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

1991
Year of Revision

Approved

91 014

Regional Supervisor — Date 12/4/90

SOS — 12/21/90

F1 — Drafted 12/7/90

Name of Waterway Ikalugtalik River

AWC# of Waterway 335-40-14775

AWC Volume & Number '

USGS Quad Nunivak Island C-1

Addition _____ Correction _____
Deletion _____ Change _____

Change to _____ Atlas
_____ Catalog
x Both

Species	Date(s) Observed	Spawning	Rearing	Migration
Coho Salmon	9-11-90		X	
Char	9-11-90		X	

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

Carl Kalb, Fishery Biologist, FRED Division, captured 67 Dolly Varden and 3 coho salmon 50 - 150 mm in length.

See attached Trip Report for details.

ALASKA DEPT. OF FISH & GAME
NOV 22 1990
REGION II
HABITAT DIVISION

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) Carl Kalb

Date: 10-29-90 Signature: R. Kim Francisco

Address: P.O. Box 90 Bethel, Alaska 99559-0090

MEMORANDUM STATE OF ALASKA

To: Bill Hauser
Regional Biologist
ADFG-FRED Div.
Anch.

Date: 25-Oct-90

Phone: 892-6816

From: Carl Kalb
Fishery Biologist
ADFG-FRED Div.
Big Lake

Subject: Trip Report;
Nelson Is/Chevak

The residents of the Nelson Island and Chevak areas are interested in the installation of in-stream salmon incubation facilities as a means of developing a commercial salmon fishery where presently none exist. Through the efforts of individuals from Western Alaska associated with its economic development (Mr. Joe Paniyak, Kolechik Fishermen's Assoc.; Mr. David Bill, Qaluyaat Fishermen's Assoc.; Mr. John Zuck, Bering Sea Fishermen's Assoc.), the FRED Division was requested to conduct a preliminary survey into the feasability of salmon production at selected sites. A variety of options for salmon enhancement resulting in terminal fisheries were to be explored from low cost instream incubation operations to more conventional permanent facilities.

A site reconnaissance trip was made by Mr. Tom Kron to the Nelson Island, Chevak and Hooper Bay area on March 22-30. Mr. Kron was shown a number of sites, supposedly ice free through the winter, by local representatives of the Fishermen's Association. Based on the findings from this trip, four sites were selected by Bob Chlupach for a comprehensive survey to be conducted in August/September. Two sites are located in the Volcano Cones area near Chevak and two sites are on Nelson Island.

Preparation for the survey began early July with the purchase of a [illegible] plankton net, juvenile fish traps, YSI dissolved oxygen meter, and a Hach digital titrator for dissolved oxygen. Water sample bottles were obtained from the FRED Disvision Limnology Lab in Soldotna.

A number of Ryan thermographs were available but an alternative was sought since their reliability was suspect due to occasional mistracking of the chart paper and jamming of mechanical components. After conversations with Mr. Peter Scorup (University of Alaska [illegible] Division, Palmer) the Omnidata Datapod was considered an alternative to the Ryan thermograph. Mr. Scorup has successfully used Datapods to record water and soil temperatures during arctic conditions in the Prudhoe Bay area. Further conversations with James Dryden of Dryden & LaRue, Inc. convinced me of the practicality of the Datapod recorders. Four used Datapod two channel data loggers were obtained from the defunct Su-Hydro study along with an Omnidata model 217 datapod reader, various temperature sensor cables and several [illegible] equipment was sent to Dryden & LaRue, Inc. for testing and repair. Additional data storage modules, sensor cables and a software package for processing recorder output were purchased from Dryden & LaRue.

A possible option for the project was to install instream incubators using Ken Roberson's Gulkana operation as a model for the Western Alaska units. Instead of full sized units a 1/16 scale (2'x2'x2') incubator design was chosen for the preliminary study and then the water intake box was futher reduced in size to 1'x2'x2'. Construction was 1/2" AB exterior fir plywood with a 1/4" Lexan diffusion plate in the incubator box, plastic fittings for 1 1/2" PVC pipe and screw fastners so the units could be disassembled for shipping. Each unit should accomodate 50,000 salmon eggs. One of the head box/incubator units went with Ken Roberson to Ilnik for installation. One hundred and fifty feet of 1 1/2" PVC pipe, thirty feet of 1 1/2" flex hose, fittings and a Ryan R-180 thermograph were included.

Initially, travel to the field site was to be by boat and ATV, arranged by the representatives in Toksook Bay and Chevak. The length of time to access each site would vary according to weather and water conditions but at best could involve several days per site because of the remoteness of the location. An estimate of travel by boat to reach the Manokinak River near Volcano Cones was eleven hours one way, a considerable portion of the journey along the Bering Sea coastline of Hazen Bay. Because of concerns for safety and knowing that inclimate weather could complicate schedules considerably, it was decided to employ a heliocopter to reach all survey locations. This would also allow the flexibilty of examining other locations in case any of the selected sites proved unsuitable. Arrangements were made with Yukon Heliocopters, (Tom Ratledge, owner/pilot) using a Jet Ranger, five place aircraft. Using the heliocopter reduced the survey trip to two days, however, since the cargo capacity is quite limited it was necessary to attach a rack on the heliocopter skids to carry all our gear. A barrel of fuel was also delivered by fixed wing aircraft to Chevak and Toksook Bay since [illegible]

Lee Cheney and I arrived in Bethel on Sept. 9 and lodged in the Fish and Game bunkhouse. A flight schedule was arranged with Yukon Helicopter for the first sampling to be done at the Volcano Cones near Chevak. The weather on Monday 9/10 was sunny, excellent visibility and no wind. We arrived at Chevak 1150 hrs. and located Mr. J Paniyak. Mr. Paniyak was unable to accompany us as originally planned so Mr. Peter Boyscout came as a translator for Mr. Francis Pingayak. The large, bulky gear was tied on the exterior rack so that all passengers could be carried in a single flight. We flew approximately dur [illegible] Cones area where Mr. Pingayak directed us to the first site.

Site #1, Volcano Cone:

The main features of this site are two large lakes, the lower lake connecting to the Manokinak River by a slow moving stream approximately 6 miles long. The upper lake lies within the volcano cone, apparently without any outlet, and is about 365 meters distant from the lower lake and 14 meters higher in elevation. A number of small springs, appearing first as heavy seepage, flow from the base of a ridge approximately 46 meters from the upper lake, from which they appear to originate. The spring waters gradually collect into large rivulets eventually forming a single stream 46 cm wide and 10 cm to 15 cm deep, flowing at 0.01 CMS (0.35 CFS). The distance from the hillside springs to the lower lake is about 305 meters with an old inactive beaver dam 43 meters from the lower lake.

The Datapod recorder was placed in a weatherproof container (surplus ammunition box) that was secured to a metal fence post driven into the creekbank approximately 3 to 3.5 meters downstream from the beaver dam. The plywood head box was dug into the stream bottom at the same location. The temperature probe cable was laid in a shallow trench and covered to prevent ice/animal damage, then secured to the bottom of the head box after which the lid was screwed down and covered with rock. The air temperature probe was protected from direct solar radiation by inserting it in a 6 inch length of 1 1/2 inch PVC pipe attached to the post directly under the data pod. The datapod recorder had a dessicant capsule placed inside with the batteries, it was then taped shut with electricans vinyl tape and more dessicant placed in a cup inside the protective container. Recorder operation began at 1550 hrs, 9/10/90 (Table 3). A Ryan J-180 thermograph was placed inside the head box as a secondary water temperature recorder.

Water temperatures were taken from both lakes, the creek and the springs (Table 2). The upper lake had a shore line of large volcanic rocks with heavy algal growth. Since there was no boat available for a vertical plankton haul or Secchi disk reading, the plankton net was only used for qualitative sampling. A turbidity meter was used to determine water clarity which measured 5 NTU in the upper lake. [illegible] were observed in this [illegible] presence of other species.

The lower lake had a gravel bottom to a distance of 10 feet where it gradually became silty to muddy. An offshore breeze caused large amounts of plankton and algae to accumulate along the shore resulting in a high turbidity reading (21.2 NTU) and an unrepresentative plankton sample. There were several other springs located along the lake's shoreline but they drained almost directly into the lake waters. Two juvenile fish traps were placed [illegible] lower lake [illegible] were fished for 2 hrs with no results.

The spring fed creek has a bottom of fine gravel to silt and abrupt grassy banks bordered by small willow, sedge, moss, grasses and berry. According to Mr. Pingayak the stream and its outlet remain ice free through the winter. The stream gradient was 5% (1.2 m drop in 24 m), sufficient to operate instream incubators. Stream flow was small (.01 CMS) so I would recommend that a measurement be taken during mid-winter to confirm adequate volume for incubator operation.

Site #2, Volcano Cones:

This site is an alternative selection suggested by Mr. Pingayak as it remains ice free through the winter.It is approximately 5.5 miles south of Site #1 and 4.5 miles southeast of a site visited by Mr. Tom Kron on March 28, 1990. The site originally visited by Mr. Kron was a lake outlet I considered unsuitable since it was very marshy with a very low gradient and no observable springs.

Site #2 is a creek which flows to a large lake that drains into the Manokinak River 7.5 miles away. A fast flowing stream about 60 meters in length and a gradient of 5.5%, connects two slack water sections of the creek. The stream is 4.5 to 6 meters wide with a rocky bottom and abrupt grassy banks. Water temperature was 7° C (Table 2) with a high dissolved oxygen content of 14.8 ppm. A Datapod recorder was placed beside the stream approximately 25 meters from the lower slack water (Table 3). A turbidity and plankton sample was taken from the upstream slack water. Juvenile fish traps were also placed in this upstream section with no results.

There were no apparent reasons why this area would remain ice free in the winter except for the rapid current and deep snow cover. Both sites in the Volcano Cones area would appear suitable for instream incubator operation if water temperatures remain high enough during the winter. The area has no known existing spawning salmon population and a terminal harvest could be established in the stream systems. The greatest difficulty will be access to the sites during the year as overland transportion is very limited and time consuming.

Since it was so late in the afternoon I decided to have Mr. Pingayak and Boyscout return to Chevak while we continued with the survey at site #2. By the time the helicopter returned the survey was complete and we returned to Bethel, arriving shortly before dark.

Site #3, Nelson Island:

On September 11, 1990 we flew to Toksook Bay on Nelson Island where we picked up Mr. David Bill of the Qaluyaat Fishermen' Association. We immediately departed for the Ikalugtulik River [illegible] was overcast, [illegible]

The Ikalugtulik River drains a large, broad valley into Hazen Bay and supports runs of Pink and Coho Salmon. The survey site is on a small creek that flows into the Ikalugtulik River about 3/4 mile from its outlet to the sea. The creek drops rapidly off the slope of Killinupak Mt. then levels out for the last 1/4 mile, a single active beaver dam about 35 meters downstream from the sample site. The Datapod recorder was set alongside the head box that was dug deeply into the stream bottom in case icing conditions develop (Table 3). It is hoped the local musk ox don't use the recorder fence post for rubbing! A Dolly Varden about 250 mm was seen at the sample site and fish traps placed in the beaver pond yielded 67 D.V. and 3 Coho salmon juveniles, 50 - 150 mm in length. Sampling results are listed in Table 2. This site is prefered by Mr. D. Bill because of its proximity to Toksook Bay and access by ATV. While we were completing the survey the helicopter returned to Toksook Bay for additional fuel.

Site #4, Nelson Island:

We flew due east from Site #3 to near the head waters of the Urumangnuk River. The river flows through a broad gentle valley and is notable for the many beaver dams in its upper section. There must be a dam every 100 - 150 meters and since the gradient is small, beaver control and dam removal would be necessary to obtain the head flow needed for instream incubator operation. The sample site is located between two beaver ponds, has a large gravel bottom, good flow (0.19 CMS) and 18.5 ppm (Table 2). This stream section is supposedly ice free through the winter. A plankton sample was taken from the downstream pond and two fish traps placed there also, though nothing was captured. This site would be difficult to reach without a helicopter in the summer as boat access is very poor due to the stream size and beaver dams.

After completing the sampling at Site #4 we flew northwest to the coast and proceeded along Hazen Bay until turning south to return to Toksook Bay. There were many streams flowing from the hills and valleys of the island that could prove feasible for incubator use if water temperatures were suitable. A more thorough winter survey could identify other sites with better access than Site #4. A fixed wing aircraft could fly the survey in the winter locating possible sites which could then be reached by helicopter or snowmachine. When a helicopter is next used for these sites I would recommend that the additional fuel needed be sent to the village via the mail flight, saving the expense of charter cost.

cc: Tom Kron

attachments

Table 1. Survey site locations.

Site No.	Location	Date Sampled	Time	Loran Coordinates	Map Quadrangle
#1	Volcano Cones	9-10-90	1315 hrs	N 61 25.98′ W 164 13.75′	Marshall (B-6)
#2	Volcano Cones	9-10-90	1800 hrs	N 61 22.56′ W 164 14.70′	Marshall (B-6)
#3	Nelson Island	9-11-90	1120 hrs	N 60 39.92′ W 165 06.42′	Baird In. (C-7)
#4	Nelson Island	9-11-90	1500 hrs	N 60 40.26′ W 164 38.10′	Nunivak Is(C-1)

Table 2. Survey site data.

Site No.	Sample Site	Air Temp. (C)	Water Temp. (C)	Diss. Oxy. (ppm)	Turb. (NTU)	Stream Flow (CMS)	Stream Gradient %	Water Sample	Plankton Sample
1	Upper Lake	10.5	13	11.5	5			Yes	Yes
	Lower Lake	10.5	12.5		21.2			Yes	Yes
	Spring Stream	10.5	7	12	1.3	.01	5	Yes	No
2	Stream	9.5	7	14.8	2.3	.22	5.5	Yes	Yes
3	Stream	8	5	12.8	.45	.14	4	Yes	Yes
4	Stream	10	5	18.5	.06	.19	Ukn	Yes	Yes

Table 3. Datapod recorder assignment.

Site No.	Datapod Serial #	Water Probe #	Air Probe #	Start Up Date	Start Up Time
1	603-B	13	4	9-10-90	1550 hrs
2	602-B	14	5	9-10-90	1930 hrs
3	600-B	10	1	9-11-90	1230 hrs
4	601-B	12	2	9-11-90	1545 hrs