FISHERIES INVESTIGATIONS IN THE SHAVIOVIK RIVER DRAINAGE, ALASKA, WITH EMPHASIS ON ARCTIC CHAR IN THE KAVIK RIVER

P.C. Craig, December, 1976

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ABSTRACT

Fisheries studies were conducted in the Shaviovik River drainage, a moderate-sized stream system on Alaska's North Slope consisting of the Shaviovik River itself, a major tributary the Kavik River, and a number of small unnamed tundra streams. Only three fish species were taken: Arctic char, grayling, and ninespine sticklebacks. The life-history of Arctic char in the Kavik River is described in this report.

The Kavik River char sample consisted of both sea-run and freshwater-resident (males only) char and ranged in size from 45 to 626 mm and in age from 1 to 11 years. Both the age and length distributions were bimodal with proportionally few fish in the age 4-7 and 300-400 mm classes. Growth, maturity, sex ratio, spawning period, and food habits of these fish were generally similar to those described for other North Slope char populations except that stream-resident males grew considerably larger than elsewhere. Sizes of these mature males were nearly intermediate between the sizes of "typical" sea-run and resident char populations.

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INTRODUCTION

In anticipation of the proposed Arctic Gas pipeline development, studies were initiated in 1972 to examine fisheries resources in the Shaviovik River drainage. Data gathered during these studies are presented in several reports: (1) a stream catalogue of fish, benthic invertebrate, and water quality data (Ward and Craig, 1974); (2) locations of Arctic char spawning and overwintering areas (Craig and McCart, 1974a); and (3) grayling growth and movements (Craig and Poulin, 1975). The present report describes the life history of Arctic char in the drainage, particularly Arctic char in the Kavik River.

METHODS

In 1972 and 1973, Arctic char in the Kavik River were sampled at frequent intervals during the open water season (late May to mid-September) and additional data were gathered during late winter (April) and early winter (November) surveys. Fish were collected by gillnet, dipnet, seine, angling, and fish weir. All gillnet gangs consisted of five monofilament panels with the following mesh sizes (stretched): 2.0, 2.5, 4.0, 6.5, and 9.0 cm. A fish weir was maintained on "Weir Creek", a tributary of the Kavik River (described in Craig and Poulin, 1975).

Laboratory analysis of fish samples included a determination of fork length to the nearest 1 mm, total and gonad weights to the nearest 0.1 g, sex, maturity, age (otoliths), and stomach contents. Egg size was determined by taking the average diameter of 10 eggs of the largest size class. Gillrakers (total count, first arch, left side) and pyloric caeca were counted on a subsample of fish. Small fish with parr marks (clear or faint) were designated freshwater-resident fish which had never migrated to the ocean; silvery fish without evidence of parr marks were termed sea-run (anadromous) char.

Field measurements were made of pH and dissolved oxygen (Hach Kit, Model DR-EL), turbidity (Hellige Turbidometer, Model TR-3000), and temperature. Chemical analyses of water samples were conducted by van Everdingen (1973).

DESCRIPTION OF THE STUDY AREA

The Shaviovik River is a moderate-sized North Slope drainage located between the Sagavanirktok and Canning rivers (Figure 1). It originates in the northern mountains and foothills of the Brooks Range, flows approximately 170 km across the Arctic Coastal Plain, and discharges into the Beaufort Sea at the juncture of Mikkelsen and Foggy Island bays. The Shaviovik has two major tributaries, Juniper Creek and the Kavik River, the latter equal in size to the Shaviovik itself. Since most sampling in this study was conducted along the Kavik River, this branch is described in detail. One tundra tributary of the Kavik River, Weir Creek, has been described in an earlier report (Craig and Poulin, 1975).

The Shaviovik and Kavik rivers conform to the general characteristics of "Mountain Streams" as described by Craig and McCart (1974b). For most of their lengths, these two rivers flow through many braided channels which are shallow and gravel-bottomed.

The streams flow throughout their length for only four to five months of the year. Spring break-up in the Kavik begins in late May and freeze-up occurs by mid-October. During the open water season, waters are well oxygenated, cool, and often turbid (Figure 2). In 1973, water temperatures rose steadily from 0-1°C in late May to mid-summer maxima of 10-13°C in July and August. By mid-August, temperatures had dropped to 8°C, and by mid-September, to 5°C. Some surface ice formed in late September and freeze-up was complete by mid-October. Turbidity levels

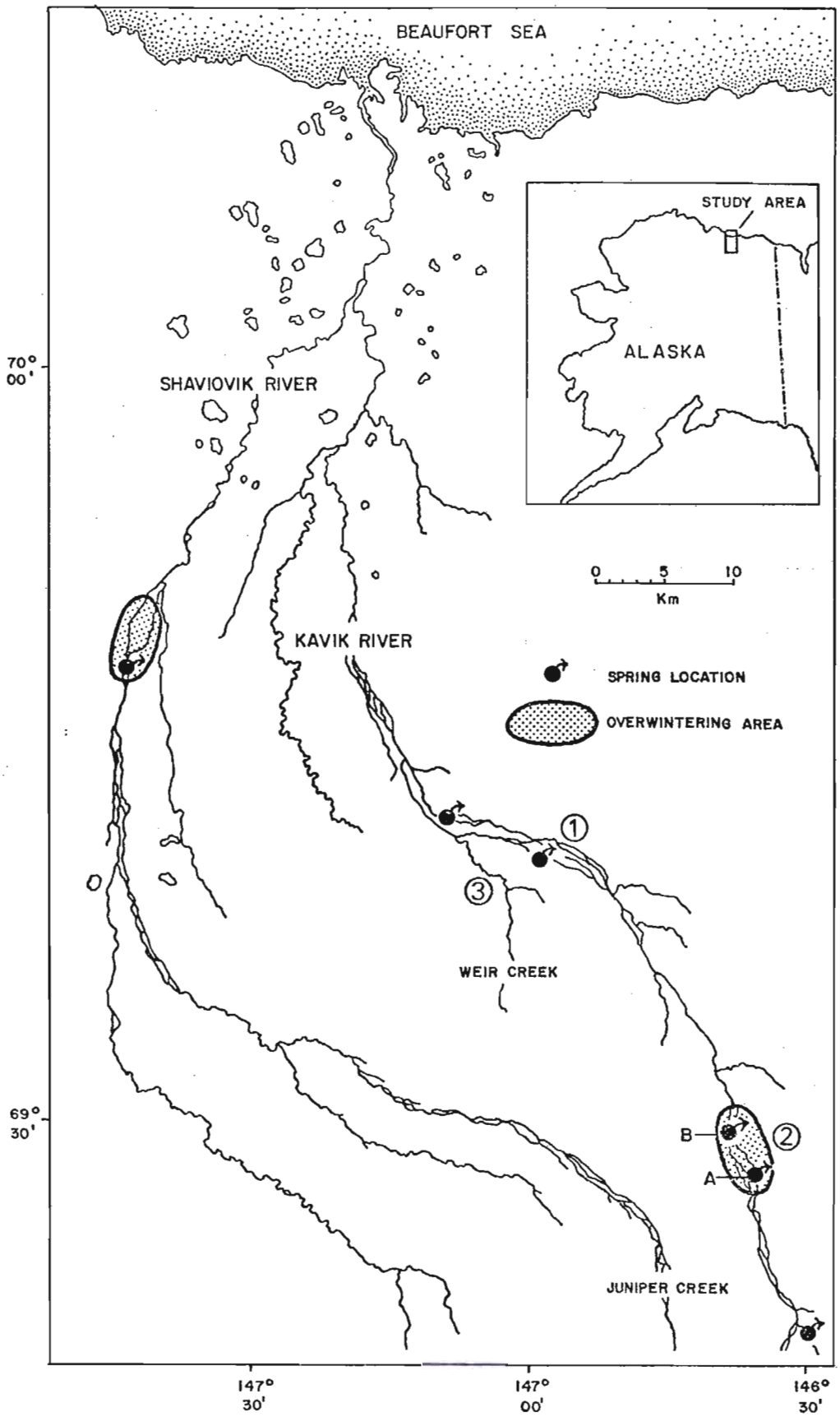


FIGURE 1. The Shaviovik River drainage. See text, page 8, for further explanation.

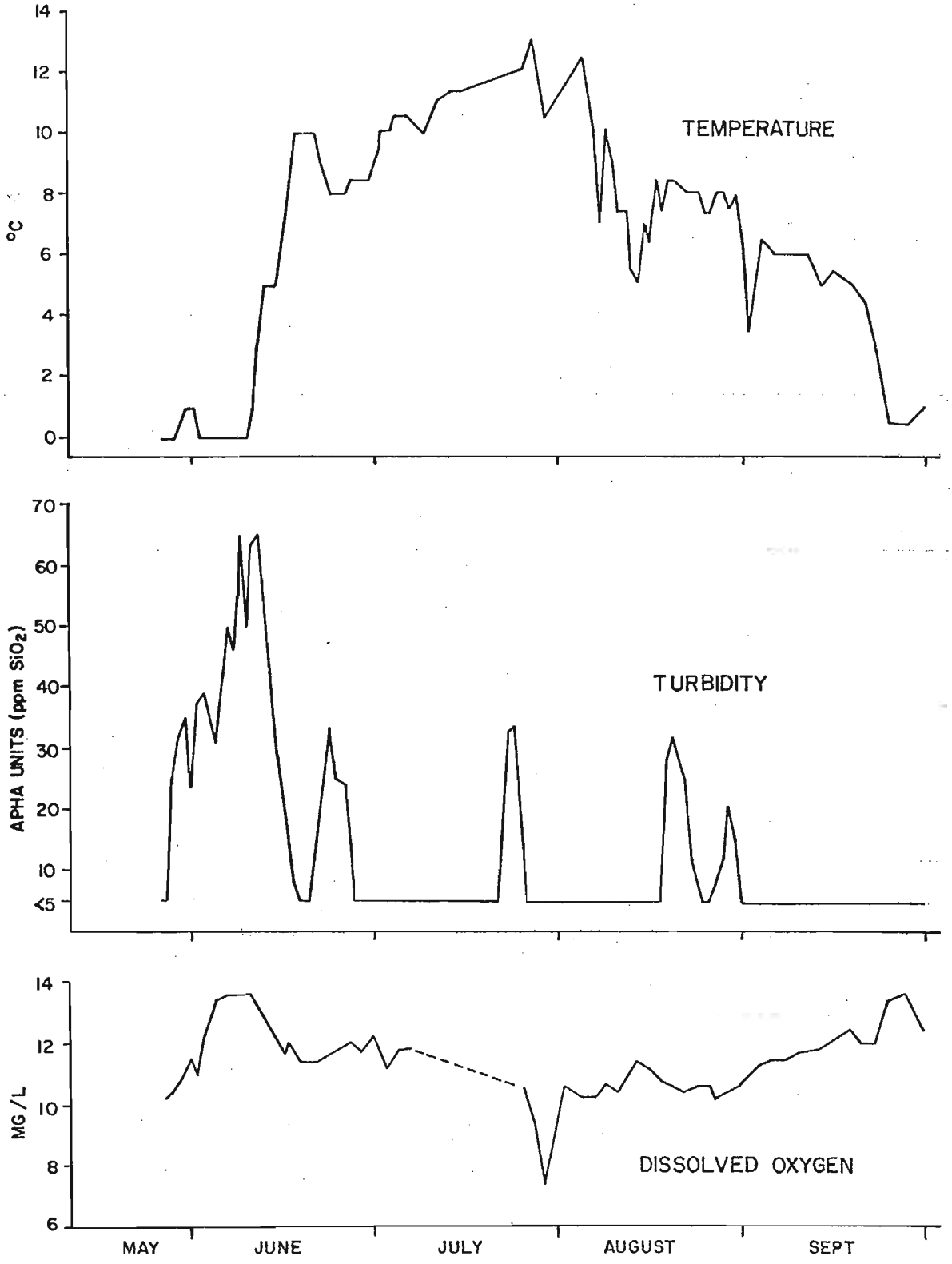


FIGURE 2. Seasonal fluctuations in water temperature, turbidity, and oxygen in the Kavik River, 1973.

were highest during spring break-up (65 ppm SiO_2) though there were other storm-generated peaks in turbidity during the summer months. Turbidities were very low in the fall when Arctic char spawn. The recorded dissolved oxygen concentrations ranged from 7.4 to 13.6 mg/l through the open water season. On the pH scale, the water was slightly basic with a seasonal mean value of 7.8 (range 7.0-8.5; N=58).

In winter, most parts of the drainage freeze to the bottom. Ice-drilling data indicate that, in 1973, the lower reaches of the Kavik River, its tributaries, and the Shaviovik near the Kavik confluence had frozen to bottom substrates by late winter (April). Though the entire drainage had not been surveyed, the only known areas with a supply of unfrozen water throughout the winter are in the vicinity of perennial springs. A single spring on the Shaviovik mainstem and several along the Kavik mainstem have been identified (Figure 1). Locations of these springs are readily apparent because of the large icings of *aufeis* fields which have formed at the downstream ends of the spring channels. The icing below Spring A on the Kavik measured 3 m in thickness on June 6, 1972. Portions of these icings persist throughout the summer months.

The Kavik and Shaviovik springs originate on the edges of the river floodplain and meander for about 1.5-3 km through dense willow thickets before entering the mainstem of the rivers (Plate 1). The spring channels are narrow (2-10 m), shallow (10-30 cm), and mud-bottomed with heavy algal growths. An analysis of major ions in water samples from Kavik Spring B and Shaviovik Spring (Table 1) indicates that these sources

PLATE 1. Principal sampling area on the Kavik River. Spring A originates in willow thickets on east bank (right side) and remnants of downstream icing are visible. Spring B originates from west bank (upper left). August 30, 1973.

PLATE 2. Sea-run and residual males in spawning colouration. Kavik River. August 26, 1973.

TABLE 1. Chemical analysis of spring waters. Temperature and dissolved oxygen are field measurements. Ionic values are expressed as mg/l.

	Shaviovik Spring 3 Nov.1973	Kavik Spring-13 5 Nov.1972
Temperature (°C)	2.0	0.0
Conductivity (μmhos/cm)	256*	284*
pH	7.0	8.0
Dissolved oxygen (ppm)	11.8	10.8
Ca	45.0	47.9
Mg	4.3	4.0
Na	1.3	1.0
K	0.5	0.3
HCO_3	140.3	146.4
CO_3	0.0	0.0
SO_4	14.0	18.4
Cl	1.1	0.2
F	<0.05	0.07
NO_3	0.15	0.30
SiO_2	3.7	2.6
TDS	210.3	220.9

*@25°C

are similar to the karst-type groundwater common in the northern Brooks Range (Craig and McCart, 1974b). Water temperatures in Spring A were 4.5°C on June 3, 1972 and 6.5°C on August 31, 1973.

One of the northernmost stands of balsam poplar *(Populus balsamifera)* grows along the Kavik River near Cobble Creek but there is no perennial spring directly associated with this stand as is the case in other North Slope drainages (Craig and McCart, 1974b).

Stream-dwelling benthic invertebrates were sampled in the middle reaches of the Kavik River and the data are presented in Ward and Craig (1974). Densities of invertebrates were variable, ranging from an atypically high 4,327 organisms/m^2 on June 15 to only 12.9 organisms/m^2 on July 28, 1973. Chironomid larvae accounted for 78% of the sample on the former date. Other common invertebrates collected in the Kavik River were plecopteran and ephemeropteran nymphs.

Sampling Sites

Arctic char samples for life history analyses were taken from three principal areas (Figure 1):

1) The Kavik River, approximtely 50 km upstream of the confluence with the Shaviovik River. Occasional samples were taken from braided stream channels adjacent to the ARCO campsite and airstrip at this location.

2) The Kavik River, approximately 80 km upstream of the confluence with the Shaviovik River. This area, designated Springs A and B, consist of two perennial springs, each with an associated downstream icing. Spring A originates on the east side of the Kavik floodplain (Plate 1); Spring B discharges from the west side about 5 km further downstream. The Springs A and B region is the major char spawning and overwintering area in the Kavik. Fish collections include samples from the spring channels as well as the braided Kavik channels in the general area. Most fish described in this report were taken at this location.

3) Weir Creek, a tributary of the Kavik River. Included in life history analyses is a subsample of 56 juvenile and freshwater-resident char which passed through the weir operated on this tundra stream.

DISTRIBUTION OF FISH IN THE SHAVIOVIK DRAINAGE

Six species of fish were collected in the Shaviovik drainage or in adjacent coastal waters. Arctic cisco *(Coregonus autumnalis)*, least cisco *(Coregonus sardinella)*, and fourhorn sculpin *(Myoxocephalus quadricornis)* were caught by gillnet in a brackish lagoon in the Shaviovik delta, but only three species, Arctic char *(Salvelinus alpinus)*, grayling *(Thymallus arcticus)*, and ninespine stickleback *(Pungitius pungitius)*, were collected in the fresh waters of the drainage. Distribution of collection sites of the latter three species are shown in Figure 3. Arctic char and grayling were taken throughout the drainage while ninespine sticklebacks were most abundant in the lower reaches of the Shaviovik. A single stickleback was taken in the weir on Weir Creek. The distribution of grayling and their utilization of Kavik tributaries for spawning and rearing is described by Craig and Poulin (1975).

During the ice-free season, anadromous Arctic char leave the drainage and enter the Beaufort Sea while juvenile and freshwater-resident char disperse through the Kavik mainstem and the large tundra tributaries. Use of the tundra tributaries by char is, however, much less extensive than that of grayling. Craig and Poulin (1975) report that only 10% of all the juvenile and adult fish enumerated at the Weir Creek were char (N=216 char); the rest were grayling. If young-of-the-year are included in this tabulation, char account for only 1.2% of the fish enumerated in Weir Creek. Most pre-smolt char appear to remain in the Kavik River itself, particularly near the spring-fed areas where the fish overwinter (see "Spawning and Overwintering Areas").

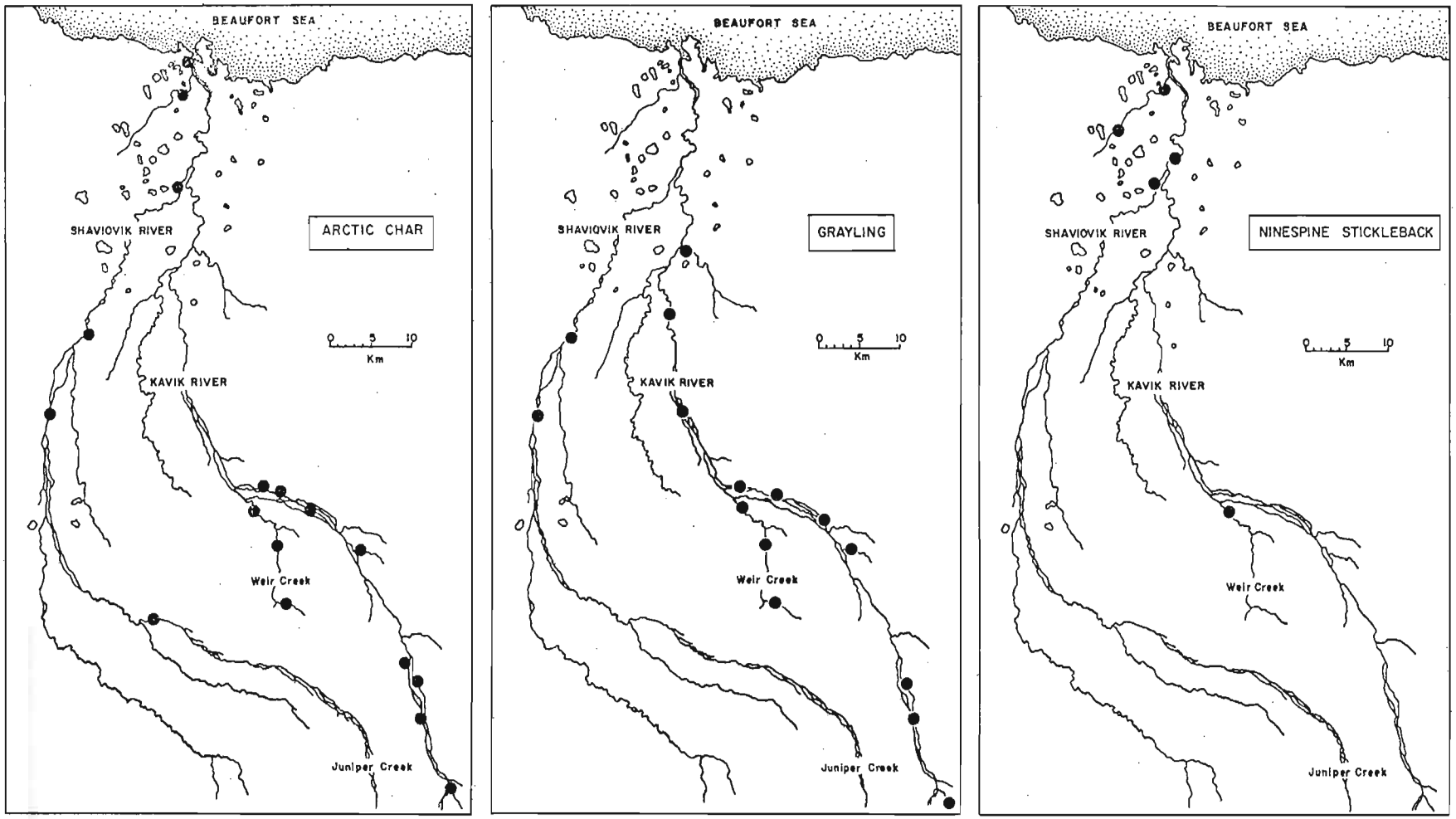


FIGURE 3. Distribution of sites where Arctic char, grayling, and ninespine sticklebacks were collected in the Shaviovik River drainage. Dots indicate collection sites.

ARCTIC CHAR LIFE HISTORY

Meristics

The low gillraker and pyloric caeca counts of both anadromous and freshwater–resident char populations in the Kavik River identify these as the Western Arctic-Bering Sea form of the Arctic char, *Salvelinus alpinus* (McPhail, 1961). The counts were:

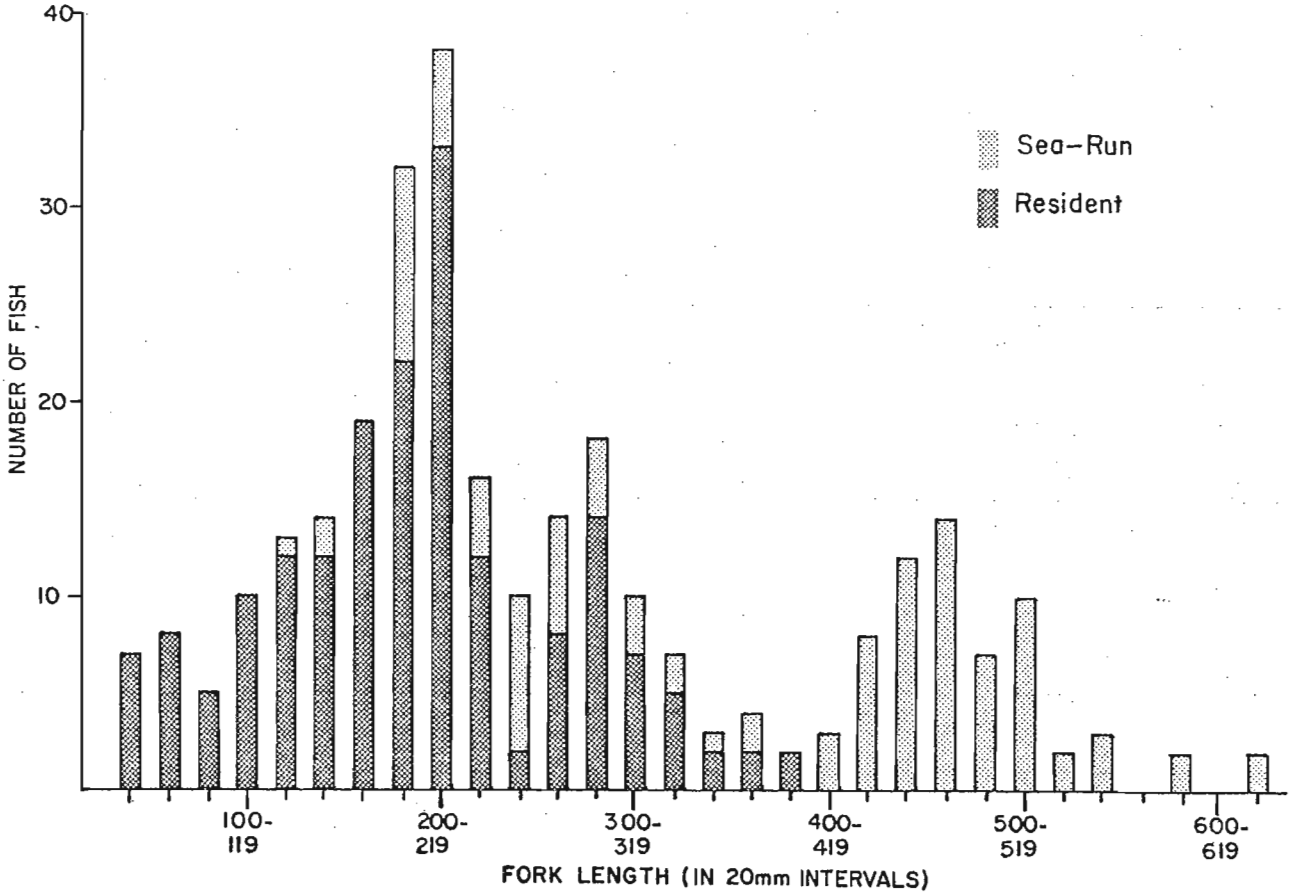
a) Sea-run char (N=28)
   22.6 gillrakers (range 19-26, SD=1.3)
   30.0 pyloric caeca (range 24-35, SD=4.0)

b) Resident char (N=15)
   21.9 gillrakers (range 20-24, SD=1.0)
   27.9 pyloric caeca (range 24-38, SD=3.7)

Length and Age Frequencies

Excluding fry, the Kavik River sample ranged in size from 45 to 626 mm and in age from 1 to 11 years (Figure 4). Maximum ages of char in the Kavik tend to be less than those of char collected from other North Slope rivers: age 11, Babbage River (Bain, 1974); age 14, Sagavanirktok River (McCart *et al.*, 1972) and Canning River (Craig, 1976); age 15, Firth River (Glova and McCart, 1974).

A bimodality is evident in both length and age distributions despite



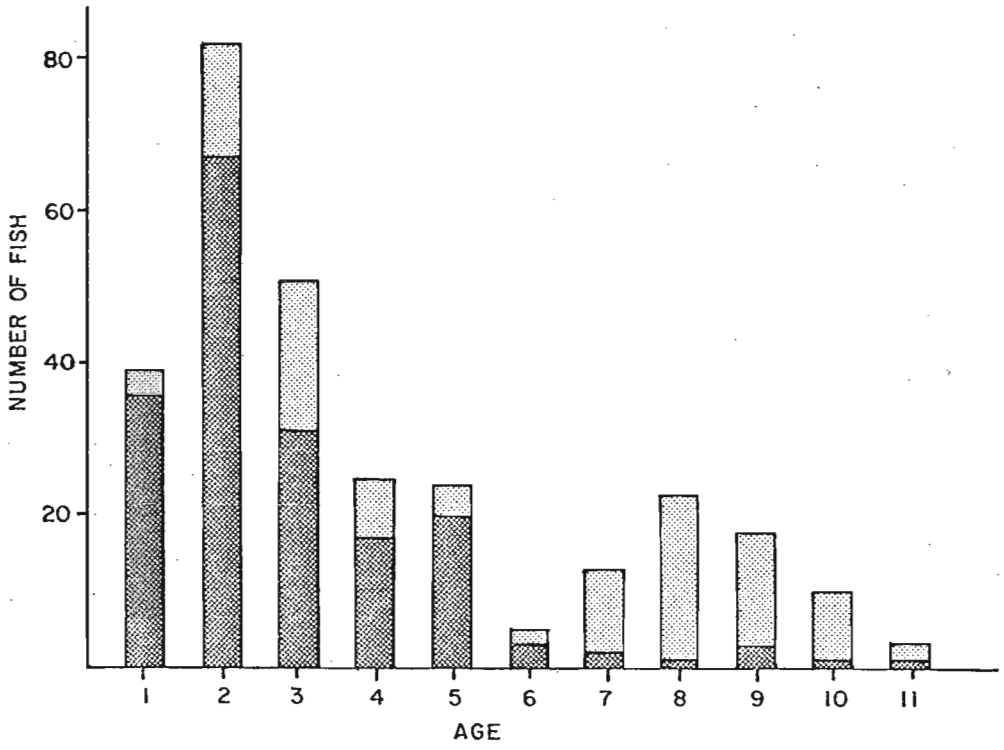


FIGURE 4. Length and age-frequencies for 182 resident and 111 sea-run char from the Kavik River.

the fact that special efforts were made to obtain fish from the less common size classes. There were peaks in length distribution at 200-219 mm, 280-299, and 460-479 mm and in age distribution at 2 and 8 years. These peaks roughly correspond to those observed in the Canning River char population which was also studied in 1972-73 (Craig, 1976). A major difference between the two populations is the abundance of large resident males in the Kavik River.

Possible reasons for the bimodality in the Kavik age and length distributions are similar to those discussed for the Canning population: sampling bias due to fish distribution or sampling gear and poor year class representation. The latter seems most likely of the bimodality in the Kavik population involving weak age 5 and 6 year classes.

Age at First Seaward Migration

Some Kavik char appear to smolt at an early age. Several age 1 and 2 fish, silvery in colour and without parr marks, were caught in autumn at the Spring B overwintering site. These fish were probably returning from their first seaward migration. In a small sample of char caught in coastal waters off the mouth of the Shaviovik River, the fish were older: age 3 (N=2), age 4 (N=6), age 5 (N=2), age 6 (N=1), and age 11 (N=1).

Age and Growth

The first year growth of char varied considerably between areas. In Spring A, fry grew relatively fast, reaching a mean length of 60 mm (N=34, range 57-78 mm) by August 31, 1973. Growth in nearby Spring B was much slower. Here the fry averaged only 40 mm (N=30, range 28-78 mm) on the same date. This mean difference of 20 mm was significant at $p<0.001$ ($t=18.2$). There was also considerable variability in the growth of individual fish. In a combined collection at these two springs taken August 31, a 50 mm size difference (28-78 mm) separated the largest and smallest fry. An even wider range was recorded at the end of the previous growing season (November 5, 1972). At that time, fry in Spring B averaged 60 mm (N=62), but the size range was 34-97 mm, almost a three-fold difference between the largest and smallest fish.

Growth of older char falls into two distinct patterns. Char which become anadromous are larger at each age class than those which have remained in fresh water (Table 2). These patterns and their associated growth differences are a characteristic feature of char in North Slope streams (McCart *et al.*, 1972; Bain, 1974; Glova and McCart, 1974; Craig, 1976). There is one noteworthy difference, however. While the growth of sea-run Kavik char is similar to that of other sea-run populations, growth of stream-resident Kavik char far exceeds other stream-resident populations in North Slope drainages. To illustrate this, a growth comparison with Canning River char, whose various growth rates encompass most char populations in other drainages, is shown in Figure 5. The age-length relationship of the Kavik residents is almost intermediate

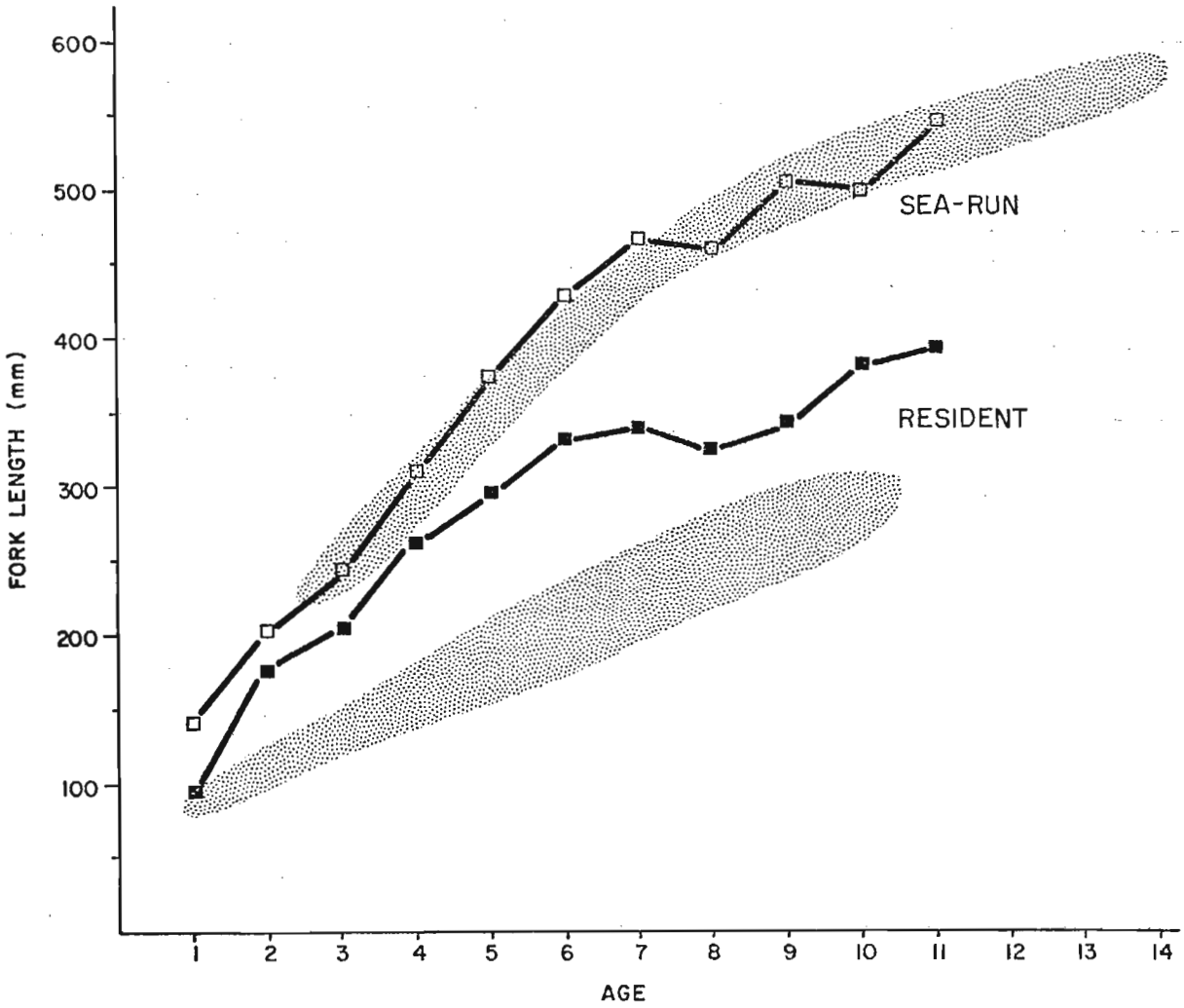


FIGURE 5. Length-age relationship for sea-run and resident char from the Kavik River. Also shown are length-age relationships of sea-run char (top stippled area) and stream-resident char (bottom stippled area) from the Canning River (Craig, 1976).

TABLE 2. Age-length relationships for freshwater-resident and sea-run char from the Kavik River.

	RESIDENTS				SEA-RUN			
Age	N	Mean	(range)	SD	N	Mean	(range)	SD
1	36	96	(45-171)	38.5	3	143	(126-154)	15.1
2	67	173	(100-221)	32.6	15	207	(180-261)	24.7
3	31	204	(155-235)	18.1	20	244	(189-291)	28.9
4	17	261	(205-301)	27.7	8	310	(272-354)	37.3
5	20	293	(261-337)	23.6	4	376	(332-438)	44.4
6	3	331	(300-352)	27.2	2	430	(415-444)	20.5
7	2	338	(311-364)	37.5	11	466	(437-483)	16.0
8	1	324	-	-	22	461	(419-525)	24.9
9	3	341	(310-376)	33.2	15	504	(409-626)	58.0
10	1	380	-	-	9	499	(430-549)	36.9
11	1	396	-	-	2	546	(500-592)	65.0
TOTALS	182				111			

between resident and sea-run segments of the Canning population. Even the minimum sizes of Kavik residents beyond age 3 are greater than those of the averaged growth curves of the Canning residents. Reasons for the unusually large sizes of the Kavik residents are not known. One possibility is that these fish actually made a brief excursion to coastal waters, thereby gaining some size advantage. However, this is not thought to be the case since parr marks, which are indicative of freshwater-residency, are often visible on the fish in question. Also, the spawning colouration of the large freshwater-residents is similar to that of other stream-resident spawners but unlike that of sea-run spawners (Plate 2). In view of the overall similarity between these fish and stream-resident spawners is other North Slope drainages, it seems unlikely that these Kavik fish ever migrated to the ocean.

Weight-Length Relationships

The following weight-length relationships were calculated for Kavik River char:

1) Sea-run char (size range 186-626 mm)

   Log_{10} Weight (g) = 2.92 Log_{10} Length (mm) - 4.82

   N=76; r=0.99

2) Resident char (size range 45-321 mm)

   Log_{10} Weight (g) = 2.50 Log_{10} Length (mm) - 3.89

   N=109; r=0.93

Covariance analysis revealed that these relationships were significantly different ($p<0.025$) in both slope ($F=5.150$) and adjusted means ($F=12.103$).

Sex Ratio

While both sexes may become anadromous at some stage in their lives, female Arctic char have a greater tendency than males to do so. Consequently, females predominate (73%) in the sea-run segment of the Kavik River population, while males predominate (61%) among those fish remaining in fresh water, especially among the older fish (Table 3). Virtually all residents beyond age 3 are males (92%). These major differences in sex ratios are common among sea-run and resident segments of Arctic char in North Slope streams.

Maturity

Char which mature in fresh water without ever undertaking a seaward migration are termed "residual fish". With few exceptions, males accounted for all residual char collected from the Kavik River. Some of these males spawned as young as age 2, but most reached sexual maturity at age 4 (Table 3). Fork lengths of residuals ranged from 113-396 mm. Only 2 of the 55 residuals in the sample were females. Both were age 5 and measured 286-308 mm.

Sea-run char reach maturity at a later age than residual char. Most spawned for the first time around age 7, though a few younger

TABLE 3. Age-specific sex ratio and maturity of stream-resident and sea-run char from the Kavik River.

	RESIDENTS							SEA-RUN						
	Total			Males		Females		Total			Males		Females	
Age	N	%Male	%Mature	N	%Mature	N	%Mature	N	%Male	%Mature	N	%Mature	N	%Mature
1	29	35	0	10	0	19	0	3	33	0	1	0	2	0
2	67	49	4	33	9	34	0	15	40	7	6	17	9	0
3	31	61	19	19	32	12	0	20	30	5	6	17	14	0
4	17	88	88	15	100	2	0	8	75	0	6	0	2	0
5	20	90	90	18	94	2	100	4	25	25	1	0	3	33
6	3	100	100	3	100	0	-	2	0	100	0	-	2	100
7	2	100	100	2	100	0	-	11	9	100	1	100	10	100
8	1	100	100	1	100	0	-	22	9	100	2	100	20	100
9	3	100	100	3	100	0	-	15	33	100	5	100	10	100
10	1	100	100	1	100	0	-	9	11	100	1	100	8	100
11	1	100	100	1	100	0	-	2	50	100	1	100	1	100
TOTALS	175	61%		106		69		111	27%		30		81	

spawners were caught. Two of the youngest, ages 2 and 3, were classified as sea-run fish on the basis of their silvery colouration and lack of parr marks.

As discussed by other authors, sea-run char do not die after spawning but may spawn more than once during their lives. Generally a fish will spawn in alternate years. Thus, the category of mature fish includes both spawners (fish which spawn in the year of capture) and non-spawners (fish which show evidence of a previous spawning but will not spawn in the year of capture). In the Kavik River, all but one of the 51 mature sea-run char caught were spawners. A single mature non-spawner was taken in the Springs A and B region.

Spawning and Overwintering Areas

Two areas where char spawn and overwinter were located during aerial surveys of the middle and upper reaches of the Shaviovik drainage (Craig and McCart, 1974a). Both are spring-fed sites, one located on the Shaviovik mainstem, the other on the Kavik at Springs A and B (Figure 1).

Numbers of fish overwintering in the vicinity of Spring B were estimated on September 16, 1973. During an aerial survey, approximately 300 large fish (sea-run char and large residuals) were sighted in the Kavik mainstem below or adjacent to Spring B and in pools in the spring itself. Two of these pools, which appeared to hold about a fifth of all fish in the spring, were seined, yielding 2,089 resident char (juveniles and residual males), 2 sea-run char, and 17 grayling. Using these

figures, it was estimated that in Spring B there was a total of 10,540 fish (10,445 resident char, 10 sea-run char, and 85 grayling). Though this estimate is very rough, it does demonstrate that densities of overwintering char can be surprisingly high. Single seine hauls (3.3 m seine) through the pools in Spring B yielded 680 fish in the first pool and 1,428 fish in the second.

During the previous winter, no fish was sighted in the ice-free channels of Spring B during an April aerial survey even though a dense aggregation had been sampled in the lower reaches of the spring earlier in the winter (November 5). Either the pool in which the char were overwintering became ice-covered or the fish had regrouped under ice cover a short distance downstream.

Additional overwintering sites may exist elsewhere in the drainage. As previously indicated (under "Maturity"), samples of sea-run fish from Springs A and B on the Kavik showed that this location was used almost exclusively by spawners. Assuming that the Kavik char follow the usual pattern of alternate year spawning, it would appear that the mature non-spawners (the fish between spawnings) overwinter elsewhere in the drainage. Various char studies in other drainages show that sea-run non-spawners (both mature and immature) may be spatially separated from spawners in the same spawning/overwintering area (Glova and McCart, 1974), or may overwinter in different parts of a drainage or occasionally in a different drainage altogether (Craig and McCart, 1975; Furniss, 1975; Craig, 1976). In the study area, possible overwintering areas for Kavik River non-spawners include the Shaviovik spawning/overwintering area

(Figure 1) or the unsurveyed portions of the lower Shaviovik.

Reproduction

A few sea-run char arrived on the Springs A and B spawning grounds during the last week of July, 1972. More arrived later and by August 30, spawners were abundant. Spawning activity was most intensive during the period from the latter half of September through October, though the complete spawning period was lengthy. In 1972, the first ripe fish (residual males) were collected on August 23 and the first ripe and spawned-out sea-run females were taken on September 8. When the last sample was taken on November 5, two potential spawners (residual males) had not yet ripened while a third was ripe.

Fecundities were determined for 28 females from the Kavik River ranging in size from 366 to 516 mm (mean size 477 mm). The average count was 3,736.6 eggs (range 2,140-5,840). Fecundity was significantly correlated with fish size ($r=0.67$, $p=0.01$):

$$\text{Log}_{10} \text{ Fecundity} = 2.15 \text{ Log}_{10} \text{ Length (mm)} - 2.19$$

The fecundity of one residual female (286 mm fork length) was 2,780 eggs.

The egg diameters of Kavik River females were similar to those reported for other char populations. Those of immature females remained 1.0 mm or less through the open water season. Spawners taken in late August and September held eggs averaging 3.9 mm in diameter (range 3.2 to

4.5 mm; N=33). The eggs taken from a residual female averaged 3.7 mm on August 23, 1972.

Food Habits

As in other North Slope drainages, stream-resident char in the Kavik River fed primarily on the larvae of stream-dwelling insects (Table 4). Dipteran larvae (mostly chironomids) were the most common food item followed by plecopteran larvae, trichopteran larvae, and fish. A fairly high proportion of empty stomachs was recorded, with many of these occurring during the spawning season. Ripe residual males often had empty stomachs (63% empty, N=30).

The stomachs of sea-run char caught in the Kavik River were generally empty (67%) or contained little food. Those fish which had eaten fed largely on the same items eaten by resident char. Identifiable fish remains in stomachs included both juvenile char and grayling.

Parasites

Small samples of Arctic char were collected from Weir Creek and the Shaviovik overwintering site for analysis of parasites. A list of metazoan parasites found in these fish is presented elsewhere (Mudry and McCart, 1976).

TABLE 4. Food habits of stream-resident and sea-run Arctic char from the Kavik River. Percent occurrence refers only to those stomachs containing food. Empty stomachs are indicated below.

FOOD ITEM	RESIDENTS % occurrence	SEA-RUN % occurrence
Plecoptera (nymph)	30	40
(adult)	2	3
Ephemeroptera (nymph)	3	3
(adult)	4	-
Trichoptera (larva)	12	-
Diptera (larva)	68	50
(incl. (pupa)	4	6
chironomids) (adult)	15	3
-tipulid (larva)	21	13
(adult)	1	-
-simuliid (larva)	2	-
Orthoptera (grasshopper)	2	-
Hymenoptera	4	-
Coleoptera	8	3
Fish	11	31
Fish eggs (char)	4	16
(grayling)	-	3
Algae	4	3
Debris	32	22
Total No. stomachs examined	171	96
Total No. stomachs empty	58(34%)	64(67%)

SUMMARY

The Shaviovik drainage and its fish populations conform to the general pattern which has emerged from descriptions of other Beaufort Sea drainages: The Sagavanirktok River (McCart *et al.*, 1972; Furniss, 1975), Canning River (Craig, 1976), Firth River (Glova and McCart, 1974), and Babbage River (Bain, 1974). The Shaviovik and its main tributary, the Kavik River, are characteristic of the braided "Mountain Streams" described by Craig and McCart (1974b).

Like many other North Slope streams, the Shaviovik and Kavik support few fish species, and are dominated by only two species, Arctic char and grayling. Grayling use of the Shaviovik drainage was described in an earlier report (Craig and Poulin, 1974).

The Arctic char population in the Kavik River includes both sea-run and freshwater-resident (males only) segments. The life histories of these two forms are similar to those described for char in other North Slope streams. One exception, however, concerns the size, growth, and abundance of stream-resident males in the Kavik River. These mature fish reach a considerably larger size than those found in nearby drainages. The growth curve of Kavik residents is almost intermediate between "typical" growth curves for sea-run and resident Arctic char in North Slope rivers. In addition, the proportion of resident males to sea-run spawners seems unusually high in the Kavik. These large resident males were very abundant in the Springs A and B region and outnumbered sea-run spawners, a situation uncommon on char spawning grounds in other drainages.

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