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STATE OF ALASKA

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ANNUAL REPORT OF PROGRESS, 1960-1961

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-2

SPORT FISH INVESTIGATIONS OF ALASKA

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Introduction

This report of progress consists of the Job Completion Reports from the State of Alaska's Federal Aid in Fish Restoration Project F-5-R-2, "Sport Fish Investigations of Alaska".

The current Project is composed of eighteen separate studies and were designed to evaluate the various aspects of the State's recreational fisheries resources. The information gathered will provide the necessary background data for the development of future programs. During the current segment continued emphasis was placed on overall inventorying of accessible waters and the evaluation of general catch data.

Several problems of immediate concern appeared sufficiently defined to warrant independent studies. As a result, two independent creel censuses, one experimental silver salmon egg take and a Resurrection Bay area silver salmon population study were instigated. Data accumulated from prior jobs dealing with the Arctic grayling has resulted in the formulation of three separate investigations during the current segment.

The rapid expansion of Alaska's population is being reflected in the ever increasing numbers of "No Trespassing" signs encountered in the vicinity of population centers. Fortunately, much of Alaska's fishing waters are still in the public domain. An aggressive program of acquiring access to fishing waters, instigated in 1959, was continued during the present segment. Increased emphasis is being placed on this job and the successful continuation of this activity, now and in the immediate future, will forestall many of the serious recreational use problems currently facing other states.

The enclosed progress reports are fragmentary in many respects and the interpretations contained therein are subject to re-evaluation as the work progresses.

ANNUAL REPORT OF PROGRESS
INVESTIGATIONS PROJECT
COMPLETION OF 1960 - 1961 SEGMENT

State: ALASKA

Project No: F-5-R-2 Name: Sport Fish Investigations
of Alaska

Job No: 1-E Title: Inventory and Cataloging of
Sport Fish and Sport Fish
Waters of the Copper River
and Prince William Sound
Drainages

Period Covered: July 1, 1960 to May 15, 1961.

Abstract:

Initial activities under Job 1-E were concentrated along the sparsely populated but well-traveled highway system in the Copper River Drainage. A total of 45 lakes and 11 streams were surveyed. Prince William Sound Drainages received no survey work during this segment. Standard survey techniques were utilized, including extensive population sampling to determine the resident and anadromous fishes present.

Aerial surveys were conducted for familiarization and orientation of waters in the area and information gathered was used to outline the work program.

The waters surveyed and the results of test netting are tabulated. They do not include aerial surveys or surveys of a general reconnaissance nature.

Recommendations for intensive management of specific waters await the result of access negotiations now underway.

A general description of the Copper River drainage is included in this first report of progress.

Objectives:

To conduct lake and stream surveys and evaluate the extent, the potential and the current use of waters available to anglers of the area.

To investigate the sources for providing a supply of trout, char, salmon and grayling eggs for experimental hatching and rearing.

Introduction:

Active field work on Job No. 1-E commenced July 1, 1960. Initial progress was hampered somewhat by lack of field equipment due to the recent establishment of the district. In addition to reconnaissance and orientation, a survey of the anadromous fishes in the drainages was started immediately. Since information of importance to the Commercial Fisheries Division was being obtained, they supplied two of the 3-man survey crew; supervision was under Job No. 1-E.

The Copper River Basin has a population of about 650 people, most of whom live in the principal settlements of Glennallen, Copper Center, Gulkana, Gakona, Paxson and Chitna. The balance reside at lodges and service enterprises along the highway and scattered residences throughout the basin. The population includes both whites and Athabascan Indians.

The Copper River Basin, ranging from 500 to over 4,000 feet above sea level, is an intermountain basin rimmed by the peaks of Chugach, Alaska, Talkeetna and Wrangell Mountains, Figure 1. The Copper River rises at the foot of the Copper Glacier on the north slope of the Wrangell Mountains at an elevation of about 3,700 feet and flows a circuitous course 265 miles to the Gulf of Alaska. Drainage area is about 21,000 square miles from which the annual run-off is approximately 24,000,000 acre feet, equivalent to a uniform flow of 33,000 cubic feet per second. Fourteen major tributaries drain into the Copper River along with numerous streams and creeks.

The Copper River Basin has a typical arctic continental weather regime with mild to warm summers and severe winters.

(U. S. Weather Bureau, 1954). Periods occur occasionally during the winter when daily minimum and maximum temperatures range between 50° and 20° F. below zero. They may last two weeks or more. In summer, daily maximum temperatures usually range from 60° to 70° F. but occasionally reach peaks in the high eighties. Although daily minimums average in the low forties, freezing temperatures have been recorded for every month of the year, though not during the same year. The average date of the last spring freeze is June 5 and that of the first fall freeze is August 12, giving a general frost-free period of about 67 days. The mean maximum temperature is 37.3° F. and the mean minimum is 16.6° F. The mean annual temperature is 27.2° F. Mean annual precipitation is 11.7 inches and the mean annual snowfall is 48.6 inches, though there is seldom more than two feet of snow on the ground at any one time.

Seasonal variation in the amount of daylight in the Copper River Basin is sufficient to modify survey operations. Figure 2 shows the approximate monthly variation for the area. There are almost 20 hours of daylight in June, about five hours in December, and over ten hours in late February.

The Copper River Basin is in a zone of discontinuous permafrost. In the unconsolidated deposits permafrost starts one or two feet below the surface. If present at all, permafrost is deeper than five feet beneath channels of small, permanent streams. Beneath lakes and in the grass or sedge marshes that border lakes, permafrost generally is deeper than five feet. (Personal Communication, O. A. Ferrians, USGS).

The Copper River Basin enjoys an extensive road system throughout. The Glenn, Richardson and Slana-Tok Highways provide approximately 350 miles of two-lane paved highway. These highways connect such population centers as Fairbanks, Anchorage and Valdez. The major portion of all auto-traveling tourists pass through the entire Copper River Basin, and constitutes a large portion of the summer angling pressure in the region. There are few secondary roads along this lightly populated highway system. Approximately 100 miles of graveled roads afford additional access to fishing streams and lakes during the summer.

Techniques:

Inventory and cataloging work were started July 1 in the Copper River Drainage. All roadside lakes and lakes within one-half mile of the highway system were surveyed. Standard survey methods were employed to gather physical data, which included such characteristics as depth, barriers and bottom types of the lakes and tributary streams. Graduated mesh experimental gill nets were used to determine the resident and anadromous fishes present and to collect age and growth data.

Lakes were assessed for potential sport fish value and recreation and public use sites were noted. This information was forwarded to the access biologist for processing.

Some lakes, streams and rivers not adjacent to the road system were surveyed by float plane or back-pack trip to evaluate the potential sport fishery available to the anglers and the amount of spawning and rearing area.

Indian fish-wheels along the Copper River were repeatedly contacted for information concerning species composition in the different tributaries; time and intensity of runs; and to substantiate the records kept by the operators of the fish-wheels.

Due to the lack of equipment, chemical analysis of waters in the area include only dissolved oxygen determinations of a selected group of marginal grayling lakes.

Findings:

Both the resident and anadromous fishes enter into the sport fishery of the Copper River Basin. Resident fishes of the area include the following: Grayling-Thymallus arcticus (Pallas), Lake Trout-Salvelinus namaycush (Walbaum), Rainbow Trout-Salmo gairdneri Richardson, Burbot-Lota lota (Linnaeus), Lake Whitefish-Coregonus clupeaformis (Mitchill), Round Whitefish-Prosopium cylindraceum (Pallas), and the Longnose Sucker-Catostomus catostomus (Forester).

The subsistence fishery is, perhaps, peculiar to Alaska. It is a legal, unlicensed fishery permitting individuals to take fish for food but not for sale or barter. Restrictions are gradually increasing but it will be an accepted means of taking fish for many years to come in isolated areas.

Grayling and lake trout are the principle fishes that enter the sport fishery at the present time. Anadromous fish found in the Copper River Basin during the past season include three species of salmon, the king salmon-Oncorhynchus tshawytscha (Walbaum), silver salmon-Oncorhynchus kisutch (Walbaum), and the red salmon-Oncorhynchus nerka (Walbaum). Chum salmon-Oncorhynchus keta (Walbaum), and pink salmon-Oncorhynchus gorbuscha (Walbaum) were reported as being taken in the subsistence fishery but none were observed. Only the king salmon enter the sport fishery at the present time, but this is a very limited fishery located on the Little Tonsina River and portions of the Gulkana River. Grayling fishing is at its peak in early spring immediately following ice breakup. At this time the grayling are at the height of the spawning migration and are available in practically all streams with flowing water. After the spring runoff many of the creeks are too shallow or are completely dry and will not afford grayling fishing again until the fall rains increase the water level and the grayling begin their downstream migration. During the summer months grayling may be taken in the perennial streams or in the headwaters of the intermittent streams and larger lakes.

Lake trout fishing is at its best in the spring and fall when the fish are congregated in the shallow water. Very good lake trout fishing is experienced throughout the summer by fishermen equipped for deep-water trolling in Crosswind, Paxson, Summit and Seven Mile lakes.

Rainbow fishing is enjoyed in two small roadside lakes, Tex Smith and Blueberry lakes. These lakes have been stocked by the Alaska Department of Fish and Game and provide many hours of angling each year. Indigenous populations of rainbows are widely scattered throughout the area. Teabay Lake is the only lake known at the present time to sustain an exceptional rainbow fishery. The Gulkana River below Paxson

Lake and Mendeltna Creek afford good to excellent rainbow fishing at certain periods during the summer months. Hanagita River below Hanagita Lake produces some very fine steelhead trout during the month of September. Other steelhead runs are known to occur in the Gulkana and Tazlina rivers, but the timing is not known at the present time.

Burbot enter the sport fishery in the winter months. Sizeable catches of these fish are made in Crosswind, Leila, Paxson and Summit lakes. The whitefish do not enter the sport fishery in the Copper River District. Although they are plentiful and of sufficient size to warrant a sport fishery, the availability of game fish and the lack of know-how to take whitefish on angling gear erases all desire to try for them.

The natives and other people living adjacent to the Copper River depend to a certain extent on the salmon runs for their winter food supply and for dog food. To meet this demand a subsistence fishing permit is issued by the Alaska Department of Fish and Game. The permittee is required to record species, number and time fish are taken. During the 1960-1961 season 35 subsistence permits were issued for the Upper Copper River drainage. Salmon are mainly taken by the use of fishwheels and dip nets, under the authority of these permits. Seventeen fishwheels operated at one time or another throughout the summer season in the Copper River Basin. A total of 7,182 fish were taken for subsistence purposes during 1960. Of this amount, fishwheels accounted for 4,404 and dip nets 855. The species taken and monthly totals are shown in Table 1. Whitefish and burbot also enter the subsistence fishery but the numbers taken are not known due to the lack of permit requirement for these species.

To date spawning area investigations have not been completed. Many potential sources for providing a supply of trout, char, salmon, and grayling eggs were noted, but further field investigation is needed in all areas. Red salmon were observed spawning in the following watersheds: Tonsina, Klutina, Tazlina, Gulkana, Chistochina, Slana, Tanada, and Chitna. King salmon were observed spawning in Tonsina, Klutina, Tazlina, Gulkana, Chistochina, Ahtell, Tanada, and Chitina watersheds. Silver salmon were observed

in the Klutina and Tonsina watersheds. Location for possible egg-taking sites on the above watersheds will be further investigated during the coming segment of the project.

A rainbow trout egg-taking source was located at the mouth of the Teabay River, with spawning activity commencing about the tenth of June and lasting for a period of ten days to two weeks. A pilot egg-take will be attempted in June of 1961.

Grayling spawn is available in any of the perennial streams throughout the Copper River drainage immediately following ice breakup. Total assessment of the size and magnitude of grayling runs in specific streams will be continued during the coming year. Possible areas for obtaining yearling grayling in appreciable numbers are being investigated. These areas are located in watersheds not accessible to the angler and may provide an ample source of grayling stock for experimental plantings.

Recommendations:

Based on available data, it is recommended that:

- 1). The inventory and cataloging program be continued to further augment available data.
- 2). Increased emphasis be placed on acquiring additional information on readily accessible waters.
- 3). A program be initiated to erect road signs indicating sport fishing lakes and lake trails, and some additional means of informing the public be devised.
- 4). Investigations for suitable egg-take sites be continued and that pilot egg-takes on rainbow trout and grayling be conducted.
- 5). Presently non-productive but suitable roadside waters be prepared for intensive management (rehabilitation and/or stocking).

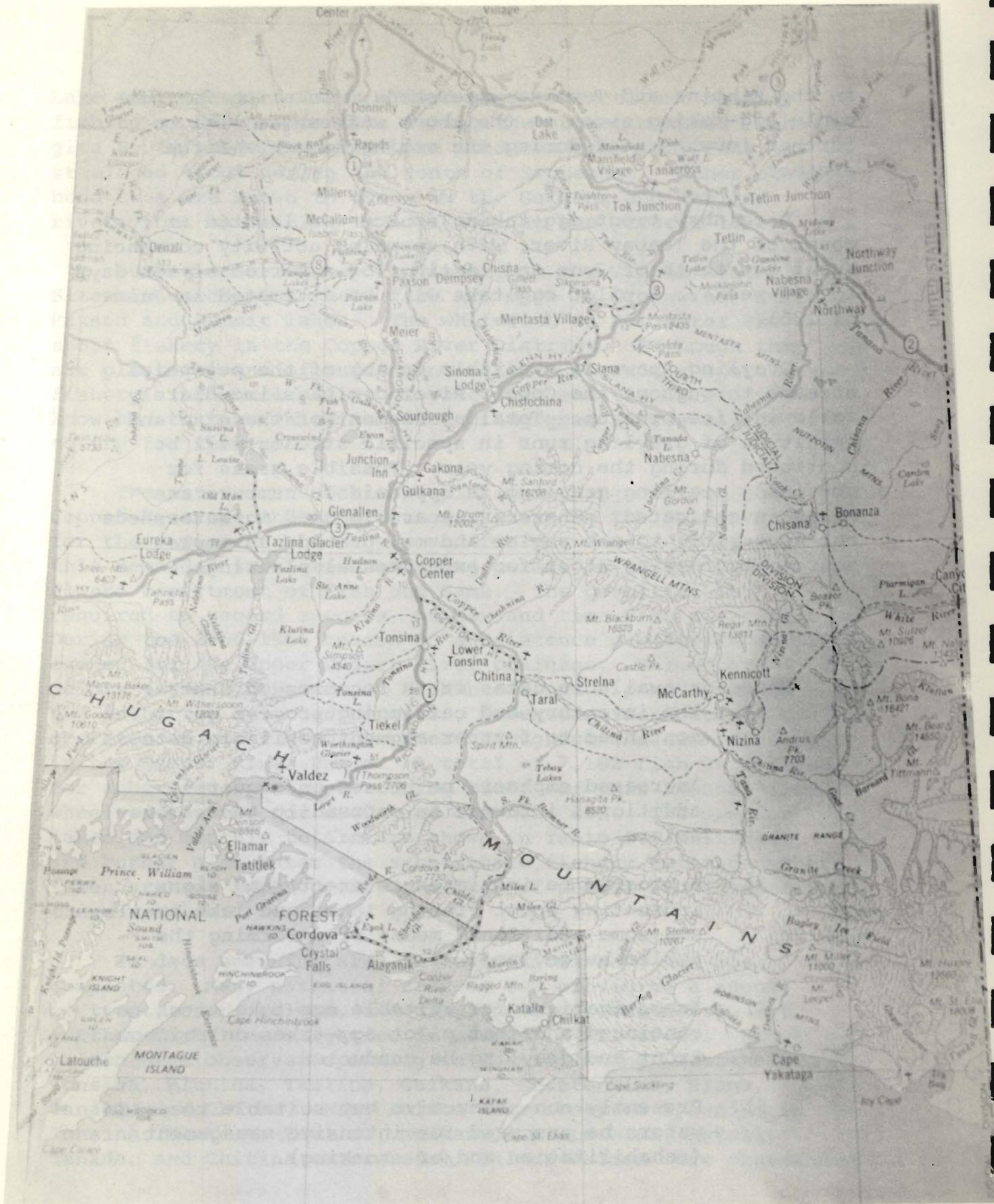


Figure 1. Portion of State of Alaska showing area of investigation of Project F-5-R-2, Job No. 1-E

Figure 2. Approximate Monthly Variation in Daylight in the Copper River Basin.

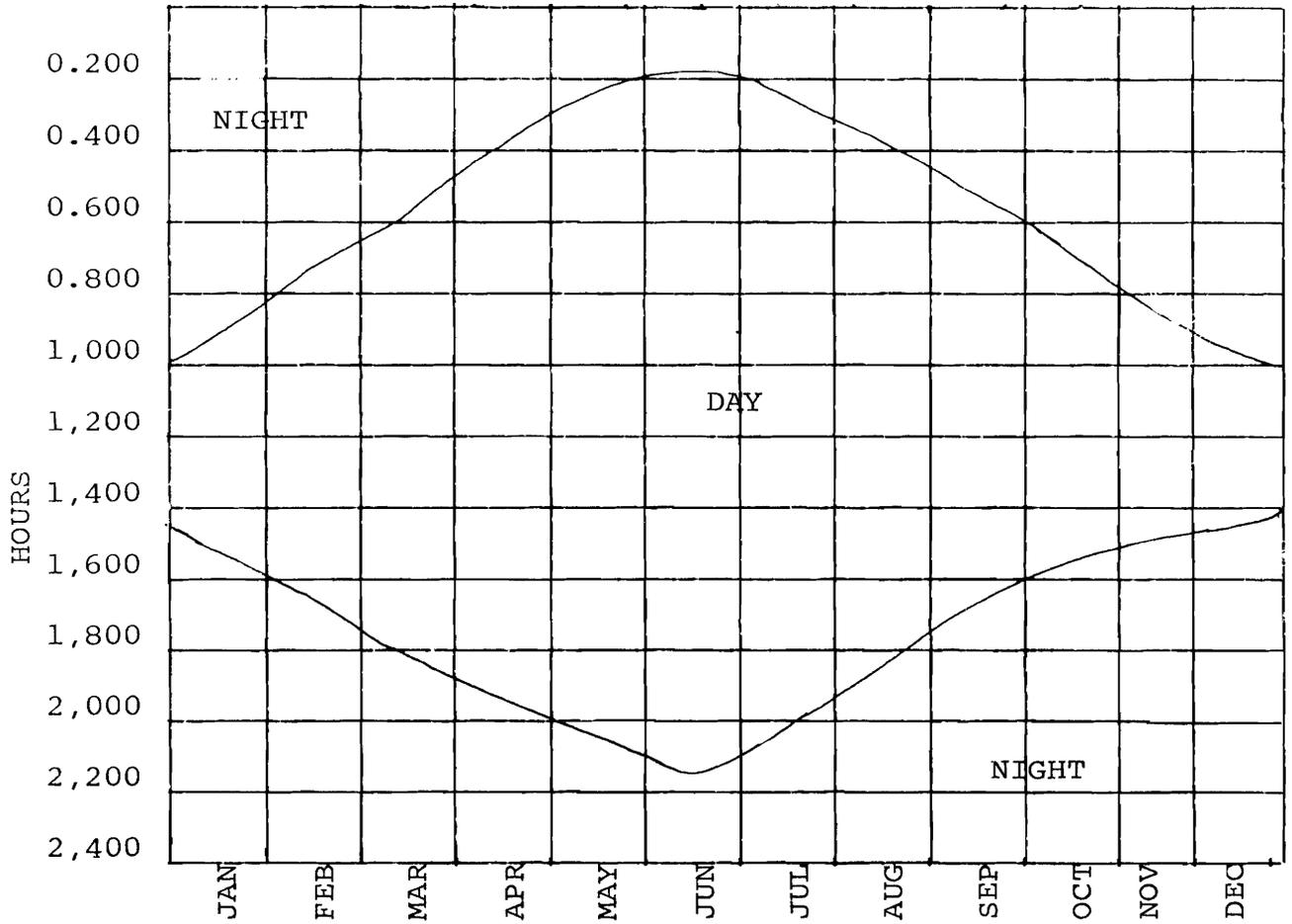


Table 1. Subsistence Fishing Upper Copper River 1960.

Month	Gear	Red Salmon	King Salmon	Chum Salmon	Silver Salmon	Pink Salmon	White- Fish
June	Dip net	188	4		7	127	100
	Fishwheel	767	2				
	Unknown	1480	90				
July	Dip net	514	4				
	Fishwheel	2081	29		7	40	
August	Dip net	153	2				
	Fishwheel	1556	5				
Sept.	Fishwheel			15	11		
Subtotal	Dip net	855	10		7	127	100
	Fishwheel	4404	36	15	18	40	
	Unknown	1480	90				

Totals		6739	136	15	25	167	100
TOTAL							7,182

Table 2. Lakes Surveyed Under Project No. F-5-R-2.
Job No. 1-E.

Name	Location	Legal Description	
		Long.	Lat.
Alabama Lake	Mi. 147 Glenn. Hwy.	62' 2"	146' 42"
Arizona Lake	Mi. 156 Glenn. Hwy.	62' 3"	146' 27"
Bear Cub Lake	Mi. 70 Slana Tok. Hwy.	62' 47"	143' 48"
Big Twin Lake	Mi. 27 Nebesna Rd.		
Blueberry Lake	Mi. 23 Richardson Hwy.	61' 5"	146' 10"
Crosswind Lake	Fly-in	62' 20"	146' 00"
Dakota Lake	Mi. 35 Chitna Rd.	61' 26"	144' 26"
Eureka Rd. House Lk.	Mi. 128 Glenn. Hwy.	61' 56"	147' 10"
Fish Lake	Mi. 151 Glenn. Hwy.	62' 3"	146' 32"
Frank & Jerry Lake	Mi. 149 Glenn. Hwy.	62' 2"	146' 38"
Gergie Lake	Mi. 155 Glenn. Hwy.	62' 2"	146' 28"
Grizzly Lake	Mi. 53 Slana Tok. Hwy.	62' 46"	144' 12"
Hanagita Lake	Fly-in	61' 14"	143' 47"
High Lake	Fly-in	61' 51"	146' 21"
Junction Lake	Mi. 156 Glenn. Hwy.	62' 5"	146' 21"
Jack Lake	Mi. 28 Nabesna Rd.		
Kenny Lake	Mi. 12 Chitna Rd.	61' 46"	144' 56"
Lee's Lake	Mi. 158 Glenn. Hwy.	62' 5"	147' 24"
Leila Lake	Mi. 121 Glenn. Hwy.	61' 46"	147' 27"
Long Lake	Mi. 22 Nabesna Rd.		
Lost Cabin Lake	Mi. 166 Glenn. Hwy.	62' 4"	146' 11"
Mae West Lake	Mi. 169 Glenn. Hwy.	62' 5"	146' 4"
Mentasta Lake	Mi. 82 Slana Tok Hwy.	62' 55"	143' 47"
Moose Lake	Mi. 170 Glenn. Hwy.	62' 9"	146' 6"
Old Man Lake	Mi. 151 Glenn. Hwy.	62' 7"	146' 40"
One Mile Lake	Mi. 38 Chitna Rd.	61' 32"	144' 26"
161 Mile Lake	Mi. 161 Richardson Hwy.	62' 42"	145' 29"
165 Mile Lake	Mi. 165 Richardson Hwy.	62' 45"	145' 28"

Table 2. (Cont'd.) Lakes Surveyed Under Project No. F-5-R-2.
Job No. 1-E.

Name	Location	Legal Description	
		Long.	Lat.
Pippin Lake	Mi. 83 Richardson Hwy.	61' 45"	145' 10"
Railroad Lake	Mi. 9 McCarthy Route.	61' 31"	144' 7"
Robe Lake	Mi. 3 Richardson Hwy.	61' 5"	146' 10"
Seven Mile Lake	Mi. 7 Denali Rd.	63' 6"	145' 38"
Snowshoe Lake	Mi. 147 Glenn. Hwy.	62' 3"	146' 42"
Summit Lake #1	Mi. 25 Richardson Hwy.	61' 8"	145' 43"
Summit Lake #2	Mi. 23 Richardson Hwy.	61' 7"	145' 42"
Suzie Lake	Mi. South of Chitna.	61' 31"	144' 26"
Tazlina Glacier Lodge			
	Lk. Mi. 157 Glenn Hwy.	62' 4"	146' 26"
Teabay Lake	Fly-in	61' 14"	144' 25"
Tex Smith Lake	Mi. 161 Glenn Hwy.	62' 6"	146' 17"
Tolsona Lake	Mi. 170 Glenn Hwy.	62' 7"	146' 4"
Two Mile Lake	Mi. 37 Chitna Rd.	61' 33"	144' 26"
Town Lake	Mi. 39 Chitna Rd.	61' 30"	146' 15"
Upper Kaina Lake	Fly-in	61' 42"	146' 15"
Van Lake	Mi. 9 McCarthy Route	61' 31"	144' 7"
Willow Lake	Mi. 88 Richardson Hwy.	61' 48"	145' 10"
Zero Lake	Mi. 35 Chitna Rd.	61' 34"	144' 26"

Table 3. Streams Surveyed Under Project F-5-R-2.
Job No. 1-E

Name	Length Miles	USGS 1:250,000 quad that Stream Heads In
Mendeltna Creek	23	Gulkana
Teabay River	18	Valdez
Upper Kaina Creek	10	Valdez
Slana River	20	Nabesna
Hanagita River (above lake)	15	McCarthy
Hanagita River (below lake)	11	McCarthy
Gulkana River (section)	7	Mt. Hayes
Crosswind Creek	3	Gulkana
Outlet Creek (Crosswind)	2	Gulkana
Gunn Creek	4	Mt. Hayes
Chitina Creek	2	Valdez

Table 4. Test Netting Summaries, 1960.

NAME	NUMBER OF FISH	SPECIES	LENGTH RANGE (In.)	LENGTH MEAN	<u>1</u> / FREQUENCY	%COMPOS- ITION
Alabama Lake	14	GR	6.0-13.0	10.1	0.77	100
Arizona Lake	No Fish Taken					
Bear Cub Lake	1	GR	11.0	11.0	0.05	1
	78	L-WF	6.0-14.0	9.3	4.33	87
	11	Suckers	7.0-13.0	10.0	0.61	12
Big Twin Lake	24	GR	7.0-13.0	10.1	1.14	1000
Blueberry Lake	14	RB	6.0-12.0	8.2	0.58	100
Crosswind Lake	30	LT	13.0-34.0	24.7	0.17	23
	77	R-WF	8.0-16.5	12.4	0.43	58
	16	L-WF	11.0-18.5	14.5	0.09	12
	9	Suckers	18.5-21.0	19.0	0.05	7
	1	GR	14.0	14.0	0.005	1

1/ No. of fish per hour in 125' Exp. Gill net.

GR - Grayling; RB - Rainbow Trout; LT - Lake Trout; L-WF - Lake White Fish;
R-WF - Round White Fish; DV - Dolly Varden

Table 4. Test Netting Summaries, 1960. (continued)

NAME	NUMBER OF FISH	SPECIES	LENGTH RANGE (In.)	LENGTH MEAN	FREQUENCY	%COMPOS- ITION
Dakota Lake	16	GR	6.7-8.0	7.0	0.09	100
Eureka Roadhouse Lake	No Fish Taken					
Fish Lake	74	GR	6.0-15.0	10.2	3.70	85
	13	Suckers	6.0-14.5	9.7	0.65	15
Frank & Jerry Lake	10	GR	9.0-14.5	12.3	0.27	91
	1	Suckers	17.0	17.0	0.02	9
Gergie Lake	12	GR	7.0-16.0	14.0	0.25	86
	2	Suckers	19.5-20.0	19.7	0.04	14
Grizzley Lake	2	King Salmon	14.0-15.0	14.5	0.13	13
	5	GR	10.0-15.0	12.4	0.31	31
	9	DV	11.0-19.0	15.4	0.56	56
Hanagita Lake	19	LT	6.7-18.5	12.8	0.68	21
	9	GR	8.7-14.5	12.1	0.32	9
	63	R-WF	7.5-15.0	11.1	2.25	70

Table 4. Test Netting Summaries, 1960. (continued)

NAME	NUMBER OF FISH	SPECIES	LENGTH RANGE (In.)	LENGTH MEAN	FREQUENCY	%COMPOS- ITION
High Lake	15	LT	13.5-21.0	16.9	0.60	100
Junction Lake	No Fish Taken					
Jack Lake	1	GR	11.0	11.0	0.05	25
	3	L-WF	10.0-20.0	14.6	0.14	75
Kenny Lake	No Fish Taken					
Long Lake	16	GR	10.0-15.0	12.9	0.70	100
Lost Cabin Lake	24	GR	6.0-11.0	7.9	1.14	60
	16	Suckers	6.0-14.0	12.0	0.76	40
Mae West Lake	105	GR	6.0-15.0	12.4	5.00	100
Mentasta Lake	60	L-WF	7.0-18.0	12.2	3.00	81
	14	Suckers	16.0-17.0	16.5	0.70	19
Moose Lake	5	GR	6.0-10.0	8.0	0.21	38
	8	Suckers	6.0-11.0	8.5	0.33	62

Table 4. Test Netting Summaries, 1960. (continued)

NAME	NUMBER OF FISH	SPECIES	LENGTH RANGE (In.)	LENGTH MEAN	FREQUENCY	%COMPOS- ITION
Old Man Lake	1	GR	9.0	9.0	0.05	1
	32	Suckers	11.5-20.2	16.6	1.77	41
	45	L-WF	8.0-14.5	10.7	2.50	58
One Mile Lake	21	GR	6.5-11.0	9.3	0.80	13
	6	DV	5.8-13.5	11.4	0.23	3
	146	Suckers	6.0-12.0	10.0	5.61	84
161 Mile Lake	No Fish Taken					
165 Mile Lake	No Fish Taken					
Pippin Lake	No Fish Taken					
Railroad Lake	No Fish Taken					
Robe Lake	7	DV	13.0-19.0	15.0	0.37	100
Zero Lake	No Fish Taken					

Table 4. Test Netting Summaries, 1960. (continued)

NAME	NUMBER OF FISH	SPECIES	LENGTH RANGE (In.)	LENGTH MEAN	FREQUENCY	%COMPOS- ITION
Seven Mile Lake	254	LT	7.2-18.0	13.6	1.76	99
	3	Burbot	11.2-11.4	11.3	0.01	1
Snowshoe Lake	1	GR	9.0	9.0	0.05	5
	20	L-WF	6.5-13.0	8.9	1.00	95
Summit Lake #1	No Fish Taken					
Suzie Lake	No Fish Taken					
Tazlina Glacier Lodge Lake	No Fish Taken					
Tex Smith Lake	9	RB	9.0-12.0	10.3	0.36	100
Tolsona Lake	19	GR	5.5- 9.0	7.2	0.47	38
	30	Suckers	6.0-11.0	8.3	0.75	62
Summit Lake #2	No Fish Taken					

Table 4. Test Netting Summaries, 1960. (continued)

NAME	NUMBER OF FISH	SPECIES	LENGTH RANGE (In.)	LENGTH MEAN	FREQUENCY	%COMPOS- ITION
Two Mile Lake	30	GR	6.3-10.1	8.1	0.30	100
Town Lake	32	GR	6.7-10.5	8.3	0.69	100
Upper Kaina Lake	No Fish Taken					
Van Lake	No Fish Taken					
Willow Lake	No Fish Taken					

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30 May 1961

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