Volume 4

1962-1963

STATE OF ALASKA

William A. Egan, Governor

ANNUAL REPORT OF PROGRESS, 1962 - 1963

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-4

SPORT FISH INVESTIGATIONS OF ALASKA

Alaska Department of Fish and Game

Walter Kirkness, Commissioner

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Sport Fish Division

Richard Haley, Coordinator

INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-4, "Sport Fish Investigations of Alaska".

The project is composed of 25 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. While some studies are of a more general nature and deal with gross investigational projects, others have been developed to evaluate specific problem areas. These include studies of king salmon, silver salmon, grayling and State Access requirements. The information gathered will provide the necessary background data for a better understanding of local management problems and development of future investigational studies.

The assembled progress reports may be considered fragmentary in many respects due to the continuing nature of the respective studies. The interpretations contained therein, therefore, are subject to re-evaluation as work progresses and additional information is acquired.

Volume 4 Report No. 8-B

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations of Alaska.

Project No: F-5-R-4 Title: Population Studies of King Salmon in the Upper Cook Inlet Drainage.

Job No: 8-B

Period Covered: February 1, 1962 to February 1, 1963

Abstract:

A survey of the Susitna River Drainage to determine the distribution, seasonal timing and abundance of king salmon was continued for the second year.

Some success has been obtained in counting spawning king salmon were observed in 32 streams.

Creel census data shows that 464 anglers checked on eight streams in the Susitna River Drainage, fished 2,484 hours to catch 352 king salmon, a seasonal rate of success of .14 fish per hour.

A sample of 116 king salmon were checked for age; scale samples indicated that 11% were 3 years old, 39% were 4 years old, 37% were 5 years old and 13% were 6 years old. Mean length of 226 king salmon caught by anglers was 26.6 inches. Eighty-two salmon sampled at a cannery averaged 32.2 inches.

Recommendations:

It is recommended that this study be continued.

Emphasis should be placed on obtaining additional creel census data, especially in those areas which have intensive fishing pressure, such as the Deshka River and Sheep Creek.

Scales from king salmon smolts should be obtained for age and growth data.

Objectives:

To determine the distribution, numbers, seasonal timing, age and growth of king salmon in Cook Inlet drainages. To determine the present sport fish catch of king salmon and to evaluate angling pressure trends and their possible impact on the existing king salmon stocks. To determine the need for specific management regulations.

Techniques Used:

A two man survey crew covered the area by airplane, boat and on foot. Records were made of fish species observed by location and, when possible, their abundance. Air charter services and individual fishermen were contacted and requested to record fishing effort and success. Creel census data was obtained by project personnel at every opportunity in several of the more accessible sport fishing areas. Aerial surveys were made to observe the distribution and numbers as well as time of arrival for spawning fish. Several streams were sampled on foot in an attempt to obtain sex ratio and length frequency information.

A counting tower, financed and manned by the Commercial Fish Division, was built at the mouth of Lake Creek to enumerate salmon, but high and turbid water made observations impossible and the installation was abandoned.

Attempts were made to determine the number of salmon spawning in streams. Two methods were tried: Observations made from a slow-flying plane, and by walking the stream banks. Neither method proved to be completely satisfactory, but the aerial count was the quickest and most economical. Streams of the Susitna drainage may be arbitrarily classified according to color as: (1) clear, (2) brown, (3) milky,

and (4) muddy. The clear streams are best surveyed by plane, while the others need different methods for enumerating the fish.

Scale impressions were made by placing the scales on gummed brown tape, covering with sheet cellulose acetate .02 inches thick and placing the packet in a heated scale press under 8,000 pounds of pressure for 10 minutes. The impressions were read with the aid of a Bausch and Lombe scale projector.

Findings:

The Susitna River Basin is partially described in last years' report of Project Number F-5-R-3, Job No. 8-B.

The main stem of the Susitna River, from its source in the Alaska Range to its point of discharge into Cook Inlet, is about 275 miles long. It flows southward from the Alaska Range for about 60 miles, then in a westerly direction through the Talkeetna Mountains for about 100 miles and then southerly for the remaining 115 miles to its mouth at Cook Inlet.

Many of the tributaties of the lower basin have as their origin glaciers in the surrounding mountain ranges. Streams that have their origins in the lower foothills some distance from the Alaska Range are clear or somewhat brown in color. These streams are, for the most part, turbulent in the upper reaches and slower flowing in the lower regions. Most of the large tributaries carry a heavy load of glacial silt.

The Yentna River, one of the largest tributaries, begins in the mountains of the Alaska Range and flows in a southeasterly direction for approximately 95 miles. The Yentna River enters the Susitna River about 24 miles from Cook Inlet.

The Talkeetna River originates in the Talkeetna Mountains and flows in a westerly direction, joining the Susitna River 80 miles upstream from salt water.

The Chulitna River heads in the Alaska Range and flows in a southerly direction, joining the Susitna River opposite the confluence of the Talkeetna River.

During the warmer months of the year, the Susitna River is silt-laden throughout its entire course. Sport fishing is thereby limited to the clear water tributaries and areas in the main Susitna River near the mouths of these tributaries. Sport fishing in Susitna Basin is comparatively light, with the primary limitation being access. Lakes and rivers on the west side of the Susitna River provide approximately nine established landing sites for float-equipped aircraft (Figure 1). Airplane symbols designate the established landing sites on the west side of the river; the arrows in general show the sports anglers sites that are accessible by plane, railroad, boat and highway. The shaded areas on the streams depict spawning areas for king salmon. For such a large area, the places where king salmon are sought by anglers are few and far between. For example, the Deshka River, located 40 air miles northwest of Anchorage receives intensive summer sport fishing pressure for king and silver salmon (Figure 2). There are only two landing sites used by anglers in over 56 miles of fishable water. Creel census records show that of 142 king salmon taken on the Deshka River 85% were caught in the lower 4 miles of the stream (Figure 3).

The entire area along the east side of the Susitna River, from Nancy at railroad mile 181 to Gold Creek at railroad mile 263, is accessible by train either from Anchorage or Fairbanks. A new road is presently being constructed from the town of Willow, north to Mt. McKinley National Park and eventually will extend to Fairbanks (Figure 4). The impact of such a road on the sport fish stocks will be considerable when one considers that this will be the major route of sportsmen and tourists between Anchorage and Fairbanks.

The project area investigated in 1962 was limited to the waters below Devils Canyon.

In review of the commercial fishing in Cook Inlet, the numbers of king salmon packed in canneries from 1951 to

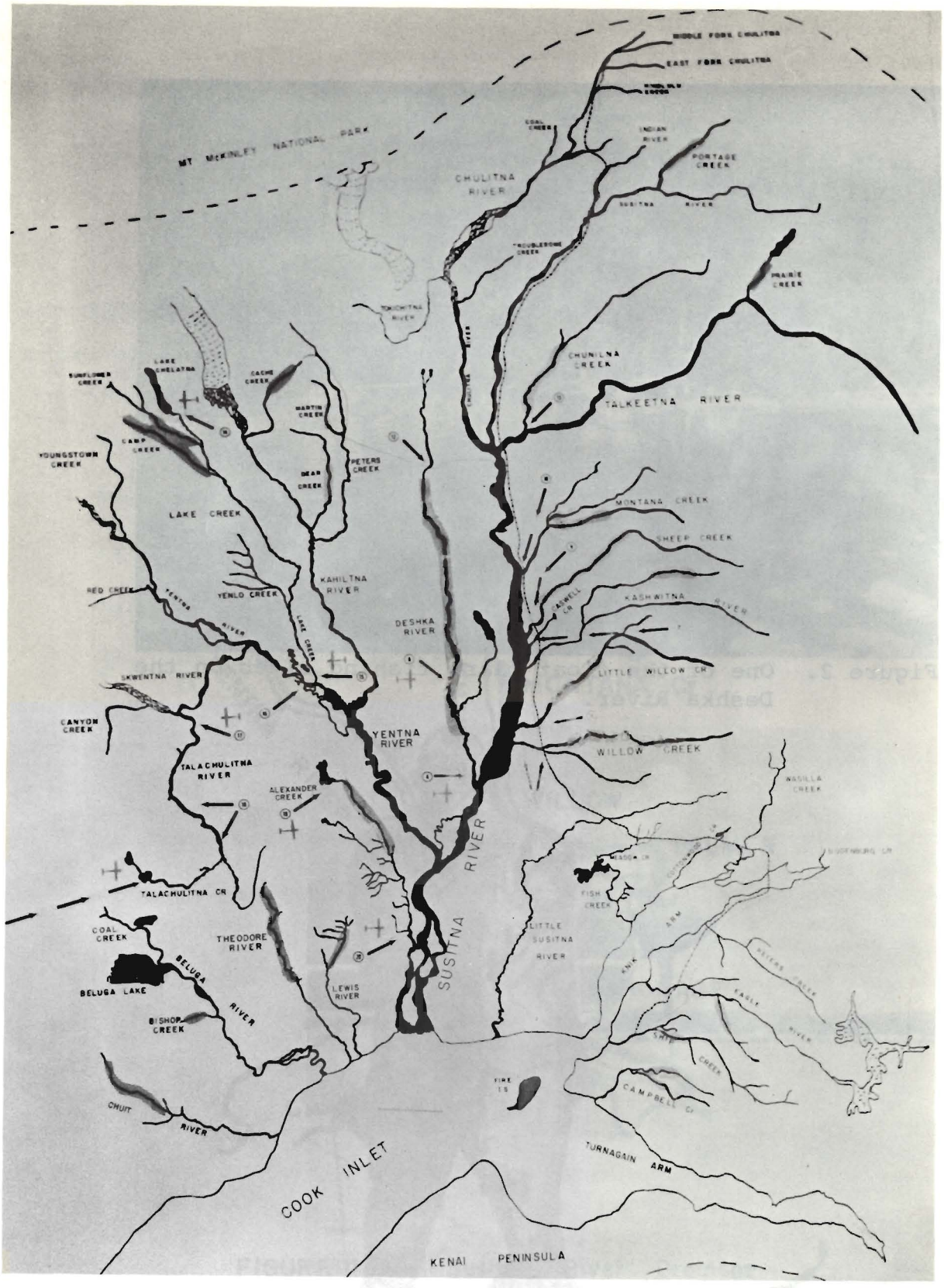

Figure 1. Fishing sites, established float plane landing sites, and spawning areas in the Susitna River Basin.

Figure 2. One of the float plane fishing sites on the Deshka River.

Figure 3. Deshka River king salmon.

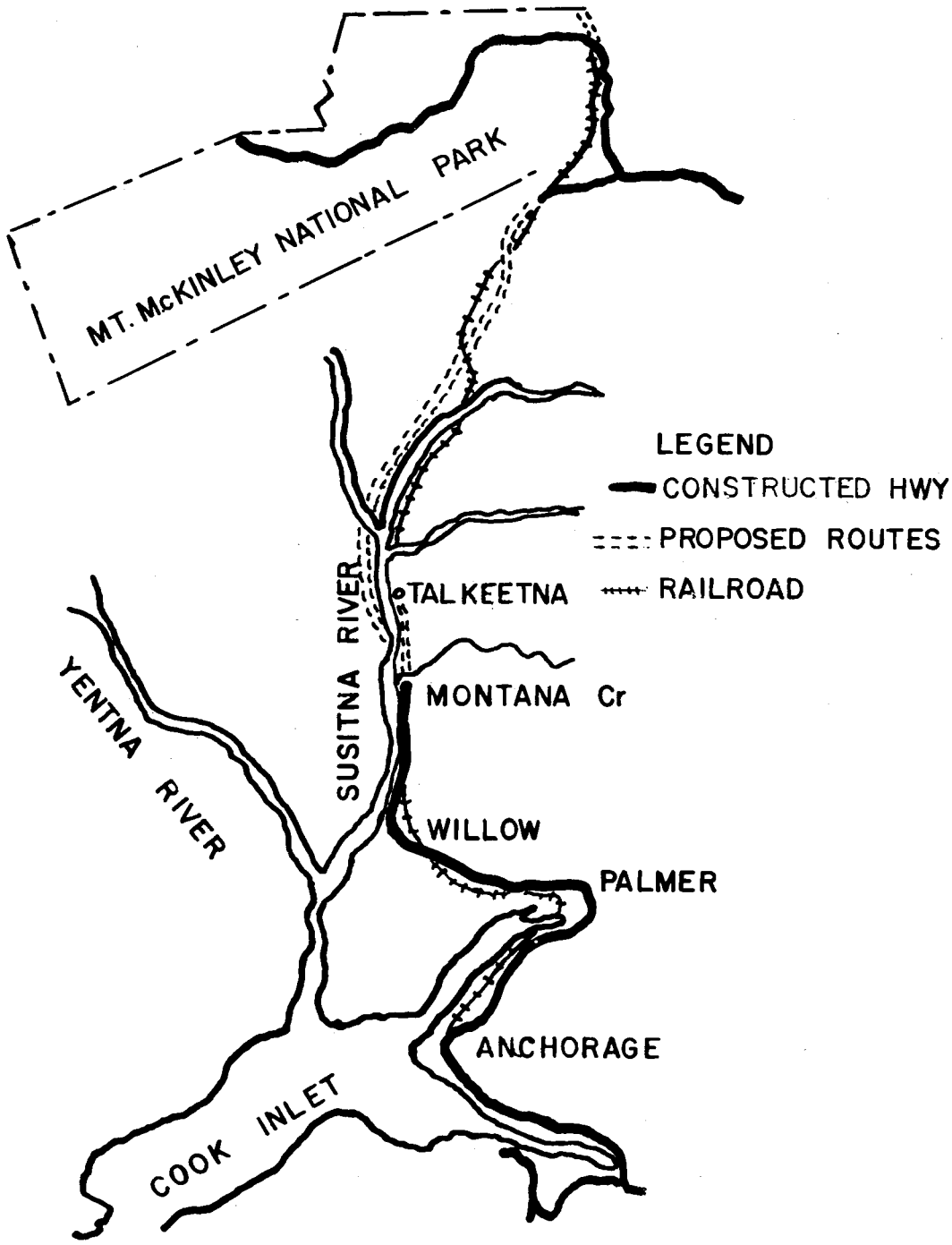

FIGURE 4. — Susitna River Drainage

1961 were taken from Commercial Salmon Catch Statistics. The 1962 figure was obtained from the Commercial Fish Division office in Homer (Table 1). In the 1961 report, the catch record was computed from case pack.

Table 1. Number of king salmon packed in the canneries of Cook Inlet from 1951 to 1962.

Year	King Salmon Catch	Year	King Salmon Catch
1951	187,511	1957	42,647
1952	74,469	1958	22,847
1953	89,429	1959	32,723
1954	65,325	1960	27,536
1955	46,495	1961	19,776
1956	65,309	1962	20,261

During the summer of 1962, a total of 56 streams and rivers were surveyed on the Beluga Lake and the Susitna River Systems. King salmon were observed in 37 of these streams (Table 2). Of these 37 streams, air and ground counts were conducted on 32, and a total of 2,244 king salmon were observed (Table 3).

Streams and dates showing where king salmon were first observed are presented in Table 4.

In comparing data from 13 streams for the years 1961 and 1962, the total count for 1962 was 1,425 while the count for 1961 was 1,025 (Table 5).

During the past two years attempts were made to obtain a total count of king salmon escapement in two different streams. Unfortunately, in both years the run of salmon occurred along with high water and the counting weir was washed out in the

Table 2. Species found in the various streams of the Susitna River Drainage.

STREAM	SPECIES PRESENT									
	Kings	Coho	Pink	Red	Chum	Rb	Gr	DV	Wf	Remarks
Alexander Creek	X	X	X	X	X	X				
Bear Creek	X									
Birch Creek			X	X						
Bishop Creek	X									
Cache Creek	X		X							
Camp Creek	X					X	X	X		
Canyon Creek	X									
Caswell Creek	X					X				
Chuit River	X	X	X							
Chunilna Creek	X		X			X				
Coal Creek of Beluga Lake	X			X						
Coal Creek of Chulitna River	X									
Deshka River	X	X	X			X	X	X	X	
Disappointment Creek										None Observed
Eight Mile Creek (Mouth Only)	X									
Fish Creek above Lake Creek		X				X				
Fish Creek of Croto Slough										None Observed
Fish Creek of Flathorn Lake	X	X	X	X		X			X	
Friday Creek			X							
East Fork Chulitna	X									
Gold Creek						X	X	X		
Goose Creek										None Observed

Table 2. (Con't)

STREAM	SPECIES PRESENT									
	Kings	Coho	Pink	Red	Chum	Rb	Gr	DV	Wf	Remarks
Hiline Creek										None Observed
Honolulu Creek	X					X	X	X		
Indian River	X					X				
Kahiltna River										None Observed
Kashwitna River	X									
Lake Creek	X	X				X	X	X	X	
Lewis River	X		X							
Little Coal Creek										None Observed
Little Willow Creek	X		X		X	X	X		X	
Martin Creek	X									
Middle Fork Chulitna	X					X	X			
Montana Creek	X	X	X		X	X	X	X	X	
Moose Creek of Yentna River		X				X	X			
Pass Creek	X									
Peters Creek	X									
Portage Creek	X									
Prairie Creek	X			X						
Question Creek										None Observed
Rabideux Creek										None Observed
Seven Mile Creek										None Observed
Sheep Creek	X	X	X		X	X	X	X	X	
Shell Creek			X	X		X				

Table 2. (Con't)

STREAM	SPECIES PRESENT									
	Kings	Coho	Pink	Red	Chum	Rb	Gr	Dv	Wf	Remarks
Sucker Creek			X	X		X		X		
Sunflower Creek	X									
Sunshine Creek	X		X			X				Kings in Mouth
Talachulitna River	X	X	X	X		X	X	X		
Talachulitna Creek	X		X	X	X	X				
Theodore River	X		X							
Thursday Creek										None Observed
Trinity Creek			X	X		X	X		X	
Troublesome Creek										None Observed
Willow Creek	X	X	X		X	X	X			
Yenlo Creek	X									
Youngstown Creek	X									

Rb - Rainbow trout DV - Dolly Varden

Gr - Grayling Wf - Whitefish

Table 3. High counts of spawning king salmon in some of the tributaries of Susitna River - 1962

Stream	Date	Observed	No. of Fish
Alexander Creek	July 23	Aerial	19
Bear Creek	July 23	Aerial	9
Cache Creek	July 23	Aerial	4
Camp Creek	July 23	Aerial	34
Canyon Creek	July 27	Aerial	23
Chunilna Creek	July 11	Aerial	70
Coal Creek	July 30	Aerial	5
Deshka River	August 8-11	Ground	998
Eight Mile Creek	July 4	Ground	2
Indian River	July 30	Aerial	28
Lake Creek	July 12	Aerial	10
Little Willow Creek	July 16	Aerial	26
Martin Creek	July 23	Aerial	6
Montana Creek	June 30	Aerial	75
North Fork Kashwitna	July 31	Aerial	19
Pass Creek	July 30	Aerial	15
Portage Creek	July 30	Aerial	27
Prairie Creek	July 30	Aerial	142
Red Creek	July 27	Aerial	11
Sheep Creek	July 16	Aerial	35
Sunflower Creek	July 23	Aerial	19
Sunshine Creek	June 27	Aerial	20
Talachulitna Creek	June 27	Aerial	12
Talachulitna River	July 27	Aerial	78
Willow Creek	July 31	Aerial	71
Yenlo Creek	July 27	Aerial	33
Youngstown Creek	July 27	Aerial	13
TOTAL FOR SUSITNA RIVER AREA			1,955

Table 3. (Con't)

Aerial High Counts of Spawning King Salmon in the Beluga Lake Area

Stream	Date	Observed	No. of Fish
Bishop Creek	August 1	Aerial	6
Chuit River	August 1	Aerial	147
Coal Creek	July 27	Aerial	25
Lewis River	August 1	Aerial	69
Theodore River	August 1	Aerial	42
TOTAL FOR BELUGA LAKE AREA			289
GRAND TOTAL FOR BOTH SUSITNA RIVER AND BELUGA LAKE AREAS			2,244

Table 4. Dates when king salmon were first observed in the various tributaries of the Sisitna River, 1962

Name of Stream	Water Color	Date	Tributary To:
Alexander Creek	Brown	6/9	Susitna River
Bear Creek	Clear	7/23	Kahiltna River
Cache Creek	Clear	7/23	Kahiltna River
Camp Creek	Clear	7/23	Lake Creek
Canyon Creek	Clear	7/27	Skwentna River
Caswell Creek	Clear	7/1	Susitna River
Chunilna Creek	Clear	6/27	Talkeetna River
Coal Creek	Clear	7/30	Chulitna River
Deshka River	Brown	5/23	Susitna River
Eight Mile Creek	Clear	7/4	Talachulitna River
Indian River	Clear	7/11	Susitna River
Lake Creek	Clear	6/5	Yentna River
Little Willow Creek	Clear	7/14	Susitna River
Martin Creek	Clear	7/23	Peters Creek
Montana Creek	Clear	6/11	Susitna River
North Fork Kashwitna River	Clear	7/31	Kashwitna River
Pass Creek	Clear	7/30	Chulitna River
Peters Creek	Clear	8/14	Kahiltna River
Portage Creek	Clear	7/30	Susitna River
Prairie Creek	Clear	7/11	Talkeetna River
Red Creek	Clear	7/27	Yentna River
Sheep Creek	Clear	6/7	Susitna River
Sunflower Creek	Clear	7/12	Lake Creek
Sunshine Creek	Clear	6/27	Susitna River
Talachulitna Creek	Clear	7/27	Talachulitna River
Talachulitna River	Clear	6/21	Skwentna River
Willow Creek	Clear	7/12	Susitna River
Yenlo Creek	Clear	7/27	Lake Creek
Youngstown Creek	Clear	7/27	Yentna River
	BELUGA AREA		
Bishop Creek	Clear	8/1	Beluga River
Chuit River	Clear	8/1	Cook Inlet
Coal Creek	Clear	7/27	Beluga Lake
Lewis River	Clear	8/1	Cook Inlet
Theodore River	Clear	8/1	Cook Inlet

Table 5. Comparison of counts of spawning king salmon in some of the tributaries of the Susitna River for 1961 - 1962.

Stream	Date 1961	No. of Fish	Observed	Date 1962	No. of Fish	Observed
Birch Creek	6/27	80	Aerial		0	Aerial
Camp Creek	7/26	86	Aerial	7/23	34	Aerial
Caswell Creek	7/6	6	Aerial	7/1	few jumpers	Ground
Chunilna River	7/14	300	Ground	7/11	70	Aerial
Deshka River	6/6	18	Ground	8/8-11	998	Ground
Kashwitna River	7/25	15	Aerial		0	Aerial
Little Willow Creek	6/27	112	Aerial	7/16	26	Aerial
Montana Creek	7/13	65	Aerial	6/30	75	Aerial
North Fork Kashwitna	7/25	35	Aerial	7/31	19	Aerial
Sheep Creek	7/6	70	Aerial	7/16	35	Aerial
Sunflower Creek	7/26	16	Aerial	7/23	19	Aerial
Talachulitna River	6/29	32	Aerial	7/27	78	Aerial
Willow Creek	7/6	170	Aerial	7/31	71	Aerial
TOTAL		1,025			1,425	

Deshka River in 1961 and Lake Creek became too turbid to observe fish in 1962. Creel census data was obtained by contacting the fishermen on the streams and from records of various air charter services in the Anchorage area. Service personnel from a military fishing camp on Sheep Creek provided the Department with creel census records in that area.

Information obtained shown that 464 anglers, checked on eight streams in the Susitna Drainage, fished 2,484 hours to catch 352 king salmon, a seasonal rate of success of 0.14 fish per hour (Table 6). Catch records indicate that 89% of the king salmon caught by the sport fishermen were taken from June 9 to July 1 (Figure 5).

Length frequencies of 226 king salmon caught by fishermen were obtained (Figure 6). The mean length was 26.6, with a size range from 8.0 to 46.0 inches. Accurate weights were obtained on 33 fish, with a range of 1.5 to 38.0 pounds, giving a mean weight of 14.5 pounds. A sample of 70 fish was examined for sex and of this number 63 were males and 12 were females.

Lengths, weights and sex were obtained from a random sample of 82 cannery fish. Mean length was 32.2 inches, with a size range from 22.0 to 43.0 inches (Figure 7). The mean weight of this sample was 18.1 pounds and the sex ratio was 41 males to 41 females. This is recognized, as far as lengths, weights and sex are concerned, as a biased sample because of selective mesh sized employed by the fishery. The most salient characteristic of the commercial catch was the absence of "jacks".

A sample of 116 cannery and sport fish caught king salmon checked for age indicated all spent one year in fresh water. Of the 59 king salmon caught by anglers, 22% (13) were 3 years old, 46% (27) were 4 years old, 29% (17) were 5 years old and 3% (2) were 6 years old; while cannery-caught salmon indicated that 32% (18) were 4 years old, 45% (26) were 5 years old, and 23% (13) were 6 years old. In combining both sets of scales, 11% (13 were 3 years old, 39% (45) were 4 years old, 37% (43) were 5 years old and 13% (15) were 6 years old. No females have been found with less than three years of ocean growth while a number of males had 1 and 2 years of ocean growth. All fish

Table 6. Summary of creel census data of the various streams during 1962, Susitna River Drainage.

Stream	Species								Hours Fished For Kings	Total Hours Fished	Catch of all Fish Per Hr.	Catch of King Salmon Per Hr.	
	Kings	Coho	Pink	Chum	Rb	Gr	Wf	DV					Total Fish
Alexander Cr.	33	1414	18	23	113		14		182	2200	.73	.18	1615
Caswell Cr.	54				2				195	195	.27	.28	56
Chuit R.		35	6		21			21		79	1.06		83
Deshka R.	142	469	17		194	28	28		1049	1921	.45	.13	873
Lake Cr.	44	28			37	31	5	1	256.5	310	.49	.17	146
Little Susitna R.		27								68	.4		27
Little Willow Cr.						10				2	5.0		10
Montana Cr.	24		15	2	29	16	3	1	267	327	.27	.09	90
Sheep Cr.	54	5	1	1	13	28	6	8	476	546	.2	.11	116
Talachulitna R.	1	8			130				36	69	2.0	.03	139
Willow Creek	3			1					24	26	.15	.12	4
TOTALS	352	1986	57	27	539	113	51	31	2484	5743			3159

Rb - Rainbow trout Gr - Grayling Wf - Whitefish DV - Dolly Varden

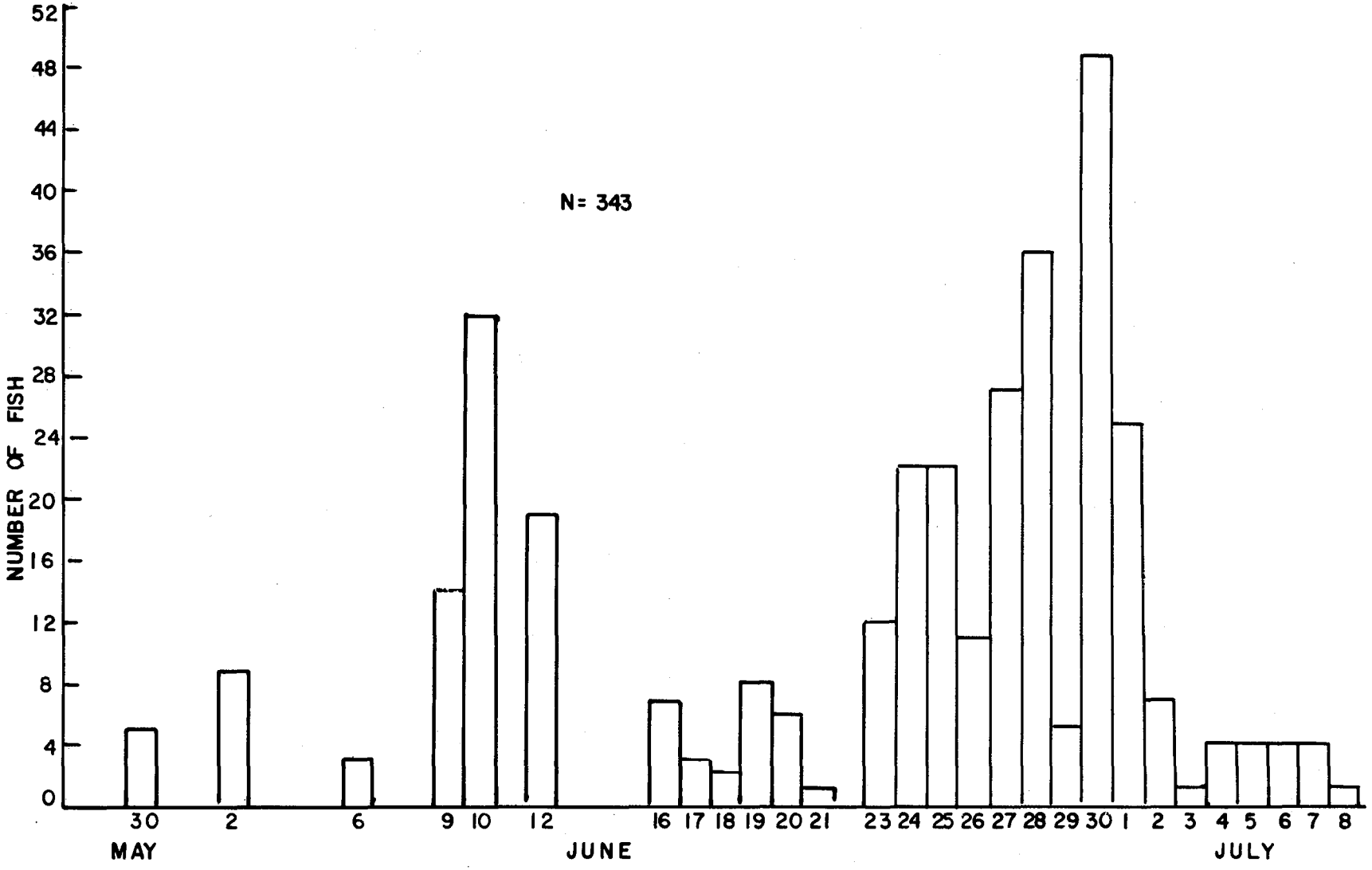

FIGURE 5.— Catch per day of king salmon on eight streams of Susitna River Drainage, 1962

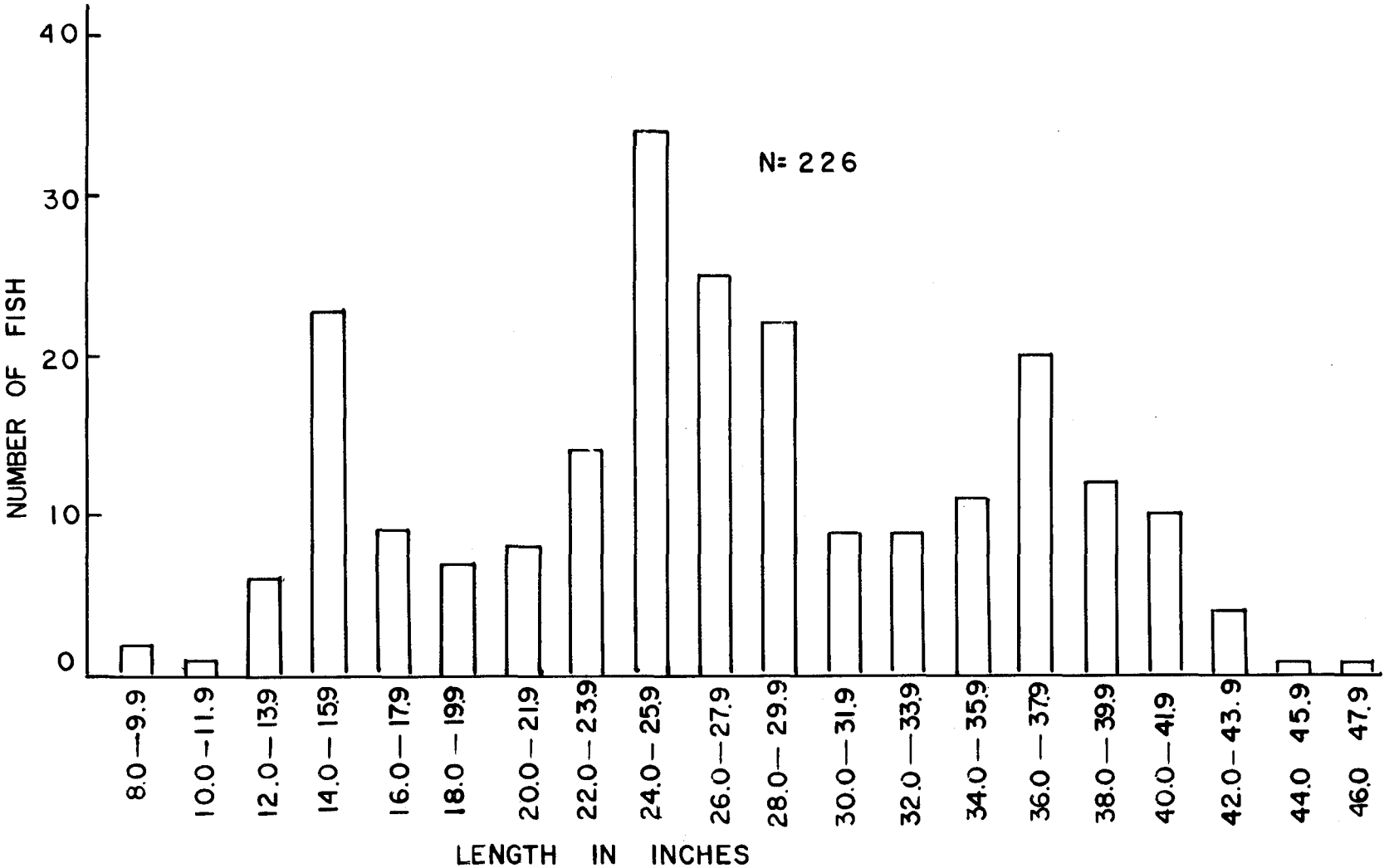

FIGURE 6.—Length frequencies of king salmon caught in the Susitna River Drainage, 1962

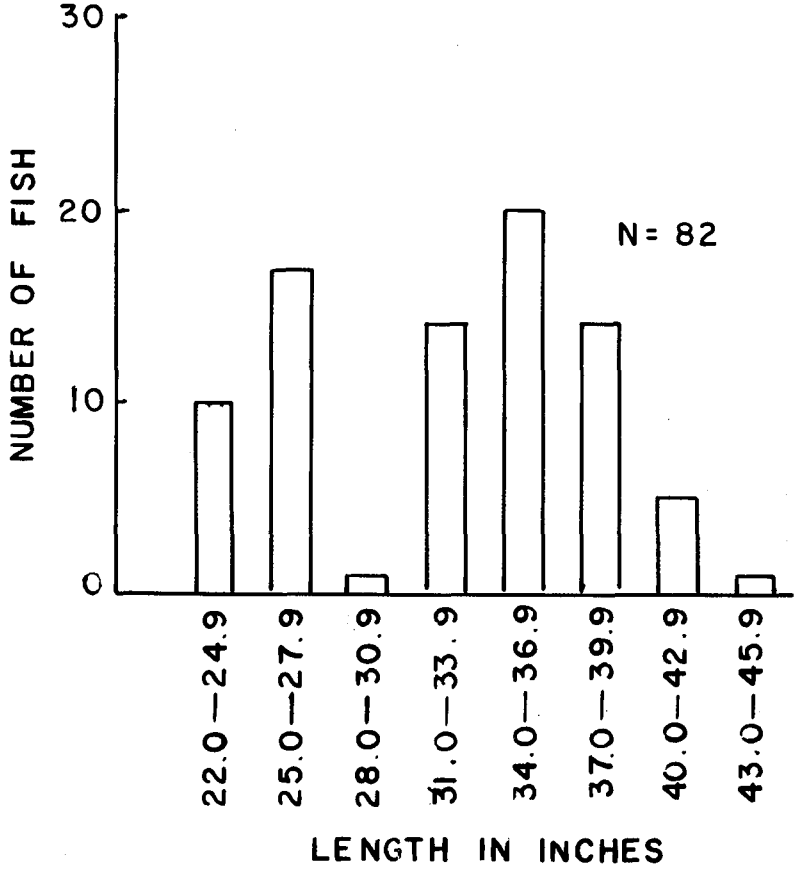

FIGURE 7.— Length frequencies of king salmon from Emards cannery, 1962

3 and 4 years old were males. Fish and Wildlife Service and the Alaska Department of Fish and Game, on aging of Cook Inlet king salmon, indicated the majority of the sampled fish to be 4 and 5 years old respectively.

While surveys were made chiefly to observe king salmon on the spawning grounds, catch records of other fish species found in the streams were recorded. Partial creel census data indicated that 1,986 silver salmon were taken on seven tributaries of the Susitna River. A total of 1,414 (Figure 8) were taken from Alexander Creek and 470 (Figure 9) from the Deshka River. Since the emphasis was placed on king salmon in this project, data on silver salmon is limited, but it should be noted that there is an important silver salmon fishery in the area. A total of 145 silver salmon were measured for lengths. A mean length was 22.6 inches, with a size range from 18.0 inches to 27.6 inches (Figure 10).

The rainbow trout caught averaged 12.5 inches, with a size range from 4.0 inches to 22.0 inches (Figure 11). The grayling caught had a mean length of 10.6 inches, with a range of 6.0 inches to 18.0 inches (Figure 11).

Both the common (Coregonus clupeaformis) and round whitefish (Prosopium cylindraceum) are found in the Susitna River System.

Four streams were sampled on foot in an attempt to get sex ratio and length frequency information from king salmon on the spawning grounds. Only two streams were found to have spawned-out king salmon. A total of 17 fish were examined averaging 31.9 inches, of which eleven were females and six were males. Inaccessibility of the other spawning areas by riverboat and plane prevented the collecting more data.

An attempt was made to sample downstream migrants with a beach seine on the Deshka River. Silver salmon smolts, sculpins, and stickleback were taken. Seining did not prove feasible so was discontinued as a sampling device.

Time and lack of proper equipment prevented sampling of numbers and distribution of king salmon spawning in glacial areas.

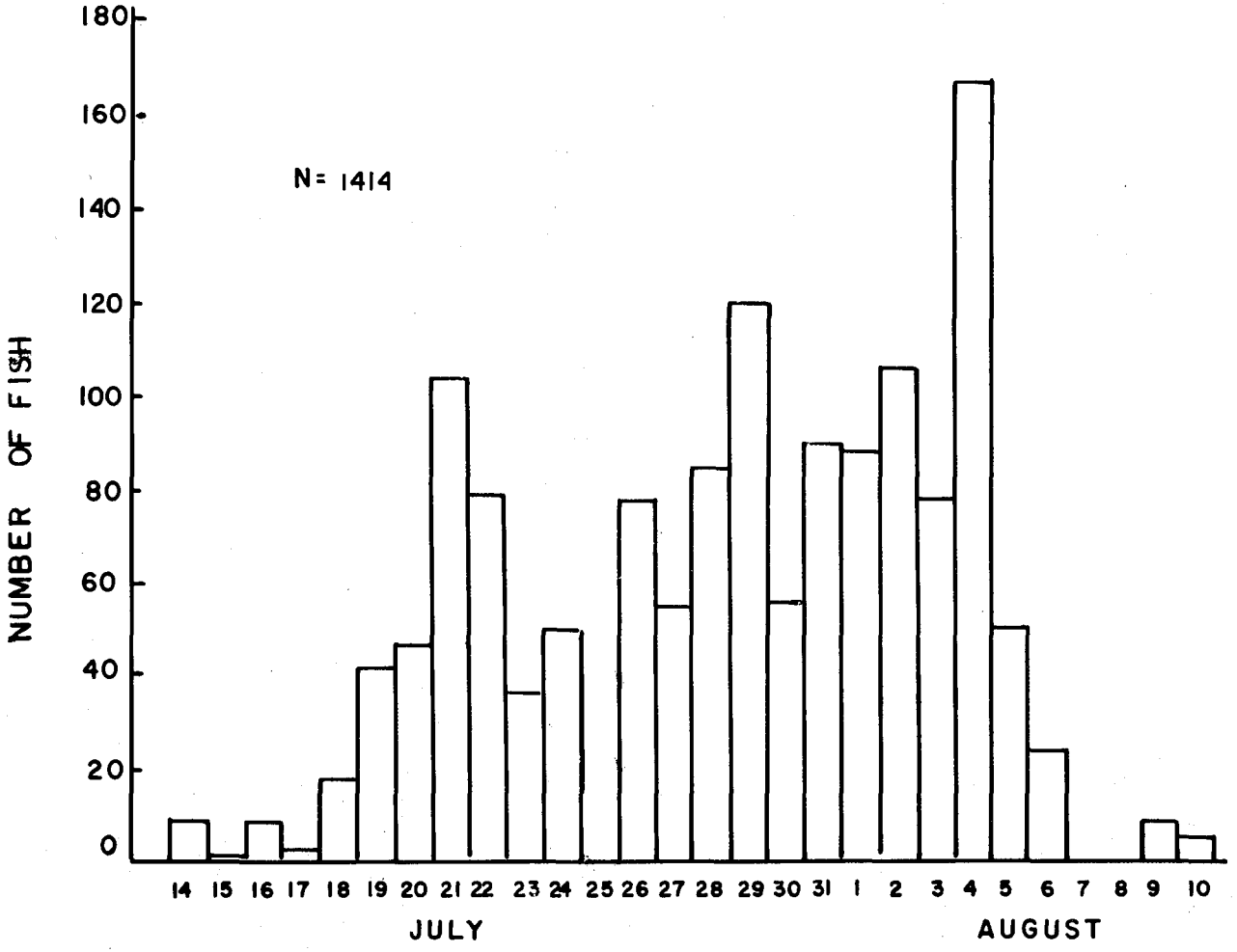

FIGURE 8.—Catch per day of silver salmon in Alexander Creek, 1962

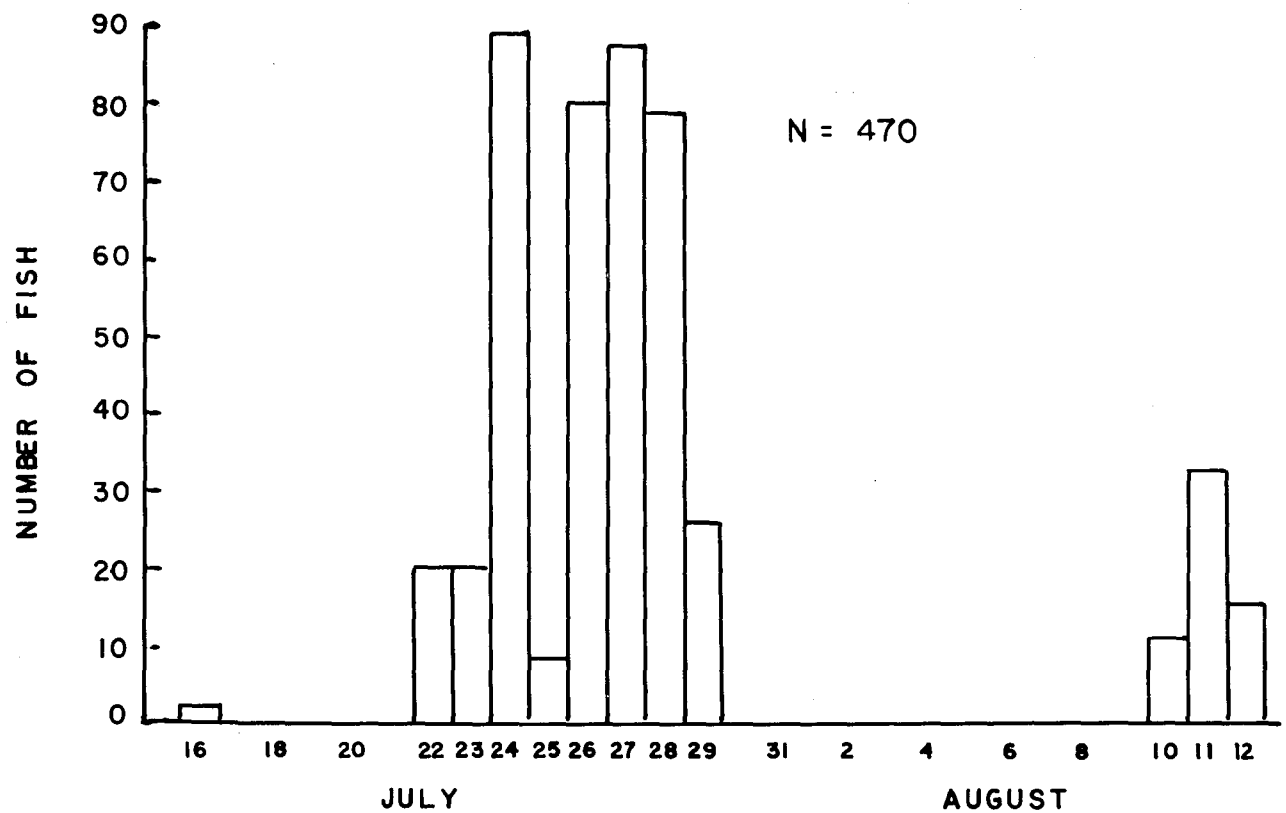

FIGURE 9.— Catch per day of silver salmon in the Deshka River, 1962

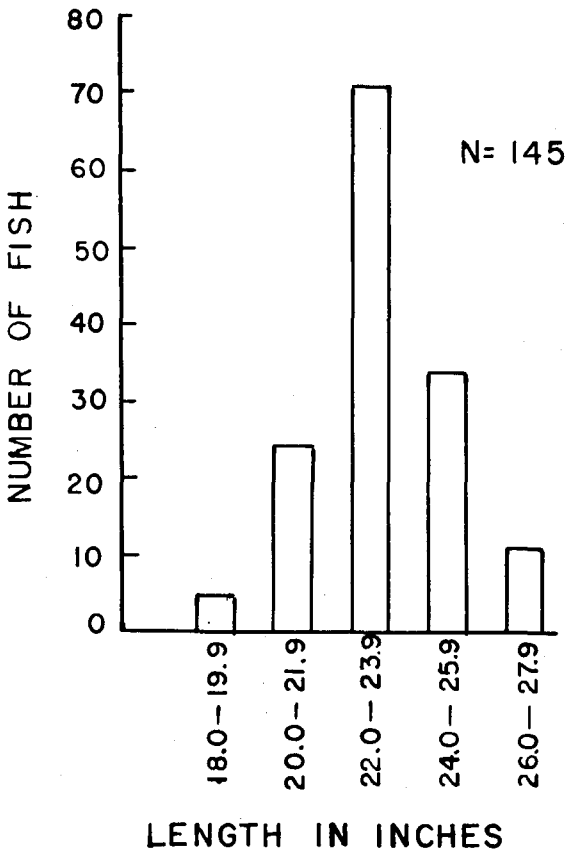

FIGURE 10.—Length frequency of silver salmon caught in Susitna River Drainage, 1962

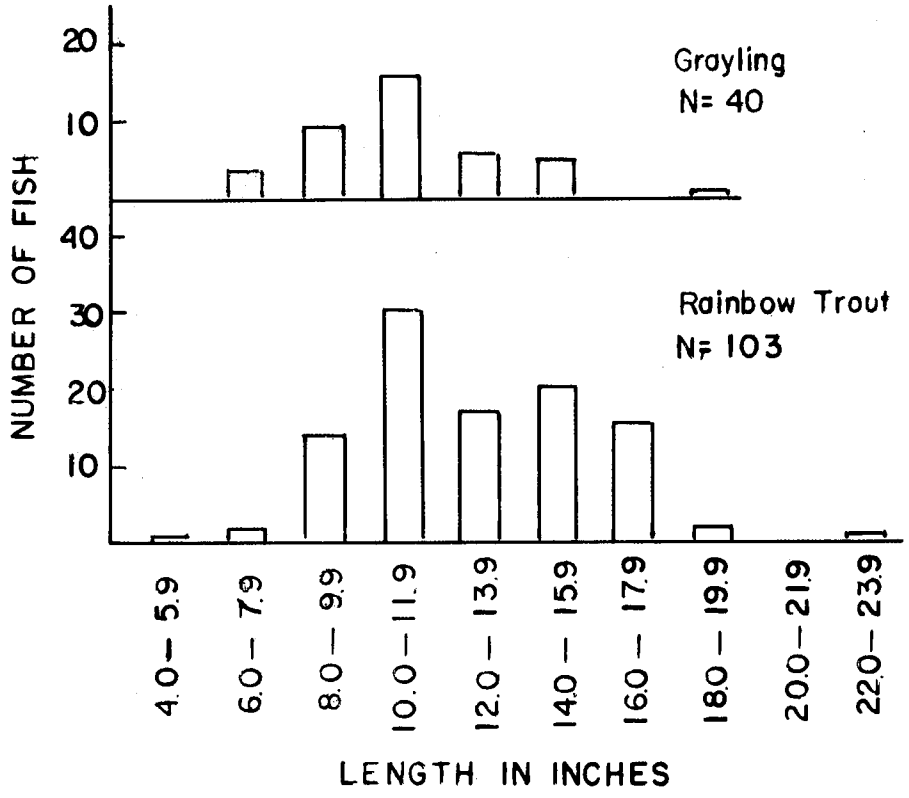

FIGURE 11. — Length frequency of grayling and rainbow trout caught in Susitna River Drainage, 1962

The 24-foot riverboat used for this study proved very capable on a good share of the streams but in narrow and shallow creeks was not usable and prevented obtaining additional data on these spawning grounds (Figure 12).

Other species of fish found in the various streams of the Susitna River Drainage are presented in Table 2.

In checking four air charter services in the Anchorage area, a total of 496 fishermen spent $12,537.00 for transportation costs to fish for king salmon from May 28 to July 8. Six charter services reported that 559 anglers paid $12,911.00 to fish for other species after the closure of the king salmon season on July 8.

There has been considerable controversy concerning the decline of king salmon stocks in Cook Inlet. Excessive harvest by sport anglers has been blamed in many instances for part of this decline. Yet, in areas such as the Chuit, Theodore, and Lewis Rivers where there is virtually no sport fishing for the king salmon, aerial surveys found the numbers of salmon to be small and scattered.

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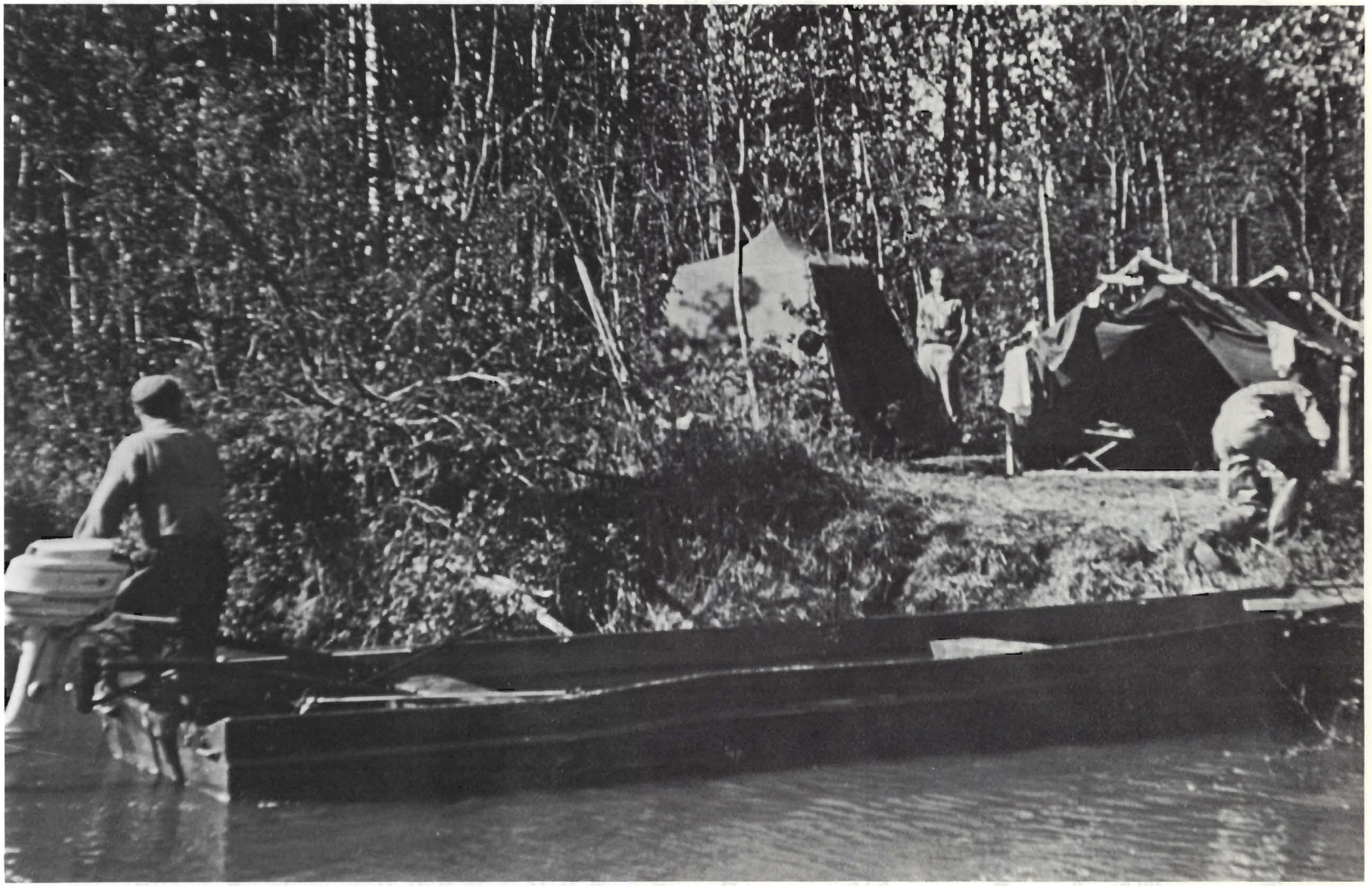

Figure 12. The riverboat that was used on the project.

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Date: March 15, 1963

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