

STATE OF ALASKA

*William A. Egan, Governor*



Annual Progress Report for

LAKE AND STREAM INVESTIGATIONS

by

*E. T. McHenry*

*S. W. Kubik*

*D. A. Watsjold*

*P. Kepler*

ALASKA DEPARTMENT OF FISH AND GAME

*James W. Brooks, Commissioner*

DIVISION OF SPORT FISH

*Rupert E. Andrews, Director*

*Howard E. Metsker, Coordinator*

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## RESEARCH PROJECT SEGMENT

State: Alaska

Project No.: F-9-5

Name: Sport Fish Investigations of  
Alaska

Study No.: G-II

Study Title: Sport Fish Studies

Job No.: G-II-B

Job Title: Anadromous Fish Population  
Studies - Upper Cook Inlet  
Drainage.

Period Covered: July 1, 1972 - June 30, 1973

## ABSTRACT

During 1972, a total of 24,262 punch cards were issued to people contemplating king salmon, Oncorhynchus tshawytscha, fishing. Forty-six percent were returned to the Department of Fish and Game after the season closed. Of the total return (13%) indicated they fished Upper Cook Inlet waters.

The 1972 recorded punch card catch of king salmon 508 mm and over was 408 fish. Approximately 73% (299) of the harvest was from the Deshka River.

Age composition of the angler harvested king salmon indicated 64.2% were four-year-olds; 29.2% were five-years-old; and 6.6% were six-year-old fish, ranging in length from 518 to 711 mm.

The 1972 escapement of king salmon into west-side Susitna streams was generally improved over 1971 levels.

## RECOMMENDATIONS

The Board of Fish and Game in December of 1972 announced the closure of king salmon in Upper Cook Inlet waters to sport fishing. How long this closure will remain in effect depends on future Board action and recommendations by the Alaska Department of Fish and Game.

Until such time as a sport fishery on king salmon is re-established, it is recommended this research project remain inactive.

## OBJECTIVES

1. To collect and analyze biological data concerning the distribution, abundance, timing, lengths, weights, age, and sex compositions of adult salmon returning to selected freshwater streams of Upper Cook Inlet. To include information on out-migrating juvenile salmon.
2. To determine the sport fish catch of king salmon in selected fresh waters of Upper Cook Inlet, and to evaluate trends in angling effort.
3. To conduct sport fish harvest studies of silver and pink salmon in selected freshwaters of Upper Cook Inlet.
4. To provide recommendations for the management of king, silver, and pink salmon in the freshwaters of Upper Cook Inlet.

## TECHNIQUES USED

The Upper Cook Inlet (west-side Susitna) king salmon harvest was derived from creel census and punch card returns. Analysis of creel census data were done according to the methods outlined by Neuhold and Lu (1957).

Sex composition and scales from king salmon were obtained by sampling anglers' catches. All fish were measured from the tip of the snout to the tip of the tail. Random creel census activities directed towards silver and pink salmon harvests were extremely limited because of poor adult returns to Upper Cook Inlet streams.

Aerial and ground surveys were utilized to observe distribution, numbers and time of arrival of adult king salmon in Upper Cook Inlet streams.

TABLE 1. King Salmon Catch, 508 mm and over in Length for West-Side Susitna Streams, 1972.

<u>Date</u>	<u>Deshka</u>	<u>Alexander</u>	<u>Lake</u>	<u>Total Harvest</u>
6/10	12	5	-	17
6/11	4	-	-	4
6/12	4	-	-	4
6/13	10	1	1	12
6/14	9	-	-	9
6/15	5	4	-	9
6/16	6	1	1	8
6/17	24	7	1	32
6/18	11	7	1	19
6/19	6	5	-	11
6/20	15	9	-	24
6/21	24	7	-	31
6/22	44	4	-	48
6/23	43	3	4	50
6/24	60	21	3	84
6/25	<u>22</u>	<u>18</u>	<u>6</u>	<u>46</u>
TOTAL	299	92	17	408
Percent by stream	73.3%	22.5%	4.2%	100%

## FINDINGS

A description of the Upper Cook Inlet Streams and past information collected on this project are presented in Dingell-Johnson Projects reports by Stefanich (1961) and Kubik (1962 through 1971).

### Punch Card King Salmon Harvest

Anglers fishing for king salmon, Oncorhynchus tshawytscha, in selected freshwater streams (Deshka River, Alexander and Lake creeks) were required for the seventh consecutive year to record their catches by streams and dates on king salmon punch cards. The 1972 recorded catch of king salmon 508 mm and over in length was 408 fish. Table I shows the 1972 catch of king salmon by stream and date.

Since 1966 annual estimates of the sport caught king salmon in Cook Inlet have been derived by means of a "punch card" system. The use of cards to derive catch estimates and other information was adopted to provide a better catch statistic, to cope with the increased magnitude of the sport fishery, and to reduce angler interview sampling which has been conducted in major fishing areas for many years. In addition to the catch estimates, the punch card provides information to the number and residence of people who participated in the fishery.

Punch cards were obtained at no cost from license agents. Persons 16 years of age or older were required to have a valid sport fishing license in his possession. All anglers, including those under 16 years of age, were required to have a card in their possession while fishing for king salmon in certain specified waters. Upon catching a king salmon, the angler was required to remove the appropriate punch and record in the space provided the date and river where the fish was caught. The angler was then required to return his card to the Department after the special season closed.

Sport fishing regulations were unchanged in 1972. The daily bag limit was one king salmon per day, and two king salmon 508 mm and over in length per year. King salmon under 508 mm in length were considered part of the daily bag limit, which was 10 in total of salmon under 16 inches in length; trout, grayling and char, provided the limit may not contain more than two (2) trout, lake trout or grayling over 20 inches in length.

The seasonal fishing period in 1972 was from June 10 through June 25. During 1972 a total of 24,262 cards were issued to people contemplating king salmon fishing in the Cook Inlet area. Approximately 15,000 more cards were issued in 1972 than in 1966 when the punch card was first required.

After the close of the season a total of 46% were returned to the Department of Fish and Game. A summary of punch cards issued and returned for Cook Inlet from 1966 to 1972 is presented in Table 2.

TABLE 2 Number of Punch Cards Issued and Returned, Cook Inlet, 1966-1972.

<u>Year</u>	<u>Number Issued</u>	<u>Number Returned</u>	<u>Percent Returned</u>
1966	8,853	6,835	77.2
1967	5,977	4,909	82.1
1968	9,524	6,724	70.6
1969	6,680	4,651	69.6
1970	16,687	12,518	75.0
1971	23,419	10,435	44.6
1972	24,262	11,182	46.1

Of the 11,182 punch cards returned, 4,828 anglers, or 43.2% of the total (11,182) indicated fishing for king salmon. Of the 4,828 reporting anglers who had fished, a total of 4,425, or 92%, resided in Alaska. The number of out-of-state anglers totaled 403, or 8%. Based on these same returns it was learned that 3,367 (70%) persons fished the Kenai Peninsula, 1,124 (23%) fished Upper Cook Inlet, and 337 (7%) fished both areas.

There were also 3,889 cards returned by people who indicated they had not fished and 2,465 cards with incomplete information. Approximately 44% of the people who obtained cards did not go king salmon fishing. This estimate was based on valid (completely filled) cards.

A total of 331 anglers were successful in landing one or two king salmon 508 mm and over in length. Seventy-seven (23%) of the successful anglers caught the seasonal limit of two king salmon. Effort during the 16-day fishery on the Deshka River was estimated at 6,140 man-hours with a harvest of 299 king salmon, a mean success rate of 0.048 fish per hour.

Creel census data collected on Lake Creek indicated 1,343 man hours of fishing effort, with 17 king salmon taken for a catch rate of 0.012 fish per hour.

Random creel census on Alexander Creek during a ten day period showed 80 successful anglers (one fish limit) fished 931 hours for a catch rate of 0.086 fish per hour.

A sample of 226 sport caught king salmon 508 mm and over in length were measured for sex, age, and size composition. The salmon ranged in length from 518 to 1,320 mm with a mean of 735 mm. Males averaged 677 mm and females 950 mm. Sex ratio of males to females was 3.7:1. The 1972 catch was predominately composed of four year old fish (1.2) ranging in length from 518 to 711 mm. Age composition of the angler harvested king salmon indicated 64.2% were four years old; 29.2% were five years old; and 6.6% were six-year-old fish.

The Deshka River has been by far the most productive stream since the punch card fishery began in 1966. Approximately 73% of the 1972 harvest was from the Deshka River, and over a seven-year period the average has been 78%. The annual harvest by stream for the years 1966 through 1972 is presented in Table 3.

TABLE 3 Sport Fish Harvest of King Salmon Upper Cook Inlet Streams, 1966-72.

<u>YEAR</u>	<u>DESHKA RIVER</u>	<u>ALEXANDER CREEK</u>	<u>LAKE CREEK</u>	<u>CHUNILNA CREEK</u>	<u>HARVEST *</u>
1972	299	92	17	**	408
1971	434	15	2	**	451
1970	579	286	1	5	871
1969	310	21	8	-	339
1968	324	71	3	-	398
1967	234	20	60	1	315
1966	<u>205</u>	<u>28</u>	<u>26</u>	<u>4</u>	<u>263</u>
TOTAL	2,385	533	117	10	3,045
PERCENT BY STREAM	78.33%	17.50%	3.84%	0.33%	100%

\* 508 mm and over

\*\* Not considered part of West Side Fishery.

### King Salmon Escapement

The 1972 run of king salmon into west side Susitna streams was generally improved over 1971. The counts were determined by aerial and ground survey techniques. On some streams, standard index areas are counted each year.

This type of count covering a fraction of the spawning area of a stream provides only relative escapement values for a comparison from one year to another. The data collected is not intended as an index to total escapement. Spawning ground counts showed two of three streams slightly above the eight-year average. Camp and Sunflower creeks, tributaries to Lake Creek, showed increases over both the 1971 count and the eight-year average. The areas counted and enumeration procedure has not varied over the years. Counts presented for the years 1964 through 1972 (Table 4) were all aerial counts and were made by the same observer.

Aerial surveys are made each year when possible over Lake Creek and some of its tributaries. An aerial count of 442 king salmon made on August 3, 1972, is the highest recorded for this creek (Table 4).

Although Moose Creek, East Fork of the Deshka River, showed more king salmon in 1972 than in 1971, escapement was 56% lower than the eight-year average. Other counts for Deshka River tributaries are shown in Table 5.

Ground surveys made on Alexander Creek from July 23 through July 25 showed 163 in the creek. The count was well below the seven-year average (Table 6). Counts were not available during 1971.

Counts made on other streams west of the Susitna River were as follows: Bear Creek - 12; Peters Creek - 95; Chuit River - 417; Talachulitna River - 405; Canyon Creek - 8; Coal Creek - 20; Theodore Creek - 79; and Lewis Creek - 7.

In addition to the west side Susitna streams, Ship and Campbell creeks, located in the Anchorage area, were surveyed for spawning populations of king salmon. Ground counts revealed both streams below the 1971 levels (Table 7). Additional information on Ship Creek is presented in Volume 14, F-9-5, G-II-D, Salmonid Rearing and Migration Study: Ship Creek System.

TABLE 4 King Salmon Escapement Aerial Counts for Lake Creek and Tributaries, 1964-1972.

	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1964-71 Average</u>
Lake Creek	45	--	30	343	362	304	54	--	442	
Camp Creek *	94	101	68	225	129	86	47	88	126	105
Sunflower Creek *	151	49	38	155	162	296	88	31	261	121
Yenlo Creek	8	3	6	--	--	28	--	--	0	
Twin Creek	7	19	5	--	--	56	--	--	0	
Total Actual Count	305	172	147	723	653	770	189	119	920	

\* Index Stream

TABLE 5 King Salmon Escapement Counts in the Deshka River and Tributaries, 1964-1972.

	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1964-71 Average</u>
West Fork	(311) **	640	(281)	(764)	(1,246)	(2,036)	(1,417)	--	(877)	
Moose (East Fork) * Deshka	(1,590)	(2,065)	(625)	(596)	(1,646)	(2,786)	(2,824)	(161) **	(867)	1,537
Trappers Creek	(234)	--	--	(121)	(184)	--	--	--	(0)	
Chiuk Creek	(238)	16	27	(54)	(242)	(14)	(190)	--	(36)	
Unnamed Tributary	49	28	--	--	--	--	5	--		
Total Actual Count	2,422	2,749	933	1,535	3,318	4,836	4,441	161	1,780	

\* Index Stream

\*\* Numbers in parentheses are ground counts - all others are aerial.

TABLE 6 King Salmon Escapement Counts For Alexander Creek and Tributaries, 1964 - 1972

	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>Average 1964-70</u>
Alexander Creek	(205) *	(400)	(197)	(354)	(563)	(588)	(420)	**	(163)	390
Sucker Creek	--	(16)	(51)	34	--	(75)	(71)	--	39	
Total Actual Count	205	416	248	388	563	663	491	--	202	

\* Numbers in parentheses are ground counts - all others are aerial.

\*\* No count made because of poor water conditions.

TABLE 7 King Salmon Escapement Counts for Ship and Campbell Creeks, 1964 - 1972.

<u>Stream</u>	<u>1972</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>	<u>1965</u>	<u>1964</u>
Ship Creek	121	221	1,746	710	500	200	50	207	94
Campbell Cr.	47	102	63	*	125	300	15	119	116

Silver and Pink Salmon

Because of poor silver salmon, O. kisutch, and pink salmon, O. gorbuscha, returns to Upper Cook Inlet streams, fishing effort during 1972 was extremely light in comparison to recent years.

Silver salmon enter the streams in mid-July and usually continue to run in September. Strong runs of silvers normally occur during even numbered years in Cook Inlet. Pink salmon also are more abundant during even numbered years and although considered relatively unimportant in the sport fishery, are caught incidentally while the angler is fishing for silver salmon.

Creel census was confined to two streams, Deshka River and Lake Creek, during 1972. High water conditions precluded any activity on Alexander Creek. Information received disclosed that 77 anglers contacted fished 322 hours to catch 72 salmon, a seasonal rate of success of 0.22 fish per hour. Harvest data for the two streams is presented in Table 8.

TABLE 8 Fishing Effort and Salmon Harvest on Deshka River and Lake Creek, 1972

<u>Stream</u>	<u>Total Anglers</u>	<u>Angler Hours</u>	<u>Pink Salmon</u>	<u>Silver Salmon</u>	<u>Fish/Angler</u>	<u>Fish/Hour</u>
Deshka River	31	185	25	24	1.58	.26
Lake Creek	<u>46</u>	<u>137</u>	<u>11</u>	<u>12</u>	<u>.50</u>	<u>.17</u>
Total	77	322	36	36	.93	.22

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