SH
11
.A73
A4
V.6

Volume 6 1964-1965

ARLIS
Alaska Resources
Library & Information Services
Anch. . . aska

STATE OF ALASKA

William A. Egan, Governor

ANNUAL REPORT OF PROGRESS, 1964 - 1965

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-6

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

Louis S. Bandirola, Coordinator

3 3755 000 46597 1

INTRODUCTION

This report of progress consists of Job Segment Reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-6, "Sport Fish Investigations of Alaska."

The project during this report period is composed of 23 separate studies designed to evaluate the various aspects of the State's recreational fishery resources. Of these, eight jobs are designed to pursue the cataloging and inventory of the numerous State waters in an attempt to index the potential recreational fisheries. Four jobs are designed for collection of specific sport fisheries creel census while the remainder of the jobs are more specific in nature. These include independent studies on king salmon, silver salmon, grayling, Dolly Varden, a statewide access evaluation program and an egg take program.

A report concerning the residual effects of toxaphene accumulates the findings of a three-year study. The report presented here terminates this segment and is a final report. The information gathered from the combined studies will provide the necessary background data for a better understanding of local management problems and will assist in the development of future investigational studies.

The subject matter contained within these reports is often fragmentary in nature. The findings may not be conclusive and the interpretations contained therein are subject to re-evaluation as the work progresses.

Volume 6 Report No. 9-C-1

JOB COMPLETION REPORT

RESEARCH PROJECT SEGMENT

STATE: ALASKA Name: Sport Fish Investigations of Alaska.

Project No.: F-5-R-6 Title: Salmonid Rearing and Migration Studies: Fire Lake System.

Job No.: 9-C-1

Period Covered: April 1, 1964 to February 24, 1965.

ABSTRACT

The March 27 earthquake severely damaged the upstream-downstream control structure on Lower Fire Lake. Reconstruction of this facility was started on June 22 and completed on August 14, 1964. The traps at the Fire Lake Hatchery were put into operation on May 15, and 15 adult rainbow trout were captured. Because the traps on Lower Fire Lake were inoperative during the peak of the coho salmon and rainbow trout out-migration, little data was obtained on migratory habits. Foot surveys of Fire Creek were conducted to determine the numbers of spawning salmon and barriers (beaver dams). The growth of hatchery-reared coho salmon, Arctic grayling and rainbow trout for the summer and fall of 1964 is discussed.

RECOMMENDATIONS

1. It is recommended that this study be continued to obtain data on the migratory patterns of the various salmonid species found in the Fire Lake System.

2. Fire Creek should be inspected periodically to assure that no barriers to fish passage have developed.

OBJECTIVES

1. To evaluate the lake rearing and migratory characteristics of various salmonid stocks and to determine the suitability of these stocks for use in various aspects of the sport fish management program.

2. To provide recommendations for management use and to direct the course of future studies.

TECHNIQUES USED

Screens and stop logs were installed at the Fire Lake Hatchery on May 4 to capture upstream and downstream migrant

fish. The trap at Lower Fire Lake was destroyed during the earthquake and was not put into operation again until August 14. Mature rainbow trout were captured in the upstream trap at the hatchery. When the trap on Lower Fire Lake became functional, samples of fish were weighed and measured. Foot surveys of Fire Creek were conducted to observe any natural or artificial barriers, numbers of spawning salmon and physical conditions of the creek.

Tricaine methanesulphonate (MS-222) was used to anesthetize fish held for fin clipping. Two fin-clip combinations were used to mark the fish trapped at Lower Fire Lake; adipose right pelvic for downstream-trapped fish and adipose left pelvic for upstream-trapped fish.

Screens of 1/4-inch mesh size were installed at the trapping facility. They formed holding pens for the trapped fish and allowed a continuous flow of water during fluctuating stream flows.

FINDINGS

Trapping Facility at Fire Lake Hatchery

The first and last rainbow trout were taken in the upstream trap on May 28 and June 14, respectively. A total of 15 was trapped in the 18-day period.

Few fish were caught in the downstream trap. Three coho salmon smolts and one Dolly Varden fingerling were taken in the spring out-migration. Fluctuating water levels and debris made maintenance of the trap difficult and some fish probably were not captured.

Trapping Facility at Lower Fire Lake

On August 14, the construction of the trapping facility on Lower Fire Lake was completed and put into operation.

The traps were in operation until October 27, at which time the screens were removed due to icing conditions. A total of 66 rainbow trout and 62 silver salmon was lifted over the downstream trap (Tables 1 and 2). Not all fish were measured. During the same period, 154 rainbow trout, 34 silver salmon and 19 Dolly Varden were passed upstream. The average fork length for silver salmon was 3.3 inches with a range of 1.6 to 4.7 inches. Length frequency data for the 80 rainbow trout sampled from the traps are presented in Tables 3 and 4. They ranged from 1.5 to 8.4 inches with an average fork length of 4.2 inches.

Movement of silver salmon juveniles was irregular. The migrational patterns of the rainbow trout and Dolly Varden were also irregular, but a preference for spring and fall movements

TABLE 1. - Length Frequency of a Sample of Silver Salmon From Lower Fire Lake Downstream Trap, 1964

Fork Length in Inches	Number of Fish Each Month	
	August	September
1.5 - 1.9	-	-
2.0 - 2.4	-	-
2.5 - 2.9	3	5
3.0 - 3.4	5	6
3.5 - 3.9	9	7
4.0 - 4.4	5	1
4.5 - 4.9	-	1

TABLE 2. - Length Frequency of a Sample of Silver Salmon From Lower Fire Lake Upstream Trap, 1964

Fork Length in Inches	Number of Fish Each Month	
	August	September
1.5 - 1.9	-	-
2.0 - 2.4	-	-
2.5 - 2.9	3	4
3.0 - 3.4	4	7
3.5 - 3.9	7	4
4.0 - 4.4	2	3

TABLE 3. - Length Frequency of a Sample of Rainbow Trout From Lower Fire Lake Downstream Trap, 1964

Fork Length in Inches	Number of Fish Each Month	
	August	September
1.5 - 1.9	-	6
2.0 - 2.4	-	2
2.5 - 2.9	-	1
3.0 - 3.4	-	-
3.5 - 3.9	-	-
4.0 - 4.4	-	-
4.5 - 4.9	2	1
5.0 - 5.4	1	1

TABLE 4. - Length Frequency of Rainbow Trout From Lower Fire Lake Upstream Trap, 1964

Fork Length in Inches	Number of Fish Each Month	
	August	September
1.5 - 1.9	-	-
2.0 - 2.4	-	-
2.5 - 2.9	-	-
3.0 - 3.4	-	1
3.5 - 3.9	-	14
4.0 - 4.4	3	17
4.5 - 4.9	2	16
5.0 - 5.4	3	7
5.5 - 5.9	1	1
6.0 - 8.4	-	1

was found. The peak period of downstream migration for both rainbow trout and silver salmon occurs during June and July (ADF&G Completion Report F-5-R-5). By the time the trap was repaired, the majority of downstream movement of young rainbow trout and silver salmon was probably completed.

All fish captured at the Lower Fire Lake trap were fin-clipped. A rainbow trout 6.5 inches long, marked in the spring of 1963, was captured during trap operations.

During July, Fire Creek was surveyed below Lower Fire Lake and two beaver dam barriers were removed. Salmon were present in the stream at this time.

Lower Fire Lake

The source of both rainbow trout and silver salmon in Lower Fire Lake is no doubt largely due to inadvertent escapement from the hatchery. There are still large areas of floating bog in the lake with some areas of the vegetation on the floating mats beginning to die. The debris breaking away from the floating mats, along with beaver activity at the culverts, has made maintenance of the trap screens difficult. A wire screen was placed about three feet forward from the culverts. This allows unrestricted movement of fish around and underneath the screen and stops the beavers from plugging the culverts.

Two adult male silver salmon were captured on September 25. A survey of Fire Creek below Lower Fire Lake in October revealed about 50 spawning silver salmon.

Prepared by:

Darwin E. Jones
Fishery Biologist

Jerry Sexsmith
Fishery Biologist

Date: April 1, 1965

Approved by:

s/ Louis S. Bandirola
D-J Coordinator

s/ Alex H. McRea, Director
Sport Fish Division

Tagging in-migrant Dolly Varden with numbered disc tags provides information on the timing and progress of movement.