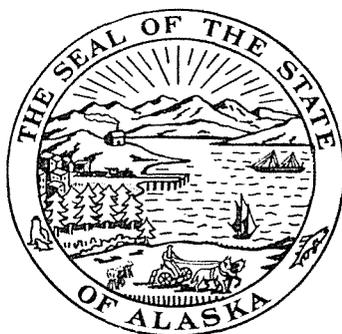


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STATE OF ALASKA

William A. Egan, Governor



ANNUAL REPORT OF PROGRESS, 1969 - 1970

FEDERAL AID IN FISH RESTORATION PROJECT F-9-2

SPORT FISH INVESTIGATIONS OF ALASKA

ALASKA DEPARTMENT OF FISH AND GAME

Wallace H. Noerenberg, Commissioner

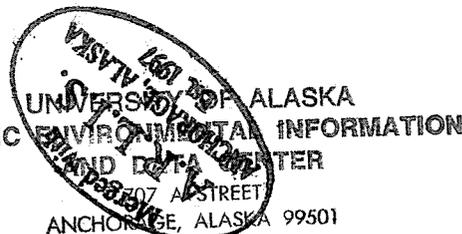
Alaska DIVISION OF SPORT FISH

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INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska, Federal Aid In Fish Restoration, Project F-9-2, "Sport Fish Investigations of Alaska".

The studies reported herein are investigations evaluating the sport fish resources of the state. Recreational and other impacts on the fishery resources necessitates a continuous endeavor of ascertaining facts and knowledge of the fisheries. The 24 jobs reported on are of a continuing nature. The investigations are composed of 11 projects involved with the inventory and cataloging of the sport fish waters of the state, sport fishery creel censuses, and access. Fish species that received special investigational effort include: Dolly Varden, anadromous fish, grayling, sheefish, whitefish, pike, char, and salmon. The information gathered from the combined studies provides necessary background data for a better understanding of management problems and constitutes a basis for necessary future investigations.

The subject matter contained in these reports is incomplete, and the findings and interpretations subject to re-evaluation as work progresses.

RESEARCH PROJECT SEGMENT

State: Alaska

Project No.: F-9-2

Name: Sport Fish Investigations of Alaska.

Job No.: 9-B

Title: Population Studies of Anadromous Species with Emphasis on Upper Cook Inlet Drainage.

Period Covered: July 1, 1969 to June 30, 1970.

ABSTRACT

Creel census data obtained during the special king salmon, *Oncorhynchus tshawytscha*, punch-card fishery disclosed that 1,550 anglers fished 12,000 hours to catch 339 king salmon over 508 mm (20 inches) in length. Seasonal success rate was 0.21 fish per angler.

Of the 6,688 king salmon punch cards issued, 70% were voluntarily returned to the Alaska Department of Fish and Game.

The 1969 king salmon sport catch from the Deshka River was predominately composed of age four (1.2) fish.

Escapement counts were obtained by aerial and ground surveys for nine streams. The 1969 Deshka River spawning population was estimated to be 5,652 king salmon.

Creel census data obtained from Deshka River and Lake Creek disclosed that 119 anglers fished a total of 396 hours to catch 216 silver salmon, *O. kisutch*, with a seasonal success rate of 0.54 fish per hour.

RECOMMENDATIONS

1. Retain the present objectives of the studies.
2. Emphasize more effort on the use of electronic counting devices as a means of enumerating salmon on the Deshka River.

OBJECTIVES

1. To determine the sport catch of king and silver salmon and evaluate angling pressure in selected freshwater areas of upper Cook Inlet.
2. To determine the distribution, abundance, time of arrival, age composition, sex ratios, and spawning areas of adult king and silver salmon in the various streams of upper Cook Inlet.
3. Recommendations will be made for management measures and for directing the course of future studies.

TECHNIQUES USED

A creel census was undertaken during the king and silver salmon season to accumulate data on angling harvest. Lengths, weights, sex composition, and scales from king and silver salmon were obtained during the creel census checks of the fishery.

Aerial, riverboat, and ground surveys were made to observe distribution, numbers, and arrival time of adult king and silver salmon in upper Cook Inlet streams.

Cellulose-acetate scale impressions were examined by microprojector for age determination.

A Bendix salmon counter was used on the Deshka River to enumerate adult king and silver salmon.

FINDINGS

A description of the upper Cook Inlet study streams and past information collected on this project are presented in Annual Progress Reports by Stefanich (1962) and Kubik (1963, 1964, 1965, 1966, 1967, 1968, and 1969).

Punch-Card Fishery

A total of 6,688 king salmon punch cards were issued to anglers for the entire Cook Inlet area during the 1969 season. This was a 30% decrease over the 1968 total. Seventy percent of the cards were returned to the Department of Fish and Game after the close of the season. Of the 4,658 punch cards voluntarily returned, 41% of the anglers reported fishing for king salmon.

The 1969 recorded total catch of king salmon, regardless of size, for upper Cook Inlet streams was 420 fish, with 19% under 508 mm in length. Table 1 shows the 1969 catch of king salmon by stream and date.

For the fourth consecutive year, Alaskan anglers sport fishing for king salmon in selected freshwater areas were required to record their catches by area and date on the king salmon punch cards.

A quota of 250 kings over 508 mm (20 inches) which was in effect in the upper Inlet area from 1966-1968 was retained during the 1969 special king salmon season. The daily bag limit was set at one king salmon per day with two king salmon over 508 mm per season.

The seasonal fishing period was set from June 7 through June 22. The season was closed by field announcement on June 9 after the census showed the area quota had been obtained.

Punch cards were issued to 197 anglers from 35 states and foreign countries. Of this total, 93 anglers from 28 states and 2 countries actually fished. Out-of-state anglers accounted for 5.1% of those fishing for king salmon in Cook Inlet.

Creel census data disclosed that 1,550 anglers fished 12,000 hours to catch 339 king salmon over 508 mm. The seasonal success rate was 0.21 fish per angler.

Extrapolation of the punch-card data provided catch estimates of 396 king salmon over 508 mm in length from upper Cook Inlet.

In 1969, the fourth consecutive year, the most productive stream was the Deshka River. Of a total

of 339 king salmon over 508 mm, 91% were caught from the Deshka River. The Deshka River supported 80% of the total fishing effort.

TABLE 1 Sport Fishing Harvest of King Salmon, 508 mm (20 inches) and Over, Upper Cook Inlet, 1969.

<u>Date</u>		<u>Alexander Creek</u>	<u>Lake Creek</u>		<u>No. of King Salmon</u>
6/7	113	8	6	--	127
6/8	82	6	2	--	90
6/9	60	6	--	--	66
6/10	20	1	--	--	21
6/11	26	--	--	--	26
6/12	7	--	--	--	7
6/12	2	--	--	--	2
Total	310	21	8	0	339
Percent	91.4	6.2	2.4	0	100
Kings under 20 inches	73	7	1	0	81

The daily harvest by stream for the years 1966-1969 is presented in Table 2.

Two hundred forty-seven anglers, or 16% of the total anglers checked, were successful in landing one or two king salmon over 508 mm in length. Ninety (39%) of the successful anglers caught the seasonal limit of two king salmon.

A sample of 249 king salmon over 508 mm were measured for size composition. The salmon ranged in length from 508 to 1,067 mm with a mean of 673 mm. Males averaged 622 mm; females averaged 881 mm. Figure 1 shows the size composition of sport-caught king salmon for the 1966-1969 seasons. Of the 1969 total, 54% of the king salmon were between 508 and 635 mm (Figure 2).

Sex ratio of males to females in the sport fishery was 4:1 in 1969, as compared to 2.9:1 in 1968.

In addition to Deshka 08 mm and over, 81 "jack" king salmon under 508 mm were caught by anglers during the punch-card fishery. King salmon under 508 mm are included in the general daily freshwater bag limit.

Data collected thus far indicates a sport fishery is partially selective to male "jack" salmon (ages 1.1 and 1.2). Figure 3 compares the catch ratio of king salmon over and under 508 mm.

Age was determined for 69 king salmon over 508 mm caught during the punch-card fishery. Composition of the sample indicated 65% were four years old; 32% were five years old; and 3% were six years old (Table 3).

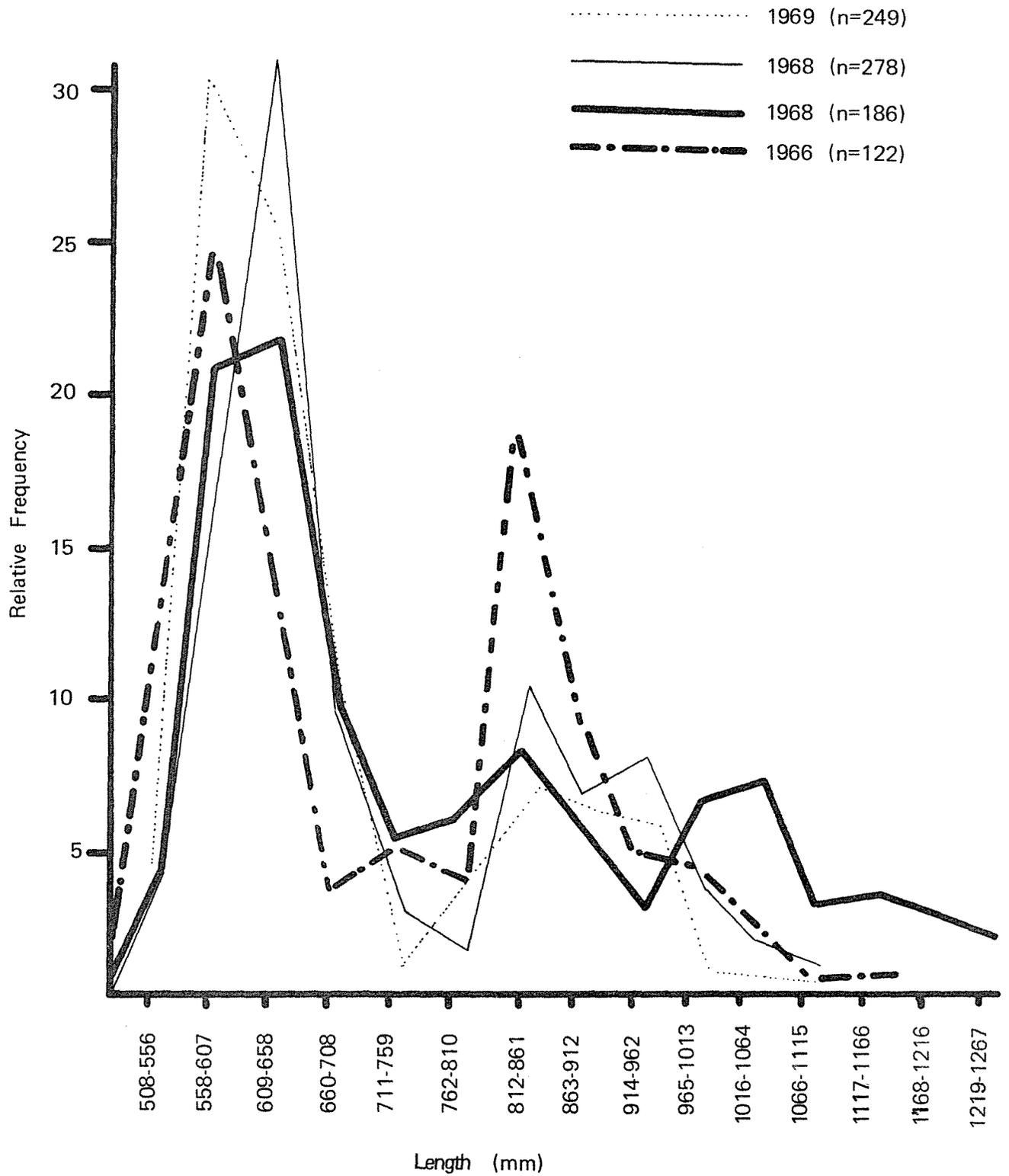


FIGURE 1 SIZE COMPOSITION OF SPORT-CAUGHT KING SALMON, UPPER COOK INLET, 1966-1968.

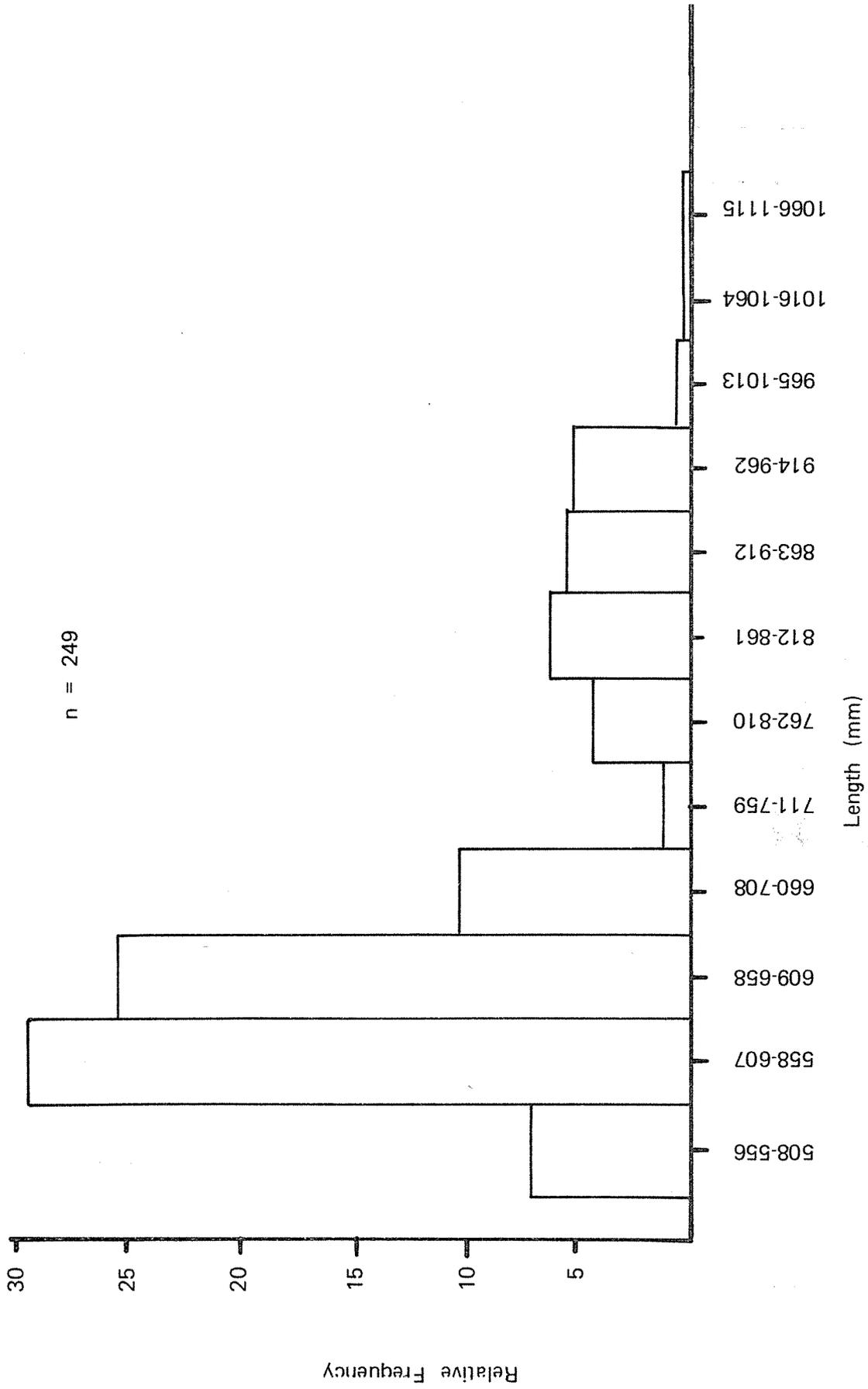


FIGURE 2 SIZE COMPOSITION OF SPORT-CAUGHT KING SALMON 508 MM & OVER, UPPER COOK INLET, 1969.

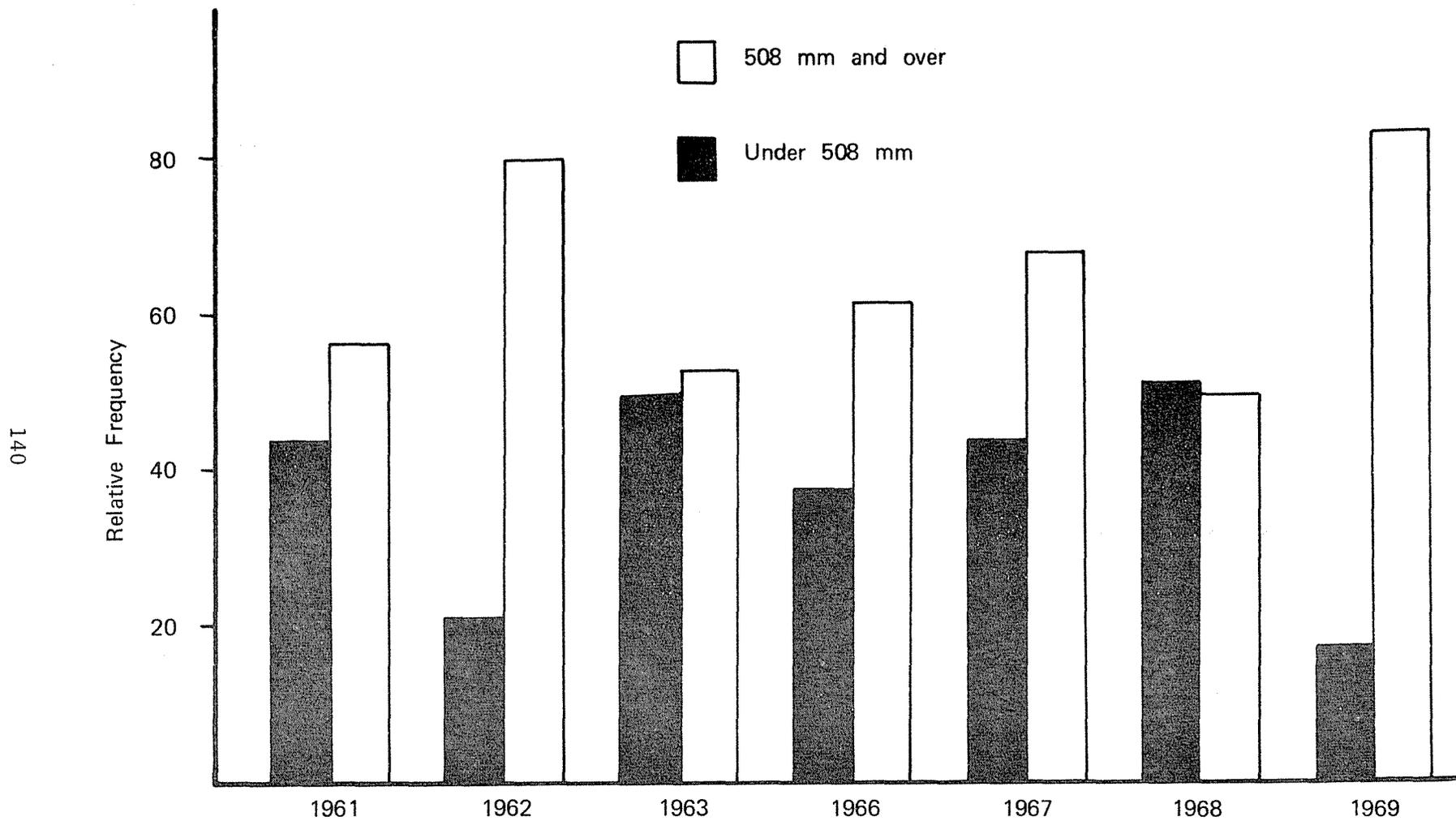


FIGURE 3 RELATION OF SPORT-CAUGHT ADULT KING SALMON AND "JACK" SALMON, UPPER COOK INLET.

TABLE 2 Summary of King Salmon Punch-Card Fishery for Upper Cook Inlet, 1966-1969.

	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>
UPPER COOK INLET				
King salmon cards issued (entire Cook Inlet)	6,688	9,524	5,977	8,853
King salmon cards returned (entire Cook Inlet)	70%	70%	82%	77%
Punch-card catch (over 20")	339	398	315	263
Punch-card catch (under 20")	<u>81</u>	<u>416</u>	<u>167</u>	<u>163</u>
TOTAL CATCH	420	814	482	426
STREAM BREAKDOWN (KS over 20")				
Deshka River	310	324	234	205
Alexander Creek	21	71	20	26
Lake Creek	8	3	61	28
Chunilna Creek	---	---	1	4
Avg. size of kings (in inches) (both sexes)	26.5	29.2	29.6	28.5
Avg. size of females (in inches)	34.7	34.2	36.3	34.0
Avg. size of males (in inches)	24.5	25.9	27.5	26.4
% of kings between 20-25 inches	54% (249)	39% (278)	33% (186)	52% (122)
% of kings under 20 inches	19% (420)	51% (814)	34% (482)	38% (426)

Age classes by length and sex of 48 king salmon over 508 mm in length from the Deshka River are presented in Table 4. In this sample, age 1.2 fish comprised 60.4%, age 1.3 fish 35.4%, and age 1.4 fish 4.2%.

The 1969 king salmon sport catch in the Deshka River was predominately composed of four-year-old fish (1.2). Age and length frequency composition indicates a fork length grouping of 520 to 711 mm for these fish. The most prevalent size group, as indicated in the sport fish catch, is presumed to be age four fish.

TABLE 3 Age-Length Frequency Distribution of Sport-Caught King Salmon Over 508 mm (20 inches) from Upper Cook Inlet, 1969.

Length (mm)	Age			Total
	1.2	1.3	1.4	
508-556	5	--	--	5
558-607	13	--	--	13
609-658	18	--	--	18
660-708	8	2	--	10
711-759	1	1	--	2
762-810	--	3	--	3
812-861	--	9	--	9
863-912	--	4	--	4
914-962	--	2	1	3
965-1013	--	1	1	2
Total	45	22	2	69
% of Total	65.0	32.0	3.0	100.0

TABLE 4 Age-Length Frequency Distribution of Sport-Caught King Salmon Over 508 mm (20 inches) from the Deshka River, 1969.

Length (mm)	Age			Total
	1.2	1.3	1.4	
508-556	2	--	--	2
558-607	10	--	--	10
609-658	13	--	--	13
660-708	3	2	--	5
711-759	1	--	--	1
762-810	--	2	--	2
812-861	--	7	--	7
863-912	--	4	--	4
914-962	--	1	1	2
965-1013	--	1	1	2
Total	29	17	2	48
% of Total	60.4	35.4	4.2	100.0

Escapement

During 1969, population enumeration of king salmon was attempted on the same eleven streams surveyed in 1967 and 1968. Table 5 presents the escapement counts for upper Cook Inlet streams from 1962 through 1969.

Four streams on the east side of the Susitna River (Willow, Little Willow, Montana, and Sheep creeks) showed an increase over the previous years' count.

TABLE 5 King Salmon Escapement Counts, Upper Cook Inlet Streams, 1962-1969.

<u>Stream</u>	<u>1969</u>	<u>1968</u>	<u>1967</u>	<u>1966</u>	<u>1965</u>	<u>1964</u>	<u>1963</u>	<u>1962</u>
Deshka River	5,652	4,863	2,500	2,000	2,749	2,422	131	998
Alexander Creek	735	727	500	300	400	205	750	19
Lake Creek	1,540	1,300	1,000	300	172	290	46	53
Chunilna Creek	375	1,000	*	300	8	319	38	70
Total	8,302	7,890	4,000	2,900	3,329	3,236	965	1,140
Ship Creek	710	500	200	50	207	94	119	58
Campbell Creek	*	125	300	15	119	116	187	40
S.F. Eagle River	*	28	50	49	159	123	135	*
Total	710	653	550	114	485	333	441	98
Willow Creek	290	125	24	103	35	51	55	71
Little Willow Creek	150**	12	6	38	3	7	11	26
Montana Creek	250**	5	2	100	57	75	23	75
Sheep Creek	150	*	*	100	3	*	24	35
Total	840	142	32	341	98	133	113	207

*No count available.

**Schooled at mouth - counted by Commercial Fisheries Division.

Three streams on the west side of the Susitna River showed a marked increase from the 1968 count. Significant factors contributing to the higher count were extremely low, clear water conditions, improving visual observation. Chunilna Creek survey counts indicated a decrease over the 1968 count.

The estimated 5,652 king salmon enumerated on the Deshka River does not include the 383 kings of all sizes taken by sport anglers during the punch-card fishery. The escapement count for 1969 is believed to be the highest recorded for the Deshka River.

A Bendix fish counter was installed and operated on the Deshka River from May 28 through August 3. The counter was located approximately four miles upstream from the confluence of the Deshka and Susitna rivers. Enumeration of king salmon from May 28 to July 11 totaled 2,969. Numerous difficulties were encountered with the counting device because of extreme water fluctuations during the summer period.

Due to low water from June 29 through June 23, the counter was recording false counts. Department personnel did not, at this time, properly adjust the depth control range.

From July 11 through August 2, an estimated 611 silver salmon adults were enumerated. Again, extremely low water conditions prevailed and numerous false counts were recorded.

Silver Salmon

During 1969, two streams (Deshka River and Lake Creek) on the west side of the Susitna River were censused for angling pressure and harvest.

Alexander Creek, which was one of the west-side streams selected for silver salmon harvest studies, could not be surveyed due to extremely low water conditions. Float planes could not land in the areas normally fished by anglers.

Creel census data obtained from the Deshka River disclosed that 83 anglers fished 252 hours to catch 136 silver salmon. The rate of success was 0.53 fish per hour.

Eighteen salmon measured from the Deshka River ranged from 432 to 609 mm with a mean of 533 mm. The sex ratio of males to females was 1:1.

On Lake Creek, 36 anglers fished 144 hours to catch 80 silver salmon. The rate of success was 0.55 fish per hour. Forty-four harvested silver salmon ranged in size from 483 to 686 mm with an average of 597 mm.

A small silver salmon escapement was indicated by stream surveys in two west-side Susitna tributaries. Surveys were conducted during July and August.

A total of 611 adult silver salmon were enumerated past the Bendix counter on the Deshka River. Few silver salmon were observed in the Deshka River during the August ground counts.

An estimated 250 silver salmon were observed in the lower five miles of Alexander Creek during an aerial survey in August.

Aerial surveys made during late August and early September showed a school of several hundred silver salmon at the mouths of the Talachulitna River and Lake Creek. Small numbers of silvers were seen in the main stream itself. Due to extremely low water conditions, it is possible that the silver salmon were entering the streams later than usual. This was reflected in the late anglers' harvest.

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Prepared by:

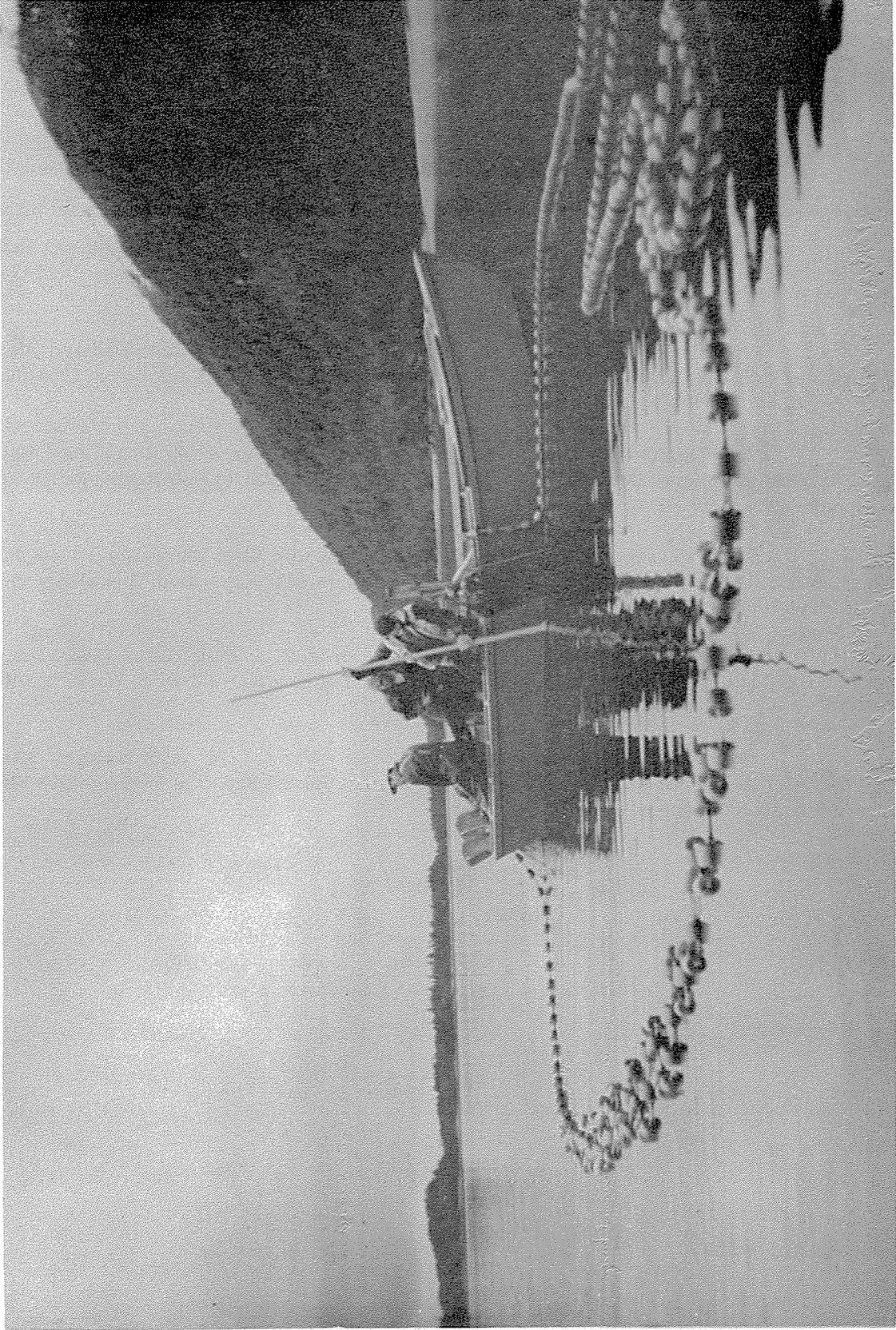
Stanley W. Kubik
Fishery Biologist

Date: March 15, 1970.

Approved by:

s/Howard E. Metsker
D-J Coordinator

s/Rupert E. Andrews, Director
Division of Sport Fish



SALMON FRY SAMPLING CONDUCTED IN PRINCE WILLIAM SOUND.