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FISHERIES STATISTICS FOR SELECTED SPORT FISHERIES ON THE LOWER KENAI PENINSULA, ALASKA, 1986 WITH EMPHASIS ON DOLLY VARDEN CHAR *(Salvelinus malma)*

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ABSTRACT

Creel surveys of the recreational fisheries on the Anchor River, Deep Creek, and Ninilchik River were conducted from 3 July to 31 October. A survey of angler opinion concerning enhancement options for Anchor and Ninilchik Rivers was conducted concurrently with the creel survey. Maximum seasonal harvest rates (fish harvested per angler-hour of fishing effort) by anglers fishing these systems were 0.0653 for Dolly Varden char (*Salvelinus malma* Walbaum) at Anchor River, 0.1000 for coho salmon (*Oncorhynchus kisutch* Walbaum) at Deep Creek, and 0.0213 for rainbow/steelhead trout (*Salmo gairdneri* Richardson) at Deep Creek. The majority of anglers favored steelhead trout enhancement on the Anchor and Ninilchik Rivers and chinook salmon enhancement on the Ninilchik River. Angler counts were conducted by aerial surveys on each of the systems. The majority of anglers were concentrated in the lower 3 kilometers of each stream. The mean angler count for the Anchor River was 29.2. This was more than four times greater than the mean count for either Deep Creek (6.2) or Ninilchik River (5.7). A total of 79 Dolly Varden char were tagged in the south fork of Anchor River.

KEY WORDS: Anchor River, Deep Creek, Ninilchik River, Dolly Varden char, coho salmon, rainbow trout, steelhead trout, creel survey, harvest rates, angler counts.

INTRODUCTION

Anchor River, Deep Creek, and Ninilchik River on the lower Kenai Peninsula (Figure 1) support recreational fisheries for chinook salmon (*Oncorhynchus tshawytscha* Walbaum), coho salmon (*O. kisutch* Walbaum), pink salmon (*O. gorbuscha* Walbaum), Dolly Varden char (*Salvelinus malma* Walbaum), and anadromous and resident rainbow trout (*Salmo gairdneri* Richardson). While sport fishing effort for resident rainbow trout and pink salmon is minor, the fisheries targeting on chinook salmon, coho salmon, and Dolly Varden char are the largest freshwater sport fisheries on the lower Kenai Peninsula. The Sterling Highway crosses the lower reach of each of these streams (Figure 1) making them readily accessible to the fishing public. Much of the frontage on these streams is publicly owned with ample camping and parking areas. Due to their relatively small size, all fishing in these streams is conducted from the bank.

Historically, the Anchor River has received the most recreational fishing effort of the lower Kenai Peninsula streams; it provided an average of 33,305 recreational fishing days (angler-days) during the period 1977-1984 (Mills 1979-1985). Ninilchik River provided an average of 13,635 angler-days and Deep Creek 12,264 angler-days during this same period (Table 1).

Regulations governing recreational fisheries on the lower streams are species specific. Chinook salmon regulations have not changed since

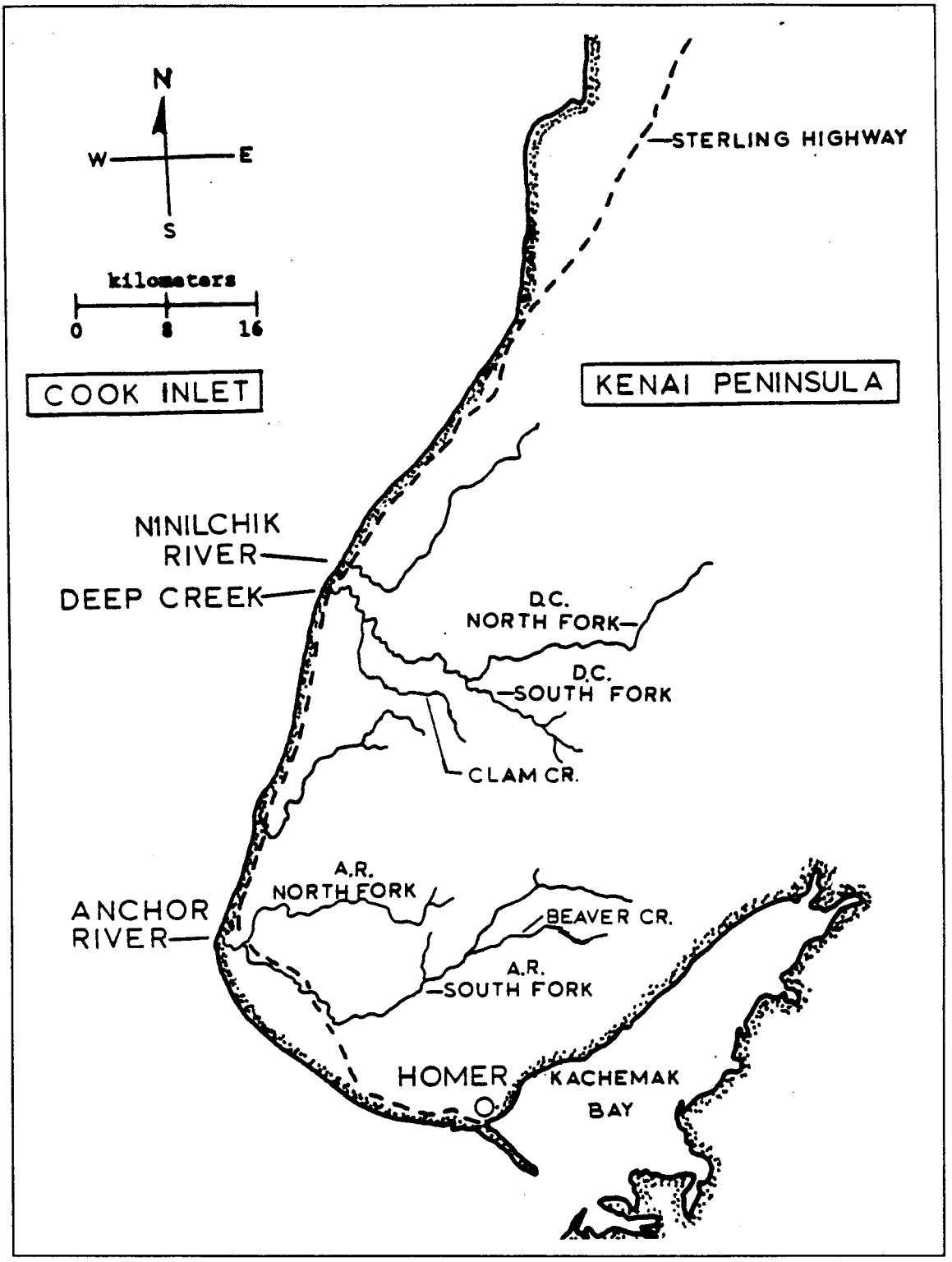

Figure 1. Map of the lower Kenai Peninsula showing the locations of Anchor River, Deep Creek, and Ninilchik River.

Table 1. Estimated recreational fishing effort[1] and harvest of Dolly Varden char (DV), steelhead trout (SH), and coho salmon (SS) on the Anchor River, Deep Creek, and Ninilchik River (Mills 1979-1986).

	Anchor River				Deep Creek				Ninilchik River			
		Harvest				Harvest				Harvest		
Year	Effort	DV	SH	SS	Effort	DV	SH	SS	Effort	DV	SH	SS
1977	31,515	9,222	1,027	1,339	11,399	1,330	269	306	11,350	424	60	122
1978	42,671	17,357	1,754	1,559	13,872	3,046	371	1,383	14,173	1,003	90	88
1979	44,220	21,364	782	2,870	12,560	2,027	145	362	18,282	2,390	127	200
1980	33,272	10,948	841	2,649	8,796	1,028	139	478	19,706	853	290	321
1981	34,257	15,271	777	2,949	10,127	1,382	140	464	14,184	875	302	432
1982	24,709	10,375	551	2,379	12,149	1,247	187	377	11,806	514	127	241
1983	28,881	17,277	1,101	1,395	13,505	1,112	126	545	9,458	199	126	210
1984	26,919	5,559	761	1,135	15,706	973	87	1,197	10,122	524	224	549
Mean	33,305	13,422	949	2,034	12,264	1,518	183	638	13,635	848	168	270
1985	31,715	7,716	423	2,239	19,802	850	75	2,301	10,213	87	50	697

1 Fishing effort estimated in angler-days.

1978. Similarly, regulations for the coho salmon fishery have been relatively consistent. However, Dolly Varden char and rainbow/steelhead trout regulations have become increasingly restrictive in recent years. Prior to 1978, the daily bag and possession limits were two rainbow/steelhead trout over 51 centimeters (20 inches) in length with no seasonal limit and no recording requirement. By 1984, the daily bag and possession limits had been reduced to one fish, a seasonal limit of two fish imposed, and a harvest record required. The rainbow/steelhead trout daily bag limit for fish less than 51 centimeters in length was reduced from ten fish to five and the Dolly Varden bag and possession limits reduced for fish of all lengths from ten fish to five in 1984, also. In addition, a regulation prohibiting the use of bait after 16 September was enacted in that year. Prior to 1978, these streams were closed annually from 1 May through 30 June. Since then the season has been reduced further. In 1986, fishing was permitted during the spring chinook salmon fishery[1] and from 1 July through 31 December.

Historical information pertaining to the Dolly Varden char, rainbow/steelhead trout, and coho salmon fisheries are in Allin (1954, 1957), Balland (1985,1986), Wallis and Balland (1981-1984) and Wallis and Hammarstrom (1979-1982). Harvest and angler-effort estimates are reported by Mills (1979-1986).

A pilot study of Dolly Varden char in lower Kenai Peninsula streams was begun in 1986. The primary objective of this study was to collect baseline data on Dolly Varden populations which would serve as a basis for future investigations. The 1986 study had three major components: (1) a creel survey of the recreational fishery to obtain catch- and harvest-per-unit-effort (CPUE and HPUE) data with emphasis on Dolly Varden; (2) aerial counts of anglers to determine inter- and intra-stream angler distribution; and (3) tagging spawning Dolly Varden in the Anchor River.

This report presents summary data for the creel survey conducted on Anchor River, Deep Creek, and Ninilchik River in 1986, this includes: catch- and harvest-per-unit-of-effort estimates for Dolly Varden char, coho salmon, pink salmon, and rainbow/steelhead trout; demographic data for anglers participating in these fisheries; and results of a survey on angler preferences regarding enhancement of chinook salmon and rainbow/steelhead trout in the study area. Results of aerial flights to count anglers and for the pilot tagging study are presented, also.

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1 Spring chinook salmon fishery dates in 1986: 24 May-26 May, 31 May-2 June, 7 June-9 June, and 14 June-16 June (Anchor River and Deep Creek only).

METHODS

Study Area

The Anchor River fishery occurs primarily in the 3-kilometer area below the junction of the north and south forks of the river. Angler effort on Deep Creek and Ninilchik River occurs primarily in the lower 3 kilometers of stream, also. These areas are accessible from public camping and parking areas. To maximize angler contacts, creel surveys were confined to these areas.

Some angler effort does occur above the areas surveyed. Aerial surveys were used to estimate the distribution of fishing effort within each stream. The number of anglers actively fishing defined sections of each stream were counted. Anchor River sections were: (1) downstream from the river forks, (2) South Fork, and (3) North Fork. Deep Creek sections were: (1) downstream from the Sterling Highway bridge, (2) upstream from the Sterling Highway bridge to Clam Creek, and (3) upstream from the confluence of Clam Creek. Ninilchik River sections were: (1) downstream from the Sterling Highway bridge and (2) upstream from the Sterling Highway bridge.

Dolly Varden were tagged in the Anchor River between the confluence of Beaver Creek and the confluence of an unnamed stream that enters Anchor River from the north (approximately 5 km downstream from Beaver Creek).

Study Design

The creel survey was conducted from 3 July through 31 October. Anchor River was surveyed independently of Ninilchik River and Deep Creek. Anchor River was surveyed on 1 randomly selected weekday and 1 randomly selected weekend day each week. Deep Creek and Ninilchik River were sampled on the other weekend day and another randomly selected weekday each week. The angler-day was defined as 18 hours long, from 0600 to 2400 hours. Each day was stratified into three 6-hour sampling periods: 0600 to 1159 hours; 1200 to 1759 hours; 1800 to 2359 hours.

To maximize angler contacts, the creel interviewer was allowed some latitude within the survey schedule in selecting the sampling period (i.e., the time to conduct a survey was not always selected randomly). Both completed-trip[1] and incomplete-trip[2] anglers were contacted during the survey. Data recorded during each interview were: number of hours fished (to the nearest 0.25 hour), total number of fish in possession by species, total number of fish released by species, and primary or target species.

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1 Refers to anglers interviewed after they had completed fishing for the day.

2 Refers to anglers interviewed while they were still fishing.

The following angler demographic data were also recorded:

1. youth/adult.

2. state resident/nonresident.

3. local (resident who lives within 24 km of the stream)/non-local (resident who lives more than 24 km from the stream).

4. Anchorage resident or from an area other than Anchorage.

The following questions were asked of anglers to determine opinions on enhancement and regulatory issues:

1. Do you favor enhancing steelhead trout in the Anchor River?

2. Do you favor enhancing steelhead trout in the Ninilchik River?

3. Do you favor enhancing chinook salmon in the Ninilchik River?

4. Do you favor the prohibition on using bait after 15 September?

Questions were always asked in the same order and were presented in a neutral manner so as to not influence responses. Answers were recorded as yes, no, or no opinion.

Each sample period for conducting angler interviews on the Anchor River was 6 hours long. Deep Creek and the Ninilchik River were sampled as a unit by dividing the 6 hour sample period into four 1.5-hour blocks. The first stream to sample (Deep Creek or the Ninilchik River) was determined daily by the flip of a coin. After completing a 1.5-hour interview period on a selected stream, the other stream was surveyed for the second 1.5-hour period. This procedure was repeated a second time so that each stream was surveyed twice on a sample day. Interviews were conducted while walking the length of the fishing area. All anglers present were interviewed.

Aerial angler counts were conducted on 1 weekday and 1 weekend day each week on Anchor River, Deep Creek, and Ninilchik River. Counts were conducted from a PA-18 Supercub. Count days and time periods periods within the angler-day were selected randomly. When weather conditions precluded a flight, the count was conducted during the next available time block.

Dolly Varden char were captured in the Anchor River with a 1-meter by 6-meter monofilament gillnet with 4-centimeter stretched mesh. All healthy Dolly Varden were tagged with numbered Floy anchor tags at the posterior base of the dorsal fin. The tip-of-snout to fork-of-tail length of each Dolly Varden caught was measured to the nearest millimeter.

Analysis

Weekdays and weekends were combined for the analysis of angler harvest and catch rates because of the small number of sampling days. Completed-trip and incomplete-trip anglers were combined, also. Angler interview data were divided into two categories for each fish species. Category "1" was all anglers interviewed when a particular species was available in a river system, regardless of which species the anglers were targeting on. Category "2" was only those anglers actively targeting on the species of interest during the same period as category "1".

The harvest rate of each species was estimated only from the interviews conducted during a time period defined to encompass the return of the species to a particular system (referred to as the run period). Harvest rate for species i was computed by:

$$\hat{H}_i = C_i/E,$$

where; C_i = the total number of fish of species i kept by anglers interviewed during the run period for that species, and

E = the total number of hours of effort by anglers interviewed during the run period for species i.

Omitting the finite population correction factor, the variance of $\hat{H}_i$ was approximated by (Jessen 1978):

$$V(C_i/E) \approx (C_i/E)^2 [s_C^2/\bar{C}_i^2 + s_E^2/\bar{E}^2 - (2r_i s_C s_E/\bar{C}_i\bar{E})],$$

where; $\bar{C}_i$ = the mean harvest of species i by anglers interviewed during the run period of species i,

$\bar{E}$ = the mean effort (in hours) by anglers interviewed during the run period of species i,

s_C^2 = the two-stage variance estimate for the mean harvest of species i ($\bar{C}_i$) during the run period of species i,

s_E^2 = the two-stage variance estimate for the mean effort (E) during the run period of species i, and

r_i = the correlation coefficient between harvest of species i and effort for individual anglers.

Variances of mean effort and mean harvest were estimated using a two-stage formula (Von Geldern and Tomlinson 1973). Days were considered the first- stage sample units and anglers interviewed during a day as the second-stage sample units. Variance was estimated by:

$$V(\bar{X}) = [1 - (d/D)]s_B^2/d + (\sum_{j=1}^{D} s_j^2/m_j)/dD$$

where $\bar{X}$ = mean effort ($\bar{E}$) or mean harvest of species i ($\bar{C}_i$),

d = number of days sampled during the run period of species i,

D = number of days possible to sample during the run period,

s_B^2 = the between-day variance for $\bar{X}$,

s_j^2 = the sample variance of $\bar{X}_j$, the mean effort or harvest of species i by anglers interviewed on day j of the run period, and

m_j = the number of anglers interviewed on day j of the run period.

Between-day variance (s_B^2) was estimated by:

$$s_B^2 = [\sum_{j=1}^{D} R\ (\bar{X}_j - \bar{\bar{X}})^2]/(d-1).$$

Catch rate for species i was estimated identically to harvest rate except that mean catch (fish kept plus those released) and its variance were substituted for mean harvest and its variance.

RESULTS

Creel Survey

Harvest and catch rates of Dolly Varden char by anglers targeting that species were highest on the Ninilchik River (Table 2). For anglers in general, regardless of target species, Anchor River anglers had the highest harvest and catch rates of Dolly Varden. As expected, anglers targeting for Dolly Varden char had much higher harvest and catch rates than anglers who were fishing for other species or were not targeting a specific species.

Of all anglers interviewed on the three systems, only seven anglers indicated that pink salmon were their target species. Deep Creek anglers had the highest harvest and catch rates of pink salmon (Table 3) for category 1 anglers.

More anglers indicated coho salmon as their target species than any other species on all three systems (Table 4). The percent of anglers interviewed during the coho salmon run period who indicated that coho salmon were their target species was 48% for Anchor River, 75% for Deep Creek, and 55% for Ninilchik River. Anglers fishing specifically for coho salmon had the highest harvest and catch rates in the Anchor River than the other systems (Table 4). For all anglers interviewed, Deep Creek anglers had the highest harvest and catch rates of coho salmon.

Deep Creek anglers had higher harvest and catch rates of steelhead trout than Anchor River anglers (Table 5). The catch rate of anglers targeting steelhead trout was 0.208 fish per hour for Deep Creek compared to 0.037 fish per hour for the Anchor River.

In all three systems, the majority of the sport anglers were adult Alaskan residents (Table 6). Of the Alaskan residents, most were nonlocal anglers who resided in Anchorage.

The majority of anglers interviewed on all three stream favored the enhancement of steelhead trout in both the Anchor and Ninilchik Rivers, and favored enhancement of chinook salmon on the Ninilchik River (Table 7). The response to the question whether to prohibit the use of bait after 15 September was varied. More Anchor River and Deep Creek anglers favored the restriction (61% and 46% responded "yes", respectively) than opposed it while more Ninilchik River anglers opposed the restriction (47% responded "no") than favored it.

Angler Counts

The section of stream downstream of the Sterling Highway bridge had the largest mean angler count in all three systems (Table 8). For the downstream sections, the mean angler count on the Anchor River (29.2 anglers per count) was more than four times larger than the mean count on Deep Creek (6.2) and the Ninilchik River (5.7). The mean angler count on weekends/holidays was larger than the mean count on weekdays in all sections of all three systems.

Table 2. Summary statistics for Dolly Varden char harvest and catch rates by anglers interviewed during the creel survey of the Anchor River, Deep Creek, and Ninilchik River, 1986.

Statistic/Category[1]	Anchor River		Deep Creek		Ninilchik River	
	1	2	1	2	1	2
Run Period:	7/03-10/31		7/13-10/25		7/13-10/19	
Mean effort (hrs) per angler:	2.1	1.7	1.8	1.9	1.4	1.2
standard error	0.13	0.18	0.21	0.46	0.13	0.44
Number of anglers interviewed:	708	163	332	52	244	26
percent targeting on species		23.0%		15.7%		10.7%
Dolly Varden char total catch:	198	79	76	48	42	26
number kept	98	60	23	15	17	10
number released	100	19	53	33	25	16
Harvest rate:	0.0653	0.2205	0.0392	0.1546	0.0485	0.3101
standard error	0.0251	0.0035	0.0013	0.0077	0.0009	0.0276
Catch rate:	0.1320	0.2903	0.1294	0.4948	0.1198	0.8062
standard error	0.0012	0.0039	0.0049	0.0227	0.0025	0.0536

[1] Category 1 summarizes all anglers who were interviewed during the run period. Category 2 summarizes all anglers who were specifically targeting on the indicated species.

Table 3. Summary statistics for pink salmon harvest and catch rates by anglers interviewed during the creel survey of the Anchor River, Deep Creek, and Ninilchik River, 1986.

Statistic/Category[1]	Anchor River		Deep Creek		Ninilchik River	
	1	2	1	2	1	2
Run Period:	7/29- 9/04		7/24- 8/12		8/12- 9/03	
Mean effort (hrs) per angler:	2.2	2.3	1.6	5.5	1.6	1.0
standard error	0.17		0.20	0.15	0.24	
Number of anglers interviewed:	436	2	156	2	88	3
percent targeting on species		0.5%		1.3%		3.4%
Pink salmon total catch:	32	2	18	2	4	2
number kept	10	2	9	2	1	0
number released	22	0	9	0	3	2
Harvest rate:	0.0102	0.4444	0.0351	0.1818	0.0071	0.0000
standard error	0.0002		0.0011	0.0352	0.0016	
Catch rate:	0.0328	0.4444	0.0702	0.1818	0.0283	0.3333
standard error	0.0011		0.0021	0.0352	0.0017	

[1] Category 1 summarizes all anglers who were interviewed during the run period. Category 2 summarizes all anglers who were specifically targeting on the indicated species.

Table 4. Summary statistics for coho salmon harvest and catch rates by anglers interviewed during the creel survey of the Anchor River, Deep Creek, and Ninilchik River, 1986.

Statistic/Category[1]	Anchor River		Deep Creek		Ninilchik River	
	1	2	1	2	1	2
Run Period:	7/03-10/22		7/24-10/06		7/24- 9/14	
Mean effort (hrs) per angler:	2.1	2.5	1.8	1.9	1.5	1.5
standard error	0.14	0.20	0.24	0.34	0.14	0.22
Number of anglers interviewed:	677	327	312	234	172	94
percent targeting on species		48.3%		75.0%		54.7%
Coho salmon total catch:	116	111	59	53	14	14
number kept	101	96	56	52	14	14
number released	15	15	3	1	0	0
Harvest rate:	0.0696	0.1183	0.1000	0.1173	0.0539	0.0991
standard error	0.0005	0.0013	0.0013	0.0020	0.0012	0.0039
Catch rate:	0.0800	0.1367	0.1053	0.1195	0.0539	0.0991
standard error	0.0006	0.0018	0.0001	0.0020	0.0012	0.0039

[1] Category 1 summarizes all anglers who were interviewed during the run period. Category 2 summarizes all anglers who were specifically targeting on the indicated species.

Table 5. Summary statistics for steelhead trout harvest and catch rates by anglers interviewed during the creel survey of the Anchor River, Deep Creek, and Ninilchik River, 1986.

Statistic/Category[1]	Anchor River		Deep Creek		Ninilchik River	
	1	2	1	2	1	2
Run Period:	8/05-10/31		8/16-10/25		NA[2]	NA[2]
Mean effort (hrs) per angler:	2.3	2.3	1.9	1.9		
standard error	0.13	0.20	0.32	0.48		
Number of anglers interviewed:	571	189	172	45		
percent targeting on species		33.1%		26.2%		
Steelhead trout total catch:	18	16	19	18		
number kept	11	9	7	7		
number released	7	7	12	11		
Harvest rate:	0.0085	0.0206	0.0213	0.0810		
standard error	0.0002	0.0013	0.0023	0.0084		
Catch rate:	0.0139	0.0367	0.0579	0.2083		
standard error	0.0002	0.0013	0.0037	0.0131		

1 Category 1 summarizes all anglers who were interviewed during the run period. Category 2 summarizes all anglers who were specifically targeting on the indicated species.

2 No steelhead trout reported in the Ninilchik River.

Table 6. Percentage of anglers in each demographic category and total number of anglers who responded during the surveys of sport anglers on the Anchor River, Deep Creek, and Ninilchik River in 1986.

Angler Category	Anchor River	Deep Creek	Ninilchik River
Adult/Youth:			
a. Adult	89%	89%	88%
b. Youth	11%	11%	12%
Sample Size	700	332	245
Sex:			
a. Male	78%	100%	86%
b. Female	22%	0%	14%
Sample Size	32	4	66
Residency:			
a. Alaska Resident	73%	65%	54%
b. Non-resident	27%	35%	46%
Sample Size	622	296	218
Alaska Resident Composition:			
a. Local	37%	22%	29%
b. Non-local	63%	78%	71%
Sample Size	433	181	115
Non-local Composition:			
a. Anchorage	95%	96%	91%
b. Other	5%	4%	9%
Sample Size	276	139	82

Table 7. Percentage of anglers in each response category concerning enhancement and a select regulation and total number of anglers who responded during the surveys of sport anglers on the Anchor River, Deep Creek, and Ninilchik River in 1986.

Question	Anchor River	Deep Creek	Ninilchik River
1. Should steelhead trout be enhanced in the Anchor River?			
a. Yes	75%	78%	78%
b. No	11%	7%	6%
c. No opinion	14%	15%	16%
Sample Size	399	162	106
2. Should steelhead trout be enhanced in the Ninilchik River?			
a. Yes	63%	80%	79%
b. No	9%	8%	6%
c. No opinion	28%	12%	15%
Sample Size	399	162	106
3. Should chinook salmon be enhanced in the Ninilchik River?			
a. Yes	65%	73%	87%
b. No	12%	18%	5%
c. No opinion	23%	9%	8%
Sample Size	398	162	106
4. Do you favor prohibiting the use of bait after September 15?			
a. Yes	61%	46%	31%
b. No	24%	39%	47%
c. No opinion	15%	15%	22%
Sample Size	399	162	106

Table 8. Counts of anglers in the Anchor River, Deep Creek, and Ninilchik River sport fisheries conducted by aerial survey, 1986.

			Angler Counts by Stream and Section[1]							
			Anchor River			Deep Creek			Ninilchik	
Date		Period[2]	D	N	S	D	C	U	D	U
18-Jul		A	9	1	8	2	5	0	3	0
21-Jul		C	26	0	5	4	3	0	28	1
26-Jul	*[3]	C	35	0	9	10	3	0	11	2
31-Jul		B	43	0	20	6	6	0	5	0
03-Aug	*	C	33	0	9	4	4	0	6	2
04-Aug		B	39	0	15	21	4	0	7	8
09-Aug	*	B	70	0	20	19	13	4	11	2
14-Aug		B	38	0	22	13	9	0	14	1
17-Aug	*	C	50	4	5	16	5	0	9	4
20-Aug		B	68	2	8	11	2	0	10	8
24-Aug	*	A	78	2	11	8	5	0	13	4
27-Aug		B	33	0	4	10	0	0	0	0
02-Sep		A	21	0	0	1	1	0	0	3
10-Sep		B	13	0	5	3	3	0	0	0
14-Sep	*	C	11	0	6	0	5	0	0	0
18-Sep		A	16	0	4	2	0	0	1	0
24-Sep		B	11	0	1	0	0	0	1	3
06-Oct		A	6	0	10	0	0	0	0	0
19-Oct	*	B	5	0	8	0	4	0	0	0
24-Oct		B	9	0	4	0	3	0	0	0
30-Oct		B	0	0	2	0	0	0	0	0
Weekdays										
Mean Count:			23.7	0.2	7.7	5.2	2.6	0.0	4.9	1.7
Standard Error:			5.0	0.2	1.8	1.7	0.7	0.0	2.1	0.8
Sample Size:			14	14	14	14	14	14	14	14
Weekends										
Mean Count:			40.3	0.9	9.7	8.1	5.6	0.6	7.1	2.0
Standard Error:			10.4	0.6	1.9	2.8	1.3	0.6	2.0	0.6
Sample Size:			7	7	7	7	7	7	7	7
All Days										
Mean Count:			29.2	0.4	8.4	6.2	3.6	0.2	5.7	1.8
Standard Error:			5.0	0.2	1.4	1.5	0.7	0.2	1.6	0.5
Sample Size:			21	21	21	21	21	21	21	21

1 D = downstream from the Sterling Highway bridge.
N = north fork of Anchor River.
S = south fork of Anchor River.
C = upstream from the Sterling Highway bridge to mouth of Clam Creek.
U = upstream from Clam Creek mouth (Deep Creek) or upstream from Sterling Highway bridge (Ninilchik River).

2 Period A - 0600 to 1159 hrs.
Period B - 1200 to 1759 hrs.
Period C - 1800 to 2400 hrs.

3 * indicates a weekend/holiday.

Dolly Varden Tagging

A total of 79 Dolly Varden char were tagged in the south fork of the Anchor River on 1 and 2 October. Tip-of-snout to fork-of-tail lengths ranged from 230 millimeters to 605 millimeters (Appendix Table 1). A single mode was evident in the length frequency of the tagged fish (Figure 2).

CONCLUSIONS AND RECOMMENDATIONS

The Dolly Varden char population of the Anchor River presents the greatest biological concern. Although effort on the Anchor River has fluctuated during the years 1977-1985, the Dolly Varden harvest in 1984 was the lowest recorded during the 9-year period (Table 1). Reduction in bag limits undoubtedly had some effect on the lower harvest levels in 1984 and 1985. Whether stricter regulations, a decline in population numbers, or a combination of both factors led to the decline in harvest levels is unknown. Additional studies are necessary to determine the appropriate harvest level for Dolly Varden in Anchor River. It is recommended that further studies be directed primarily on the Dolly Varden char population of the Anchor River with emphasis on:

1. Estimating the numbers of Dolly Varden in the spawning population.

2. Estimating angler effort and harvest during the summer period when the fishery targets Dolly Varden char.

3. Determining the amount of interchange among other lower Kenai Peninsula streams and the Anchor River.

4. Identifying Dolly Varden char spawning areas.

5. Estimating age/length relationships for spawning Dolly Varden.

6. Identifying over-wintering areas of Dolly Varden in the Anchor River.

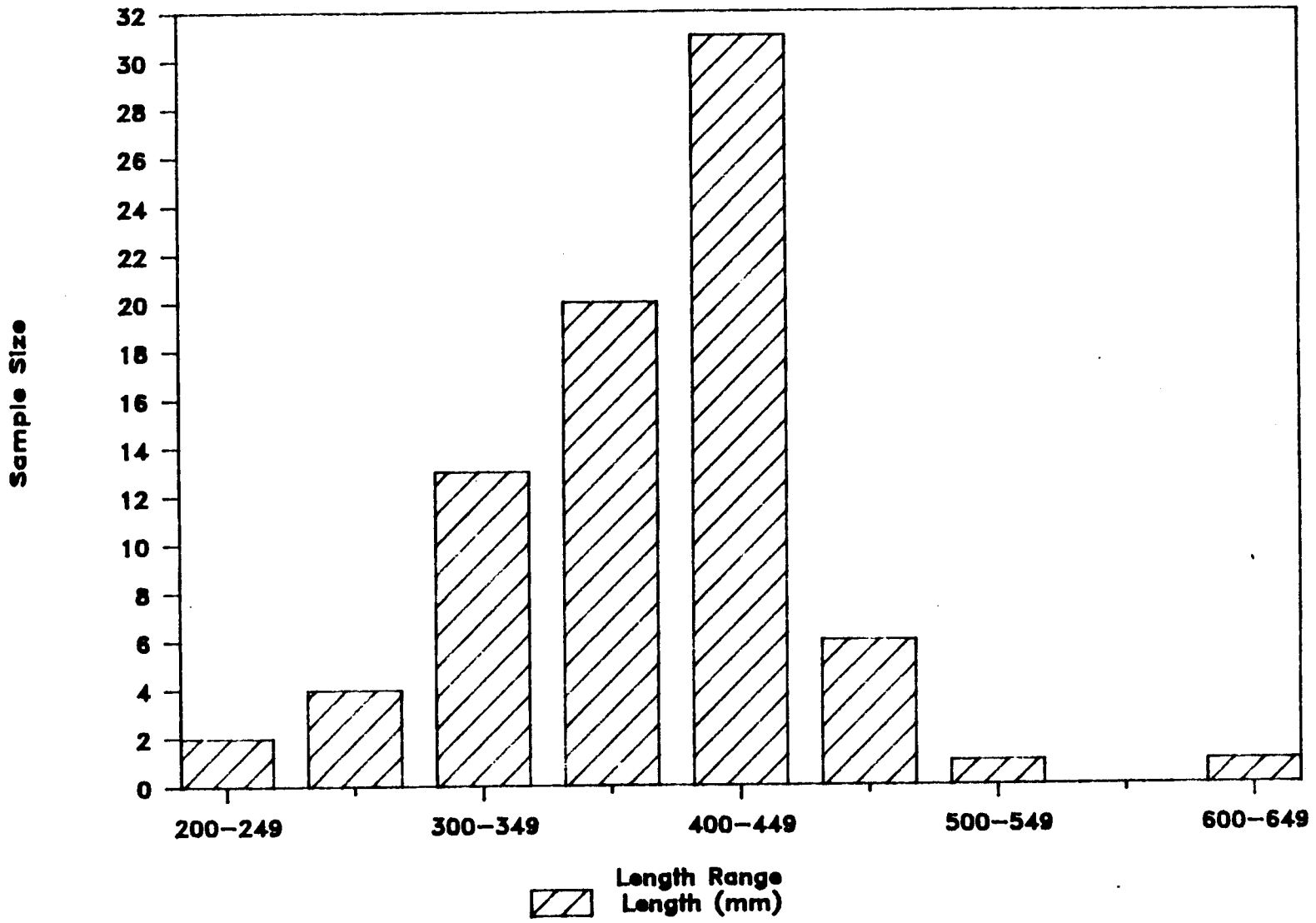

Figure 2. Length frequency of Dolly Varden char captured with gillnets in the south fork of the Anchor River and tagged, 1986.

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Appendix Table 1. Tag number and tip-of-snout to fork-of-tail length of Dolly Varden char tagged in the south fork of the Anchor River on 1 and 2 October, 1986.

Tag Number	Length (mm)	Tag Number	Length (mm)	Tag Number	Length (mm)
4	395	41	425	78	410
5	335	42	430	79	360
6	360	43	400	80	605
7	410	44	295	81	310
8	290	45	370	82	420
9	400	46	280	83	460
10	330	47	420	84	420
11	405	48	390		
12	425	49	320		
13	415	50	390		
14	230	51	440		
15	430	52	410		
16	460	53	325		
17	280	54	360		
18	340				
19	365	56	430		
20	425	57	355		
21	385	58	385		
22	460	59	360		
23	430	60	445		
24	430	61	410		
25	355	62	390		
26	340	63	405		
27	360	64	440		
28	415	65	300		
29	520	66	420		
30	380	67	450		
31	245	68	405		
32	300	69	410		
33	410	70	400		
34	370	71	330		
35	410	72	350		
36	365	73	475		
37	410	74	310		
		75	475		
39	330	76	325		
40	380	77	340		