



State of Alaska
Department of Fish and Game
Habitat and Restoration Division

Nomination for Waters
Important to Anadromous Fish

Region WESTERN

USGS Quad Iditarod A-5

Anadromous Water Catalog Number of Waterway 335-20-16600-2671- 3100

Name of Waterway Donlin Creek USGS Name Local Name

Addition Deletion Correction Backup Information

For Office Use

Nomination # <u>01 174</u>	<u>[Signature]</u> Regional Supervisor	<u>7/23/01</u> Date
Revision Year: <u>2001</u>	<u>[Signature]</u> AWC Project Biologist	<u>7/10/01</u> Date
Revision to: Atlas _____ Catalog _____ Both <u>X</u>	<u>[Signature]</u> Drafted	<u>8/20/01</u> Date
Revision Code: <u>A-2</u>		

Arc# 1033

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
COHO	9/15-18/1997		X		<input checked="" type="checkbox"/>
Arctic Grayling	9/15-18/1997			X	<input type="checkbox"/>
Slimy Sculpin	9/15-18/1997			X	<input type="checkbox"/>
Dolly Varden	9/15-18/1997			X	<input type="checkbox"/>
Round Whitefish	9/15-18/1997			X	<input type="checkbox"/>

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: Rearing coho salmon were sampled at three sites along Donlin Creek between it's confluence with Crooked Creek and the mouth of Ophir Creek. See attached portions of Aquatic Resources Reconnaissance Study Donlin Creek Gold Project by John Morsell. Fish were sampled by a combination of backpack electroshocker, minnow traps and seine. Add stream with coho rearing. Report notes that coho spawning may also be occurring.

Submitted by Wayne Dolezal for John Morsell.

Name of Observer (please print): John Morsell

Signature: _____

Date: 7/10/01

Address: Northern Ecological Services

Anchorage, Alaska

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]

Revision 3/97

ANNUAL REPORT -1997

AQUATIC RESOURCES RECONNAISSANCE STUDY
DONLIN CREEK GOLD PROJECT

by

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Prepared for

Placer Dome U.S.
Anchorage, Alaska

October, 1997

INTRODUCTION

Placer Dome U.S. in conjunction with Calista Corporation is investigating the feasibility of developing a hard rock gold prospect in southwestern Alaska along the middle reaches of the Kuskokwim River near the village of Crooked Creek (Figure 1). A substantial exploration program is currently ongoing at the site. Northern Ecological Services (NES) was contracted in 1996 to conduct a general assessment of the aquatic resources within the area potentially influenced by proposed mine development. The intent of the study program was to assess permit requirements and provide information to assist project design and mitigation planning as specifically applied to protection of fish and aquatic habitats.

Field investigations were conducted in June and August of 1996. The results of those investigations along with other background information are documented in the 1996 Annual Report. The results of these prior studies along with discussions with regulatory agency personnel suggested the presence of several potential information gaps that could best be filled by additional investigation. These gaps included:

1. Winter fish use of Donlin and Upper Crooked Creeks
2. Distribution of chinook and chum salmon spawning in the Crooked Creek drainage. Need for aerial surveys.
3. Fall fish use of Donlin and Upper Crooked Creeks with special emphasis on juvenile coho salmon distribution and adult coho salmon spawning.

The 1997 study program was designed to specifically address these perceived needs.

Placer Dome is also sponsoring water quality and hydrological studies of the Crooked Creek watershed. The results of these studies provide information on the physical characteristics of the streams and should be used to supplement the biological information provided in this and previous reports.

STUDY METHODS

Winter Fish Use

An investigation of winter fish use and habitat availability of the Donlin/Upper Crooked Creek area was conducted on March 24-27, 1997. The mainstream study segment extended from Crooked Creek just below the confluence with Omega Creek upstream to Donlin Creek above the confluence with Snow Gulch, a distance of about 5 miles (Figure 2). American Creek was also investigated in the vicinity of the project



FIGURE 1. Project location.

Ophir sample site
referenced in
Appendix A

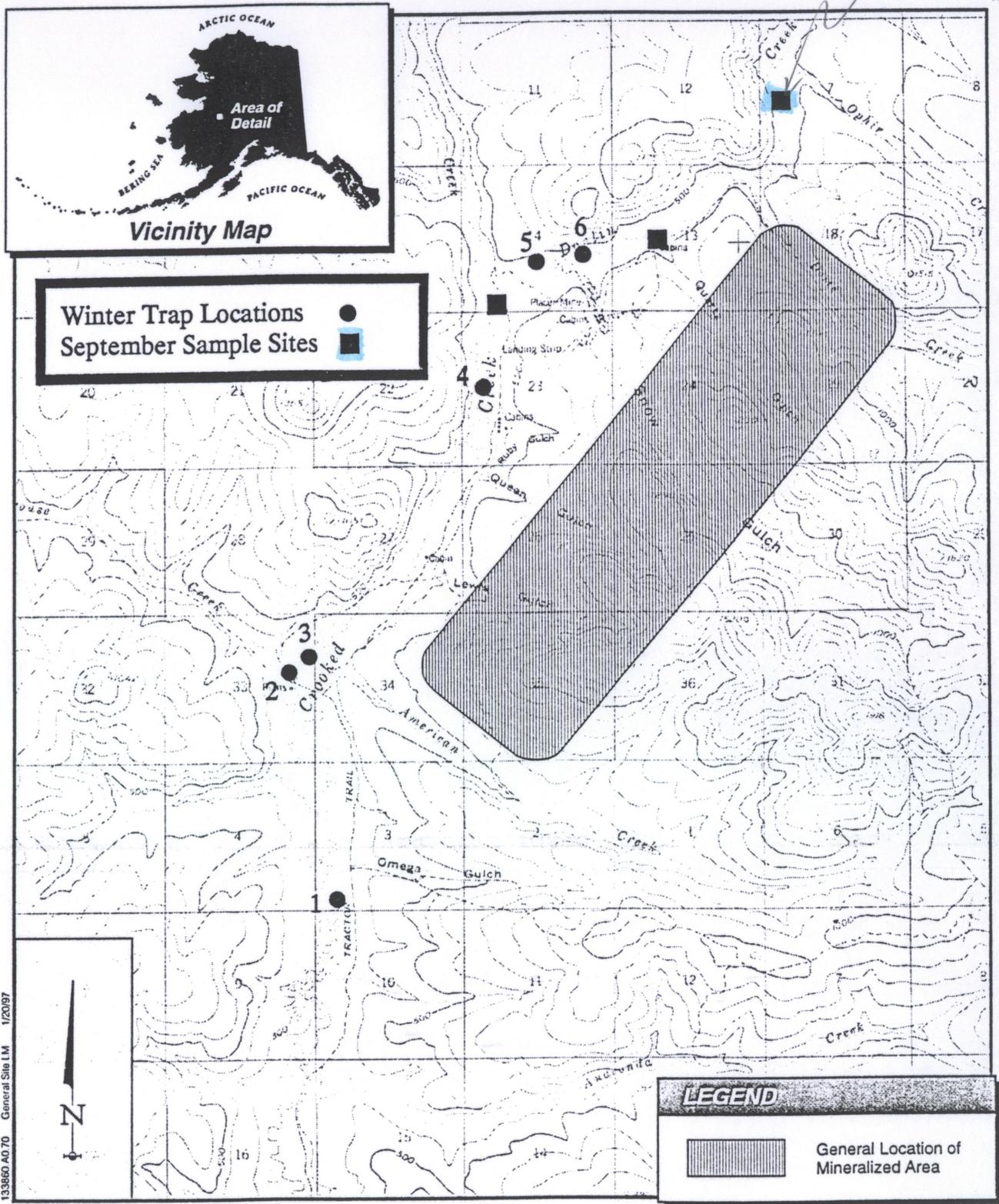


Figure 2
General Site Location map
With Sample Site Locations

road crossing. Holes were drilled in the river ice at selected locations using an ice auger. Standard 1/4 inch wire mesh minnow traps baited with preserved salmon eggs were set in the stream at all locations where the depth of unfrozen water was greater than about 1.5 ft. The traps were allowed to fish overnight and checked the following day. All captured fish were identified to species, measured, and returned alive to the location of capture.

Mid-Summer Aerial Surveys

The Crooked Creek drainage responds quickly to precipitation and is often turbid. Consequently, water clarity was a critical factor in successful aerial survey. Stream conditions were relayed to NES personnel by project personnel on site. A long dry period in late July caused stream water to be low and clear. An aerial survey from a helicopter was conducted by a biologist on July 29, 1997. The survey extended from the mouth of Crooked Creek upstream to upper Donlin Creek. The upstream endpoint was about 3 miles upstream from the confluence of Ophir and Donlin Creeks.

Fall Stream Investigations

A field investigation was conducted during the period September 15-18, 1997. Time constraints and limited access necessitated that sampling be limited to selected stream reaches within the overall study area. The three sample sites are indicated on Figure 2. The upper and lower sample sites corresponded with the locations of water quality and hydrology monitoring sites. Each sample reach was about 0.5 miles long. Access was by helicopter.

Because of the varying physical characteristics within the drainage and the variety of potential fish species using the area, several different techniques were used to sample and/or observe fish within each sample reach. Sampling techniques included backpack electroshocker, minnow traps baited with preserved salmon eggs, beach seine, and angling. Visual observations supplemented the active sampling techniques. The shocker that was employed was a Smith-Root Model 12 with programmable wave form. The beach seine was 16 m long and 1.8 m deep with 1/4 inch mesh. The seine was usually deployed from shore by wading into the stream with one end, pulling the end through the water in the direction of the current, and returning to shore resulting in a more or less circular set. In some areas, a fine mesh minnow seine was used in conjunction with the shocker in fast water to catch stunned fish washed downstream. Fish captured during the study were identified to species, measured, and returned alive to the place of capture.

Aerial observations were not feasible during the fall investigation because of rain, poor light conditions, and somewhat turbid water.

RESULTS

Winter Fish Use

Approximately 20 auger holes were drilled in river ice within the mainstream study segment. As anticipated, much of the river was frozen to the bottom; however, unfrozen water was found under the ice at various locations within the study segment and it was clear that some flow was present. Ice depth ranged from 2 ft. to 7 ft. with the thickest ice occurring in overflow areas. The greatest overflow seemed to be between Queen and Lewis Gulches with no overflow present in the Snow Gulch area. The deepest pool of unfrozen water was about 2.6 ft. deep.

Six locations had sufficient depth of unfrozen water under the ice to allow fish traps to be set. Trap locations are illustrated in Figure 2 and trap station descriptions and catch are presented in Table 1. Total catch included 3 Dolly Varden ranging in length from 105 to 155 mm, one juvenile coho salmon (117 mm), and one slimy sculpin. The largest Dolly Varden had bright orange spots suggesting that it may have been sexually mature. It is likely that the Dolly Varden represent a slow-growing population that are present in the upper stream year-round.

The only tributary stream that was investigated was American Creek. Prior investigation indicated that the other east-side tributaries were either frozen to the bottom or contained too little water for fish. Auger holes in American Creek immediately upstream from the bridge crossing indicated that only a small amount of flowing water was present. The depth was insufficient for the use of fish traps.

Mid-Summer Aerial Surveys

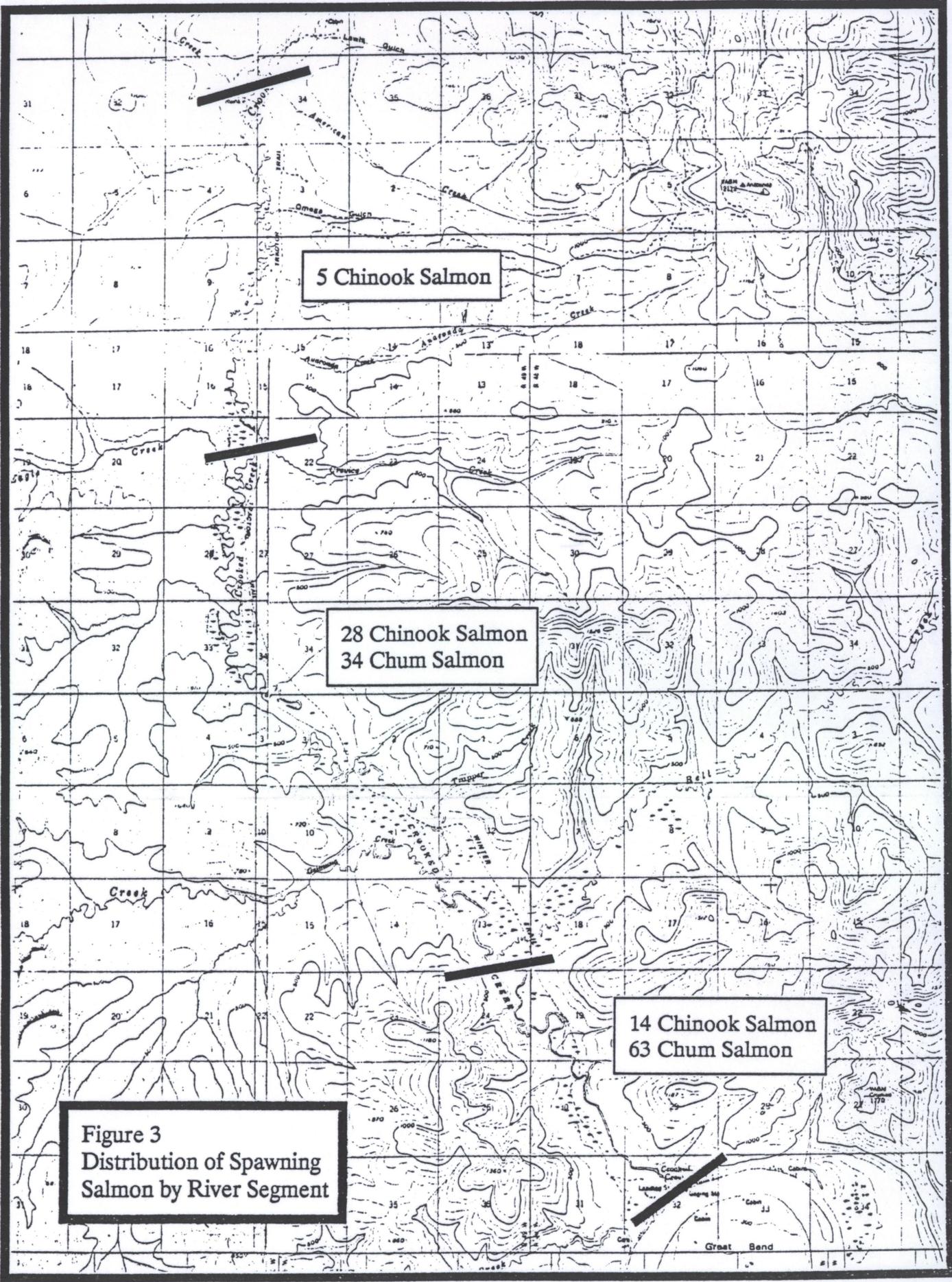
Survey conditions were generally excellent with low, clear water and favorable lighting. Direct sunlight was present during about 70 percent of the survey.

No salmon were observed within Donlin Creek proper or in Crooked Creek upstream from American Creek. Small numbers of chinook (king) salmon were observed in Crooked Creek starting just south of American Creek and continuing to the mouth. A total of 47 chinooks was seen with the greatest concentration between Crevice and Bell Creeks (3-9 miles downstream from the American Creek confluence). Ninety-seven chum salmon were also observed, almost all in the lower 6 miles of Crooked Creek. The distribution of salmon is illustrated on Figure 3.

The condition of the fish suggested that spawning for both species was in its latter stages. The number of fish observed was probably less than the total escapement because of attrition of fish that had already completed spawning. However, no chinook salmon carcasses were observed suggesting that the chinook count may be

TABLE 1. Minnow trap catch and site characteristics - Upper Crooked and Donlin Creeks, winter 1997.

Trap No.	Date	Trap Hrs.	Total Depth	Ice Thick.	Water Depth	Bottom Substrate	Fish Species	Length (mm)
1	03/26	17	6.3	3.7	2.6	Gravel	No Fish	-
2	03/27	22.3	3.8	2.1	1.7	Gravel	Dolly Varden Dolly Varden	105 122
3	03/27	21.9	3.5	2.0	1.5	Gravel	Coho Salmon	117
4	03/27	18.8	8.5	7.0	1.5	Cobble	Slimy sculpin	82
5	03/27	16.5	3.7	2.5	1.2	Gravel	Dolly Varden	155
6	03/27	15.7	5.2	3.0	2.2	Gravel	No Fish	-



reasonably representative of peak numbers.

Fall Stream Investigations

A complete catch record for all sample sites and methods is presented in Appendix A. Table 2 summarizes the overall catch by sample site. Conditions for fish sampling were generally favorable during the September sample period because of low flow and relatively low turbidity; nearly all portions of the drainage could be waded. Because of varying conditions, catch data should be considered primarily qualitative.

Juvenile coho salmon, adult and subadult Arctic grayling, and sculpins were the dominant fish at all three stations. The density of coho salmon appeared to be highest at the upstream (Ophir Creek) station, whereas grayling were most abundant at the Flat Creek station.

The coho salmon ranged in length from 47 to 74 mm with most fish between 50 and 60 mm suggesting that one age class is represented, probably young-of-the-year. Most grayling were large suggesting adult or subadult status. However, three grayling were in the length group 61-68 mm and were probably young-of-the-year fish.

DISCUSSION

Winter Fish Use

The results indicate that Donlin and Upper Crooked Creeks support some fish throughout the winter. The small number of fish is probably reflective of the minimal flow and extreme channel constriction due to thick ice. Like many interior Alaska streams, surface flow likely becomes discontinuous in late winter resulting in isolated stream segments containing pools that are suitable for fish survival. There was no indication that any part of the study area was heavily used by overwintering fish or provided special conditions. No obvious spring areas were observed.

Mid-Summer Aerial Survey

Relatively small numbers of chinook and chum salmon spawned in Crooked Creek in 1997 with all chinook spawning occurring downstream from American Creek and all chum spawning in the lower river, well downstream from the project area. Conditions probably were not suitable for chinook spawning upstream from American Creek because of shallow water and the presence of at least 10 beaver dams. However, water levels were unusually low during the 1997 mid-summer period and it is likely that chinook spawning extends further upstream in some years.

TABLE 2. SEPTEMBER CATCH SUMMARY - ALL METHODS COMBINED

STREAM	SITE	SPECIES	NUMBER
DONLIN CREEK	AT OPHIR	COHO SALMON (JUV.)	12
		ARCTIC GRAYLING	6
		ROUND WHITEFISH	1
		SLIMY SCULPIN	17
DONLIN CREEK	AT QUARTZ	COHO SALMON (JUV.)	7
		ARCTIC GRAYLING	4
		9-SPINE STICKLEBACK	2
		SLIMY SCULPIN	19
DONLIN CREEK	AT FLAT	COHO SALMON (JUV.)	7
		ARCTIC GRAYLING	26
		ROUND WHITEFISH	3
		DOLLY VARDEN	3
		BURBOT	1
		9-SPINE STICKLEBACK	1
SLIMY SCULPIN	7		

Fall Stream Investigations

The overall species composition and distribution in September, 1997 was similar to that seen during the summer of 1996 with some notable exceptions. The consistent presence of young-of-the-year coho salmon in upper Donlin Creek has not been noted previously and suggests that coho salmon spawning occurred in upper Donlin Creek in 1996. Upstream migration of small juvenile cohos to upper Donlin Creek seems unlikely because of multiple beaver dam barriers. Project personnel reported seeing large salmon in Donlin Creek near the Ophir Creek station in mid-September 1996. No adult salmon were observed in this area in 1997, but, again, low water conditions and beaver dams may have prevented access.

The presence of young-of-the-year Arctic grayling in Donlin Creek is another difference from previous studies and suggests that some grayling spawning occurs in Donlin Creek or its tributaries. No small Dolly Varden were observed during the September sample period in contrast to the summer 1996 investigations. It is possible that most small Dolly Varden had moved downstream in response to cooling water temperatures.

APPENDIX A. SEPTEMBER CATCH RECORD

DATE	SITE	STREAM	METHOD	SPECIES	LENGTH	NUMBER	TRAP HRS.	CATCH/HR.
09/16/97	OPHIR	DONLIN	TRAP	COHO	80		167.5	
				COHO	86			
				COHO	84			
				COHO	55			
				COHO	87			
				COHO	89			
				COHO	84			
				COHO	74	8		.05
				SCULP	76			
				SCULP	84	2		.01
			SHOCKER	COHO	80			
				COHO	84	2		
				GR	81	1		
				SCULP		14		
			SEINE	COHO	82			
				COHO	83	2		
				GR	270			
				GR	276			
				GR	83			
				GR	268			
				GR	291	5		
				RWF	205	1		
				SCULP		1		
	FLAT	DONLIN	SEINE	COHO	55			
				COHO	55			
				COHO	57			
				COHO	59	4		
				GR	190			
					88			
					203			
					300			
					160			
					185	6		
				DV	223	1		
				RWF	338			
					364			
					331	3		
				SCULP	77			
					80			
					82			
					88			
					92	5		
				STICK	55	1		
			ANGLING	GR	198			
					218			
					228			
					253			
					260			
					215			
					304	7		

COHO = COHO SALMON
 GR = ARCTIC GRAYLING
 DV = DOLLY VARDEN
 RWF = ROUND WHITEFISH
 BURBOT = BURBOT
 SCULP = SLIMY SCULPIN
 STICK = NINE-SPINE STICKLEBACK

APPENDIX A (CONT). SEPTEMBER CATCH RECORD

DATE	SITE	STREAM	METHOD	SPECIES	LENGTH	NUMBER	TRAP HRS.	CATCH/HR.
09/17/87	FLAT	DONLIN	TRAP	COHO	62	1	180	.01
				SCULP	98			
					85	2		.01
			SHOCKER	COHO	47			
					50	2		
				GR	224			
					182			
					209			
					315			
					298			
					213			
					221	7		
				DV	172	1		
				BURBOT	225	1		
			ANGLING	GR	181			
					281			
					182			
					183			
					250			
					213	8		
				DV	246	1		
	QUARTZ	DONLIN	SEINE	COHO	ESC	1		
				GR	298	1		
			ANGLING	GR	284	1		
09/18/87	QUARTZ	DONLIN	TRAP	COHO	68		187.5	
					65	2		.01
				SCULP	92			
					78	2		
			SHOCKER	GR	187			
					222	2		
				COHO	84			
					50			
					49			
					ESC	4		
				STICK	75			
						2		
				SCULP		17		

COHO = COHO SALMON
 GR = ARCTIC GRAYLING
 DV = DOLLY VARDEN
 RWF = ROUND WHITEFISH
 BURBOT = BURBOT
 SCULP = SLIMY SCULPIN
 STICK = NINE-SPINE STICKLEBACK