

Volume 4

ARLIS
Alaska Resources
Library & Information Services
Anchorage, Alaska

1962-1963

SH
11
.A73
A4
v. 4

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

E. S. Marvich, Deputy Commissioner

Alex H. McRea, Director

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.

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

State: Alaska Name: Sport Fish Investigations
of Alaska.

Project No: F-5-R-4 Title: Inventory and Cataloging
of the Sport Fish and Sport
Fish Waters on the Kenai
Peninsula and Prince
William Sound.

Job No. 6A

Period Covered: July 1, 1962 to June 30, 1963.

Abstract:

Inventory and cataloging activities were conducted primarily on the Kenai National Moose Range and Kenai District of the Chugach National Forest. A creel census was conducted on the Russian River. Standard survey techniques were used in assessing the lakes and streams surveyed, emphasis being placed on those lakes accessible to the angler by roads.

Ten lakes were surveyed, six of which were test netted. Species composition of the netted lakes is set forth in Table 1.

Ten streams were surveyed, their lengths and methods of survey are recorded in Table 2.

A creel census was conducted on the Russian River to evaluate the harvest and utilization of the red salmon fishery on this river. The results of this creel census are presented in Table 3.

Table 1. Test Netting Summaries for 1962.

Name	No. of Fish Taken	Species of Fish Taken	Length (Inches)		Frequency*	% Composition
			Range	Mean		
Lower Trail	3	Dolly Varden	6.2-16.3	13.1	.04	16.7
	6	Lake Trout	12.0-17.5	14.5	.08	33.3
	8	Whitefish	6.5-13.6	10.1	.11	44.4
	1	Rainbow		15	.01	5.6
Rock	No fish taken					
Upper Alcatraz	65	Rainbow	5.5-14.6	9.0	1.7	98.5
	1	Dolly Varden	6.0	6.0	.03	1.5
Lower Alcatraz	24	Rainbow	4.9- 9.3	6.6	0.7	100
Rainbow	31	Rainbow	6.1-20.9	12.2	0.4	100
Dolly Varden	7	Rainbow	7.2-18.6	10.0	0.1	78.0
	2	Dolly Varden	13.8-16.0	14.9	0.03	22.0

* Catch per hour per 125' experimental gill net.

Table 2. Streams surveyed under Project F-5-R-4,
Job No. 6-A.

Name	Length in Miles	Method Surveyed
Swanson River	28	Plane and boat
Chickaloon River	26	Plane
Canyon Creek	10	Plane and foot
Six Mile Creek	8	Plane and foot
East Fork Creek	7	Foot
Otter Creek	6	Plane
Lost Creek	5	Plane
Lower Russian River	4	Foot
Pincher Creek	4	Plane
Bedlam Creek	4	Plane

Age and growth data collected from the Crescent Lake grayling population proved insufficient for an age and growth study; although sufficient data was collected to compute condition factors and length frequency for age classes I and II.

Recommendations for the continuation of this project are set forth.

Recommendations:

1. Continue cataloging and inventory program as new waters become accessible through road development.
2. Resurvey the more productive lakes for current data on population composition and comparative species abundance.
3. Continue a creel census study on the Russian River and collect data on all species entering the creel.
4. Initiate a creel census study on Resurrection Creek.
5. Continue collecting data on the life history of the Crescent Lake grayling.
6. Continue investigation for sources of rainbow, steelhead and silver salmon eggs and conduct a pilot egg-take for rainbow trout.
7. Enumerate non-productive roadside waters for experimental stocking and/or rehabilitation.

Objectives:

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

To investigate potential sources of trout, char, grayling and salmon eggs for experimental hatching and rearing.

To investigate the feasibility of, and formulate plans for, experimental rehabilitation.

To determine the relative need for future management investigations and direct the course of such studies.

To investigate the feasibility of experimental introductions of Arctic grayling on the Kenai Peninsula.

Techniques Used:

Background information from prior studies conducted by the Alaska Department of Fish and Game and U. S. Fish and Wildlife Service were incorporated in these investigations.

Experimental gill net sets were made to determine species distributions and composition, estimates of comparative abundance, age composition and growth rates.

Physical, chemical and biological characteristics were compiled by means of standard lake survey techniques. Volumetric surveys were accomplished with the aid of aerial photographs. A recording fathometer was utilized for determining lake bottom configurations. Water samples were collected with the aid of a Kemmerer water sampler. Oxygen tests and pH determinations were made in the field with the Hach colorimeter.

The creel census design is a modification of the method described by Neuhold and Lui (1952). The sample periods were separated into weekdays and weekends. All weekend days were sampled. The weekdays sampled were randomly selected by drawing the days to be sampled from a container until each day of the week was sampled at least once during each sampling period.

The length of day, 18 hours, was divided into seven 2-1/2-hour periods, length of time needed to travel from one end of the open fishing water to the other end. Each 2-1/2-hour period is randomly sampled until each period is sampled once during the sample period.

All creel census interview data was collected alternately at the two access points to the river. Access was so limited that it was possible to intercept all fishermen leaving the area via either of the two available access points. Interviews were made on the days counts were made. The interviews were usually made during the noon hour or evening hours depending on the counting schedule.

Findings:

Lake surveys. The major emphasis in previous years has been on the cataloging and inventorying of the roadside lakes on the Kenai Peninsula. Except for a few private lakes, plus those lakes which are now accessible as a result of oil exploration activities during the winter of 1962-63, nearly all of the roadside lakes from the town of Coho east to the Seward Highway have been surveyed. During the field season of 1962 six lakes were test netted (Table 1) and two lakes were surveyed for volumetric and temperature data. One fly-in lake, Crescent Lake, was surveyed. Data collected from this lake covered available spawning areas and population composition.

During the test netting operations only one previously unsurveyed lake was netted, Lower Trail Lake. The other five lakes had been surveyed in 1961 or 1962. Data collected from these resurvey activities will be evaluated at a later date when sufficient data is obtained to determine population trends.

Except for Lower Trail Lake, species composition of the lakes surveyed was rainbow trout--Dolly Varden with the rainbow trout being the dominant species in all cases. In Lower Trail Lake, lake trout and lake whitefish represented 77.7 percent of the fish sampled.

Upper Alcatraz Lake:

Upper Alcatraz Lake lies at Mile 8 on the Old Sterling Highway. The surface area of the lake is

roughly 30 acres. Maximum depth measured was 25 feet.

Forty-one hours of gill netting yielded 65 rainbow trout and one Dolly Varden. The mean length of the rainbows was 9.0 inches; these fish ranged in size from 5.5 to 14.6 inches (total length). The one Dolly Varden taken was six inches in total length.

Scale samples and weights were taken from these 66 fish for age analysis at a later date. Water chemistry and temperature data were also collected during the survey.

Lower Alcatraz Lake:

Lower Alcatraz Lake is located at Mile 9 on the Old Sterling Highway and serves as a float plane base for sheep hunting in the Twin Lake-Iceberg Lake area. The surface area of the lake was estimated to be 150 acres. Maximum depth measured was 94 feet.

Thirty-two and one-half hours of gill netting yielded 24 rainbows. The mean length of these rainbows was 6.6 inches and the size ranges were from 4.8 to 9.3 inches in total length.

Scale samples were taken from all 24 rainbows for age and growth analysis at a later date. Water chemistry and temperature data were also collected during the survey.

Rock Lake:

Rock Lake is located at Mile 7 on the Old Sterling Highway. This lake contains an estimated surface area of 5 acres. Maximum depth recorded was 17 feet.

Sixteen hours of gill netting yielded no fish. This lake was stocked with 294 silver salmon and 71 Dolly Varden fingerlings in September, 1960. The lake was sampled by gill net in 1961 and several silver

and Dolly Varden were harvested. It is assumed that the fish in this lake died during the winter of 1961-62. Water chemistry and temperature data were collected.

Rainbow Trout Lake:

Rainbow Trout Lake is located 3 miles south of the Swanson River on the Swanson River Road. The surface area of this lake was estimated at 165 acres.

Sixty-nine hours of gill netting yielded 31 rainbows. The mean length of these fish was 12.2 inches; size ranges were from 6.1 to 20.9 inches in total length. Scale samples were taken from all of these fish for age and growth analysis. Water chemistry and temperature data were also collected during the survey.

Dolly Varden Lake:

Dolly Varden Lake is located 6 miles south of the Swanson River on Swanson River Road. The surface area of the lake was estimated at 255 acres.

Sixty-nine hours of gill netting yielded seven rainbows and two Dolly Varden. The mean length of the rainbow was 10 inches; size ranged from 7.2 to 18.6 inches in total length. The mean length of the Dolly Varden was 14.9 inches with a size range of 13.8 to 16.0 inches in total length.

Other Lakes:

Inventory and cataloging work were carried on in Lower Trail Lake, Crescent Lake and Lakes C1 and C2. Data collected on these lakes were recorded on the Department's standard lake survey forms.

Stream Surveys:

Ten streams were surveyed during the past field season (Table 2). Data was collected on anadromous

fish migrations, stream barriers and possible sources of silver salmon, steelhead, rainbow trout and grayling eggs.

Swanson River was surveyed by boat and plane. As a result of the survey, an experimental egg take program was initiated in September, 1962. At the Swanson River weir site 305,900 silver salmon eggs were taken. Data collected during the survey covered migration timing, spawning areas and weir site locations.

Chickaloon River was surveyed by plane to determine whether any spring migrating steelhead were using this river as a spawning area. No fish were observed. Several potential weir sites were located which could be utilized to collect silver salmon eggs if the need arises.

Canyon Creek was surveyed by foot and plane. This survey was conducted to collect data on anadromous fish migrations and possible stream barriers. A complete barrier was located four miles above the confluence of East Fork Creek. The barrier is the result of an old mining diversion dam. During the foot survey no salmon were noted, although, chum salmon were using East Fork Creek.

East Fork Creek was surveyed by foot and plane. The survey was conducted to collect data on anadromous fish migrations and possible stream barriers. No physical barriers were found but a partial velocity barrier was located on Six Mile Creek. The barrier is formed by the confluence of Canyon and East Fork Creeks. Several spent chum salmon carcasses were examined in East Fork Creek and found to be spawned out. No silvers were observed by this writer, however, several of the anglers approached on the stream stated they had on other occasions caught silver salmon.

Six Mile Creek was surveyed by foot and plane in order to obtain data on anadromous fish migrations. A partial velocity barrier located in a steep canyon approximately two miles below Canyon Creek's entrance

into Six Mile Creek was noted. The barrier was observed during the peak of the pink and chum salmon migrations. This precipitous canyon forms a velocity barrier that partially restricted migrating pink salmon. Chum salmon were able to overcome the velocity barrier. No pink salmon were observed above the barrier.

Otter Creek was surveyed by plane to determine if silver salmon utilized the creek for spawning. A barrier was located at the mouth of the creek where it reaches the Cook Inlet beach. Due to the barrier the stream was dropped as a silver salmon spawning area.

Lost Creek was surveyed by plane to determine if grayling (proposed 1963 introduction) could migrate out of the lake. The proposed introduction was cancelled due to the lack of a natural outlet barrier.

Pincher Creek was surveyed by plane to learn if it could possibly be utilized by anadromous fish for spawning. An aerial survey revealed an impassible barrier at its mouth.

Bedlam Creek was surveyed by plane. Several clear water lakes drain into Bedlam Creek which are accessible to migrating steelhead. Several potential weir sites were observed. Additional data was gathered from Fish and Wildlife Service personnel which confirmed the fact that steelhead utilize the creek.

Russian River Creel Census Studies:

Increasing sport fishermen utilization of the red salmon resources in the Russian River points out the need for harvest and utilization data on this fishery. In order to evaluate the effects of the fishery on the red salmon resources in the river, a creel census was instigated during the 1962 field season. Data is presented in tabular form, Table 3.

From July 1 to August 12, 1962, 41 fishermen were counted. Of this number, 24 counts were made on weekends

Table 3. Analysis of Russian River Creel Census, 1962.

Sampling Period	Number of Anglers Sampled	Total Estimated Anglers	Number of Red Salmon Sampled	Total Estimated Harvest	Number of Hours Sampled	Estimated Total Hours Fished	Rate of Success Fish per Hour
June 18-30*		1103		767		3112	
July weekdays	616	2214	697	1771	3485	8856	.20
July weekends	256	1836	457	1395	2405	7344	.19
Aug. 1-12 weekdays	221	525	100	504	420.25	2100	.24
Aug. weekends	19	578	8	263	30	1012	.26
Totals	1112	6256	1262	4700	6340.25	22424	0.22

* The June 15-20 period of this fishery was missed, all figures used are estimates on the assumption that the initial 12 days of the season are similar to the last 12 days of the season, based on escapement count figures.

and 17 counts were made on weekdays. Fishermen interviews were made on the same days that counts were made.

Projection of the count data reveals that 6256* fishermen participated in this fishery. These fishermen fished an average of 3.4 hours per day and harvested an average of 0.75 fish per person per day. Total estimated number of hours expended fishing by these fishermen from June 15 to August 12 was 22,424 hours. Mean catch per hour for the entire season was 0.22 fish. Total red salmon harvest for the 1962 season was 4700 fish or 8.8 percent of the Russian River red salmon escapement from June 18 to August 31, 1962.

Red salmon fishery on the Russian River provided an estimated 6595.3 fishermen days' use during this short season which totaled 58 days. The fishery is considered one of the most important in Alaska.

Crescent Lake Grayling Studies:

An investigation of the life history of the grayling in Crescent Lake was initiated during the 1962 field season. Initially, scale samples, lengths and weights were collected for age and growth determinations. Available spawning area was also surveyed. No data on the fecundity of these grayling were gathered due to the late date at which the study commenced.

Scales were collected from 119 grayling. Age determinations indicated that only the first three age classes were sampled and included 66 one-year olds, 52 two-year olds and one three-year old grayling. In view of this deficiency no growth increments were calculated. Additional scale samples will be collected during the next field season for age and growth calculations.

*Fishermen use and harvest data for the period from June 15 to 30 has been estimated.

Length frequencies were plotted for the first and second age classes by length groups within the two age classes (Figure 1). Condition factors were calculated and plotted by length groups for two age classes (Figure 2). The mean condition factor for the 119 samples collected was 1.45.

Spawning grounds for the grayling in Crescent Lake was confined to the initial 400 yards of Crescent Creek, the outlet of Crescent Lake. Access to additional spawning sites in Crescent Creek is prevented by a debris dam in a narrow constriction of the stream channel. This barrier restricts movement of adult grayling but does not interfere with downstream movement of grayling fry. A potential weir site exists at the mouth of Crescent Creek.

Two experimental grayling transplants were made with grayling secured from Crescent Lake. These fish were planted in two barren lakes, Upper Paradise Lake and Jerome Lake.

Jerome Lake is located at Mile 30.5 on the Seward Highway. The lake contains a surface area of approximately 20 acres with one inlet. Approximately 50 yards of grayling spawning area is available in this inlet. Jerome Lake once supported a population of Dolly Varden. The population was removed when the lake was rehabilitated in 1961.

Two transplants (a total of 283 grayling) were made in Jerome Lake with a known mortality of 26 percent of the transplanted grayling.

Upper Paradise Lake is located nine miles up the north fork of the Snow River in Paradise Valley. The lake is accessible by float plane or via a Forest Service trail. The lake contains an estimated surface area of 275 acres. There is one excellent inlet to the lake. Accessible spawning area extends for approximately one-half mile. The inlet should provide sufficient spawning area for the development of a self-subsisting population of grayling.

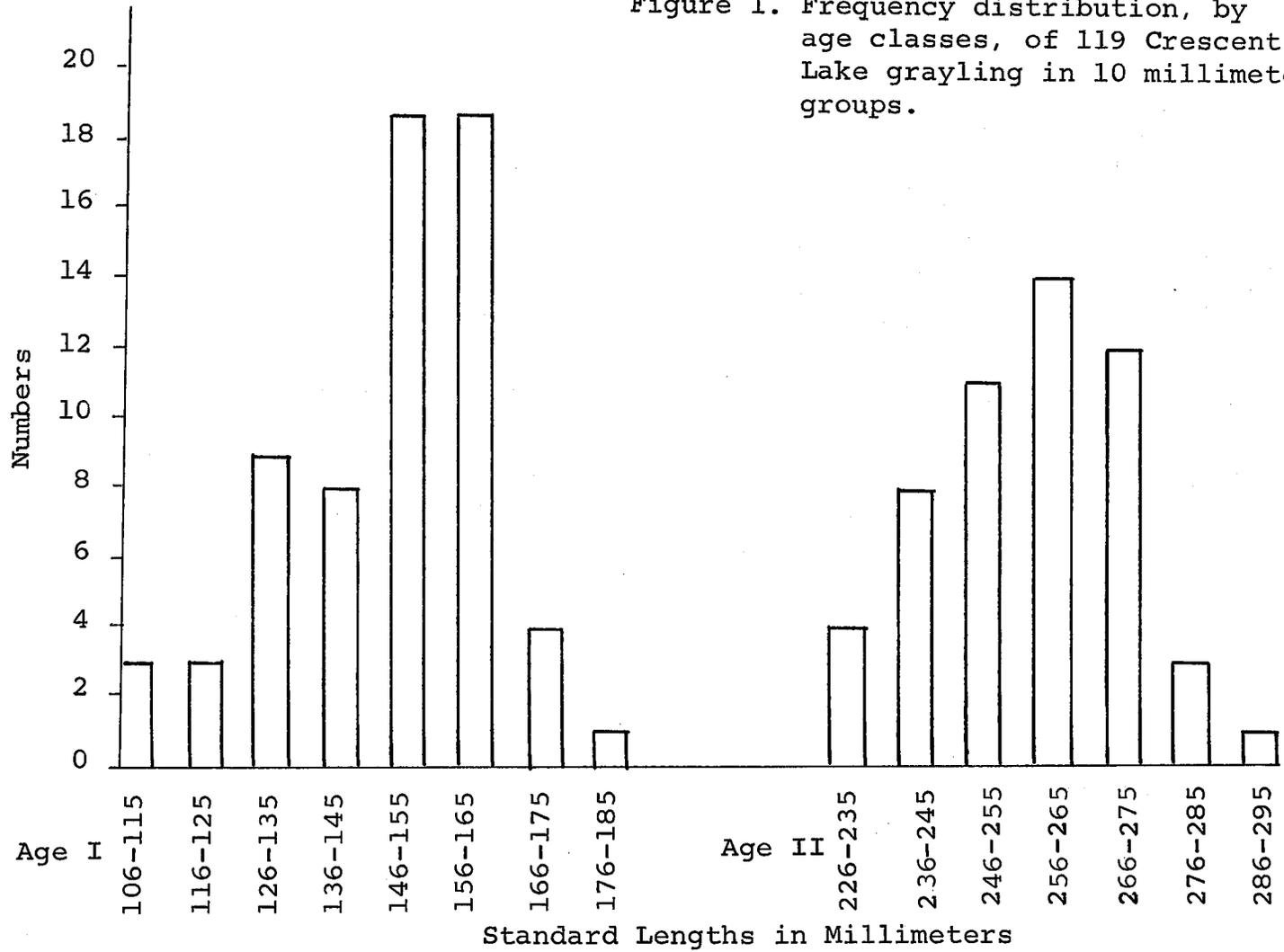


Figure 2. Mean condition factors for 119 Crescent Lake grayling, by age classes, in 20 millimeter length groups.



Two transplants (a total of 242 grayling) were made in Upper Paradise Lake with a known mortality of 27 percent of the transplanted grayling.

Subsequent transplants will be made in the two lakes until spawning migrations are noted. The lake was closed to fishing immediately following the transplant. Success of these two initial transplants will govern our experimental introduction of grayling into other barren bodies of water on the Kenai Peninsula.

Potential sources for procuring silver salmon, rainbow, steelhead and grayling eggs were investigated. Sources of silver salmon eggs were located on the Swanson River, Dairy Creek and at the Department's weir site on Bear Creek. Sources of resident rainbow eggs were located on the East Fork of Moose River which has a series of seven interconnected lakes. Five of these seven lakes support known populations of rainbows which migrate into the East Fork of the Moose River to spawn each year. Presently these populations are under harvested and could furnish the Department with an easily accessible source of rainbow eggs. Included in the findings are a source of grayling eggs available at the mouth of Crescent Creek on Crescent Lake.

Prepared by:

Approved by:

Robert E. Lawler
Fishery Biologist

Richard Haley
D-J Coordinator

Date: March 15, 1963

Alex H. McRea, Director
Sport Fish Division