

SH
11
A73

STATE OF ALASKA

William A. Egan, Governor

Alaska Department of Fish and Game

C. L. Anderson, Commissioner

Sport Fish Division

E. S. Marvich, Director

ANNUAL REPORT OF PROGRESS, 1960-1961

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

SPORT FISH INVESTIGATIONS OF ALASKA

Alex H. McRea, Coordinator, Juneau
Robert T. Baade, Fishery Biologist, Ketchikan
Gary L. Finger, Fishery Biologist, Juneau
Jean R. Dunn, Fishery Biologist, Seward
Edward J. Cramer, Fishery Biologist, Anchorage
Rupert E. Andrews, Fishery Biologist, Palmer
George L. Van Wyhe, Fishery Biologist, Glennallen
Roger J. Reed, Fishery Biologist, Fairbanks

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 PROJECTS
COMPLETION OF 1960 - 1961 SEGMENT

State: ALASKA

Project No: F-5-R-2

Name: Sport Fish Investigations
of Alaska

Job No: 1-C

Title: Inventory and Cataloging
of the Sport Fish and Sport
Fish Waters in the Cook
Inlet and Copper River
Drainages

Sub-Job No: (a)

Sub-Title: Silver Salmon Egg-Take
Investigation

Period Covered: July 26, 1960 to September 26, 1960.

Abstract:

Cottonwood Creek, the outlet to Wasilla Lake in the Matanuska Valley foreplain, was investigated as a source of providing silver salmon eggs for experimental hatching and rearing. A total of 125 males and 214 females were successfully spawned for a quota of 500,000 eggs. Female silver salmon averaged slightly over 2,300 eggs per adult female.

Cottonwood Creek was selected for an egg-taking site after an attempt to locate on Jim Creek, a tributary to the Knik River, proved unfeasible because of flooding by the Lake George break-out,

Scale samples were taken from the spawned fish for historical data. The spawning run sampled in Cottonwood Creek were all 3-year fish, i.e., one year in fresh water and two years in marine. Females averaged 21.7 inches in length and averaged 4.1 pounds in weight.

An upstream weir was constructed and placed in fishing operation on July 26. Silver salmon were taken immediately

with increased daily numbers until a peak movement was reached during the first week of September.

A total run of 4,000 silver salmon is estimated for the entire Cottonwood drainage. Anglers are estimated to have harvested from two-thirds to three-fourths of the total run.

Recommendations are presented for future egg-taking operations and for future management regulations concerning the sport fishery on the adult silver salmon.

Objectives:

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

Procedures:

Background information from prior studies, conducted by the Alaska Department of Fish and Game and the U. S. Fish and Wildlife, Bureau of Commercial Fisheries and Bureau of Sport Fish and Wildlife, were reviewed and utilized.

Introduction:

The preliminary evaluation of the egg-source investigation pointed out the possible value of increased utilization of silver salmon in the fish-stocking program. Experimental plantings of these fry by the Alaska Department of Fish and Game in the Matanuska Valley - Anchorage areas have given promising returns. These plantings have been significantly successful in marginal lakes as compared with plantings of rainbow fry. Recent investigations of lakes in the Matanuska Valley by the Alaska Department of Fish and Game fishery biologists have indicated silver salmon survival in lakes with low winter oxygen concentrations to be appreciably higher than the survival from plantings of domesticated rainbow trout. Lakes that received silver salmon plants were test netted in the spring and in the fall. Results of the test netting in some instances showed silver salmon to survive in satisfactory numbers even when planted in the face of competition from other species and established, older age classes. Growth rates of silver salmon fry in these waters compare favorably with other salmonids "land-locked". Silver salmon are

enthusiastically sought by anglers and are especially enjoyed for their eating qualities.

It was not feasible to investigate remote streams during the initial phases of the search for a suitable source of silver salmon eggs, although the necessity of developing a source not subjected to heavy fishing pressure was recognized.

In the upper Cook Inlet area, known as Knik Arm, present knowledge indicates four streams which support known runs of adult silver salmon. These streams are: Jim Creek, Wasilla Creek, Cottonwood Creek and Fish Creek. The magnitude of the silver salmon run is known in Cottonwood Creek only, (D-J Job Completion Report No. 4, Volume 8, April 1, 1958 to April 1, 1959). The remaining three streams have not been investigated, although the first and unsuccessful attempt to establish a pilot egg-take was made on Jim Creek in the present investigation.

Techniques:

On July 26, a weir was constructed at a point one-half mile below the outlet of Wasilla Lake in Cottonwood Creek. The weir was of the deck and horse type design and functioned well, Figure 1.

The screens were 3' x 3' constructed of galvanized screening with one inch square mesh. Pickets in the 'V' trap were one inch square and placed 1½ inches apart.

The majority of the weir construction was prefabricated and transported to the site. All material was obtained locally and was rough sawed cottonwood planking with spruce dimension stock for framing.

Three holding pens were provided for the fish; these consisted of a buck pen, a green pen and a ripe pen.

During spawn-taking operations the females were killed by severing the dorsal artery. The dead fish were then placed in a bleeding rack, Figure 2. Approximately one male served for two females. None of the males were killed.

Findings:

The weir was successful in trapping a total of 1,161 adult silver salmon. The first silver salmon were spawned on September 12 and the last were spawned on September 26.

Stream counts were made below the weir site on September 20 and 21. A total of 241 silver salmon were counted below the weir on spawning redds.

Statistics of the silver salmon escapement for 1960 are as follows:

| | | |
|---------------------------------------|-------|----------------------------------|
| Total number counted at weir: | 1,161 | |
| Total live escapement over weir: | 759 | - Females (493) - Males (266) |
| Total holding mortality: | 63 | |
| Total females spawned: | 214 | |
| Total males spawned: | 125 | |
| Total count below weir: | 241 | |
| Estimated number in sport fish catch: | 2,500 | |
| Total silver salmon run (all totals): | 4,000 | |

Spot checks of the angling pressure during the season indicated a very intensive sport fishery on the silver salmon entering Cottonwood Creek. Sport fishing on silver salmon begins about the middle of July. The earliest fish reported taken in 1960 was on July 9 in the tidal area at the stream terminus. Fishing pressure was so intensive that there were many days when anglers appeared to be shoulder to shoulder for a couple of stream miles; 200 to 300 fishermen were counted on these days. Twenty-five hundred silver salmon were estimated to have been taken by sport fishing. There are approximately 45 days of effective fishing on the silver salmon. The early fish do not immediately ascend the stream, but move back and forth in the tidal slough with the tides until they are sexually mature. While they remain in the tidal slough, the silvers are subjected to constant angling pressure. Silvers take salmon eggs drifted along the bottom with amazing voraciousness. One creel check by Department personnel showed approximately 300 salmon were taken by anglers. Although sport fishing on the silvers was better on the incoming tides, they were taken at all tides in numbers.

Table 1 presents the daily weir counts of both silver salmon and red salmon. The peak of the silver salmon upstream migration at the weir occurred during the last week of August and the first week of September. Other species of Pacific salmon entering the drainage are chum, king and pink salmon. These species are restricted in numbers and are not significant to the total salmon population in the system.

Scale samples were obtained from the fish held for spawning and were analyzed for age composition. All of the adult fish sampled were age III with one fresh water annulus and two salt water annuli. Lengths and weights were also recorded for historical data and the silver salmon sampled were found to average 21.7 inches in length and to average 4.1 pounds in weight.

Recommendations:

The sport fishery on silver salmon in Cottonwood Creek is one of the most valuable sport fisheries in upper Cook Inlet. Precautions should be taken to protect and preserve the fishery.

It is recommended that an intensive sport fishing survey be made to determine the total catch and angling pressure.

It is recommended that sport fishing for silver salmon be allowed from the stream terminus to the Cottonwood Road crossing only. Silver salmon moving above that point are not in prime condition and, since the stream is small above that point, they are susceptible to undue pressure from the sport fishermen.

It is recommended that Fish Creek be opened to sport fishing for salmon from August 1 to December 31, instead of August 22 to December 31, to distribute sport fishing pressure on other silver salmon stocks in the Matanuska Valley foreplain.

It is recommended that other silver salmon streams in upper Cook Inlet be investigated also for possible sources of silver salmon eggs.

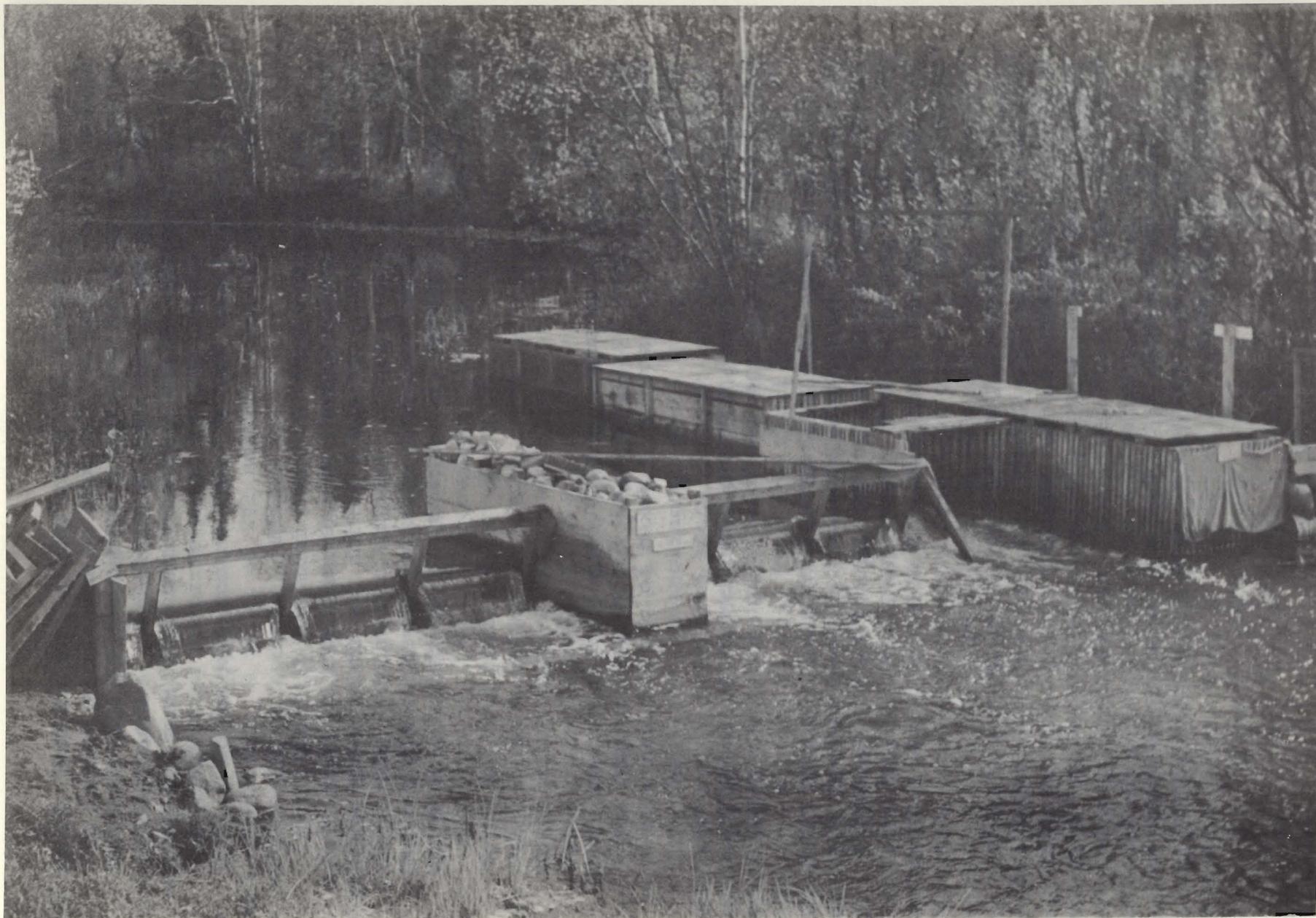


Figure 1. Overall view of the construction of the Cottonwood Creek weir, 1960.



Figure 2. Silver salmon bleeding rack, Cottonwood Creek weir.

Table 1. Daily weir counts of Red Salmon and Silver Salmon, Cottonwood Weir, 1960.

| Date | Red Salmon | Silver Salmon | Date | Red Salmon | Silver Salmon |
|---------|------------|---------------|---------|------------|---------------|
| July 27 | 82 | 4 | Aug. 23 | 6 | 2 |
| 28 | 157 | 1 | 24 | 12 | 4 |
| 29 | 367 | 6 | 25 | 1 | 7 |
| 30 | 130 | 2 | 26 | 3 | 18 |
| 31 | 1074 | 42 | 27 | 4 | 51 |
| | | | 28 | 11 | 206 |
| Aug. 1 | 299 | 15 | 29 | 8 | 37 |
| 2 | 313 | 5 | 30 | 1 | 29 |
| 3 | 361 | 6 | 31 | 3 | 23 |
| 4 | 198 | 12 | | | |
| 5 | 88 | 24 | Sept. 1 | | 7 |
| 6 | 143 | 12 | 2 | | 88 |
| 7 | 28 | 1 | 3 | | 41 |
| 8 | 84 | 17 | 4 | | 28 |
| 9 | 39 | 4 | 5 | | 16 |
| 10 | 18 | 8 | 6 | | 16 |
| 11 | 77 | 21 | 7 | | 34 |
| 12 | 21 | 15 | 8 | | 44 |
| 13 | 11 | 3 | 9 | | 39 |
| 14 | 14 | 2 | 10 | | 45 |
| 15 | 6 | 1 | 11 | | 37 |
| 16 | 8 | 2 | 12 | | 49 |
| 17 | 3 | 17 | 13 | | 41 |
| 18 | 5 | 23 | 14 | | 33 |
| 19 | 3 | 6 | 15 | | 0 |
| 20 | 1 | 0 | 16 | | 10 |
| 21 | 1 | 2 | 17 | | 4 |
| 22 | 1 | 1 | 18 | | 0 |

Totals 3,581 1,161

Submitted by:

Rupert Andrews
Fishery Biologist
15 May 1961

Approved by:

Alex H. McRea
D-J Coordinator

E.S. Marvich, Chief
Sport Fish Division



A well varied fish sample taken by a graduated mesh gill net. This catch is composed of suckers, whitefish, lake trout and grayling.