FEBRUARY INVESTIGATIONS IN THE UPPER SUSITNA RIVER WATERSHED BETWEEN DEVIL CANYON AND CHULITNA RIVER

INTRODUCTION

Winter investigations in the Upper Susitna River watershed from Devil Canyon to the Chulitna River are directed toward assessing anadromous fry distribution and abundance, and winter conditions in the sloughs and main stem Susitna River (Figure 1). Studies conducted during the previous two months have established that coho fry (Oncoryhnchus kisutch) are wintering in Sloughs No. 8-A, No. 9, No.11 and the Susitna River, and that the Susitna River was transporting suspended solid loads ranging from 4 ppm to 228 ppm.

METHODS

Field investigations were conducted from a camp established at the confluence of Indian and Susitna Rivers from February 12 through 18. Access to the sampling stations was obtained primarily with the aid of a single track snow vehicle. Sloughs were monitored for dissolved oxygen and pH levels, relative water depth, ice cover and thickness, snow depth, and water flow and temperature. Minnow traps baited with salmon roe were fished in the sloughs affording sufficient operational depth.

The Susitna River was monitored at Gold Creek, Chase, and the Fairbanks-Anchorage Highway bridge for water temperature, dissolved oxygen and pH levels, ice cover and thickness, and snow depth. At the Gold Creek Station, a Ryan thermograph was installed to assess daily water temperature fluctuations. Indian River, Gold Creek, and Lane Creek were sampled for water temperature, water flow and relative depth, and ice cover and thickness.

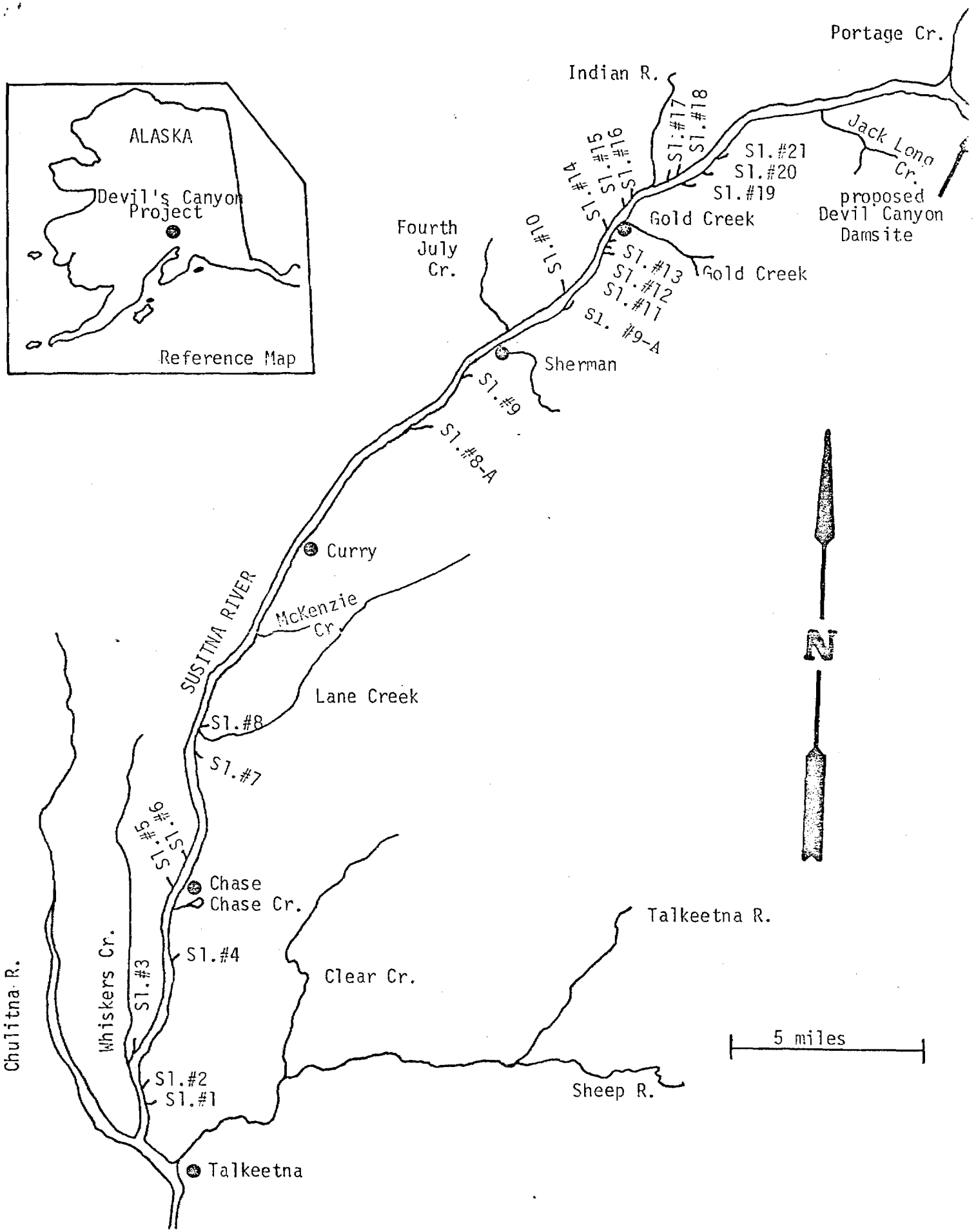

Figure 1. Map of the area encompassed in the Devil Canyon investigations on the upper Susitna River Watershed, Devil's Canyon Winter Project, 1975.

RESULTS

The Susitna River was completely ice covered at the Chase and Anchorage Highway stations, and at the Gold Creek station ice cover was approximately 95 percent (Table 1). Total suspended solid levels at these stations averaged approximately 14 mg/l with a range of 9 mg/l at Chase at 20 mg/l at Gold Creek. The settables, referring to that portion of the total suspended solids which settle within a 24 hour period, comprised approximately 90 percent of the samples. River temperature was 32° at the three sampling stations and dissolved oxygen levels averaged 9.3 ppm.

Presented in Figure 2 is a transposition of the thermograph data collected between January 14 and February 15, in the Susitna River at the Gold Creek sampling station.

Minnow trapping was conducted in the Susitna River from the Gold Creek railroad trestle to Slough No. 17, and produced a catch of six age 0.0 coho fry. The average length, weight, and condition factor of these fish was 70.0 mm, 3.9 gm, and 1.137, respectively (Table 2).

A summary of the winter components monitored in Sloughs No. 8, No. 8-A, No. 9, No. 9-A, No. 10, No. 11, No. 12, No. 13, No. 14, No. 15, No. 16, No. 17, No. 18, No. 19, No. 20, and No. 21 is presented in Table 3. Rearing coho fry were trapped in Sloughs No. 9, No. 9-A, No. 11, and No. 19. A length and weight analysis of these fry by slough is presented in Table 2. The entire catch represented fry produced from the 1973 brood year. Their mean length, weight, and condition factor was 70.5 mm, 41.1 gm, and 1.170, respectively.

On February 17, Slough No. 9-A was located and identified for the first time (Figure 3). Approximately twenty hours of minnow trapping in this slough afforded a relatively high catch of 21 coho fry.

Table 1. Survey of winter conditions in the Susitna River at Gold Creek, Chase and Anchorage-Fairbanks Highway crossing, Devil's Canyon Winter Project, 1975.

Susitna River Site	Date	Time (Military)	Temperature (°F) Air	Temperature (°F) Water	D.O. (ppm)	pH	Sample Size (l)	Suspended Solids Settlable (mg/l)	Suspended Solids Non-Filterable (mg/l)	Suspended Solids Total Suspended (mg/l)	Water Depth (inches)	Ice Cover (%)	Ice Thickness (inches)	Snow Depth On Ice (inches)	Ancho Ice Preser
Gold Creek	2/14/75	1515	14	32	10.1	5.8	2	19	1	20	47	95	32	0.0-18	No
Chase	2/18/75	1630	27	32	9.0	5.8	2	8	1	9	50	100	14	24-30	No
Fairbanks Anchorage Highway	2/18/75	2030	23	32	8.8	5.9	2	10	2	12	50	100	27	12	No
	2/20/75	1200			9.7		2	6	1	7					No

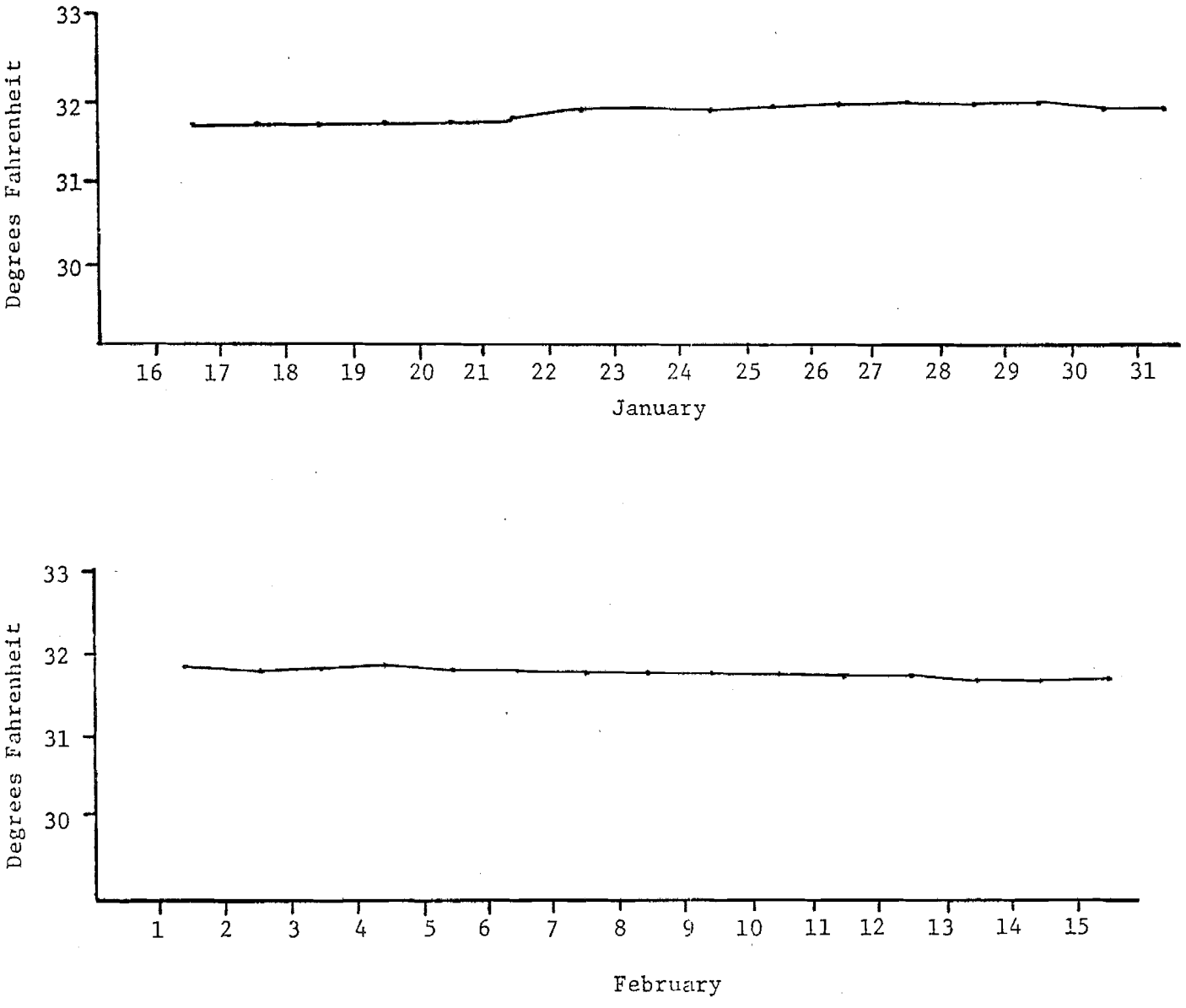

Figure 2. Profile of water temperatures recorded daily in the Susitna River at Gold Creek, Devil Canyon Winter Project, 1975.

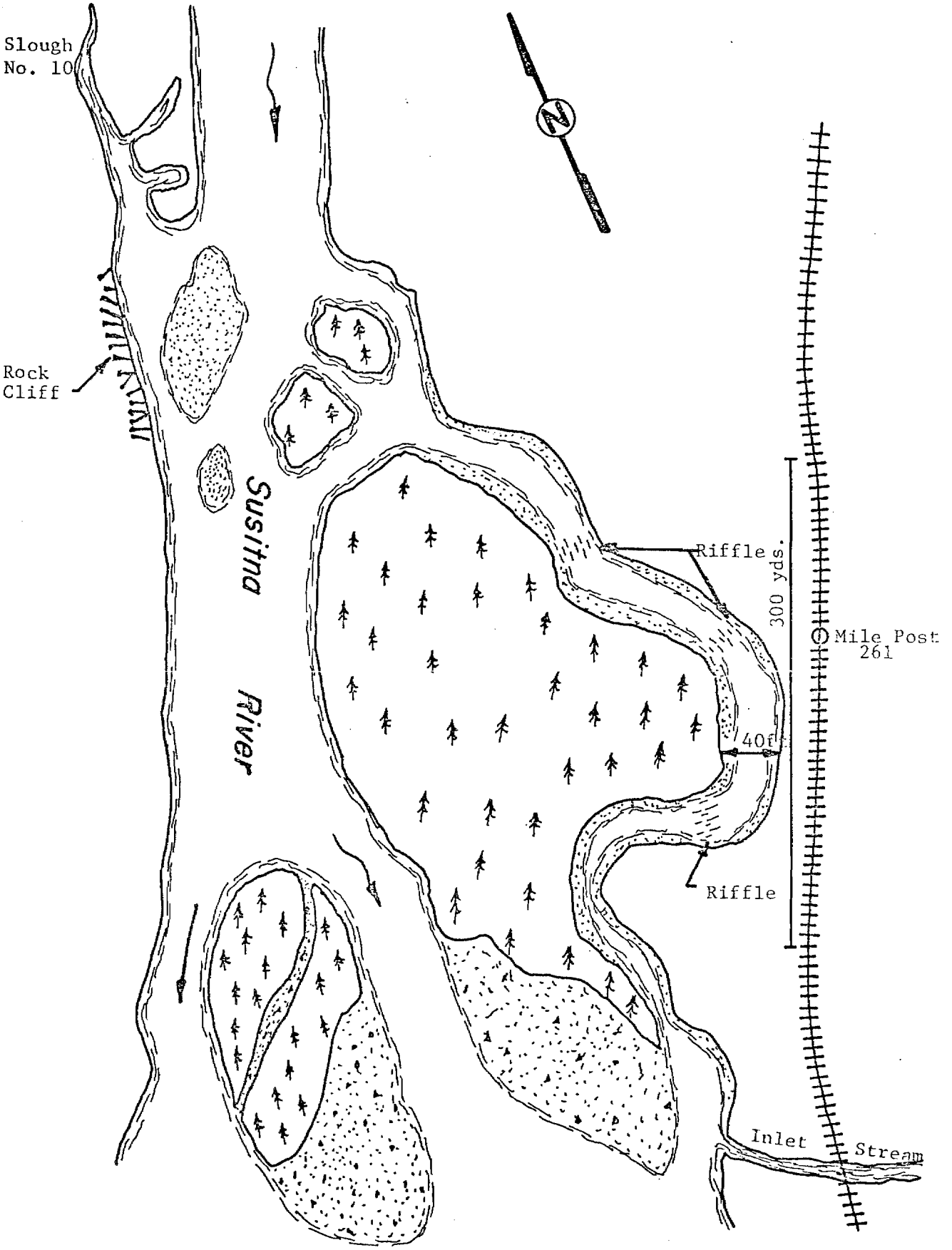

Figure 3. Map of Slough No. 9-A as composed on February 17, Devil's Canyon Winter Project, 1975.

Table 2. Age, length and weight analysis of coho fry collected in Sloughs No. 9, No. 9-A, No. 11, No. 19 and in the Susitna River, Devil's Canyon Winter Project, 1975.

Sampling Site	Date	Sample Size	0.0 Age Class Percent Composition	Mean Length (mm)	Standard Deviation	Mean Weight (g)	Standard Deviation	Condition Factor	Brood Year
Sl. 9	2/18/75	7	100.0	70.1	4.3	3.7	0.6	1.074	1973
Sl. 9-A	2/18/75	8	100.0	73.5	4.5	4.9	0.9	1.234	1973
Sl. 11	2/15/75	2	100.0	62.0	2.8	2.8	0.1	1.175	1973
Sl. 19	2/17/75	1	100.0	67		3.4		1.130	1973
Susitna River (Gold Cr.-Sl. 17)	2/14-16/75	6	100.0	70.0	4.9	3.9	0.9	1.137	1973

Table 3. Survey of winter conditions and rearing fry distribution and abundance in Sloughs No. 8, No. 8-A, No. 9, No. 9-A, No. 10, No. 11, No. 12, No. 13, No. 14, No. 15, No. 16, No. 17, No. 18, No. 19, No. 20, and No. 21, Devil's Canyon Winter Project, 1975.

Slough No.	Survey Site	Date	Time (Military)	Temperature (°F) Air	Temperature (°F) Water	Dissolved Oxygen(ppm)	pH	Ice Thickness (inches)	Ice Cover (%)	Snow Depth On Ice (inches)	Water Depth (inches)	Water Flow Detectable	Anchor Ice Present	No.Hours Fished	Minnow Trap Catch Fish Species: Coho	Grayling	Rainbow	Sculpin
8	A	2/18/75	1344	30	36	8.8	5.4	1.0-3	50	4-28	2.0	+	No	0.0				
8-A	A	2/17/75	1420	25	33	8.5	5.8	0.5-4	95	2-14	3.0	+	No	0.0				
	B	2/17/75	1448	24	33	7.2	5.8	0.5-6	99	2-30	4.5	+	No	21.8	0	0	0	0
9	A	2/17/75	1245	27	33	9.0	5.3	0.8-10	95	1-30	9.5	+	No	0.0				
	B	2/17/75	1315	26	34	7.4	5.3	0.4-10	95	0.5-16	10.0	+	No	45.4	7	0	0	0
9-A	A	2/17/75	1545	24	35.5	6.1	5.4	0.5-2	65	2-5	9.5	+	No	20.3	21	0	0	0
10	A	2/17/75	1615	24	34.5	7.4	5.4	1.0-4	55	0.3-16	6.0	+	No	0.0				
11	A	2/13/75	1025	-6	36	8.1	5.8	0.4-9	95	0.0-0.3	20.0	+	No	24.5	0	0	0	0
	B	2/13/75	1100	-2	36	7.4	5.4	0.3-8	95	0.0-0.3	14.0	+	No	68.5	2	0	0	0
12	B	2/13/75	1230	0	34	8.5	5.8	0.5-2	99	8-18	11.5	+	No	0.0				
	C	2/13/75	1155	3	34	9.4	5.2	0.3-9	98	1-24	4.5	-	No	0.0				
13	A	2/13/75	1355	1	34	9.2	5.7	0.5-2	75	0.0-10	4	+	No	0.0				
	B	2/13/75	1420	0	34	9.2	5.6	0.5-2	75	0.5-10	7.5	+	No	0.0				
14	A	2/16/75	1140	16	34	8.8	5.7	0.3-10	90	1-15	3.3	+	No	0.0				
	B	2/16/75	1210	16	33	9.7	5.7	0.3-3	100	1-14	4.5	+	No	0.0				
15	B	2/15/75	1205	9	33	8.1	5.5	12	100	7-16	9.0	-	No	0.0				
	C	2/15/75	1230	8	34	7.4	5.3	1.0-7	100	0.5-30	5.0	-	No	0.0				
16	A	2/17/75	0942	26	35	6.5	5.2	0.5-3	70	1.0-18	3.0	+	No	0.0				
17	A	2/13/75	1700	-2	33	8.5	5.3	0.3-3	95	0.0-12	13.0	+	No	23.5	0	0	0	0
	B	2/13/75	1740	-3	36	8.3	5.5	0.3-4	50	0.0-8	4.0	+	No	0.0				
18	A	2/14/75	1035	6	33.5	7.2	5.7	5-9	100	0.0-28	6.5	-	No	0.0				
19	A	2/16/75	1720	16	34	9.0	5.5	0.5-6	98	14-28	9.5	-	No	16.6	1	0	0	0
20	A	2/16/75	1430	17	32	10.3	5.5	6-15	100	23-36	2.0	+	No	0.0				
	B	2/16/75	1530	16	32		5.4	14	100	23-36	9.0	-	No	0.0				
21	A	2/16/75	1620	17	34	9.4	5.7	1.0-12	100	0.5-10	5.0	+	No	0.0				
	B	2/16/75	1635	16	32.5	9.4	5.4	3-10	100	0.5-16	8.5	-	No	0.0				

Indian River, Lane Creek, and Gold Creek were surveyed, and the results are presented in Table 4.

DISCUSSION

Susitna River water samples contained relatively minor amounts of suspended solids. Minnow trapping near the community of Gold Creek established the presence of rearing coho fry in the main stem Susitna River. It was also documented that coho fry were rearing in Sloughs No. 9, No. 9-A, No. 11, and No. 19. Based upon an analysis of length and weight data, the coho fry captured in the sloughs and Susitna River were in relatively good condition.

Stable ice conditions on the Susitna River permitted the first winter access to sloughs No. 10, No. 17, No. 19, No. 20, and No. 21. Although these sloughs were appreciably dewatered from their summer/fall state, the author suggests that only "harsh" egg incubation conditions were present in Slough No. 20 where water temperatures were 32° and ice thickness averaged in excess of 10 inches.

RECOMMENDATIONS

Discontinue minnow trapping in Sloughs No. 9 and No. 11, but expand trapping efforts in the other sloughs. Locate and fish minnow trap sites near the community of Curry. Install permanent depth stakes at the sampling stations.

Table 4. Survey of winter conditions in Indian River, Lane Creek and Gold Creek, Devil's Canyon Winter Project, 1975.

Stream	Survey Site	Date	Time (Military)	Temperature (°F) Air	Temperature (°F) Water	Ice Thickness (Inches)	Ice Cover (%)	Snow Depth On Ice (Inches)	Water Depth (Inches)	Water Flow (c.f.s.)	Anchor Ice Present
Indian River	0.2	2/18/75	0934	27	32	7-12	100	14-40	7.0	+	No
Lane Creek	0.1	2/18/75	1538	28	33	6-14	100	5-36	7.0	+	No
Gold Creek	0.3	2/16/75	1100	15	32.5	1.0-7	100	28.36	7.2	+	No