State of Alaska
Department of Fish and Game
Habitat and Restoration Division

Nomination for Waters Important to Anadromous Fish

Region: ARCTIC

USGS Quad: FLAXMAN ISLAND 1:250 000

Anadromous Water Catalog Number of Waterway: 330-00-10290 & 10290-0020

Name of Waterway: East Balami Creek

USGS Name ☒ Local Name

☑ Addition ☐ Deletion ☐ Correction ☐ Backup Information

For Office Use OK LHT

Nomination # 99 255			10-29-99
Revision Year:		Regional Supervisor	Date
Revision to: Atlas ____ Catalog ____ Both ____			1/24/00
		AWC Project Biologist	Date
Revision Code: A1, A2, E7, A5		2. Krone	2/1/00
		Drafted	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
DV	8/95, 7/98, 7/95		X	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:

Dolly Varden have been captured in East Balami Creek & the Balami Mine Site. Dolly Varden were captured in 1995 during July & August sampling, prior to Mine Site construction. Once the mine site was completed Fish Monitoring was conducted. In 1998 Dolly Varden were captured in both East Balami Creek and the Mine Site. Enclosed are trip Reports & excerpts from Technical Report No. 96-3.

Name of Observer (please print): William A. Morris

Signature: William A. Morris IV

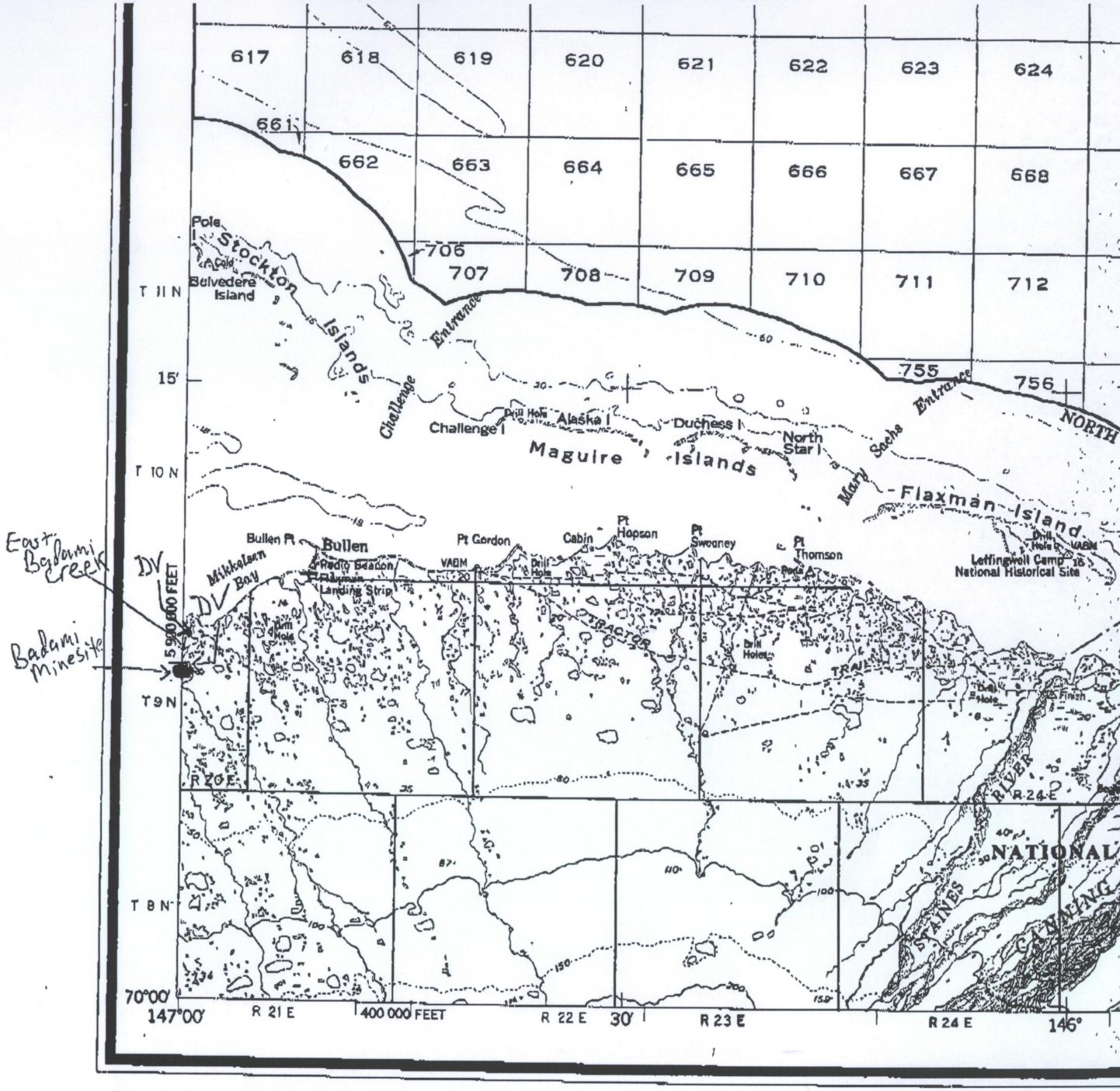
Date: 9/3/99

Address: 1300 College Rd.
Fairbanks AK 99701

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 Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes per AS 16.05.870.

Signature of Area Biologist: _____

Revision 3/97



MAPPED, EDITED, AND PUBLISHED BY THE GEOLOGICAL SURVEY

CONTROL BY USGS, NOS/NOAA, AND USCE

COMPILED IN 1959 FROM DEFENSE MAPPING AGENCY 1:50,000-SCALE MAPS, SURVEYED 1955. REVISED IN PART FROM AERIAL PHOTOGRAPHS TAKEN 1979. MAP NOT FIELD CHECKED

PROJECTION AND 10,000-METER GRID TICKS SHOWN IN BLUE:
UNIVERSAL TRANSVERSE MERCATOR, ZONE 6
100,000-FOOT GRID TICKS BASED ON ALASKA COORDINATE SYSTEM, ZONE 3
1927 NORTH AMERICAN DATUM. TO PLACE ON THE PREDICTED NORTH AMERICAN DATUM 1983 MOVE THE PROJECTION LINES 24 METERS NORTH AND 111 METERS EAST

SELECTED HYDROGRAPHIC DATA COMPILED FROM NOS CHARTS 16043–16046
THIS INFORMATION IS NOT INTENDED FOR NAVIGATIONAL PURPOSES

GRAY LAND LINES REPRESENT UNSURVEYED AND UNMARKED LOCATIONS PREDETERMINED BY THE BUREAU OF LAND MANAGEMENT
FOLIOS U-1 AND U-2, UMIAT MERIDIAN

SWAMPS, AS PORTRAYED, INDICATE ONLY THE WETTER AREAS, USUALLY OF LOW RELIEF, AS INTERPRETED FROM AERIAL PHOTOGRAPHS

THERE MAY BE PRIVATE INHOLDINGS WITHIN THE BOUNDARIES OF THE NATIONAL OR STATE RESERVATIONS SHOWN ON THIS MAP

OFFSHORE PROTRACTION SURVEY DATA, PRINTED IN RED, COMPILED BY MINERALS MANAGEMENT SERVICE. HEAVY LINES INDICATE LIMITS OF MMS OUTER CONTINENTAL SHELF OFFICIAL PROTRACTION DIAGRAMS DATED OCTOBER 1975 AND 1976
THE PROTRACTIONS ON THIS MAP ARE NOT FOR FEDERAL LEASING PURPOSES: FOR SUCH PURPOSES, REFER TO THE 1:250,000-SCALE OCS OFFICIAL PROTRACTION DIAGRAMS AVAILABLE FROM MINERALS MANAGEMENT SERVICE

FEDERAL RESERVATION BOUNDARIES ESTABLISHED BY THE ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT, PL 96-487, DEC 2, 1980 ARE SHOWN AS COMPILED BY THE ADMINISTERING AGENCIES

5

FISH SURVEYS OF SELECTED COASTAL STREAMS SAGAVANIRKTOK RIVER TO BULLEN POINT, 1995

By
Carl R. Hemming

Technical Report No. 96-3

Janet Kowalski
Director
Alaska Department of Fish and Game
PO Box 25526
Juneau AK 99802-5526

RESULTS

East Badami Creek

We captured ninespine stickleback, Dolly Varden and fourhorn sculpin (Myoxocephalus quadricornis) in East Badami Creek (Table 1).

Table 1. Fish captured in East Badami Creek, 1995.

Dates	Time Fished Days	Mean Water Temp. ° C	Fish Species *	Number Captured	CPUE Fish/Day
June 20-23	2.9	5.7	NSB	680	243.5
July 17-20	3.0	12.0	DV	1	0.3
			NSB	4,576	1,525.3
August 28-31	2.8	3.3	DV	2	0.7
			FSC	1	0.4
			NSB	1.287	459.6

*** DV = Dolly Varden, NSB = Ninespine stickleback, FHS = Fourhorn sculpin**

We captured ninespine stickleback in each of the three sample periods with the greatest catch rates in July. We found juvenile Dolly Varden in July and August while a single 132 mm fourhorn sculpin was captured in August (Appendix I). In August we collected a water sample and photographed the East Badami Creek sample site (Figure 3). We found freshwater conditions in August (287 umho/cm).

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

HABITAT & RESTORATION DIVISION

TONY KNOWLES, GOVERNOR

1300 COLLEGE ROAD
FAIRBANKS, ALASKA 99701-1599
PHONE: (907) 459-7289
FAX: (907) 456-3091

July 30, 1998

Dr. Ray Jacubczak, HSE Assurance Supervisor
Environmental and Regulatory Affairs, Alaska
BP Exploration (Alaska) Inc.
P.O. Box 196612
Anchorage, AK 99519-6612

Dear Dr. Jacubczak:

RE: Badami Mine Site Trip Report

Enclosed is a copy of a field trip report prepared by Mr. Hemming and Mr. Morris covering fish and water quality monitoring of the East Badami Creek mine site. Fyke-nets were fished in the mine site and in East Badami Creek and a water quality profile was done in the mine site. Dolly Varden and ninespine stickleback was documented and measurements made indicate that water quality is suitable for fish rearing and overwintering. If there are any questions, please contact either Mr. Hemming or me at 459-7289.

Sincerely,

Alvin G. Ott, Regional Supervisor
Habitat and Restoration Division
Alaska Department of Fish and Game

cc: Bill Morris, UAF, Fairbanks
Janet Kowalski, ADF&G, Juneau
Mike Joyce, AAI, Anchorage
Larry/Chris Brown, AAI, Kuparuk
Martin Bozeman, AAI, Anchorage
John Burr, ADF&G, Fairbanks
Ted Rockwell, EPA, Anchorage
Nancy Welch, ADNR, Fairbanks
Shawn Leonard/Wade Srock, BPXA, Anchorage
Craig George, NSB, Barrow
Charles Swanton, ADF&G, Fairbanks
Carl Hemming, ADF&G, Fairbanks
Harry Engel, AAI, Prudhoe
Ken Donajkowski, AAI, Anchorage
Phillip Martin, USFWS, Fairbanks
Jeanne Hanson, NMFS, Anchorage
Tom Barnes, BPXA, Anchorage

AGO/ago

Badami Mine Site

Fish and Water Quality Monitoring Report

By : Carl Hemming and William Morris

Introduction

BP Exploration (Alaska), Inc. (BPX) completed construction of the gravel roads and pads for the Badami oilfield in the winter of 1996/1997, and the pipeline connecting the field to the Prudhoe Bay oilfield complex and pipeline system was completed in the winter of 1997/1998. Gravel material requirements were minimal for the pipeline construction phase of the project because a temporary ice road was used to support winter construction. Project cost and environmental impacts were reduced by constructing the pipeline without a gravel access road between the Badami development area and existing pipeline and road infrastructure in the Sagavanirktok River delta area. Gravel for construction of roads and pads within the Badami development area was excavated from an area adjacent to East Badami Creek. The material site design and rehabilitation plan was developed with the goal of providing a freshwater source for the Badami oilfield and fish rearing and overwintering habitat. Design features included a connection channel to East Badami Creek that allows fish to access the site and provides for freshwater recharge of the basin during the spring flood, a deep excavated zone for wintering fish, and a 100 foot benched area on three sides of the basin to provide fish rearing habitat. The benched area was covered with organic and fine grained overburden material to provide a shallow water, littoral zone (between 0.5 and 1.0 m deep), suitable for establishment of emergent aquatic plants. Shallow water habitats with emergent vegetative communities produce a greater diversity and abundance in invertebrate organisms that provide a food source for fish and waterbirds.

In 1994 and 1995, we sampled East Badami Creek to evaluate fish use of the drainage prior to mine site development. In 1994, a fyke net was fished in East Badami Creek during late July and in early and late August. Ninespine sticklebck were captured in each sample period and two juvenile Arctic grayling (*Thymallus arcticus*) were captured in late August (Hemming and Ott 1994). In 1995, a site on East Badami Creek was fished for three day periods in June, July, and August. Ninespine stickleback were again captured during each of the sample periods, juvenile Dolly Varden (*Salvelinus malma*) were found in July and August, and a single fourhorn sculpin (*Myoxocephalus quadricornis*) was also captured in August (Hemming 1996). In August 1997, the first open water season after the East Badami Creek mine site was excavated and flooded, we sampled the pit and East Badami Creek at the inlet to the pit. Ninespine stickleback was the only fish species captured and they were found both in the creek and the mine site with the largest number of stickleback found within the mine site (Hemming and Morris 1997). This report contains the results of fish and water quality sampling conducted at the Badami Mine Site and in East Badami Creek on July 20 and 21, 1998.

Methods

We selected two net sites: East Badami Creek at the inlet channel to the mine site and in the north side of the mine site near the access ramp and water extraction area. Fish were live captured in fyke nets. The nets were 3.7 m in length with two 0.9 m (3 ft) entrance frames, five hoops, a 1.8 m cod end, and 0.9 by 7.6 m net wings attached to the entrance frame. A center lead was anchored to shore and attached to the square net entrance frame. The species of each fish captured was determined, the fork length was measured to the nearest millimeter, and the fish were released at the capture site. Ninespine stickleback (*Pungitius pungitius*) were identified, enumerated, and released without length measurement.

A water quality sampling station was selected at the center of pit. We used an Avon® inflatable raft for access, anchored in the center of the pit, and used the raft as a work platform. Water measurements were taken at the surface and at one meter intervals through the water column to the bottom. Water measurements were taken with a Hydrolab®, MiniSonde®, water quality multiprobe connected by a cable to a Surveyor® 4 water quality data display unit. Parameters measured included temperature ° C, dissolved oxygen concentration (mg/l), dissolved oxygen percent saturation (temperature and barometically corrected), pH, salinity, and depth (measured with cable calibrations). The meter was calibrated to suggested specification prior to use in the field and rechecked after sampling was completed. The dissolved oxygen concentration was calibrated using the Winkler Titration method (average of three measurements) and pH and conductivity were calibrated with standard solutions.

Results

Fish Sampling

We captured ninespine stickleback and Dolly Varden (*Salvelinus malma*) at each of the two net sites (Table 1).

Table 1. Results of fyke net fish sampling at Badami Gravel Site, July 21-22, 1998.

Date	Net Location	Fish Species	Number	Fork Length
July 22	Access Ramp	Dolly Varden	2	180
				214
		Ninespine stickleback	57	n/a
July 22	East Badami Cr	Dolly Varden	1	265
	@ inlet	Ninespine stickleback	96	n/a

Water Quality

Water measurements were made at 6 depth intervals from the surface to the bottom at 5.0 m (Table 2). The measurements indicate a well mixed waterbody as all parameters were

fairly uniform through the water column. Percent saturation ranged from a high of 97.2 % at the surface to 92.2 % near the bottom. The reservoir contains freshwater and the pH is basic.

Table 2. Water quality characteristics of Badami Mine Site, July 21, 1998.

Depth (m)	Temp ° C	D.O. Concentration mg/l	D.O. % Saturation	Salinity ppt	pH
Surface	12.96	10.25	97.2	0.09	8.62
1	12.94	9.95	94.6	0.09	8.65
2	12.95	9.84	93.4	0.09	8.66
3	12.94	9.76	92.9	0.09	8.67
4	12.93	9.72	92.4	0.09	8.67
5 (bottom)	12.94	9.70	92.2	0.09	8.67

Discussion

Conditions in the reservoir appear suitable for wintering fish populations. Dissolved oxygen concentrations are near saturation at all depths through the water column and the water depth is at least 5.0 m in the deepest portion of the basin. Plan drawings indicate depths in excess of 10 m. Assuming a maximum of 2 m ice cover, an estimated 3.0 to 8.0 m of well oxygenated water will remain under the ice for wintering fish. Two meters of ice closely approximates conditions measured at several similar freshwater sites in the area (Hemming 1993). Slightly elevated dissolved oxygen concentrations and percent saturation were measured at the surface. It is likely the elevated dissolved oxygen levels were caused by surface exchange from wind mixing. The mine site had breaking waves generated by winds of 20 mph.

The fish species found in the mine site and in East Badami Creek are similar to that found in East Badami Creek prior to excavation of the mine site (Hemming 1996). The connection channel to East Badami Creek allows fish to move into and out of site and to use stream and nearshore habitats at various times during the open water season. The water quality measurements indicate that the mine site provides high quality wintering habitat that may be used by either Dolly Varden or ninespine stickleback.

Arctic grayling and fourhorn sculpin were captured in East Badami Creek prior to development of the Badami Mine Site. Fourhorn sculpin are associated with marine and brackish water habitats and it is unlikely that this species will colonize the Badami Mine as long as it remains a freshwater habitat. Arctic grayling were found in East Badami Creek in 1994, but dispersal of this species may depend upon favorable low salinity conditions in the nearshore Beaufort Sea, such conditions allow freshwater fish to disperse from nearby drainages such as the Shaviovik River. Nearshore salinity conditions that allow grayling dispersal to East Badami Creek may not occur every year.

Dolly Varden were not found in our 1997 sampling of the Badami Mine site but were found in 1998, in both the creek and the mine site. The dispersal of juvenile Dolly Varden and the summer use of small, coastal, stream systems may also vary between years. Because Dolly Varden have the physiological ability to adapt to a wider range of salinity conditions, movements between stream systems are probably controlled by factors such as the availability of food items, avoidance of predation or competition.

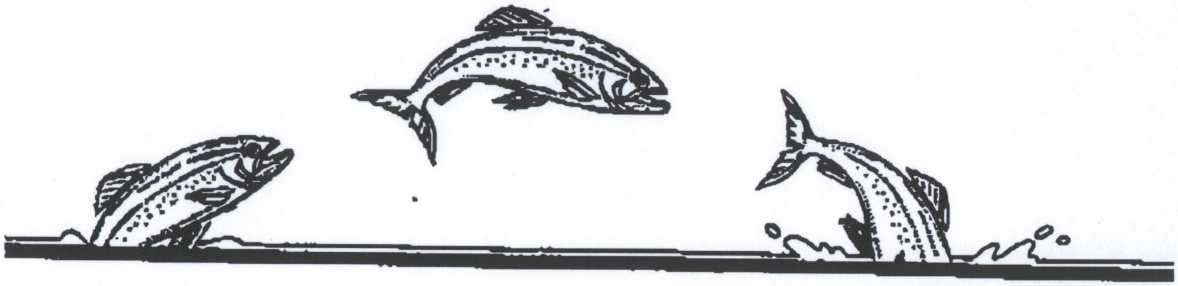
Literature Cited

Hemming, C. and A. Ott. 1994. Badami field trip report, July 30 to August 2, 1994. Alaska Department of Fish and Game, Habitat and Restoration Division. Fairbaks. 18 pp.

Hemming, C.R. 1993. Tundra stream fish habitat investigations in the North Slope oilfields. Alaska Department of Fish and Game, Habitat and Restoration Division Technical Report No. 93-1. Juneau. 64 pp.

Hemming, C.R. 1996. Fish surveys of selected coastal streams Sagavanirktok River to Bullen Point. Alaska Department of Fish and Game, Habitat and Restoration Division. Technical Report 96-3. Juneau. 28 pp.

Hemming, C. and W. Morris. 1997. Badami Mine Site fish and water quality sampling report. August 5 and 6, 1997. Alaska Department of Fish and Game, Habitat and Restoration Division. Fairbanks. 8 pp.



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RAPIFAX TRANSMITTAL SHEET

TO: Edward Weiss
FROM: Bill Morris
DATE: 10/29/99
Number of pages following this cover page: 9

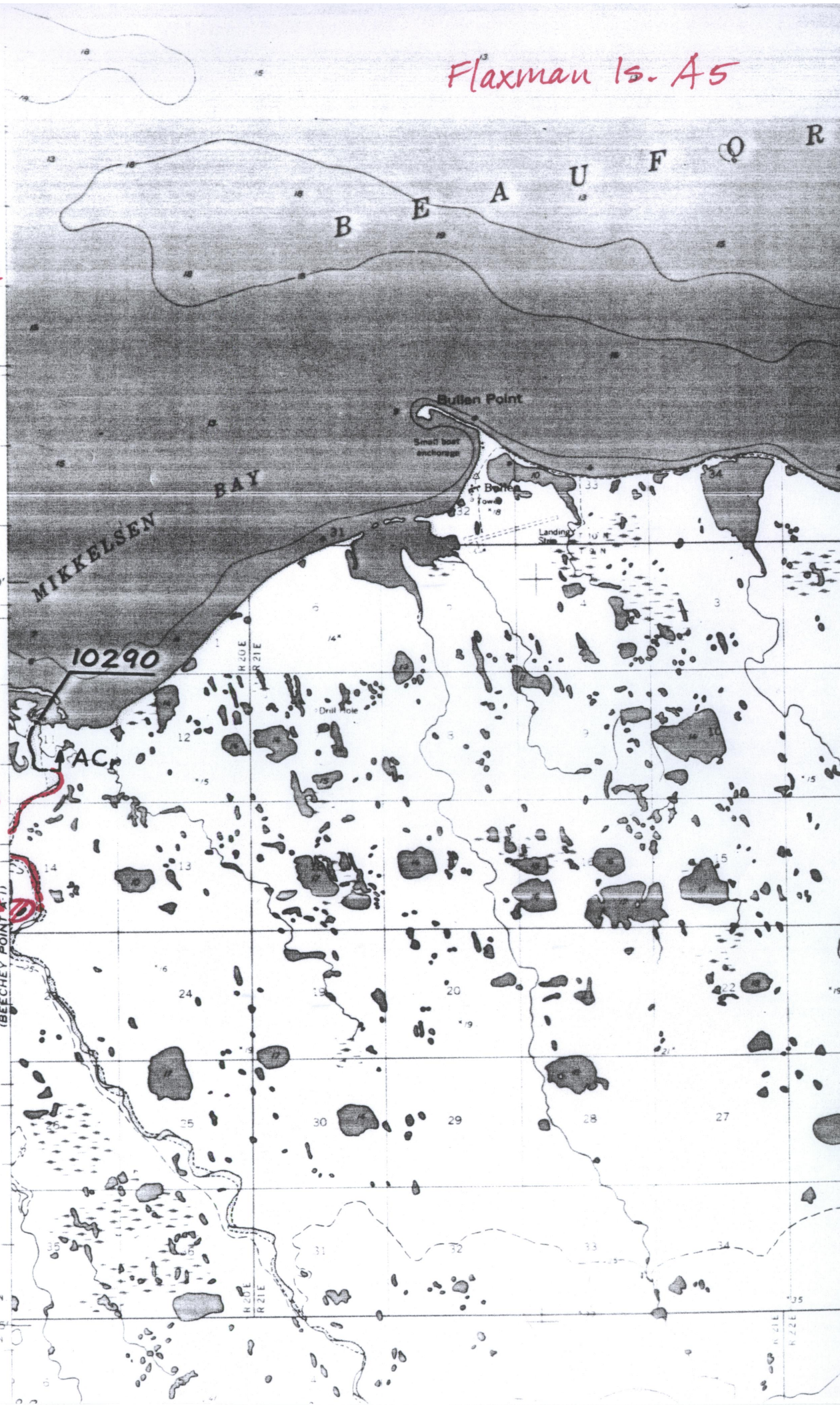
MESSAGE: Anadromous Catalog Nomination.
Thanks Ed
Bill

Flaxman Is. A5

ET-
Correction of species
ACr to
DVr

Extension ~~of~~ of
330-00-
10290

Addition of
330-00-
10290-0020
with
DVr




Beechy Pt A1
Reliance Point
MIKKELSEN BAY
Upper points document limits of fish surveys and usually not the extent of fish habitat.
AC
ACr
ACr
10300
330-00-10298
0020
(FLAXMAN ISLAND A-5)
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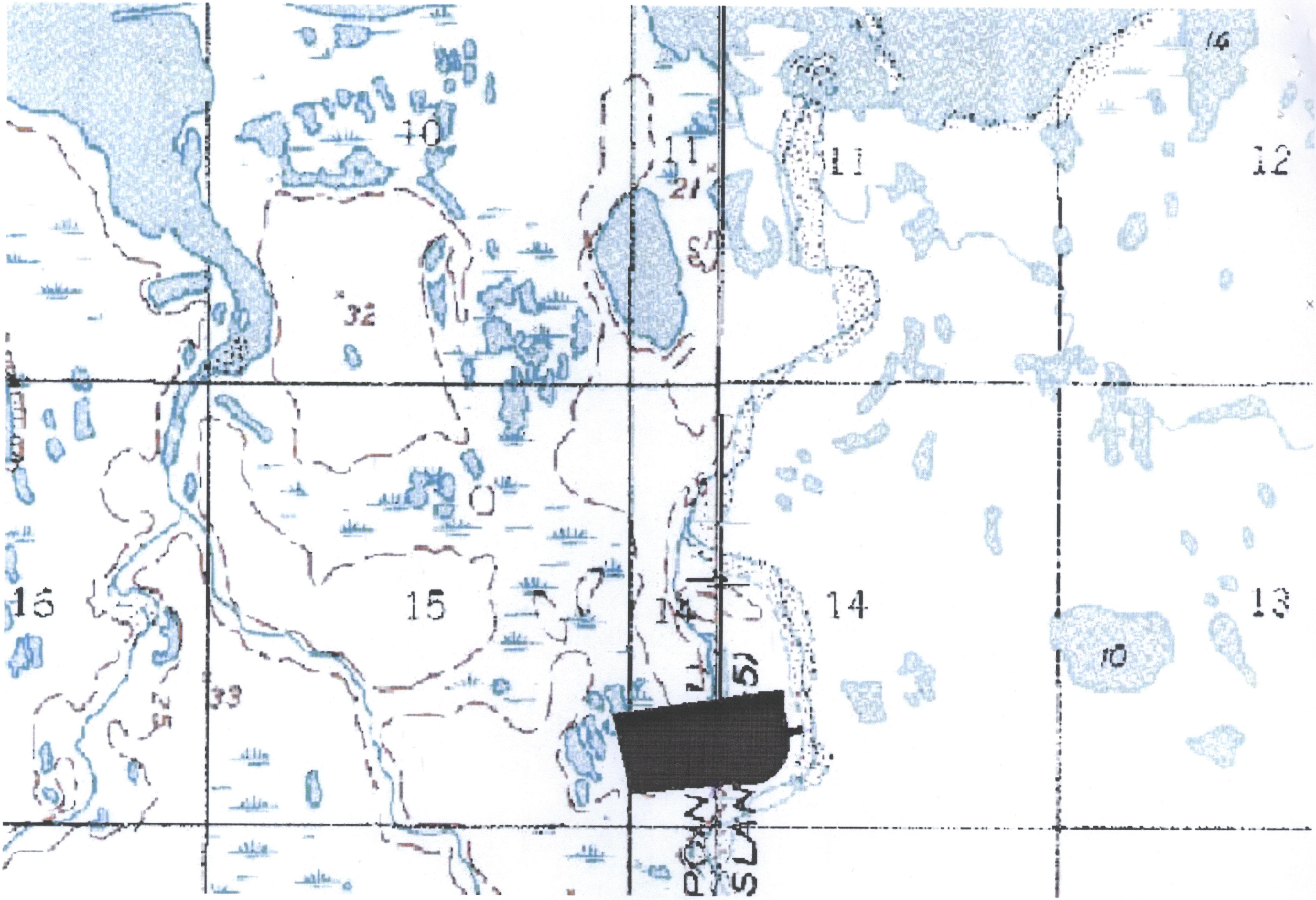
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POINT
SLAND A-5)