State of Alaska
Department of Fish and Game
Division of Sport Fish

Nomination Form
Anadromous Waters Catalog

Region: INT

USGS Quad(s): MELOZITNA A-1

Anadromous Waters Catalog Number of Waterway: 334-40-11000-2405

Name of Waterway: Illinois Creek ☑ USGS Name ☐ Local Name

☐ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use

Nomination #: 12-046

Revision Year: 2013

Revision to: Atlas ____ Catalog ____ Both ____

Revision Code: F-1

Fisheries Scientist	Date
Habitat Operations Manager	Date 5/30/12
AWC Project Biologist	Date
Cartographer	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
Chum salmon	Aug 9/10 1991			X	☑
coho salmon			X		☑
					☐
					☐
					☐

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: Anadromous fish observations included in Final Report - "Aquatic Resources Assessment Study Illinois Creek Gold Project" for North Pacific Mining Corporation, by John W. Morsell w/Northern Ecological Services December 1991

Name of Observer (please print): J. Johnson

Signature: _____ Date: 5/30/2012

Agency: ADF&G SF

Address: 333 Raspberry Road

Anchorage, AK 99518

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 Anadromous Waters Catalog.

Signature of Area Biologist: _____ Date: _____ Revision 05/08

Name of Area Biologist (please print):

Johnson, J D (DFG)

From: Borba, Bonnie M (DFG)
Sent: Thursday, December 29, 2011 9:36 AM
To: Johnson, J D (DFG)
Subject: RE: Illinois creek
Attachments: IllinoisCreek.pdf

Here you go. BB

From: Johnson, J D (DFG)
Sent: Wednesday, December 28, 2011 9:46 AM
To: Borba, Bonnie M (DFG)
Subject: RE: Illinois creek

Bonnie
Attached is doc used to back up Illinois Creek (334-40-11000-2405) , it actually pertains to both Illinois Creek & Golden Creek (334-40-11000-2405-3020). I would appreciate a copy of the doc you mentioned, thx
j

From: Borba, Bonnie M (DFG)
Sent: Friday, December 23, 2011 12:02 PM
To: Johnson, J D (DFG)
Subject: Illinois creek

What do you have for back up on the nomination for coho salmon in Illinois Creek in the Yukon River? I found a document speaking to the data that recommended it for nomination to AWC "Final Report Aquatic Resources Assessment Study Illinois Creek Gold Project". I could scan it to you if you do not already have it.

Bonnie Borba
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FINAL REPORT

AQUATIC RESOURCES ASSESSMENT STUDY
ILLINOIS CREEK GOLD PROJECT

Prepared for

North Pacific Mining Corporation
Anchorage, Alaska

FINAL REPORT

AQUATIC RESOURCES ASSESSMENT STUDY
ILLINOIS CREEK GOLD PROJECT

by

John W. Morsell
Northern Ecological Services
Anchorage, Alaska

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INTRODUCTION

The North Pacific Mining Corporation is examining the feasibility of developing a hard rock gold prospect located about 30 miles southeast of Kaltag and 60 miles southwest of Galena (Figure 1). The topographic setting of the Illinois Creek Gold Project is in hilly terrain at the southern fringe of the Kaiyuh Mountains. The primary drainage within the project area is Illinois Creek, a small tributary to the Little Mud River in the Innoko River drainage system (Figure 2).

Reconnaissance level biological information was collected with regard to aquatic resources within those streams that could be potentially affected by the project. Such information was intended to provide the basis for an initial evaluation of potential impacts and provide input to project planning relative to impact minimization. Hydrological studies were also initiated in 1991 and will be continuing, thus providing additional information regarding the physical aspects of streams in the project area.

DESCRIPTION OF THE STUDY AREA

Background Information

No previous studies have looked at aquatic resources in Illinois Creek or the Little Mud River drainage and few studies have examined the Innoko River, in spite of its size and significance. Alt (1983) surveyed portions of the Innoko River and some of its major tributaries and found the full array of fish species that would be expected in a major tributary of the Yukon River including sheefish, northern pike, Arctic grayling, Arctic char, several species of whitefish, as well as chum, coho and chinook salmon. The closest sampling to the project area was a gill net set at the mouth of the Mud River resulting in a catch of

several northern pike (Alt 1983). The Mud River and its tributaries (including the Little Mud River and Illinois Creek) are not currently listed as anadromous fish streams (ADF&G 1990).

Stream Descriptions

An aerial reconnaissance of the Illinois Creek Gold Project area indicated that the only stream within the potential project impact area is Illinois Creek (Figure 2). California Creek, a larger tributary to the Little Mud River, is located east of the area but will not be impacted by the project. The USGS topographic map shows another small unnamed stream immediately west of Illinois Creek; however, no stream actually exists at this location, rather the drainage consists of a swale with occasional wet spots.

Illinois Creek is 4-5 miles long (not including meanders) originating at an elevation of about 500 ft. and ending at the Little Mud River at an elevation of less than 200 ft. The stream originates primarily from a fan-shaped series of springs that flow out of the hill sides. The upper portion of the stream is 3-10 ft. wide and 0.5-2.5 ft. deep while the lower stream is 15-30 ft. wide. At the time of the survey the stream had been unaffected by man's activities except for a low-water crossing (ford) at the exploration roadway crossing at the upper end and a log bridge at a trail crossing on the middle reaches of the stream (Figure 2).

SURVEY METHODS

A visual reconnaissance of the project area was conducted on June 30, 1991. The project area and surrounding terrain were observed from the air and selected portions of Illinois Creek were observed from the ground. The reconnaissance trip was followed by a two day field investigation on August 9 and 10, 1991.

Methods used during the field investigation included visual observations of selected stream portions with emphasis on observations of adult salmon and potential spawning and rearing habitat. The reaches observed on foot are indicated on Figure 2. In addition, standard 1/8 inch wire mesh minnow traps were baited with preserved salmon eggs (inside a perforated plastic container) and placed at selected locations in the stream. The traps were fished for varying lengths of time up to 3 hours per location. Fish caught in the traps were identified to species and most were measured (fork length to the nearest mm). In some cases species were simply enumerated without measurement. All trapped fish were returned to the stream alive at the point of capture.

Additional information was obtained by interviewing the mining camp caretaker and other camp residents relative to fish presence.

RESULTS

Fish Presence

Minnow trap catches are presented in Table 1. All minnow traps caught juvenile coho salmon with catches ranging from 4 to 33 fish per trap-hour. The highest catch in an individual trap was 85 fish. Visual observations indicated that juvenile coho salmon were present in all portions of the stream that were observed, but were more abundant in the vicinity of the mine road crossing and above. Minnow trap catches confirmed this impression. Length/frequency analysis for the coho salmon (Figure 3) suggests the presence of 2 and, possibly, 3 year classes. The smaller cohort probably consisted of fish that hatched in the spring of 1991 (0+) and the larger cohort probably consisted of fish that hatched in the previous year (1+). A third cohort (2+) may also have been present.

On August 9, 8 adult chum salmon carcasses were observed in

Illinois Creek along with one live chum salmon. Of these fish, 6 were observed above the mine road crossing and 3 were observed in the surveyed area below the crossing. According to camp personnel, chum salmon were first noted at the road crossing in late July. Spawning, if it occurred, had obviously been completed by the time of the field survey. A second run of chum salmon was noted by camp personnel starting in late September (first seen September 26) and continuing into mid-October. Up to 30 chum salmon were seen by camp personnel in Illinois Creek between the road crossing and the upper springs. The observer also reported seeing one chinook salmon in the same area.

Arctic grayling, ranging in size from 6 to 12 inches were observed in upper Illinois Creek during both the June and August field observations. Grayling appeared to be most abundant above the upper mine road crossing; on June 30, 11 grayling were observed in this stretch. Grayling were also observed below the road crossing but in lesser numbers. No grayling were seen in the surveyed portion of lower Illinois Creek on August 10.

Habitat Suitability

Illinois Creek is a clear water stream with very constant flow as indicated by moss and grass growing on the tops of boulders in midstream that were only a few inches above stream level. Groundwater apparently is the major water source. Of particular interest is the fact that a warm spring (66 degrees F.) located immediately upstream from the mine road crossing increases flow in the stream by 10-20 percent and undoubtedly affects downstream water temperature with the greatest relative effect expected to occur in the winter. Water temperature at headwaters springs was in the low 40's which would also provide a moderating influence in winter.

The lower 2/3 of Illinois Creek is characterized by a

primarily sandy bottom with much overhanging vegetation and woody debris. Intermittent stretches of gravel and cobble separated by sand bottom reaches are present starting about 3/4 mile below the upper mine road crossing and continuing up to the crossing. Immediately above the road crossing, cobble and boulder substrates are dominant with some patches of gravel. About 800 ft. above the crossing is an area formerly impacted by beavers consisting of drained silt-bottomed ponds and remnants of beaver dams. Groundwater input is very evident in the beaver impoundment area as evidenced both by springs entering the stream from the hillsides and water bubbling up through the silt of the pond bottoms.

Spawning habitat for salmonid fish is limited by the shortage of gravel areas. The stable temperature and flow regime resulting from groundwater input likely enhances the value of the potential spawning areas that do exist.

Abundant caddis fly larvae and algae suggest that the creek is unusually productive relative to other headwaters stream areas in interior Alaska. This productivity combined with the high number of juvenile coho salmon would imply that Illinois Creek provides high quality rearing habitat for the salmon. The creek also provides feeding habitat for adult and sub-adult Arctic grayling. No small grayling were observed possibly due to competition from the aggressive juvenile salmon. The downstream areas of the creek would probably be less productive of fish food organisms because of the relatively sterile sand bottom. However, the abundance of woody debris may act to offset the unproductive substrate.

DISCUSSION AND CONCLUSIONS

Illinois Creek, while small, is an unusual body of water and provides high quality rearing habitat for coho salmon throughout its length and at least some spawning habitat for chum salmon at

the upper end of the stream.

Estimates of absolute density of juvenile coho salmon were not conducted for this study; however, the minnow trap catch-per-unit-effort is very high when compared to other studies done in productive salmon streams (Environmental Research and Technology 1984; Wadman and Delaney 1979). Growth rate of 0+ and 1+ coho salmon appears to be somewhat faster than occurs in the Little Susitna River in southcentral Alaska (Wadman and Delaney 1979).

The number of chum salmon spawning in Illinois Creek in 1991 was small and the scarcity of suitable spawning habitat probably limits the value of the creek to spawning salmon. The abundance of juvenile cohos in the upper stream suggests that coho salmon may also spawn in Illinois Creek. Such spawning, if it occurs, would probably be in October or November as is typical of coho salmon in the Yukon drainage (U.S. Dept. of Interior 1987).

The groundwater origin of Illinois Creek very likely contributes to its value because of the constant flow, moderate temperature, and possibly mineral rich water.

Illinois Creek (and, by implication, Little Mud River and Mud River) should be nominated for anadromous stream status. There is no question that Illinois Creek provides significant habitat for anadromous salmon.

REFERENCES

Alaska Dept. of Fish & Game, 1990. Catalog of waters important for spawning, rearing or migration of anadromous fishes. ADF&G Habitat Division, Juneau, Ak.

Alt, Kenneth, 1983. Inventory and cataloging of sport fish and sport fish waters of western Alaska. Alaska Dept. of Fish & Game, Federal Aid in Fish Restoration Research Project Completion Report, Vol. 24.

Environmental Research and Technology, Inc., 1984. Aquatic biology baseline studies project, Vol. I. Prepared for Diamond Shamrock-Chuitna Joint Venture, Anchorage, AK.

U.S. Dept. of the Interior, 1987. Innoko National Wildlife Refuge comprehensive conservation plan, environmental impact statement, and wilderness review. U.S. Fish and Wildlife Service, Region 7, Anchorage, Ak.

Wadman, Roger and Kevin Delaney, 1979. Little Susitna River juvenile chinook and coho study, 1978. Alaska Dept. of Fish & Game, Division of Sport Fish.

TABLE 1. MINNOW TRAP CATCH RECORDS ON ILLINOIS CREEK

DATE	STREAM SECT.	TRAP NO.	TIME SET	SPECIES	CATCH	CATCH/HR.
8/9/91	ABOVE RD. XING	1	1:45	COHO SALMON	56	32
		2	2:15	COHO SALMON	28	12
		3	2:20	COHO SALMON	12	5
		4	2:25	COHO SALMON	50	21
8/10/91	BELOW RD. XING	1	2:35	COHO SALMON	85	33
				SCULPIN	1	0.4
		2	2:40	COHO SALMON	11	4
		3	2:37	COHO SALMON	33	13
		4	2:35	COHO SALMON	11	4
8/9/91	LOWER TRAIL XING	1	1:00	COHO SALMON	14	14
		2	1:10	COHO SALMON	19	16

Figure 1. Location of Illinois Creek Project

FIGURE 3. LENGTH FREQUENCY DISTRIBUTION
COHO SALMON