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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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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, Cataloging and Population Sampling of the Sport Fish and Sport Fish Waters of the Cook Inlet Drainage.

Job No: 10-A

Period Covered: January 1, 1962 to December 31, 1962.

Abstract:

Forty Upper Cook Inlet lakes were investigated in 1962. The five waters visited in the Big Lake area contained fishable populations of native game fishes. Ten lakes surveyed in the Talkeetna-Kashwitna area were recommended for public use sites. Fourteen of the waters investigated were considered unsuitable for game fish.

The second identification of Arctic char in Cook Inlet was made at Big Lake, near Talkeetna.

Experimental gill nets were used in the annual population trend study of 20 intensively managed lakes in the Matanuska Valley area. Best production was obtained in Echo Lake and Falk Lake.

Creel census studies indicated that Echo Lake was the most heavily fished and best producing local stocked lake in 1962. Low fishing success occurred in other local managed lakes.

Silver salmon runs were high in Wasilla Creek and Little Susitna River.

Winter dissolved oxygen tests of 30 valley lakes disclosed concentrations below 5.0 parts per million in 6 intensively managed waters.

A brief pre-season test fishing experiment at Echo Lake resulted in a decline in catch success for rainbow trout two years of age and an increase in success for one-year old fish.

Canoe Lake and Beach Lake were surveyed for volume.

Objectives:

To evaluate the extent, the potential and the current use of the waters readily available to the area's anglers.

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

To investigate the feasibility and formulate plans for experimental rehabilitation.

To investigate and measure the sport fish population trends in major recreational fishing waters which are readily available to the area's anglers.

To provide recommendations for the management of those waters.

Recommendations:

1. It is recommended that the cataloging and inventory program be continued in Upper Cook Inlet. Evaluation for public use value should be made before angling pressure and private land interests become realities.

2. An intensive creel census and escapement study should be undertaken for silver salmon in Cottonwood Creek during 1963 fishing season. The daily bag limit for silver salmon has been raised from three to six fish in Cook Inlet.

3. A need exists for intensive management on heavily fished waters near population centers which have become contaminated with undesirable fish. It is recommended that the following lakes be rehabilitated in 1963 with rotenone to establish populations of game fishes:

Canoe Lake, Gooding Lake (pending receipt of public access site), Kepler-Bradley Lake and Lucille Lake.

It is recommended that a brief test fishing program identical to that performed at Echo Lake in May, 1962, be repeated in 1963 for further information concerning early catch success trends.

Techniques Used:

1. Basic surveys for physical, chemical and biological characteristics were accomplished on 40 lakes. Sixteen of the lakes were visited by truck and 24 by floatplane.

2. Variable mesh, 125 foot experimental type gill nets were used for population trend studies. Each lake sampled received at least one net set for a minimum of 24 hours.

3. Creel census data was obtained on local lakes and streams.

4. A Hack colorimeter and Hellige pocket (pH) comparator were used for dissolved oxygen and pH tests of 30 lakes.

5. Test fishing by hook and line was undertaken at one of six early-opening local stocked lakes to determine the catch success trend from ice out to opening day, a period averaging three weeks. Two men fished for a three hour period once every three days from 8:00 A.M. until 11:00 A. M.

6. Volumetric surveys were made on two lakes with the use of surveyor's chain, stakes, ice augers, sounding lines, plane table and alidade.

Findings:

The 40 surveyed waters (Table 1) were in the Matanuska Valley, Big Lake and Talkeetna areas. Most of the valley lakes accessible by automobile are considered too shallow to support game fish. Eklutna Lake was one of the exceptions. It is a large, deep reservoir saturated with grey, glacial run-off water. A few Dolly Varden inhabit one clear water inlet stream, but the lake has no potential for a fishery.

The five waters surveyed in the Big Lake vicinity contain good populations of rainbow trout, residual silver salmon and whitefish, in addition to numerous suckers and stickleback.

Five of the fifteen Talkeetna area waters investigated contained fishable populations of game fishes. Small numbers of rainbow and/or silver salmon were present. Public access has been requested for ten lakes of the Talkeetna group. All surveys in this group were conducted on waters which lie within one-half mile of the proposed Talkeetna Highway.

The following is a list of surveyed lakes recommended for public use sites:

Campbell Lake Reservoir	Clover Lake
Christiansen Lake	Cow Lake
East Sunshine Lake	Finger (Crooked) Lake
Lorraine Lake	Kashwitna Lake
Peggy Lake	North Friend Lake
Question Lake	North Papoose Twin Lake
Rainbow (Clam) Lake	Seven Mile Lake
West Sunshine Lake	South Friend Lake
X Lake	South Papoose Twin Lake
Y Lake	

Four lakes that have potential fisheries but have present public access problems are:

Johnson Lake	Oscar Lake
Reed Lake	Marlow Lake.

Table 1. A list of lakes and their locations that were surveyed from May to December, 1962.

Name	Location	Section
Beach Lake *	T 15 N., R. 2 W.	12
Beaver Tail Lake **	T 17 N., R. 3 W.	5
Big Lake	T 24 N., R. 4 W.	9 & 10
Boot Lake **	Long. 150° 7'	Lat. 61° 43'
Campbell Creek Reservoir*	T 12 N., R. 4 W.	15
Canoe Lake *	T 17 N., R. 1 E.	13
Christiansen Lake **	T 26 N., R. 4 W.	29
Clam Lake (Rainbow)	T 19 N., R. 5 W.	25 & 36
Clover Lake	T 17 N., R. 3 W.	8
Cook Lake	T 17 N., R. 4 W.	14
Cow Lake	T 17 N., R. 5 W.	4 & 9
Crooked Lake (Finger)	T 17 N., R. 4 W.	31 & 32
East Sunshine Lake **	T 24 N., R. 4 W.	8
Edmonds Lake **	T 16 N., R. 1 W.	35
Eklutna Lake **	Eklutna River	
Fish Lake	T 25 N., R. 4 W.	17, 18 & 20
Horseshoe Lake *	T 17 N., R. 4 W.	11 & 12
Johnson Lake	T 17 N., R. 1 E.	14
Kashwitna Lake	T 20 N., R. 4 W.	7 & 18
Lake # 1 **	T 25 N., R. 4 W.	32
Lake # 2 **	T 25 N., R. 4 W.	32
Lake # 4 **	T 25 N., R. 4 W.	32
Little Beaver Lake **	T 17 N., R. 3 W.	5 & 8
Lorraine Lake **	T 14 N., R. 4 W.	20
Marlow Lake **	Long. 150° 8'	Lat. 61° 42'
North Friend Lake	T 24 N., R. 4 W.	29
North Papoose Twin Lake	T 17 N., R. 4 W.	19 & 20
Oscar Lake	T 17 N., R. 4 W.	31
Peggy Lake **	T 24 N., R. 4 W.	31
Question Lake	T 25 N., R. 4 W.	30
Reed Lake	T 18 N., R. 1 E.	8
Sharon Lake **	T 17 N., R. 3 W.	12
Seven Mile Lake	Long. 149° 56'	Lat. 61° 27'
South Friend Lake	T 24 N., R. 4 W.	29 & 32
South Papoose Twin Lake	T 17 N., R. 5 W.	25
Stevens Lake	T 19 N., R. 4	15, 16 & 17
Wallace Lake **	T 17 N., R. 2 W.	11 & 12
West Sunshine	T 24 N., R. 4 W.	8
X Lake **	T 26 N., R. 4 W.	32
Y Lake	T 26 N., R. 4 W.	32

* Lakes in which no test nets were set.

** Lakes in which no fish were caught in sampling nets.

The following 14 surveyed lakes appeared to be of limited value for intensive management due to shallowness, to presence of outlets or to excessive turbidity:

Beach Lake	Lake # 1
Beavertail Lake	Lake # 2
Boot Lake	Lake # 4
Big Lake	Little Beaver Lake
Cook Lake	Sharon Lake
Edmonds Lake	Stevens Lake
Eklutna Lake	Wallace Lake

Results of individual lake surveys are recorded on standard Lake Survey Forms on file at the Palmer, Anchorage and Juneau offices.

Horseshoe Lake was investigated for possible rehabilitation and restocking. An aerial survey of the flat marshy drainage disclosed that five lakes connect with Horseshoe Lake via permanent and intermittent streams. An estimated 738 acres of water and 697 acres of swamp would require treatment. Observation by boat and foot showed that the outlet stream is permanent, of low gradient and flows through several miles of marsh to the Little Susitna River. Little possibility exists for installation of a barrier sufficient to prevent reinfestation of undesirable fish. It was concluded that chemical treatment and subsequent management is not feasible.

The second identification of Arctic char in Cook Inlet was made at Big Lake, near Talkeetna, where two survey nets took four fish of this species. Identification was confirmed by fishery scientists at the University of British Columbia.

A summary of population sampling results for 20 stocked lakes, 6 lakes rehabilitated in 1961 with toxaphene and 18 of the 40 surveyed waters is found in Table 2. The remaining surveyed lakes were either test netted prior to 1962 or produced no fish to the nets when surveyed in 1962. No fish were captured in gill nets set in Bumblebee, Crystal, Finger, Florence, Kelly, Loon and Meir Lakes. Complete records of test net results are on

file at the Palmer office. Of note are net returns from the two recently rehabilitated and restocked local lakes. Echo Lake, treated in 1959 with rotenone and replanted in 1960, yielded rainbow trout two years of age which ranged from 15.5 to 17.5 inches in length in May (Figure 1). A length-frequency histogram of test net results of the two age classes entering the nets (1960 and 1961 plants) is included as Figure 3. Falk Lake was rehabilitated with rotenone and planted with silver salmon in 1961. These fish ranged from 10.0 to 10.4 inches in length in June, 1962. A few rainbow trout stocked showed a slightly higher growth rate (Figure 2). Frequency of net capture at Echo Lake was .75 rainbow trout per hour and at Falk Lake .68 silver salmon and rainbow trout per hour.

Creel census data indicated that Echo Lake, four miles south of Palmer, was the best producing and most heavily fished of the stocked Upper Cook Inlet lakes in 1962. Results of creel census studies on five of the six local stocked lakes opened to fishing one week prior to the general season opening day are found in Table 3. Included are early opening and regular opening weekends. The data approaches 100% coverage at Echo Lake and Kepler Lake with the exception of May 20. Coverage is somewhat less at the other waters. Presence of few anglers on the regular opening day, May 26, at all early opening lakes but Echo Lake, was a result of low success the preceeding weekend.

Exceptionally good runs of silver salmon ascended two Matanuska Valley salmon streams. Angling success at Wasilla Creek reached two fish per hour of effort in mid-August. Reports were received of high angling success on the lower part of Little Susitna River which is accessible by airplane. One trip was made to the area. Although the peak of the run had passed, large numbers of fish were present and angling success exceeded one fish per hour.

Dissolved oxygen and pH samples were taken during late winter at 30 lakes (Table 4). Waters sampled included those currently stocked and those considered for future stocking.

Table 2. Results of population by gill net, 1962.

Lake	No. Nets	Hours/Net	*Species	No.	Length in Inches	Fre- quency	% Composi- tion
Big Lake (Talkeetna Area)	2	18.25	Arctic Char	4	10.8-15.0	.08	100.0
Clam (Rainbow)	2	24.25	Rb	2	6.5- 7.2	.04	6.2
			Sucker	29	6.0-19.0	.60	90.6
			SS	1	4.6	.02	3.2
Clover	2	22.00	Rb	3	7.5- 8.4	.07	30.0
			SS	7	8.7-10.8	.16	70.0
Cook	2	24.5	Sucker	11	6.0-19.0	.22	100.0
Cow	2	25.00	Rb	17	11.5-19.4	.34	48.5
			WF	6	11.6-16.4	.12	17.1
			Sucker	12	6.0-19.0	.24	32.2
Crooked (Finger)	2	24.5	Rb	25	6.0-15.8	.51	89.3
			SS	1	5.5	.02	3.5
			WF	2	7.5- 7.9	.04	7.2
DeLaney	2	19.00	SS	27	6.8- 8.3	.71	93.1
			Rb	2	14.4-17.6	.05	6.9
Echo	2	22.00	Rb	33	8.5-16.6	.75	100.0

Table 2 (Cont.)

Lake	No. Nets	Hours/Net	*Species	No.	Length in Inches	Frequency	% Composition
Falk	2	16.25	Rb	1	13.9	.03	4.3
			SS	22	9.3-11.6	.67	95.7
Fish	2	23.25	Wf	41	7.9-16.3	.88	77.3
			Sucker	12	16.0-19.0	.27	22.7
Green	2	19.5	Rb	17	5.0-12.4	.435	100.0
Gregory	2	19.5	SS	33	6.5-10.1	.85	100.0
Jewel	2	19.00	Rb	1	11.9	.03	3.0
			SS	32	6.6- 8.9	.84	97.0
Kashwitna	2	17.75	SS	9	6.5-13.5	.25	17.0
			Sucker	44	12.0-20.0	1.24	83.0
Kepler-Bradley	4	21.00	Rb	1	17.5	.01	100.0
Knik	4	20.00	Rb	25	7.0-21.9	.31	89.2
			SS	3	11.0-21.6	.04	10.8
Long (Mile 86, Glenn Hwy.)	4	21.75	Rb.	2	20.7-22.4	.02	6.5
			GR	17	9.0-17.1	.20	54.8
			LC	11	8.7-15.5	.13	35.4
			Sucker	1	17.7	.01	3.3

Table 2 (Cont.)

Lake	No. Nets	Hours/Net	*Species	No.	Length in Inches	Frequency	% Composition
Lower Bonnie	2	22.75	Rb	42	5.6-17.8	.92	100.0
Lucille	6	24.00	Rb	16	7.9-13.7	.11	17.3
			SS	77	5.5-15.5	.53	82.7
Lynn	4	25.00	Rb	4	8.8- 9.3	.04	100.0
Mirror	2	25.25	Rb	5	9.8-12.3	.10	10.7
			SS	42	5.8-11.7	.83	89.3
North Friend	1	18.75	SS	2	12.5-13.2	.11	14.3
						.64	84.7
North Papoose	2	22.5	Rb	3	14.2-19.8	.07	30.0
Twin			Sucker	7	9.0-18.0	.16	70.0
Oscar	2	24.25	Rb	2	7.0- 8.3	.04	25.0
			SS	6	9.9-15.1	.12	75.0
Otter	2	19.25	Rb	1	9.2	.03	100.0
Question	2	25.75	Rb	1	10.4	.02	11.2
			Sucker	8	16.0-19.0	.16	88.8

Table 2 (Cont.)

Lake	No. Nets	Hours/Net	*Species	No.	Length in Inches	Frequency	% Composition
Ravine	2	23.00	Rb	11	7.7-10.1	.24	100.0
Reed	2	24.00	DV	3	11.9-13.9	.06	100.0
Rocky	4	22.6	Rb	4	14.7-17.9	.04	100.0
Seven Mile	2	23.5	Rb	21	12.3-17.6	.45	80.7
			SS	5	11.8-14.4	.11	19.3
South Friend	1	17.5	SS	5	8.8-13.8	.29	45.5
			Sucker	6	10.0-12.0	.34	54.5
South Papoose	2	24.00	Rb	12	8.6-16.0	.25	70.5
Twin			Wf	1	14.0	.02	6.0
			Sucker	4	9.0-18.0	.08	23.5
Stevens	2	17.5	Rb	1	11.7	.03	4.0
			SS	7	9.2-14.5	.20	28.0
			Sucker	17	18.0-20.0	.48	68.0
Twelve Mile	2	25.00	Rb	7	11.6-14.7	.14	23.4
			SS	23	5.7- 9.6	.46	76.6

Table 2 (Cont.)

Lake	No. Nets	Hours/Net	*Species	No.	Length in Inches	Frequency	% Composition
West Sunshine	1	22.5	Rb	3	13.2-13.5	.13	75.0
			SS	1	7.5	.04	25.0
Weiner	4	21.0	Rb	43	6.8-14.9	.51	89.5
			DV	5	9.4-10.4	.06	10.5
Willow **	3	21.0	SS	2	3.3- 3.8	.03	100.0

** Lakes rehabilitated with toxaphene in 1961.

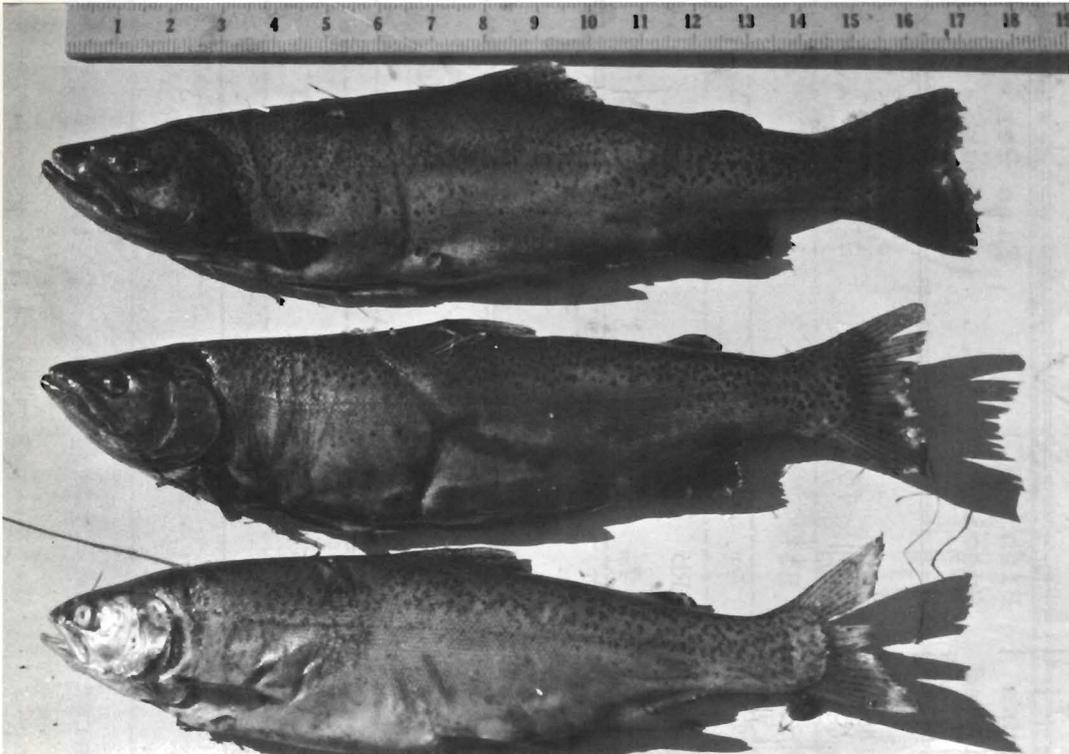


Figure 1. Two-year-old planted rainbow trout from Echo Lake, Gill net samples, 1962.



Figure 2. One-year-old silver salmon and rainbow trout from Falk Lake. Gill net samples, 1962.

Table 3. Creel census results from the Matanuska area stocked lakes for the early and regular opening weekends 1962.

Lake	Date	No. of Men	Hours Fished	Fish Species	No.	Fish Per Hour
Echo	5-19	104	447	Rb	80	.18
	*5-20	30	133	Rb	37	.28
	5-26	41	152	Rb	27	.18
Kepler - Bradley	5-19	17	80	Rb	3	.04
	5-26	3	12		0	0
Knik	*5-19	15	75.5			
Lucille	5-19	41	124.5	SS	1	.01
	*5-26	8	19	SS	5	.26
Rocky	5-19	42	107	Rb	4	.04

Table 4. Lakes tested for dissolved oxygen during 1962.

Name	Date	Location	Depth of:			Depth	O ₂ ppm	pH
			Water	Snow	Ice			
Beaver	3-10-62	T. 17 N., R. 3 W. Section 3-9	12'	8'	30"	5'	4.6	7.25
						10'	1.8	
Bumblebee	3-26-62	T. 19 N., R. 4 W. Section 29-30	12'	16"	32"	5'	8.6	7.0
						10'	8.3	
Crystal	4-11-62	Long. 150° 06' Lat. 61° 42'	12.5'	10"	35"	5'	8.5	6.75
						10'	7.2	
Drill	3-26-62	T. 20 N., R. 5 E. Section 26-27	22.5'	14"	30"	5'	5.5	7.50
						10'	5.5	
Echo	3-13-62	T. 17 N., R. 1 E. Section 24	29.5'	4"	36"	5'	4.4	7.25
						10'	3.4	
Falk	3-13-62	T. 17 N., R. 2 E. Section 16	45'	8"	32"	5'	6.5	7.25
						10'	5.0	
Finger	3-14-62	T. 17 N., R. 1 E. Section 33-34	26'	2"	40"	5'	8.0	7.25
						10'	7.4	
Florence	4-4-62	Long. 150° 06' Lat. 61° 43'	34'	10"	36"	5'	10.1	6.75
						10'	9.1	

Table 4 (Cont.)

Name	Date	Location	Depth of:			Depth	O ₂ ppm	pH
			Water	Snow	Ice			
Gooding	3-14-62	T. 18 N., R. 1 E. Section 23-27				5'	4.0	
			12'	5"	40"	10'	1.5	6.75
Jacobsen	4-10-62	T. 17 N., R. 2 W. Section 2-7	16'	0	30"	5'	2.1	6.75
						10'	0.6	
Kelly	3-26-62	T. 19 N., R. 4 W. Section 28	16.5'	18"	32"	5'	6.7	6.75
						10'	4.5	
Kepler - Bradley	3-21-62	T. 17 N., R. 1 E. Section 24	37'	3"	32"	5'	6.7	7.25
						10'	5.8	
Knik	3-23-62	T. 16 N., R. 3 W. Section 19	30'	5"	31"	5'	4.2	7.25
						10'	3.8	
Long	2-15-62	T. 20 N., R. 7 E. Section 20-21	47'	4"	30"	5'	7.0	7.50
						10'	6.3	
Loon	3-23-62	T. 18 N., R. 3 W. Section 36	12'	5"	29"	5'	9.4	6.75
						10'	7.0	
Lower Bonnie	3-1-62	T. 20 N., R. 6 E. Section 19-20	21'	10"	30"	5'	8.3	7.75
						10'	7.6	

Table 4 (Cont.)

Name	Date	Location	Depth of:			Depth	O ₂ ppm	pH
			Water	Snow	Ice			
Lucille	4-10-62	T. 17 N., R. 1 W. Section 8-9	5'	0.5"	34"	5'	10.2	7.25
Lynn	3-26-62	T. 19 N., R. 4 W. Section 25-36	34'	16"	34"	5' 10'	7.2 6.5	7.0
Meir	3-13-62	T. 17 N., R. 1 E. Section 18	37.5'	4"	36"	5' 10'	1.2 1.1	7.0
Marvo	3-23-62	T. 18 N., R. 3 W. Section 34	12'	5"	28"	5' 10'	8.2 3.2	6.5
Patricia	3-20-62	T. 18 N., R. 3 W. Section 26-35	14'	7'	28"	5' 10'	10.2 5.3	7.25
Prator	3-23-62	T. 18 N., R. 3 W. Section 25	16'	7"	30"	5' 10'	12.2 9.1	7.0
Ravine	2-15-62	T. 20 N., R. 6 E. Section 19	19'	2"	40"	5' 10'	4.4 4.0	7.25
Reedy	3-21-62	T. 17 N., R. 1 W. Section 26	6'	1"	37"	5'	0.7	6.75

Table 4 (Cont.)

Name	Date	Location	Depth of:			Depth	O ₂ ppm	pH
			Water	Snow	Ice			
Rocky	3-20-62	T. 17 N., R. 3 W. Section 16-21	12'	6"	34"	5'	4.4	6.75
						10'	2.8	
Sharon	4-20-62	T. 17 N., R. 3 W. Section 12	14'	0	28"	5'	1.5	6.5
						10'	1.3	
Twelve Mile	3-27-62	Long. 149° 43' Lat. 61° 46'	18'	10"	28"	5'	5.0	6.5
						10'	2.8	
Weinie	3-21-62	T. 17 N., R. 1 W. Section 27	5'	1"	32"	5'	2.1	7.0
						10'		
Weiner	3-21-62	T. 20 N., R. 7 E. Section 22	15'	16"	27"	5'	4.0	7.50
						10'	4.3	
Willow	3-27-62	T. 19 N., R. 4 W. Section 7-8	10.5'	14"	37"	5'	1.0	6.75
						10'	0.7	

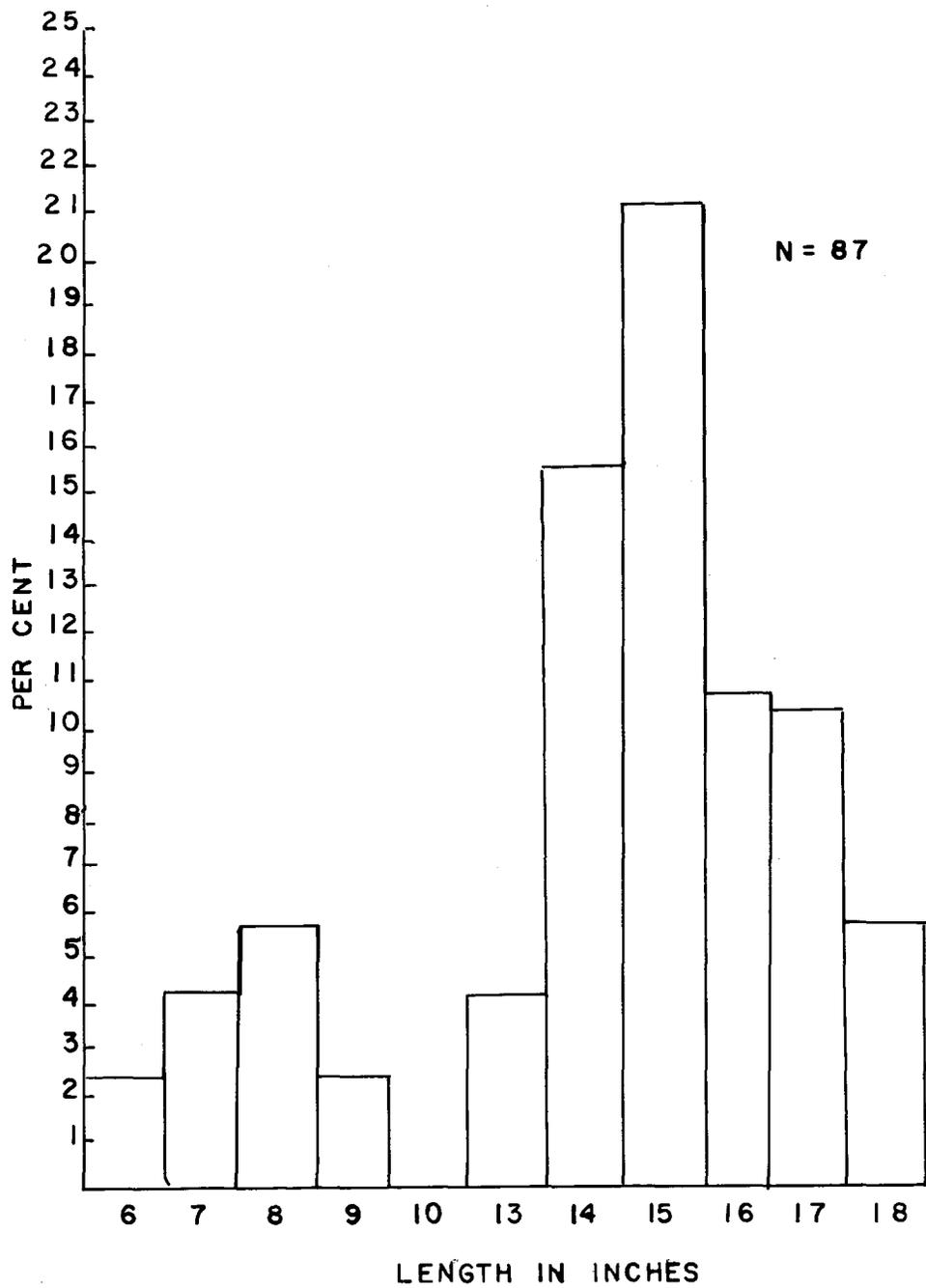


Figure 3. Length - frequency of rainbow trout in Echo Lake, 1962

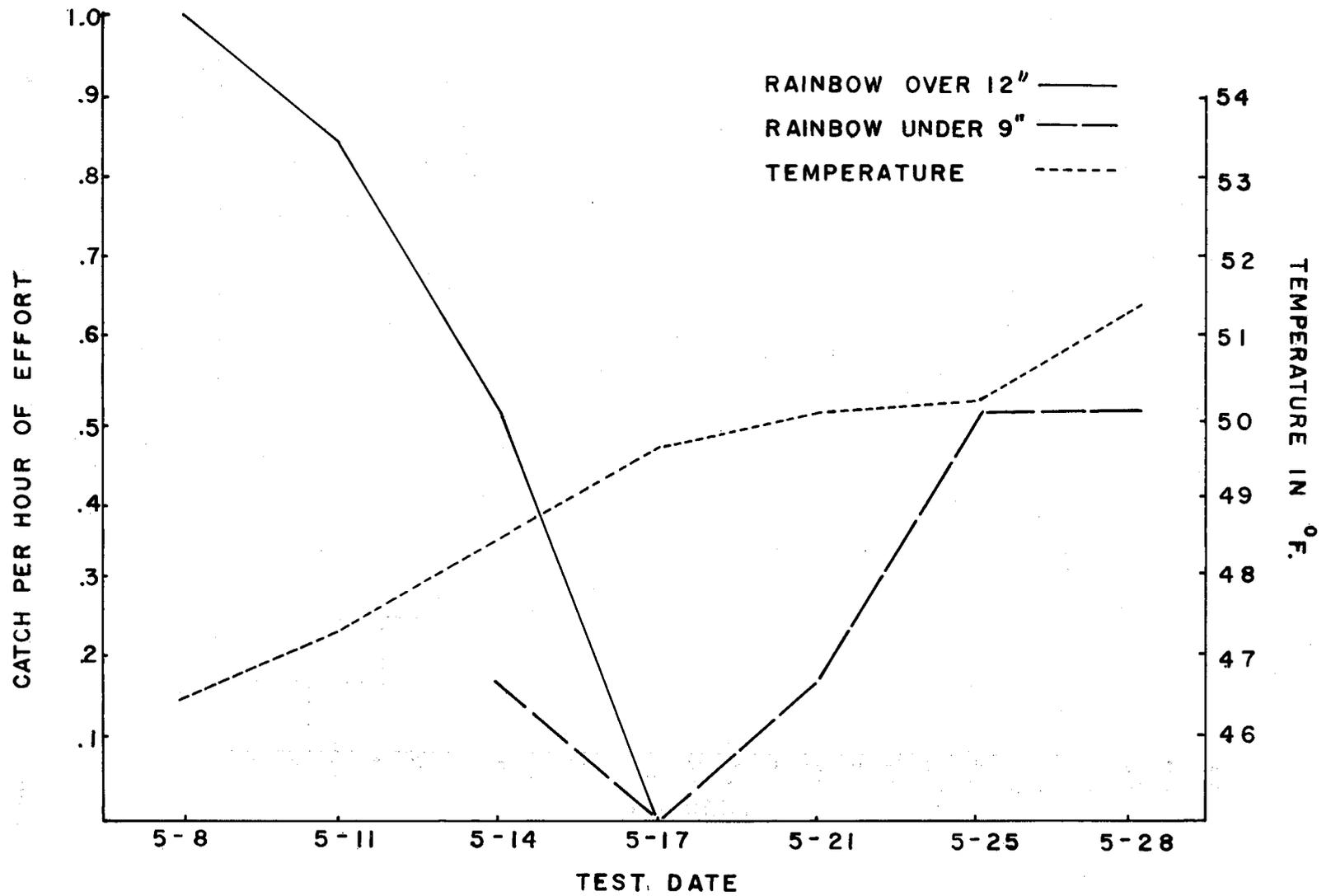


Figure 4. Preseason test fishing trend in Echo Lake, 1962

Results of the brief experimental test fishing project at Echo Lake are summarized in Figure 4. Rehabilitated with rotenone in 1959, it was stocked with rainbow trout in 1960 and 1961. At the time of testing older fish ranged from 15.5 to 17.5 inches and younger fish from 7.0 to 10.0 inches. A decreased catch trend appeared in two-year old fish until May 14, at which time the one-year group entered the catch. Angling success of smaller fish increased until the project was terminated. None of the older age class entered the catch after May 14.

Canoe Lake and Beach Lake tentatively planned for rehabilitation were volumetrically surveyed. Canoe Lake has good fish production potential, while Beach Lake is considered marginal for winter survival of game fish.

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The variable mesh gill nets samples a cross section of a lakes population