STATE OF ALASKA

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Annual Progress Report for

LAKE AND STREAM INVESTIGATIONS

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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-H Job Title: Anadromous Fish Population Studies Matanuska Valley and East Side Tributaries of the Susitna River and Tributaries of the Chulitna River.

Period Covered: July 1, 1972 through June 30, 1973.

ABSTRACT

Boat and foot surveys on Willow, Montana and Moose creeks during 1972 indicated minimum escapements of king salmon, Oncorhynchus tshawytscha.

Aerial surveys were conducted on nine streams to determine minimum king salmon escapements.

Information from king salmon punch cards revealed a harvest in Willow Creek, Little Susitna River and Chunilna Creek of 16, 25 and 43 king salmon, respectively.

During streambank surveys of spawning salmon, O. kisutch, in established index areas on Wasilla, Cottonwood, Birch, Fish and Meadow creeks, maximum counts of 19, 21, 69, 118 and 27 silver salmon were obtained.

During an economic survey conducted on nine streams, a total of 214 parties (806 individuals) were interviewed. Five hundred ninety-one (73.3%) were Alaska residents and 215 (26.7%) were non-residents. Of the 591 residents interviewed, 96.8% lived in the Greater Anchorage Area Borough.

An estimated 7,345 cars (21,153 anglers and 6,537 non-anglers) were on the nine streams during the 36-day survey, with an estimated average of 3.77 persons per car. A minimum of $34.73 per trip, of $17.19 per day, was spent by each party in the survey area. A minimum of $191,925 was spent in the Greater Anchorage Area Borough and $63,167 was spent in the Matanuska-Susitna Borough.

RECOMMENDATIONS

1. Continue enumeration of king and silver salmon stocks in existing index areas.

2. Expand aerial and foot surveys to catalog and enumerate additional king and silver salmon populations.
3. Evaluate the reliability of aerial surveying on certain streams.
4. Evaluate returning marked king salmon that were stocked in Willow Creek as smolts in 1971.
5. Continue operation of the Fish Creek weir to determine silver salmon escapement.
6. Collect biological data (length and sex) from king salmon carcasses on Willow and Montana creeks.

OBJECTIVES

1. To investigate and evaluate population trends of anadromous fish species in the Matanuska Valley and east side tributaries of the Susitna River and tributaries of the Chulitna River.
2. To determine the recreational catch of king salmon, and evaluate angling pressure on anadromous streams in the job area.
3. To assist in the determination of the monetary value of recreational salmon fisheries in the Cook Inlet area.
4. To make recommendations for future management, and to direct the course of future studies relating to anadromous fishes within the job area.

TECHNIQUES USED

King salmon spawning populations were enumerated by aerial, raft and foot surveys.

Silver salmon spawning populations were enumerated by foot surveys in established index areas defined by Redick (1969, 1971).

A temporary weir was located on Fish Creek immediately downstream from the Goose Bay-Wasilla Highway culvert. Salmon were identified by species and enumerated as they passed through a trap built into the weir fence.

Recreational king salmon harvests were estimated by creel census and from punch card returns. The creel census method was described by Watsjold (1972).

Car counts were conducted to estimate man-days of fishing effort expended during the king salmon punch card fishery on Willow Creek and Little Susitna River. Individuals were interviewed to determine the average number of anglers per car. The number of anglers was determined by multiplying the average number of anglers per car times the total number of cars counted during the fishery.

The methods used during the economic survey to estimate the total number of cars, anglers, and non-anglers was described by Watsjold (1971).

The monetary value of recreational salmon fisheries in selected eastside Susitna Valley streams was obtained using the same procedure as outlined by Watsjold (1971). The interview form (Figure 1) used during the 1972 economic survey was an alteration of the form used during the 1970 economic survey.

Figure 1. Economic Survey Interview Form.

Expenditures Individual

Party

CONFIDENTIAL ON-SITE SPORT FISHERY SURVEY

LOCATION (STREAM NAME) _____

Number Fishing in party: Licensed _____ Unlicensed _____ Total _____

Resident Non-resident

Hometown: _____ Living in Alaska Yes No

Military (or Dependent) Military (or Dependent) Yes No

Type of Vehicle: Car Pickup Camper Airplane Private Charter

Other _____

Type of License: 10-day Hunting and Fishing Fishing

Number of Days this entire trip _____ Type of lodging _____

Estimated Expenditures:	In this immediate stream area	From place of origin
Gasoline	$ _____	$ _____
Food	$ _____	$ _____
Fishing tackle	$ _____	$ _____
Other	$ _____	$ _____

Anticipated expenditures: (for entire trip)	In this area	In other areas (for entire trip)
Gasoline	$ _____	$ _____
Food	$ _____	$ _____
Fishing tackle	$ _____	$ _____
Other	$ _____	$ _____

Number and species of salmon caught (this day, this trip) _____

Comments: _____

FINDINGS

King Salmon Escapement

Boat and foot surveys were conducted to estimate numbers of spawning king salmon, Oncorhynchus tshawytscha, in Willow, Montana and Moose creeks. A description of areas surveyed is presented in Table I. Low streamflows and clear skies resulted in excellent counting conditions during 1972 surveys.

The number of king salmon observed in Willow, Moose and Montana creeks is presented in Table 2.

A total of 370 king salmon were enumerated during a boat survey on Willow Creek. Based on data collected since 1969 it appears that the 1972 escapement equals the three-year average for this system.

The 1972 king salmon escapement into the Montana Creek system was the highest recorded since escapement surveys were initiated in 1969. The 1972 count of 317 king salmon includes enumeration of the main stem and three forks of Montana Creek. Prior to 1971, counts were conducted solely on the main stem of Montana Creek. Since 1971, counts on the three forks have been separated from main stream counts for comparison purposes. It is possible a larger escapement entered the system in 1970 when 261 king salmon were observed in the main stem of Montana Creek.

A total of 21 king salmon were observed in Moose Creek, which is the lowest count since surveys were initiated in 1970.

Increased effort was directed toward aerial surveys on streams known to contain king salmon spawning populations. Aerial surveys were conducted on nine streams during the peak of spawning, which occurred during the latter part of July and the first week in August. Results of the surveys are presented in Table 3.

In most instances there are no prior escapement counts with which to compare these aerial counts.

Sheep Creek normally has a glacial coloration that prohibits aerial surveying. In 1971 part of the main channel of Sheep Creek changed its course and cut into Goose Creek. The reduced flow in Sheep Creek permitted aerial enumeration in 1972.

Prairie Creek appears to be one of the better king salmon producing streams east of the Susitna River. The stream is only six or seven miles in length and flows out of Stephan Lake and drains into Talkeetna River. A total of 630 king salmon were observed, which is considered a minimum count,

TABLE 1 Description of King Salmon Enumeration Index Areas, Upper Cook Inlet Streams, 1972.

Stream and Location	Description of Index Area
Willow Creek, T19N, R4W	From the canyon downstream to its confluence with the Susitna River. Deception Creek from the end of Four Mile Road to its confluence with Willow Creek.
Montana Creek, T24N, R4W	From its confluence with Susitna River upstream to the three forks. Approximately three miles up the North, Middle and South Forks.
Moose Creek, T19N, R2E	From the first waterfall downstream to its confluence with Matanuska River.

TABLE 2 Observed King Salmon Escapements for Willow, Montana and Moose Creeks, (Foot and Boat Surveys), 1969-72.

Date	Willow Creek*	Montana Creek**		Moose Creek**
		Main Stream	Three Forks	
1969	290	150	--	No Count
1970	640	261	--	126
1971	165	24	20	40
1972	370	211	106	21
1969-71 Average	365	145	20	83

* Boat Counts
** Foot Counts

since it was very difficult making an aerial count on areas containing large numbers of salmon. A previous aerial count in 1970 revealed that 820 king salmon were present in the creek. Ground counts will have to be conducted to accurately assess the escapement in this system.

Harvest:

A total of 24,262 king salmon punch cards were issued to anglers for the entire Cook Inlet area during the 1972 season. Forty-six percent of the cards were returned to the Department of Fish and Game after the close of the season.

A limited creel census was conducted to estimate king salmon harvest in Willow Creek and Little Susitna River.

On Willow Creek it was estimated that a minimum of 1,000 man-days were spent sport fishing for king salmon during the June 24 through July 3 punch card fishery. During the census only three king salmon were observed taken in Willow Creek. Information from king salmon punch cards returned through February 1, 1973, indicated a total of 16 king salmon were taken from Willow Creek.

Observations made during the king salmon migration suggested the bulk of the run entered Willow Creek after the king salmon fishery closed on July 3. It is believed that king salmon remain in the Susitna River until they reach an advanced stage of maturation and then enter Willow Creek and other east side tributaries of the Susitna River.

The king salmon season on the Little Susitna River occurred from June 17 through July 2. Very little fishing effort occurred during the first week because of high turbid stream conditions. An estimated 100 man-days of effort occurred during the fishery. The low effort is due to poor access to the lower part of the river and poor stream conditions. During the census 12 king salmon were observed caught by sport fishermen. Punch card returns revealed that a total of 25 king salmon were taken from the Little Susitna River.

Chunilna Creek was open to king salmon fishing from July 1 through July 11. A creel census was not conducted because high water covered the landing strip. The stream was accessible only by riverboat. Punch card returns showed that 43 king salmon were harvested by sport fishermen.

Silver Salmon Escapement

Foot surveys were conducted to estimate spawning silver salmon, O. kisutch, on Wasilla, Cottonwood, Birch, Fish and Meadow creeks. A summary of the index counts is presented in Table 4.

TABLE 3 King Salmon Escapement Counts, East Side Susitna Tributaries (Aerial Surveys), 1969-72.

Stream	1969	1970	1971	1972
Sheep Creek	---	---	---	101
Little Willow Creek	---	45*	---	99
Kashwitna - North Fork	---	---	1	31
Chunilna Creek	375	58*	5*	91
Byers Creek	---	---	3	7
Troublesome Creek	---	---	5	5
Prairie Creek	---	820	---	630
Indian River	---	---	---	35
Portage Creek	---	---	---	68

* Poor Conditions

TABLE 4 Numbers of Silver Salmon in Escapement Index Areas, Upper Cook Inlet, 1968-72.

Date	Wasilla Creek	Cottonwood Creek	Birch Creek	Fish Creek	Meadow Creek	Total
1968	No Count	22	125	35*	54	236
1969	No Count	9	142	852	109	1,112
1970	101	5	206	176	49	537
1971	104	29	138	141**	9	421
1972	19	21	69	118	27	254
1968-71 Average	103	16	153	301	55	557

* Count was made after peak of spawning.
** Because of high water a boat count was necessary.

A weekend-only fishery has been permitted on Wasilla, Cottonwood and Fish creeks since 1971. Although widely accepted by anglers, the regulation has resulted in a substantial reduction in effort.

Only 19 silver salmon were observed in Wasilla Creek in 1972. This count is far below previous escapement counts of 101 and 104 silver salmon in 1970 and 1971, respectively.

A maximum count of 21 silver salmon was attained during the escapement survey on Cottonwood Creek. This count is about average for the Cottonwood Creek index area.

A count of 69 silver salmon was obtained in the Birch Creek index area. This is the lowest escapement count since the index was established in 1968. Counting conditions were not ideal but it is thought a poor run occurred in this system in 1972.

In 1972, a total of 716 silver salmon were enumerated through the Fish Creek weir between July 24 and September 10. Fish Creek is the outlet of Big Lake and drains into Cook Inlet. In 1969, this weir allowed index counts in Fish and Meadow creeks to be evaluated against a numerically known escapement. In 1970 and 1971 heavy rains caused severe flooding conditions and the weir was washed downstream before the silver salmon run could be enumerated.

In 1972, a total of 118 silver salmon were observed in the Fish Creek index area. This is the lowest index count since 1969. Counting conditions were excellent and three man-days were expended to obtain a complete count to determine what percentage of the total run utilized the area. The index area count of 118 silver salmon represents 16.5% of the run entering the system. Redick (1970), determined that 20.1% of the 1969 run was enumerated within this area.

A maximum count of 27 silver salmon was attained in the index area on Meadow Creek which flows into Big Lake. The peak count of 27 silver salmon represents 3.8% of the run to the system. Redick (1970), determined that 2.6% of the 1969 run passing through the weir was enumerated in the Meadow Creek index area.

In 1969, the Meadow Creek and Fish Creek index areas, combined, accounted for 22.7% of the run passing through the Fish Creek weir. In 1972, the same index areas accounted for 20.3% of the total run. These two years of data indicate that index areas may be a very reliable method in determining the strength of a silver salmon run during any given year in this system. Additional data will be obtained in future years to substantiate the reliability of index counts.

It appears from index area counts and observations of sport fisheries occurring on streams throughout the Matanuska-Susitna valleys, that a weak silver salmon run occurred in 1972. Commercial silver salmon catches in Cook Inlet during

TABLE 5 Number of Military and Civilian, Resident and Non-resident Individuals, Interviewed in the Survey Area, July 22 through August 26, 1972.

	Resident	Non-resident	Total
Military	216 (53.5%)	87 (40.5%)	403 (50.0%)
Civilian	275 (46.5%)	128 (59.5%)	403 (50.0%)
Total	591 (73.3%)	215 (26.7%)	806

TABLE 6 Types and Numbers of Vehicles Utilized by Interviewed Parties in the Survey Area, July 22 through August 26, 1972.

Type of Vehicle	No.	%
Car	96	44.9
Pickup Camper	88	41.1
Van	11	5.2
Pickup	9	4.2
Travel Home	8	3.7
Jeep	2	0.9
Total	214	

TABLE 7 Number of Days Spent on Each Trip to the Survey Area, July 22 through August 26,1972.

No. Days	No. Parties	%
1	69	32.3
2	106	49.5
3	25	11.7
4 (or more)	14	6.5
Total	214	

Total Effort

Car counts were conducted during the survey to determine the total number of individuals present on each of the nine study streams.

Information from interviews revealed that the average party was composed of 3.77 people, 2.88 of whom were anglers. The estimated number of cars, anglers and non-anglers is presented in Table 9.

In 1970 an estimated 21,482 and in 1972, 27,690 individuals traveled to the survey area. The 1972 estimate represents a 29% increase in the number of persons utilizing the area.

Expenditures

Anglers were requested to estimate their out-of-pocket expenses during each trip. Indirect costs such as depreciation on vehicles, campers, camping gear and fishing tackle were not included.

In 1970 anglers were hesitant to estimate their anticipated expenditures. During the 1972 survey anticipated expenditures were obtained and are included in the expenditure information; therefore, expenditure data collected during the two surveys are not directly comparable.

The 214 interviewed parties spent an average of 2.02 days per trip. Each party spent an estimated average of $17.19 per day, or $34.73 per each trip to the Willow-Talkeetna area. Expenditures are broken down into four categories in Tables 10 and 11.

The largest expenditure in the Matanuska-Susitna Borough was for food ($2.81 per trip) and $2.77 was spent per trip for gasoline. In the Greater Anchorage Area Borough, the largest expenditure was for food ($12.94 per trip), while $7.10 was spent per trip for gasoline.

An estimated 7,345 parties were on the nine streams during the 36-day period; therefore it was possible to calculate the total amount spent for specific goods and services purchased by all parties traveling to the survey area (Table 12).

Total expenditures are also broken down by stream (Table 13).

The majority of expenditures ($191,925) were made in the Anchorage area as expected, since 96.8% of the persons interviewed were Greater Anchorage Area Borough residents. Since the majority of the persons were from the Anchorage area, the $63,167 spent in the Matanuska-Susitna Borough is a net infusion of new funds entering the Matanuska-Susitna Borough.

TABLE 8 Type of Lodging Utilized by Remaining Overnight in the Survey Area, July 22 through August 26, 1972.

Type of Lodging	No. Parties	%
Pickup Camper	71	49.0
Travel Trailer	47	32.4
Tent	10	6.9
Van	7	4.8
Travel Home	6	4.1
Car	4	2.8
Total	145	

TABLE 9 Estimated Number of Cars, Anglers, and Non-anglers on each Stream in the Study Area, July 22 through August 26, 1972.

Stream	Number of Cars	Number of Anglers	Number of Non-anglers
Willow Creek	3,310	9,533	2,946
Montana Creek	1,957	5,636	1,742
Sheep Creek	913	2,629	813
Sunshine Creek	431	1,241	384
Little Willow Creek	294	847	261
Caswell Creek	213	613	190
Kashwitna River	107	308	95
Goose Creek	78	225	69
Birch Creek	42	121	37
Total	7,345	21,153	6,537

TABLE 10 Expenditures Per Day Made by Each Party in the Matanuska-Susitna Borough and Greater Anchorage Area Borough during the Survey Period, July 22 through August 26, 1972.

	Expenditures/Day					
Item	Mat-Su Borough	%	Anchorage Borough	%	Total	%
Food	$1.39	32.7	$6.41	49.5	$7.80	45.4
Gasoline	1.37	32.3	3.52	27.2	4.89	28.4
Fishing Tackle	.32	7.5	2.34	18.1	2.66	15.5
Miscellaneous	1.17	27.5	.67	5.2	1.84	10.7
Total	$4.25		$12.94		$17.19	

TABLE 11 Expenditures Per Trip Made by Each Party in the Matanuska-Susitna Borough and Greater Anchorage Area Borough during the Survey Period, July 22 through August 26, 1972.

	Expenditures/Trip					
Item	Mat-Su Borough	%	Anchorage Borough	%	Total	%
Food	$2.81	32.7	$12.94	49.5	$15.75	45.5
Gasoline	2.77	32.2	7.10	27.2	9.87	28.4
Fishing Tackle	.65	7.6	4.73	18.1	5.38	15.5
Miscellaneous	2.37	27.5	1.36	5.2	3.73	10.7
Total	$8.60		$26.13		$34.73	

TABLE 12 Total Expenditures on Goods and Services Purchased by All Parties Traveling to the Survey Area, July 22 through August 26, 1972.

Item	Mat-Su Borough	Anchorage Borough	Total
Food	$20,639	$95,044	$115,683
Gasoline	$20,346	$52,150	$72,496
Fishing Tackle	$4,774	$34,742	$39,515
Miscellaneous	$17,408	$9,989	$27,397
Total	$63,167	$191,925	$255,092

TABLE 13 Total Expenditures by All Parties Traveling to the Survey Area, July 22 through August 20, 1972.

Stream	Mat-Su Borough	Anchorage Borough	Total	%
Willow Creek	$28,466	$86,490	$114,956	45.1
Montana Creek	16,830	51,136	67,966	26.6
Sheep Creek	7,852	23,857	31,709	12.4
Sunshine Creek	3,707	11,262	14,969	5.9
Little Willow Creek	2,529	7,682	10,210	4.0
Caswell Creek	1,832	5,566	7,398	2.9
Kashwitna River	920	2,796	3,716	1.4
Goose Creek	671	2,038	2,709	1.1
Birch Creek	361	1,098	1,459	0.6
Total	$63,167 (24.8%)	$191,925 (75.2%)	$255,092	

Data collected during the economic survey were sent to Michael Brogan, Graduate Research Assistant, with the Institute of Agricultural Sciences, University of Alaska. These data will be analyzed and included in a report being prepared by the economists on the economic value of Cook Inlet salmon fisheries.

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