

STATE OF ALASKA

Jay S. Hammond, Governor



Annual Performance Report for

INVENTORY AND CATALOGING
INTERIOR ALASKA

by

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RESEARCH PROJECT SEGMENT

State: ALASKA

Name: Sport Fish Investigations
of Alaska

Project No.: F-9-8

Study No.: G-I

Study Title: INVENTORY AND CATALOGING
(Continuation Report)

Job No.: G-I-P

Job Title: Inventory and Cataloging of
Sport Fish Waters of Western
Alaska

Period Covered: July 1, 1975 to June 30, 1976

ABSTRACT

During the first year of a two year study of the fisheries resources of the waters of the lower Kuskokwim River and Kuskokwim Bay, six rivers and lakes were completely or partially surveyed. Rainbow trout, Salmo gairdneri Richardson, were found in all streams and lake trout, Salvelinus namaycush (Walbaum), and Arctic char, S. alpinus (Linnaeus), were abundant in the study waters. Preliminary analysis of biological data indicate growth rates slower than Interior Alaska populations but faster than Arctic Alaska populations.

BACKGROUND

With an increase in sport fishing pressure in the Bristol Bay area, it is only a matter of time until anglers begin discovering the excellent sport fishing potential of streams in the lower Kuskokwim River and Kuskokwim Bay.

The rainbow trout is one of the most sought after game species in the area. Excellent sport fishing for grayling, Arctic char, lake trout, pike, and king, silver and red salmon also exists. Virtually no written information exists on the physical characteristics of the waters or biological parameters of the fish species.

A two year study was undertaken in 1975 to collect baseline information on fish populations in the major streams and lakes of the lower Kuskokwim

River and Kuskokwim Bay. The Kuskokwim River study area includes the waters flowing into the Kuskokwim River from the south, namely the Aniak, Tuluksak, Kisarolik, Kweethluk and Kasigluk rivers and also the Arolik, Kanektok and Goodnews river drainages of the Kuskokwim Bay. The Aniak River will receive special emphasis because at this location the rainbow trout reaches its farthest upstream and northernmost distribution in the world.

OBJECTIVES

1. To survey the principal tributaries of the lower Kuskokwim River and Kuskokwim Bay, including major headwater lakes. In 1975, the Aniak, Kisaralik, Kanektok, and Goodnews river systems will be surveyed as time permits.
2. To assess the fish species composition of these waters, with emphasis on sport fish species.
3. To determine life history parameters of these fish, including age and growth, reproduction, and migration timing.
4. To determine the present sport fishing utilization of these waters and their potential for supporting a sport fishery.
5. To evaluate other waters and sport fisheries in the job area as demand warrants.

TECHNIQUES USED

Streams were divided into sections according to habitat type. Surveys were conducted by boat or raft.

Lakes were sounded using a Lowrance flashing depth finder. Chemical analyses were made with a Hach kit.

Size of lakes was taken from U. S. G. S. quadrangle maps.

Fish populations were sampled using variable mesh gill nets, hook and line, seine and minnow traps. Basic biological information including weight, length, sex, maturity and food habits was collected on fish sampled. Scales and otoliths were collected for ageing.

Meristic counts on Arctic char were made on the excised first left arch.

Information on salmon escapement and utilization came from the Division of Commercial Fisheries.

FINDINGS

During 1975 complete or partial stream surveys were conducted on four streams in the lower Kuskokwim River (Aniak, Kisarolik, Kasigluk and Kweethluk rivers) and two streams and ten lakes in the Kuskokwim Bay area (Kanektok River, and Kagati, Kanuktuk, Klak and Oknlik lakes; Goodnews River and Goodnews, Canyon, Asriguat, Kukatlim, North Middle Fork and South Middle Fork lakes). Physical data on the waters as well as test netting results were recorded on Alaska Department of Fish and Game lake and stream survey forms and placed in Department files in Fairbanks and Juneau. These forms will be updated and completed as new data are collected during the 1976 field season.

A final report consisting of: Part I, A Lake and Stream Catalogue of the Lower Kuskokwim River and Kuskokwim Bay; and Part II, Biological Data of Fishes of the Lower Kuskokwim River and Kuskokwim Bay, will be submitted after completion of 1976 field work.

Summary of 1975 Lake and Stream Surveys

The streams and lakes of the study area all have their origins in the Kilbuck Mountains and are similar in character. All streams are less than 300 km in length, all have watersheds of approximately 3,200 km², all are clear, fast moving streams with gravel bottoms over almost their entire lengths and, all have excellent spawning habitat for grayling, Thymallus arcticus (Pallas), Arctic char, Salvelinus alpinus (Linnaeus) rainbow trout, Salmo gairdneri Richardson, and salmon, Oncorhynchus sp. The streams flowing into the Kuskokwim River have a 10-20 km reach of the lower river where the current is slower, and the bottom is mud covered. Their numerous sloughs provide habitat for typical Kuskokwim River species such as pike, Esox lucius (Linnaeus), sheefish, Stenodus leucichthys, suckers, Catostomus catostomus (Forster), burbot, Lota lota (Linnaeus), humpback whitefish, Coregonus pidschian (Gmelin), broad whitefish, C. nasus (Pallas), and least cisco, C. sardinella Valenciennes. The streams flowing into Kuskokwim Bay generally do not have this type of habitat and this may be the reason why sheefish, suckers, pike, burbot, humpback whitefish, broad whitefish, least cisco and Bering cisco, Coregonus laurettae Bean, are not present in these streams.

Streams generally become ice free in May and freeze up in October. Spring run off generally lasts through June.

The lakes of the study area thus far surveyed have all been in the Kuskokwim Bay drainage and all are quite similar in character and species composition. All lakes but Kukatlim Lake are situated in mountainous terrain, at elevations over 1,500', are oligotrophic, and over 30 m. deep. Kukatlim Lake is less closely surrounded by mountains and its maximum depth is 2.2 m. Kagati Lake flows directly into the Kanektok River; the other lakes of the drainage enter the Kanektok via tributary streams. Goodnews Lake drains directly into the Goodnews River and other lakes enter the mainstem Goodnews River or the Middle Fork Goodnews River via tributary

streams. Because of the numerous lakes in the systems, the Kanektok and Goodnews rivers are excellent red salmon, Oncorhynchus nerka (Walbaum), streams and as many as 30,000 spawners may utilize the lakes of the Goodnews system in a year. Lake trout, Arctic char, round whitefish, Prosopium cylindraceum (Pallas), and red salmon are the most common species found in the lakes. Silver salmon, Oncorhynchus kisutch (Walbaum), and king salmon, O. tshawytscha (Walbaum), spawn at least in Asriguat and Klak lakes. Only one grayling was caught in the lakes sampled (that in Kagati Lake). A single northern pike was captured in Goodnews Lake, the first record of this species in the drainages of Goodnews River.

Summary of Biological Information of Fishes of Lower Kuskokwim River and Kuskokwim Bay

Twenty-four species of freshwater fish inhabit the study area, including ten important sport species (Table 1). The Dolly Varden, Salvelinus malma (Walbaum), may also be present. All of the above species except the threespine sticklehead, Gasterosteus aculeatus, are present in the lower Kuskokwim River streams, but only sixteen species have been found thus far in Kuskokwim Bay drainages. The Kuskokwim Bay drainages did not contain any whitefish other than round whitefish, nor were boreal smelt, Osmerus dentex, Arctic lamprey, Lampetra japonica (Martens), and longnose sucker found there. Only one pike was found in Kuskokwim Bay drainages.

Fish associations include one species, the sheefish (inconnu), at its southernmost range in Alaska and one species, the rainbow trout, at its most northerly distribution. Fish populations in the study area are typical of subarctic populations in that growth rates are relatively slow, fish mature at a late age but have long life spans, and intermittent spawning may be the rule.

Rainbow Trout

Although not the most numerous species in the study area, the rainbow trout is the most sought after sport species and is of great biological significance as the Aniak River represents the farthest north distribution of a naturally reproducing population. Rainbow trout in the study were found in all rivers sampled and are year-round stream residents. In the Aniak River their distribution generally coincides with the upstream distribution of salmon spawners and they are seldom encountered any farther upstream than the Salmon River confluence. They are generally found in areas of fast moving water but gill net catches in late May indicated their presence, along with pike, grayling, round whitefish and Arctic char, in slow or dead water sloughs of the lower Aniak River. The largest trout captured weighed 6.25 lbs (2.8 kg) and was from the Goodnews River. An age and growth study utilizing 153 fish captured indicated a maximum age of XI with most fish belonging to Age Classes VIII-X. Trout from Kuskokwim Bay drainages grew faster than fish from lower Kuskokwim River streams but both groups grew slower than rainbow trout in Lake Iliamna drainages (Russel, 1975). In 1975 rainbow trout in the Aniak River had not begun spawning by May 28, when water temperature was 3.5°C.

Table 1. List of common and scientific names of fish found in the study area. Abbreviations used in the text are also included. Common and scientific names follow Bailey, 1970.

Arctic lamprey	<u>Lampetra japonica</u> (Martens)	AL
Chinook (king) salmon	<u>Oncorhynchus tshawytscha</u> (Walbaum)	KS
Sockeye (red) salmon	<u>Oncorhynchus nerka</u> (Walbaum)	RS
Coho (silver) salmon	<u>Oncorhynchus kisutch</u> (Walbaum)	SS
Chum (dog) salmon	<u>Oncorhynchus keta</u> (Walbaum)	CS
Pink salmon	<u>Oncorhynchus gorbuscha</u> (Walbaum)	PS
Rainbow trout	<u>Salmo gairdneri</u> Richardson	RT
Lake trout	<u>Salvelinus namaycush</u> (Walbaum)	LT
Arctic char	<u>Salvelinus alpinus</u> (Linnaeus)	AC
Inconnu (sheefish)	<u>Stenodus leucichthys</u> (Guldenstadt)	SF
Round whitefish	<u>Prosopium cylindraceum</u> (Pallas)	RWF
Least cisco	<u>Coregonus sardinella</u> Valenciennes	LCI
Bering cisco	<u>Coregonus laurettae</u> Bean	BCI
Humpback whitefish	<u>Coregonus pidschian</u> (Gmelin)	HWF
Broad whitefish	<u>Coregonus nasus</u> (Pallas)	BWF
Arctic grayling	<u>Thymallus arcticus</u> (Pallas)	GR
Boreal smelt	<u>Osmerus mordax</u> (Mitchill)	SM
Northern pike	<u>Esox lucius</u> Linnaeus	NP
Blackfish	<u>Dallis pectoralis</u> Bean	BL
Longnose sucker	<u>Catostomus catostomus</u> (Forster)	SU
Burbot	<u>Lota lota</u> (Linnaeus)	BB
Threespine stickleback	<u>Gasterosteus aculeatus</u> Linnaeus	TST
Slimy sculpin	<u>Cottus cognatus</u> Richardson	SC
Ninespine stickleback	<u>Pungitius pungitius</u> (Linnaeus)	NST

Dolly Varden, Salvelinus malma, may also be present in lake situations.

Grayling

Grayling are probably the most numerous resident fish species to be found in the streams of the study area, generally being distributed from the headwaters to areas of slower moving water and silt gravel bottom near mouths of streams. The reason for their absence or low abundance in the lakes is unknown. In the streams of the lower Kuskokwim, grayling are found with resident char, round whitefish and rainbow trout, and all species have similar food habits. In the Aniak system grayling had not begun spawning in the lower Salmon River and in the main Aniak at Mile 60 on May 26 (water temp. 3.5°C) but on May 27 spent grayling began appearing in the catches in the backwater areas of the lower reaches of the Aniak River. Water temperature was 4°C. The grayling in the streams of the lower Kuskokwim reach a smaller maximum size than grayling in rivers of Kuskokwim Bay where 18-21" (47-53 cm) grayling are common. Grayling collected during 1975 will be combined with 1976 caught fish prior to making age determinations.

Arctic Char

Arctic char are present as lake residents, stream residents, and anadromous char. Anadromous char are found only in streams of Kuskokwim Bay, where they arrive in July. Taxonomic studies may identify lake dwelling char as Dolly Varden. Stream resident char from the lower Kuskokwim River rarely reach 500 mm in length, while lake resident char reach 640 mm and anadromous char in the Goodnews River reached a maximum size of 700 mm and 4.5 kg (10 lbs). Anadromous char grow more rapidly than resident or lake char and reached Age XII in the Goodnews River. Lake char reached Age XIII.

Lake Trout

Lake trout are found in all lakes thus far surveyed as well as in the entire length of the Goodnews River. Gill net catches in lakes of Kuskokwim Bay consisted of in many cases over 40% lake trout (0.5-13 lake trout per net night). Round whitefish, char and red salmon were the other dominant species. Lake trout ranged from 277 to 773 mm and from 250 to 6,500 gr. No lake trout less than Age VI were taken and most trout were Age Class IX to XI. Age Class XIX was maximum for trout from Arolik and Kanuktik lakes. Lake trout fed on a variety of organisms including insects, snails, clams, voles and eight species of fish.

Sheefish

Sheefish are found only in the lower reaches of streams of the lower Kuskokwim River and only as a feeding visitor. A large migration of mainly prespawning adults migrate upstream in the Kuskokwim in late May and early June and some individuals enter the lower reaches of the streams. Pertinent biological data on this species has been published by Alt (1972).

Northern Pike

With the exception of one pike taken in Goodnews Lake this species is confined to the slower moving sections of streams of the lower Kuskokwim River.

They do not reach the large size of pike further up the Kuskokwim and the largest pike captured weighed 4 kg. They reach Age XIII. Northern pike were spawning in the flooded portions of the lower 35 km of the Aniak River the last four days of May in 1975.

Sport Fishery

At present there is a moderate sport fishery directed mainly at rainbow trout in the Aniak, Kweethluk, and Kisarolik rivers. Pressure comes mainly from Bethel residents and residents of villages near the rivers. Bethel anglers also exert sport fishing pressure on some of the lakes in the study area, especially Kagati and Arolik lakes, where lake trout and Arctic char are the target species. Nonresident sport fishing pressure on the Aniak, Kweethluk, Kisarolik, Goodnews, and Kanektok rivers is light at present and directed mainly at rainbow trout. A small number of anglers fly into the lakes at the head of the Arolik, Kanektok, and Goodnews rivers and float down the streams to fish for rainbow trout, char, grayling, and king and silver salmon. Present use of the stream waters of the study area with the exception of the Aniak, Kisarolik, and Kweethluk rivers is considered to be very light.

Sport fishing pressure for inconnu and northern pike is very light but silver salmon are actively sought by sportsmen in all streams of the lower Kuskokwim River and Kuskokwim Bay in August and September.

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