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

Nomination for Waters Important to Anadromous Fish

Region: INTERIOR

USGS Quad: EAGLE A-1

Anadromous Water Catalog Number of Waterway: 334-45-11000-2600-3035

Name of Waterway: MOOSE CREEK ☒ USGS Name ☐ Local Name

☐ Addition ☒ Deletion ☐ Correction ☐ Backup Information GLCLLA

For Office Use

Nomination # 99 336			
Revision Year:		Regional Supervisor	3-8-00 Date
Revision to: Atlas ___ Catalog ___ Both X		AWC Project Biologist	3/20/00 Date
Revision Code: D-2		Drafted	4/10/00 Date

OBSERVATION INFORMATION

Species	Date(s) Observed	Spawning	Rearing	Present	Anadromous
					☐
					☐
					☐
					☐
					☐

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:

SEE ATTACHED LETTER AND Documentation

ALASKA DEPT. OF FISH & GAME
MAR 13 2000
REGION II
HABITAT AND RESTORATION DIVISION

Name of Observer (please print): ROBERT F. McLEAN 1-27-00

Signature: Robert F McLean 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

TABLE . Correlation of chinook and fall chum salmon returns in the Canadian mainstem Yukon River with observations of salmon in the U.S. Forty Mile River watershed.

	U.S. - Canada Border Passage Estimate		Observations in the Alaska Segment - Forty Mile River		Observations in the Canadian Segment - Forty Mile River					Mainstem Forty Mile River
Year	Chinook	Fall Chum	Chinook	Fall Chum	Chinook	Fall Chum	Brood Year of Juvenile Observations	Alaska Fish Surveys	Canadian Fish Surveys	Min. Measured Winter Discharge (cfs) at Taylor Highway Bridge [1]
1980		39,130								
1981		66,347		1 - Adult				X		
1982	36,598	47,049			2 - Adult				X	
1983	47,741	118,365							X	
1984	43,911	81,900			63 - Juvenile		1983		X	
1985	29,881	99,755		Anecdotal	2 - Juvenile		1984		X	
1986	36,479	101,826						X		
1987	30,823	125,121	2 - Adult					X		
1988	44,445	69,280								
1989	42,620	55,861						X		
1990	56,679	82,947	16 - Juvenile		4 - Juvenile		1989	X	X	
1991	41,187	112,303								
1992	43,185	67,962								29
1993	45,027	42,165								12
1994	46,680	133,712	Adult - Sp. Unknown	Adult - Sp. Unknown				X		3.8
1995	52,353	198,203		15						8.3
1996	47,955	143,758								
1997	53,400	94,725								
1998	22,588	48,047	1 - Juvenile				1997	X		

	Chinook	Fall Chum
Average	42,444	90,971
Median	43,911	82,947
80th Percentile	47,912	121,067
85th Percentile	50,594	127,698
Average When Adult Fish Observed in Alaska	38,752	124,504
Average For Brood Year When Juvenile Fish Observed in Alaska	48,010	N/A

1/ Source: Kostohrys, J., Sterin, B., and Hammond, T. 1999. Water Resources of the Fortymile National Wild and Scenic River, Alaska. BLM Open File Report 75, BLM/AK/ST-99/016+7200+020. Anchorage, AK.

ALASKA DEPARTMENT OF FISH AND GAME

(Calculations From: McLean, 1997, ADF&G-H&RD Technical Report 97-6)

PROJECT SITE: WB Fortymile River Survey **Waterbody:** Moose Creek **ADF&G #:** n/a
USGS Quad: Eagle B-1 **Fish Resource Values:** Unknown; no fish captured 8/7/98 **APMA #:** n/a

REGIONAL REGRESSION PEAK DISCHARGE ESTIMATES: (Formulas for the Upper Yukon River and its Tributaries - USGS AREA 5)

The 1993 USGS Regressions (Jones and Fahl, 1993) are considered the most reliable for instantaneous high flows.

Drainage Area (mi.^{2}) =	53.16	Regression*	Bankfull	Q2	Q5	Q10	Q20	Q25	Q50
Forest Cover % =	90	Jones & Fahl 1993	146	244	646	838		1,105	1,318
Lake Storage % =	0	Lamke 1979		379					1,730
Min. Jan Temp. (F) = (from Jones & Fahl, 1993)	-24	Kane & Janowicz 1989		494	895	1,221	1,575		2,098
Precip. (inches) = (from Jones & Fahl, 1993)	15	Madison & Parks 1985		371	717	1,036		1,605	2,166
Mean Watershed Elevation (feet) =	2500	Ashton et al. 1984 SPRING	99	152	232	290	349		
Valley Slope(ft./ft.) =	0.0337	GAGED**							
Max. Channel Vel. (from Table 1) =	4.3	Ashton et al. 1984 SUMMER	37	60	96	132	271		
	Ashton et al. 1984 30-day SUMMER LOW FLOW		26	Approximation of average annual summer flow					

*Note: Bankfull discharge varies somewhat by hydrogeomorphic area but is estimated, on average, to be approximately 60% of the Q2 flood discharge.

**Note: If correction factors are available for similar, adjacent gaged watersheds - use them to adjust Jones and Fahl regression values and input under "Gaged Flows."

FIELD OBSERVATIONS (8/7/98)

Rosgen Channel Type =	B4	
Bankfull Width (ft.) =	20	feet
Bankfull Depth (ft.) =	3	feet
Meander Wavelength =		feet
Valley Floor Width =		feet
Channel Slope =		ft./ft.
Watershed Aspect =		
Armor Layer (d50) =	4	inches (est.)
Subpavement (D50) =	3	inches (est.)
Ratio (d50/D50) =	1.33333	

PRELIMINARY HYDRAULIC CALCULATIONS		NOTES / EQUATIONS
Hydraulic Radius (R_h)@Q_{bf} =	1.49	●*Hydraulic radius approx.= depth if W/D Ratio >10*
(Se) Equilibrium Slope =	0.0529	●where Se=0.08*d50/0.75*(R_h)
Is Equilibrium Slope > Valley Slope?	**YES**	
CALC. Design Shear Stress =	0.0725	●where T = (Depth*So)/(¥$_s$/¥$_w$)-1)*d50 [Depth in (m); ¥$_s$ = spec. weight of sediment; ¥$_w$ = spec. weight of water; d50=med. diam. armor layer in (m)]
MAX Critical Bed Shear Stress =	0.064896231	●where T_c = 0.0834*(d50/D50)^-0.872
MAX Critical Bank Shear Stress =	0.0487	●where $T_{c\,bank}$ = 75% T_c
Is Design Stress < Critical (Bed)?	**NO**	●Applies to moderately straight channels on mild slopes;
Is Design Stress < Critical (Bank)?	**NO**	decrease by 10% for slightly sinuous; 25% for moderate.

c:\projects\40 Mile\Moose Creek Hydrology

PROJECT SITE: WB Fortymile River Survey **Waterbody:** Moose Creek **ADF&G #:** n/a
USGS Quad: Eagle B-1 **Fish Resource Values:** Unknown; no fish captured 8/7/98 **APMA #:** n/a

CALCULATED TYPE "C" MEANDER AND BRAIDED BANKFULL CHANNEL MORPHOLOGY (does not include constructed floodplain)

Investigator/Method	FORMULA (Ft./Lbs. Units)		OUTPUT	Correlation (r^2)	
Bray (1982)	W=2.38*Q2^.53	BF Top Width (ft.) =	43.80	0.962	
	d=0.226*Q2^.33	Bankfull Depth (ft.) =	1.39	0.871	
	V=1.58*Q2^.14	Av. Vel. (fps) =	3.41	0.499	
Emmett (1972)	W=2.39*Qbf^.5	BF Top Width (ft.) =	28.89		
(Alaskan Meander Streams)	d=.26*Qbf^.35	Bankfull Depth (ft.) =	1.49		
	V=1.62*Qbf^.15	Av. Vel. (fps) =	3.42		
Drage & Carlson (1977)	W=4.66*Qbf^.47	BF Top Width (ft.) =	48.50	0.54	
(Braided Streams)	d=.13*Qbf^.38	Bankfull Depth (ft.) =	0.86	0.63	
	V=1.65*Qbf^.15	Av. Vel. (fps) =	3.48	0.29	
General Hydraulic Model	$W=aQ2^b$	BF Top Width (ft.) =	54.77		
Beschta (1992)	$d=cQ2^f$	Bankfull Depth (ft.) =	1.21		
Q=discharge	AVERAGE VALUES: b=0.5; f=0.4				
W=channel width	a and c are back calculated from observed flows and channel widths in the				
d=mean depth	general geographic area. (upper Birch Ck.; a=3.51; c=0.134).				
USGS Channel Width	W=(Q2/.4)^1/1.82	BF Top Width (ft.) =	33.88		
	D=0.12W^0.69	Bankfull Depth (ft.) =	1.36		
	(USGS N/A; Used Williams (1986) W/D Relationship)				
Lacey (1948)	W=2.67Qbf^.5	BF Top Width (ft.) =	32.27		
	$D=(Qbf/(13.5*((D_{50}*25.4)^{0.5})))^{0.333}$	Bankfull Depth (ft.) =	1.02		
Yukon Placer 1990 DFO W/D	W=2.73*Qbf^0.5	BF Top Width (ft.) =	33.00		
Charts (converted from metric)	D=0.22*Qbf^0.333	Bankfull Depth (ft.) =	1.16		
Chang (1988)	$W=[1.905+0.249(\ln(0.0001065*D_{50}^{1.15})/(S*Qbf^{0.42}))]*Qbf^{0.47}$	BF Top Width (ft.) =	19.97	Sc	So
	$D=[0.2077-0.0418(\ln(0.000442*D_{50}^{1.15})/(S*Qbf^{0.42}))]*Qbf^{0.42}$	Bankfull Depth (ft.) =	1.24	0.0090	0.0337
				Is So > Sc?	YES

TONY KNOWLES, GOVERNOR

DEPARTMENT OF FISH AND GAME

HABITAT AND RESTORATION DIVISION

P.O. BOX 25526
JUNEAU ALASKA 99802-5526
PHONE: (907) 465-4105/4125
FAX: (907) 465-4759

February 18, 1999

RECEIVED
FEB 24 1999
Alaska Dept. of Fish & Game
Habitat – Region III

Mr. David W. Likins, President
Fortymile Mining District
P.O. Box 106
Eagle, AK 99738-0106

Dear Mr. Likins:

RE: Anadromous Stream Classification for the Fortymile River

At your request, the Department committed last spring to surveying the Fortymile River and its tributaries to determine whether its listing remained warranted in the *Catalog and Atlas of Waters Important for the Spawning, Rearing or Migration of Anadromous Fish.* A survey was completed by Mr. Mac McLean, Habitat and Restoration Division - Fairbanks, and Mr. Chuck Meachum, a representative of the Fortymile Mining District, on August 7-9, 1998. Sites were sampled with baited minnow traps at 29 locations over 50 stream miles in the mainstem, North Fork, South Fork and Walker Fork Fortymile River and their tributary streams. Two hundred and thirty nine trap hours were fished. In total, one juvenile chinook salmon and ten sculpins were collected. The single chinook salmon juvenile was collected in lower Polly Creek located just upstream of the Taylor Highway bridge.

Prior to the 1998 survey, our records dating back to the 1960s indicate that a total of 16 juvenile and two adult chinook salmon, 16 adult chum salmon, and one unidentified salmon have been observed by state, federal, and private entities in the Alaskan portion of the Fortymile River. After reviewing hydrologic conditions, including winter water flow observations by the Bureau of Land Management since the early 1990s, and salmon run indicators on the Canadian side of the border, it is our preliminary conclusion that anadromous fish runs in the Fortymile River are at the upper limit of their natural distribution and may not successfully reproduce on an annual basis. Some years it appears there is adequate winter water flows to support a successful egg hatch. But most years it appears there is not. This may explain why juvenile salmon are periodically observed but not consistently year to year.

Based on the available information, I have determined that the department will delist, without predjudice, the Fortymile River and its tributaries from the *Catalog and Atlas of Waters Important for the Spawning, Rearing or Migration of Anadromous Fish.* The Department reserves the right to redesignate these waters in the future if additional data supports such classification. We do not anticipate a formal revision of the Catalog or Atlas for at least one

DUNST
FILE CO
RMN
CRH
RFM
AGO
RAP
RTS
AHT
PKW
JFW

Table 1. Summary of Fortymile River Juvenile Salmon Fish Survey Results, August 7-9, 1998.

River Segment	Waterbody Name	Date	Location	No. Minnow Traps	Trap Hours	Fish Captured
South Fork (5.68 river miles surveyed)	Unnamed	8/9/98	East bank; Unnamed Tributary #A	2	5.32	None
	Unnamed	8/9/98	East bank; Unnamed Tributary #B	2	4.50	None
	Unnamed	8/9/98	East bank; Unnamed Tributary #C	2	3.83	None
	Wall Street Creek	8/9/98	East bank immendiately upstream of S.F. 40 Mile Bridge (Site #D)	2	3.50	None
	Unnamed	8/9/98	East bank approx. 1/2 mile above S.F. bridge; set in overhanging rock cluster at outlet of small spring-fed creek (Site #E)	2	2.83	None
	Unnamed	8/9/98	East bank - 1st trib above bridge	2	2.33	None
Walker Fork (single point)	Walker Fork - Mainstem	8/8/98 - 8/9/98	North bank, at BLM campground	2	22.83	None
North Fork (4.98 river miles surveyed)	Unnamed		North bank; Unnamed Tributary #8	2	2.66	None
Upper Mainstem (16.6 river miles surveyed)	O'Brien Creek	8/8/98	West bank	2	14.66	None
	Polly Creek	8/8/98	East bank	2	14	1-KS (66 mm); 1 sculpin
	Unnamed	8/8/98	South bank, Anad. Cat. # 3101	2	10.43	None
	Unnamed	8/8/98	South bank, Unnamed Tributary #1	2	12.66	None
	Unnamed	8/8/98	South bank, Unnamed Tributary #2	2	10.23	None
	Unnamed	8/8/98	North bank, Unnamed Tributary #3	2	9.32	None
	Unnamed	8/8/98	North bank, Unnamed Tributary #4	2	8.33	None
	Unnamed	8/8/98	North bank, Unnamed Tributary #5	2	9.67	5 sculpin
	Unnamed	8/8/98	South bank, Unnamed Tributary #6	2	7.166	None
	Unnamed	8/8/98	South bank, Unnamed tributary #7	2	4.834	None

Table 1. Summary of Fortymile River Juvenile Salmon Fish Survey Results, August 7-9, 1998 (Continued).

River Segment	Waterbody Name	Date	Location	Traps	Trap Hours	Fish Captured
Lower Mainstem (23.23 river miles surveyed)	Flat Creek	8/7/98	North bank	2	15.666	None
	Bow Creek	8/7/98	South bank	2	14.434	1 sculpin
	Steele Creek	8/7/98	South bank	2	12.834	None
	Twin Creek	8/7/98	North bank	2	11.67	None
	Canyon Creek	8/7/98	South bank	2	9.32	None
	Nugget Gulch	8/7/98	North bank	2	10.67	2 sculpin
	Smith Creek	8/7/98	South bank	2	6.166	None
	Moose Creek	8/7/98	South bank	2	4	None
	Snow Creek	8/7/98	North bank	2	2.67	None
	Sam Patch Creek	8/7/98	North bank	2	2	1 sculpin
	40 Mile - Mainstem	8/7/98	North bank	1	0.67	None
TOTAL				57	239.21	1 KS; 10 Sculpin

Title: **1998 Fortymile River Watershed Anadromous Fish Survey**

Project Staff: Robert F. McLean, Habitat Biologist III, Project Leader
Alaska Department of Fish and Game, Habitat and Restoration Division
1300 College Road, Fairbanks, AK 99701
Telephone: 907/459-7281
FAX: 907/456-3091 E-Mail: mmclean@fishgame.state.ak.us

(*Mr. McLean, ADF&G, has worked as a fisheries and habitat biologist since 1973. Past experience includes adult and juvenile salmonid surveys in the Kenai, Mat Su, Copper River, Alaska Peninsula, Bristol Bay, Norton Sound, Northwest, and Interior regions of Alaska. Sampling techniques include: aerial and ground visual surveys, minnow traps, seine, gill net, electrofishing (backpack and boat), weir, and side/upward array sonar.*)

The project team will include one additional habitat biologist or college intern/volunteer who will assist with actual field investigations. A professional services contract will be made with Mr. Larry Taylor, a local suction dredge miner and year-round resident of the Fortymile, for local boat transportation and guide services.

Abstract: Two surveys will be conducted: one in early August 1998 and the second in late September 1988 to document the presence or absence of anadromous fish species in the mainstem Fortymile River, O'Brien Creek, and their primary tributaries. Fish distribution, geomorphic, and habitat surveys will be conducted. Fish sampling will include use of minnow traps and backpack electrofisher.

The survey is a direct response to a 1998 request by the Fortymile Mining District and representatives of the Alaska State Legislature for a reassessment of the validity of the current listings of several waterbodies in the *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes (hereafter Catlog) Copies of this correspondence is included in Attachment 1.*

Based on the results of the surveys and the data collected, including geomorphic and habitat evaluations of each surveyed watershed, ADF&G will (1) recommend either retention or deletion of the current Catalog listings or (2) specify what additional surveys are necessary..

Project Cost: $10,753.08

Project Need: ADF&G's designation of the Fortymile River and several of its tributaries in the Catalog has been a recurring point of contention amongst many commercial miners in the Fortymile Mining District. Numerous petitions have been filed both on the Yukon and Alaska sides of the border requesting delisting of the Fortymile River and its listed tributaries as a salmon stream.

In 1998 the ADF&G committed to resurveying the Fortymile River and making appropriate changes to the Catalog in the next scheduled regulatory revision (Attachment 1).

While the Fortymile River has been surveyed repeatedly, there is some question regarding whether the timing of previous fish surveys was appropriate (i.e. the assumption that fish distribution in the Fortymile watershed is similar to Interior Alaska) or whether the optimum time for documenting use is later in the fall. The Division of Wildlife Conservation's 1985 anedotal report of fall chum salmon fishing near Stelle Creek in late September/early October clearly warrants additional field surveys at that time (Attachment 2).

In 1997, ADF&G reviewed 44 placer mine applications and 15 recreational suction dredge permit applications in the Fortymile District. Most of the operations were located on benches, adjacent tributaries, or were suction dredge operations targeting inside meander bars on the mainstem river. Although all operations have the potential to adversely impact fish habitat, most current operations are not considered a significant threat to long-term fish habitat maintenance in the Fortymile River. Current mining and reclamation practices and existing Environmental Protection Agency wastewater discharge permit requirements have significantly reduced long-term impacts from placer mining in the Fortymile basin.

The primary benefit of the proposed study is to resolve questions by the Fortymile Mining District and several legislators regarding the validity of ADF&G's Catalog listings and procedures.

Additional Information: The Fortymile watershed has been surveyed by ADF&G, the Department of Fisheries and Oceans Canada, and the Bureau of Land Management personnel repeatedly over the past 17 years. While significant numbers of adult anadromous fish have not been documented, repeated sightings of a few adult chinook and chum salmon spawners and, in particular, juvenile chinook salmon give rise to conjecture that the Fortymile River and some of its tributaries may have value as anadromous fish habitat. Conversely, those petetioning for its delisting believe the adult sightings represent occassional strays and that the Fortymile River

upstream of Clinton Creek is not suitable for spawning or overwintering due to a lack of winter flow.

A historical summary of fish observations follows.

1995 BLM. Twelve live and three dead adult chum salmon observed at Mickey Creek.

1994 BLM. One salmon (spp. ???) observed at confluence of Champion Creek and North Fork Fortymile River.

1990 ADF&G and DFO. Clinton Creek to Alma Creek. Minnow trap survey. Twenty juvenile chinook salmon (16 in Alaska and 4 in Canada), 6 juvenile suckers, and 1 slimy sculpin captured.

1989 ADF&G. Minnow trap survey of river immediately above and below bridge. Extremely low water levels with perched tributary mouths. Slimy sculpin, an unidentified whitefish and Arctic grayling documented.

1987 BLM. Two adult chinook salmon observed in the North Fork Fortymile River at the Kink.

1986 ADF&G. Minnow trap survey. No salmonids documented.

1985 ADF&G received reports of chum salmon being captured in September and early October in the lower Fortymile River near Steele Creek by a resident of Tok, AK (Attachment 2).

1985 DFO. Eight seine sets in lower river below U.S./Canada border. Two juvenile chinook salmon captured 9.5 km below border.

1984 DFO. Minnow trapping and beach seines. Lower Fortymile River near Clinton Creek, Clinton Creek, and Mickey Creek. Sixty-three juvenile chinook salmon captured.

1983 DFO. Minnow trapping, hand seine, and beach seining. Lower river below U.S./Canada border. No salmonids captured.

1982 DFO. Two radio-tagged adult salmon tracked into the Fortymile River.

1981 Dames and Moore. Report of adult chum salmon in the North Fork Fortymile River near the Kink (mid-August).

1960 USFWS. Reports of salmon spawning near the Taylor Highway.

Survey Plan: First Survey - August, 1998. O'Brien Creek and its nine primary tributaries will be accessed by highway vehicle along the Taylor Highway. The mainstem Fortymile River and its tributaries will be surveyed by jet boat from the Fortymile Bridge at MP 112 down to the U.S. Canada boundary. Operations will be staged from Mr. Larry Taylor's private residence located near the Fortymile Bridge.

Waterbodies will be located on a 1:63360 Series USGS map. Coordinates for the mouths of each stream and sample locations will be obtained with a Garmin 40 GPS unit. Observations on waterbody morphology, including bankfull width and depth, slope, substrate composition, habitat types, and water temperature will be collected.

Adult salmon distribution will be visually noted and photographed. Juvenile salmonids will be captured in minnow traps baited with frozen salmon roe. Multiple trap sets will be made at each sample site and fished for a minimum of 2 hours but not more than 24 hours per set. All collected fish will be identified using the Alaska Working Group on Cooperative Forestry/Fisheries Research 1992 *Standards for Sight Identification of Salmon and Trout* and Morrow's (1980) key to *The Freshwater Fishes of Alaska.* Fork length, total length, and body depth (the latter two items are needed for an unrelated culvert fish passage research project) will be measured to the nearest mm. All data will be recorded on a standard waterbody survey form (Attachment 3).

The priority waterbodies are those presently listed in the Catalog, including Moose Creek, Alma Creek, Smith Creek, Flat Creek, Polly Creek, and an unnamed tributary located in Section 19, T7S, R32 E, FM. Despite isolated reports of adult chinook and chum salmon in the North Fork of the Fortymile River, it will not be surveyed until existing Catalog listings in the lower river are reconfirmed. However, we will continue to coordinate with BLM Tok Office staff regarding their observation during reconnaissance float trips down the North Fork Fortymile River from the Joseph Creek airstrip. Several float trips are scheduled annually.

Second Survey - September 1998. A foot survey will be conducted in late September 1988 of the lower mainstem Fortymile River between the Fortymile Bridge and the U.S./Canada border. The primary target area is the mainstem river near Steele Creek. Anedodal information indicates a Tok resident has historically caught fall chum salmon in the mainstem near this location. Access to the site will be by jet boat (contract with Mr. Larry Taylor). If water levels are too low for boating or if an early freeze-up occurs, alternate access will be either by six-wheeler ATV along an established cat trail (5.1 miles) from the Taylor Highway to Steele Creek or by foot along the riverbank from the Taylor Highway (7.1 miles).

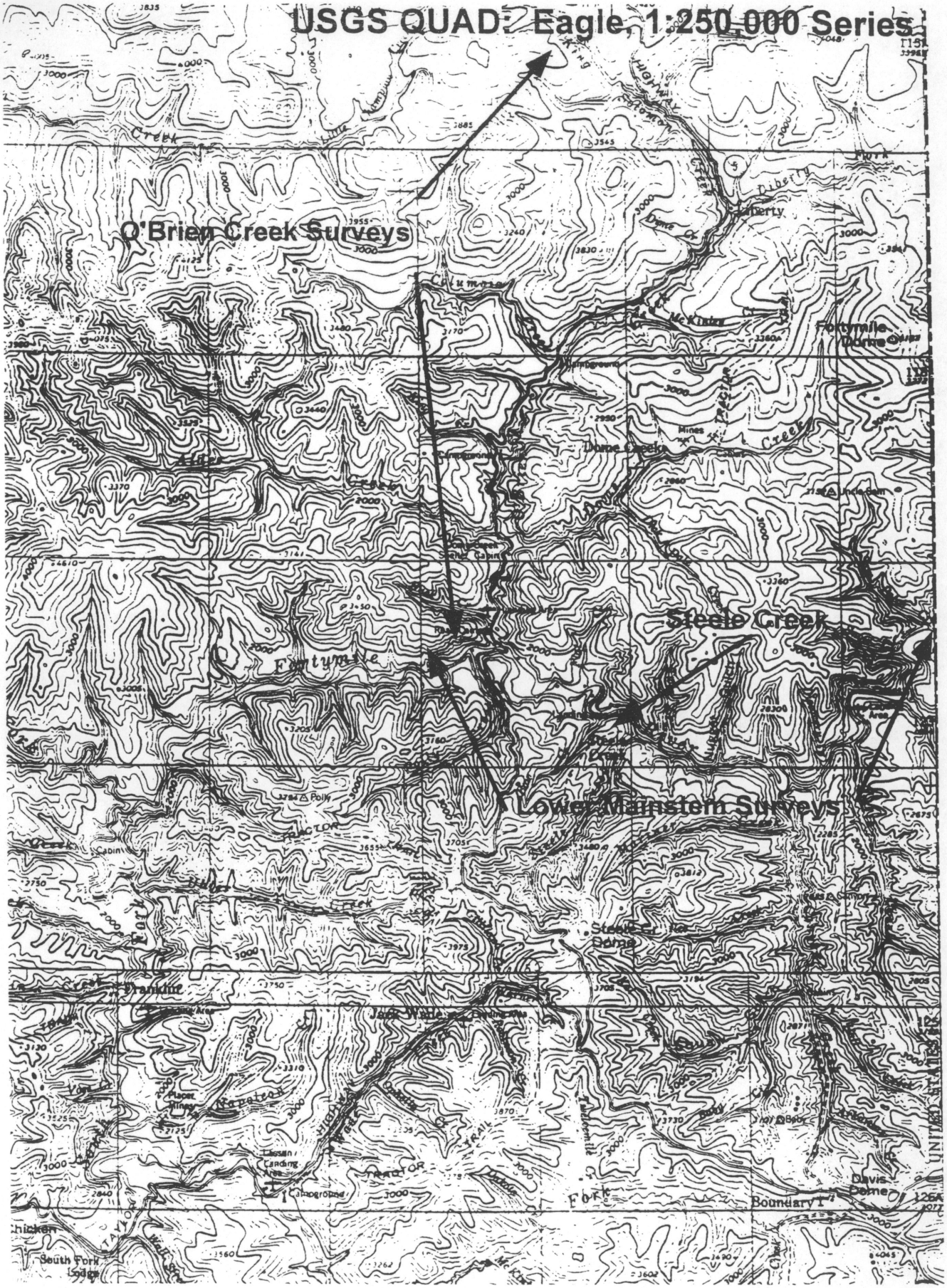
Budget:

Personnel	
Field Preparation (Both Surveys)	
HBIII, 40 hours @ $41.03/hr.	1,641.20
August - Travel from/to Fairbanks (700 Miles) and Camp Setup/Takedown	
HB III, 16 hours @ $41.03/hr	656.48
HB II, 16 hours @ $27.00/hr	432.00
O'Brien Creek Surveys (August)	
HB III, 16 hours @ $41.03/hr	656.48
HB II, 16 hours @ $27.00/hr	432.00
Lower Mainstem Surveys (August)	
HB III, 16 hours @ $41.03/hr	656.48
HB II, 16 hours @ $27.00/hr	432.00
Travel from/to Fairbanks (700 Miles) and Camp Setup/Takedown	
HB III, 16 hours @ $41.03/hr	656.48
HB II, 16 hours @ $27.00/hr	432.00
Lower Mainstem Survey (September)	
HB III, 16 hours @ $41.03/hr	656.48
HB II, 16 hours @ $27.00/hr	432.00
Report Preparation and Anadromous Catalog Nominations	
HB III, 25 hours @ $41.03/hr	1,025.75
Prepare Letters to Fortymile Mining District and Legislators	
HB III, 1 hour @ $41.03/hr	41.03
	8,150.38
Travel/Per Diem	
20 days at $42/day	**840.00**
Contractual	
Vehicle Fuel (100 gallons diesel @$1.22/gal.)	122.00
Guide/Boat Services - Larry Taylor (4 days @ $200/day)	800.00
Telephone Xerox (distribution to Fortymile Mining District, etc.)	40.00
Film/Developing	60.00
Camp Supplies (Blazo, tarps, etc.)	50.00
	1,072.00
Supplies	
MT2 Steel Minnow Traps (60 @ $8.67/ea)	520.20
Poly Rope (for traps)	20.00
Photodegradeable Flagging (5 rolls @ $1.75/roll)	8.75
4' by 30' Minnow Seine (1/4" mesh)	129.25
Rite in the Rain Field Notebook	12.50
	690.70
GRAND TOTAL	**10,753.08**

Schedule: Phase I is scheduled to coincide with the presumed period juvenile chinook salmon are expected to be distributed in tributary streams. In Interior Alaska, maximum upstream dispersal of juvenile chinook salmon typically occurs by early August. As water temperatures begin to drop in late August, juvenile fish typically drop back down out of the smaller tributaries into larger tributary and mainstem habitats.

Phase II is scheduled for late September (prior to freezeup) to investigate past reports that fall chum salmon have been narvested near Steele Creek in late September/early October. Fall chum salmon in the Delta River typically begin arriving on the spawning grounds in mid-September and have been observed as late as early December. Fall chum salmon runs in Canada typically are intercepted downstream of the spawning grounds from the first of September to mid-October. The proposed field schedule is positioned mid-way during the prime target window but before freeze-up makes boat travel impossible.

Trip reports will be prepared immediately following each sample period. A final report and nomination forms for Anadromous Catalog additions, revisions, or deletion will be prepared in October 1998 and submitted to Habitat and Restoration Division Region II for inclusion in the next scheduled update to the Catalog. A draft letter from Director Kowalski to the Fortymile Mining District and interested legislators will be prepared for her signature in October 1998 and will outline the basic survey findings and proposed department regulatory action on Catalog listi


USGS QUAD: Eagle, 1:250,000 Series
O'Brien Creek Surveys
Steele Creek
Lower Mainstem Surveys
Fortymile Dome
Dome Creek
Liberty
Steele Cr. Dome
Davis Dome
Boundary
Franklin
Jack Wade
Fortymile
Creek
Fork
South Fork Lodge