Fishery Data Series No. 00-26

Survey of the Chinook Salmon Sport Fishery in the Lower Alagnak River, Alaska, 1998

by

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and

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November 2000

Alaska Department of Fish and Game **Division of Sport Fish**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
metric ton	mt
milliliter	ml
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
ounce	oz
pound	lb
quart	qt
yard	yd

Spell out acre and ton.

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
hour (spell out for 24-hour clock)	h
minute	min
second	s

Spell out year, month, and week.

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.
All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.
and	&
at	@
Compass directions:	
east	E
north	N
south	S
west	W
Copyright	©
Corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
et alii (and other people)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.,
id est (that is)	i.e.,
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
number (before a number)	# (e.g., #10)
pounds (after a number)	# (e.g., 10#)
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)

Mathematics, statistics, fisheries

alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	F, t, χ^2, etc.
confidence interval	C.I.
correlation coefficient	R (multiple)
correlation coefficient	r (simple)
covariance	cov
degree (angular or temperature)	°
degrees of freedom	df
divided by	÷ or / (in equations)
equals	=
expected value	E
fork length	FL
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
mideye-to-fork	MEF
minute (angular)	'
multiplied by	x
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
standard length	SL
total length	TL
variance	Var

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

A survey of the sport fishery for chinook salmon *Oncorhynchus tshawytscha* was conducted on the lower Alagnak River in Southwest Alaska from 3-29 July 1998. Anglers were interviewed for information on catch, effort, use of guide services and demographic characteristics. Age, sex, length and weight data were collected from chinook salmon harvested by anglers. A total of 1,480 interviews were conducted, resulting in a catch rate of 0.20 (SE = 0.01) fish/h. Guided anglers comprised 82% of the trips and non-Alaskan residents comprised 92% of the trips. The majority of anglers interviewed used spin gear (84%), whereas 12% used fly gear and 4% used a combination of spinning and fly fishing gear.

Key words: chinook salmon, *Oncorhynchus tshawytscha*, Alagnak River, catch rates, angler characteristics, biological composition.

INTRODUCTION

The Alagnak River, known locally as the Branch River, is located in the Kvichak River drainage approximately 60 km (40 miles) north of the community of King Salmon, Alaska (Figure 1). The Alagnak River hosts significant recreational fisheries for chinook salmon *Oncorhynchus tshawytscha*, rainbow trout *O. mykiss*, and several other species. The Alagnak River's proximity to the community of King Salmon makes it an attractive alternative to fishing the more crowded Naknek River. Anglers typically access the river from local lodges and by float-equipped aircraft from King Salmon.

Chinook salmon is a species of great interest to sport anglers of the Alagnak River. The Alagnak River chinook salmon sport fishery primarily occurs in the lower 12 miles of the river and peaks in mid to late July. This chinook salmon run is about 2 weeks later and fish are typically larger than other chinook salmon in the area, which incites greater interest among recreational anglers.

There have been several regulatory changes since 1993, the year the chinook salmon fishery in the lower Alagnak River was last surveyed (Dunaway 1994). Prior to 1998, the daily bag limit was two chinook salmon >28 in (710 mm) with a total daily bag of three, no annual bag limit, the season was 8 June-9 April, and only unbaited, single-hook, artificial lures could be used. Effective in 1998, the daily bag limit is now one chinook salmon >28 in (total daily bag remains three), there is an annual bag limit of five (Bristol Bay wide), the season is now 8 June-31 July, and bait restrictions remain unchanged (ADF&G 1998). To determine if these regulation changes affected the fishery, another survey investigating angler success and angler characteristics was required.

Angling effort was first estimated in 1981 (Mills 1982) for the Alagnak River. Since 1981, the annual estimates of recreational fishing effort have been erratic but show an overall trend of growth. Prior to 1992 the fishery reached its highest level in 1986 at 7,628 angler-days (Table 1). However, angler effort has increased substantially since 1991, averaging 11,355 angler-days for 1992-1997 (Table 1). Harvest of chinook salmon has been more variable, ranging from 97 to almost 2,000 prior to 1992 and from 790 to 1,515 chinook salmon between 1992 and 1997; harvest was 1,531 chinook salmon in 1998 (Table 1). The potential effect on chinook salmon stocks by the expanding sport fishery in the Alagnak River is a source of concern to resource managers, local residents and members of the sport fishing industry. This survey was designed to provide timely, detailed data not available from statewide mail surveys.

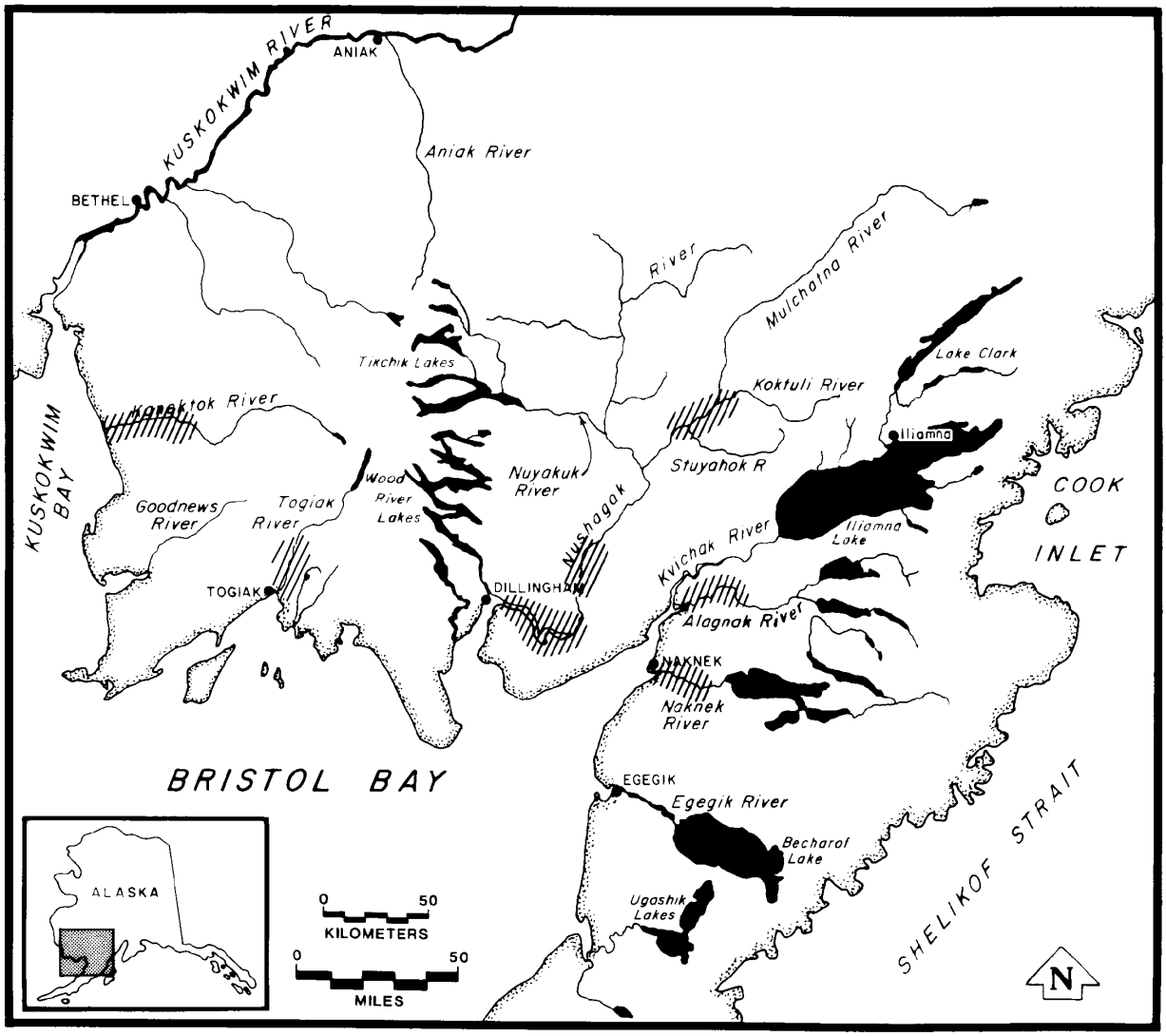

Figure 1.-Popular chinook salmon sport fisheries in the Southwestern Alaska Management Area.

The objectives for the 1998 survey of the chinook salmon sport fishery in the lower Alagnak River were:

1. Estimate the weekly and overall catch per unit effort (CPUE),
2. Characterize anglers by terminal tackle type (flies, bait or lures) and angler-type (resident or nonresident; guided, unguided or guides);
3. Index daily angler effort during each sampled day; and
4. Estimate the age, sex, length and weight compositions of chinook salmon harvested by the sport fishery in each survey area.

Table 1.-Sport fishing effort and harvest of chinook salmon in the Alagnak River fishery, 1981-1998.

Year	Effort[a]	Harvest[a]
1981	1,947	97
1982	2,252	220
1983	2,348	252
1984	5,119	661
1985	2,473	757
1986	7,628	680
1987	4,786	1,969
1988[b]	1,182	93
1989	2,717	959
1990	6,571	474
1991	6,079	790
1992	12,323	1,160
1993	12,440	1,515
1994	10,949	1,048
1995	13,232	891
1996	8,121	931
1997	11,062	982
1981-1991 Average	3,918	632
1992-1997 Average	11,355	1,088
1998	7,715	1,531

Source: Mills 1982–1994;
Howe et al. 1995–1999.
1996-1998 estimates are revised estimates.

[a] Effort is angler-days for all species.

[b] Unpublished.

METHODS

STUDY DESIGN

A systematic survey of the chinook salmon sport fishery was conducted on the lower Alagnak River from 5 km above its confluence with the Kvichak River and extending 19 km upstream (Figure 2). Sampling occurred from 3 through 29 July 1998, 5 days per week (Sunday through Thursday) and 7 hours per day (1000 to 1830 hours). During each 7-hour day, the technician conducted angler interviews (complete and incomplete trips), one angler count and collected biological data from fish retained by interviewed anglers.

The schedule for collecting interviews and conducting counts was selected to correspond to seasonal, weekly and daily peaks in the sport fishery for chinook salmon as determined from previous surveys (Dunaway 1990, Dunaway 1994) and their unpublished crew leader reports. To obtain a representative sample of all anglers, the sample days were selected to access weekend anglers (typically using float trips or fly-ins) and weekday anglers (characterized as using local lodges).

CPUE as an Index of Abundance

This survey design and corresponding schedule were directed at obtaining a consistent proportional sample of the fishery throughout the progression of the survey. Accordingly, "weekly" estimates of CPUE should be unbiased as indices of abundance as salmon pass through the fishery (Bernard et al. 1998)[1]; therefore it is expected that the estimates of CPUE are reflective of gross changes in fish abundance[2]. However, estimates of CPUE are not expected to be unbiased estimates of the catch rate of the fishery as a whole, because not all days of the week and all hours of the angling day were sampled with equal probability.

Interviews were obtained by roving the fishery, which can result in “length of stay" (LOS) bias. The bias could be substantial because the probability of interviewing anglers is proportional to the length of their daily fishing trip. The duration of the trip can be affected by the daily bag limit, which may result in an arrest of angling when achieved. However, the likelihood of severe LOS bias and its effects are ameliorated because the Alagnak River fishery is remote, which results in trips of specific duration due to travel constraints. Therefore, anglers tend to switch to catch-and-release fishing or different species after filling their bag limits. However, the estimates of CPUE may not accurately reflect overall catch rates because the entire fishing day is not covered and exit locations and methods of access are extensive.

Angler Effort Index

One angler count was conducted each day at the same time. These counts will represent an unbiased index of the angler effort during the days and time sampled if the distribution of angler effort throughout the sampling day does not vary during the course of the survey. Accordingly, the count was not used to estimate angler effort for the fishery since all possible count times were not surveyed.

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[1] With the proviso that catchability of the salmon remains constant throughout the course of the fishery.

[2] Estimates of CPUE as an index of abundance may be calculated separately for anglers who use guides versus anglers who do not use guides. These two types of anglers typically exhibit substantial differences in catch rates. We assumed that the make-up of the fishery in terms of guided versus unguided anglers did not change through the course of the survey; however, if it did, then estimates of CPUE may not accurately reflect changes of fish abundance.

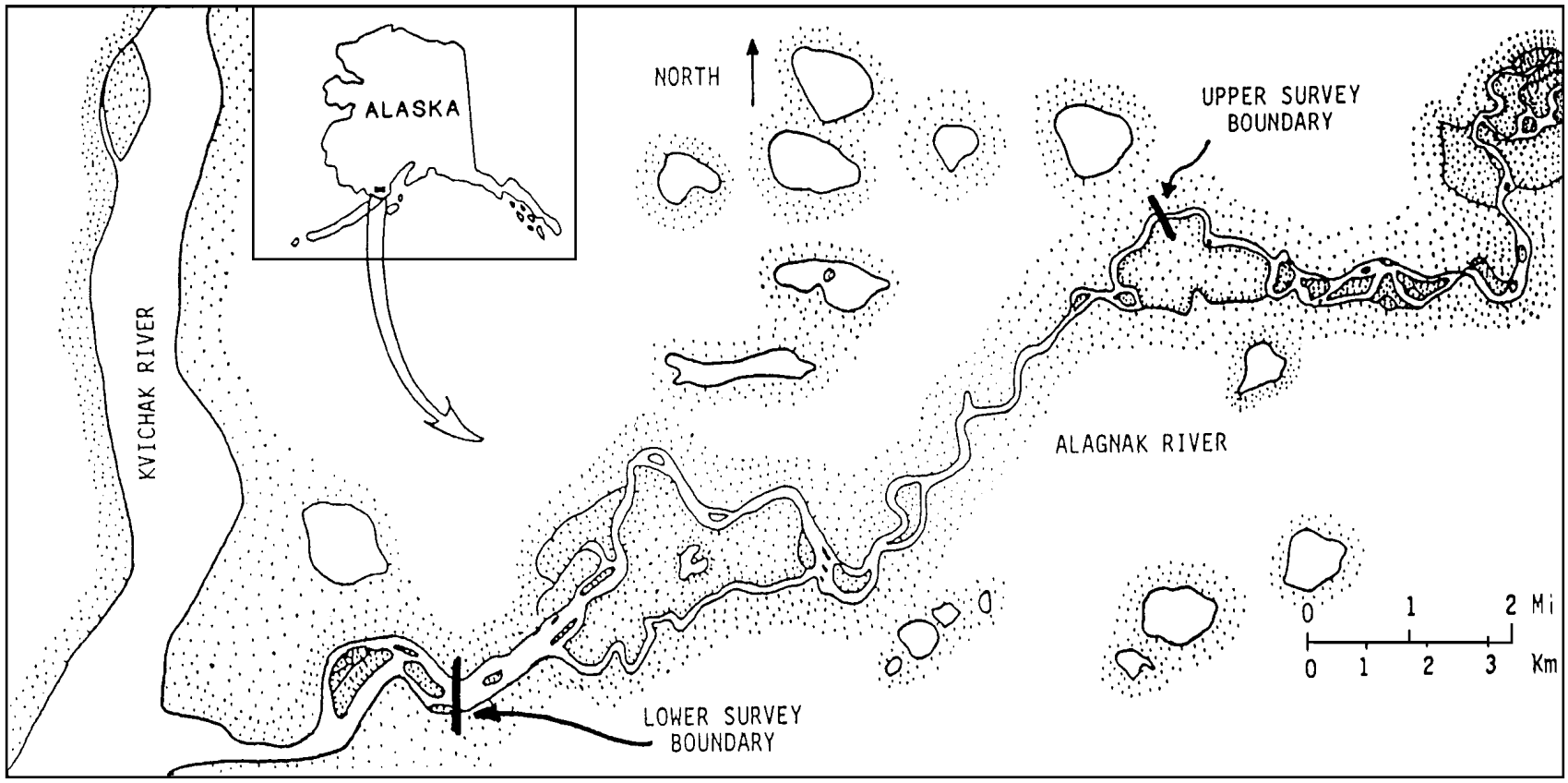

Figure 2.-Alagnak River chinook salmon angler survey site.

Angler Characteristics

Since all angling days were not covered, data describing the characteristics of angler-trips (by terminal gear use and angler-type) were expected to be reflective of the fishery only on the sampled days and periods. If different types of anglers fish during the days of the week and/or during the hours of the day not sampled, then estimates of angler-trips by angler-type will not be representative of the whole fishery.

DATA COLLECTION

Angler Interviews

The technician on duty traveled (roved) throughout the fishery via motorboat to conduct interviews and count all anglers participating in the fishery. Interviews were conducted from 1000-1830 hours, excluding time used for angler counts. Interviews consisted of obtaining catch, harvest, effort (time duration), angler-type (guided, unguided, guides), terminal tackle and demographic information from anglers encountered in the fishery.

Both complete-trip (anglers who had suspended fishing for the day) and incomplete-trip interviews were collected. Technicians attempted to distribute their interview effort uniformly among all angling groups and throughout the survey area. Effort was made to interview a high proportion (> 70%) of the anglers present on a given sampling day.

Angler Counts

A single daily angler count was used to index fishing effort. Angler counts took no more than 70 minutes, and were considered instantaneous and representative of angler effort when conducted. The starting time for the daily count was 1030 hours. The start time was chosen to create an index during what was thought to be the peak effort period.

The technician counted all active anglers while driving the boat at a constant rate of speed through the fishery. Active anglers are individuals fishing and includes those handling rods and tackle, repositioning a boat, landing a fish, repairing gear or assisting another angler. Active anglers did not include people solely operating boats, eating lunch or engaging in other activities not associated with angling.

Biological Sampling of Harvested Fish

Sport harvested chinook salmon encountered during the angler interviews were sampled for age, sex, length and weight data. When possible, all chinook salmon retained by interviewed anglers were sampled (i.e., no subsampling of the creel). The sampling design was expected to yield a proportional sample of the harvest through the progression of the fishery (i.e., equal proportion of the harvest). The resultant data were treated as if collected from a simple random sample.

Harvested chinook salmon were measured to the nearest millimeter for mid-eye to fork-of-tail length, weighed to the nearest 0.25 kilograms, and sexed based on external characteristics. In addition, three scales were removed from the preferred area[3] and mounted on an adhesive-coated card. Standard age determination procedures were used (see Jerald 1983 for a general description of the principles used). The European system of age designation was used, where the

[3] The left side of the fish approximately two rows above the lateral line and on a diagonal line downward from the posterior insertion of the dorsal fin to the anterior insertion of the and fin (Scarnecchia 1979 and Welander 1940).

number of freshwater winter annuli precedes the decimal and the number of marine winter annuli follows. Total age from the brood year is the sum of the two numerals plus one.

DATA ANALYSIS

Catch Rate

Overall and weekly estimates of CPUE were calculated according to the procedures outlined below. All of the individual angler interview data collected during the 5 days sampled in a week were combined to obtain these estimates. The first step involved calculating the CPUE for each angler interviewed:

$$cpue_{hi} = \frac{c_{hi}}{e_{hi}}, \tag{1}$$

where, c_{hi} equals the number of fish caught (both kept and released) by the i^{th} angler interviewed during the h^{th} week of the survey, and e_{hi} is the effort of the angler.

Then the weekly mean estimate of CPUE is simply:

$$\overline{cpue}_h = \frac{\sum_{i=1}^{m_h} cpue_{hi}}{m_h}, \tag{2}$$

where, m_h equals the number of anglers interviewed within each week of the survey.

Estimates of the variance of the mean CPUE estimates were calculated as follows:

$$\hat{V}\left[\overline{cpue}_h\right] = \frac{\sum_{i=1}^{m_h}\left(cpue_{hi} - \overline{cpue}_h\right)^2}{m_h(m_h - 1)}, \tag{3}$$

and standard error was calculated as the square root of the variance. Confidence intervals (95%) were calculated to compare CPUE from week to week.

Angler Effort

As noted above, the single angler count conducted each day represents an index of angler effort, and no analysis was performed.

Angler Characteristics

The proportion of angler-trips as defined by the categories of terminal gear type used and/or angler-type (e.g., guided versus unguided) were calculated as:

$$p_z = \frac{m_z}{m}, \tag{4}$$

where, m_z equals the number of the interviewed anglers whose trips are categorized as z, and m equals the total number of classifiable anglers interviewed.

No estimates of the sampling variance were calculated, since these proportions are merely descriptive in nature and can not be used to make inferences about the fishery.

Assumptions

The assumptions necessary for unbiased point and variance estimates for the various parameters obtained by the procedures outlined above include the following:

1. Interviewed anglers accurately reported their fishing time and the number of fish by species kept and released;
2. The technician accurately classified anglers and the interviewed anglers accurately reported their residency, trip type (guided, unguided), and the terminal gear type used during their fishing trip;
3. Catch rate and duration of fishing trip were independent (necessitated by the use of a roving method of interviewing—anglers with longer fishing trips have a greater probability of being intercepted for interview);
4. The distribution of angler effort within the angling day did not vary substantially during the course of the survey (necessary for CPUE to be an unbiased index of fish abundance, and for the single angler count to be an unbiased index of angler effort); and
5. Catchability of the salmon did not vary substantially during the course of the survey (necessary for CPUE to be an unbiased index of fish abundance).

There are no direct ways of evaluating or testing any of the assumptions. For assumptions 1 and 2, anglers are expected to have fairly good recollection of the total number of fish caught and to accurately report their fishing trip characteristics. Validation of assumptions 3, 4 and 5 were addressed previously (see subsection CPUE as an Index of Abundance, above).

BIOLOGICAL COMPOSITION

The proportion of harvested chinook salmon that are age u was estimated as:

$$\hat{p}_u = \frac{n_u}{n}, \tag{5}$$

where, n_u equals the number of the sampled chinook salmon harvested that are age u; and n equals the total number of chinook salmon sampled.

For samples collected $\hat{V}[\hat{p}_u]$ was calculated without the finite population correction factor, since we do not have harvest estimates:

$$\hat{V}[\hat{p}_u] = \frac{\hat{p}_u(1-\hat{p}_u)}{n-1}, \tag{6}$$

and standard error was calculated as the square root of the variance. Mean length-at-age and mean weight of harvested chinook salmon were estimated, following standard procedures (Sokal and Rohlf 1981, Boxes 4.2 and 7.1, pages 56 and 139). Data files and computer programs used to produce this report are listed in Appendix B1.

RESULTS

CATCH RATES AND ANGLER COUNTS

Estimates of CPUE ranged from 0.08/h (SE = 0.01) to a peak of 0.38/h (SE = 0.04) and overall averaged 0.20/h (SE = 0.01, Table 2). The number of anglers counted ranged from a low of 26 on 25 July to a peak of 96 on 13 July (Appendix A1).

ANGLER CHARACTERISTICS

Of the 1,480 interviews conducted during the lower Alagnak River chinook salmon study, 82% of the anglers were guided, 13% were unguided, and 5% were guides fishing (Table 3). Most anglers were nonresidents of Alaska (92%) and 14% were non-U.S. residents. Most anglers used spinning gear (84%) followed by fly-fishing gear (12%) and a combination of both (4%).

BIOLOGICAL COMPOSITION

Biological data were collected from 290 harvested chinook salmon. The majority of the harvest was males (71%, SE = 3.0, Table 4). The predominant age groups among all fish sampled were age 1.4 (61%, SE = 3.0) and age 1.3 (29%, SE = 3.0). Overall average length was 824 mm (SE = 7.0) and overall average weight was 10.0 kg (SE = 0.2). The largest fish sampled was 1,084 mm in length, weighed 21.5 kg and was caught on 14 July. Anglers also caught sockeye salmon *O. nerka*, chum salmon *O. keta*, and pink salmon *O. gorbuscha* (Appendix A2).

DISCUSSION

Although the study design for the 1998 survey of the Alagnak chinook salmon sport fishery was different than previous studies (Dunaway 1990, 1994), several statistics are comparable (Table 5). These statistics include catch rates, angler characteristics and age composition of the sport harvest. CPUE of chinook salmon in 1998 was similar to the CPUE observed in 1989. In 1998, anglers caught 0.20 chinook salmon/h, whereas in 1989 CPUE was 0.18 chinook salmon/h (Dunaway 1994, Table 5). Though the chinook fishery in this river typically peaks in mid to late July, catch rates decreased during the final 2 weeks in 1998. This may have been due to anglers switching from targeting chinook to chum salmon, as was noted by the survey technicians.

Table 2.-Catch per unit effort for the chinook salmon sport fishery in the lower Alagnak River, 3-29 July 1998.

	Sample			95% Confidence Interval	
Temporal Component	Size	CPUE[a]	SE	Lower	Upper
1 (03-09 July)	307	0.24	0.02	0.20	0.27
2 (10-16 July)	433	0.38	0.04	0.30	0.46
3 (17-23 July)	402	0.10	0.01	0.08	0.11
4 (24-30 July)	338	0.08	0.01	0.07	0.10
Entire Season	1,480	0.20	0.01	0.18	0.23

[a] Number of fish caught per angler-hour of effort.

Table 3.-Number and percent of angler trips by angler and gear type during the chinook salmon sport fishery on the lower Alagnak River, 3-29 July 1998.

Characteristic	Angler Trips	Percent
ANGLER TYPE		
Guided	1,209	82
Unguided	188	13
Guide who is fishing	83	5
RESIDENCY		
Alaskan Residents	116	8
Local Alaskan Residents[a]	0	0
Nonlocal Alaskan Residents[b]	116	8
Non-Alaskan Residents	1,364	92
U.S. Resident	1,161	78
Non-U.S. Resident	203	14
GENDER		
Male	1,357	92
Female	123	8
TACKLE TYPE		
Spin	1,243	84
Fly	176	12
Spin and Fly	61	4
Total Angler Trips	1,480	

[a] Alaskan resident living in Levelock and Naknek/King Salmon area.

[b] All other Alaskan residents.

Table 4.-Mean lengths (millimeters) and weights (kilograms) of chinook salmon, by sex and age group, from samples collected from the lower Alagnak River sport harvest, 3-29 July 1998.

		Age Group						
	Unknown	1.1	1.2	1.3	1.4	1.5	2.3	Total
Females								
Percent				6	22	1		29
SE				1	3	1		3
Sample size				15	58	3		76
Mean length	865			849	874	947		871
SE	17			9	7	11		6
Sample size	8			15	58	3		84
Mean weight	11.0			10.5	11.0	14.8		11.1
SE	0.7			0.4	0.3	0.3		0.2
Sample size	8			15	58	3		84
Males								
Percent		1	4	23	38	4	0	71
SE		1	1	3	3	1	0	3
Sample size		2	11	61	101	11	1	187
Mean length	817	505	570	728	863	959	868	805
SE	28	73	19	14	9	16		9
Sample size	19	2	11	61	101	11	1	206
Mean weight	9.8	2.0	3.1	6.9	11.4	15.1	11.0	9.6
SE	0.9	1.0	0.3	0.4	0.3	0.9		0.3
Sample size	19	2	11	61	101	11	1	206
All Samples								
Percent		1	4	29	61	5	0	100
SE		1	1	3	3	1	0	0
Sample size		2	11	76	159	14	1	263
Mean length	831	505	570	752	867	957	868	824
SE	21	73	19	13	6	12		7
Sample size	27	2	11	76	159	14	1	290
Mean weight	10.2	2.0	3.1	7.6	11.3	15.0	11.0	10.0
SE	0.7	1.0	0.3	0.4	0.2	0.7		0.2
Sample size	27	2	11	76	159	14	1	290

Table 5.-Comparison of catch rates, angler characteristics and gear selection observed during surveys of the chinook salmon sport fishery in the lower Alagnak River in 1989, 1993, and 1998.

	Survey Year		
Parameter	1989[a]	1993[b]	1998
Survey Dates	6/28 to 8/6	7/2 to 8/3	7/3 to 7/29
Total Interviews	758	2,204	1,480
Completed-trip Interviews	758	229	356
Catch Rate	0.18	N/A	0.20
	Percentage of Angler-trips		
Angler Type			
Guided	78	83	82
Unguided	22	17	13
Guide who is fishing			5
Residency			
Non-Alaskan Residents	Not reported	Not reported	92
Alaskan Residents	Not reported	Not reported	8
Tackle Type			
Spin	Not reported	73	84
Fly	Not reported	21	12
Spin and Fly	Not reported	7	4

[a] Dunaway 1990.

[b] Dunaway 1994.

The proportion of guided anglers was also consistent among studies. Guided anglers comprised 82% of anglers interviewed on the lower Alagnak River in 1998 compared to 83% in 1993 and 78% in 1989. Although spinning gear was the predominant choice of anglers in the 1993 and 1998 studies, the proportions have changed. The percentage of anglers using spinning gear increased from 73% in 1993 to 84% in 1998, whereas the percent of anglers using fly fishing gear declined from 21% in 1993 to 12% in 1998. The effect of this change on CPUE is unknown.

The age composition of chinook salmon harvested in the sport fishery was similar among the 1989, 1993 and 1998 surveys. Age-1.3 and -1.4 chinook salmon comprised more than 80% of the sport harvest sampled in all three surveys. Age-1.4 chinook salmon were the predominant age class, 51% and 61% of the sample in 1993 and 1998, respectively.

The results of this survey were very similar to those of the 1989 and 1993 surveys. The survey was most useful in characterizing the utilization of the lower Alagnak River chinook salmon fishery by nonresident guided anglers who either used local lodges or were flown in from another lodge for the day. These anglers tend to fish on scheduled patterns easily captured by this survey method. No local Alaskan residents were interviewed and this is most likely due to the absence of towns and villages near the river.

We recommend using similar methods in future surveys of the Alagnak River chinook salmon fishery. By using the similar methods in the future, we will have information that is more easily comparable and thus more useful for monitoring changes in the fishery. Periodic surveys of the Alagnak River chinook salmon fishery should be continued to ensure effective management of this important sport fishery. With greater understanding of the fishery and its participants, the department will be more prepared to face management challenges in the future.

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APPENDIX A. SUPPORTING STATISTICS

Appendix A1.-Angler counts, by day, during the survey on the lower Alagnak River, 3-29 July 1998.

Date	Count
03-Jul-98	52
04-Jul-98	41
05-Jul-98	54
06-Jul-98	63
07-Jul-98	60
08-Jul-98	Scheduled off
09-Jul-98	Scheduled off
10-Jul-98	75
11-Jul-98	66
12-Jul-98	94
13-Jul-98	96
14-Jul-98	79
15-Jul-98	Scheduled off
16-Jul-98	Scheduled off
17-Jul-98	72
18-Jul-98	50
19-Jul-98	79
20-Jul-98	46
21-Jul-98	75
22-Jul-98	Scheduled off
23-Jul-98	Scheduled off
24-Jul-98	38
25-Jul-98	26
26-Jul-98	64
27-Jul-98	56
28-Jul-98	54
29-Jul-98	35

Appendix A2.-Cumulative catches (kept and released) of all species caught by interviewed anglers during the chinook salmon survey on the lower Alagnak River, 3-29 July 1998.

Species	Kept	Released
Chinook Salmon	415	930
Chum Salmon	79	976
Sockeye Salmon	74	45
Pink Salmon	2	37
Rainbow Trout	0	2
Dolly Varden	1	0
Arctic Grayling	0	1
Coho Salmon	1	0

APPENDIX B. DATA FILES AND COMPUTER PROGRAMS USED TO PRODUCE THIS REPORT.

Appendix B1.-Data files and computer programs used to produce this report.

Data Files

S-000801i011998.dta	Angler interview data from 3 through 29 July 1998.
S-000801c011998.dta	Angler count data from 3 through 29 July 1998.
S-000801b011998.dta	Alagnak River chinook salmon AWL data.

Analysis Programs

BBX.SAS	A SAS program that uses biological data (AWL files) to produce tables of mean length and weight by sex and age group.