

State of Alaska
 Department of Fish and Game
 Nomination for Waters
 Important to Anadromous Species

1992
 Year of Revision

Name of Waterway Beaver creek
 AWC# of Waterway 334-40-11000-2810-3100
 AWC Volume & Number Interior Region 4
 USGS Quad Livengood CZ and BZ
 Addition X Correction _____
 Deletion _____ Change _____
 Change to _____ Atlas
 _____ Catalog
 _____ Both

Approved

<u>92 200</u>	<u>12-22-91</u>
<u>Regional Supervisor</u>	<u>Date</u>
<u>EW</u>	<u>1/23/92</u>
<u>FI</u>	<u>1/15/92</u>
<u>Drafted</u>	

ALASKA DEPT. OF
 FISH & GAME
 NOV 04 1991

REGION II
 FAIRBANKS DIVISION

Species	Date(s) Observed	Spawning	Rearing	Migration
King Salmon	4/12/91		✓	
King Salmon	4/24/91		✓	

Comments: Provide any clarifying information, including number of fish observed, location of fish survey data, etc.

King salmon juveniles were collected by electrofishing within open water leads at 65° 29' 10" N Lat 147° 34' 00" E Long (15 fish) on 4-12-91 and at SW 1/4 SW 1/4 SW 1/4, sec 16, T7N, R1W, FM (dk fish) on 4-24-91. Survey data is located at the BLM Fairbanks office on University Ave. and ADF&G on College Rd. (Trip Reports #3-5)

Attach a copy of a map showing location of mouth and upper points of each species, specific stream reaches identified for spawning or rearing, locations of barriers, such as falls. Attach a copy of the fish survey data, if available.

Name of Observer (please print) Brian Lubinski
 Date: 7-18-91 Signature: Brian Lubinski / BLM S/W M D
 Address: 1150 University Avenue
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Larry A. Dunton
Fishery Biologist
ADF&G - F&G
8-2-91

1991 TRIP REPORT

1
RECEIVED
APR 24 1991

WATER BODY/TRIP#: BEAVER CREEK/TRIP #3 & 4
DATES: 4-1 to 4-4 & 4-11 to 4-12-91
ACTIVITY: Winter fish surveys
AGENCY/PERSONNEL: BLM/Lubinski (fisheries) - Yeager (recreation) Alaska Dept. of Fish & Game
Kostohrys (hydrology) Habitat - Region III

SAMPLE SITES: s#1-Big Bend below Shebals (Livengood B-2;
65° 29'10''N Lat 147° 34'00''E Long)
s#2-0.8 km below site #1 (Livengood B-2;
65° 29'40''N Lat 147° 34'00''E Long)
s#3-1.3 km below site #1 (Livengood B-2;
65° 29'50''N Lat 147° 34'10''E Long)
s#4-Slough, west bank of site #1 (Livengood
B-2; 65° 29'45''N Lat 147° 34'10''E Long)

REMARKS:

Winter fisheries surveys were conducted within a large, spring-fed, open water lead, which begins at a sharp bend approximately 0.6 km downstream of the Fossil/Beaver Creek confluence. This spring area is open, to some extent, all winter long and is fed by several large springs located along the east bank at the upstream bend and numerous small springs. Dense algae mats are widespread, especially around the springs, and have been identified as the green algae *Horomidium*.

Qualitative invertebrate samples were taken and showed chironomids were extremely abundant within the algae mats. Other invertebrates collected included trichoptera, plecoptera and hirudinea. Most of the hirudinea collected were dead. A few adult trichopterans were observed on the first trip and were abundant by the second trip.

Passive and active fish sampling gear was employed on both trips. Slimy sculpin were the only fish observed on visual surveys. Hook & line sampling was unproductive after 5 man-hours of effort. Experimental gill nets captured 4 round whitefish and 1 grayling after a total of 100 net hours (4 different sets). Electroshocking efforts were productive in capturing slimy sculpin, burbot and king salmon juveniles. Pulsed DC was used at 30 PPS and 700 volts with both burbot and salmon exhibiting good galvanotaxis and sculpin stunning quickly. Sculpin were collected in all habitat types, burbot from within the algae mats and salmon from underneath ice ledges and shadows of rocks in depths as shallow as 12 cm. Four salmon were collected in 1 m of water off an active beaver lodge.

The juvenile salmon were identified as kings by both BLM and ADF&G and represent the first documented case of successful king salmon reproduction and survival to age-1 within the White Mountains National Recreation Area. Spawning kings were observed in late July, 1989, by Winston Hobgood within this same spring area. These observations extend the anadromous stream designation for Beaver Creek approximately 50 km.

REMARKS-continued

Burbot, grayling and whitefish stomach contents were examined and revealed burbot were the only actively feeding fish at the time of the sample. Food items included juvenile salmon (67 mm FL), sculpin (28-65 mm TL) and plecopterans (12-16 mm). Stomachs from the grayling and whitefish were taunt and contained a few plecopterans.

DATA:

1. WATER QUALITY: **WATER TEMP (C)**

MAX	MIN	1500hrs	(4-1/4 & 4-11/12-91)
1.1	0.0	0.6	(s #1)
4.0	4.0	4.0	(large spring, s#1)

2. HYDROLOGY: **WIDTH XDEPTH MAXDEPTH KVEL MAXVEL DISCH**

(Below s#1)	WIDTH	XDEPTH	MAXDEPTH	KVEL	MAXVEL	DISCH
(s#1)	38.10m	.25m	.46m	.35m/s	.69m/s	1.81m ³ /s
(s#2)	30.48m	.61m	1.22m			
(s#3)	15.24m	.61m	.91m			
(s#4)	10.67m	1.22m	1.83m			
(s#5)	.57m	.30m	1.00m			

3. FISHERIES:

S#	SUBSTRATE	SIZE	HABITAT DESCRIPTION		GRADIENT	HAB TYPE
			EMBEDDEDNESS			
1	boulder	(150-300mm)	0-25%	(silt/sand)	1-2.5%	glide/pool
2	boulder	(150-300mm)	0-25%	(sand)	1-2.5%	glide
3	boulder	(150-300mm)	0-25%	(sand)	1-2.5%	glide

S#	DATE	GEAR	GEAR EFFICIENCY			CPUE
			SPECIES	NUMBER	TIME	
1	4-2/4	GN	RWF	4	43hrs	0.09 fish/hr
1	4-2/4	GN	AGR	1	43hrs	0.02 fish/hr
1	4-12	SHK	SSC	37	38min	0.97 fish/min
1	4-12	SHK	BB	8	38min	0.21 fish/min
1	4-12	SHK	KS	15	38min	0.39 fish/min
4	4-12	SHK	SSC	2	14min	0.14 fish/min

S#	DATE	SPECIES	FISH DATA		SEX	AGE
			LENGTH (mm)	WEIGHT (gr)		
1	4-2/4	RWF	345 FL	--	MF	
1	" "	" "	295 FL	--	MM	
1	" "	" "	308 FL	--	MF	
1	" "	" "	291 FL	--	MF	
1	" "	AGR	312 FL	--	MM	
1	4-12	SSC	50 to 80 TL/avg	67 TL		
1	" "	BB	212 TL	60	IMF	
1	" "	" "	174 TL	30	IMM	
1	" "	" "	180 TL	50	IMM	
1	" "	" "	183 TL	40	IMM	
1	" "	" "	205 TL	60	IMF	
1	" "	" "	220 TL	65	IMF	

FISH DATA-continued						
S#	DATE	SPECIES	LENGTH (MM)	WEIGHT (GR)	SEX	AGE
1	4-12	BB	225 TL	65	--	
1	" "	" "	187 TL	55	--	
1	" "	KS	85 FL	--	--	1
1	" "	" "	80 FL	--	--	1
1	" "	" "	84 FL	--	--	1
1	" "	" "	82 FL	--	--	1
1	" "	" "	85 FL	--	--	1
1	" "	" "	82 FL	--	--	1
1	" "	" "	83 FL	--	--	1
1	" "	" "	84 FL	--	--	1
1	" "	" "	91 FL	--	--	1
1	" "	" "	79 FL	--	--	1
1	" "	" "	85 FL	--	--	1
1	" "	" "	87 FL	--	--	1
1	" "	" "	87 FL	--	--	1
1	" "	" "	93 FL	--	--	1
1	" "	" "	78 FL	--	--	1

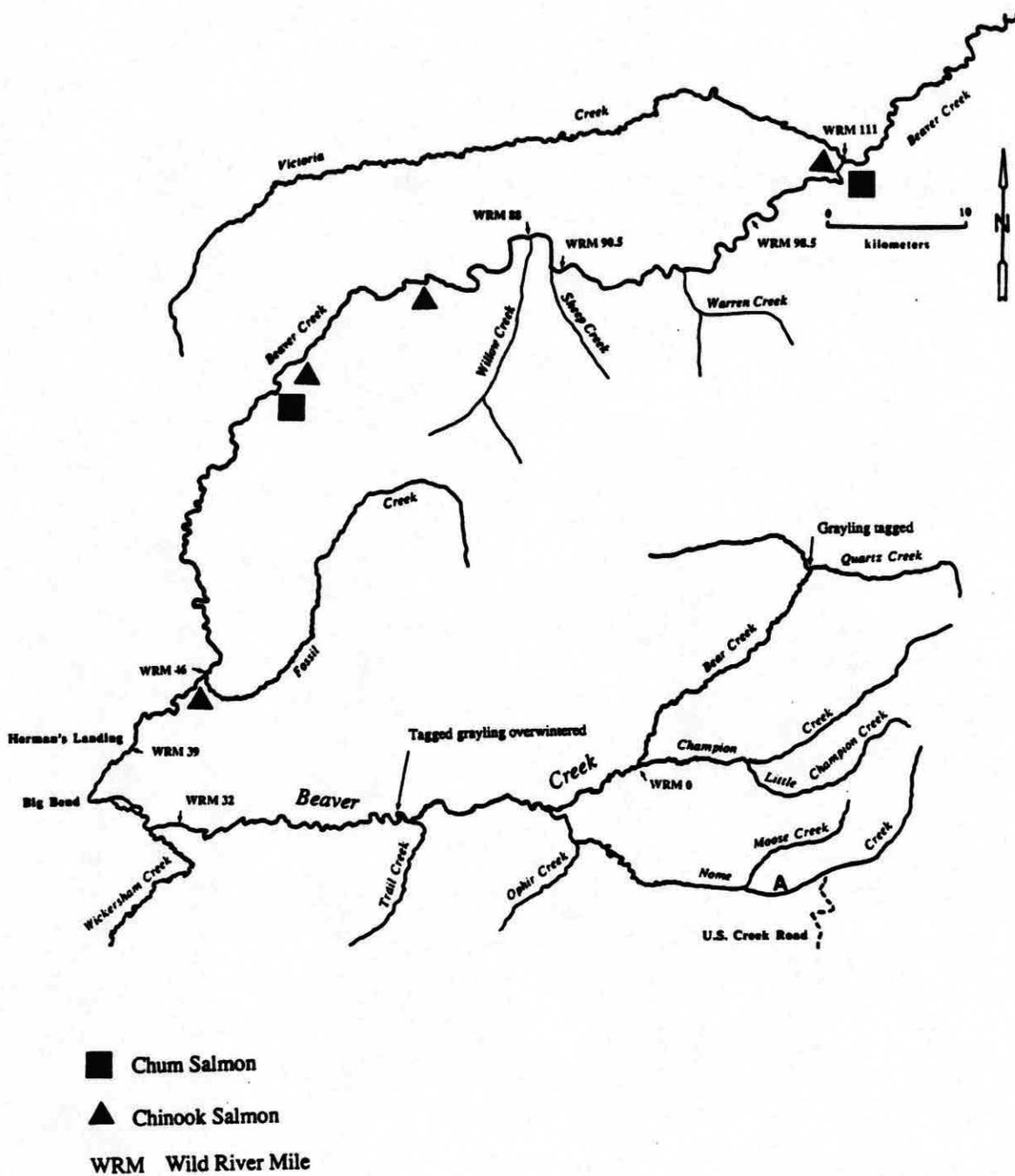


Figure 1. Survey sites by wild river miles (WRM) and 1987-89 salmon observations in Beaver Creek.

grayling could not be read because the scale used in the analysis was regenerated. Age class determinations were made for 34 grayling.

B. River Users

Aerial surveys to record recreation and other use on Beaver Creek resulted in a total of 10 flights of one hour each. Eight parties were counted; they contained a total of 18 people, for an average of 2.25 people per party. The time frame was from June 1 to September 15, covering a total of 107 days.

Table 4. Beaver Creek aerial survey, user counts for 1989.

Date	1= Weekday 2= Weekend	Section	Time	Count		
				People	Watercraft	Aircraft
June 8	1	A	3 p.m.	0	0	0
June 18	1	B	10 a.m.	6	3	0
June 30	1	B	5 p.m.	0	0	0
July 9	1	A	8 a.m.	0	0	0
July 18	2	A	2 p.m.	0	0	0
July 28	1	B	4 p.m.	7	3	0
August 8	1	B	11 a.m.	5	2	0
August 18	1	A	1 p.m.	0	0	0
August 28	2	B	12 p.m.	0	0	0
Sept. 8	1	A	9 a.m.	0	0	0
Mean				6.0	2.7	0
Standard Deviation				0.82	0.5	0

Projection of the survey results are as follows: 10 samples in 107 days = 9.3% of total time sampled, and observed 8 parties with a total of 18 persons. Sample expanded to 100% (or 107 days) = 8 parties x 107 = 86 parties with 241 persons using the river. Table 4 depicts the user counts for 1989.

During the user surveys in July and September 1989, observations were made for salmon movements in Beaver Creek (Figure 1). Clarity of water and sunny days provided good observations, but salmon were not sighted during the aerial surveys. Chinook salmon (35) were observed and reported by the wildlife team doing survey work along Beaver Creek from July 26 to August 8, 1989. These salmon were observed spawning in deep riffles, often behind log obstructions. Salmon presence was documented below Shebal's at WRM 47 (Township 8 North; Range 1 West; Section 36) to WRM 110 (Township 11 North; Range 5 East; Section 2). Most of the spawners were observed at WRM 82 (Township 10 North; Range 2 East; Section 1).

C. Revegetation and Riparian Habitat Enhancement

Water quality samples were collected from Nome Creek on September 21, 1989. Two samples were taken in the Maze at the same sites as in 1988. One was taken at the head of the Maze and one at the end of the Maze (Township 6 North; Range 5 East; Sections 19 and 20), see Figure 1, A. Results are listed on Table 5.

1991 TRIP REPORT

RECEIVED
MAY 10 1991

WATER BODY/TRIP#: BEAVER CREEK/TRIP #5
DATES: 4-23 to 4-25-91
ACTIVITY: Winter fish surveys
AGENCY/PERSONNEL: BLM/Lubinski (fisheries), Yeager & Jozisek (recreation), Kostohrys (hydrology)
 Alaska Dept. of Fish & Game
 Habitat Region III

SAMPLE SITE(S): **AREA A:** Open water lead at Hermans (Livengood B-2; E1/2W1/2, sec 16, T7N, R1W, FM)
S#1A: SW1/4SW1/4SW1/4, sec 16, T7N, R1W, FM
S#2A: SW1/4NE1/4SW1/4, sec 16, T7N, R1W, FM
S#3A: NW1/4NE1/4SW1/4, sec 16, T7N, R1W, FM
S#4A: SW1/4SE1/4NW1/4, sec 16, T7N, R1W, FM

REMARKS:

Winter fisheries surveys were conducted within a spring-fed section of Beaver Creek beginning at Hermans Landing Strip (SE1/4NW1/4SE1/4NW1/4, sec 16, T7N, R1W, FM) and terminating 1.2 km upstream at a large spring (SW1/4SW1/4SW1/4SW1/4, sec 16, T7N, R1W, FM). This area is open, to some extent, all winter long and is primarily fed by the large spring at the upstream extent of the sample area. Dense mats of the green algae Hormidium are widespread as are patches of the water moss Fontinalis. Sections of Hormidium could be seen floating downstream and quickly collected in the gill nets.

Qualitative invertebrate samples were taken and revealed chironomids, plecopterans, trichopterans, ephemeropterans and notonectids were abundant. Adult plecopterans, culicids and trichopterans were also observed.

Passive and active fish capture techniques were employed. Visual surveys revealed numerous live slimy sculpins and a number of dead fish including 6 slimy sculpin, 6 arctic grayling (52, 52, 74, 67, 70, 68 mm FL) and 1 king salmon (77 mm FL). Hook and line sampling was unproductive after 4 man-hours of effort. Experimental gill nets were found filled with algae after only 4 hours in the water and were not fishing. A Smith-Root generator powered electrofisher (model 15-A) was effective in capturing slimy sculpin (62), king salmon (11) and arctic grayling (5). Pulsed DC was used at 30 pps and 800 volts with all fish either stunning quickly (slimy sculpin) or exhibiting good galvanotaxis (king salmon and arctic grayling). Slimy sculpin were collected in all habitat types. King salmon were consistently collected from the 0.5 to 1.0 meter deep shoreline boulder areas (200 to 600 mm diameter) of reduced velocity (<0.3 m/s), containing woody debris (mostly willow branches). This habitat type was not

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NJF _____ abundant. Two king salmon fry were collected in a slack water
 CRH _____ area 5 cm deep with willow branches and rubble size (64 to 256
 RFM _____ mm) substrate. This habitat type was also not abundant. Arctic
 AGO _____ grayling were collected in habitat similar to that preferred by
 RAP _____ the juvenile salmon, but appeared to show a wider preference for
 MHR _____ cover using boulder, woody debris, shadows and/or ice ledges.
 _____ The salmon fry and age-1 juveniles were identified as kings
 _____ by BLM. These observations are significant in that they represent
 _____ the farthest upstream point king salmon have been observed in

RTS _____
 AHT _____ ✓
 PKW _____
 JFW _____

REMARKS: continued

Beaver Creek, extending the anadromous stream designation 12 km from the previous farthest point (SE1/4, SW1/4, SW1/4, SW1/4, sec 30, T8N, R1E, FM) documented by BLM on 12 April, 1991 (see 1991 BLM Beaver Creek Trip Report #3 & 4). Additionally, the observation of the king salmon fry documents not only the approximate time of emergence, but also the general location of successful spawning, incubation and growth to the fry stage for Beaver Creek king salmon. Discussions with ADF&G biologists indicate that this years hatch may be unseasonably early.

DATA:**1. WATER QUALITY:**

S#	WATER TEMP		TEMP (C)
	DATE	TIME	
4A	4-23-91	1730	4
4A	4-24-91	1700	4
3A	4-24-91	0930	1
3A	4-24-91	1700	3

2. HYDROLOGY:

S#	XWIDTH	XDEPTH	MAXDEPTH	XVEL	MAXVEL	DISCH
1A	24m	0.7m	1.0m	0.30m/s	0.30m/s	
2A	24m	0.8m	0.9m	0.33m/s	0.34m/s	
3A	20m	0.4m	0.6m	0.68m/s	1.27m/s	
4A	22m	0.6m	0.9m	0.44m/s	0.64m/s	2.92m ³ /s

3. FISHERIES:

S#	SUBSTRATE SIZE	HABITAT DESCRIPTION		HABITAT TYPE
		EMBEDDEDNESS	GRADIENT	
1A	rubble (60-250mm)	0-25% (sand)	1-2.5%	pool/glide
2A	rubble (60-250mm)	0%	1-2.5%	glide
3A	rubble/boulder	0-25% (sand)	1-2.5%	riffle/glide
4A	rubble/boulder	0-25% (sand)	1-2.5%	pool/glide

GEAR EFFICIENCY

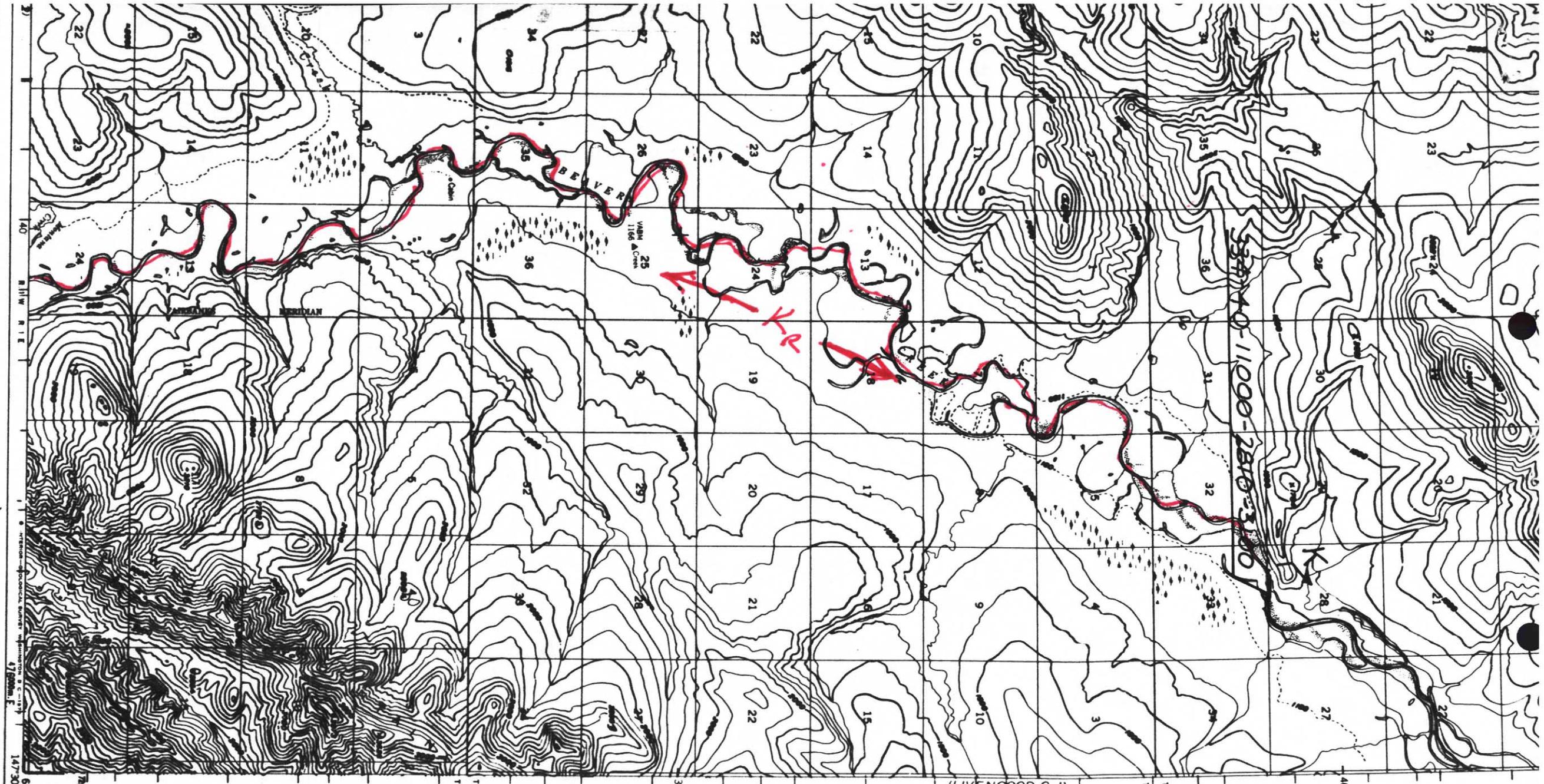
S#	DATE	GEAR	SPECIES	NUMBER	EFFORT	CPUE
ALL	4-24	SH	SSC	62	93min	0.67 fish/min
ALL	4-24	SH	KS	11	93min	0.12 fish/min
ALL	4-24	SH	AGR	5	93min	0.05 fish/min
1A & 2A NOT SAMPLED						
3A	4-24	SH	SSC	35	53min	0.66 fish/min
3A	4-24	SH	KS	9 (2 fry)	53min	0.11 fish/min
3A	4-24	SH	AGR	2	53min	0.04 fish/min
4A	4-24	SH	SSC	27	40min	0.68 fish/min
4A	4-24	SH	KS	2	40min	0.05 fish/min
4A	4-24	SH	AGR	3	40min	0.08 fish/min

*NOTE: SITE 3A; 2 king salmon and many sculpin missed
 SITE 4A; many sculpin and unidentified fry missed

FISH DATA				
S#	DATE	SPECIES	LENGTH (mm)	AGE
ALL	4-24	SSC	32 to 114 TL/avg	63 TL
3A	4-24	KS	87 FL	1
" "	" "	" "	84 FL	1
" "	" "	" "	85 FL	1
" "	" "	" "	85 FL	1
" "	" "	" "	78 FL	1
" "	" "	" "	84 FL	1
" "	" "	" "	92 FL	1
" "	" "	" "	34 TL	0
" "	" "	" "	34 TL	0
3A	4-24	AGR	65 FL	-
" "	" "	" "	69 FL	-
4A	4-24	KS	88 FL	1
" "	" "	" "	85 FL	1
4A	4-24	AGR	70 FL	-
" "	" "	" "	67 FL	-
" "	" "	" "	68 FL	-

ABBREVIATIONS:

SSC- slimy sculpin	M- meter
KS- king salmon	S- second
AGR- arctic grayling	TL- total length
SH- shock (electrofishing)	FL- fork length
S#- sample site number	



334-40-11000-2810-3100

EXTENDS 334-40-11000-2810-3100
w/K/R

68°30'

Regina, N.

T 9 N

35

(LIVENGOOD C-11)

T 10 N

40

R14W R1E

147°30'

UNITED STATES GEOLOGICAL SURVEY WASHINGTON, D. C. 20541
4750000 5