



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

Nomination Form  
Anadromous Waters Catalog

PS  
E

Region South Central USGS Quad(s) Tyonek A-4  
 Anadromous Waters Catalog Number of Waterway 247-20-10010-2030  
 Name of Waterway Unnamed Lake (Lake 4)  USGS Name  Local Name  
 Addition  Deletion  Correction  Backup Information

For Office Use

Nomination # <u>130027</u>	_____	_____
Revision Year: <u>2014</u>	Fisheries Scientist	Date
Revision to: Atlas _____ Catalog _____	Habitat Operations Manager	Date <u>1/31/13</u>
Both _____	AWC Project Biologist	Date
Revision Code: <u>F-1</u>	Cartographer	Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
<u>coho salmon</u>	<u>7/21/06 - 1 juvenile</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<u>coho salmon</u>	<u>8/19/07 1 adult</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>

**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: Lake is located at: 61.2090°N in Section 22/T. 13 N/R. 12 W (S.M)  
151.396°W  
151.3948°W Single fish of each life stage  
 On 7/21/06:  
 During environmental baseline studies, 1 juvenile coho salmon was captured in a baited minnow trap and observed by myself. An adult coho salmon was captured in a multimesh gillnet by OASIS staff on 8/19/07.

Name of Observer (please print): JOSH BREKKEN  
 Signature: [Signature] Date: 11/14/12  
 Agency: ADF+G  
 Address: 333 Raspberry Rd  
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 \_\_\_\_\_

02/08

FISH & GAME  
JAN 18 2013



2006 Fish Total Length Measurement Datasheet  
(Fig 2)

E

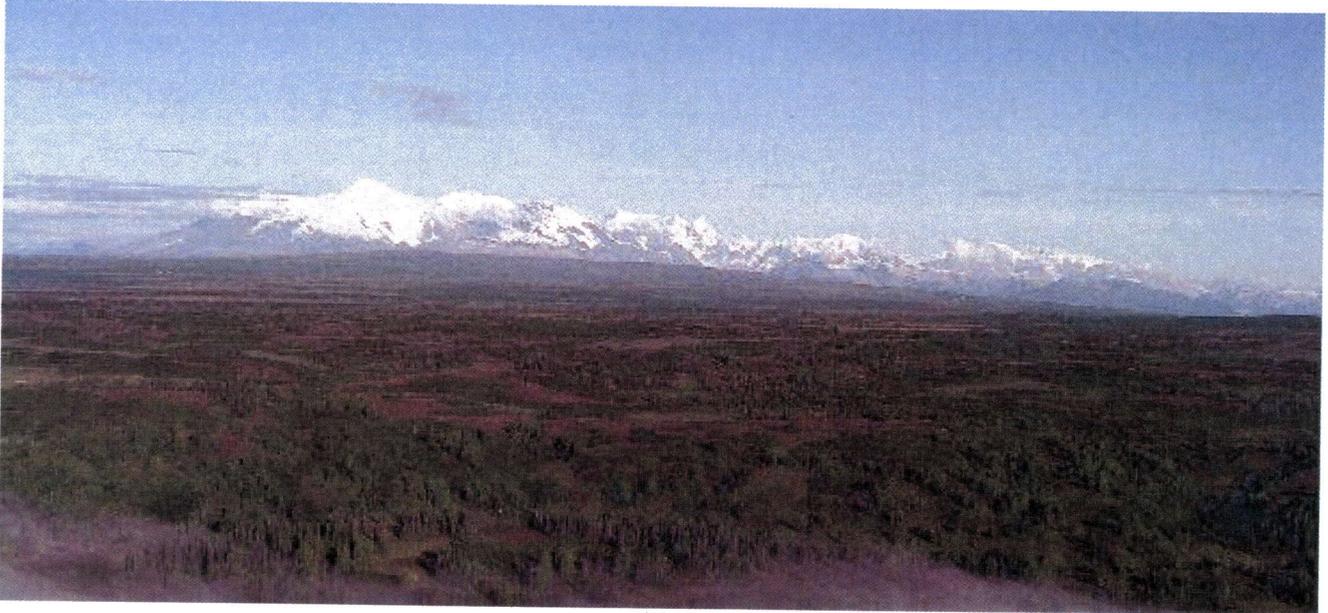
DATE: 7/21/06		SITE ID: ML 4A	
CHECK TIME: 0935		INITIALS: Ho JB	
SPECIES	LENGTH (mm)	SPECIES	LENGTH (mm)
1	cp 41	35	
2	tadpole 54	36	
3		37	
4		38	
5		39	
6		40	
7		41	
8		42	
9		43	
10		44	
11		45	
12		46	
13		47	
14		48	
15		49	
16		50	
17		51	
18		52	T° = 17.07
19		53	Do =
20	depth = 3.3	54	
21		55	cond 18
22	v = 0.0	56	
23		57	pH = 6.60
24		58	
25		59	
26		60	
27		61	
28	61°12'34.94 N	62	
29	151°23'28.04 W	63	
30		64	
31		65	
32		66	
33		67	
34		68	

SP CODES	CK CHINOOK	RT RAINBOW TROUT	SL SC SLIMY SCULPIN
	CO COHO	DV DOLLY VARDEN	CO SC COASTRANGE
	PK PINK	9-STB 9 SPINE STICKLEE	OT OTHER
	SO SOCKEYE	3-STB 3 SPINE STICKLEE	UN UNKNOWN
	CM CHUM	LA LAMPREY SP.	

co dead - DF larvae feeding on it  
 craneflies = 6 total 1 collected in vial 2  
 1 dragonfly larvae

# ***Chuitna Coal Project – 2007 Freshwater Aquatic Biology Study Program***



March 28, 2008

Prepared for:



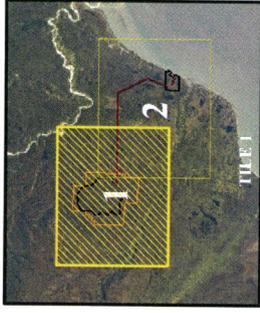
711 H St. Suite 350  
Anchorage, Alaska 99501

Prepared by:



825 W. 8th Ave.  
Anchorage, AK 99501

**FIGURE 2.1-4**  
2007 SAMPLING SITES FOR SELECTED  
LAKES AND DOCUMENTED  
FISH SPECIES

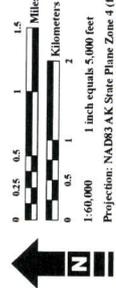


**FIGURE LOCATION MAP**

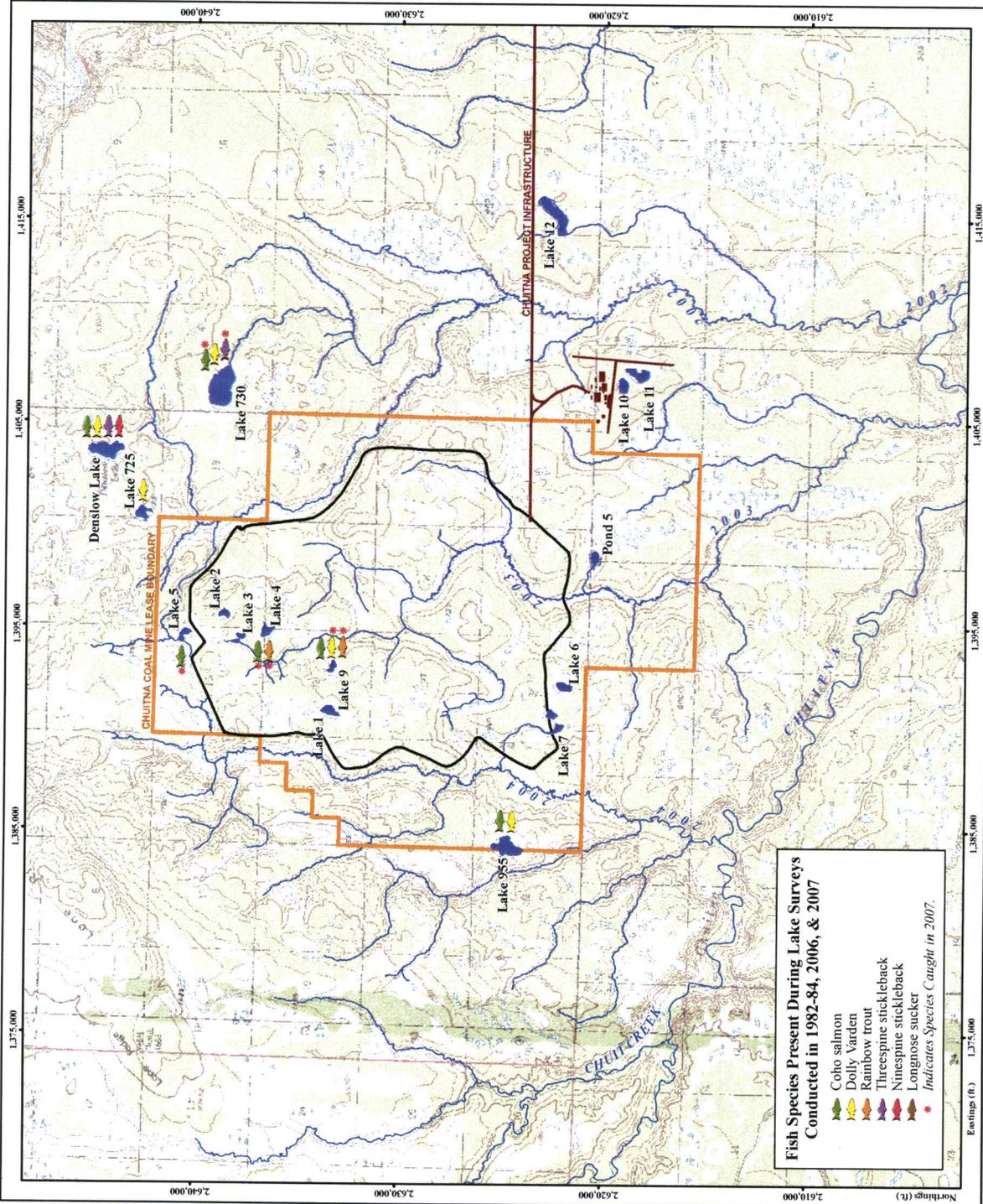
**Legend**

- Project Area Stream
- Project Area Lake
- Proposed Road & Conveyor
- Proposed Facilities
- Ladd Landing Boundary
- Lease Mining Unit-1 Boundary
- Lease Boundary

**Data Sources:**  
Lake Sample Sites & Fish Species, Oasis, 2007.  
Mine Infrastructure, Mine Engineers, 2006.  
Hydrology, Oasis, 2007.  
USGS Topographic Quadrangle, 1:63,160,  
Tyonok Sheets A2, A3, & A7, 1958.



**CHUITNA COAL PROJECT**  
PacRim Coal, LP  
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Phone: (907) 276-6868



effect of dozens of beaver dams and the wetland complexes they give rise to are likely a major driver in the underlying hydrology and channel morphology of the system (Collen and Gibson 2001).

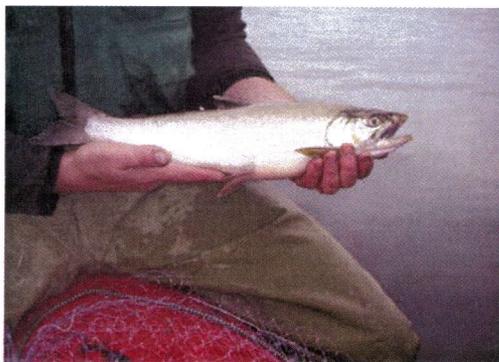
Spawning survey results presented above represent point-in-time observational data and are useful as a rough index of instantaneous escapement (much as aerial surveys are). That said they are also very likely to underestimate the actual numbers of spawning salmon in a particular stream at any given moment. Survey teams obviously cannot be at every location to observe the entirety of spawning habitat use in all cases. The problem of underestimation is particularly acute during high water as was experienced on September 14 and September 19 2007.

### 3.1.5. Lakes

Six different species of fish were documented in selected lakes within or near the proposed mine area, including coho salmon (*Onchorynchus kisutch*), rainbow trout (*Onchorynchus mykiss*), Dolly Varden (*Salvelinus malma*), threespine stickleback (*Sasterosteus aculeatus*), ninespine stickleback (*Pungitius pungitius*), and longnose sucker (*Catostomus catostomus*) (Table 3.1-18).

Of the fourteen lakes gillnetted in 2007, adult coho salmon were captured in five different lakes: two out of six lakes within the proposed mine area, two out of seven lakes outside of the proposed mine area, and one lake within the Ladd Landing area. At each of these lakes, as with most lakes in the area, is a beaver dam or series of beaver dams at the outlet. These dams potentially create a temporal or partial fish barrier, and the presence of adult coho salmon suggests a residual population of salmon in these lakes. These are coho salmon that spend their entire lives in fresh water. It is suggested that these fish are not part of a self-sustaining resident population, but rather a population derived from anadromous parents or migrating juveniles that replenish the stock periodically (Groot and Margolis 1991). Likely, extremely high water levels allow adult fish to enter the lakes, or juvenile salmonids are accessing the lakes when conditions allow. However, Ladd Lake 2, contained juvenile and adult coho salmon, suggesting a spawning, self-sustaining population or regular recruitment for a residual population, with access by juvenile fish from the outlet stream. An inlet stream was not observed when this lake was surveyed, the outlet was partially or temporally blocked by a series of beaver dams, and numerous seeps were observed feeding the lake from the west hillside.

ERT documented adult salmon in two additional lakes located outside the proposed mine area: Denslow Lake in the upper 2002 drainage; and Lake 955 located west of stream 2004. Changing water levels, different seasons, and variable beaver activity could limit or permit access to all lakes surveyed in the project vicinity. Habitat found in lakes that are currently supporting fish populations was equally found in lakes without captured fish. Lack of captured fish during 2007 surveys does not indicate absence of fish that were present during the surveys, or are present seasonally. In other words, lakes in which fish were not captured may have fish populations or may have populations in the future. This assumption follows for all species captured currently in surveyed lakes, especially coho salmon, Dolly Varden, and rainbow trout.



Coho salmon captured on August 19, 2007 in gillnet in Lake 4



Longnose sucker captured on October 17, 2007 at LL2

Dolly Varden were captured in one of the six lakes surveyed within the proposed mine area, but none of the eight lakes that were gillnetted outside of the proposed mine area. Historically, ERT documented Dolly Varden in three additional lakes which are located outside the proposed mine area. Dolly Varden are migratory and adaptable, able to use a wide range of habitat types and tend to overwinter in lakes (Morrow 1980). Additionally, the southern form of Dolly Varden homes to the same lacustrine watershed when overwintering in fresh water (Bernard and Hepler 1995), but may also overwinter at sea some seasons, hence it is likely these fish are still present in these lakes or will enter the lakes at other times. All lakes within the proposed mine area appeared consistent with habitat in lakes that do support Dolly Varden and are considered, in the least, capable of supporting rearing or overwintering Dolly Varden.

Five out of twenty surveyed lakes contain ninespine and/or threespine sticklebacks based on minnow trap results. Two of the lakes are located in the Ladd Landing Area, one is in the Threemile Creek drainage, and the other two are larger large lakes in the headwaters of the 2002 drainage. Although these are not commercially important fish species, they play an important role in local ecosystems and may form a significant part of the food of large fishes. They are an important forage species for Dolly Varden and other predaceous fish (Morrow 1980). These fish also provide food for a variety of bird species further adding to their importance in the overall food chain.

Rainbow trout were captured in two of the lakes surveyed. Both are located in the 2003 drainage within the proposed mine area. Trout captured in gillnets ranged from 28 to 30 cm in size, but no juvenile trout were captured in the minnow traps. These fish are likely entering the lakes to feed and could stay for part of or across seasons, but are most likely leaving to spawn. Available food in the lakes includes insect larvae, plankton, crustaceans, tadpoles, leeches, and small fish or fish eggs. Most lakes within the proposed mine area could probably support rainbow trout in some capacity, either for feeding or overwintering, with spawning occurring in flowing waters, including inlet or outlet streams.

Unique to Ladd Lake 2, longnose suckers were captured in gillnets, ranging in size from 23 to 30 cm. This is the only species of sucker located in Alaska and can be found in both lakes and streams where the water temperature is usually clear and cold. Suckers sometimes travel to streams to spawn, but can also spawn in lakes (Mansfield 2004). Lake-dwelling adults feed mainly on crustaceans, mollusks, insect larvae, and sometimes algae (Morrow 1980).

Table 3.1-18. Lake Survey Results Summary

General Location	Lake ID	Fish Captured		
		2007 w/ gillnets and traps	2006 (OASIS, 2007) w/ traps and/or hook & line	1982-1984 (ERT, 1984) w/ gillnets
Within Mine Area	Lake 1	NF	NF	NS
	Lake 2	NF	NF	NS
	Lake 3	NF	NF	NS
	<b>Lake 4</b>	Coho salmon; Rainbow Trout	Coho salmon	NS
	Lake 7	NF	NF	NS
	<b>Lake 9</b>	Rainbow Trout; Dolly Varden	Coho salmon	NS
Adjacent to Mine Area or Project Infrastructure	<b>Lake 5</b>	Coho salmon	NF	NS
	Lake 6	NF	NF	NS
	<b>Lake 8</b>	NS	Threespine stickleback	NS
	Lake 10	NF	NF	NS
	Lake 11	NF	NF	NS
	Lake 12	NF	NF	NS
	Pond 5	NF	NF	NS
	<b>Denslow Lake</b>	NS	Threespine stickleback; ninespine stickleback	Coho salmon; Dolly Varden; threespine stickleback
	<b>Lake 955</b>	NS	NF	Coho salmon; Dolly Varden
	<b>Lake 725</b>	NS	NF	Dolly Varden
	<b>Lake 730</b>	Coho salmon; threespine stickleback	Three-spine stickleback	Coho salmon; Dolly Varden; threespine stickleback
Within Ladd Landing	<b>LL1</b>	NS	Three-spine stickleback	NS
	<b>LL2</b>	Coho salmon; threespine stickleback; long-nose suckers	Coho salmon; threespine stickleback	NS
	LL3	NS	NF	NS

NS = Not surveyed

NF = Netted and/or trapped, but no fish captured

BOLD = Fish Lakes, or lakes where fish have been captured

Physical measurements and habitat notes for lakes surveyed in 2007 are included in Table 3.1-19. Lakes were surveyed once during the season from August to mid-October. Lake depths are variable, but generally shallow, with the maximum depth of lakes being near 25 feet. Water clarity was usually good, but slightly compromised by tannins that are common in the area's surface water.