

Region ARCTIC

USGS Quad TELLER A-1

Anadromous Water Catalog Number of Waterway 332-00-10250-2110

Name of Waterway PILGRIM RIVER USGS Name Local Name

Addition Deletion Correction Backup Information

For Office Use

Nomination #	<u>03 216</u>	<u>AKG</u>	<u>4-3-03</u>
Revision Year:		Regional Supervisor	Date
Revision to: Atlas	Catalog		
	Both	AWC Project Biologist	Date
Revision Code:	<u>F-1</u>	Drafted	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
<u>BROAD</u>	<u>WHITEFISH</u>			<u>X</u>	<u>X</u>
<u>HUMPBACK</u>	<u>WHITEFISH</u>			<u>X</u>	<u>X</u>
					<input type="checkbox"/>
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IMPORTANT: Provide all supporting documentation that this water body is important for the spawning, rearing or migration of anadromous fish, including: number of fish and life stages observed; sampling methods, sampling duration and area sampled; copies of field notes; etc. Attach a copy of a map showing location of mouth and observed upper extent of each species, as well as other information such as: specific stream reaches observed as spawning or rearing habitat; locations, types, and heights of any barriers; etc.

Comments:

ALT, K. T. 1972. A LIFE HISTORY OF SHEEPFISH AND WHITE FISH IN ALASKA. ADF&G VOL 13: STUDY R-11

Name of Observer (please print)

KENNETH T. ALT

Date: 1/16/03

Signature:

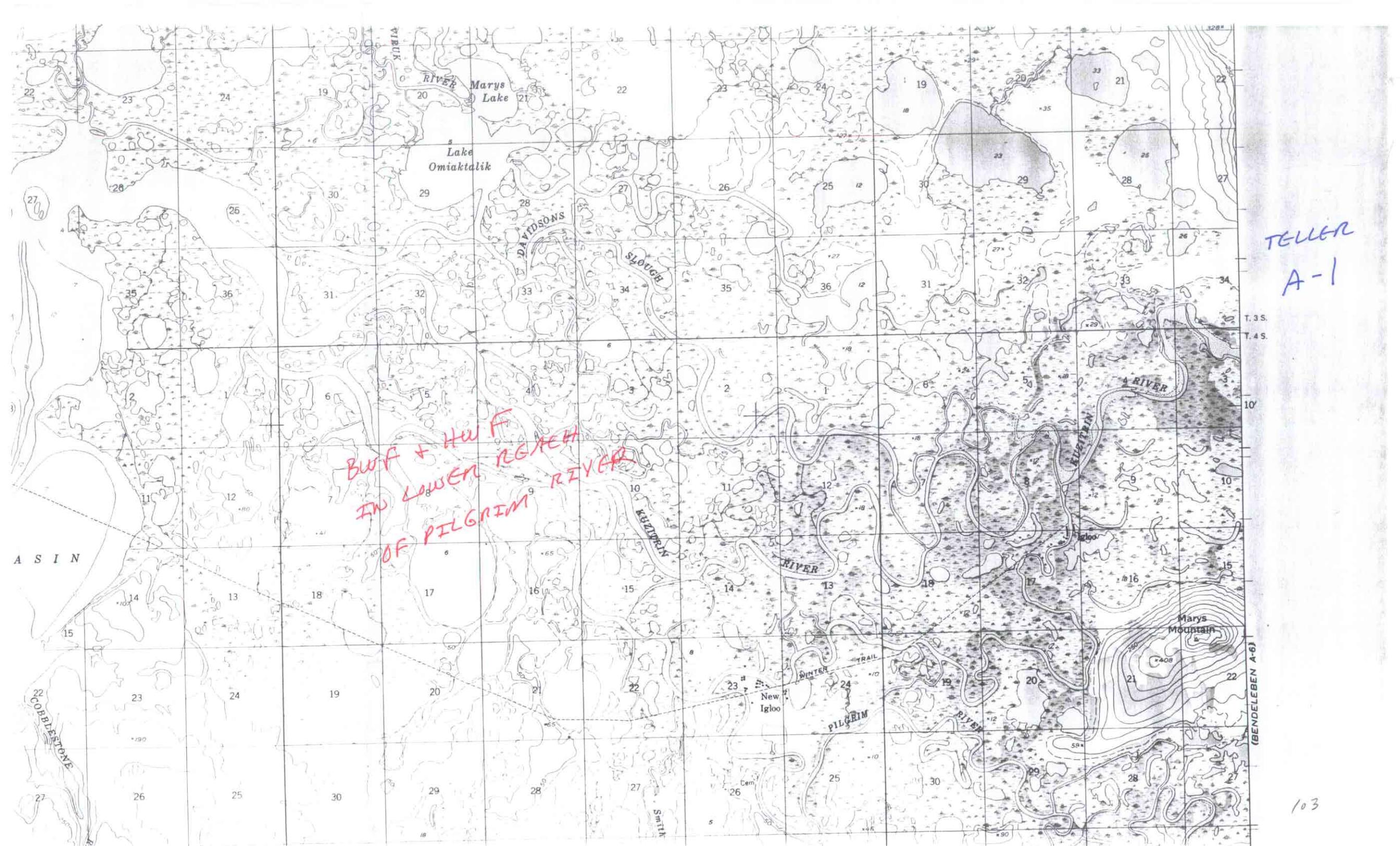
Address:

ALASKA DEPT. OF FISH & GAME
 APR 8 - 2003
 REGION II HABITAT AND RESTORATION DIVISION

This certifies that in my best professional judgment and belief the above information is evidence that this waterbody should be included in or deleted from the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist:

[Signature]



BUFF + HW F
IN LOWER REACH
OF PILGRIM RIVER

TELLER
A-1

(GENDELEBEN A-6)

STATE OF ALASKA

William A. Egan, Governor



Annual Progress Report for

A LIFE HISTORY STUDY OF SHEEFISH
AND WHITEFISH IN ALASKA

by

Kenneth T. Alt

ALASKA DEPARTMENT OF FISH AND GAME

James W. Brooks, Commissioner

DIVISION OF SPORT FISH

Rupert E. Andrews, Director

Howard E. Metsker, Coordinator

Job R-II-G Distribution, Movements, Age and Growth, and Taxonomic Status of Whitefish (Coregonus sp.) in the Arctic-Yukon-Kuskokwim Area.

Objectives

1. To determine whitefish distribution in the Arctic-Yukon-Kuskokwim area.
2. To determine growth and age at sexual maturity.
3. To determine the taxonomic status of whitefish in the Arctic-Yukon-Kuskokwim drainage and the North Slope.

Tanana Drainage

A broad whitefish was captured in the Tanana River 14 km upstream from the mouth of the Chena River in September, 1971. This represents the farthest upstream penetration of this species documented in the Tanana drainage.

Only least cisco and humpback whitefish were taken by gill net in Nelson Clearwater Creek.

Round whitefish were the only species of whitefish captured with a shocker boat in the Delta Clearwater River in May and early October.

Middle Yukon River

In June, 1971, round, broad, and humpback whitefish, least cisco, and Bering cisco, *C. laurettae*, were taken in the majority of middle Yukon tributaries sampled (Table 3).

A large number of mature Bering cisco were migrating upstream into Hess Creek and Ray River on June 22 and 23. Whitefish distribution will be discussed in greater detail after all tributaries of the middle Yukon have been test netted in 1972.

Kuskokwim River

Round, humpback, and broad whitefish and least cisco were taken in the Holitna River during June and July, 1971. The greatest upstream movement was during early June.

The upstream spawning migration of Bering cisco in the South Fork of the Kuskokwim River had begun by July 22. None were taken in any other tributary sampled. Humpback and broad whitefish and least cisco were taken in Big River and the South and East forks of the Kuskokwim at this time.

Three net nights of fishing in the North Fork of the Kuskokwim 12 km upstream from its junction with McKinley Fork in early September resulted in the capture of humpback, broad, and round whitefish.

Test netting in Highpower Creek at the extreme limit of navigation in the Kuskokwim River revealed the presence of spawning round, broad, and humpback whitefish and least cisco.

Four whitefish species appear to be distributed throughout the Kuskokwim drainage. Bering cisco have a more limited distribution.

Sagavanirktok River - North Slope

Extensive test netting during the Arctic char, Salvelinus alpinus, tagging program indicates that round, broad, and humpback whitefish and least and Arctic cisco, C. autumnalis, are present in the Sagavanirktok River drainage. Round whitefish are abundant in the upstream areas.

Age and Growth Studies

Round Whitefish:

A sample of 210 round whitefish, 200 - 420 mm fork length, was collected by shocker boat on May 17, 1971, in the lower Delta Clearwater River. The majority were 280 - 350 mm in length and ages V - VIII (Table 6). No fish of age classes I and II or over age X were captured. Both males and females become sexually mature at ages VI and VII.

The data indicate Delta Clearwater round whitefish grow faster than Colville River specimens (Kogel, 1970).

TABLE 6 Age-Length Relationship of 58 Round Whitefish, Delta Clearwater River, May, 1971.*

Age Class	n	Length (mm)	
		Range	Mean
I	0	--	--
II	0	--	--
III	2	200 - 225	212
IV	5	225 - 260	242
V	12	260 - 305	283
VI	9	275 - 335	307
VII	8	320 - 355	339
VIII	8	330 - 370	354
IX	7	360 - 405	384
X	7	375 - 420	396

*Sample selected to represent each 10 mm length group nearly equally.

TABLE 7 Mean Back-Calculated Length of Minto Flats Broad Whitefish (Sexes Combined).

Age at Capture	n	Mean Fork Length (mm) at End of Each Year of Life											
		L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	L ₈	L ₉	L ₁₀	L ₁₁	
V	7	163	286	367	438	503							
VI	26	145	263	350	435	497	543						
VII	21	130	230	318	398	464	524	569					
VIII	18	134	224	293	351	418	474	525	577				
IX	4	115	201	268	327	381	429	484	531	584			
X	3	127	203	278	315	365	408	450	495	537	589		
XI	1	125	200	245	295	345	430	485	515	555	610	630	
	80	138	242	323	396	460	508	530	560	564	594	630	

Mean Length for All Age-Groups

Broad Whitefish:

A comparative age and growth study was carried out on five populations of broad whitefish including 80 fish from the Minto Flats, 53 from Imuruk Basin on the Seward Peninsula, 32 from the Porcupine River, 73 from the Kuskokwim River, and 104 from the Sagavanirktok River. Fish were collected in 1970 and 1971.

Lengths of fish in all populations were back calculated from scale samples because few young fish were captured.

Minto Flats broad whitefish ranged in length from 40 - 64 cm and 0.9 - 4.1 kg in weight. Most were captured in the Tolovana River in the vicinity of New Minto village. No small broad whitefish were taken in the large mesh gill nets used.

Fish ranged from age V - XI with 81% between ages VI and VIII (Table 7). Minto Flats broad whitefish grow rapidly, often reaching 60 cm and 3.6 kg by age VIII. The growing season begins in May soon after ice goes out, and scale annuli are usually present by late May. Lee's phenomenon is apparent in Minto Flats broad whitefish. The reason is that apparently slower-growing fish live longer than the faster-growing fish.

Nearly all broad whitefish sampled in the Minto Flats were mature. Females are apparently non-consecutive spawners as many large fish were found during the summer that contained tiny eggs (less than 0.5 mm) and residual eggs of the previous year's spawning.

Imuruk Basin broad whitefish were 23.5 - 45.0 cm in length. They were taken in Imuruk Basin proper as well as the lower reaches of the three major rivers flowing into the Basin: the Agiapuk, Kuzitrin, and Pilgrim rivers. Most Imuruk Basin fish were ages V - VIII (Table 8).

Males generally matured between 32 and 38 cm and VI - VII years of age; females matured at 38 - 40 cm and at VII - VIII years of age.

The Sagavanirktok River broad whitefish were collected in the lower river and the adjacent estuarine areas in the Beaufort Sea. They were captured with large mesh gill nets used in the Arctic char study, so fish of young age groups are poorly represented. Fish of age classes VII through X made up 77% of the catch (Table 9). No broad whitefish over 50 cm were taken.

Data on sexual maturity are sparse but, in general, males mature at age VII - IX and females at age VIII - X.

Fish of age classes V - VII were most frequently captured in the Porcupine River (Table 10).

In this limited sample, age at sexual maturity was males, age V (47 cm) and females, age V and VI (48 cm).

TABLE 9 Mean Back-Calculated Length of Sagavanirktok River Broad Whitefish (Sexes Combined).

Age at Capture	n	Mean Fork Length (mm) at End of Each Year of Life																
		L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	L ₈	L ₉	L ₁₀	L ₁₁	L ₁₂	L ₁₃				
II	3	105	156															
III	3	109	152	199														
IV	--	--	--	--	--													
V	5	110	163	206	246	286												
VI	8	99	162	214	260	295	327											
VII	23	102	159	214	258	299	332	355										
VIII	20	106	157	216	259	301	335	361	391									
IX	21	115	168	223	276	331	352	378	399	423								
X	16	110	158	209	247	301	337	365	393	417	439							
XI	3	114	166	216	274	313	345	377	408	438	460	477						
XII	1	118	160	200	240	280	316	350	370	415	445	472	498					
XIII	1	128	160	190	218	248	295	335	358	395	417	440	460	480				
		Mean Length for All Age-Groups																
	104	108	161	215	260	306	338	365	395	420	442	468	479	480				

TABLE 10 Mean Back-Calculated Length of Porcupine River Broad Whitefish (Sexes Combined).

Age at Capture	n	Mean Fork Length (mm) at End of Each Year of Life								
		L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	
IV	1	168	290	400	475					
V	10	134	282	372	429	476				
VI	10	139	250	349	420	469	512			
VII	10	130	237	320	383	431	476	520		
VIII	1	154	260	320	365	420	460	488	528	
	32	136	258	349	411	457	492	517	528	
				Mean Length for All Age-Groups						

These fish were taken in the Kuskokwim River near the mouth of the Holitna River and in the lower 54 km of the Holitna. No broad whitefish under 40 cm were taken even though a graduated mesh gill net was fished intermittently throughout the summer. Age classes V - VII were the most commonly represented (Table II). These fish ranged between 40 and 56 cm in length.

Examination of gonads indicated that males were mature at ages V and VI at lengths from 40 - 46 cm and females were mature at ages VI and VII at 42 - 46 cm.

Broad whitefish taken on the spawning grounds in Highpower Creek (1350 km up the Kuskokwim) in early October included a 36 cm age IV male and a 44 cm age V female. Their growth rates are similar to that of Holitna River fish, and tag recovery data indicate this is a migratory population with wintering grounds in the lower Kuskokwim River.

Comparative Results:

Figure 3 compares growth of broad whitefish from five Alaskan populations. Porcupine River fish are the fastest growing followed closely by Holitna River and Minto Flats fish. Although the Porcupine River is above the Arctic Circle, growth of these fish indicates a growing season similar to Interior Alaskan streams.

Growth of broad whitefish from lower Mackenzie River, Northwest Territory (Hatfield, et al., 1972) and Kolyma River, Siberia (Berg, 1948) is intermediate between growth of Sagavanirktok and Porcupine River fish. The Sagavanirktok fish have growth rates similar to those of Coppermine River, Northwest Territory (Muth, 1969).

Whitefish Taxonomy

In 1971, taxonomic data were collected on Bering cisco from the Kuskokwim and middle Yukon rivers; humpback whitefish from Highpower Creek, a Kuskokwim tributary; the middle Yukon River and the Kobuk River.

Bering Cisco:

Ciscoes collected in 1970 with a terminal mouth and immaculate ventral fins were designated as C. autumnalis, the Arctic cisco (Alt, 1970). Those collected at the Colville and Sagavanirktok rivers had total gill raker counts of 41 - 44. Those from the Seward Peninsula had total counts of 31 - 36 while Porcupine River ciscoes had total counts of 33 - 37 (Alt, 1970). Gill raker counts of Bering Sea drainage ciscoes collected in 1971 were similar to counts of the 1970 sample (Table 12).

Those ciscoes with a terminal mouth and immaculate ventral fins with 20 - 25 gill rakers on the upper arch or total gill raker counts of 30 - 38

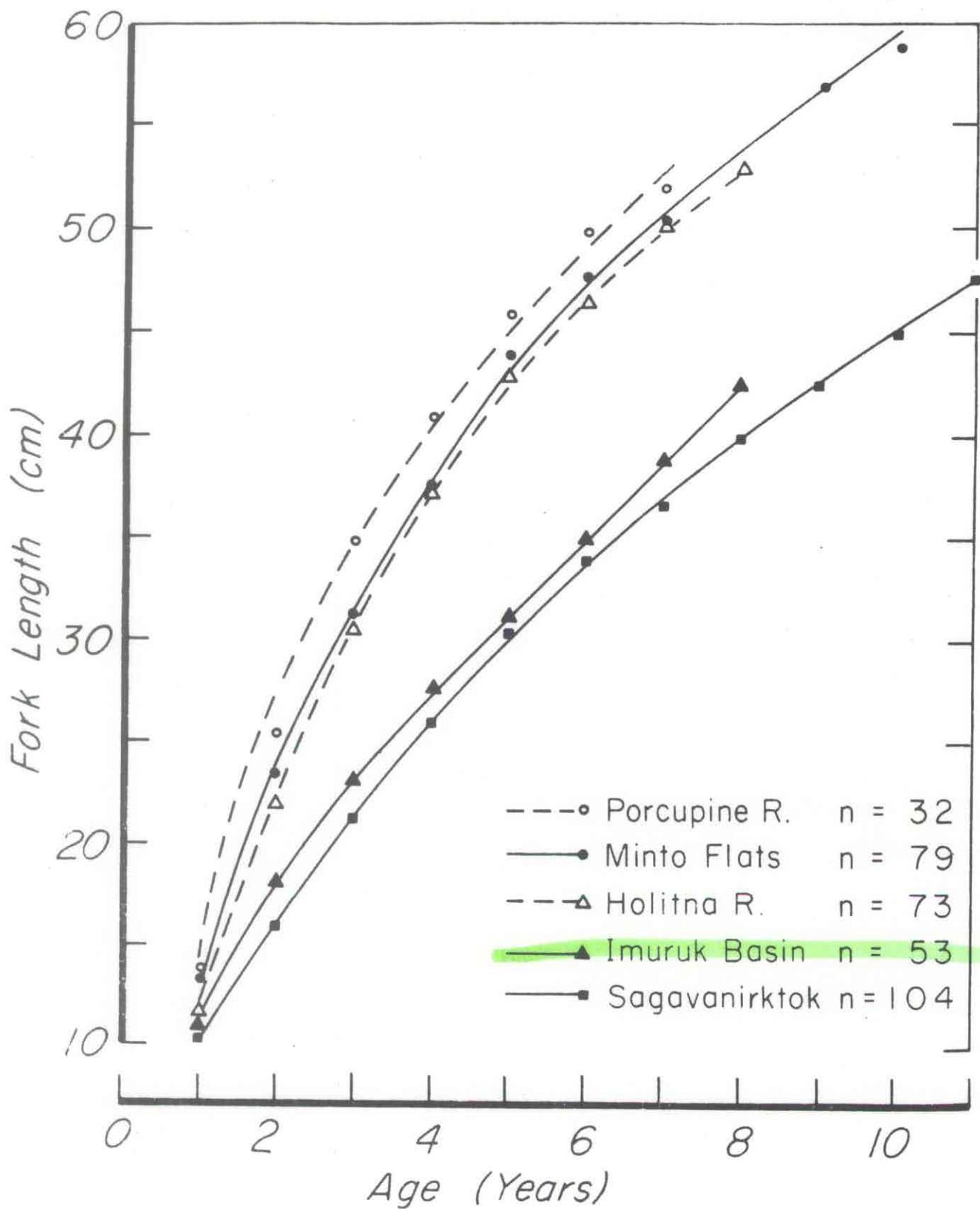


FIGURE 3 GROWTH OF ALASKAN BROAD WHITEFISH

should be designated as the Bering cisco, *C. laurettae*, as advocated by McPhail (1966) and McPhail and Lindsey (1970). The Bering cisco is distributed throughout the Bering and Chukchi Sea drainages and the Prince William Sound area.

TABLE 12 Gill Raker Counts of Bering Cisco From Two Alaskan Drainages, 1971.

Gill Raker Counts					
Area	n	Upper Arch		Total Count	
		Range	Mean	Range	M
Middle Yukon River	24	20 - 24	21.2	33 - 37	35
South Fork of Kuskokwim River	9	20 - 22	21.4	33 - 37	35

Humpback Whitefish:

Gill raker counts of humpback whitefish collected during 1971 are presented in Table 13.

TABLE 13 Gill Raker Counts of Humpback Whitefish Collected in Various Alaskan Drainages, 1971.

Area	n	Range	\bar{x}	Modal Count
Highpower Creek (Upper Kuskokwim)	15	20 - 24	21.9	22
Dall River mouth (Middle Yukon)	5	23 - 25	24.2	24 and 25
Kobuk River	14	19 - 24	21.9	23

Generally speaking, humpback whitefish populations in more interior waters have higher modal and mean gill raker counts (Alt, 1970). The low count for Highpower Creek is an exception to this, or it is an anadromous population. The high counts for middle Yukon fish are similar to counts for humpback whitefish from the Chatanika River. The larger sample of fish from the Kobuk River in 1971 gives a lower mean gill raker count than the 1970 sample, although the modal counts would only be slightly higher.

Modal counts of humpback whitefish taken near the coast usually are 23 or fewer; e.g., Colville River - 22 (n = 15), Imuruk Basin - 23 (n = 11).

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Prepared by:

Kenneth T. Alt
Fishery Biologist

Date: April 30, 1972.

Approved by:

s/Howard E. Metsker
Federal Aid Coordinator

s/Rupert E. Andrews, Director
Division of Sport Fish