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STATE OF ALASKA

William A. Egan, Governor

Alaska Department of Fish and Game

Walter Kirkness, Commissioner

Sport Fish Division

Alex H. McRea, Director

ANNUAL REPORT OF PROGRESS, 1961-1962

FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-3

SPORT FISH INVESTIGATIONS OF ALASKA

Richard Haley, Coordinator, Juneau  
Robert Baade, Fishery Biologist, Ketchikan  
Roger Wadman, Fishery Biologist, Wrangell  
Jeremy Sexsmith, Fishery Biologist, Kodiak  
Sidney Logan, Fishery Biologist, Seward  
Frank Stefanich, Fishery Biologist, Anchorage  
Edward J. Cramer, Fishery Biologist, Anchorage  
Rupert E. Andrews, Fishery Biologist, Palmer  
George Van Wyhe, Fishery Biologist, Glennallen  
Henry J. McKirdy, Fishery Biologist, Fairbanks

## INTRODUCTION

This report of progress consists of the job completion reports from the State of Alaska Federal Aid in Fish Restoration Project F-5-R-3, "Sport Fish Investigations of Alaska."

The current project is composed of twenty separate studies and was designed to evaluate the various aspects of the State's recreational fishery resources. The information gathered will provide the necessary background data for better management practices and for the development of future studies. During the current segment, continued emphasis was placed on the overall inventory and cataloging of accessible waters, evaluation of catch data, and investigations on various species of fish.

As a result of several problems of immediate concern, several new studies were instigated during the report year. Data accumulated from these studies has helped solve some problems in projects already in progress.

The population of Alaska is increasing rapidly and this is being reflected in the ever increasing number of "No Trespassing" signs put up by individuals in the vicinity of population centers. Fortunately, much of Alaska's fishery waters are still in the public domain. The division's program of acquiring access to fishing waters continued at a much faster pace since being instigated in 1959. Emphasis is being placed on this job and the successful continuation of this activity will forstall many 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.

JOB COMPLETION REPORT  
RESEARCH PROJECT SEGMENT

State: ALASKA

Project No: F-5-R-3                      Name: Sport Fish Investigations  
of Alaska

Job No: 6-A                              Title: Inventory and Cataloging  
of the Sport Fish and  
Sport Fish Waters on the  
Kenai Peninsula and  
Prince William Sound

Period Covered: May 1, 1961 to April 1, 1962

Abstract:

Surveys of roadside lakes indicate that rainbow trout are the most common resident game fish on the Kenai Peninsula. Net caught rainbows averaged 11.7 inches and .90 pounds. The rainbow trout catch-per-net-hour ranged from 2.94 to .002 for 33 lakes. Seventeen percent of the rainbows were grossly parasitized. Dolly Varden catches ranged from 2.61 to .003 per-net-hour in 16 lakes. Landlocked silver salmon occur in 8 lakes and lake trout were sampled in 3 lakes. Twenty-one lakes contained no game fishes.

Recommendations:

Roadside lakes with limited spawning facilities should be more thoroughly surveyed to determine how natural recruitment takes place. Within physical and financial limits spawning facilities should be improved or cut off completely. Elimination of borderline spawning areas would ensure a successful stocking program preceded by chemical rehabilitation.

Trails should be cleared and marked to encourage trout fishing in lakes situated close to, but not visible from, the road system. The majority of these lakes are within the

boundaries of the Kenai National Moose Range and the Chugach National Forest. The need for well marked trails is critical in the Moose Range where comparatively flat terrain and dense vegetation compound the chances of persons becoming lost.

Hidden Lake should be more thoroughly studied. This valuable lake trout fishery is subjected to intense angling pressure and may be in need of special regulation.

Skilak Lake and Kenai Lake should be more thoroughly sampled during periods when adult salmon are absent. If game fish concentrations are found, sport fishing techniques should be developed.

Grayling should be stocked in Bernice Lake to test the adaptability of the species in sub-standard waters. Triangle Lake offers the same opportunity.

#### Objectives:

To conduct lake and stream surveys and 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 and to conduct pilot egg takes if practicable.

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

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

#### Techniques used:

Survey techniques used are identical to those reported by Dunn in the 1960-61 segment report.

Freshwater commercial fishing activities were monitored to obtain inexpensive winter sampling data.

## Findings:

This report is designed to summarize the information collected since August, 1959. As is usually the case a large collection of information on an area's sport fisheries points to multiple unknowns. Some Kenai Peninsula fisheries that were good 20 years ago do not exist now. One new and valuable fishery was created a few years ago by the introduction of Arctic grayling. Some game fish stocks have been available for years but are not utilized. Road building has opened areas with waters that have probably never been fished. Anadromous salmon are caught by increasing numbers of anglers at the same time commercial salmon fishing effort and efficiency is increasing.

## Description of Area:

The Kenai Peninsula is part glacier, part glaciated mountains and valleys, and part undulating glacial moraine. The peninsula is connected to the Alaska mainland by a narrow strip of mountains in the north. The north and west coasts border silt laden Cook Inlet, the south coast faces the Gulf of Alaska, and the east coast is on Prince William Sound.

The entire land mass is extremely wet all summer. Streams in the mountainous glacier areas go dry or nearly dry in mid-winter. Streams in the lower valleys and the comparatively flat west side are generally slow and meandering with little fluctuation except during extremely cold or rainy weather.

The entire peninsula, below the 3,000 foot level, is heavily forested with spruce, aspen, birch, cottonwood, and alder. Everywhere, except at extreme elevations and near live glaciers, the ground is covered with a deep bed of mosses, lichens, and low shrubs. Peat bogs are common and drainages between lake and streams are obscured in many instances.

On the west, or Cook Inlet side, the 2,000 or so lakes are all dystrophic clear or dystrophic brown

except the two large glacier fed lakes; Tustumena and Skilak. The mountainous areas have hundreds of lakes of many sizes and types. Those associated with glaciers are either chocolate colored with mud and silt or green with suspended glacial rock flour. Above timberline some of the lakes are a chalky blue color due to small amounts of rock flour carried by snow melt. Eutrophic lakes are rare. Large deep oligotrophic lakes are common. Where bog conditions occur dystrophic lakes are found. The largest lakes are characterized by being long, narrow, and deep.

A rapidly changing road system, some 300 miles long, touches 70 lakes and many streams. In the North Kenai to Homer section there are short spur roads but both roads and lakes are often posted against trespass. Automobiles are the most popular mode of travel for sport fishermen. Pontoon equipped aircraft are commonly seen on the larger lakes. A lack of defined trails inhibits hiking even though hundreds of unfished lakes and streams are within 5 miles of the roads. A few people use canoes and light skiffs to fish the slow streams and connected lakes.

The salt water shoreline is of two types. From Portage to Anchor Point the ocean is muddy. Fishing occurs only in or near stream estuaries. From Anchor Point to Whittier the sea is clear. Dozens of fjord type bays provide shelter and fishing for boat owners.

#### Existing sport fishery:

Eighty-eight waters have been catalogued on the Kenai Peninsula. Slightly more than 1/3 of these are barren of game fishes.

Hidden Lake, Anchor River, Ninilchik River, Deep Creek, Russian River and Resurrection Creek are heavily fished by any standard.

Alcatraz Lakes, Kenai River, Daniel's Lake, Swanson River, Swanson River lakes, Upper Alcatraz Lake,

Skilak Lake, Kenai Lake, Ptarmigan Creek, Moose River, Moose River lakes, Russian Lakes, Juneau Lake, Trout Lake, Jean Lakes, Trail Lakes, Quartz Creek, Crescent Lake, Crescent Creek, Crooked Creek, Stariski Creek, Cooper Lake, Grant Creek, Summit Lakes, Mud Lake and a few of the restricted access bog lakes are utilized in a light to moderate degree.

With the exception of Hidden Lake angling for resident game fish is of minor intensity. The apparently small populations of trout found in a majority of the roadside lakes gives one the impression that there is no good lake fishing on the Kenai Peninsula. The inexperienced fisherman will find this true unless he fishes the "hot spots" such as Upper and Lower Russian lakes. Skilled anglers, particularly those who use artificial flies, can find quality fishing in many roadside lakes.

One factor that creates adverse publicity for the lake fishing is the season opening. An opening date near the end of May finds most of the rainbow trout out of the lakes. The fish are simply not available except in spawning areas.

Some lake populations are accused of being parasitized so heavily that the fish are undesirable. Sampling shows an incidence of 17% gross parasitism in Kenai Peninsula resident rainbows. This is probably on a par with trout populations in the rest of Alaska and doesn't appear to be a valid reason for the low popularity of roadside lakes.

The average length (11.7 inches) and weight (.90 pounds) of 321 rainbows sampled are certainly within the range sought by anglers. In fact, 3 lakes are producing rainbows weighing in excess of 4 pounds, 2 lakes have 3 pound trout, and 13 lakes have rainbows weighing between 1 and 3 pounds. Quality fishing is available.

As a bonus to lake fishermen Dolly Varden are found in 22% and landlocked silver salmon occur in 16% of the rainbow lakes. These species reach lengths and weights equal to those attained by rainbow trout.

That lake trout are a desirable species is indicated by the intense angling pressure on Hidden Lake. Glacial Kenai and Skilak lakes are fished by a few adventurous souls but until specialized angling techniques are developed the trout catch will be small.

Lake trout distribution is apparently limited to lakes where stratification is incomplete. The species has become established only in oligotrophic lakes where wind action is severe.

For a species normally considered of trophy size, Kenai Peninsula lake trout are surprisingly small. Their average length is recorded as 14.9 inches. Average weight is 1.53 pounds. The largest specimen reported for the period 1959-1961 weighed only 10 pounds. In Kenai Lake the species matures at about 12 inches.

Evaluation of resident Dolly Varden populations is complex. The species will have to be much more thoroughly studied to determine if lake populations are composed of genetically resident races or are simply landlocked anadromous fish. The rare populations of dwarf Dolly Varden, locally called "golden fins", are invariably found above barriers to anadromous fishes. The fact that Arctic char have been described from the Kenai River drainage introduces another complexity. If, in truth, the Arctic char is a lake spawner its distribution in Kenai Peninsula lakes should be obvious. Dolly Varden reproduction in Peninsula lakes is apparently just as dependent on tributary streams as is rainbow reproduction.

Average Dolly Varden size statistics are slightly indicative of the problem. The variation between anadromous and non-anadromous races is extreme and should be the subject of further investigation.

The "golden fins" of Lower Summit Lake average 8.6 inches. Gill net catches ranged from 6.9 to 13.4 inches. Reeder Lake, with its population of Dolly

TABLE 1.

Lakes containing rainbow trout listed in order of gill net catch per hour to indicate relative population densities and distribution.

Name of Lake	Area	Surface Acres	Maximum Depth	Species	Catch Per Hour	Mean Length	Mean Weight	Survey Date
Porcupine	St H	30	27'	<u>RT</u> , SB	2.94	10.4"	---	9/9/60
A-2	St H	140	3'	<u>RT</u> , SK, SB, Sclp.	1.08	9.5"	.56 lb.	7/6/60
A-7	St H	170	45'	<u>RT</u> , SK, SB	.68	12.8"	.88 lb.	7/11/60
Daniel's	N K R	---	51'	<u>RT</u> , SS, RS, SB	.58	11.2"	.73 lb.	8/27/61
A-4	St H	75	16'	<u>RT</u> , SK, SB	.27	14.4"	1.26 lb.	7/6/60
Porcupine #3	St H	20	27'	<u>RT</u> , SB	.24	9.5"	.42 lb.	8/26/60
Porcupine #1	St H	40	23'	<u>RT</u> , SB	.22	10.9	.59 lb.	8/26/60
Upper								
Alcatraz	O St H	30	25'	<u>RT</u> , DV	.22	10.6	.55 lb.	6/17/60
Upper								
Salamatoff	N K R	200	---	<u>RT</u> , SB	.19	11.5	.80 lb.	9/24/60
Lower								
Salamatoff	N K R	160	---	<u>RT</u> , DV, SB	.18	13.1	1.32 lb.	9/22/60
Lower								
Alcatraz	O St H	150	94'	<u>RT</u> , SB	.18	12.4	.84 lb.	6/16/60
S-10	S R R	20	33'	<u>RT</u> , SS, SB, SK, Sclp.	.17	11.3	.88 lb.	8/4/61
A-6	St H	95	48'	<u>RT</u> , SK, SB	.17	11.1	.68 lb.	7/9/60
Porcupine #2	St H	50	18'	<u>RT</u> , SB	.12	11.6	.94 lb.	8/27/60
S-1	S R R	165	25'	<u>RT</u> , SB	.12	13.7	1.25 lb.	7/22/60
32-10	S R R	15	30'	<u>RT</u> , SB	.09	17.4	2.47 lb.	8/15/61
Sport	St H	75	20'	<u>RT</u> , SB	.09	14.3	1.27 lb.	8/2/60

TABLE 1. (Continued)

Name of Lake	Area	Surface Acres	Maximum Depth	Species	Catch Per Hour	Mean Length	Mean Weight	Survey Date
M-2	St H	165	20'	<u>RT</u> ,SS,SB	.09	12.4"	.93 lb.	8/6/60
S-11	S R R	70	21'	<u>RT</u> ,SB,SK	.08	12.0"	1.12 lb.	8/4/61
M-3	St H	120	30'	<u>RT</u> ,SS,SB	.06	10.9"	.69 lb.	8/9/60
Jean	St H	140	75	<u>RT</u> ,DV,RS,SB	.06	13.5"	1.02 lb.	6/29/60
S-6	S R R	45	33'	<u>RT</u> ,SB,ScIp.	.06	14.6"	1.30 lb.	7/20/61
Upper Jean	St H	50	50'	<u>RT</u> ,SB	.04	16.7"	2.16 lb.	7/28/61
					(.03	9.6"	.47 lb.	7/15/60)
S-8	S R R	20	21'	<u>RT</u> ,SB,SK	.04	9.3"	.33 lb.	7/25/61
Hidden	O St H	1,920	145'	<u>RT</u> ,DV,SS,LT, RS,SB	.01	13.1"	.94 lb.	6/23/60
					(.03	10.1"	.39 lb.	9/6/61)
Juneau	St H	---	---	<u>RT</u> ,WF	.01	7.7"	.25 lb.	9/13/61
McLanes	K R	30	20'	<u>RT</u> ,DV,SB	.01	12.9"	.96 lb.	8/22/60
Joseph #1	St H	20	35'	<u>RT</u> ,DV,SB	.008	7.6"	.15 lb.	8/18/60
Skilak	O St H		600+'	<u>RT</u> ,DV,LT,WF,KS SS,RS,CS,PS,SB, ScIp.	.005	14.5"	1.30 lb.	7/15/61
M-4	St H	85	30'	<u>RT</u>	.004	8.7"	.30 lb.	8/9/60
S-2	S R R	255	100'	<u>RT</u> ,DV,SB,ScIp.	.004			7/22/60
Scout	St H	110	25'	<u>RT</u>	.003	8.4"	.25 lb.	7/29/60
Engineer	O St H	240	18'	<u>RT</u> ,DV,SS,SB	.002	13.7"	1.74 lb.	6/21/60

TABLE 1. (Continued)

KEY:	Species	
		RT = Rainbow trout
		DV = Dolly Varden
		SS = Silver salmon
		SB = Stickleback
		RS = Red salmon
		SK = Sucker
		WF = Whitefish
		CS = Chum salmon
		PS = Pink salmon
		KS = King salmon
		LT = Lake trout
		Sclp.= Sculpin
	Area	
		O St H = Old Sterling Highway
		St H = Sterling Highway
		N K R = North Kenai Road
		K R = Kasilof Road
		S R R = Swanson River Road
		G L R = Gas Line Road
		S H = Seward Highway

TABLE 2.

Lakes containing Dolly Varden listed in order of gill net catch per hour to indicate relative population densities and distribution.\*

Name of Lake	Area	Surface Acres	Maximum Depth	Species	Catch			Survey Date
					Per Hour	Mean Length	Mean Weight	
Lower Summit	S H	55	12'	<u>DV</u>	2.61	8.7"	.26 lb.	7/12/60
Upper Summit	S H	240	76'	<u>DV</u>	.49	8.6"	.25 lb.	7/1/60
Upper Alcatraz	O St H	30	25'	<u>DV</u> , RT	.20	8.9"	.27 lb.	6/17/60
S-2	S R R	255	100'	<u>DV</u> , RT, SB, Sclp.	.14	13.5"	.83 lb.	7/22/60
Reeder	St H	15	25'	<u>DV</u> , SS, SB	.10	10.7"	.35 lb.	9/6/60
McLane's	K R	30	20'	<u>DV</u> , RT, SB	.07	12.9"	.96 lb.	8/22/60
S-5	S R R	100	51'	<u>DV</u> , SB, Sclp.	.04	14.1"	1.04 lb.	7/20/61
Lower Salamatoff	N K R	160	--	<u>DV</u> , RT, SB	.04			9/22/60
Skilak	O St H		600+'	<u>DV</u> , RT, LT, KS, SS, RS, CS, PS, SB, Sclp, WF	.04	12.9"	1.22 lb.	7/15/61
Joseph #1	St H	20	35'	<u>DV</u> , RT, SB	.02	7.6"	.15 lb.	8/18/60
Woody's	St H	50	15'	<u>DV</u> , SB	.01	11.1"	.55 lb.	9/4/60
Highland	C R	20	26'	<u>DV</u>	.01	19.4"	2.65 lb.	9/4/60
De Long	St H	220	35'	<u>DV</u>	.01	20.4"	3.67 lb.	7/27/60
Jean	St H	140	75'	<u>DV</u> , RT, RS, SB	.01			6/29/60
Engineer	O St H	240	18'	<u>DV</u> , RT, SS, SB	.005	21.1"	4.20 lb.	6/21/60
Hidden	O St H	1,920	145'	<u>DV</u> , RT, SS, LT, RS, SB	.003	8.8"	.20 lb.	6/23/60
						( 0.0"		9/6/61)

\* Key in Table 1.

TABLE 3.

Lakes containing landlocked silver salmon listed in order of gill net catch per hour to indicate relative population densities and distribution.\*

Name of Lake	Area	Surface Acres	Maximum Depth	Species	Catch			Survey Date
					Per Hour	Mean Length	Mean Weight	
M-2	St H	165	20'	<u>SS</u> , RT, SB	.10	12.4"	.93 lb.	8/6/60
Reeder	St H	15	25'	<u>SS</u> , DV, SB	.08	10.7"	---	9/6/60
M-3	St H	120	30'	<u>SS</u> , RT, SB	.07	11.8"	.81 lb.	8/9/60
Daniel's	N K R	--	51'	<u>SS</u> , RT, RS, SB	.06	5.5"	.09 lb.	8/27/61
S-10	S R R	20	33'	<u>SS</u> , RT, SB, SK, Sclp.	.02	6.2"	.10 lb.	8/4/61
Johnson	St H	90	15'	<u>SS</u> , SB	.02	10.7"	.62 lb.	8/14/60
Engineer	O St H	240	18'	<u>SS</u> , RT, DV, SB	.01	13.7"	1.85 lb.	6/21/60
Hidden**	O St H	1,920	145'	<u>SS</u> , RT, DV, LT, RS, SB	.003 (.03 .10 .35	13.4" 9.9" 13.9"	1.05 lb. .47 lb. 1.24 lb.	6/26/60 6/26/60 9/6/61 9/6/61)

\* Key in Table 1.

\*\* Hidden Lake contains both kokanee and silver salmon. Based on stomach samples it is assumed that both species were identified as red salmon by the survey crews. The low catch per hour figure for each year indicates fish recorded as red salmon that had been eating stickleback--these are probably silver salmon. The high figures lump all red salmon except where identification was obvious in mature fish.

TABLE 4.

Lakes containing lake trout listed in order of gill net catch per hour to indicate relative population densities and distribution.\*

Name of Lake	Area	Surface Maximum		Species	Catch			Survey Date
		Acres	Depth		Per Hour	Mean Length	Mean Weight	
Hidden	O St H	1,920	145'	LT,SS,RS,RT,	.18	15.7"	1.80 lb.	9/6/61
				DV,SB	(.03	10.1"	.39 lb.	6/26/60)
Skilak	O St H		600+'	LT,DV,RT,KS,SS, RS,CS,PS,SB, Sclp.,WF	.08	12.9"	1.22 lb.	7/15/61
Trout	St H	---	---	LT	.08	12.9"	.70 lb.	9/15/61

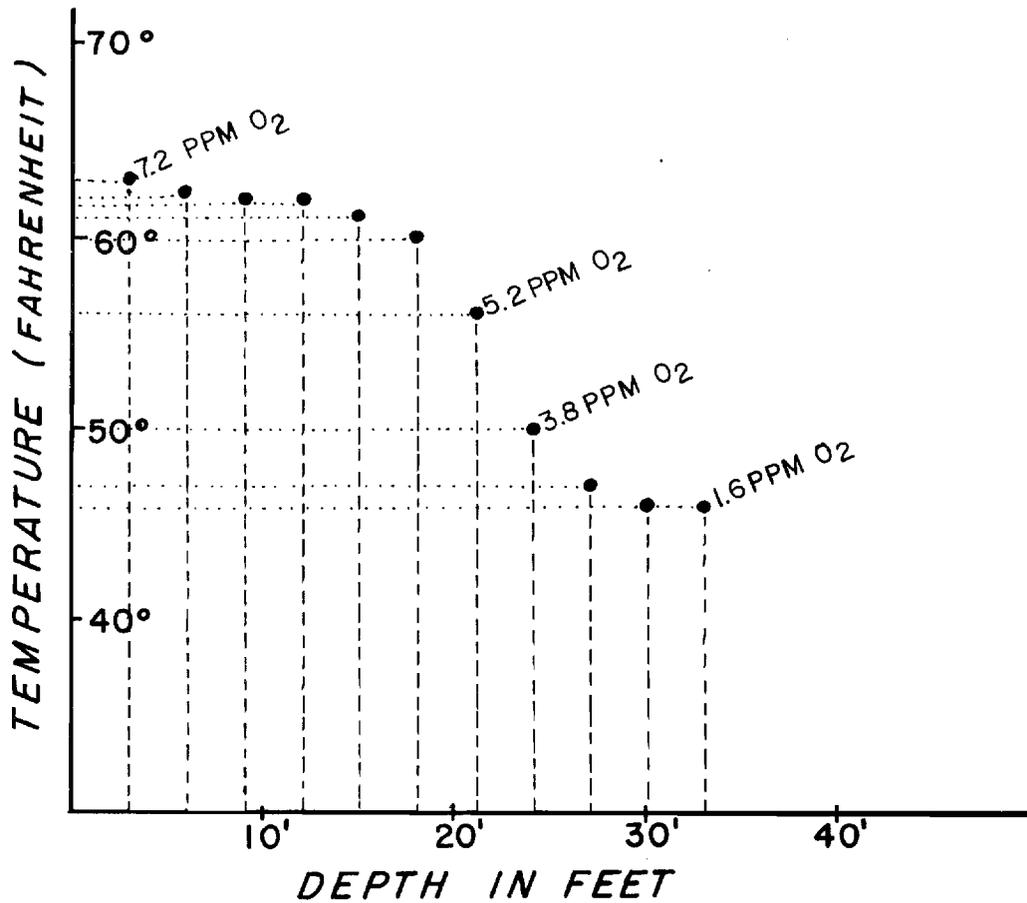
\*Key in Table 1.

TABLE 5.

Kenai Peninsula lakes barren of game fishes in  
1961. Listed in order of maximum depth.\*

Name of Lake	Area	Surface Acres	Maximum Depth	Species	Survey Date
S-4	S R R	140	55'	SB	8/2/60 - 7/23/61
Arrowhead	S R R	---	55'	--	8/10/61
Joseph #2	St H	55	48'	SB	8/19/60
C-2	G L R	---	44'	SB	7/13/61
Island	N K R	---	39'	SB	8/28/61
S-7	S R R	60	39'	SB	7/29/61
Ophar	St H	70	36'	--	9/11/60
C-1	G L R	50	24'	SB	7/17/61
Swan	St H	20	23'	SB	9/9/60
Whisper	St H	150	20'	SB	8/5/60
Pack	O St H	45	19'	--	7/31/61
Encelewski	St H	100	16'	SB	9/12/60
S-9	S R R	15	16'	--	7/27/61
Upper Skilak	St H	30	15'	SB	8/16/60
M-1	St H	40	14'	--	8/4/60
Triangle	St H	280	10'	SB	7/19/60
M-5	St H	45	10'	SB	8/11/60
Aqua-Linda	St H	30	10'	SB	8/21/60
Bernice	N K R	180	9'	SB	9/20/60
Pennayer	St H	30	8'	--	8/16/60
Trap	St H	200	7'	SB	9/1/60

\* Key in Table 1.

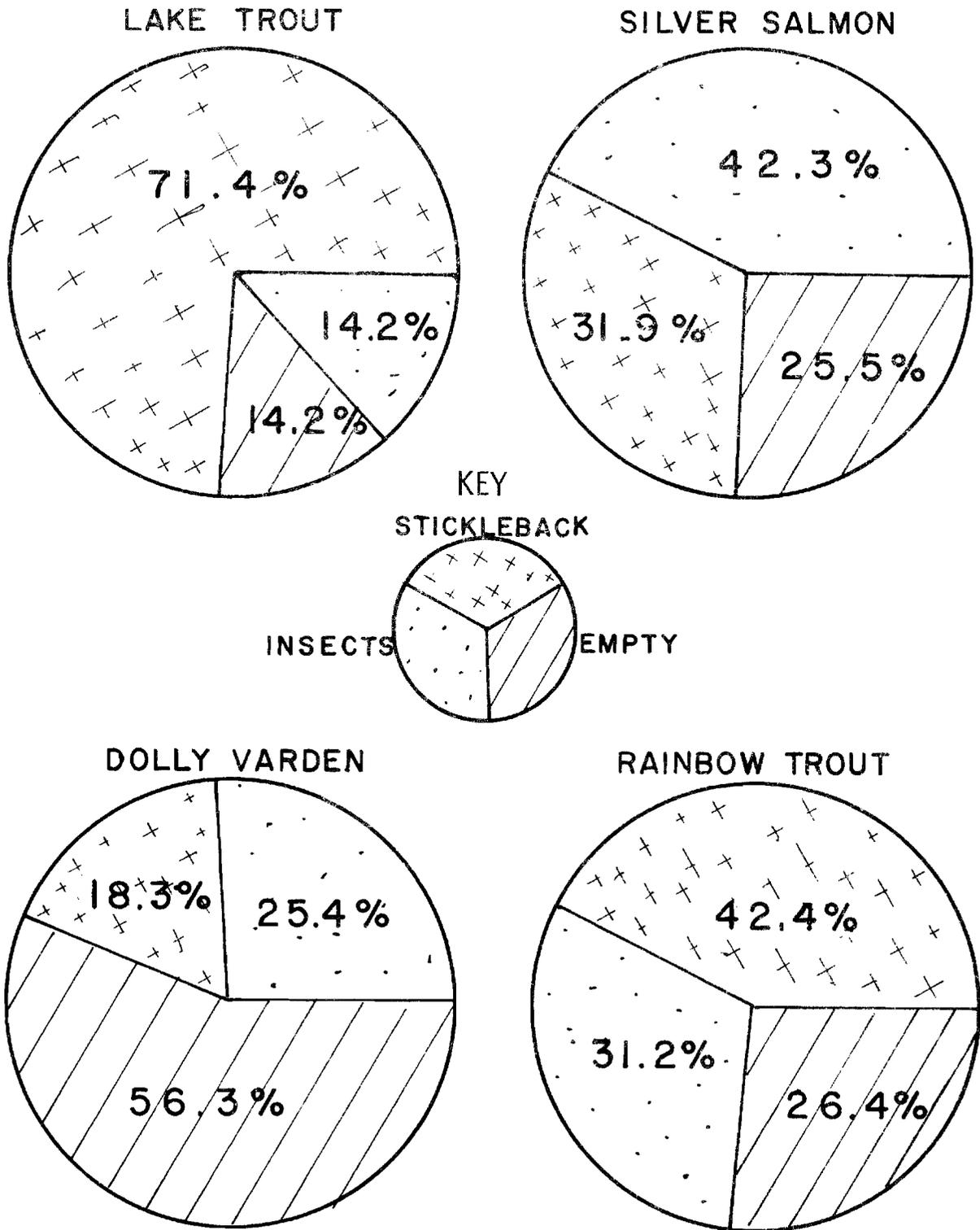


**FIG. 1** *TEMPERATURE-OXYGEN PATTERN OF A TYPICAL KENAI PENINSULA DYSTROPHIC LAKE.*

Figure 2

GRAPHIC PRESENTATION OF LAKE RESIDENT GAME FISH FOOD HABITS

ILLUSTRATING THE UTILIZATION OF THREESPINE STICKLEBACK AS FORAGE.



Varden and silver salmon, illustrates the chronic land-locked situation. Reeder Lake Dolly Varden average 10.7 inches and range from 10.0 inches to 11.2 inches. The anadromous Dolly Varden population wintering in Bear Lake in 1959 had an average length of 10.4 inches and ranged from 5.5 inches to 20.9 inches.

Arctic Grayling were successfully introduced in 1952. From the original Crescent Lake plant of 240 two to four year olds, the species has become established in much of the Kenai River drainage. Adult grayling have been recorded from Ptarmigan Creek, Daves Creek, Quartz Creek, Crescent Creek, Upper Trail Lake and Kenai Lake. The specimen from Upper Trail Lake, an extremely muddy body of water, was a ripe female captured near the mouth of Moose Creek. The Crescent Lake fishery is popular and productive.

Anadromous red salmon and pink salmon are popular sport fishes in fresh water. The Russian River red salmon run and the Resurrection Creek pink salmon run are heavily fished. Although both species are available in numerous streams, these particular runs are large and very accessible.

Freshwater sport fishing for anadromous silver salmon is minor. Quartz Creek, Anchor River and Kenai River are subject to short but intensive pressure. This species enters fresh water, after the moose hunting season opens; a period when relatively few sport fishermen are active. Adult silver salmon are available and in fair to good condition as late as January. This is a fishery that will probably develop with publicity.

Prepared by:

Approved by:

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Richard Haley  
Fishery Biologist

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Richard Haley  
D-J Coordinator

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Alex H. McRea, Director  
Sport Fish Division