Field Report, Ungalik River Fishing Survey, ADF&G - BLM, July 23-30, 1977

6522 (933)

State Office
555 Cordova Street
Anchorage, Alaska 99501

SEP 1

Mr. Scott Grundy
Regional Supervisor
Habitat Protection Section
Alaska Department of Fish and Game
1300 College Road
Fairbanks, Alaska 99701

Dear Scott,

The enclosed report summarizes my participation in the cooperative fishery survey with the Alaska Department of Fish and Game. Most of the information included is basic observations of the Ungalik River fishery. All participants in the survey were requested to prepare and submit a general report to Alan Townsend of Alaska Department of Fish and Game so that he could draft a formal report for the projects.

Sincerely yours,

/s/Louis Carufel

Louis Carufel
Fishery Biologist

Enclosure

LCarufel:car:8/31/77

SEP 1 1977

Fishery Biologist

In reply refer to:
6522 (933)

Ungalik River Fishing Survey Trip
Report

Chief, Division of Resources (930)
THRU: Chief, Branch of Biological Resources (933)

FIELD REPORT
UNGALIK RIVER FISHING SURVEY
ADF&G - BLM
July 23-30, 1977

Introduction

Scott Grundy, Alaska Department of Fish and Game (ADF&G), Habitat Section, initially requested a cooperative study to survey salmon movement and spawning on the Ungalik River. Due to limited funds and manpower, Grundy made this request for a cooperative project. During July 23-30, 1977, I assisted Alan Townsend, Project Leader, ADF&G Habitat Section, with the survey. The Department's concern is on salmon movements, spawning activities and habitat conditions in the Ungalik River, especially adjacent to the gold mining operation belonging to Mr. Pat Bliss. This activity consists of a bench mining operation in progress and a gold dredge which is closed down due to lack of a State permit to dredge in the main channel of the Ungalik River. The Ungalik River is spawning habitat for thousands of chum and pink salmon and some king salmon.

Saturday, July 23, 1977

I left Anchorage on Wien Airlines at 7:20 a.m. and arrived in Nome at 8:45 a.m. Upon arrival I was met by Mr. Robert Fedeler, Wildlife Biologist, ADF&G-Fairbanks. We departed Nome at 9:15 a.m. on a Cessna 185 chartered by ADF&G from Foster Aviation. After one hour and fifteen minutes we landed at Mr. Pat Bliss' private airstrip adjacent to the Ungalik River.

Three BLM employees from the Fairbanks District Office--Keill, Webb and Woodworth--departed on the return flight after having assisted Al Townsend with the survey from July 18-23, 1977. Our gear and equipment were rafted downstream to about 1/3 of a mile to the field camp.

The second shift field crew sampled several areas on the river with hook and line to ascertain salmon spawning readiness. Most salmon were ripe for spawning except for a few females (pink and chum). Arctic char and grayling were caught during the salmon spawning readiness survey. All fish caught were released live into the river.

Spawning activities were observed over five river miles, from the area east of the airstrip to about 1/4 mile below the dredge tailings. Thousands of chum and pink salmon were seen. Preliminary chum salmon spawning activity was noted. Hundreds of pink salmon were spawning with several redds being guarded. One dead (spent) male chum salmon was examined in the spawning area adjacent to the airstrip.

One group of chum salmon was spawning in a backwater eddy area directly in front of the field camp. The redd was about six foot square. A minnow trap, located about 20 feet from the redd, was used to sample juvenile fish. When inspected, a burbot and char were taken.

Sunday, July 24, 1977

Since July 18, 1977, the river had dropped six inches as indicated by marked gauge stick. Both air (60°F) and water (58°F) temperatures were recorded at 8:00 a.m. Project personnel spent most of the day walking the river looking for signs of spawning salmon below the dredge tailings (T 11S, R 11W, NW 1/4 Sec. 14). One large king was seen in the pool above the riffle, but no redds were observed. Also chum and pink salmon were caught, examined and found to be not ripe.

Both chum and pink salmon were observed at various concentrations over 4-1/2 river miles from Section 14 (below dredge tailings) to Section 8 (3/4 mile from the mouth). Fines and small gravels (1/4" to 2" in diameter) make up 90 percent of the bottom composition between NE 1/4 of Section 8 to NW 1/4 of Section 9. Upstream from the NW 1/4 of Section 9 gravels become increasingly larger—2 to 4 inches in diameter. Both chum and pink salmon were observed spawning in the stream sections containing small to large gravel. The field survey indicates that greater concentrations of salmon used the larger sized gravels.

Monday, July 25, 1977

Air temperature 67°F - water temperature 55°F at 12:00 noon. Stream flow measurements were made with the velocity head rod. Each site measured is marked on the enclosed map.

1. Side channel flow in front of Camp - chum spawning area. Bottom type 50% cobble, 40% gravel and 10% sand.

   Stream Width - 30 feet
   Velocity - 0.80 fps
   Discharge - 1.41 cfs

2. Double riffle to right of camp (on main stem). Bottom type - 35% cobble, 55% gravel and 10% sand.

   a. Stream Width - 24 feet
      Velocity - 2.54 fps
      Discharge - 14.90 cfs

   Bottom same as a. above.

   b. Stream Width - 27 feet
      Velocity (fps) - 3.6 fps
      Discharge (cfs) - 80 cfs

3. Approximately 200 yards below camp in main stem. Bottom type - 15% large rock (8-12" in diameter), 40% cobble, 30% gravel and 5% sand. Depth varied from 6 to 28 inches.

   Stream Width - 66 feet
   Velocity - 1.6 fps
   Discharge - 138.5 cfs

Tuesday, July 26, 1977

8:10 a.m., air temperature - 68°F, water temperature - 53°F. River appeared to have risen about three inches according to the marked gauge stick.

4. A velocity head rod measurement was made directly above the island on the up end riffle of the channel flowing in front of the camp. Bottom type - 55% cobble, 35% gravel and 10% sand.

   Stream Width - 112 feet
   Velocity - 2.3 fps
   Discharge - 159 cfs

   Spent several hours observing active spawning by both chum and pink salmon.

   Chum salmon spawning in the eddy in front of the camp had extended the redd by several feet--approximately 12 x 15 feet. Male chums were deteriorating rapidly with large patches of fungus over 70-85% of their bodies.

King salmon were noted in the area about 100 feet below camp, but appeared not to be spawning. One thing of interest to me was the fact that king salmon young in Alaska stay in the parent stream about a year or so after hatching. In California young juvenile kings start their out migration 90 days after hatching.

Adult king salmon appear to utilize finer material (1 to 3 inches) for spawning in Alaska than reported and observed (2 to 6 inches) in the Trinity and Klamath Rivers of California. This may be based on either a genetic characterisitc or available material for spawning.

Based on my observations and inquiries, pink salmon in the Nome geographical areas travel several miles upstream for spawning as compared to pinks in Southern Alaska, which utilize tidal, inter-tidal, and a few miles of a stream to spawn.

Wednesday, July 27, 1977

A velocity head rod measurement was made below the tailings and dredge.

5. First riffle. Bottom type - 40% cobble, 40% gravel, 10% sand and 10% silt.

   Stream Width - 200 feet
   Velocity - 1.5 fps
   Discharge - 192 cfs

   An attempt was made to sample eggs from the redds a couple hundred feet below the tailings. Two pink redds were sampled with a shovel and Surber sampler with no success. Some of the adult pink salmon examined were spent.

   Redds sampled upstream near camp produced no eggs, but possibly sampling was done in false redds.

   Several more spent adult chum and pink salmon were observed. Dead adult males were also observed. All areas observed indicated that spawning activity was occurring at 90 percent of the sites. A maximum water temperature of 59°F was recorded.

Thursday, July 28, 1977

8:00 a.m., air temperature 60°F, water temperature 57°F.

6. Velocity head rod measurements were made at the head of the island to the west bank. Bottom type - 40% cobble, 50% gravel and 10% sand.

Stream Width - 95 feet
Velocity - 2.6 fps
Discharge - 164 cfs

Ahead of this riffle, several groups of pink salmon were spawning. All showed advance deterioration as compared to 7/27/77 observations on this same group and site. Several pink males were moving up through this shallow riffle (4 to 6 inches) with backs extending out of the water. They too showed signs of advanced deterioration. Gravels in this site were from 1/2 to 4 inches.

7. Approximately 100 yards downstream from Site 5 another velocity head rod measurement was taken. NW end to island to west bank. Bottom type - 25% large rock (8-12"+ diameter), 35% cobble, 35% gravel and 15% sand.

   Stream Width - 36 feet
   Velocity - 3.6 fps
   Discharge - 141 cfs

Friday, July 29, 1977

8:00 a.m., air temperature 63°F and water temperature 58°F. Packed up equipment and moved it to landing strip for pickup to Nome. Plane arrived at 12:50 p.m. to pick up Carufel, Fedeler, and Townsend.

Flew the Ungalik River from the dredge site upstream to Christmas Creek. Several thousand salmon were observed from below the dredge site to the confluence of the Ungalik River and Christmas Creek. Kings were noted in relatively moderate numbers (50 or more) between Willow and Christmas Creeks. King salmon were readily spotted due to their size and red coloration.

Saturday, July 29, 1977

Departed Nome 11:00 a.m. for Anchorage.

GENERAL COMMENTS

1. The Ungalik River may have supported more king salmon prior to dredging operations but no data is available to ascertain former salmon use. Also the main stem of the river had been dredged for several miles and the larger stream bottom materials were easily covered with fines and sediment, thus reducing possible king salmon habitat.

2. Currently, habitat in the river, from the mouth to the airstrip, appears to be suitable for chum and pink salmon. More pink salmon

were observed in Ungalik River than chums, which may be due to commercial fishing operations in Norton Bay and at the mouth of Ungalik for chum salmon. Canneries in Nome areas are paying twice as much per pound for chums (.30) than pinks (.15), according to ADF&G biologists. The commercial and subsistence fishery may be one of the factors limiting numbers of chum salmon in Norton Bay area streams.

2. How much does the sedimentation caused by mining harm streams? This is a debatable issue. Because there are many naturally murky streams caused by glacial silt, it behooves us to maintain the present clear productive streams in Alaska. Also the problem of silt and sedimentation in previously clear streams has been studied with detrimental effects upon fish listed as follows:

   a. Cements spawning gravel and prevents spawning.
   b. Smothers eggs.
   c. Prevents proper embryo development.
      (1) Reduces removal of waste gases, from substrate, during egg and fry development.
   d. Prevents fry from emerging from gravel.
   e. Destroys or buries food producing areas.
   f. Destroys aquatic insects.
   g. Destroys algae & phytoplankton.
   h. Reduces photosynthesis.
   i. Fish cannot see to feed.
   j. Prevents or retards fingerling growth.
   k. Reduces carrying capacity of stream.
   l. Fills in resting pools.
   m. Induces fungus growth and degrades gills.
   n. Extreme siltation can asphyxiate fish.
   o. Changes water chemistry.
      (1) Reduces subgravel and surface dissolved oxygen supply.

4. Pat Bliss, miner, wants to dredge the middle of the Ungalik River as it was done in the past. Under this procedure, it would be a more economical operation as related to both cost and return in pay dirt; however, the above will certainly result in sedimentation that adversely affects fish species and their habitat. Also, dredging in the stream will stop fish passage and reduce utilization to the point that it may be several years before the habitat is restored to its present condition.

One alternative that appears to be less detrimental on the fishery and the habitat would be to dredge the sides or banks. Some suggestions regarding sedimentation, tailings and fish passage are:

a. Using properly designed settling ponds so that sedimentation settles out before the overburden residue goes back into the stream.

b. Draining the water and residue through tailings piles. Could encourage vegetation to reclaim the void areas, etc.

c. Dredging side channel, leaving main stem free so that fish can pass at all times.

d. Landscaping where practical.

/s/Louis Carufel

LCarufel:car:8/31/77