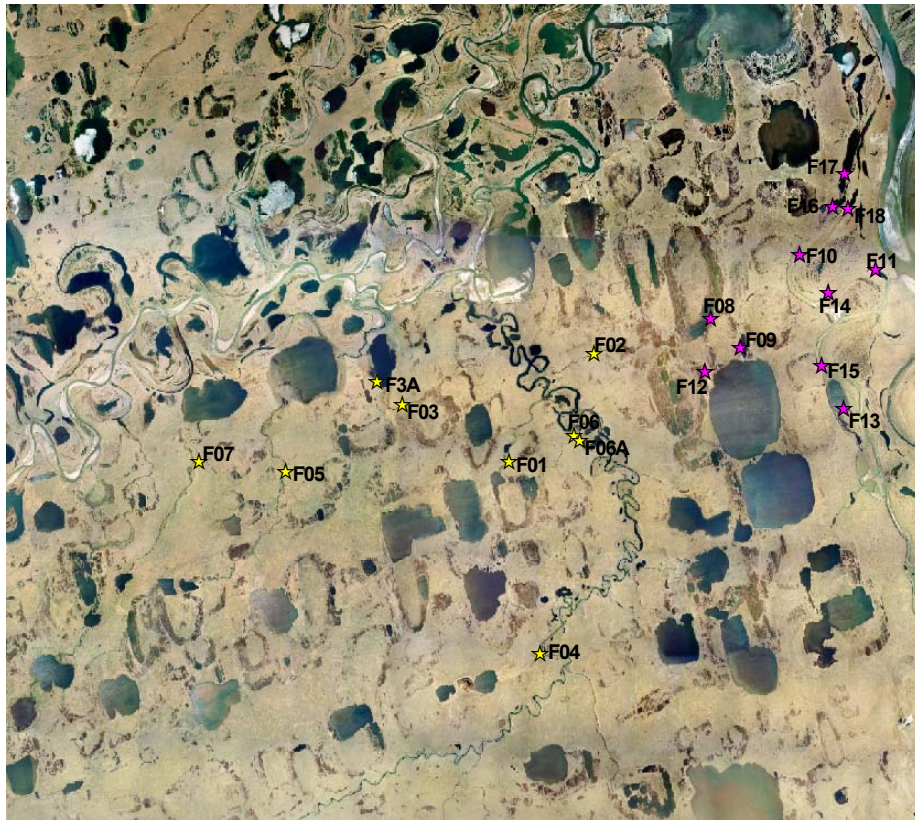


# BASELINE SURVEYS OF FISH HABITATS IN EASTERN NPR-A, 2003

Summary Data Report

September 2003



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**Prepared for:**

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700 G Street  
Anchorage, AK**

**and**

**Anadarko Petroleum Corp.  
1200 Timberloch Place  
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## **BASELINE SURVEYS OF FISH HABITATS IN EASTERN NPR-A, 2003**

### **INTRODUCTION**

ConocoPhillips Alaska Inc. (CPAI) has been exploring for oil within the eastern portion of the National Petroleum Reserve–Alaska (NPR-A) since the winter of 1999/2000. Oil reserves have been located in the region, and the feasibility of developing a producing field in the area is being investigated. Part of the evaluation process includes assessing the potential environmental impacts, which requires information specific to the activity area in order to evaluate the biological sensitivity of streams and lakes in the region. Streams in the area may be crossed by ice roads during winter or by roads and/or pipelines after development. An understanding of the fish populations in these streams is needed to minimize effects to these populations during field development. The inventory of fish and fish habitat provides information for assisting permitting decisions regarding road and pipeline routing.

Streams in the study region have previously been investigated by Netsch et al. (1977), and Bendock and Burr (1984). These surveys consisted of one-day visits at each site for inventory-level surveys over a wide area, with sampling by gill net, seine, minnow trap, and angling. Species reported from Uvlutuuq (Fish Creek) and Iqalliqpiq (Judy Creek) included broad whitefish, arctic grayling, round whitefish, slimy sculpin and ninespine stickleback. The Tingmiaqsiugvik (Ublutuocho River) was also reported to contain arctic grayling, slimy sculpin and ninespine stickleback.

The present study continues the first detailed examination of fish populations in the drainages of eastern NPR-A begun in 2001 (Moulton 2003). The study was designed to provide details of fish populations in eastern NPR-A (Figure 1), and the habitats used by those populations, so that oilfield facilities can be sited, designed and constructed in a manner that will avoid or minimize impacts. The fish surveys conducted in 2003 were organized into two segments: 1) an investigation of fish using small streams in the vicinity of proposed roads and pads, and 2) the distribution of fish in aquatic habitats near the Alpine West region of eastern NPR-A.

Specific objectives of the 2003 small streams study were to conduct studies on small streams tributary to the Uvlutuuq (Fish Creek) and Tingmiaqsiugvik (Ublutuocho River) drainage systems to:

- a) describe the fish species and habitat use patterns within the small streams of eastern NPR-A,
- b) obtain information on fish movements within the drainages, and
- c) document the recovery of tagged fish.

The main objective of the Alpine West fish survey was to identify fish use in the various aquatic habitats in the Alpine West region immediately west of the proposed Nigliq Channel crossing.

## METHODS

### Biological Sampling

During summer 2003, the study design included two tasks to investigating fish habitat in eastern NPR-A. The first task was to sample small streams in the eastern NPR-A study area in the vicinity of potential roads and pads (Figure 2). Streams selected were tundra streams that discharged directly into Uvlutuuq (Fish Creek) and Tingmiaqsiugvik (Ublutuochoch River) or into lakes associated with those two drainages. The second task involved sampling aquatic habitats in the Alpine West region with fyke nets. Stations sampled represented a variety of habitats (Figure 3), including tundra lakes, perched lakes, side channel off the Nigliq channel, and backwater areas off the side channel.

Sampling was by fyke net so that fish could be released unharmed. Sampling in small streams covered late June (June 14-22) to evaluate post-breakup movements, mid July (July 11-21) to evaluate fish use of channels after spring out-migration was complete, and mid August (August 16-22) to evaluate late summer stream use. Sampling in Alpine West was from July 19 to August 3, 2003.

Fyke nets used had an opening 0.9 m deep by 1.1 m wide, the trap end was 4.9 m long, made of 9.5 mm mesh. The wings (5 m long) and lead (15 m long) were made of 12.7 mm mesh. The nets were emptied daily. Fish were measured and released, with no fish retained for laboratory analysis. Duration of each set was recorded to allow calculation of catch rates. Water chemistry measurements taken in conjunction with the fyke net sampling included water temperature, specific conductance, dissolved oxygen, turbidity and pH.

In 2003, fish longer than 180 mm were tagged with Floy FD-94 anchor tags (monofilament = 1/2 inch, vinyl = 3/4 inch) to investigate fish movements within the study area and to reveal the extent to which fish caught in the study area contribute to the subsistence catch. Recapture was monitored in research sampling within Colville Delta and eastern NPR-A study areas, in the Nuiqsut subsistence fishery and in the Colville Delta commercial fishery.

### Water Chemistry Sampling

Water chemistry parameters were measured to assess habitat conditions and provide information on the suitability of water for use. Water chemistry measurements included surface measures of water temperature, specific conductance, dissolved oxygen, pH, and turbidity. Temperature, specific conductance and dissolved oxygen were *in situ* measurements taken at a depth of approximately 0.5 m near the trap end of the fyke net with a YSI Model 85 meter. A sample obtained from the surface was returned to the field office to measure pH and turbidity. PH was measured with an Oaktron Acorn Series pH5 meter. Turbidity was measured with an H.F. Scientific DRT15CE turbidity meter.

## RESULTS

### Physical Environment

**Small Streams.** Sampling began in mid-June as stream flows were receding from peak break-up flows. As flow receded, the nets had to be re-positioned to keep the trap funnels under water so that the nets continued to fish. By July, flow ceased in two streams (F03 and F06), and the nets were moved to lakes at the downstream end of the drainage.

At the onset of sampling, water temperature in the streams reflected the remnant ice and snow drifts, running between 2 to 4°C (Table 2, Figure 4). Temperatures rose to the upper teens by mid-July, then declined into August.

Specific conductance generally rose slowly at stream stations through the summer as snow melt and runoff decreased (Table 2, Figure 4). One notable exception was at Station F02, where specific conductance rose rapidly during June, then gradually declined in July. Two apparent decreases at Stations F03 and F06 reflect the change from stream to lake habitat when the nets were moved because of low stream flow.

**Alpine West.** Water temperature in Alpine West habitats was near 15°C when sampling was initiated in late July, then declined to below 10°C by early August (Figure 5). Specific conductance in Alpine West varied greatly between habitats, with those most closely associated with the Colville River channels having the highest values (Table 3, Figure 5).

### Biological Observations

#### *Species Occurrence in Small Streams*

Nine species were captured in small streams in eastern NPR-A during the 2003 fyke net sampling (Table 2). Ninespine stickleback were the most abundant species, followed by Arctic grayling. Station F01 produced the greatest number of grayling, followed by Station F04 on the Tingmiaqsiugvik (Ublutuoq River). While juvenile grayling dominated the catches, adults were also present during the summer (Appendix Table C-1). There were thirteen recaptures of tagged Arctic grayling, with one fish recaptured three times during the summer (Table 5).

#### *Species Occurrence in Alpine West*

Twelve species were captured in the Alpine West region of eastern NPR-A during 2003 sampling (Table 3). The greater diversity resulted from the wider range of habitats sampled in that portion of the study area. Ninespine stickleback were again the most abundant species followed by longnose sucker and broad whitefish. The catch of adult longnose sucker at Station F10, a backwater off the Nigliq Channel (Appendix Table C-7), was the greatest number of this species yet recorded from the Colville Delta region.



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- Bendock, T.N. and J. Burr. 1984. Freshwater fish distributions in the Central Arctic Coastal Plain (Ikpikpuk River to Colville River). Alaska Department of Fish and Game, Sport Fish Division, Fairbanks, AK. 52p.
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Table 1. Stations fished by fyke net during ConocoPhillips 2003 Fish Studies in eastern NPR-A.  
(datum = NAD27)

Study Station	Habitat	Latitude	Longitude	Dates Sampled
<b>Small Streams</b>				
F01	stream	70.28001	151.32677	Jun 14-22, Jul 11-22, Aug 16-22
F02	stream	70.30304	151.27081	Jun 14-22, Jul 11-22
F03	stream	70.29114	151.40044	Jun 14-22, Jul 11-22
F03A	perched lake	70.29634	151.41449	Jun 14-22, Jul 11-22
F04	stream (Ublutuoch R)	70.24241	151.29841	Jun 14-22, Jul 11-22, Aug 16-22
F05	stream (Ck 16 of 2002)	70.27649	151.47816	Jun 14-22, Jul 11-22
F06	stream	70.28560	151.28278	Jun 14-22, Jul 11-22
F06A	perched lake (L9824)	70.28500	151.27585	Jun 14-22, Jul 11-22
F07	stream (Ck 17 of 2002)	70.27830	151.53770	Jun 14-22, Jul 11-22
<b>Alpine West</b>				
F08	tundra lake	70.31116	151.18820	Jul 19-22
F09	tundra lake	70.30537	151.16808	Jul 19-22
F10	backwater off river channel	70.32516	151.12877	Jul 19-22
F11	perched lake	70.32244	151.07678	Jul 19-22
F12	tundra lake	70.30003	151.19144	Jul 22-23
F13	perched lake (L9306)	70.29295	151.09669	Jul 23-27
F14	tapped lake	70.31739	151.10835	Jul 24-27
F15	side channel	70.30194	151.11203	Jul 24-27
F16	perched lake (L9305)	70.33539	151.10665	Jul 25-27
F17	perched lake (L9304)	70.34249	151.09907	Aug 1-3
F18	perched lake (M9932)	70.33497	151.09649	Aug 1-3

Table 2. Fish caught by fyke net in small streams of eastern NPR-A during 2003.

All Stations				
Species	June Total	July Total	August Total	Total
Broad whitefish	3	153	0	156
Humpback whitefish	1	4	0	5
Least cisco	0	53	0	53
Round whitefish	0	4	1	5
Arctic grayling	274	1,529	44	1,847
Burbot	0	1	1	2
Alaska blackfish	93	25	0	118
Slimy sculpin	1	36	0	37
Ninespine stickleback	10,696	3,013	8	13,717
Effort (hrs)	1,351.3	1,545.9	322.2	3,219.4

Station F02			
Species	June Total	July Total	Total
Broad whitefish	1	1	2
Humpback whitefish	0	0	0
Least cisco	0	0	0
Round whitefish	0	0	0
Arctic grayling	10	93	103
Burbot	0	0	0
Alaska blackfish	0	1	1
Slimy sculpin	0	13	13
Ninespine stickleback	35	36	71
Effort (hrs)	214.7	191.1	405.8

Station F04				
Species	June Total	July Total	August Total	Total
Broad whitefish	2	4	0	6
Humpback whitefish	1	0	0	1
Least cisco	0	2	0	2
Round whitefish	0	1	1	2
Arctic grayling	157	44	21	222
Burbot	0	0	0	0
Alaska blackfish	0	0	0	0
Slimy sculpin	1	8	0	9
Ninespine stickleback	281	24	0	305
Effort (hrs)	215.5	269.2	161.0	645.7

Station F06/F06A			
Species	F06 Total	F06A Total	Total
Broad whitefish	0	0	0
Humpback whitefish	0	0	0
Least cisco	0	0	0
Round whitefish	0	0	0
Arctic grayling	0	2	2
Burbot	0	0	0
Alaska blackfish	32	4	36
Slimy sculpin	0	0	0
Ninespine stickleback	345	1,687	2,032
Effort (hrs)	188.8	189.3	378.2

Station F01				
Species	June Total	July Total	August Total	Total
Broad whitefish	0	3	0	3
Humpback whitefish	0	0	0	0
Least cisco	0	3	0	3
Round whitefish	0	0	0	0
Arctic grayling	105	1,266	23	1,394
Burbot	0	0	1	1
Alaska blackfish	2	0	0	2
Slimy sculpin	0	15	0	15
Ninespine stickleback	369	14	8	391
Effort (hrs)	213.3	260.3	161.2	634.8

Station F03/F03A			
Species	F03 Total	F03A Total	Total
Broad whitefish	0	145	145
Humpback whitefish	0	4	4
Least cisco	0	48	48
Round whitefish	0	3	3
Arctic grayling	0	124	124
Burbot	0	1	1
Alaska blackfish	34	9	43
Slimy sculpin	0	0	0
Ninespine stickleback	390	293	683
Effort (hrs)	211.6	262.2	473.8

Station F05 (CK 16)			
Species	June Total	July Total	Total
Broad whitefish	0	0	0
Humpback whitefish	0	0	0
Least cisco	0	0	0
Round whitefish	0	0	0
Arctic grayling	2	0	2
Burbot	0	0	0
Alaska blackfish	17	2	19
Slimy sculpin	0	0	0
Ninespine stickleback	8,810	69	8,879
Effort (hrs)	187.8	182.5	370.4

Station F07 (CK 17)			
Species	June Total	July Total	Total
Broad whitefish	0	0	0
Humpback whitefish	0	0	0
Least cisco	0	0	0
Round whitefish	0	0	0
Arctic grayling	0	0	0
Burbot	0	0	0
Alaska blackfish	8	9	17
Slimy sculpin	0	0	0
Ninespine stickleback	466	890	1,356
Effort (hrs)	119.4	191.3	310.7

Table 3. Fish caught by fyke net in the Alpine West region of eastern NPR-A during 2003.

Species	F08 tundra lake	F09 tundra lake	F10 back- water	F11 perched lake	F12 tundra lake	F13 perched lake	F14 tapped lake	F15 side channel	F16 perched lake	F17 perched lake	F18 perched lake
Broad whitefish	0	0	37	0	0	15	64	46	0	0	2
Humpback whitefish	0	0	2	0	0	0	0	2	0	0	0
Least cisco	0	0	13	3	0	30	3	9	0	3	2
Round whitefish	0	0	4	0	0	0	12	28	0	0	0
Arctic grayling	0	0	15	0	0	0	6	2	0	0	0
Burbot	0	0	3	0	0	1	2	0	0	0	0
Rainbow smelt	0	0	0	0	0	0	0	1	0	0	0
Longnose sucker	0	0	412	0	0	0	26	8	0	0	0
Alaska blackfish	0	0	0	30	0	0	0	0	0	0	0
Fourhorn sculpin	0	0	1	0	0	0	0	0	0	0	0
Slimy sculpin	0	0	0	1	0	0	0	0	0	4	0
Ninespine stickleback	304	938	30	1,076	29	98	5	2	3,150	195	21
Effort (hrs)	100.7	98.0	100.4	101.2	41.2	112.1	99.5	96.7	73.8	67.9	68.5

Table 4. Tagged fish released in NPR-A habitats during 2003.  
(includes release of recaptured fish)

<u>Species</u>	<u>Floy Tags Released</u>
Broad whitefish	16
Humpback whitefish	7
Least cisco	59
Arctic grayling	169
Round whitefish	9
<u>Total:</u>	<u>260</u>

Table 5. Recovery of tagged fish during 2003 summer studies.

Species	Recovery Station	Recovery Date	Recovery Length	Release Station	Release Date	Release Length	Days Out	Tag ID
Arctic grayling								
	F01	6/21/2003	180	F01	6/20/2003	182	1	MJM020740
	F01	7/11/2003	335	F04	7/25/2001	323	716	MJM010833
	F01	7/11/2003	332	F01	6/17/2003	327	24	MJM020726
	F01	7/12/2003	294	F04	6/21/2003	289	21	MJM020571
	F01	7/18/2003	361	F04	8/31/2001	303	686	MJM011383
	F01	7/20/2003	189	F01	7/11/2003	185	9	MJM020838
	F01	8/17/2003	335	F01	7/18/2003	355	30	MJM021655
	F03A	7/21/2003	190	F03A	7/14/2003	285	7	MJM020925
	F04	6/22/2003	338	F04	6/25/2001	303	727	MJM010118
	F04	7/13/2003	336	F04	6/22/2003	338	21	MJM010118
	F04	7/13/2003	212	F04	7/11/2003	212	2	MJM020841
	F04	7/16/2003	337	F04	7/13/2003	336	3	MJM010118
	F14	7/25/2003	219	F14	7/24/2003	215	1	MJM021075
Least cisco								
	F03A	7/20/2003	335	F03A	7/14/2003	336	6	MJM020787
	F03A	7/21/2003	210	F03A	7/14/2003	207	7	MJM020781
	F03A	7/21/2003	198	F03A	7/14/2003	196	7	MJM020919
	F13	7/27/2003	262	F13	7/23/2003	260	4	MJM020662
Round whitefish								
	F03A	7/16/2003	362	F03A	7/14/2003	364	2	MJM020779

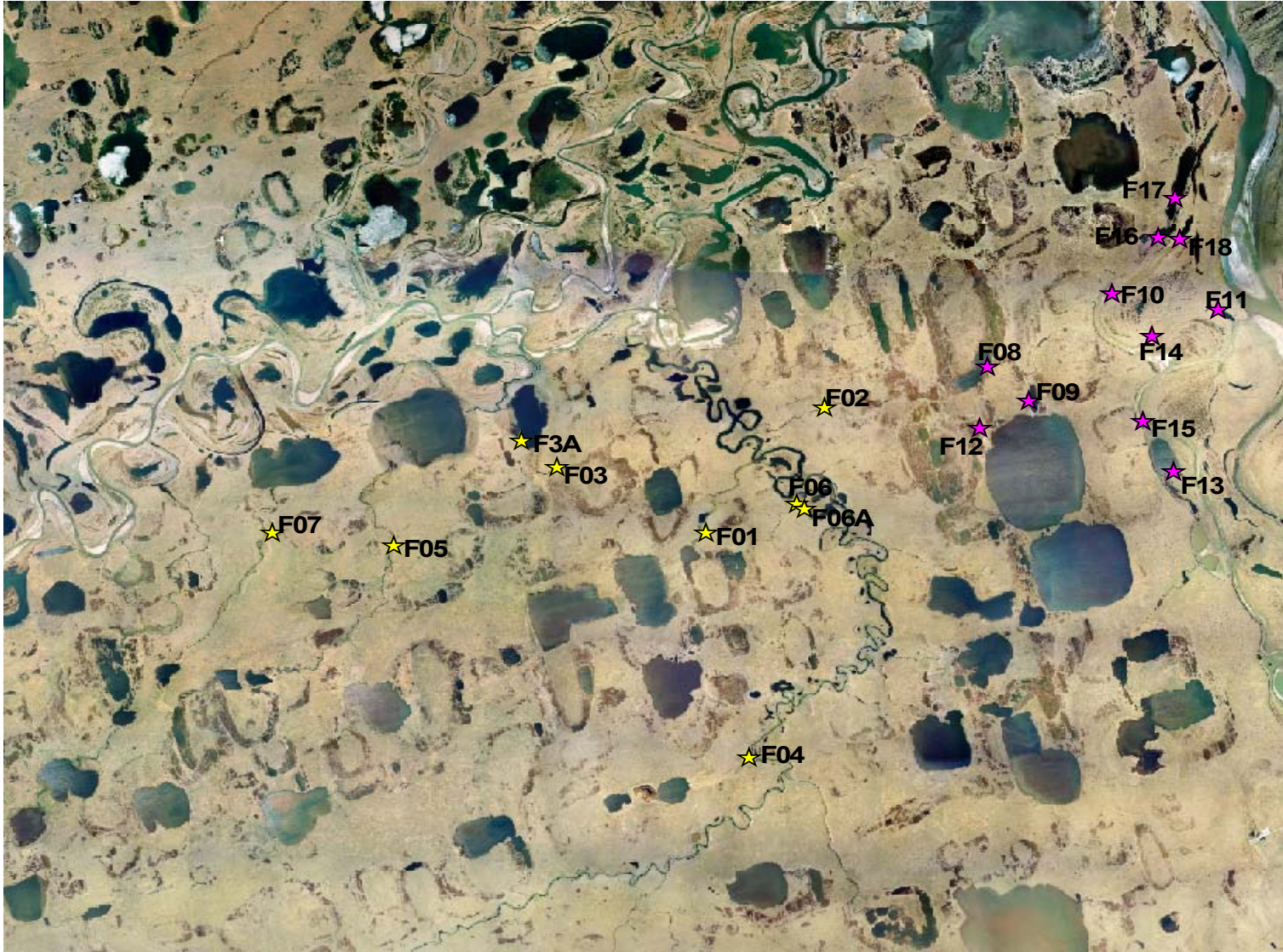


Figure 1. Fyke net locations in the eastern NPR-A study area, Alaska, 2003.



Figure 2. Fyke net locations in small streams of the eastern NPR-A study area, 2003.



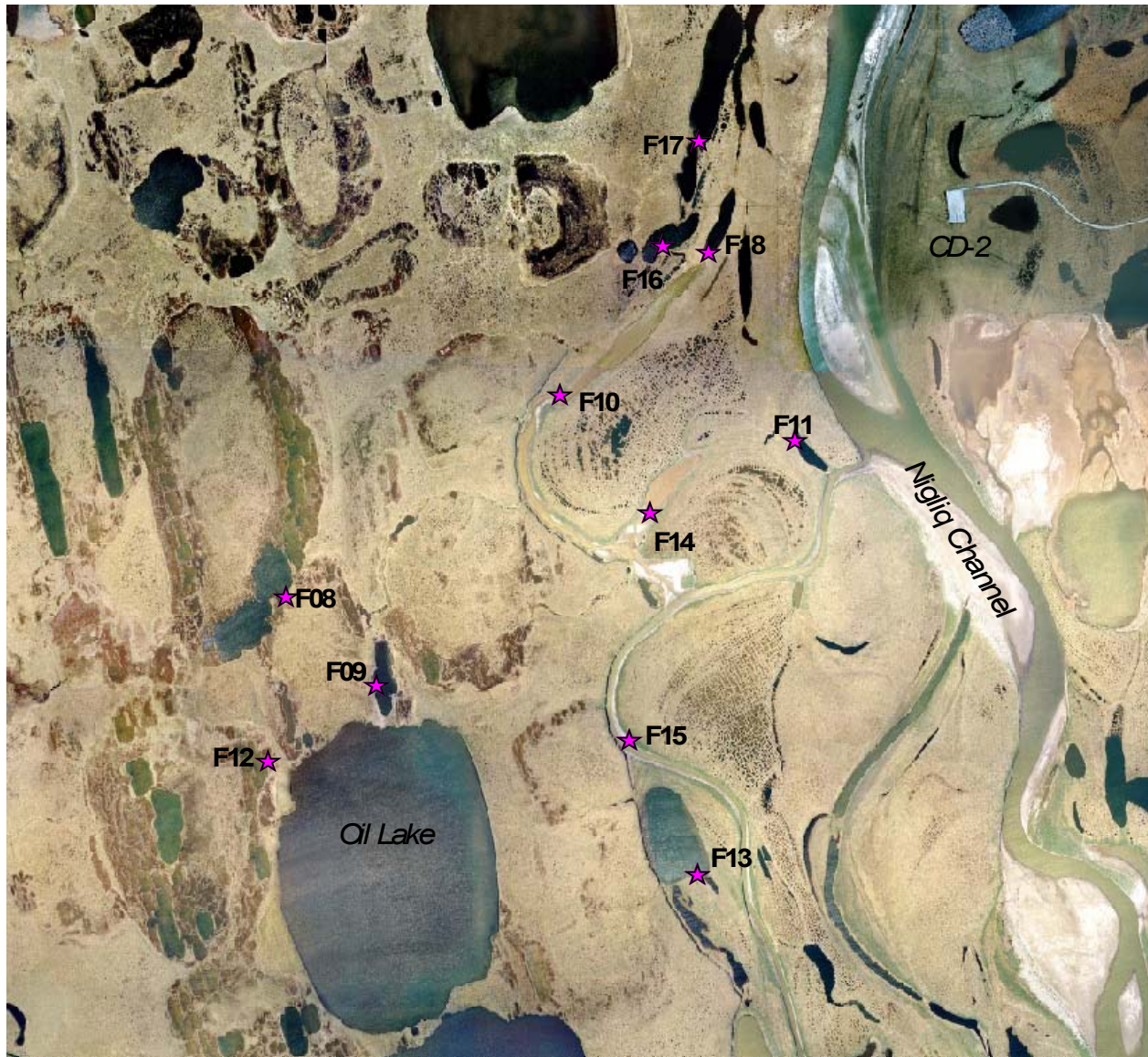


Figure 3. Fyke net locations in the Alpine West region of eastern NPR-A, 2003.

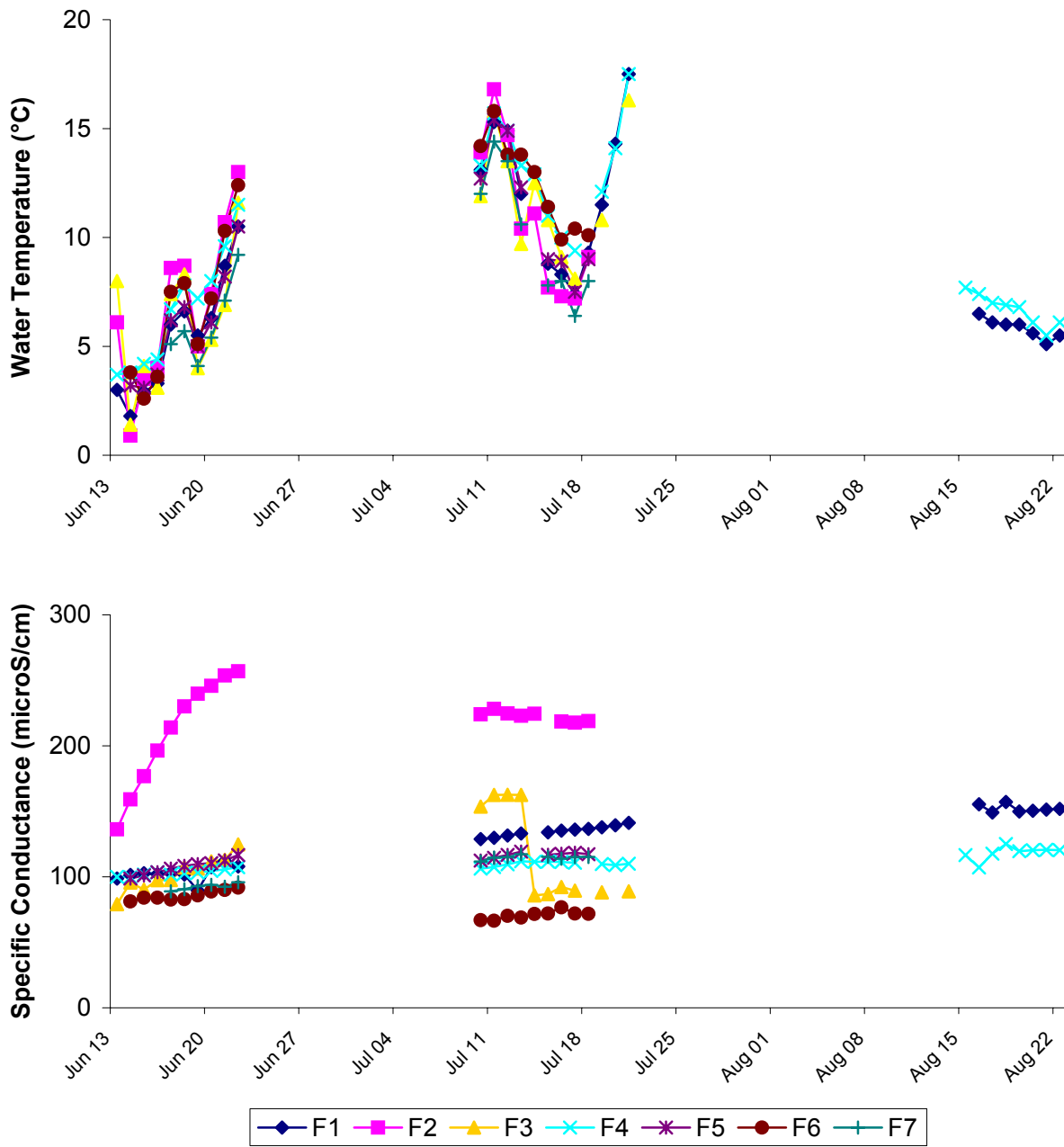


Figure 4. Water temperature and specific conductance at stations sampled in small streams of eastern NPR-A study area, 2003.

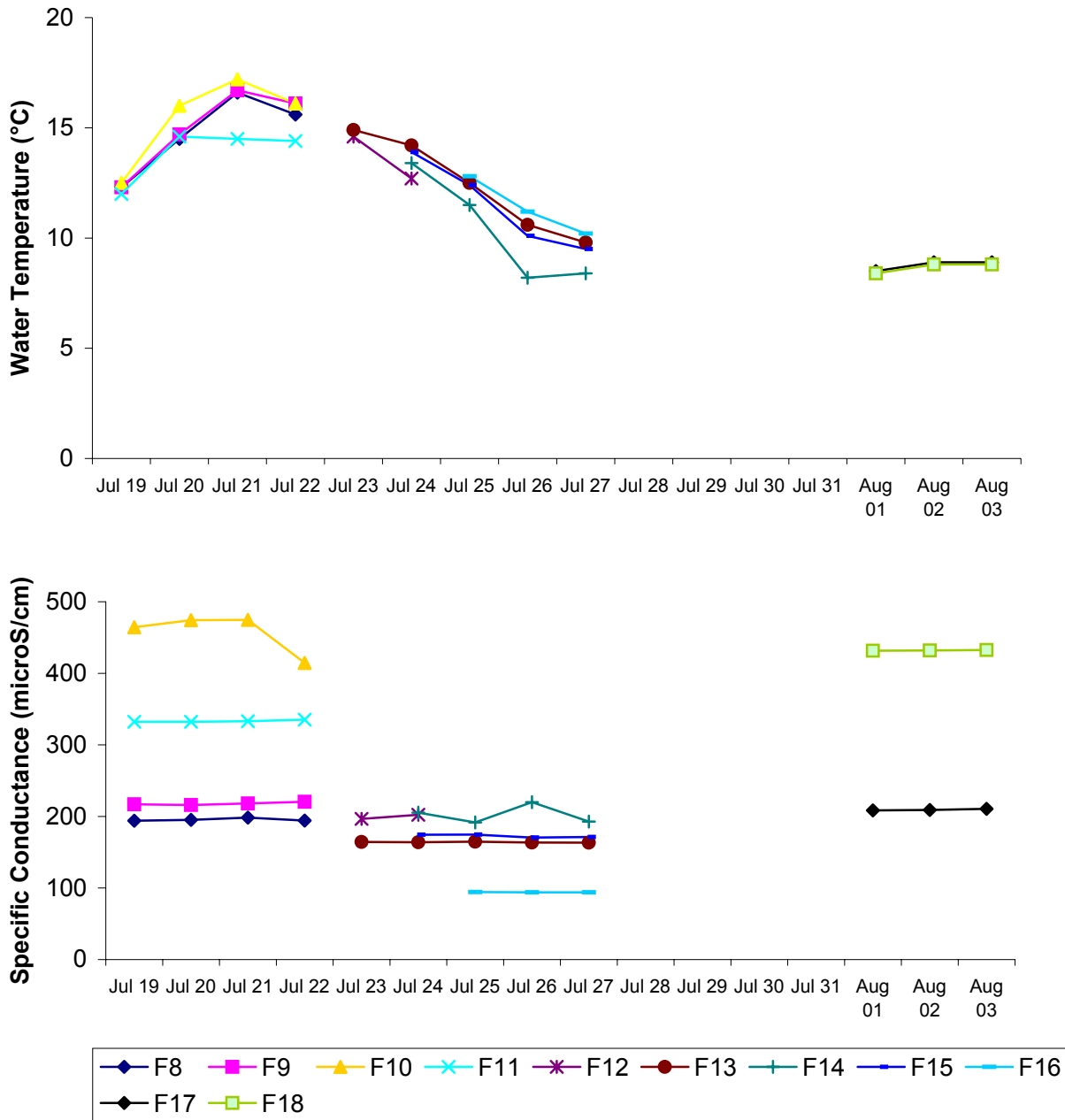


Figure 5. Water temperature and specific conductance at stations sampled in the Alpine West region of eastern NPR-A study area, 2003.

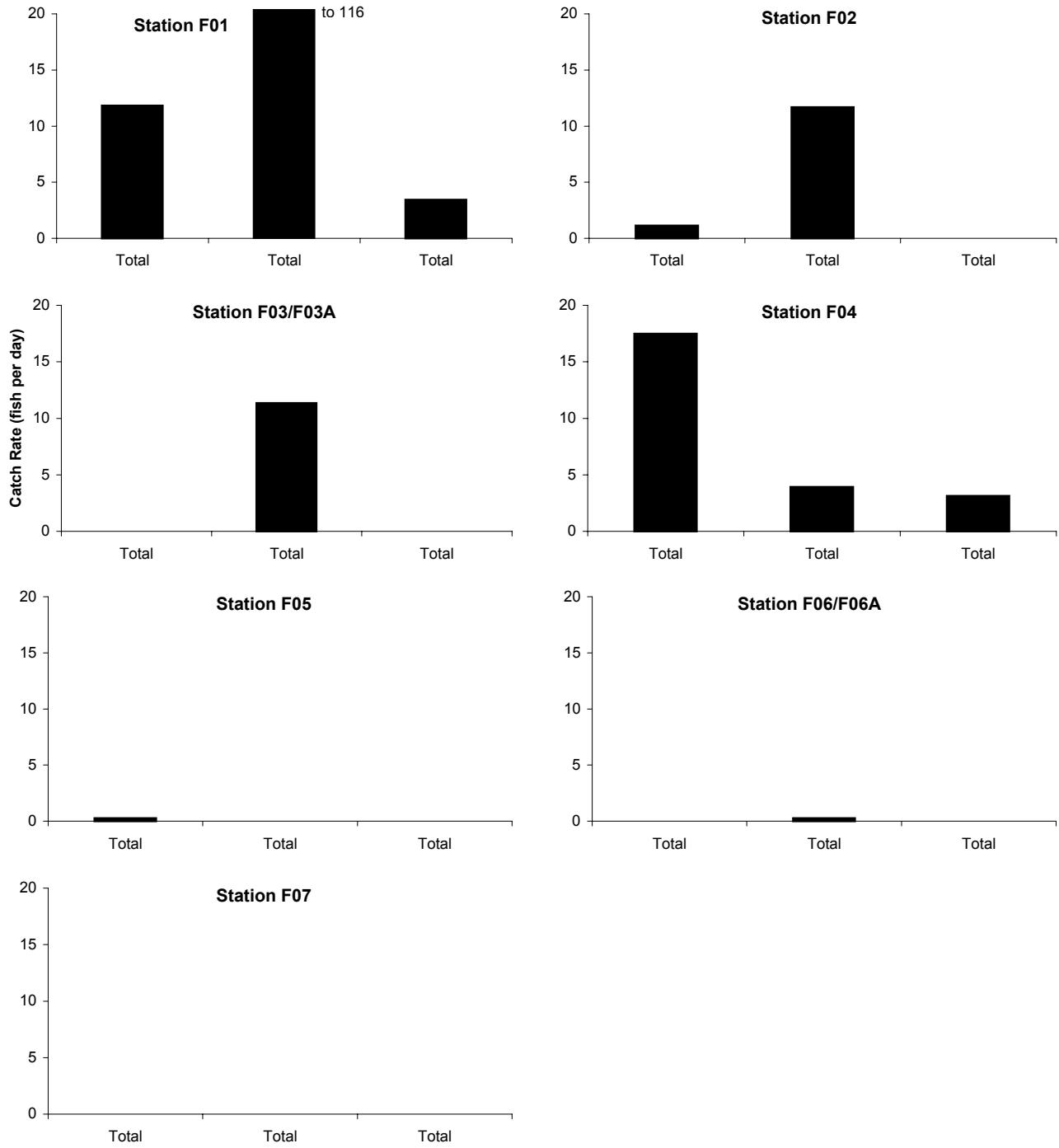


Figure 6. Mean catch rate of Arctic grayling in small streams of eastern NPR-A, 2003.

**APPENDIX A**  
**Water chemistry from fyke net stations**  
**in eastern NPR-A during 2003**

Appendix Table 1. Water chemistry measured at NPR-A small stream sampling sites, 2003

Station	Habitat	Date	Temp (°C)	Dissolved Oxygen		Specific Conductance		Turbidity (NTU)
				(mg/l)	(%)	(microS/cm)	pH	
F01	beaded stream	6/13/2003	3.0	13.83	101.5	98.7	7.43	1.0
		6/14/2003	1.8	13.14	95.1	101.5	7.32	1.4
		6/15/2003	2.9	13.09	96.8	102.8	7.35	1.0
		6/16/2003	3.3	12.87	96.8	102.0	7.37	0.9
		6/17/2003	6.0	12.12	97.1	102.8	7.53	0.9
		6/18/2003	6.6	11.91	98.2	101.8	7.45	0.7
		6/19/2003	5.5	11.92	95.1	89.6	7.50	1.6
		6/20/2003	6.3	12.28	99.7	107.3	7.51	1.0
		6/21/2003	8.7	11.48	93.9	112.0	7.17	0.4
		6/22/2003	10.5	11.06	99.6	107.9	7.48	0.8
		7/10/2003	13.1	9.97	95.4	128.8	7.42	2.5
		7/11/2003	15.3	9.39	92.4	129.7	7.50	1.7
		7/12/2003	14.9	9.09	88.9	131.6	7.53	2.1
		7/13/2003	12.0	9.90	91.7	133.0	7.50	1.8
		7/14/2003					7.66	1.6
		7/15/2003	8.8	10.37	89.2	133.9	7.65	1.3
		7/16/2003	8.3	10.70	91.7	135.2	7.66	1.0
		7/17/2003	7.4	10.96	91.3	136.0	7.59	1.0
		7/18/2003	9.3			136.5	7.58	1.1
		7/19/2003	11.5	10.14	94.4	137.8	7.57	1.5
		7/20/2003	14.3	9.80	96.0	139.4		
		7/21/2003	17.5	9.02	93.5	141.2	7.59	1.3
		8/16/2003	6.5	12.45	102.0	155.4	7.67	1.6
		8/17/2003	6.1	11.94	96.2	149.1	7.60	1.6
		8/18/2003	6.0	11.87	96.2	157.1	7.51	1.5
		8/19/2003	6.0	12.21	98.2	149.9	7.60	1.2
		8/20/2003	5.6	12.67	100.9	150.4	7.61	1.3
		8/21/2003	5.1	12.38	97.7	151.3	7.59	1.3
		8/22/2003	5.5	12.34	98.5	151.9	7.59	1.1
		F02	beaded stream	6/13/2003	6.1	11.92	96.0	136.3
6/14/2003	0.9			13.41	94.3	159.2	7.35	0.9
6/15/2003	3.5			13.10	98.8	176.8	7.40	0.9
6/16/2003	4.0			12.78	97.4	196.4	7.48	0.6
6/17/2003	8.6			11.19	95.9	213.9	7.46	0.6
6/18/2003	8.7			11.51	99.0	230.2	7.50	0.5
6/19/2003	5.0			12.26	95.9	239.8	7.58	0.6
6/20/2003	7.4			11.55	96.2	245.8	7.58	0.6
6/21/2003	10.7			10.86	98.4	253.7	7.60	0.5
6/22/2003	13.0			10.35	98.7	256.9	7.57	0.5
7/10/2003	13.9			10.15	98.8	224.1	7.28	1.4
7/11/2003	16.8			9.68	100.6	228.2	7.58	0.8
7/12/2003	14.7			9.58	94.2	224.7	7.56	1.2
7/13/2003	10.4			11.25	100.9	223.0	7.52	0.9
7/14/2003	11.1			10.39	94.2	224.5	7.73	1.2

Appendix Table 1. Water chemistry measured at NPR-A small stream sampling sites, 2003

Station	Habitat	Date	Temp (°C)	Dissolved Oxygen		Specific Conductance (microS/cm)	pH	Turbidity (NTU)	
				(mg/l)	(%)				
F02	beaded stream	7/15/2003	7.7	11.18	94.6		7.61	0.8	
		7/16/2003	7.3	11.14	92.9	218.6	7.64	0.8	
		7/17/2003	7.2	11.60	96.7	217.7	7.53	0.8	
		7/18/2003	9.1			218.9	7.62	0.7	
F03	beaded stream	6/13/2003	8.0	10.94	92.7	79.1	7.34	0.6	
		6/14/2003	1.4	12.30	87.8	95.6	7.20	0.6	
		6/15/2003	4.1	12.39	94.4	90.2	7.17	0.6	
		6/16/2003	3.1	12.44	94.7	97.5	7.07	0.6	
		6/17/2003	7.4	11.80	98.3	97.6	7.07	0.4	
		6/18/2003	8.3	11.59	98.5	107.2	7.18	0.6	
		6/19/2003	4.0	12.50	95.4	106.4	7.12	0.5	
		6/20/2003	5.3	12.37	97.6	111.7	7.13	0.5	
		6/21/2003	6.9	11.27	93.0	112.9	7.51	0.9	
		6/22/2003	11.6	10.71	98.0	124.7	7.23	0.5	
			7/10/2003	11.9	9.98	93.9	153.6	7.20	0.6
			7/11/2003	15.8	9.53	96.5	162.6	7.39	0.5
			7/12/2003	13.5	9.67	94.5	162.6	7.47	1.2
	7/13/2003	9.7	10.96	95.1	162.5	7.39	0.9		
F03A	perched lake	7/14/2003	12.5	10.55	98.8	85.8	7.98	1.6	
		7/15/2003	10.8	10.51	94.8	86.9	7.85	1.0	
		7/16/2003	9.1	10.50	91.4	92.2	7.58	1.4	
		7/17/2003	8.1	11.15	94.2	89.5	7.72	1.1	
		7/18/2003							
		7/19/2003	10.8	10.62	94.2	88.1	7.72	2.0	
		7/20/2003							
	7/21/2003	16.3	10.32	105.7	88.9	8.14	1.1		
F04	Ublutuoch R.	6/13/2003	3.7	13.42	100.8	100.0	7.52	2.1	
		6/14/2003	3.8	13.02	99.8	99.7	7.43	2.2	
		6/15/2003	4.2	12.38	94.4	101.7	7.41	2.5	
		6/16/2003	4.4	12.03	93.1	103.5	7.37	1.6	
		6/17/2003	6.7	11.79	97.1	101.6	7.36	1.8	
		6/18/2003	7.8	11.87	100.0	102.6	7.43	1.4	
		6/19/2003	7.2	11.15	93.2	103.2	7.47	1.4	
		6/20/2003	8.0	11.42	97.0	104.5	7.50	1.4	
		6/21/2003	9.6	11.33	99.7	105.7	7.51	1.2	
		6/22/2003	11.5	10.85	99.8	107.4	7.52	1.3	
			7/10/2003	13.3	10.15	96.2	106.2	7.52	1.1
			7/11/2003	15.7	9.92	99.5	107.5	7.64	1.0
			7/12/2003	14.9	9.32	91.8	109.5	7.51	1.4
			7/13/2003	13.3	10.16	97.1	111.9	7.60	1.0
			7/14/2003	12.9	10.17	96.6	111.5	7.81	1.4
			7/15/2003	11.0	10.14	91.5	111.7	7.68	1.1
	7/16/2003	10.0	10.41	92.4	111.3	7.68	1.0		

Appendix Table 1. Water chemistry measured at NPR-A small stream sampling sites, 2003

Station	Habitat	Date	Temp (°C)	Dissolved Oxygen		Specific Conductance (microS/cm)	pH	Turbidity (NTU)		
				(mg/l)	(%)					
F04	Ublutuoch R.	7/17/2003	9.4	11.24	98.2	110.8	7.51	1.0		
		7/18/2003								
		7/19/2003	12.1	10.80	101.2	109.7	7.71	1.0		
		7/20/2003	14.1	10.74	102.2	108.9	7.64	1.3		
		7/21/2003	17.5	9.84	102.9	110.0	7.86	1.2		
		8/15/2003	7.7	12.10	102.2	116.6	7.74	1.5		
		8/16/2003	7.4	12.01	100.3	107.1	7.63	1.6		
		8/17/2003	7.0	11.82	97.1	117.6	7.63	1.6		
		8/18/2003	6.9	12.38	101.6	125.0	7.53	1.3		
		8/19/2003	6.8	12.21	100.7	119.6	7.64	1.3		
		8/20/2003	6.1	12.15	98.1	120.3	7.59	1.3		
		8/21/2003	5.5	12.19	96.8	120.6	7.57	1.4		
		8/22/2003	6.1	12.26	98.6	120.3	7.55	1.4		
		F05	beaded stream	6/13/2003						
				6/14/2003	3.2	12.31	92.2	98.7	7.17	1.0
6/15/2003	3.1			12.36	94.6	101.1	7.17	0.6		
6/16/2003	3.7			12.13	91.6	103.5	7.13	0.8		
6/17/2003	6.2			10.60	88.0	106.3	7.07	0.5		
6/18/2003	6.8			11.25	92.2	108.4	7.13	0.8		
6/19/2003	5.0			11.62	91.2	109.7	7.15	0.6		
6/20/2003	6.1			11.16	90.6	110.5	7.17	0.5		
6/21/2003	8.2			10.67	91.2	112.5	7.17	0.4		
6/22/2003	10.5			9.44	85.2	116.6	7.11	0.5		
7/10/2003	12.7			9.44	89.0	112.4	7.21	0.6		
7/11/2003	15.4			8.66	87.4	114.5	7.19	0.7		
7/12/2003	14.9			8.59	85.3	116.7	7.19	0.9		
7/13/2003	12.3			9.46	87.8	119.2	7.28	1.0		
7/14/2003							7.50	0.8		
7/15/2003	9.0			9.83	87.8	116.8	7.36	0.7		
7/16/2003	8.9			10.57	92.4	117.5	7.38	0.8		
7/17/2003	7.5			11.14	94.6	118.4	7.38	1.1		
7/18/2003	9.0			117.2	7.42	0.6				
F06	beaded stream	6/13/2003								
		6/14/2003	3.8	12.60	96.4	81.2	7.26	0.7		
		6/15/2003	2.6	12.91	94.5	84.1	7.12	0.5		
		6/16/2003	3.6	12.89	95.8	84.1	7.09	0.5		
		6/17/2003	7.5	11.46	95.2	82.6	7.06	0.7		
		6/18/2003	7.9	11.58	100.7	83.0	7.14	0.5		
		6/19/2003	5.1	12.24	96.2	85.8	7.13	0.5		
		6/20/2003	7.2	11.30	93.4	88.8	7.14	0.7		
		6/21/2003	10.3	10.72	96.7	90.0	7.10	0.5		
		6/22/2003	12.4	9.67	90.4	91.8	7.11	0.4		



Appendix Table 1. Water chemistry measured at NPR-A small stream sampling sites, 2003

Station	Habitat	Date	Temp (°C)	Dissolved Oxygen		Specific Conductance		Turbidity (NTU)
				(mg/l)	(%)	(microS/cm)	pH	
F06A	perched lake	7/10/2003	14.2	10.45	102.4	66.9	7.56	0.8
		7/11/2003	15.8	10.49	104.6	66.5	7.64	0.8
		7/12/2003	13.8	9.94	98.0	70.2	7.28	1.0
		7/13/2003	13.8	10.55	102.0	68.9	7.47	0.7
		7/14/2003	13.0	10.09	96.5	71.6	7.62	0.9
		7/15/2003	11.4	10.27	93.7	72.0	7.44	0.7
		7/16/2003	9.9	10.07	89.3	76.7	7.50	0.7
		7/17/2003	10.4	10.82	96.6	72.0	7.62	1.0
		7/18/2003	10.1			71.7	7.62	0.8
F07	beaded stream	6/13/2003						
		6/14/2003						
		6/15/2003						
		6/16/2003						
		6/17/2003	5.1	10.74	85.8	88.9	6.75	1.2
		6/18/2003	5.7	11.98	95.8	90.6	6.73	1.0
		6/19/2003	4.1	12.28	95.3	92.9	6.80	0.6
		6/20/2003	5.4	11.50	92.5	93.8	6.78	0.5
		6/21/2003	7.1	10.27	85.5	92.4	6.71	0.4
		6/22/2003	9.2	9.72	84.9	95.8	6.71	0.3
		7/10/2003	12.0	8.84	82.4	111.6	6.86	0.6
		7/11/2003	14.4	7.86	76.6	114.6	6.92	0.6
		7/12/2003	13.5	8.70	84.7	115.1	6.96	0.9
		7/13/2003	10.6	9.50	85.5	117.2	6.97	0.7
		7/14/2003					7.09	0.7
		7/15/2003	7.8	11.47	96.6	115.3	6.97	0.7
		7/16/2003	8.0	11.50	97.2	113.9	6.99	0.5
		7/17/2003	6.4	11.19	91.2	115.1	6.99	0.5
		7/18/2003	8.0	10.32	88.1	115.2	7.04	0.5

Appendix Table A-2. Water chemistry measured at Alpine West fyke net sampling sites, 2003

Station	Habitat	Date	Temp (°C)	Dissolved Oxygen		Specific Conductance		Turbidity (NTU)
				(mg/l)	(%)	(microS/cm)	pH	
F08	tundra lake	7/19/2003	12.3	11.23	103.6	194.1	8.04	0.5
		7/20/2003	14.5	10.50	106.2	195.1	8.05	1.3
		7/21/2003	16.6	10.12	105.2	198.3	8.24	0.6
		7/22/2003	15.6	9.49	95.6	194.3	8.09	0.9
F09	tundra lake	7/19/2003	12.3	10.78	101.9	217.0	8.21	0.7
		7/20/2003	14.7	11.25	111.1	216.0	8.27	1.0
		7/21/2003	16.7	10.28	106.7	218.2	8.51	0.9
		7/22/2003	16.1	9.78	99.8	220.6	8.45	0.8
F10	backwater off Nigliq channel	7/19/2003	12.5	10.83	101.9	464.4	8.06	11.9
		7/20/2003	16.0	11.03	108.2	474.2	8.11	15.1
		7/21/2003	17.2	10.26	104.2	474.7	8.22	13.8
		7/22/2003	16.1	9.25	92.6	414.6	8.21	18.2
F11	perched lake	7/19/2003	12.0	10.30	100.2	332.2	7.89	0.7
		7/20/2003	14.6	10.75	105.6	332.2	8.09	0.9
		7/21/2003	14.5	10.14	99.3	333.0	7.87	1.0
		7/22/2003	14.4	9.07	94.1	335.3	8.02	1.5
F12	tundra lake	7/23/2003	14.6	10.05	97.9	196.7	8.05	3.9
		7/24/2003	12.7	10.02	95.1	202.3	8.30	0.8
F13	perched lake (L9306)	7/23/2003	14.9	10.34	102.0	164.4	7.88	1.3
		7/24/2003	14.2	9.68	94.1	163.9	7.93	1.7
		7/25/2003	12.5	9.99	93.7	164.7	7.66	1.4
		7/26/2003	10.6	11.01	99.7	163.6	7.72	1.7
		7/27/2003	9.8	11.00	97.7	163.5	7.66	3.6
F14	tapped lake	7/24/2003	13.4	10.11	97.1	205.3	8.23	9.5
		7/25/2003	11.5	10.03	92.0	191.6	8.15	9.7
		7/26/2003	8.2	11.18	94.8	220.0	8.25	7.5
		7/27/2003	8.4	11.20	96.2	192.8	8.19	9.6
F15	side channel	7/24/2003	13.9	9.96	96.9	174.5	8.25	9.4
		7/25/2003	12.4	9.95	93.3	174.6	8.20	8.1
		7/26/2003	10.1	10.36	92.2	170.4	8.21	10.8
		7/27/2003	9.5	10.86	95.6	171.3	8.20	11.4
F16	perched lake (L9305)	7/25/2003	12.8	9.45	88.7	94.4	7.28	1.8
		7/26/2003	11.2	9.95	90.5	94.0	7.30	1.9
		7/27/2003	10.2	10.27	91.1	94.0	7.33	2.5
F17	perched lake (L9304)	8/1/2003	8.5	11.88	100.4	208.4	7.88	0.8
		8/2/2003	8.9	11.94	103.5	209.1	7.87	1.2
		8/3/2003	8.9	11.32	98.2	210.5	7.75	1.2
F18	perched lake (M9932)	8/1/2003	8.4	11.46	98.1	431.5	7.81	0.9
		8/2/2003	8.8	11.62	99.2	432.0	7.84	1.4
		8/3/2003	8.8	11.56	99.5	432.5	7.72	2.1

**APPENDIX B**  
**Fish caught by fyke net**  
**in eastern NPR-A during 2003**

Appendix Table B-1. Daily fish catches from sampling with fyke nets in NPR-A streams during June 2003.

Station F01										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling	7	1	5	7	13	7	8	26	31	105
Burbot										0
Alaska blackfish	1								1	2
Slimy sculpin										0
Ninespine stickleback	56	62	32	56	20	15	22	57	49	369
Effort (hrs)	20.2	25.2	23.3	25.3	25.0	21.8	23.9	24.5	24.1	213.3

Station F02										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish						1				1
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling				1	1	2		4	2	10
Burbot										0
Alaska blackfish										0
Slimy sculpin										0
Ninespine stickleback			7	12	1	8		4	3	35
Effort (hrs)	20.3	25.3	23.9	25.3	25.2	21.7	24.1	25.3	23.8	214.7

Station F03										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Alaska blackfish	2	1	1	2	5	2	4	6	9	32
Slimy sculpin										0
Ninespine stickleback	45	7	16	46	12	10	26	10	69	241
Effort (hrs)	20.1	24.4	22.6	25.4	24.8	22.0	23.8	24.5	23.9	211.6

Station F04										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish								1	1	2
Humpback whitefish								1		1
Least cisco										0
Round whitefish										0
Arctic grayling	15	2		10	13	1	6	49	61	157
Burbot										0
Alaska blackfish										0
Slimy sculpin								1		1
Ninespine stickleback	5	20	11	24	37	117	62	2	3	281
Effort (hrs)	20.1	25.7	24.6	25.5	25.2	21.8	23.8	24.5	24.4	215.5

Appendix Table B-1. Daily fish catches from sampling with fyke nets in NPR-A streams during June 2003.

Station F05										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling					1				1	2
Burbot										0
Alaska blackfish		2	1			1	2	4	7	17
Slimy sculpin										0
Ninespine stickleback		457	733	2890	235	190	175	1100	3030	8810
Effort (hrs)		19.4	23.8	25.3	25.3	21.8	23.9	24.4	23.8	187.8

Station F06										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Alaska blackfish		1	2	1	1	2	1	5	19	32
Slimy sculpin										0
Ninespine stickleback		9	44	88	33	20	12	57	82	345
Effort (hrs)		19.3	25.3	25.0	25.0	21.8	23.8	24.6	24.0	188.8

Station F07										
Species	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jun 20	Jun 21	Jun 22	June Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Alaska blackfish						1	2	2	3	8
Slimy sculpin										0
Ninespine stickleback					27	58	51	165	165	466
Effort (hrs)					25.5	21.8	23.8	24.5	23.8	119.4

Appendix Table B-2. Daily fish catches from sampling with fyke nets in NPR-A streams during July 2003.

Station F01												
Species	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	July Total
Broad whitefish	1								1		1	3
Humpback whitefish												0
Least cisco			1	2								3
Round whitefish												0
Arctic grayling	245	195	108	109	37	39	48	30	144	153	158	1266
Burbot												0
Alaska blackfish												0
Slimy sculpin	1				1	1			1	11		15
Ninespine stickleback			4				8		1		1	14
Effort (hrs)	24.2	22.1	23.2	25.1	22.6	24.1	22.3	26.3	21.0	23.6	25.9	260.3

Station F02												
Species	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	July Total
Broad whitefish		1										1
Humpback whitefish												0
Least cisco												0
Round whitefish												0
Arctic grayling	25	10	21	23	7		4	3				93
Burbot												0
Alaska blackfish				1								1
Slimy sculpin	1	1		2	1	1	6	1				13
Ninespine stickleback	17	3	1	7	1	1	3	3				36
Effort (hrs)	27.2	22.9	23.4	28.8	19.6	21.8	25.3	22.0				191.1

Station F03/F03A												
Species	F3			F3A								July Total
	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	
Broad whitefish				5		2		14		27	97	145
Humpback whitefish									2	1	1	4
Least cisco				24		3	1	3	1	6	10	48
Round whitefish				1		1				1		3
Arctic grayling				13	5	15	6	3	1	15	66	124
Burbot										1		1
Alaska blackfish	1		1		2			2		1	4	11
Slimy sculpin												0
Ninespine stickleback	65	41	43	26	8	29	9	67	76	46	32	442
Effort (hrs)	24.9	24.0	23.9	24.8	18.4	27.1	19.4	26.3	20.9	23.1	29.3	262.2

Station F04												
Species	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	July Total
Broad whitefish										1	3	4
Humpback whitefish												0
Least cisco	1		1									2
Round whitefish										1		1
Arctic grayling	1	1	9	14	2	3	5	5	1	2	1	44
Burbot												0
Alaska blackfish												0
Slimy sculpin					8							8
Ninespine stickleback	10	8		2		1					3	24
Effort (hrs)	27.4	23.8	24.9	27.8	19.7	23.8	22.6	25.5	22.2	23.5	27.8	269.2

Appendix Table B-2. Daily fish catches from sampling with fyke nets in NPR-A streams during July 2003.

Station F05												
Species	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	July Total
Broad whitefish												0
Humpback whitefish												0
Least cisco												0
Round whitefish												0
Arctic grayling												0
Burbot												0
Alaska blackfish			1		1							2
Slimy sculpin												0
Ninespine stickleback		2	33		18	6	2	8				69
Effort (hrs)	24.0	22.2	17.7		48.1	24.2	22.4	23.9				182.5

Station F06A												
Species	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	July Total
Broad whitefish												0
Humpback whitefish												0
Least cisco												0
Round whitefish												0
Arctic grayling			1	1								2
Burbot												0
Alaska blackfish				2	2							4
Slimy sculpin												0
Ninespine stickleback	1226	22	58	224	107	18	12	20				1687
Effort (hrs)	27.0	22.9	24.6	26.9	19.6	23.6	23.5	21.2				189.3

Station F07												
Species	Jul 11	Jul 12	Jul 13	Jul 14	Jul 15	Jul 16	Jul 17	Jul 18	Jul 19	Jul 20	Jul 21	July Total
Broad whitefish												0
Humpback whitefish												0
Least cisco												0
Round whitefish												0
Arctic grayling												0
Burbot												0
Alaska blackfish	4			1	1	1	1	1				9
Slimy sculpin												0
Ninespine stickleback	300	171	183	139	55	30	7	5				890
Effort (hrs)	23.9	25.3	23.3	28.0	20.1	24.3	22.2	24.2				191.3

Appendix Table B-3. Daily fish catches from sampling with fyke nets in NPR-A streams during August 2003.

Station F01								August
Species	Aug 16	Aug 17	Aug 18	Aug 19	Aug 20	Aug 21	Aug 22	Total
Broad whitefish								0
Humpback whitefish								0
Least cisco								0
Round whitefish								0
Arctic grayling	6	4	1		3	5	4	23
Burbot						1		1
Alaska blackfish								0
Slimy sculpin								0
Ninespine stickleback							8	8
Effort (hrs)	22.7	23.5	22.8	23.0	22.3	21.5	25.3	161.2

Station F04								August
Species	Aug 16	Aug 17	Aug 18	Aug 19	Aug 20	Aug 21	Aug 22	Total
Broad whitefish								0
Humpback whitefish								0
Least cisco								0
Round whitefish							1	1
Arctic grayling	3	2		5	8	2	1	21
Burbot								0
Alaska blackfish								0
Slimy sculpin								0
Ninespine stickleback								0
Effort (hrs)	22.3	23.6	21.8	24.4	22.1	21.4	25.4	161.0



Appendix Table B-4. Fish caught by fyke net in the Alpine West region of eastern NPR-A during 2003.

Station F08										
Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Rainbow smelt										0
Longnose sucker										0
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback	1	32	203	68						304
Effort (hrs)	24.4	23.3	23.8	29.3						100.7

Station F09										
Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Rainbow smelt										0
Longnose sucker										0
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback	112	460	201	165						938
Effort (hrs)	23.4	23.8	22.7	28.0						98.0

Station F10										
Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish		5	10	22						37
Humpback whitefish		2								2
Least cisco	2	3		8						13
Round whitefish		2	1	1						4
Arctic grayling	2	13								15
Burbot			2	1						3
Rainbow smelt										0
Longnose sucker	129	34	43	206						412
Alaska blackfish										0
Fourhorn sculpin			1							1
Slimy sculpin										0
Ninespine stickleback		11	19							30
Effort (hrs)	23.7	23.6	21.6	31.6						100.4

Appendix Table B-4. Fish caught by fyke net in the Alpine West region of eastern NPR-A during 2003.

Station F11

Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish										0
Humpback whitefish										0
Least cisco	1			2						3
Round whitefish										0
Arctic grayling										0
Burbot										0
Rainbow smelt										0
Longnose sucker										0
Alaska blackfish		9	9	12						30
Fourhorn sculpin										0
Slimy sculpin				1						1
Ninespine stickleback	14	304	160	598						1076
Effort (hrs)	23.1	24.1	20.4	33.6						101.2

Station F12

Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Rainbow smelt										0
Longnose sucker										0
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback				6	23					29
Effort (hrs)				19.0	22.2					41.2

Station F13

Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish					4	4	3	4		15
Humpback whitefish										0
Least cisco					15	8	3		4	30
Round whitefish										0
Arctic grayling										0
Burbot						1				1
Rainbow smelt										0
Longnose sucker										0
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback					6	3	17	12	60	98
Effort (hrs)					16.8	24.1	22.3	24.0	25.0	112.1

Appendix Table B-4. Fish caught by fyke net in the Alpine West region of eastern NPR-A during 2003.

Station F14

Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish						4	7	46	7	64
Humpback whitefish										0
Least cisco						2			1	3
Round whitefish						4	3	4	1	12
Arctic grayling						4	1		1	6
Burbot						1	1			2
Rainbow smelt										0
Longnose sucker						2	4	18	2	26
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback						1		3	1	5
Effort (hrs)						26.8	22.9	24.4	25.4	99.5

Station F15

Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish						21	15	6	4	46
Humpback whitefish							1	1		2
Least cisco						5	2		2	9
Round whitefish						16	11	1		28
Arctic grayling						2				2
Burbot										0
Rainbow smelt								1		1
Longnose sucker						8				8
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback						1			1	2
Effort (hrs)						24.9	22.3	24.2	25.2	96.7

Station F16

Species	Jul 19	Jul 20	Jul 21	Jul 22	Jul 23	Jul 24	Jul 25	Jul 26	Jul 27	Total
Broad whitefish										0
Humpback whitefish										0
Least cisco										0
Round whitefish										0
Arctic grayling										0
Burbot										0
Rainbow smelt										0
Longnose sucker										0
Alaska blackfish										0
Fourhorn sculpin										0
Slimy sculpin										0
Ninespine stickleback							250	2900	0	3150
Effort (hrs)							24.0	24.9	24.9	73.8

Appendix Table B-4. Fish caught by fyke net in the Alpine West region of eastern NPR-A during 2003.

Station F17

Species	Aug 01	Aug 02	Aug 03	Total
Broad whitefish				0
Humpback whitefish				0
Least cisco	1	1	1	3
Round whitefish				0
Arctic grayling				0
Burbot				0
Rainbow smelt				0
Longnose sucker				0
Alaska blackfish				0
Fourhorn sculpin				0
Slimy sculpin		3	1	4
Ninespine stickleback	7	151	37	195
Effort (hrs)	20.6	23.1	24.3	67.9

Station F18

Species	Aug 01	Aug 02	Aug 03	Total
Broad whitefish		2		2
Humpback whitefish				0
Least cisco		2		2
Round whitefish				0
Arctic grayling				0
Burbot				0
Rainbow smelt				0
Longnose sucker				0
Alaska blackfish				0
Fourhorn sculpin				0
Slimy sculpin				0
Ninespine stickleback	8	13		21
Effort (hrs)	20.8	23.4	24.2	68.5

**APPENDIX C**  
**Length frequencies of fish caught by fyke net**  
**in eastern NPR-A during 2003**

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net during 2003.

Fork Length (mm)	F01			F02		F03A	F04			F05	F06A	F10	F14	F15
	June	July	August	June	July	July	June	July	August	July	July	July	July	July
0														
10														
20														
30			1											
40														
50		1						9						
60		150		1	14	11	5	5				1		
70		529	2		33	18	1	7	1		1			1
80		207	5	1	10	13	19	2	4					1
90	12	20	7	1	3	4	40		1					
100	22	32	2	3		2	19			1		1		
110	11	86			3	7	6						1	
120	7	55	1	2	3	19	4	1				3		
130	8	15	1		2	19	5							
140	2	14			2	9	4	1						
150	7	6	1			3	1					2	1	
160	3	9				6	2							
170	8	17				9		2				1		
180	4	7	1			4	1							
190	1	6				1	1							
200		3					2					2		
210	2	3						2				1	2	
220	2	2					2	1				1		
230		8					2						1	
240	1	1	1				3					1		
250	1	3					5					1		
260	2	3					4	1	1	1				
270	2	3					3							
280	1	2				1	3	1	1					
290	2	3					2							
300	2	1					2							
310	1	5					3					1		
320	1	2					4						1	
330		4	1				2	2						
340	1	3					1							
350		3						1	1					
360		3					1	1						
370	1	3												
380	1	1						1						
390														
400								1						
410		1						1						
420														
430														
440														
450														
Total:	105	1211	23	8	70	126	156	30	20	2	1	15	6	2
Effort (hrs):	213.3	260.3	161.2	214.7	191.1	189.4	215.5	269.2	161.0	182.5	189.3	100.4	99.5	96.7

Appendix Table C-2. Length frequencies of broad whitefish caught by fyke net during 2003.

Fork Length (mm)	F01		F02		F03A		F04		F10	F13	F14	F15	F18
	July	June	July	July	June	July	July	July	July	July	July	July	July
0													
10													
20													
30								16			3	3	
40								5		18	7	7	
50								2	1	1	4	4	
60													
70					1			1					
80					4			2	2	4	4	4	
90			1		14		1	2		12	3	3	
100					45		2	2		12			
110	2				32			1	2	4	2	2	1
120		1			7			1	1	1	3	3	
130					5			2		1	6	6	
140					5			1		5	6	6	
150					8			1		2			
160					6			2			2	2	
170					13			1			2	2	
180					2								
190											1	1	
200													
210										1			
220										1			
230													
240													
250												2	
260													
270													
280													
290								1					
300													
310													
320													
330													
340										1			
350										1			
360													
370													
380										2		1	
390													
400													
410													
420													
430													
440													
450													
460													
470										1			
480													
490													
500													
510													
520	1					1							1
530													
540													
550													
Total:	3	1	1	143	2	4	38	15	64	46	2		
Effort (hrs):	260.3	214.7	191.1	189.4	215.5	269.2	100.4	112.1	99.5	96.7	68.5		

Appendix Table C-3. Length frequencies of humpback whitefish caught by fyke net during 2003.

Fork Length (mm)	F03A	F04	F10	F15
	July	June	July	July
0				
10				
20				
30				
40				
50				
60				
70				
80	1		1	
90				
100				
110	1			
120				
130				
140			1	
150				
160				
170				
180				
190				
200				
210				
220				
230				
240				
250				
260				
270				1
280				
290				
300				
310				
320				
330				
340				
350				1
360				
370	1	1		
380				
390				
400	1			
410				
420				
430				
440	1			
450				
460				
470				
480				
490				
500				
Total:	5	1	2	2
Effort (hrs):	189.4	215.5	100.4	96.7



Appendix Table C-4. Length frequencies of round whitefish caught by fyke net during 2003.

Fork Length (mm)	F03A	F04		F10	F14	F15
	July	July	August	July	July	July
0						
10						
20						
30						
40					1	4
50					1	2
60						
70				1	1	
80					4	9
90					1	5
100						2
110						2
120				1		2
130						1
140						
150		1				
160			1			
170					1	
180				1		
190				1	2	
200						1
210					1	
220						
230						
240						
250						1
260						
270						
280						
290						
300						
310						
320						
330						
340						
350						
360	3					
370						
380						
390						
400						
410						
420						
430						
440						
450						
460						
470						
480						
490						
500						
Total:	3	1	1	4	12	29
Effort (hrs):	189.4	269.2	161.0	100.4	99.5	96.7

Appendix Table C-5. Length frequencies of least cisco caught by fyke net during 2003.

Fork Length (mm)	F01 July	F03A July	F04 July	F10 July	F11 July	F13 July	F14 July	F15 July	F17 July	F18 July
0										
10										
20										
30										
40										
50										
60						2				
70		3		1	1					
80		3		3		4		1	1	
90		4		1		5	1	2		
100		2				5		1		
110		4				1	1		1	
120										
130		10								
140		2		1		2		2		
150		2								
160		4	1	1		1	1	1		
170		2		1				1		
180		4		1						
190		3		1						
200		3		1				1		
210		3		1						
220		1								
230	1	2								
240										
250										
260		1				2				1
270		2		2		1				
280										
290		1				1			1	1
300		1				5				
310						1				
320						1				
330		3				1				
340		1								
350		1								
360										
370		4								
380		3								
390		1								
400		2								
410										
420										
430										
440										
450										
Total:	1	72	1	14	3	30	3	9	3	2
Effort (hrs):	260.3	189.4	269.2	100.4	101.2	112.1	99.5	96.7	67.9	68.5

Appendix Table C-6. Length frequencies of burbot caught by fyke net during 2003.

Fork	F01	F03A	F10	F13	F14
Fork Length (mm)	August	July	July	July	July
0					
10					
20					
30					
40					
50					
60					
70					
80					
90			1		
100			1	1	
110		1			
120			1		
130	1				1
140					
150					
160					
170					
180					1
190					
200					
210					
220					
230					
240					
250					
Total:	1	1	3	1	2
Effort (hrs):	161.2	189.4	100.4	112.1	99.5

Appendix Table C-7. Length frequencies of longnose sucker caught by fyke net during 2003.

Fork Length (mm)	F10 July	F14 July	F15 July
0			
10			
20			
30			
40			
50			
60			
70		1	
80			
90			
100	5		
110	14	2	1
120	11		1
130	15	1	
140	13	1	1
150	10		
160	15		
170	8		
180	6		
190	6		
200	5		
210	2		
220	4		
230			
240	2		
250	1		
260	3		
270	6	1	
280	5		
290	4		
300	11		
310	12		
320	13		
330	15	1	
340	16		1
350	25	1	
360	18		1
370	19	1	
380	20	1	
390	29	1	1
400	24	4	1
410	19	1	
420	15	4	1
430	11	1	
440	7	3	
450	8		
460	8	1	
470	3		
480	1	1	
490	1		
500			
510			
520			
530			
540			
550			
Total:	410	26	8
Effort (hrs):	100.4	99.5	96.7

Appendix Table C-8. Length frequencies of Alaska blackfish caught by fyke net during 2003.

Fork Length (mm)	F01	F02	F03		F03A	F05		F06	F06A	F07		F11
	June	June	June	July	July	June	July	June	July	June	July	July
0												
10												
20						1						
30									1		1	
40			7			1		6		4	3	
50			3		1	2		6	2		2	1
60		1	3			5	1	5			1	2
70	1		3		1	2		2		1	1	4
80			4	1	1	1	1	1		2		12
90			5		2			3				11
100		1	5		2			2		1		
110			2		4	2		2				
120					1	3						
130				1				1				
140	1							2				
150								2				
160												
170												
180												
190												
200												
210												
220												
230												
240												
250												
260												
270												
280												
290												
300												
Total:	2	2	32	2	12	17	2	32	3	8	8	30
Effort (hrs):	213.3	214.7	211.6	72.8	189.4	187.8	182.5	188.8	189.3	119.4	191.3	101.2

Appendix Table C-9. Length frequencies of slimy sculpin caught by fyke net during 2003.

Fork	F01	F02	F04		F11	F17
Fork Length (mm)	July	July	June	July	July	July
0						
10						
20					8	
30		1		1		
40		3				3
50		5				
60	3	2			1	1
70	2					
80			1			
90						
100						
110						
120						
130						
140						
150						
160						
170						
180						
190						
200						
210						
220						
230						
240						
250						
Total:	5	11	1	9	1	4
Effort (hrs):	260.3	191.1	215.5	269.2	101.2	67.9