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STATE OF ALASKA

William A. Egan, Governor



ANNUAL REPORT OF PROGRESS, 1965 - 1966
FEDERAL AID IN FISH RESTORATION PROJECT F-5-R-7
SPORT FISH INVESTIGATIONS OF ALASKA

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INTRODUCTION

This report of progress consists of Job Segment Reports conducted under the State of Alaska Federal Aid in Fish Restoration Project F-5-R-7, "Sport Fish Investigations of Alaska."

The project during this report period is composed of 18 separate studies. Some are specific to certain areas, species or fisheries, while others deal with a common need for information. Each job has been developed to meet the needs of various aspects of the State's recreational fishery resource. Seven jobs are designed to pursue the cataloging and inventory of the numerous State waters. These jobs, which are of a continuing nature, will eventually index the potential recreational fisheries. Four jobs are directed toward specific sport fish studies. These include specialized efforts toward the anadromous Dolly Varden of Southeastern Alaska, the silver salmon in Resurrection Bay, the king salmon stocks on the Lower Kenai Peninsula, the king salmon stocks in Upper Cook Inlet, and the Arctic grayling of the Tanana River system.

The statewide access program is developing rapidly. Our efforts in investigating existing and potential recreational sites and access has resulted in favorable action being taken on our proposals and recommendations submitted to the land management agencies at both the State and Federal levels.

The remaining jobs included a specialized creel census effort in Southeastern, an egg-take program designed to establish indigenous egg-take sources, and evaluation of the Fire Lake system.

Three special reports have been completed from past studies on the Dolly Varden study. These appear in the Department's "Research Report" series and are a direct result of the Federal Aid In Fish Restoration Program. To date, the following reports have been published: Research Report No. 3, "Some Migratory Habits of the Anadromous Dolly Varden Salvelinus malma (Walbaum) in Southeastern Alaska," 1965, Robert H. Armstrong; Research Report No. 4, "Annotated Bibliography on the Dolly Varden Char," 1965, Robert H. Armstrong; and Research Report No. 5, "Age and Growth of Anadromous Dolly Varden Char Salvelinus malma (Walbaum), in Eva Creek, Baranof Island, Southeastern Alaska," 1966, David W. Heiser.

The material contained in this progress report is often fragmentary in nature. The findings may not be conclusive and the interpretations contained herein are subject to re-evaluation as the work progresses.

RESEARCH SEGMENT

STATE: ALASKA Name: Sport Fish Investigations of Alaska.
Project No.: F-5-R-7
Job No.: 12-A Title: Inventory and Cataloging of the Sport
Fish and Sport Fish Waters in the
Bristol Bay and Lower Kuskokwim
Drainages.
Period Covered: June 1, 1965 to September 15, 1965.

ABSTRACT

Specific studies to catalog and inventory the freshwater sport fisheries in the Bristol Bay and lower Kuskokwim drainages were started in 1963 and continued each successive year, (Paddock, 1963, 1964). The present report is a continuation of these prior studies.

Field work was reduced during the 1965 work season due to the resignation of the project leader. Two fishery aides were assigned to the study area from June 15 through September 15. A minimal amount of data was obtained to maintain project continuity.

Enumeration of the king salmon, Oncorhynchus tshawytscha (Walbaum), in Big Creek, Naknek River drainage, was continued for the third successive year to gather population trend data.

Six hundred and sixty rainbow trout, Salmo gairdneri (Richardson), scale samples were gathered from the Lake Iliamna drainage, impressed in plastic and analyzed for total age and anadromous characteristics (steelhead). Nine age groups were present in the sample and ranged from Age II to Age X.

A compilation of 15 freshwater sport fishing areas and their accessibility is presented.

RECOMMENDATIONS

1. It is recommended that the objectives of the present study be continued.
2. It is recommended that an attempt be made to enumerate and describe the king salmon subsistence fishery in the Naknek River.
3. King salmon enumeration surveys should be continued on Big Creek and King Salmon Creek, tributaries to the Naknek River, and expanded to include the Alagnak (Branch) River, tributary to the Kvichak River.

4. Rainbow trout studies in the Iliamna-Kvichak watershed should be terminated except for cursory observations, and emphasis should be shifted to the Naknek River. Manpower and budgetary allotments are inadequate to conduct a large scale study in such a vast area. The Naknek River sustains a sport fishing pressure higher than all other areas in Bristol Bay combined. In addition, transportation and housing facilities are readily available at King Salmon.
5. It is further recommended that regulatory measures be taken to restrict the taking of rainbow trout in the Iliamna-Kvichak watershed for subsistence purposes and encourage the taking of other, more abundant, species such as lake trout and whitefish.

OBJECTIVES

1. To assess the environmental characteristics of the existing and potential fishery waters of the job area and where practicable, obtain estimates of existing or potential angler use and sport fish harvest.
2. To evaluate application of fishery restoration measures and availability of sport fish egg sources.
3. To assist as required in the investigation of public access status to the area's fishing waters.
4. To evaluate multiple water use development projects (public and private) and their effects on the area's streams and lakes for the proper protection of the sport fish resources.

TECHNIQUES USED

Species composition and distribution were sampled by use of seine, gill nets, and hook and line.

King salmon escapements were estimated by float surveys.

Background information was reviewed from prior Alaska Department of Fish and Game studies and reports, U. S. Fish and Wildlife reports and Fishery Research Institute reports.

Narrative discussions are presented as historical background for three freshwater sport fisheries: Naknek, Lake Iliamna, and Ugashik.

FINDINGS

Naknek River King Salmon Studies

Specific studies of the Naknek River king salmon, Oncorhynchus tshawytscha (Walbaum), stocks began in 1963 with aerial surveys of the spawning escapement in the Big Creek and King Salmon Creek tributaries (Paddock, 1963). The study was expanded in 1964 with the addition of float surveys of Big Creek and King Salmon Creek (Paddock, 1964).

Enumeration of the escapement of king salmon was continued during 1965 in Big Creek. King Salmon Creek was not surveyed.

Determination of the numbers of king salmon bound for the Naknek River is complicated by the commercial fishery in salt water. King Salmon entering the commercial fishery are composed of fish bound for both the Naknek and Kvichak Rivers. The commercial fishery for king salmon in the Naknek-Kvichak District has remained largely incidental to the effort directed toward red salmon.

King salmon bound for the Naknek River are also subjected to an intense subsistence gill net fishery. The total annual catch of this fishery is unknown. More than 50 permits are issued annually to take king salmon in the Naknek River for personal use.

The sport fishery for king salmon in the Naknek River developed rapidly during the mid-1950's and continues presently at a high level.

It was reported by Paddock (1964), that a downward trend of king salmon returning to the Naknek River was evident. The 1965 enumeration of spawning king salmon in Big Creek indicated the downward trend continued (Table 1).

TABLE 1 - Spawning Counts of King Salmon, Big Creek, Naknek Drainage, 1963, 1964, 1965.

<u>Date</u>	<u>Type</u>	<u>Total Count</u>	<u>Remarks</u>
8/13/63	Aerial	1,345	Good survey
8/15-18/64	Float	1,130	Fair to good survey
8/5-8/65	Float	578	Fair survey

Iliamna-Kvichak Rainbow Trout Studies

The present status of major rainbow trout stocks, Salmo gairdneri (Richardson), in the Kvichak watershed is unknown. Biological knowledge is based almost completely upon observations made in 1964. Information collected to date consists of: (1) scales and length data; (2) gonads in various stages of development; and (3) some samples of fry and fingerlings. Much of the foregoing remains to be thoroughly analyzed.

In total, 660 scale samples were obtained from the Kvichak drainage during the field season of 1964. These scales were obtained from sport fishermen and by personnel of the Department of Fish and Game using gill nets and hook and line sampling. The scales were impressed in plastic and analyzed for age and anadromous growth characteristics. All scales were analyzed by personnel of the Fishery Research Institute, University of Washington.

Personnel of the FRI subjected three samples, consisting of ten scales each, to the scrutiny of four semi-experienced steelhead trout scale readers. Almost complete disagreement was noted between readers concerning the ability to discern between stream and lake growth. It was concluded that, due to stream and lake growth scale pattern similarities, the fish in the sample were not migrating to sea.

Spawning marks were not always clear. This was thought due to the scale samples being taken from different areas on each fish.

Total age agreement was quite good among the readers and is used to show age and length frequency for the fish in the sample. Age frequency of rainbow trout in the Iliamna-Kvichak drainage is presented in Figure 1, and the mean length by age group is shown in Figure 2. Figure 2, however, is a biased curve as the samples from which it is drawn were collected from April through September and changes in growth are not accurately shown. Nine age groups were present in the sample and ranged from Age II to Age X.

The presence or lack of steelhead in the system is still academic. From analysis of the scale growth patterns it is possible that rainbow trout that were spawned in the tributaries of Lake Iliamna migrate to the lake where they mature. However, saltwater migrations cannot be ruled out. Referring to Table 2, it can be observed that a considerable range of sizes occurs within a particular age class and a significant range is noted for the number of age classes within a particular length group.

Sport exploitation of, and interest in, the rainbow trout of this extensive area is experiencing a steady and, in some places, rapid growth.

Historic utilization for subsistence purposes may be expected to continue unless a program of education is instituted which is successful in: (1) pointing out the increased value of this fishery to the historical user when utilized by sport fishermen and (2) a satisfactory substitute is demonstrated to be readily available. The inception and growth of a commercial fishery on lake trout and whitefish, to which this species has been demonstrated to be incidentally vulnerable, threatens explosive consequences should problems currently inhibiting the growth of this commercial fishery be overcome.

Ugashik Lakes Grayling Study

The Arctic grayling, Thymallus arcticus (Pallas), of the Ugashik Lakes, particularly those at the Narrows between the two lakes and at the outlet of the lower lake, have long been known in Western Alaska for their large size. Grayling are abundant throughout Bristol Bay, and the existence of a sport fishery on this species in the Ugashik Lakes is dependent upon their trophy size. Exploitation to a degree which would remove the majority of trophy-sized individuals from the available population would quickly bring about the demise of this fishery.

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A brief field trip was made to the Ugashik system to obtain a sample of grayling for age and growth data. A sample of 17 fish was obtained by hook and line sampling. Scale samples were obtained, impressed in plastic, and analyzed for total age. Lengths were also recorded. Four age classes, Age V to Age IX, were present. Fork lengths ranged from 17.5 inches to 22.5 inches. Fifteen fish in the sample were Age VII and older, one fish was Age VI and one fish was not aged as the scale sample was regenerated.

TABLE 2 - Iliamna-Kvichak, Rainbow Trout Age and Length Frequency Data, 1964.

Length Group (Inches)	2	3	4	5	6	7	8	9	10	Number of Fish
5	2									2
6		1								1
7	3	3								6
8	3	8								11
9		20	4							24
10		10	9							19
11		5	21	4						30
12		4	10	4	1					19
13		4	13	7	1					25
14		3	9	6	1					19
15			7	7	5					19
16		1	2	8	2					13
17			2	7	3	1				13
18			1	13	5					19
19			3	8	3	1				15
20			2	8	10	4	2			26
21			2	11	14	6	1	1		35
22			4	4	7	6	1			22
23			1	4	13	7	3			28
24				5	5	6	1			17
25					5	6	2		1	14
26					8	1	5	1	1	16
27					6	7	5		1	19
28					1	5	4	3	1	14
29							2	2		4
30										
31							1			1
TOTAL	8	59	90	96	90	50	27	7	4	431
Percent of Sample	1.9	13.7	20.9	22.3	20.9	11.6	6.2	1.6	0.9	
Mean Length	6.9	10.0	13.5	17.9	21.5	25.3	26.4	29.4	27.0	

Compilation of Sport Fishing Waters

Table 3 is presented to summarize data collected on 15 freshwater areas. Predominant sport fish species and accessibility is included. Additional waters are to be included in future listings as information is obtained.

TABLE 3 - Compilation of Sport Fishing Waters in the Kuskokwim - Bristol Bay - Alaska Peninsula Areas, 1965.

<u>Water</u>	<u>Fish Present*</u>	<u>Accessibility</u>
Kuskokwim River System Aniak Lake	LT, WF	Air charter services from Aniak. Commercial airline services from Anchorage. Accommodations and supplies available at Aniak.
Aniak River	RT, DV, GR KS, SS, SF	River boat services available from Aniak.
Owhat River	SF, GR, WF	Four and one-half miles up the Kuskokwim River from Aniak via river boat. Fishing best where Owhat River joins the Kuskokwim River.
Togiak River System Togiak Lake (outlet) Ongivinuk Lake (outlet) Gechiak Lake (outlet) Pungokepuk Lake (outlet)	GR, AC RB, GR, AC RB, GR, AC, SS RB, GR, NP	Air charter service available from Dillingham. No accommodations at the lakes.
Igushik River System Amanka Lake (outlet) Kathlene River (mouth)	RB, GR, SS, AC GR, AC	Air charter service available from Dillingham. No accommodations at lake.
Wood River System Lake Aleknagik (outlet) Agulowak (Second Wood River) Agulukpak (Third Wood River) Lynx Creek (Lake Nerka) Little Togiak River (Lake Nerka) Peace River (Fourth Wood River) Wind River (Fifth Wood River) Grant River (Sixth Wood River)	AC, RB, GR RS, NP (All waters)	Aleknagik village may be reached from Dillingham by road during the summer and fall months. All of the Wood River lakes are accessible by boat from Aleknagik. Air charter service available from Dillingham and King Salmon. Fishing camp present. Prior arrangement for accommodations suggested.

TABLE 3 (Con't) - Compilation of Sport Fishing Waters in the Kuskokwim -
Bristol Bay - Alaska Peninsula Areas, 1965.

<u>Water</u>	<u>Fish Present*</u>	<u>Accessibility</u>
Tikchik Lake System		
Nuyakuk River	RB, GR	Served by charter and scheduled aircraft from Dillingham. Accommodations at lakes available by prior arrangement.
Tikchik Lake (outlet)	RB, LT, GR	
Nuyakuk-Tikchik Narrows	LT, GR, AC	
Chauekuktuli-Nuyakuk Narrows	GR	
Nushagak River System		
Nushagak River-	RB, GR, DV,	Served by charter aircraft from Dillingham and King Salmon. Some spots near villages served by scheduled airlines from Dillingham. Inquire locally for further information.
Mulchatna River-	KS, SS, PS,	
including the following:	NP	
Portage Creek (mouth)	(All waters)	
Klutuk Creek (mouth)		
Koktuli River (mouth)		
Old Stuyahok River (mouth)		
King Salmon River (mouth)		
Kvichak River System		
Igiugig-Kashanak Flats	RB, DV, GR, SS, PS, NP	Iliamna Village reached by scheduled flights. Entire area served by charter service from Anchorage, King Salmon, Dillingham, and Iliamna. Accommodations available at Iliamna and Igiugig. Boats usually available at Newhalen River and Igiugig.
Lower Talaric Creek	RB, GR, DV	
Lake Clark	LT, NP	
Newhalen River	RB, DV, GR	
Copper River	RB, GR, NP	
Gibraltar Lake	RB, GR	
Alagnak (Branch) River System		
Kukaklek Lake (outlet)	RB, GR, LT	Charter and some scheduled air service from King Salmon. Fish camps present. Prior arrangements for accommodations desirable.
Battle River	RS, DV	
Funnel Creek	(All waters)	
Nonvianuk Lake (outlet)		
Kulik River		
Naknek River System		
Naknek River	RB, GR, KS SS, PS, RS	Naknek River and King Salmon Creek may be reached on foot from King Salmon. Accommodations available at King Salmon. Boats sometimes available. Outlying areas served by charter and some scheduled air service from King Salmon. Fish camps present. Prior arrangements desirable.
King Salmon Creek	RB, DV, GR KS, SS	
Big Creek	RB, DV, GR KS	
Brooks River	RB, GR, DV RS	
Idavain Lake	DV	
Naknek Lake	LT, AC, NP	
Coville-Grosvenor Narrows	DV, RB, GR LT, NP	
American River	RB, DV, GR RS	

TABLE 3 (Con't) - Compilation of Sport Fishing Waters in the Kuskokwim -
Bristol Bay - Alaska Peninsula Areas, 1965.

<u>Water</u>	<u>Fish Present*</u>	<u>Accessibility</u>
Egegik River System Becharof Lake (outlet) Ruth River Featherly Creek and others	RB, GR, AC, DV (All waters)	Air charter service avail- able from King Salmon and Pilot Point. No accommo- dations at lakes.
Ugashik River System Lower Ugashik Lake (outlet) Narrows between lakes	GR, AC, DV GR, AC, DV	Air charter service avail- able from King Salmon and Pilot Point. Accommodations available only by prior arrangements.
Bear River System	DV, AC	Air charter from Port Moller and Cold Bay. No accommo- dations at lake.

* Legend:

RB - Rainbow Trout
LT - Lake Trout
GR - Grayling
AC - Arctic Char
DV - Dolly Varden
SF - Sheefish
WF - Whitefish
NP - Northern Pike
SS - Silver Salmon
KS - King Salmon
PS - Pink Salmon

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Prepared by:

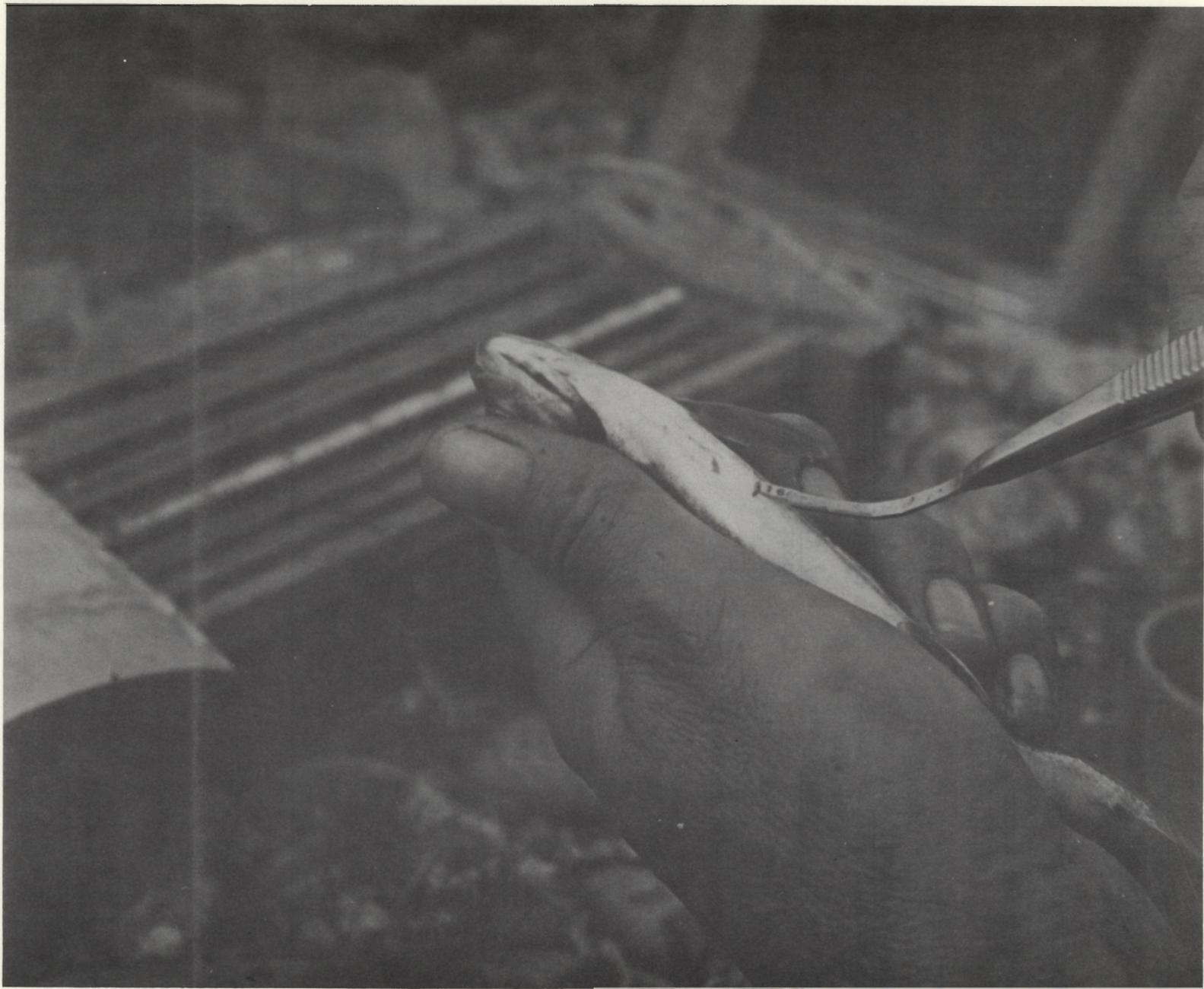
Rupert Andrews
Fishery Biologist

Date: April 1, 1966

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s/ Louis S. Bandirola
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s/ Alex H. McRea, Director
Sport Fish Division



Arctic Grayling are Tagged with Subcutaneous Tags to Provide Information on Movements and Growth.