jul	WE					
21-Jul	WD				0	
22-Jul	WD					
23-Jul	WD			3		
24-Jul	WD					

-Continued-

Appendix Table 2. Angler counts for the upper section of the lower Kanektok River sport fishery, 1986 (Continued).

Date	WD/ WE ¹	Period				
		A	B	C	D	E
25-Jul	WD			0		
26-Jul	WE					
27-Jul	WE					
28-Jul	WD					
29-Jul	WD					
30-Jul	WD					
31-Jul	WD					
01-Aug	WD			0		
02-Aug	WE					2
03-Aug	WE					
04-Aug	WD					
05-Aug	WD					
06-Aug	WD					
07-Aug	WD		0			
08-Aug	WD					
09-Aug	WE					
10-Aug	WE					
11-Aug	WD					
12-Aug	WD					
13-Aug	WD				2	
14-Aug	WD					
15-Aug	WD					
16-Aug	WE					
17-Aug	WE			3		
18-Aug	WD					
19-Aug	WD					
20-Aug	WD		6			
21-Aug	WD					
22-Aug	WD					
23-Aug	WE		7			
24-Aug	WE					
25-Aug	WD			13		
26-Aug	WD	0				
27-Aug	WD					
28-Aug	WD					

-Continued-

Appendix Table 2. Angler counts for the upper section of the lower Kanektok River sport fishery, 1986 (Continued).

Date	WD/ WE ¹	Period				
		A	B	C	D	E
29-Aug	WD	0				
30-Aug	WE					
31-Aug	WE					
01-Sep	WD					
02-Sep	WD					
03-Sep	WD					
04-Sep	WD					

¹ WD = Weekday; WE = Weekend/Holiday

Appendix Table 3. Summary of daily angler effort and catch rates (CPUE) for chinook, sockeye, chum, and coho salmon from angler interviews in the lower Kanektok River, 1986.

Date	WD/ WE ¹	Sample Size	Catch													
			Effort		Chinook			Sockeye			Chum			Coho		
			Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
6/20	WD	5	3.350	0.16956	0.000	0.00000	0.000	0.000	0.00000	0.000	0.200	0.20000	0.060	0.000	0.00000	0.000
6/21	WE	2	2.000	0.50000	1.000	0.00000	0.500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/22	WE	6	3.917	0.41164	2.000	0.85635	0.511	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/23	WD	3	2.083	1.34112	0.667	0.33333	0.320	0.667	0.66667	0.320	0.000	0.00000	0.000	0.000	0.00000	0.000
6/24	WD	9	2.000	0.70315	0.778	0.46481	0.389	0.000	0.00000	0.000	0.556	0.44444	0.278	0.000	0.00000	0.000
6/25	WD	16	2.364	0.59453	1.625	0.61152	0.687	0.000	0.00000	0.000	0.875	0.63163	0.370	0.000	0.00000	0.000
6/26	WD	8	3.260	0.72223	1.625	0.86474	0.498	0.000	0.00000	0.000	1.000	0.46291	0.307	0.000	0.00000	0.000
6/27	WD	11	3.750	0.70120	1.364	0.49125	0.364	0.000	0.00000	0.000	1.909	0.93861	0.509	0.000	0.00000	0.000
6/28	WE	18	2.685	0.34350	1.222	0.41661	0.455	0.000	0.00000	0.000	0.889	0.32226	0.331	0.000	0.00000	0.000
6/29	WE	13	3.955	0.49214	1.769	0.80187	0.447	0.000	0.00000	0.000	0.769	0.36080	0.194	0.000	0.00000	0.000
6/30	WD	15	4.249	0.54141	0.800	0.36775	0.188	0.000	0.00000	0.000	3.800	1.93268	0.894	0.000	0.00000	0.000
7/01	WD	9	3.630	0.52954	0.778	0.77778	0.214	0.111	0.11111	0.031	3.000	1.30171	0.826	0.000	0.00000	0.000
7/02	WD	9	4.241	0.61784	1.000	0.44096	0.236	0.111	0.11111	0.026	1.556	0.83518	0.367	0.000	0.00000	0.000
7/03	WD	5	6.600	0.28573	1.200	0.96954	0.182	0.400	0.40000	0.061	6.600	3.91918	1.000	0.000	0.00000	0.000
7/04	WD	5	5.818	1.79499	1.000	0.77460	0.172	0.000	0.00000	0.000	1.400	1.16619	0.241	0.000	0.00000	0.000
7/05	WD	15	4.694	0.73199	1.267	0.38380	0.270	0.000	0.00000	0.000	0.733	0.49248	0.156	0.000	0.00000	0.000
7/06	WE	8	2.790	0.65843	1.750	0.49099	0.627	0.000	0.00000	0.000	0.750	0.61962	0.269	0.000	0.00000	0.000
7/07	WE	7	5.620	0.99412	0.714	0.28571	0.127	0.000	0.00000	0.000	6.000	1.86445	1.068	0.000	0.00000	0.000
7/08	WD	15	1.806	0.34759	0.400	0.16330	0.221	0.067	0.06667	0.037	1.333	0.58282	0.738	0.000	0.00000	0.000
7/10	WD	7	4.714	0.51730	0.286	0.18443	0.061	0.286	0.28571	0.061	4.857	1.53419	1.030	0.000	0.00000	0.000
7/11	WD	4	4.165	0.96992	0.250	0.25000	0.060	0.250	0.25000	0.060	4.750	2.75000	1.140	0.000	0.00000	0.000
7/12	WE	5	5.750	1.56924	2.800	0.80000	0.487	0.000	0.00000	0.000	1.400	1.16619	0.243	0.000	0.00000	0.000
7/13	WE	10	2.650	0.70880	0.100	0.10000	0.038	0.100	0.10000	0.038	4.500	1.92209	1.698	0.000	0.00000	0.000
7/14	WD	4	3.582	0.58393	1.500	1.50000	0.419	0.000	0.00000	0.000	2.250	1.93111	0.628	0.000	0.00000	0.000
7/16	WD	3	1.500	0.25000	0.333	0.33333	0.222	0.000	0.00000	0.000	1.000	0.57735	0.667	0.000	0.00000	0.000
7/17	WD	4	2.938	2.02684	0.000	0.00000	0.000	0.000	0.00000	0.000	0.750	0.47871	0.255	0.000	0.00000	0.000

-Continued-

Appendix Table 3. Summary of daily angler effort and catch rates (CPUE) for chinook, sockeye, chum, and coho salmon from angler interviews in the lower Kanektok River, 1986 (Continued).

Date	WD/ WE ¹	Sample Size	Catch													
			Effort		Chinook			Sockeye			Chum			Coho		
			Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
7/18	WD	5	3.884	0.88218	3.000	1.48324	0.772	0.000	0.00000	0.000	0.600	0.60000	0.154	0.000	0.00000	0.000
7/20	WE	3	1.530	0.64000	0.000	0.00000	0.000	0.000	0.00000	0.000	1.667	0.88192	1.089	0.000	0.00000	0.000
7/21	WD	2	0.375	0.12500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.500	0.50000	1.333	0.000	0.00000	0.000
7/23	WD	2	4.835	1.83500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.500	0.50000	0.103	0.000	0.00000	0.000
7/25	WD	2	3.250	0.00000	0.500	0.50000	0.154	0.500	0.50000	0.154	2.000	1.00000	0.615	0.000	0.00000	0.000
7/26	WE	9	4.519	0.89362	0.111	0.11111	0.025	0.111	0.11111	0.025	1.778	0.77778	0.393	1.111	0.48432	0.246
7/28	WD	2	2.125	1.87500	0.000	0.00000	0.000	0.000	0.00000	0.000	2.500	2.50000	1.176	0.000	0.00000	0.000
7/29	WD	9	3.731	0.75965	0.000	0.00000	0.000	0.000	0.00000	0.000	0.889	0.58794	0.238	1.556	0.76578	0.417
7/30	WD	5	3.202	1.27353	0.000	0.00000	0.000	0.000	0.00000	0.000	0.200	0.20000	0.062	1.600	0.92736	0.500
8/01	WD	4	2.125	1.12500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.250	0.25000	0.118	2.500	2.17945	1.176
8/03	WE	5	0.800	0.21506	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	1.600	0.60000	2.000
8/04	WE	4	1.290	0.52808	0.000	0.00000	0.000	0.000	0.00000	0.000	0.250	0.25000	0.194	4.000	2.67706	3.101
8/05	WD	5	3.150	0.67815	0.000	0.00000	0.000	0.000	0.00000	0.000	0.600	0.40000	0.190	6.000	1.73205	1.905
8/06	WD	4	5.645	1.29413	0.000	0.00000	0.000	0.000	0.00000	0.000	0.750	0.75000	0.133	2.250	1.03078	0.399
8/08	WD	2	2.710	2.54000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	1.000	1.00000	0.369
8/09	WE	5	1.550	0.36572	0.000	0.00000	0.000	0.000	0.00000	0.000	0.200	0.20000	0.129	7.400	2.48193	4.774
8/10	WE	4	1.957	0.87758	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	6.000	4.35890	3.065
8/11	WD	10	3.084	0.63408	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	10.500	3.80424	3.405
8/12	WD	8	1.594	0.68064	1.875	1.87500	1.176	0.000	0.00000	0.000	0.000	0.00000	0.000	4.375	1.88923	2.745
8/13	WD	5	2.850	0.70975	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	7.400	2.97658	2.596
8/14	WD	5	1.416	0.78997	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	3.000	1.04881	2.119
8/15	WD	2	1.915	1.41500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	8.500	7.50000	4.439
8/16	WE	8	5.592	1.10579	0.000	0.00000	0.000	0.000	0.00000	0.000	0.125	0.12500	0.022	17.750	8.13228	3.174
8/17	WE	3	0.833	0.58333	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	6.667	3.17980	8.000
8/19	WD	3	2.333	0.88192	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	6.667	2.66667	2.857

-Continued-

Appendix Table 3. Summary of daily angler effort and catch rates (CPUE) for chinook, sockeye, chum, and coho salmon from angler interviews in the lower Kanektok River, 1986 (Continued).

Date	WD/ WE ¹	Sample Size	Effort		Catch														
			Mean	Std Err	Chinook			Sockeye			Chum			Coho					
					Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE			
8/20	WD	2	3.165	1.16500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	6.000	5.00000	1.896
8/21	WD	3	1.057	0.44333	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	2.667	0.88192	2.524
8/22	Wd	2	1.500	0.50000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	8.000	6.00000	5.333
8/23	WE	2	3.835	0.16500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	6.500	0.50000	1.695
8/24	WE	6	1.290	0.62269	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	2.833	1.27584	2.196
8/25	WD	3	0.667	0.22048	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	1.667	0.88192	2.500
8/28	WD	2	2.330	2.25000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	5.000	5.00000	2.146
8/30	WE	6	2.430	0.58615	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	3.667	1.11555	1.509
8/31	WE	5	2.866	1.20932	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	1.200	0.96954	0.419
9/01	WE	3	3.973	0.51385	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	3.333	1.20185	0.839

¹ WD = Weekday; WE = Weekend/Holiday

Appendix Table 4. Summary of daily angler effort and catch rates (CPUE) for rainbow trout, pink salmon, and Dolly Varden from angler interviews in the lower Kanektok River, 1986.

Date	WD/ WE ¹	Sample Size	Effort		Rainbow Trout			Pink Salmon			Dolly Varden		
			Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
6/20	WD	5	3.350	0.16956	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/21	WE	2	2.000	0.50000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/22	WE	6	3.917	0.41164	0.000	0.00000	0.000	0.000	0.00000	0.000	0.667	0.66667	0.170
6/23	WD	3	2.083	1.34112	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/24	WD	9	2.000	0.70315	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/25	WD	16	2.364	0.59453	0.000	0.00000	0.000	0.000	0.00000	0.000	0.063	0.06250	0.026
6/26	WD	8	3.260	0.72223	0.250	0.25000	0.077	0.000	0.00000	0.000	0.125	0.12500	0.038
6/27	WD	11	3.750	0.70120	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/28	WE	18	2.685	0.34350	0.056	0.05556	0.021	0.000	0.00000	0.000	0.000	0.00000	0.000
6/29	WE	13	3.955	0.49214	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
6/30	WD	15	4.249	0.54141	0.067	0.06667	0.016	0.133	0.13333	0.031	0.000	0.00000	0.000
7/01	WD	9	3.630	0.52954	0.111	0.11111	0.031	0.000	0.00000	0.000	0.000	0.00000	0.000
7/02	WD	9	4.241	0.61784	0.222	0.14699	0.052	0.000	0.00000	0.000	0.000	0.00000	0.000
7/03	WD	5	6.600	0.28573	0.400	0.40000	0.061	0.000	0.00000	0.000	0.600	0.40000	0.091
7/04	WE	5	5.818	1.79499	0.400	0.40000	0.069	0.000	0.00000	0.000	0.200	0.20000	0.034
7/05	WE	15	4.694	0.73199	0.000	0.00000	0.000	0.000	0.00000	0.000	0.067	0.06667	0.014
7/06	WE	8	2.790	0.65843	0.125	0.12500	0.045	0.000	0.00000	0.000	0.250	0.25000	0.090
7/07	WD	7	5.620	0.99412	0.000	0.00000	0.000	1.571	0.94761	0.280	0.000	0.00000	0.000
7/08	WD	15	1.806	0.34759	0.000	0.00000	0.000	0.067	0.06667	0.037	0.067	0.06667	0.037
7/10	WD	7	4.714	0.51730	0.429	0.20203	0.091	0.143	0.14286	0.030	0.143	0.14286	0.030
7/11	WD	4	4.165	0.96992	0.000	0.00000	0.000	1.500	0.95743	0.360	0.000	0.00000	0.000
7/12	WE	5	5.750	1.56924	1.600	1.36382	0.278	4.000	4.00000	0.696	0.000	0.00000	0.000
7/13	WE	10	2.650	0.70880	0.200	0.13333	0.075	2.300	1.06510	0.868	0.700	0.33500	0.264
7/14	WD	4	3.582	0.58393	0.250	0.25000	0.070	1.250	0.94648	0.349	0.000	0.00000	0.000
7/16	WD	3	1.500	0.25000	0.000	0.00000	0.000	0.667	0.33333	0.444	0.000	0.00000	0.000
7/17	WD	4	2.938	2.02684	0.500	0.50000	0.170	0.500	0.50000	0.170	2.750	2.75000	0.936
7/18	WD	5	3.884	0.88218	0.400	0.40000	0.103	0.000	0.00000	0.000	0.000	0.00000	0.000

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Appendix Table 4. Summary of daily angler effort and catch rates (CPUE) for rainbow trout, pink salmon, and Dolly Varden from angler interviews in the lower Kanektok River, 1986 (Continued).

Date	WD/ WE ¹	Sample Size	Effort		Rainbow Trout			Pink Salmon			Dolly Varden		
			Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
7/20	WE	3	1.530	0.64000	0.000	0.00000	0.000	1.000	1.00000	0.654	0.000	0.00000	0.000
7/21	WD	2	0.375	0.12500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
7/23	WD	2	4.835	1.83500	1.000	1.00000	0.207	0.000	0.00000	0.000	1.000	1.00000	0.207
7/25	WD	2	3.250	0.00000	0.000	0.00000	0.000	3.500	0.50000	1.077	2.500	0.50000	0.769
7/26	WE	9	4.519	0.89362	0.111	0.11111	0.025	21.222	10.79838	4.696	1.222	0.61864	0.270
7/28	WD	2	2.125	1.87500	1.000	1.00000	0.471	6.500	5.50000	3.059	3.000	3.00000	1.412
7/29	WD	9	3.731	0.75965	1.333	0.60093	0.357	6.111	2.16951	1.638	2.111	0.84071	0.566
7/30	WD	5	3.202	1.27353	1.800	1.56205	0.562	4.400	2.76767	1.374	4.200	3.95474	1.312
8/01	WD	4	2.125	1.12500	1.500	1.50000	0.706	1.000	0.70711	0.471	1.000	0.70711	0.471
8/03	WE	5	0.800	0.21506	0.000	0.00000	0.000	1.000	0.44721	1.250	0.000	0.00000	0.000
8/04	WE	4	1.290	0.52808	0.000	0.00000	0.000	1.250	1.25000	0.969	0.000	0.00000	0.000
8/05	WD	5	3.150	0.67815	0.200	0.20000	0.063	4.600	3.89358	1.460	1.000	0.44721	0.317
8/06	WD	4	5.645	1.29413	0.000	0.00000	0.000	0.500	0.50000	0.089	0.000	0.00000	0.000
8/08	WD	2	2.710	2.54000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/09	WE	5	1.550	0.36572	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/10	WE	4	1.957	0.87758	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/11	WD	10	3.084	0.63408	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/12	WD	8	1.594	0.68064	0.250	0.25000	0.157	0.125	0.12500	0.078	0.250	0.16366	0.157
8/13	WD	5	2.850	0.70975	0.200	0.20000	0.070	0.600	0.40000	0.211	0.000	0.00000	0.000
8/14	WD	5	1.416	0.78997	0.000	0.00000	0.000	0.000	0.00000	0.000	0.200	0.20000	0.141
8/15	WD	2	1.915	1.41500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/16	WE	8	5.592	1.10579	5.500	3.38590	0.983	0.375	0.26305	0.067	6.625	2.32177	1.185
8/17	WE	3	0.833	0.58333	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/19	WD	3	2.333	0.88192	0.333	0.33333	0.143	0.000	0.00000	0.000	1.667	1.66667	0.714

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Appendix Table 4. Summary of daily angler effort and catch rates (CPUE) for rainbow trout, pink salmon, and Dolly Varden from angler interviews in the lower Kanektok River, 1986 (Continued).

Date	WD/ Sample		Effort		Rainbow Trout			Pink Salmon			Dolly Varden		
	WE ¹	Size	Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
8/20	WD	2	3.165	1.16500	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/21	WD	3	1.057	0.44333	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/22	WD	2	1.500	0.50000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/23	WE	2	3.835	0.16500	3.000	3.00000	0.782	0.000	0.00000	0.000	0.500	0.50000	0.130
8/24	WE	6	1.290	0.62269	1.667	1.66667	1.292	0.000	0.00000	0.000	0.167	0.16667	0.129
8/25	WD	3	0.667	0.22048	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/28	WD	2	2.330	2.25000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
8/30	WE	6	2.430	0.58615	0.667	0.66667	0.274	0.000	0.00000	0.000	0.000	0.00000	0.000
8/31	WE	5	2.866	1.20932	0.000	0.00000	0.000	0.000	0.00000	0.000	1.000	1.00000	0.349
9/01	WE	3	3.973	0.51385	1.000	1.00000	0.252	0.000	0.00000	0.000	0.667	0.66667	0.168

¹ WD = Weekday; WE = Weekend/Holiday

Appendix Table 5. Summary of daily angler effort and catch rates (CPUE) for chinook, sockeye, chum, and coho salmon from angler interviews in the upper Kanektok River, 1986.

Date	WD/ WE ¹	Sample Size	Catch													
			Effort		Chinook			Sockeye			Chum			Coho		
			Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
7/01	WD	3	5.697	0.35573	0.000	0.00000	0.000	1.667	0.33333	0.293	13.667	4.70225	2.399	0.000	0.00000	0.000
7/03	WD	2	6.960	0.46000	1.000	1.00000	0.144	1.500	0.50000	0.216	7.000	5.00000	1.006	0.000	0.00000	0.000
7/10	WD	2	1.790	1.29000	0.000	0.00000	0.000	0.000	0.00000	0.000	1.500	1.50000	0.838	0.000	0.00000	0.000
7/11	WD	3	2.360	0.90716	0.667	0.33333	0.282	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
7/12	WE	2	4.750	2.75000	0.000	0.00000	0.000	0.000	0.00000	0.000	7.000	3.00000	1.474	0.000	0.00000	0.000
7/25	WD	3	4.417	0.41667	0.000	0.00000	0.000	1.667	0.88192	0.377	1.667	1.66667	0.377	0.000	0.00000	0.000
8/02	WE	5	5.268	0.99721	0.000	0.00000	0.000	0.400	0.40000	0.076	0.200	0.20000	0.038	5.400	1.98997	1.025
8/13	WD	4	4.542	0.37546	0.250	0.25000	0.055	0.000	0.00000	0.000	0.250	0.25000	0.055	17.750	7.63080	3.908
8/20	WD	2	1.420	1.25000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	5.000	5.00000	3.521
8/23	WE	4	3.437	0.47675	0.250	0.25000	0.073	0.000	0.00000	0.000	0.000	0.00000	0.000	14.500	6.27827	4.218
8/25	WD	5	2.082	0.34181	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	2.800	1.01980	1.345
8/26	WD	3	0.640	0.11000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000	4.000	1.52753	6.250

¹ WD = Weekday; WE = Weekend/Holiday

Appendix Table 6. Summary of daily angler effort and catch rates (CPUE) for pink salmon, rainbow trout, and Dolly Varden from angler interviews from the upper Kanektok River, 1986.

Date	WD/ WE ¹	Sample Size	Effort		Pink Salmon			Rainbow Trout			Dolly Varden		
			Mean	Std Err	Mean	Std Err	CPUE	Mean	Std Err	CPUE	Mean	Std Err	CPUE
7/01	WD	3	5.697	0.35573	0.333	0.33333	0.059	1.000	0.57735	0.176	0.000	0.00000	0.000
7/03	WD	2	6.960	0.46000	0.000	0.00000	0.000	0.000	0.00000	0.000	0.000	0.00000	0.000
7/10	WD	2	1.790	1.29000	0.000	0.00000	0.000	0.500	0.50000	0.279	0.000	0.00000	0.000
7/11	WD	3	2.360	0.90716	0.000	0.00000	0.000	1.000	0.57735	0.424	0.000	0.00000	0.000
7/12	WE	2	4.750	2.75000	0.500	0.50000	0.105	0.000	0.00000	0.000	0.000	0.00000	0.000
7/25	WD	3	4.417	0.41667	5.000	5.00000	1.132	2.000	0.00000	0.453	3.000	1.52753	0.679
8/02	WE	5	5.268	0.99721	8.600	3.60000	1.633	2.800	1.85472	0.532	1.600	0.50990	0.304
8/13	WD	4	4.542	0.37546	1.250	0.75000	0.275	2.750	2.42813	0.605	7.500	7.50000	1.651
8/20	WD	2	1.420	1.25000	1.000	1.00000	0.704	0.500	0.50000	0.352	0.000	0.00000	0.000
8/23	WE	4	3.437	0.47675	0.000	0.00000	0.000	0.750	0.75000	0.218	4.500	3.52373	1.309
8/25	WD	5	2.082	0.34181	0.000	0.00000	0.000	1.800	1.11355	0.865	9.000	2.54951	4.323
8/26	WD	3	0.640	0.11000	0.000	0.00000	0.000	0.333	0.33333	0.521	1.000	1.00000	1.563

¹ WD = Weekday; WE = Weekend/Holiday

