FISH POPULATIONS IN STREAMS TO BE CROSSED BY A PROPOSED ROAD TO THE GMT-1 WELL PAD IN EASTERN NPR-A: 2013

Final Report

February 2014

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Prepared for:
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EXECUTIVE SUMMARY

During summer 2013, fyke nets were used to sample two stream crossings (Tingmiaqsiugvik [Ublutuoch River] and Barely Creek) along the proposed road to the GMT-1 well pad. Sampling was by fyke net so that fish could be released unharmed. Fyke nets were arranged to sample fish moving both upstream and downstream and were emptied daily. Fish were measured and released. Fish longer than 180 mm were tagged to evaluate movement patterns within the drainage system and to reveal the extent to which fish caught in the study area contribute to the subsistence catch.

Sampling began in June as stream flows were receding from peak break-up flows. At the onset of sampling on June 12, the channel ice had melted and water temperatures had reached 3°C in the Tingmiaqsiugvik (Ublutuoch River). Subsequently, temperatures increased rapidly to near 10-13°C. Water temperatures generally decreased during the July sampling, beginning near 15 to 16°C and dropping to around 10-13°C. By late August, water temperatures ranged around 6 to 7°C

Species Composition

Substantial differences in species composition were found in fish using small drainages of eastern NPR-A. Ten species were captured, with least cisco the most abundant species, followed by arctic grayling. The Tingmiaqsiugvik (Ublutuoch River) produced the most diverse catch, with nine species caught in June and July combined. Barely Creek produced only Alaska blackfish, ninespine stickleback, and a pair of arctic grayling. These results are consistent with previous sampling in these two streams, with the Tingmiaqsiugvik (Ublutuoch River) showing the greatest diversity and Barely Creek the least.

Seasonal Distribution

In June, catches in the Tingmiaqsiugvik (Ublutuoch River) were primarily arctic grayling, which comprised 76 percent of the catch. In July, the proportion of grayling decreased to 16 percent of the catch at the same station. Most of the grayling in the Tingmiaqsiugvik (Ublutuoch River) during June were immature fish, with 66 percent less than 250mm.

At the Tingmiaqsiugvik (Ublutuoch River), broad whitefish, humpback whitefish and least cisco increased in abundance from June to July. Round whitefish increased slightly during the first two sampling periods, but had a larger increase in the last sampling period. The increase in least cisco during July was caused by smaller fish moving into the study reach, while lengths of round whitefish were similar in all study periods. Burbot were only caught during August and this was the first year that burbot were caught at fyke net stations in the Tingmiaqsiugvik (Ublutuoch River). Three adult male chum salmon were also captured in August.

Catches of both Alaska blackfish and ninespine stickleback in Barely Creek were higher during July than in June. Ninespine stickleback covered a similar size range in both June and July.

Tag Returns

Tags were applied to 780 fish, with all being released in the Tingmiaqsiugvik (Ublutuoch River). Arctic grayling were 59% of the releases, followed by humpback whitefish, broad whitefish, round whitefish and least cisco. An arctic grayling released in 2009 from the Crea Creek station was recaptured. An additional grayling tagged in 2006 was recaptured at the Tingmiaqsiugvik (Ublutuoch River) station. These were the only two recaptures from fish tagged in previous years, despite release of over 2,400 tagged arctic grayling between 2001 and 2009. In previous years, around 300 broad whitefish, 430 humpback whitefish, 120 round whitefish, and 160 least cisco had been released in the Fish Creek/Tingmiaqsiugvik system, but none were recaptured in 2013.

Arctic Grayling Swimming Rates

In 2013, one grayling moved between stations U0901 and U1301, a distance of 3.9 kilometers, in 2 hrs 20 minutes, or a rate of approximately 40 km/day. While it is unlikely that the fish would have kept moving at this rate all day, it does reveal that these fish have the capability to move rapidly within the Fish Creek drainage. Other examples of high movement rates were a grayling that moved from Crea Creek to Bill's Creek (21.6 km) in 20 hours (26 km/day), and from U0901 to U1302 (11.9 km) in just over 23 hrs (12 km/day). While 58% of the observed movement rates were 1 km/day or less, rates between 2 to 5 km/day were relatively common.

Estimates of Arctic Grayling and Broad Whitefish

Consistent and high recapture rates of tagged arctic grayling allowed estimating the number of fish likely entering the study area during summer. Two estimating models were used, the Schnabel method and the Schumacher-Eschmeyer method. Estimates of arctic grayling entering the study area were similar in both 2004 and 2005 for both estimating models, which indicated that between 4,100 and 4,400 grayling in excess of 180 mm fork length likely used the study area. The estimate decreased to between 3,250 to 3,350 fish in 2006, and was in a similar range in 2013 (3,270 to 4,455 fish).

An estimated annual average of 365 broad whitefish entered the study area from 2004-2006, with annual estimates ranging from 163 to 506 fish. The estimate of 509 broad whitefish using the study area in 2013 was similar to the 506 fish estimated in 2006.

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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. A road has been proposed to access well sites in the Greater Moose's Tooth Unit (GMTU), with the proposed road route crossing several streams (Figure 1). Information on fish populations that use the streams crossed by the proposed road will be needed to evaluate potential effects of the stream crossings. This report documents the second year of a 3-year study required by Required Operating Procedure E-14 of the Bureau of Land Management's July 2008 Record of Decision for the Northeast National Petroleum Reserve – Alaska Supplemental Integrated Activity Plan.

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 (Ublutuoch River) was also reported to contain arctic grayling, slimy sculpin and ninespine stickleback.

Detailed study of streams in this region began in 2001 as the first detailed examination of fish habitats and populations in the eastern NPR-A study area (Moulton 2002, 2003, 2005, 2006, 2009; Moulton and Seigle 2007). 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 goal of the present study effort is to develop information needed to monitor fish populations using streams crossed by the proposed road so that changes, if any, in fish use of the drainage systems after field development can be evaluated.

Specific objectives of the 2013 fish survey were to conduct studies on streams along the proposed road alignment to:

a) obtain information on the composition and seasonal distribution of fish populations within the drainages, and
b) obtain information on fish movements within the drainages.

METHODS

Biological Sampling

During summer 2013, fyke nets were used to sample two stream crossings along the proposed road (Figures 1 and 2). Both streams had previously been sampled at various times, beginning in 2001. Sampling was in the Tingmiaqsiugvik (Ublutuoch River) was conducted during three time periods in 2013, while one of its tributaries, Barely Creek, was sampled during June and four days in July (Table 1). Sampling at Barely Creek was suspended after four days of sampling in July because of low flow, and was not sampled during August. Crea Creek was not sampled in 2013 at the request of BLM, which was continuing a special study of that tributary and requested that CPAI not sample the stream to minimize stress on sampled fish.

Sampling was by fyke net so that fish could be released unharmed. 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. Fyke nets were arranged to sample fish moving both upstream and downstream and were emptied daily. Fish were measured and released, except for fish retained for a separate study of potential contaminants in subsistence foods being conducted by ERM on behalf of ConocoPhillips Alaska Inc. Duration of each set was recorded to allow calculating catch rates.

Fish longer than 180 mm fork length were tagged to evaluate movement patterns within the drainage system and to reveal the extent to which fish caught in the study area contribute to the subsistence catch. Floy FD-94 anchor tags (monofilament = 1/2 inch, vinyl = 3/4 inch) were applied to whitefish, cisco, and burbot. Recapture was monitored in research sampling within the eastern NPR-A study area and in the Nuiqsut subsistence fishery.

BLM has been applying passive integrated transponder (PIT) tags to arctic grayling and supplied us with a tag detector to assist with tag detection in our study areas.

Water Chemistry Sampling

Water chemistry parameters were measured to assess habitat conditions during summer. Water chemistry measurements included surface measures of water temperature, specific conductance, pH, and turbidity. Temperature and specific conductance 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 about 15 cm below 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 a LaMotte Model 2020 turbidity meter.

Population Estimates

Numerical estimates were made of arctic grayling (greater than 180 mm fork length) using the study area from 2004 to 2006 and 2013. Two different multiple census models were used: 1) the

Schnabel method and 2) the Schumacher-Eschmeyer estimate, as described in Ricker (1975). Estimates of population (N) used the following notations:

m = number of periods, in this case, sample days
M_i = total marked fish in the population at the start of the ith sampling period ($i = 1,..., m$).
C_i = total sample taken in period i.
R_i = number of recaptures in the sample C_i.
R = (sum of) R_i total recaptures during the experiment.

Method 1: Schnabel (adjusted): The Schnabel approximation to the maximum likelihood estimator of population, N, from multiple censuses (Ricker 1975) was:

$$N = \sum_{i=1}^{m} \frac{C_i M_i}{R+1}$$

Approximate 95% confidence limits for this estimator were obtained by treating R as a Poisson variable and substituting limits found in Ricker (1975) for R.

Method 2: Schumacher-Eschmeyer: The Schumacher-Eschmeyer method uses the regression slope estimator in the plot of recovery rate versus the number of marked fish to obtain the following estimator:

$$N = \frac{\sum_{i=1}^{m} C_i M_i^2}{\sum_{i=1}^{m} M_i R_i}$$

Approximate 95% confidence limits for N were obtained by first calculating limits for 1/N and then inverting those limits. The confidence limits for 1/N were based on a t-value with m-1 degrees of freedom and the standard error (S.E.) of 1/N.

$$\text{S.E. } (1/N) = \sqrt{\frac{\sum_{i=1}^{m} \frac{R_i^2}{C_i} - \frac{\left(\sum_{i=1}^{m} R_i M_i\right)^2}{\sum_{i=1}^{m} C_i M_i^2}}{(m-1)\sum_{i=1}^{m} C_i M_i^2}}$$

There are three key assumptions on which these estimators depend:

1. marked fish are randomly dispersed into the general population.

2. all fish are equally catchable within each sampling period, including both marked and unmarked fish (not necessarily among sampling periods).
3. the population is closed (i.e., no immigration or emigration during the experiment).

An estimate of the number of broad whitefish exceeding 180 mm fork length entering the Tingmiaqsiugvik (Ublutuoch River) study area was calculated by assuming that the ratio of broad whitefish catches to arctic grayling catches is an indicator of relative abundance. Confidence intervals were estimated in the same manner.

RESULTS AND DISCUSSION

Water Chemistry

Sampling in 2013 began in June as stream flows were receding from peak break-up flows. At the onset of sampling on June 12, channel ice had melted and water temperatures had reached 3°C in the Tingmiaqsiugvik (Ublutuoch River) (Figure 3). Subsequently, temperatures increased rapidly to near 10-13°C. Water temperatures generally decreased during the July sampling, beginning near 15 to 16°C and dropping to around 10-13°C. By late August, water temperatures ranged around 6 to 7°C. During the period of study, specific conductance rose slowly at all sites through the summer as snow melt and runoff decreased. Daily measurements at each station are in Appendix A.

Turbidity in the Tingmiaqsiugvik (Ublutuoch River) and its tributaries was low throughout the summer, generally in the range of 3 NTU or less, indicating consistently clear water. Highest values were in June, when snow melt contributed to high runoff.

Biological Sampling and Observations

Species Composition

Substantial differences in species composition were found in fish using small drainages in the eastern NPR-A study area. Ten species were captured (Table 2). Least cisco were the most abundant species (30% of the total catch, 38% of the non-stickleback catch), followed by arctic grayling. Station U0901 in the Tingmiaqsiugvik (Ublutuoch River) produced the greatest number of least cisco and arctic grayling. While juvenile grayling dominated the catches, adults were also present (detailed length frequencies of arctic grayling are in Appendix Table C-1).

The Tingmiaqsiugvik (Ublutuoch River) produced the most diverse catch, with nine species caught in the three seasonal efforts combined at Station U0901. Barely Creek produced only Alaska blackfish, ninespine stickleback, and two juvenile arctic grayling. These results are consistent with previous sampling in these two streams, with the Tingmiaqsiugvik (Ublutuoch River) showing the greatest diversity and Barely Creek the least (Table 3). Catches of arctic grayling in the Tingmiaqsiugvik (Ublutuoch River) in 2004 were substantially higher than in subsequent years. Sampling in Barely Creek has produced only ninespine stickleback, Alaska blackfish, and the two arctic grayling already mentioned.

Arctic grayling were abundant throughout the season, while the other major species were most abundant during the July sampling (Figure 4). This pattern was most extreme for least cisco, with 644 of the 649 least cisco being caught in July.

Fyke nets were placed to catch fish moving both upstream and downstream in the sampled streams. Analysis of variance (ANOVA) was used to test for differences in upstream and downstream movements of arctic grayling in the Tingmiaqsiugvik (Ublutuoch River) during the June and July

sampling periods, however none of the tests indicated a significant difference in the upstream and downstream movements. No trends in arctic grayling movements were obvious in the daily catch patterns at Station U0901, however strong upstream movements of grayling were noticeable at station U1301 and U1302 (Figure 5). Data on directionality of movement seemed to indicate the broad whitefish were moving between stations U0901 and U1301 (Figure 6).

Seasonal Distribution

In June, catches in the Tingmiaqsiugvik (Ublutuoch River) were primarily arctic grayling, which comprised 68 and 90 percent of the catch at each station, respectively. In July, the proportion of grayling decreased to 11 and 52 percent of the catch at the same stations. Most of the grayling in the Tingmiaqsiugvik (Ublutuoch River) during June were immature fish, with 66 percent less than 250 mm (Figure 7). Since grayling spawn in early to mid-June, these patterns indicate that mature grayling were not spawning near the Tingmiaqsiugvik (Ublutuoch River) station.

At the Tingmiaqsiugvik (Ublutuoch River), broad whitefish, humpback whitefish and least cisco increased in abundance from June to July. The greatest number of broad whitefish caught during a sampling season was during 2013, with most of those caught during July in the Tingmiaqsiugvik (Ublutuoch River) (Figure 8). Abundance of large broad whitefish remained high during August sampling, while fewer small fish were caught.

Round whitefish were similar during both sampling periods but spiked during the third sampling period (Table 2). The increase in least cisco was caused by smaller fish moving into the study reach, while lengths of round whitefish were similar in both study periods (Figure 9).

Catches of both Alaska blackfish and ninespine stickleback in Barely Creek were higher during July than in June. Ninespine stickleback covered a similar size range in both June and July (Figure 10).

Tag Returns

There were 784 releases of tagged fish in the Tingmiaqsiugvik (Ublutuoch River), which includes releases of recaptured fish. Arctic grayling were 59% of the releases, followed by humpback whitefish, broad whitefish, round whitefish and least cisco (Table 4). There were 48 recaptures of tagged grayling, five for burbot, three for least cisco and one for humpback whitefish. None of the 60 tagged broad whitefish or 55 round whitefish were recaptured. Appendix E contains a listing of all 2013 releases and recaptures.

One tagged arctic grayling (MJM023353) released in 2006 was recaptured, and another arctic grayling (MJM090036) released in 2009 moving from the Crea Creek station where it was released to the Tingmiaqsiugvik (Ublutuoch River) station (Table 5). These were the only two recaptures from fish tagged in previous years, despite releasing over 2,400 tagged arctic grayling between 2001 and 2009. In previous years, around 300 broad whitefish, 430 humpback whitefish, 120 round whitefish, and 160 least cisco have been released in the Fish Creek/Tingmiaqsiugvik system, but none were recaptured in 2013.

A total of 23 arctic grayling missing their adipose fin were captured in 2013 (one was captured twice). All were carefully scanned with the PIT tag detector and 14 were confirmed to contain tags. This information was submitted to the BLM researchers (Table 6).

Arctic Grayling Swimming Rates

During the eight years of survey on the Tingmiaqsiugvik (Ublutuoch River) system, there have been 46 recoveries of tagged arctic grayling moving between stations within 5 days of release. Actual movement rates are difficult to determine based on fyke net catches because there is no way to tell how long the fish has been in the net prior to discovery, but short-term recaptures give some indication of potential movement rates. The highest movement rates may provide the best indication of potential movement within the study area. In 2013, one grayling moved between stations U0901 and U1301, a distance of 3.9 kilometers, in 2 hrs 20 minutes, or a rate of approximately 40 km/day. While it is unlikely that the fish would have kept moving at this rate all day, it does reveal that these fish have the capability to move rapidly within the system. Other examples of high movement rates were a grayling that moved from Crea Creek to Bill's Creek (21.6 km) in 20 hours (26 km/day), and from U0901 to U1302 (11.9 km) in just over 23 hrs (12 km/day). While 58% of the observed movement rates were 1 km/day or less, rates between 2 to 5 km/day were relatively common (Figure 10).

Population Estimates of Arctic Grayling and Broad Whitefish

The consistent and high recapture rates of tagged arctic grayling allowed estimating the number of fish likely entering the study area during summer. Two estimating models were used, the Schnabel method and the Schumacher-Eschmeyer method. Both estimating models are appropriate when there are multiple release and recapture events through a study period.

There are three key assumptions on which these estimators depend:

1. marked fish are randomly dispersed into the general population.
2. all fish are equally catchable within each sampling period, including both marked and unmarked fish (not necessarily among sampling periods).
3. the population is closed (i.e., no immigration or emigration during the experiment).

These assumptions are generally not met, thus the estimated numbers must be viewed as approximations, however, they may be useful for comparison with future tag recovery trends. Assumption 1 is rarely true for any fish population, as behavioral interactions will likely preclude random mixing. Assumption 2 is also problematic because groups of fish are usually headed in a particular direction (either upstream or downstream) when caught for tagging, and thus are likely to be unavailable for sampling periods immediately after release; recovery is likely to occur when the fish next happen to move past the sampling station, either later in the summer or the following year. The third assumption (i.e. the population is closed) may be the most valid assumption. Tag returns indicate that arctic grayling show a degree of fidelity to this

stream system, and return year after year to these feeding areas. Although the fish move downstream to winter, they return to the same stream/lake systems during summer. It is also clear that there are additional groups moving farther upstream in the Tingmiaqsiugvik (Ublutuoch River) that are rarely encountered again.

The population estimates of arctic grayling entering the study area were similar in both 2004 and 2005 for both estimating models, which indicated that between 4,100 and 4,400 grayling in excess of 180 mm fork length likely used the study area (Table 7). The estimate decreased to between 3,250 to 3,350 fish in 2006, and was in a similar range in 2013 (3,270 to 4,455 fish).

In 2013, the Schnabel model provided a lower estimate and tighter confidence intervals that did the Schumacher-Eschmeyer model. This is in contrast to previous years when both models returned similar results.

An estimate can be made of the number of broad whitefish exceeding 180 mm fork length entering the Tingmiaqsiugvik (Ublutuoch River) study area if it is assumed that the ratio of broad whitefish catches to arctic grayling catches is a reasonable indicator of relative abundance. An insufficient number of anchor tags were returned to make a direct estimate of broad whitefish, but if it is assumed that fish in excess of 180 mm in both species are equally vulnerable to catch by fyke nets, then the ratio of broad whitefish to arctic grayling can be used to estimate numbers of broad whitefish (Table 8). Using this approach, an annual average of 365 broad whitefish (range: 163-506) entered the study area from 2004-2006. The estimate of broad whitefish using the area in 2013, 509 fish, was similar to that estimated in 2006.

CONCLUSIONS

Sampling during 2013 indicated, as in previous years, that the Tingmiaqsiugvik (Ublutuoch River) drainage system is heavily used by arctic grayling, broad whitefish, humpback whitefish, least cisco and round whitefish. Barely Creek, which is primarily formed by a melting snow field, becomes intermittent during summer, with the isolated pools supporting ninespine stickleback, Alaska blackfish and occasional juvenile arctic grayling.

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Table 1. Location of fyke net stations fished in eastern NPRA during 2013.

Station[1]	Location	Dates Fished	Latitude (NAD83)	Longitude (NAD83)
C0301	Crea Creek (trib to Ublutuoch)	not fished at request of BLM		
C0306 (US)	Barely Creek (trib to Ublutuoch)	Jun 13-19 Jul 21-24	70.28183	151.29215
C0306 (DS)	Barely Creek (trib to Ublutuoch)	Jun 13-19	70.28183	151.29215
U0901 (US)	Ublutuoch River	Jun 13-19 Jul 21-28 Aug 24-30	70.28248	151.25758
U0901 (DS)	Ublutuoch River	Jun 15-19 Jul 21-28 Aug 24-30	70.28248	151.25758
U1301 (US)	Ublutuoch River	Jul 26-28 Aug 25-30	70.27062	151.24768
U1301 (DS)	Ublutuoch River	Jul 26-28 Aug 25-30	70.27062	151.24768
U1302 (US)	Ublutuoch River	Jun 15-19 Jul 21-28 Aug 25-27	70.23985	151.30320
U1302 (DS)	Ublutuoch River	Jul 21-28 Aug 25-27	70.23985	151.30320

[1] US = net set to catch fish moving upstream, DS = net set to catch fish moving downstream

Table 2. Catches of fish by direction and season at fyke net stations in eastern NPRA streams during 2013.

Station U0901 - Tingmiaqsiugvik (Ublutuoch River)

	June		July		August		Total
Species	(DS)	(US)	(DS)	(US)	(DS)	(US)	Catch
Chum salmon						2	2
Broad whitefish	1		90	29	18	47	185
Humpback whitefish	2		73	2	3	13	93
Least cisco	3		353	291		2	649
Round whitefish		2	5	3	25	26	61
Arctic grayling	61	102	84	34	96	57	434
Burbot		3			11	12	26
Ninespine stickleback	19	38	34	61	3	1	156
Slimy sculpin	7			1			8
Total catch	93	145	639	421	156	160	1,612
No. of Species	6	4	6	7	6	8	9
Effort (hours)	117.2	182.1	185.3	186.4	167.9	166.9	1,005.8

Station U1301 - Tingmiaqsiugvik (Ublutuoch River)

	June		July		July		Total
Species	(DS)	(US)	(DS)	(US)	(DS)	(US)	Catch
Chum salmon	--	--					0
Broad whitefish	--	--	2	32	2	3	39
Humpback whitefish	--	--	7	1			8
Least cisco	--	--	50	33			83
Round whitefish	--	--		7	2	2	11
Arctic grayling	--	--	6	34	29	39	108
Burbot	--	--				14	14
Ninespine stickleback	--	--	6	48	10	3	67
Slimy sculpin	--	--	1				1
Total catch	--	--	72	155	43	61	331
No. of Species	--	--	6	6	4	5	8
Effort (hours)	0.0	0.0	72.3	72.4	170.9	170.8	486.4

Station U1302 - Tingmiaqsiugvik (Ublutuoch River)

	June		July		July		Total
Species	(DS)	(US)	(DS)	(US)	(DS)	(US)	Catch
Chum salmon	--				1		1
Broad whitefish	--			1	2		3
Humpback whitefish	--	2					2
Least cisco	--	1	1	15	1		18
Round whitefish	--	1		8	1	2	12
Arctic grayling	--	110	19	44	1	5	179
Burbot	--						0
Ninespine stickleback	--	8	3	31			42
Slimy sculpin	--						0
Total catch	--	122	23	99	6	7	256
No. of Species	--	5	3	5	5	2	7
Effort (hours)	0.0	116.9	188.2	187.5	94.9	94.7	682.3

Table 2. Catches of fish by direction and season at fyke net stations in eastern NPRA streams during 2013.

Barely Creek

Species	June (DS)	June (US)	July (DS)	July (US)	August (DS)	August (US)	Total Catch
Arctic grayling	1	1	--	0	--	--	2
Alaska blackfish	2	14	--	1	--	--	17
Ninespine stickleback	126	60	--	37	--	--	223
Total catch	128	74	--	38	--	--	240
No. of Species	3	3	--	2	--	--	3
Effort (hours)	162.5	162.3	0.0	92.5	0.0	0.0	417.2

DS = fish moving downstream, US = fish moving upstream

Table 3. Comparison of fish catches in small streams of eastern NPRA during 2001-2006, 2009 and 2013.

Number of fish caught

	Tingmiaqsiugvik (Ublutuoch River)								Crea Creek						Barely Creek		
Species	2001	2002	2003	2004	2005	2006	2009	2013	2003	2004	2005	2006	2009	2013	2003	2009	2013
Chinook salmon				4													
Chum salmon	1				1			3									
Sockeye salmon					2												
Broad whitefish	121	155	6	76	26	23	16	227	3	8	5	1	2				
Humpback whitefish	192	5	1		26	67	28	103				1	1				
Least cisco	37	66	2	13	24	8	53	750	3	1	1						
Arctic cisco							4										
Round whitefish	70	11	2		18	20	56	84				5					
Arctic grayling	660	630	222	749	705	265	206	721	1,394	1,175	1,381	267	102				2
Rainbow smelt							1										
Burbot								40	1	3	1		3				
Alaska blackfish									2	5		1	1		32	49	17
Ninespine stickleback	52	15	305	296	92	93	7	265	391	1,213	901	562	147		345	1,253	223
Slimy sculpin	7	7	9	5	1	2	1	9	15	5	5						
Total catch	1,140	889	547	1,143	895	478	372	2,202	1,809	2,410	2,294	837	256		377	1,302	242
Number of Species	8	7	7	6	9	7	9	9	7	7	6	6	6	not	2	2	3
Effort (hours)	653.7	590.3	645.7	987.3	1,347.8	859.5	674.8	2,174.5	634.8	1,331.3	1,462.1	1,049.6	666.2	sampled	188.8	671.6	417.2

Catch Rate (fish per day)

	Tingmiaqsiugvik (Ublutuoch River)								Crea Creek						Barely Creek		
Species	2001	2002	2003	2004	2005	2006	2009	2013	2003	2004	2005	2006	2009	2013	2003	2009	2013
Chinook salmon				0.10													
Chum salmon	0.04				0.02			0.03									
Sockeye salmon					0.04												
Broad whitefish	4.44	6.30	0.22	1.85	0.46	0.64	0.57	2.51	0.11	0.14	0.08	0.02	0.07				
Humpback whitefish	7.05	0.20	0.04		0.46	1.87	1.00	1.14				0.02	0.04				
Least cisco	1.36	2.68	0.07	0.32	0.43	0.22	1.88	8.28	0.11	0.02	0.02						
Arctic cisco							0.14	0.00									
Round whitefish	2.57	0.45	0.07		0.32	0.56	1.99	0.93				0.11					
Arctic grayling	24.23	25.62	8.25	18.21	12.55	7.40	7.33	7.96	52.70	21.18	22.67	6.11	3.67				0.12
Rainbow smelt							0.04	0.00									
Burbot									0.04	0.05	0.02		0.11				
Alaska blackfish									0.08	0.09		0.02	0.04		4.07	1.75	0.98
Ninespine stickleback	1.91	0.61	11.34	7.20	1.64	2.60	0.25	2.92	14.78	21.87	14.79	12.85	5.30		43.85	44.78	12.83
Slimy sculpin	0.26	0.28	0.33	0.12	0.02	0.06	0.04	0.10	0.57	0.09	0.08						
Total CPUE	41.9	36.1	20.3	27.8	15.9	13.3	13.2	23.9	68.4	43.4	37.7	19.1	9.2	not	47.9	46.5	13.9
Number of Species	8	7	7	6	9	7	9	9	7	7	6	6	6	sampled	2	2	3

Table 4. Tagged fish released by station in the Tingmiaqsiugvik (Ublutuoch River) during 2013.

	Release Station			Total
Species	U0901	U1301	U1302	Release
Arctic grayling	305	61	113	479
Broad whitefish	60	0	0	60
Humpback whitefish	91	8	2	101
Round whitefish	44	4	7	55
Least cisco	47	3	6	56
Burbot	20	13	0	33
Total Releases	567	89	128	784

Table 5. Recapture and release data for arctic grayling recaptured in the Tingmiaqsiugvik (Ublutuoch River) during 2013.
(bold italics indicate different release and recapture stations)

Tag	Release Data			Recapture Data			Days
Number	Station	Date	Length	Station	Date	Length	At Large
MJM0101952	U0901	7/24/2013	289	U0901	7/28/2013	288	4
MJM0101982	U0901	7/23/2013	344	U0901	7/27/2013	344	4
MJM0101982	U0901	7/27/2013	344	U0901	8/28/2013	352	32
MJM0101999	U1302	7/23/2013	289	U1302	7/26/2013	289	3
MJM0102091	U0901	8/28/2013	372	U0901	8/29/2013	374	1
MJM0102160	U0901	8/24/2013	291	U0901	8/28/2013	291	4
MJM0102160	***U0901***	***8/28/2013***	***291***	***U1301***	***8/28/2013***	***292***	***0***
MJM0102162	***U0901***	***8/24/2013***	***264***	***U1301***	***8/26/2013***	***263***	***2***
MJM0102169	U0901	8/24/2013	304	U0901	8/28/2013	305	4
MJM0102170	***U0901***	***8/24/2013***	***319***	***U1301***	***8/28/2013***	***320***	***4***
MJM0102443	U0901	7/28/2013	302	U0901	8/24/2013	310	27
MJM0102567	***U0901***	***8/24/2013***	***286***	***U1301***	***8/28/2013***	***288***	***4***
MJM0102654	U1302	7/21/2013	323	U1302	7/23/2013	325	2
MJM0102693	***U0901***	***7/23/2013***	***343***	***U1301***	***7/26/2013***	***347***	***3***
MJM0103452	***U0901***	***8/26/2013***	***315***	***U1301***	***8/28/2013***	***318***	***2***
MJM0104070	U0901	6/19/2013	284	U0901	8/28/2013	306	70
MJM0104080	***U1302***	***6/19/2013***	***321***	***U1301***	***7/26/2013***	***330***	***37***
MJM0104150	***U0901***	***6/16/2013***	***338***	***U1302***	***6/19/2013***	***339***	***3***
MJM0104436	***U0901***	***6/17/2013***	***360***	***U1302***	***6/18/2013***	***360***	***1***
MJM0104437	U0901	6/17/2013	251	U0901	8/28/2013	285	72
MJM0104437	U0901	8/28/2013	285	U0901	8/29/2013	286	1
MJM023353	***U0601***	***6/20/2006***	***199***	***U1302***	***6/17/2013***	***349***	***2554***
MJM090036	***CK0301***	***6/20/2009***	***268***	***U1301***	***8/25/2013***	***345***	***1527***
MJM090197	***U0901***	***6/14/2013***	***214***	***U1302***	***6/17/2013***	***217***	***3***
MJM090306	U0901	6/15/2013	223	U0901	6/18/2013	223	3
MJM090326	U0901	6/18/2013	231	U0901	7/28/2013	251	40
MJM090331	***U1302***	***6/18/2013***	***204***	***U0901***	***8/29/2013***	***247***	***72***
MJM090332	U1302	6/18/2013	218	U1302	7/23/2013	240	35
MJM090335	U1302	6/18/2013	194	U1302	7/21/2013	216	33
MJM090335	U1302	7/21/2013	216	U1302	7/22/2013	216	1
MJM090337	U1302	6/18/2013	249	U1302	7/21/2013	261	33
MJM090337	U1302	7/21/2013	261	U1302	7/22/2013	262	1
MJM090337	U1302	7/22/2013	262	U1302	7/26/2013	262	4
MJM090338	***U1302***	***6/18/2013***	***234***	***U0901***	***8/28/2013***	***267***	***71***
MJM090505	U1302	7/21/2013	189	U1302	7/22/2013	190	1
MJM090528	U0901	7/23/2013	239	U0901	8/28/2013	256	36
MJM090531	U0901	7/23/2013	225	U0901	8/29/2013	242	37
MJM090536	U0901	7/24/2013	204	U0901	8/26/2013	206	33
MJM090548	U1301	7/26/2013	207	U1301	7/27/2013	209	1
MJM090583	***U0901***	***7/21/2013***	***237***	***U1302***	***7/23/2013***	***230***	***2***
MJM090702	U0901	8/24/2013	202	U0901	8/28/2013	205	4
MJM090719	U0901	8/26/2013	244	U0901	8/29/2013	246	3
MJM090738	***U0901***	***8/28/2013***	***220***	***U1301***	***8/29/2013***	***219***	***1***
MJM090743	U0901	8/28/2013	230	U0901	8/29/2013	229	1
MJM090785	U1301	7/27/2013	225	U1301	8/25/2013	233	29
MJM090787	U1301	7/27/2013	246	U1301	7/28/2013	250	1
MJM090787	U1301	7/28/2013	250	U1301	8/25/2013	252	28
MJM090787	U1301	8/25/2013	252	U1301	8/28/2013	253	3

Table 6. Arctic grayling recaptured with a missing adipose fin, which indicates a fish that had been released with a PIT tag.

Floy Tag Number	Recapture Station	Latitude (NAD83)	Longitude (NAD83)	Date	Fork Length (mm)	PIT Tag Number
MJM0101955	U0901	70.28248	151.25758	7/25/2013	342	180574518
MJM0101958	U0901	70.28248	151.25758	7/25/2013	271	180574189
MJM0101960	U0901	70.28248	151.25758	7/26/2013	290	adipose clip, no PIT
MJM0101966	U1301	70.27062	151.24768	7/26/2013	301	adipose clip, no PIT
MJM0101999	U1302	70.23985	151.30320	7/23/2013	289	adipose clip, no PIT
MJM0102058	U0901	70.28248	151.25758	8/28/2013	293	180574244
MJM0102059	U0901	70.28248	151.25758	8/28/2013	300	adipose clip, no PIT
MJM0102065	U0901	70.28248	151.25758	8/28/2013	279	180547995
MJM0102068	U0901	70.28248	151.25758	8/28/2013	260	adipose clip, no PIT
MJM0102073	U0901	70.28248	151.25758	8/28/2013	316	adipose clip, no PIT
MJM0102156	U0901	70.28248	151.25758	8/24/2013	275	adipose clip, no PIT
MJM0102162	U0901	70.28248	151.25758	8/24/2013	264	180574149
MJM0102162	U1301	70.27062	151.24768	8/26/2013	263	180574149
MJM0102499	U0901	70.28248	151.25758	8/26/2013	261	180574224
MJM0102601	U1302	70.23985	151.30320	7/26/2013	327	180597965
MJM0102687	U0901	70.28248	151.25758	7/22/2013	298	adipose clip, no PIT
MJM0102775	U0901	70.28248	151.25758	8/29/2013	269	181700610
MJM0103443	U0901	70.28248	151.25758	7/28/2013	298	180574347
MJM0104113	U1302	70.23985	151.30320	6/17/2013	398	180574283
MJM0104131	U0901	70.28248	151.25758	6/15/2013	356	180574388
MJM090036	U1301	70.27062	151.24768	8/25/2013	345	adipose clip, no PIT
MJM090090	U1302	70.23985	151.30320	6/17/2013	349	180574172
MJM090415	U1302	70.23985	151.30320	6/17/2013	219	180574355
MJM090502	U0901	70.28248	151.25758	7/21/2013	219	180597899

Table 7. Estimates of Arctic grayling using northeast NPR-A study area streams during 2004 to 2013.

				Schnabel Model		Schumacher-Eschmeyer Model	
System	Fish Caught	Tags Released	Tags Recovered	**Population Estimate**	95% Confidence Interval	**Population Estimate**	95% Confidence Interval
Ublutuoch Study Area							
2004	617	557	43	**4,212**	3,145-5,769	**4,122**	2,860-7,376
2005	741	704	63	**4,408**	3,457-5,710	**4,086**	3,216-5,601
2006	369	366	21	**3,256**	2,171-5,133	**3,353**	2,093-8,428
2009			insufficient data				
2013	610	479	46	**3,277**	2,470-4,442	**4,455**	2,979-8,833

Table 8. Estimates of broad whitefish using northeast NPR-A study area streams during 2004 to 2013.

System	Year	**Population Estimate**	95% Confidence Interval
Ublutuoch Study Area			
	2004	**427**	319-585
	2005	**163**	127-211
	2006	**506**	337-797
	2009	insufficient data	
	2013	**509**	384-690

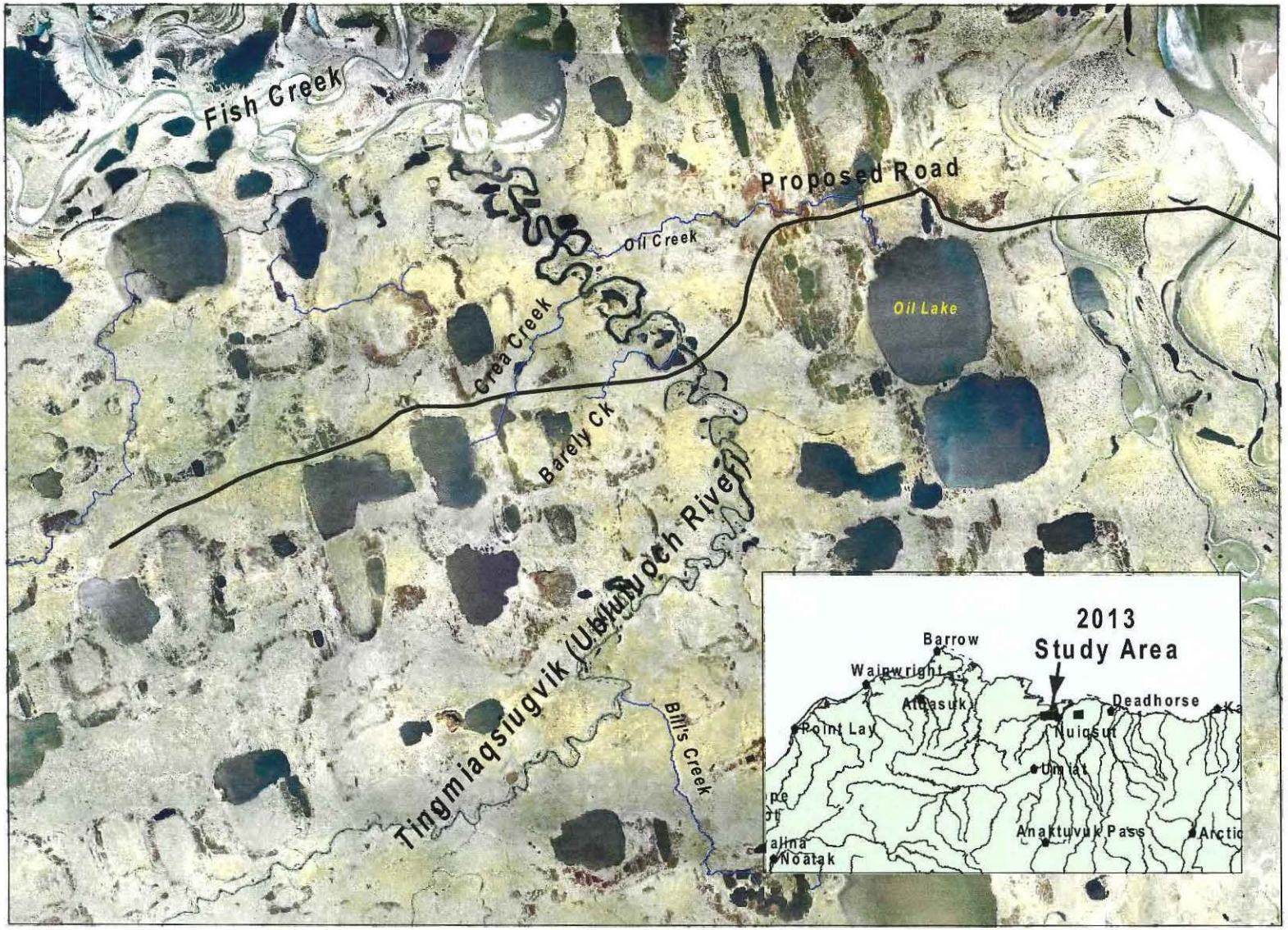

Figure 1. Location of the eastern NPR-A study area and proposed road alignment, 2013

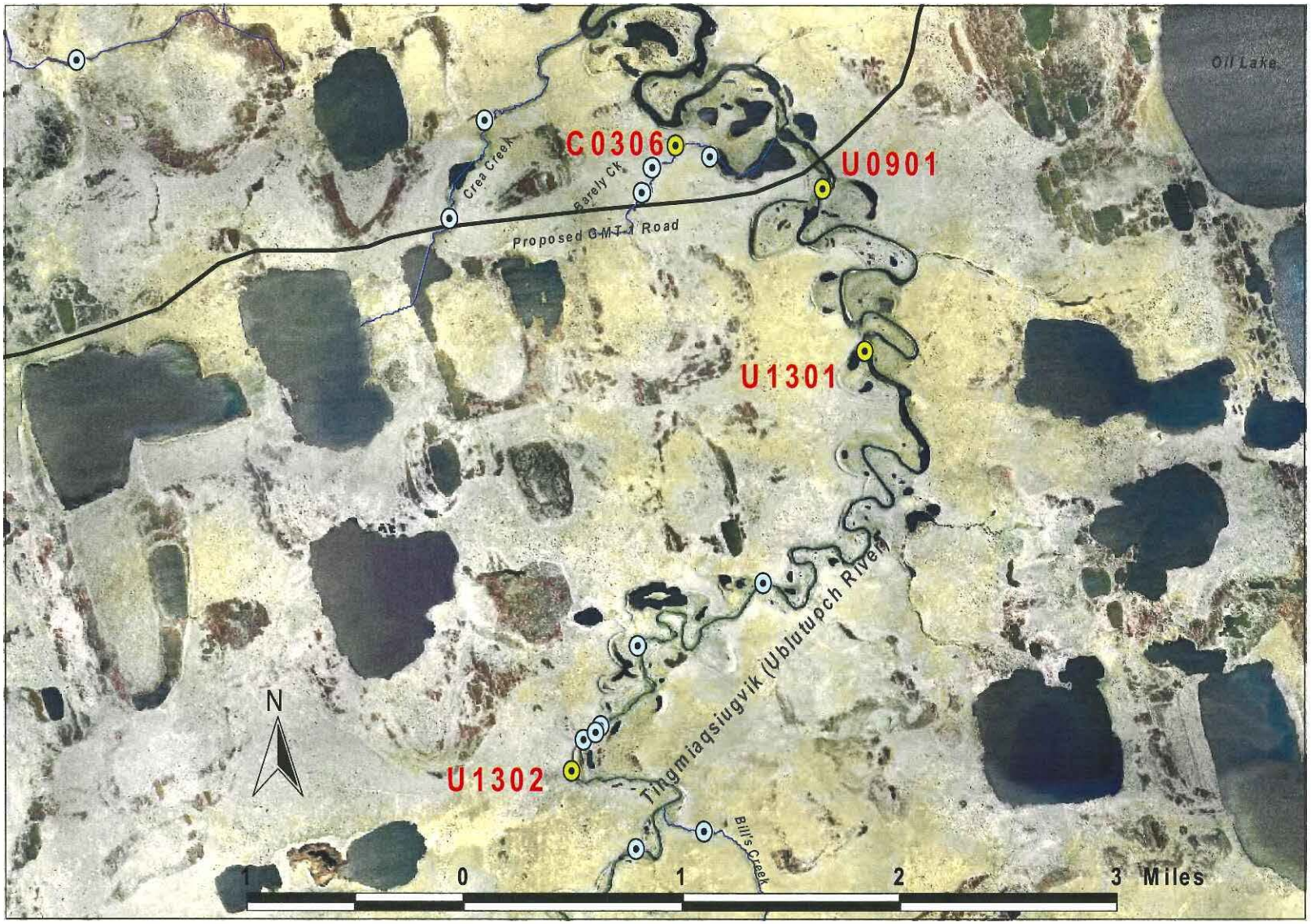

Figure 2. Fyke net locations in the eastern NPR-A study area, 2013 (yellow stations sampled in 2013, blue stations sampled in previous years).

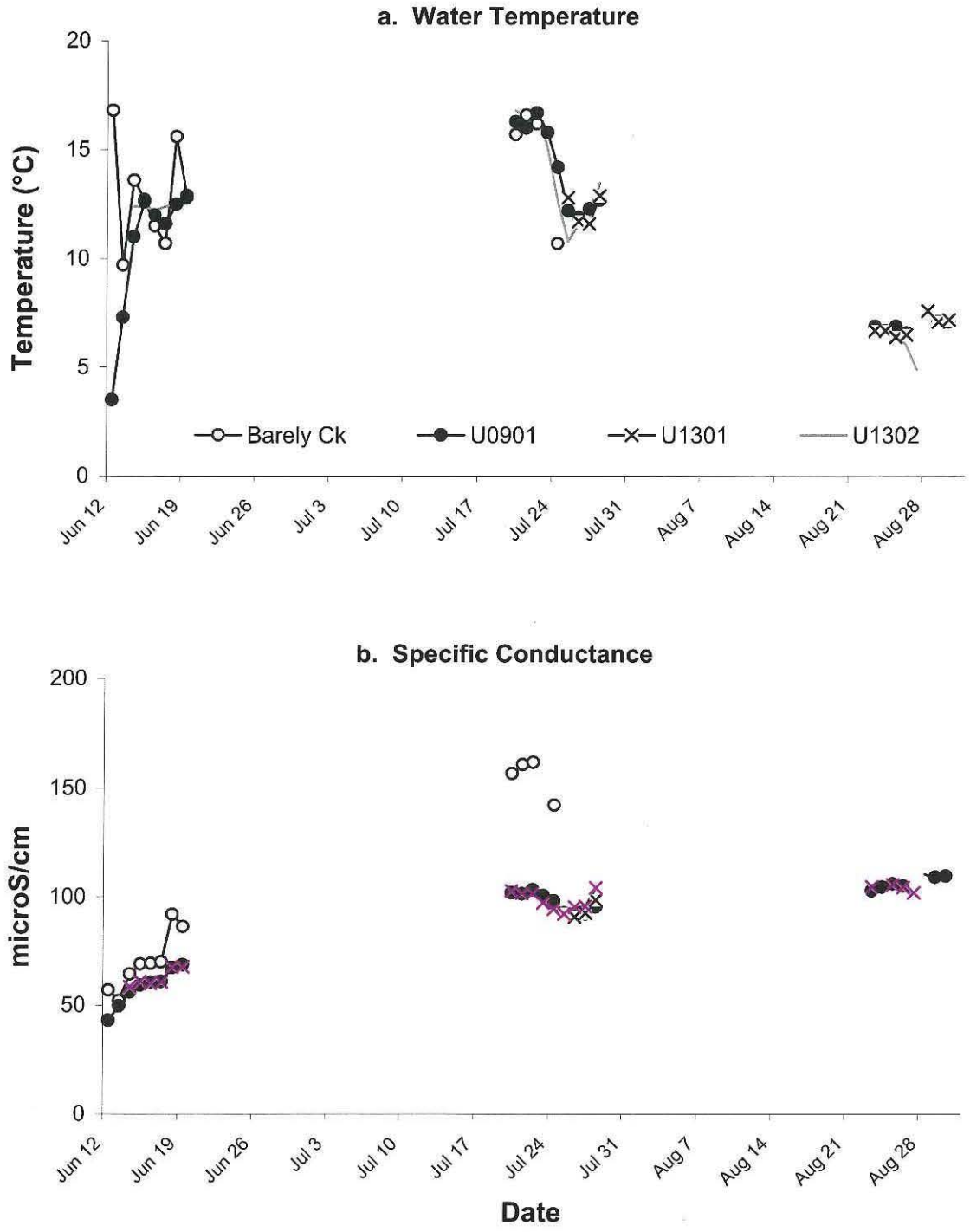

Figure 3. Water temperature and specific conductance at streams sampled in the eastern NPR-A study area, 2013.

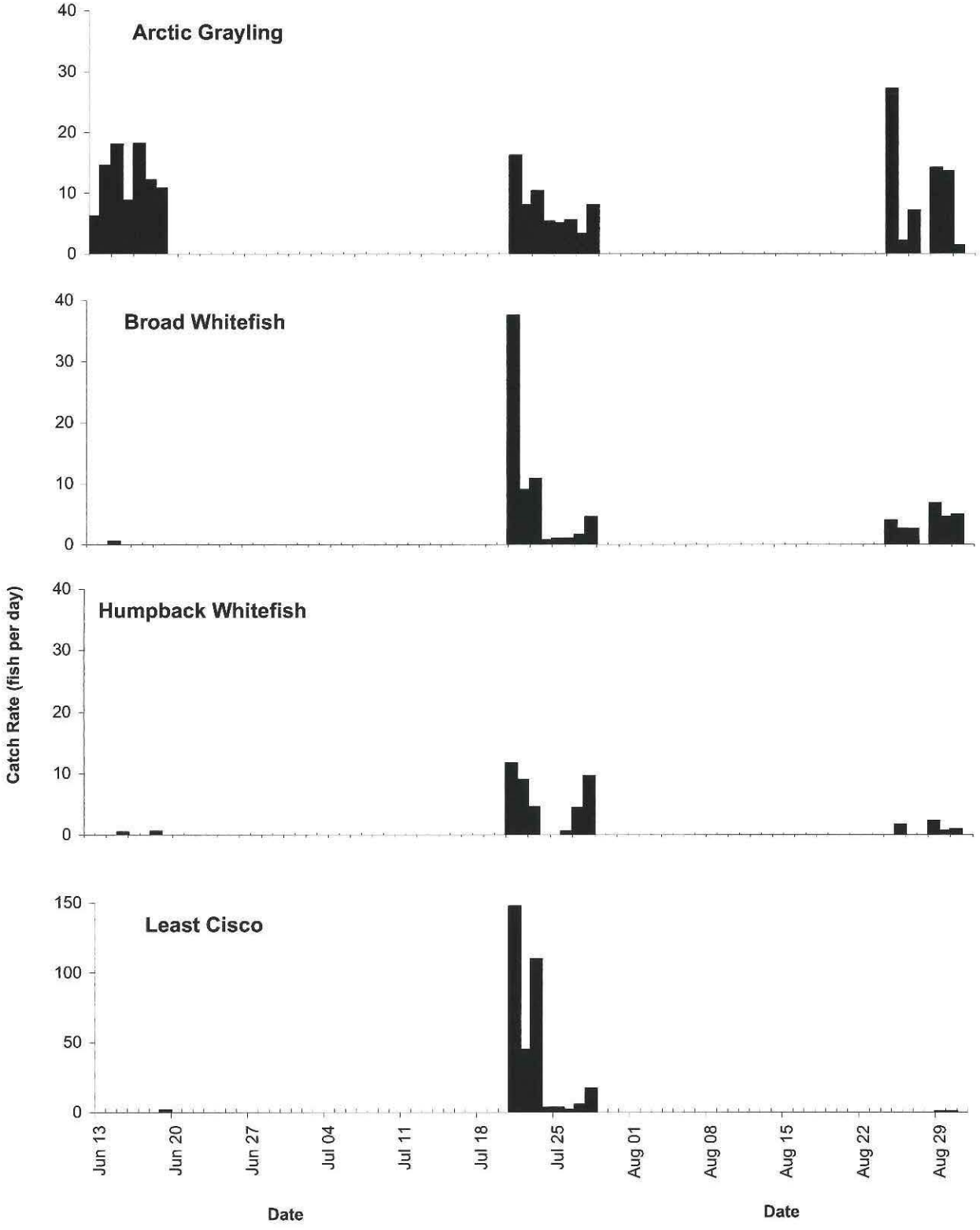

Figure 4. Daily catch rates for major species caught by fyke net at Station U0901 in the Tingmiaqsiugvik (Ublutuoch River) during 2013.

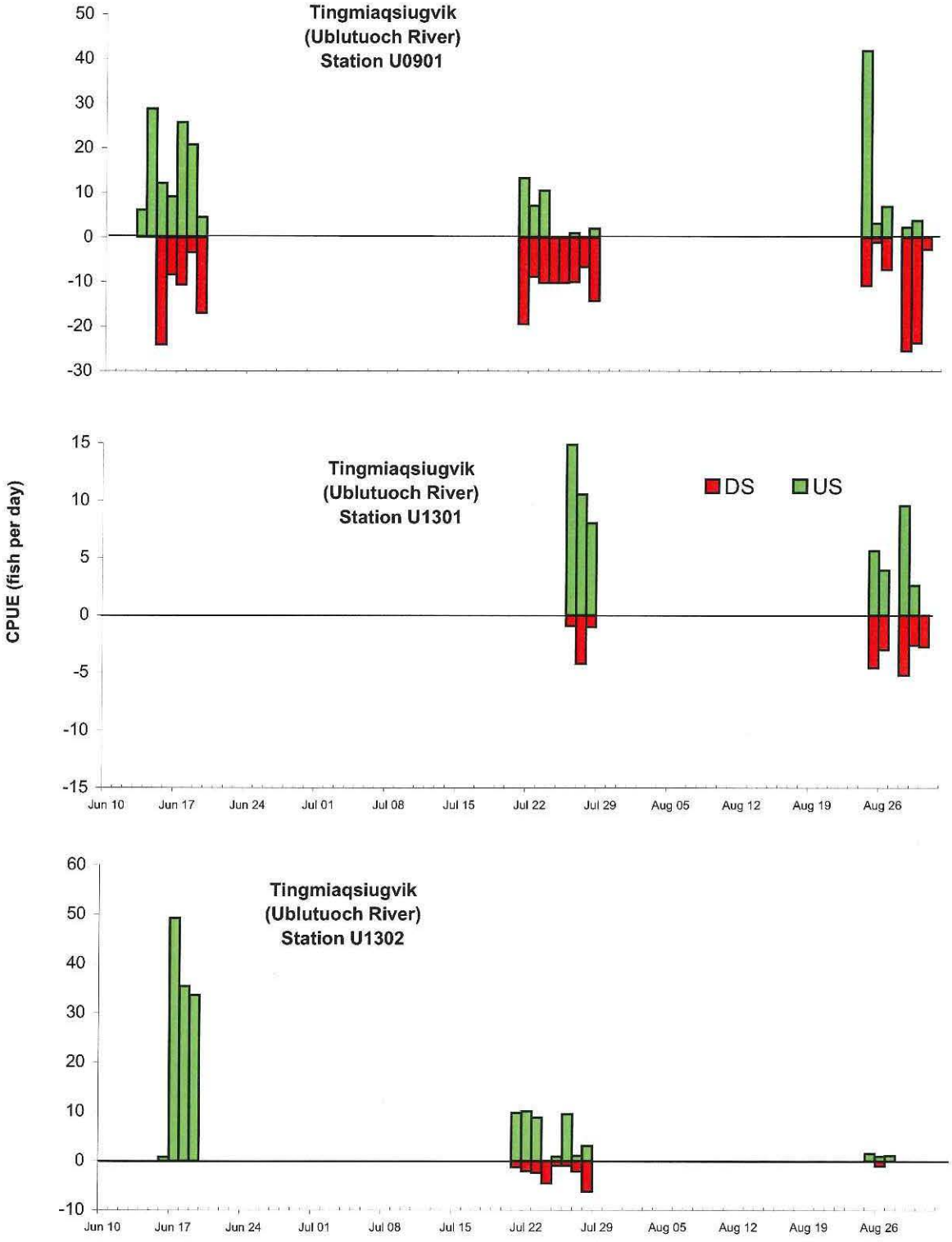

Figure 5. Comparison of arctic grayling catch rates for fish moving upstream and downstream in the Tingmiaqsiugvik (Ublutuoch River)of eastern NPR-A during 2013.
(DS = fish moving downstream, US = fish moving upstream)

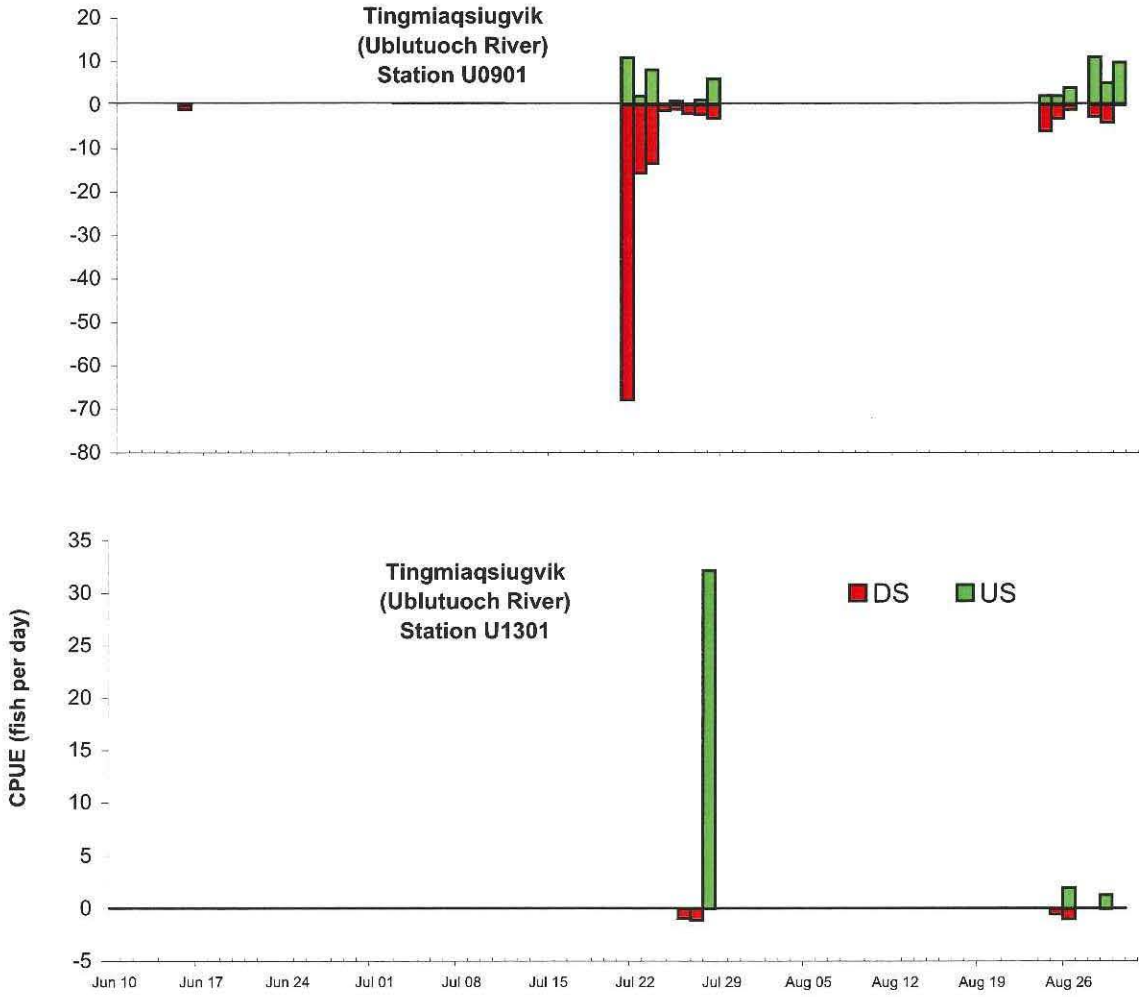

Figure 6. Comparison of broad whitefish catch rates for fish moving upstream and downstream in streams of eastern NPR-A during 2009.
(DS = fish moving downstream, US = fish moving upstream)

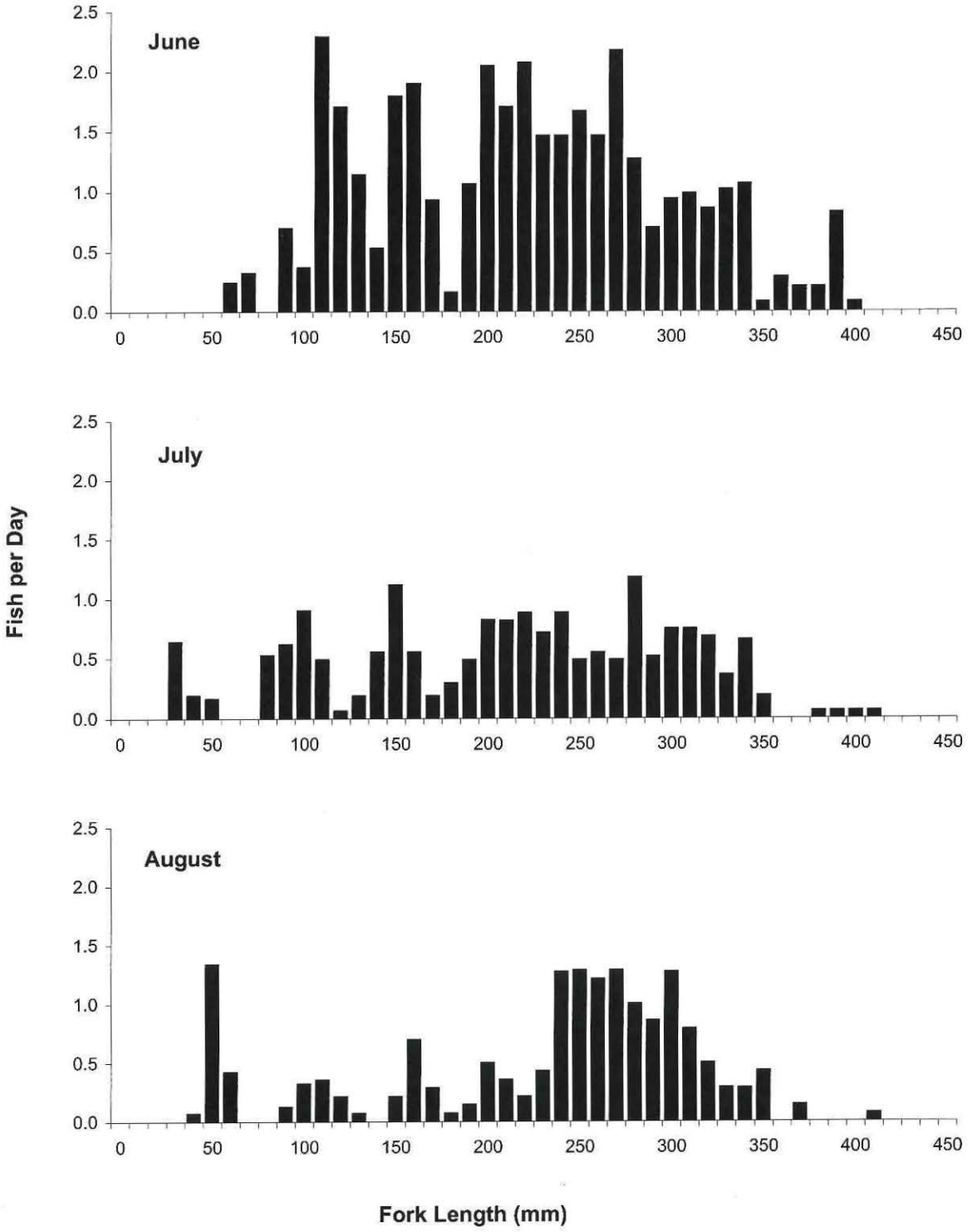

Figure 7. Length frequencies of arctic grayling in the Tingmiaqsiugvik (Ublutuoch River) during June, July, and August, 2013

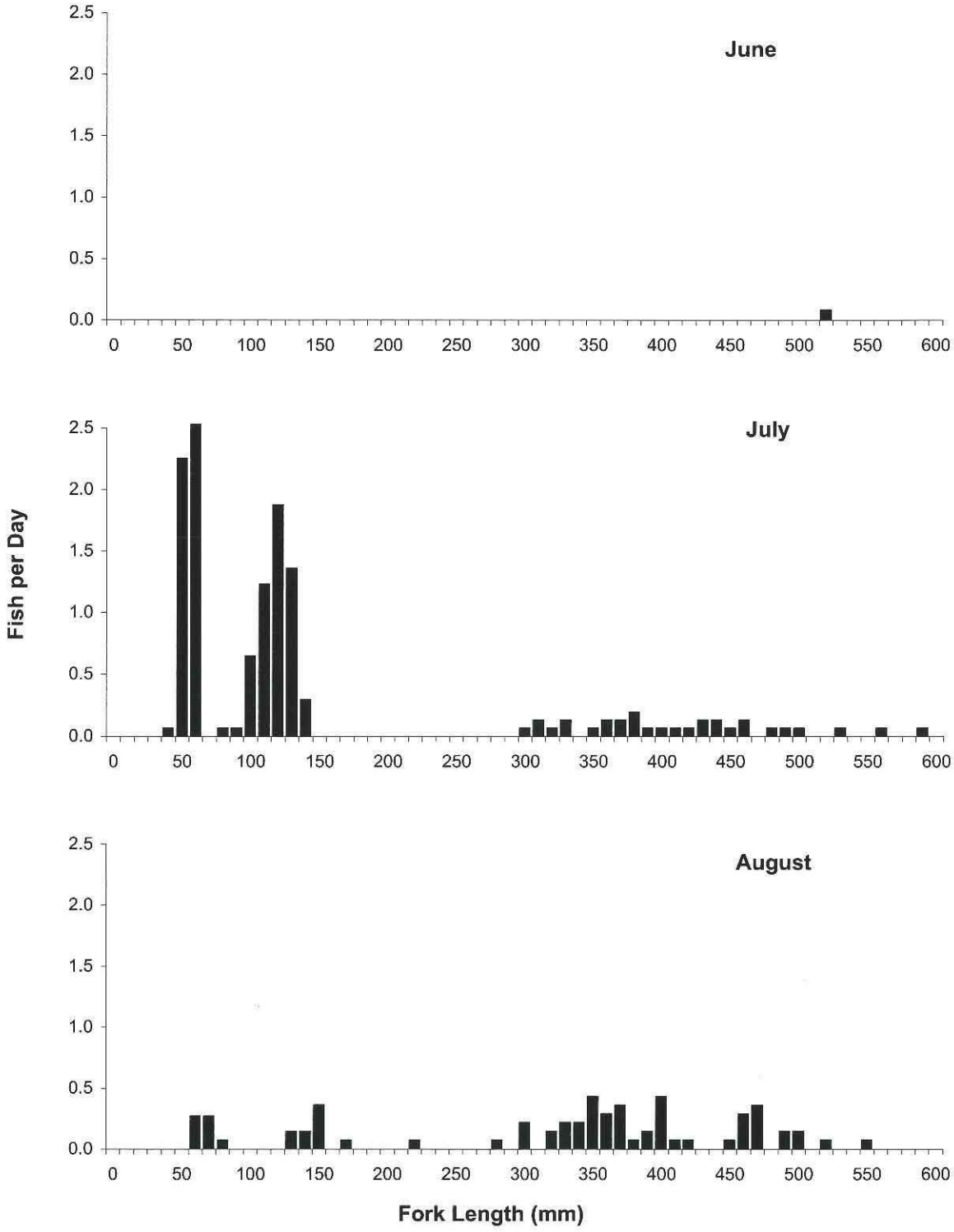

Figure 8. Length frequencies of broad whitefish in the Tingmiaqsiugvik (Ublutuoch River) during June, July, and August, 2013

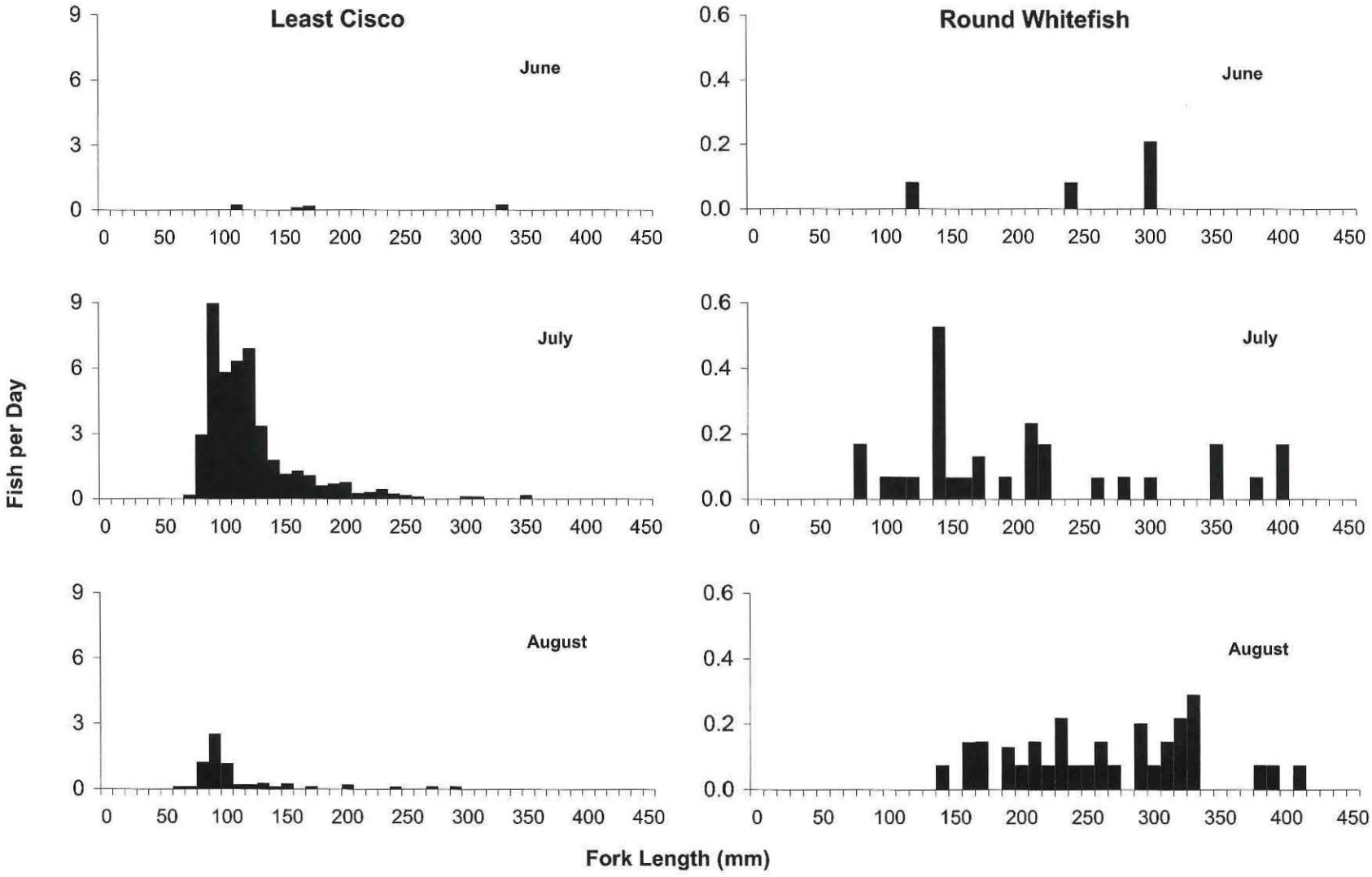

Figure 9. Length frequencies of least cisco and round whitefish in the Tingmiaqsiugvik (Ublutuoch River) during June, July, and August, 2013

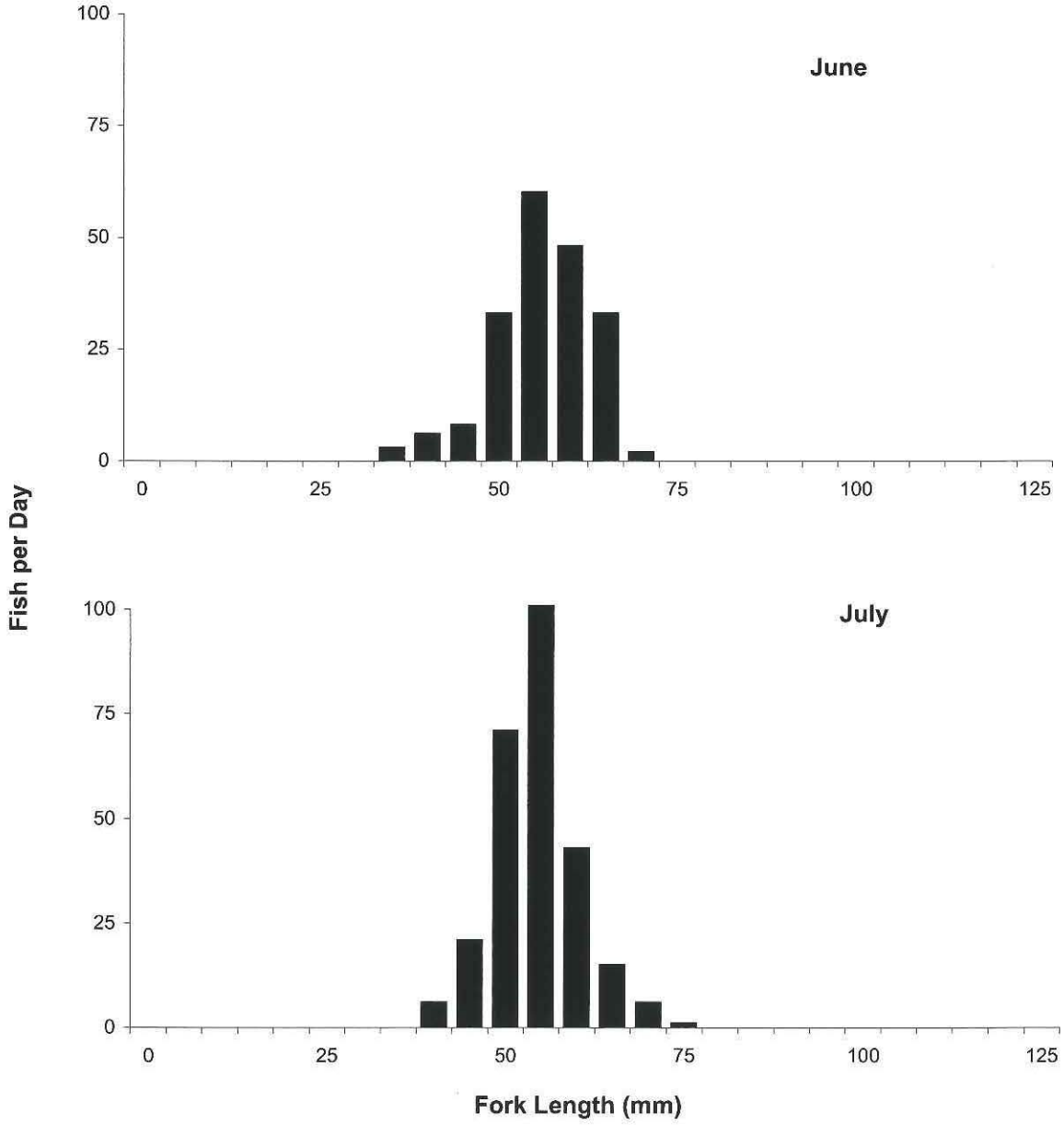

Figure 10. Comparison of ninespine stickleback lengths in Barely Creek during June and July, 2013.

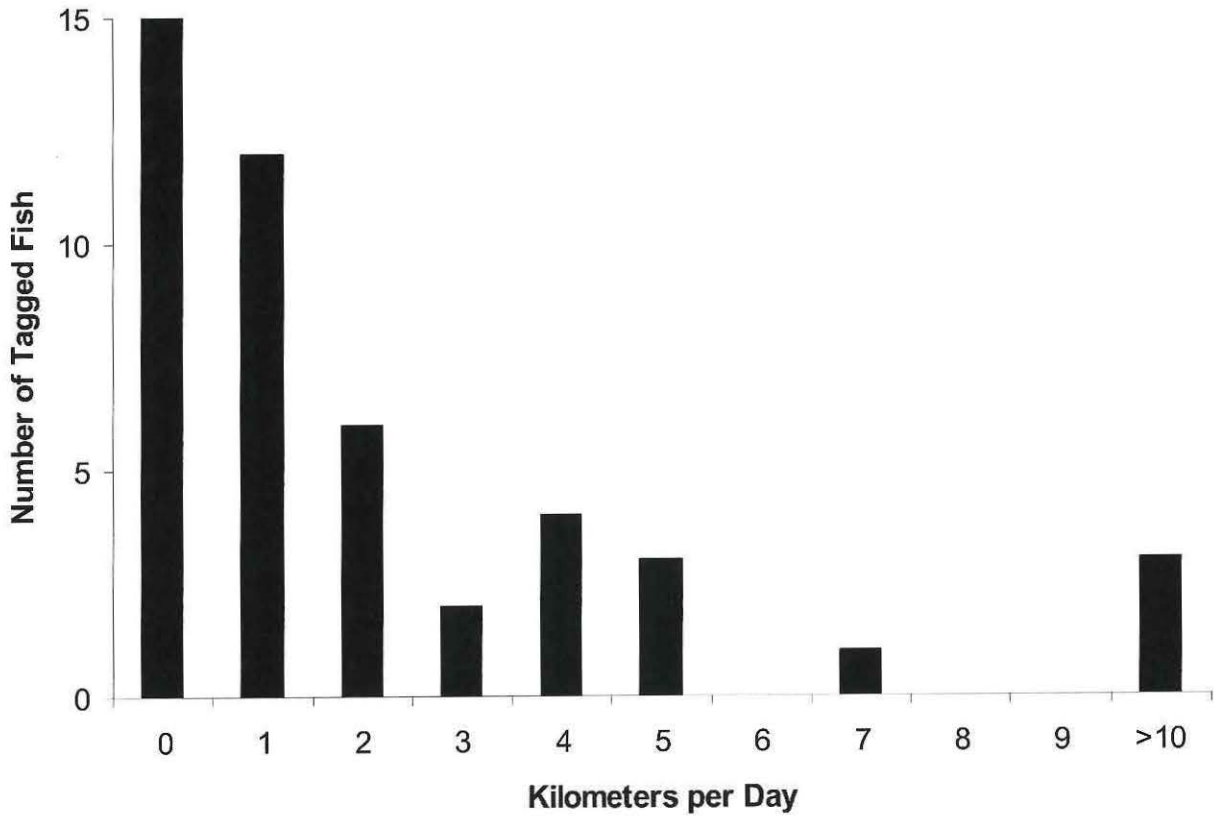

Figure 10. Movement rates of arctic grayling within the Tingmiaqsiugvik (Ublutuoch River) system can exceed 10 kilometers/day.

APPENDIX A
Water chemistry from fyke net stations in eastern NPR-A during 2013

Appendix Table A-1. Water chemistry parameters measured at NPRA fyke net sampling sites, 2013.

Station	Date	Water Temp (°C)	Specific Conductance (microS/cm)	Turbidity (NTU)	pH
C0306	6/12/2013	16.8	67.6	0.0	7.53
	6/13/2013	9.7	73.8	0.0	6.88
	6/14/2013	13.6	82.5	0.0	6.47
	6/15/2013	12.7	90.3	0.0	6.40
	6/16/2013	11.5	93.4	0.0	7.10
	6/17/2013	10.7	96.3	0.0	6.79
	6/18/2013	15.6	112.0	0.0	7.51
	6/19/2013	12.9	112.2	0.0	6.91
C0306	7/20/2013	15.7	190.5	2.7	6.85
	7/21/2013	16.6	191.5	3.3	6.82
	7/22/2013	16.2	194.5	3.7	6.84
	7/24/2013	10.7	195.6	3.5	6.88
U0901	6/12/2013	3.5	73.1	5.3	7.70
	6/13/2013	7.3	75.2	5.2	6.99
	6/14/2013	11.0	76.7	3.2	6.48
	6/15/2013	12.6	77.8	2.4	6.37
	6/16/2013	12.0	80.6	2.1	7.03
	6/17/2013	11.6	82.0	1.2	6.98
	6/18/2013	12.5	88.5	0.8	7.25
	6/19/2013	12.8	89.6	0.5	7.03
U0901	7/20/2013	16.30	122.21	0.35	7.44
	7/21/2013	16.0	122.3	0.3	7.53
	7/22/2013	16.7	122.8	0.1	7.56
	7/23/2013	15.8	122.0	0.1	7.49
	7/24/2013	14.2	123.6	0.5	7.41
	7/25/2013	12.20	122.43	0.90	7.51
	7/26/2013	11.9	122.6	0.5	7.45
	7/27/2013	12.3	121.7	0.5	7.52
	7/28/2013	12.7	124.7	0.7	7.56
U0901	8/23/2013	6.9	157.3	2.0	7.39
	8/24/2013	6.7	160.7	1.6	7.39
	8/25/2013	6.9	162.0	1.53	7.37
	8/26/2013	6.6	162.1	1.87	7.30
	8/29/2013	7.1	165.8	2.15	7.37
	8/29/2013	6.8	167.5	1.76	7.44
	8/30/2013	7.1	166.7	1.8	7.39

Station	Date	Water Temp (°C)	Specific Conductance (microS/cm)	Turbidity (NTU)	pH
U1301	7/25/2013	12.8	120.2	0.6	7.41
	7/26/2013	11.7	121.7	0.8	7.29
	7/27/2013	11.6	124.3	0.9	7.45
	7/28/2013	12.9	128.1	0.9	7.35
	8/23/2013	6.7	161.1	2.3	7.47
	8/24/2013	6.7	162.8	2.2	7.40
	8/25/2013	6.4	163.6	1.9	7.42
	8/26/2013	6.5	163.3	2.0	7.02
	8/28/2013	7.6	165.5	2.2	7.48
	8/29/2013	7.1	164.3	2.2	7.49
	8/30/2013	7.2	166.4	2.2	7.38
U1302	6/14/2013	12.4	76.9	2.5	6.48
	6/15/2013	12.4	80.2	2.1	6.34
	6/16/2013	12.2	79.4	1.7	6.98
	6/17/2013	12.4	79.8	1.6	7.08
	6/18/2013	12.5	88.8	1.0	7.15
	6/19/2013	12.5	88.9	0.9	7.01
U1302	7/20/2013	16.8	121.7	0.4	7.23
	7/21/2013	16.5	121.3	0.3	7.35
	7/22/2013	16.7	120.7	0.3	7.35
	7/23/2013	15.1	119.7	0.3	7.28
	7/24/2013	12.6	123.4	0.6	7.24
	7/25/2013	10.8	126.2	0.8	7.25
	7/26/2013	11.6	127.9	0.7	7.21
	7/27/2013	11.8	127.7	0.5	7.24
	7/28/2013	13.5	133.3	1.0	7.23
U1302	8/23/2013	6.6	161.1	2.4	7.32
	8/25/2013	6.6	163.1	1.9	7.34
	8/25/2013	6.7	162.2	2.1	7.28
	8/26/2013	6.0	163.7	1.9	7.09
	8/27/2013	4.9	165.4	1.9	7.13

APPENDIX B
Fish caught by fyke net in eastern NPR-A during 2013

Appendix Table B-1. Daily catches of fish and effort at fyke net Station U0901 in eastern NPRA during 2013.

Tingmiaqsiugvik (Ublutuoch River) - Station U0901, June

	Jun 13	Jun 14	Jun 14	Jun 15	Jun 15	Jun 16	Jun 16	Jun 17	Jun 17	Jun 18	Jun 18	Jun 19	Jun 19
Species	US	US	US	DS	US	DS	US	DS	US	DS	US	DS	US
Chum salmon													
Broad whitefish				1									
Humpback whitefish						1						1	
Least cisco												3	
Round whitefish		2											
Arctic grayling	5	26	1	23	12	10	11	10	24	3	19	15	4
Burbot		1	1		1								
Ninespine stickleback	11	18	4	3	1	12		1	1			3	3
Slimy sculpin						1				3		3	
Effort (hrs)	19.4	21.7	22.9	22.9	23.7	28.7	28.9	22.6	22.3	21.8	21.9	21.2	21.3

Tingmiaqsiugvik (Ublutuoch River) - Station U0901, July

	Jul 21	Jul 21	Jul 22	Jul 22	Jul 23	Jul 23	Jul 24	Jul 24	Jul 25	Jul 25	Jul 26	Jul 26	Jul 27	Jul 27	Jul 28	Jul 28
Species	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
Chum salmon																
Broad whitefish	49	9	16	2	16	10	1		1	1	2		2	1	3	6
Humpback whitefish	18		18		11						1		6	2	19	
Least cisco	190	38	85	5	55	211	2	3	6	1	4		1	9	10	24
Round whitefish	1			1	1	2					1		2			
Arctic grayling	14	11	9	7	12	13	8		11		10	1	6		14	2
Burbot																
Ninespine stickleback	6			14	1		9		4		2		2	15	10	32
Slimy sculpin				1												
Effort (hrs)	17.3	19.8	24.5	23.5	28.5	29.6	18.9	17.2	26.1	26.2	24.1	24.0	22.1	22.1	23.7	24.1

Tingmiaqsiugvik (Ublutuoch River) - Station U0901, August

	Aug 24	Aug 24	Aug 25	Aug 25	Aug 26	Aug 26	Aug 27	Aug 27	Aug 28	Aug 28	Aug 29	Aug 29	Aug 30	Aug 30
Species	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
Chum salmon		1								1				
Broad whitefish	5	2	3	2	1	4			6	24	3	4		11
Humpback whitefish			3							10		1		2
Least cisco												1		1
Round whitefish	4	10			5	1			13	11	3	1		3
Arctic grayling	9	39	1	3	7	7			58	5	18	3	3	
Burbot	3		2		3					6		4	3	2
Ninespine stickleback											3	1		
Slimy sculpin														
Effort (hrs)	20.2	22.3	24.1	22.2	23.6	24.0	--	--	54.8	52.5	18.2	19.0	27.1	26.9

Appendix Table B-2. Daily catches of fish and effort at fyke net Station U1301 in eastern NPRA during 2013.

Tingmiaqsiugvik (Ublutuoch River) - Station U1301, July

	Jul 26	Jul 26	Jul 27	Jul 27	Jul 28	Jul 28
Species	DS	US	DS	US	DS	US
Chum salmon						
Broad whitefish	1		1			32
Humpback whitefish	2		5	1		
Least cisco	2	3	36	7	12	23
Round whitefish		2				5
Arctic grayling	1	16	4	10	1	8
Burbot						
Ninespine stickleback		1	2	46	4	1
Slimy sculpin			1			
Effort (hrs)	25.8	25.8	22.7	22.7	23.8	23.9

Tingmiaqsiugvik (Ublutuoch River) - Station U1301, August

	Aug 25	Aug 25	Aug 26	Aug 26	Aug 27	Aug 27	Aug 28	Aug 28	Aug 29	Aug 29	Aug 30	Aug 30
Species	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
Chum salmon												
Broad whitefish	1		1	2						1		
Humpback whitefish												
Least cisco												
Round whitefish	1	1	1					1				
Arctic grayling	9	11	3	4			12	22	2	2	3	
Burbot		4		2				4		2		2
Ninespine stickleback	5						2		2	2	1	1
Slimy sculpin												
Effort (hrs)	47.3	46.8	24.2	24.3	--	--	55.1	55.1	18.3	18.4	26.1	26.2

Appendix Table B-3. Daily catches of fish and effort at fyke net Station U1302 in eastern NPRA during 2013.

Tingmiaqsiugvik (Ublutuoch River) - Station U1301, June

	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19
Species	US	US	US	US	US
Chum salmon					
Broad whitefish					
Humpback whitefish			1	1	
Least cisco				1	
Round whitefish			1		
Arctic grayling		1	48	31	30
Burbot					
Ninespine stickleback	4	4			
Slimy sculpin					
Effort (hrs)	22.4	28.7	23.4	21.0	21.4

Tingmiaqsiugvik (Ublutuoch River) - Station U1301, July

	Jul 21	Jul 21	Jul 22	Jul 22	Jul 23	Jul 23	Jul 24	Jul 24	Jul 25	Jul 25	Jul 26	Jul 26	Jul 27	Jul 27	Jul 28	Jul 28
Species	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
Chum salmon																
Broad whitefish		1														
Humpback whitefish																
Least cisco	1	10						4								1
Round whitefish		4												2		2
Arctic grayling	1	8	2	10	3	11	3		1	1	1	10	2	1	6	3
Burbot																
Ninespine stickleback	1	2		23				3	2					3		
Slimy sculpin																
Effort (hrs)	19.7	19.7	23.6	23.7	30.8	30.1	16.0	16.1	26.2	26.2	25.7	25.2	22.8	22.8	23.4	23.8

Tingmiaqsiugvik (Ublutuoch River) - Station U1301, August

	Aug 25	Aug 25	Aug 26	Aug 26	Aug 27	Aug 27
Species	DS	US	DS	US	DS	US
Chum salmon			1			
Broad whitefish	2					
Humpback whitefish						
Least cisco					1	
Round whitefish				2	1	
Arctic grayling		3	1	1		1
Burbot						
Ninespine stickleback						
Slimy sculpin						
Effort (hrs)	50.2	48.7	24.0	25.0	20.8	21.0

Appendix Table B-4. Daily catches of fish and effort at fyke net Station C0306 in eastern NPRA during 2013.

Barely Creek - Station C0306, June

	Jun 13	Jun 13	Jun 14	Jun 14	Jun 15	Jun 15	Jun 16	Jun 16	Jun 17	Jun 17	Jun 18	Jun 18	Jun 19	Jun 19
Species	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
Arctic grayling				1			1							
Alaska blackfish				1	1	2	1	1		1		4		5
Ninespine stickleback	41	24	31	14	25	11	14	1	6	2	5	6	4	2
Effort (hrs)	16.8	16.6	23.4	23.5	23.8	23.8	29.3	29.2	22.3	22.2	27.2	27.2	19.7	19.8

Barely Creek - Station C0306, July

	Jul 21	Jul 22	Jul 23	Jul 24
Species	US	US	US	US
Arctic grayling				
Alaska blackfish	1			
Ninespine stickleback	2	4		31
Effort (hrs)	22.6	23.7	--	46.2

APPENDIX C

Length frequencies of fish caught by fyke net in eastern NPR-A during 2013

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**																			
	Jun 13	Jun 14	Jun 14	Jun 15		Jun 16		Jun 17		Jun 18		Jun 19		Jul 21		Jul 22		Jul 23	
	US	US	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																			
10																			
20																			
30																			
40																			
50																			
60						1			1			1							
70									1		1	1	1						
80																			
90												1		1	1				1
100						1			1					4	1		1		
110		5				1			1		1						1		1
120		5		1	1	1	1				1	1							
130		1	1								1		1		1	1			
140		2		1					1					1	1	1		1	
150		4		2					1					1	1	1		1	
160		3		3				3	3	1	2	1		1				1	1
170		1		2	1		1		2		1	1		1					1
180							1					1							
190									2		1						1		2
200	1	2							1		1					1		2	
210	1	2		1	2	1	2	1					1		1				
220				1	2	1	1		2		4	2		1		1			1
230		1		1	1	1		1	1		2			1				2	1
240	1			3				1	2				1	1					
250				2	2	1		2				1							1
260	1			2		1	1		1	1	1						1		
270				1	1		1		1						1	1			
280												3				1		1	1
290							1							1			1		
300				1				1	1		1						2	1	1
310	1						1							1	1			1	
320				2							1				1				1
330							1	1		1	1	1			1	1			
340					1				1			1						2	
350					1														1
360									1										
370																			
380																			
390																1			
400						1									1				
410																			
420																			
430																			
440																			
450																			
Total:	5	26	1	23	12	10	11	10	24	3	19	15	4	14	11	9	7	12	13

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**																			
	Jul 24		Jul 25		Jul 26		Jul 27		Jul 28		Aug 24		Aug 25		Aug 26		Aug 27		Aug 28	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																				
10																				
20																				
30					1															
40	1				1															
50											1	1								
60											1									
70																				
80																				
90					2															
100			2																	
110					1							1				1				
120																			2	
130																				
140	1								1											
150	2										1									
160			1		1	1					1				1				2	1
170															1				1	
180					1														1	
190			2																	
200	1									1	1	1	1		1				1	
210									1		1	1			1					
220									1										1	
230															2	1			1	
240			1		1									1	1	1			7	
250									2			4							5	
260												5		1		1			4	
270			1				1		1			6							7	
280	1		1						2		1	2							7	
290			1		1				1		1	4							3	
300					1					1		5							8	
310							2		2			2		1		2			4	
320	1		1						1		1	2							1	
330												2				1			1	
340	1		1				1					1							1	
350									2			1							1	3
360																				
370																				1
380							1													
390																				
400																				
410							1					1								
420																				
430																				
440																				
450																				
Total:	8	0	11	0	10	1	6	0	14	2	9	39	1	3	7	7	0	0	58	5

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**			
	Aug 29		Aug 30	
	DS	US	DS	US
0				
10				
20				
30				
40				
50				
60				
70				
80				
90				
100				
110				
120				
130	1			
140				
150				
160			1	
170				
180				
190	1			
200				
210				
220		1		
230				
240	4			
250	4		1	
260	1			
270	2			
280	1	1		
290		1		
300	2			
310				
320	1			
330				
340			1	
350				
360				
370	1			
380				
390				
400				
410				
420				
430				
440				
450				
Total:	18	3	3	0

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U1301**														
	Jul 26		Jul 27		Jul 28		Aug 25		Aug 26		Aug 28		Aug 29		Aug 30
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS
0															
10															
20															
30															
40															1
50	1						1		2	1		10	2		1
60							3			1					1
70															
80		2													
90				1											
100							1								
110						1		2				1			
120								1							
130															
140				1											
150				1	1	2	1				1				
160		1									2				
170											1	1			
180				1											
190						1		1							
200		1		2			1				1				
210		2		1						1				1	
220		1		1		1					1				
230			1	1			1	1							
240		1	1			1					1			1	
250						1		1			3				
260		1						2	1	1	1				
270		1						1			2				
280		1	2			1					2				
290							1	1			1				
300		1									1				
310		1									2				
320				1							2				
330		1													
340		2						1							
350											1				
360															
370															
380															
390															
400															
410															
420															
430															
440															
450															
Total:	1	16	4	10	1	8	9	11	3	4	22	12	2	2	3

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U1302**																			
	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jul 21		Jul 22		Jul 23		Jul 24		Jul 25		Jul 26		Jul 27	
	US	US	US	US	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																			
10																			
20																			
30																		2	1
40												1							
50																			
60																			
70																			
80									3										
90				3								1					1		
100				1					2		1				1				
110			3	2	3				1		1								
120		1	1		2				1										
130				3	1							1							
140			1																
150			1	1	4						1								
160			1	1	1														
170			1														1		
180						1													
190				2	2														
200			4	1	3														
210			2	1	1		1		1		1								
220			2	1	2		1				1								
230			1	1	2				1		1								
240			2	1	1						1			1			1		
250			2	3			1										1		
260			2	1	1		2		1		1						1		
270			7	1	1														
280			2	1	2												1		
290			2	1			2										1		
300			2	1							1						2		
310			2	2												1			
320				2	1		1				1						1		
330			2		1						1								
340			4																
350																			
360				1															
370					1														
380			1																
390			3		1														
400																			
410																			
420																			
430																			
440																			
450																			
Total:	0	1	48	31	30	1	8	0	10	0	11	3	0	1	1	1	10	2	1

Appendix Table C-1. Length frequencies of Arctic grayling caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U1302**							
	Jul 28		Aug 25		Aug 26		Aug 27	
	DS	US	DS	US	DS	US	DS	US
0								
10								
20								
30	6							
40								
50								
60								
70								
80								
90				1				
100		2		1	1			
110								
120								
130								
140								
150								
160						1		
170								
180								
190								
200								
210								
220								
230								
240								1
250								
260								
270								
280								
290								
300				1				
310		1						
320								
330								
340								
350								
360								
370								
380								
390								
400								
410								
420								
430								
440								
450								
Total:	6	3	0	3	1	1	0	1

Appendix Table C-2. Length frequencies of broad whitefish caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**																			
	Jun 15		Jul 21		Jul 22		Jul 23		Jul 24		Jul 25		Jul 26		Jul 27		Jul 28		Aug 24	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																				
10																				
20																				
30																				
40						1														
50									1				1					2		
60																		1	1	
70																				
80								1												
90																		1		
100			5		2			2			1									
110			9	4	4		1	1												
120			11	3	3	1	3	4					1				1	1		
130			15	2	2		1	1												
140			2																	1
150																				
160																				
170																				
180																				
190																				
200																				
210																				
220																			1	
230																				
240																				
250																				
260																				
270																				
280																				
290																				
300					1															
310																	1	1		
320					1														1	
330					1		1													
340																				
350			1																	
360							2													
370							2													
380							1	1				1								
390			1																	
400							1												1	
410			1																	
420							1													
430					1										1					
440			1													1				
450																	1			
460			1				1													1
470																				
480															1					
490			1																	
500							1													
510																				
520	1																		1	
530			1																	
540																				
550																				
560					1															
570																				
580																				
590							1													
Total:	1	0	49	9	16	2	16	10	1	0	1	1	2	0	2	1	3	6	5	2

Appendix Table C-2. Length frequencies of broad whitefish caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	Aug 25		Aug 26		Aug 28		Aug 29		Aug 30	
	DS	US	DS	US	DS	US	DS	US	DS	US
0										
10										
20										
30										
40										
50										
60										
70										
80				1						
90										
100										
110										
120										
130					1					
140							1			
150		1			2		1	1		
160										
170					1					
180										
190										
200										
210										
220										
230										
240										
250										
260										
270										
280										1
290										
300						3				
310										
320						1				
330						3				
340						1		1		1
350						5				1
360				1		3				
370	1					3				1
380										1
390						1		1		
400	1			1		1		1		1
410							1			
420					1					
430										
440										
450						1				
460		1	1							1
470	1			1		1				1
480										
490						1				1
500					1					1
510										
520										
530										
540										
550										1
560										
570										
580										
590										
Total:	3	2	1	4	6	24	3	4	0	11

Appendix Table C-2. Length frequencies of broad whitefish caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	Ublutuoch River - Station U1301												Station U1302			
	Jul 26		Jul 27		Jul 28		Aug 25		Aug 26		Aug 29		Jul 21		Aug 25	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																
10																
20																
30																
40																
50			1			11										
60						21			1						1	
70							1					1			1	
80																
90																
100																
110																
120														1		
130										1						
140	1															
150																
160																
170																
180																
190																
200																
210																
220																
230																
240																
250																
260																
270																
280																
290																
300																
310																
320																
330																
340																
350																
360																
370																
380																
390																
400																
410																
420																
430																
440																
450																
460																
470																
480																
490																
500																
510																
520																
530																
540																
550																
560																
570																
580																
590																
Total:	1	0	1	0	0	32	1	0	1	1	0	1	0	1	2	0

Appendix Table C-3. Length frequencies of humpback caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**																			
	Jun 16		Jun 19		Jul 21		Jul 22		Jul 23		Jul 26		Jul 27		Jul 28		Aug 25		Aug 28	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																				
10																				
20																				
30																				
40																				
50																				
60																				
70																				
80																				
90																				
100																				
110																				
120																				
130																				
140																				
150																				
160																				
170																				
180																				
190																				
200																				
210																				
220																				
230																				
240																				
250																				
260																				
270																				
280																				
290																				
300																				
310																				
320													1							
330					2															
340					2															
350							1		2				1							1
360	1		1		3		1		2					1	1		1			1
370					1		1		1		1		1		3					
380					2		2								1		1			
390					3		2		2						3					1
400					1		4								6					1
410					3		2		2					1	1					
420							1						3							2
430							4								2		1			3
440					1				1											
450															2					1
460									1											
470																				
480																				
490																				
500																				
Total:	1	0	1	0	18	0	18	0	11	0	1	0	6	2	19	0	3	0	0	10

Appendix Table C-3. Length frequencies of humpback caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**				**Station U1301**				**Station U1302**			
	Aug 29		Aug 30		Jul 26		Jul 27		Jun 17		Jul 18	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0												
10												
20												
30												
40												
50												
60												
70												
80												
90												
100												
110												
120												
130												
140												
150												
160												
170												
180												
190												
200												
210												
220												
230												
240												
250												
260												
270												
280												
290												
300												
310												
320												
330												
340					2			1				
350												
360												
370							1					
380				1			1			1		
390							2					
400		1		1			1					
410												
420												
430												1
440												
450												
460												
470												
480												
490												
500												
Total:	0	1	0	2	2	0	5	1	0	1	0	1

Appendix Table C-4. Length frequencies of least cisco caught by fyke net in eastern NPR-A, 2013.

Fork	**Ublutuoch River - Station U0901**																		
Length	Jun 19	Jul 21		Jul 22		Jul 23		Jul 24		Jul 25		Jul 26		Jul 27		Jul 28		Aug 29	
(mm)	DS	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																			
10																			
20																			
30																			
40																			
50																			
60																			
70		1				1													
80		11	4	2		5	18								1		4		
90		17	4	10		17	67	1	1		1	1			5	4	9		
100		13		7		9	47		1	2		1			2	3	2		
110		35	6	17	2	5	26			1		1			1		1		
120		31	6	21	1	6	28	1		1				1		1	6		
130		22	9	9		1	8									1	1		
140		10	4	3	1	2	5										1		
150		9		4			3												
160	1	8	1	4		1	5												
170	2	3	2	3		3	3		1										
180		3	1	1			1			1		1							
190		8				2													
200		9		1	1														
210		3																	
220		2	1																
230		2		1		2													
240		2																	
250										1									
260																1			
270																			
280																			
290																			1
300				1															
310				1															
320																			
330																			
340																			
350		1				1													
360																			
370																			
380																			
390																			
400																			
410																			
420																			
430																			
440																			
450																			
Total:	3	190	38	85	5	55	211	2	3	6	1	4	0	1	9	10	24	0	1

Appendix Table C-4. Length frequencies of least cisco caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	Station U0901 Aug 30		Station U1301 Aug 26		Aug 27		Aug 28		Station U1302 Jun 18	Jul 21		Jul 24		Jul 28		Aug 27	
	DS	US	DS	US	DS	US	DS	US	DS	DS	US	DS	US	DS	US	DS	US
0																	
10																	
20																	
30																	
40																	
50																	
60								1									
70								1									
80					9		1	7									
90			1	1	16	2	6	9							1		
100				1	7	1	3	4			1		1				
110					1		1			1			1				
120				1			1				1		2				
130					1	1		1									
140			1								1						
150					1						1					1	
160																	
170					1						1						
180											1						
190																	
200						2											
210																	
220											1						
230											1						
240		1									1						
250											1						
260																	
270						1											
280																	
290																	
300																	
310																	
320																	
330									1								
340																	
350																	
360																	
370																	
380																	
390																	
400																	
410																	
420																	
430																	
440																	
450																	
Total:	0	1	2	3	36	7	12	23	1	1	10	0	4	0	1	1	0

Appendix Table C-5. Length frequencies of round whitefish caught by fyke net in eastern NPR-A, 2013.

Round Whitefish

Fork	**Ublutuoch River - Station U0901**																	
Length	Jun 14	Jul 21		Jul 22		Jul 23		Jul 26		Jul 27		Aug 24		Aug 26		Aug 28	
(mm)	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																	
10																	
20																	
30																	
40																	
50																	
60																	
70																	
80																	
90																	
100							1										
110						1											
120	1				1												
130																	
140							1						1				
150																	
160															1		
170		1															2
180																	
190								1									
200																	1
210												1					1
220																	
230													1				2
240	1												1				
250																	
260																	1
270													1				
280										1							
290													1				
300																	1
310													1				1
320													2				1
330												2	2				
340																	
350																	
360																	
370																	
380										1		1					
390																	
400																	
410																	1
420																	
430																	
440																	
450																	
Total:	2	1	0	0	1	1	2	1	0	2	0	4	10	0	1	0	11

Appendix Table C-5. Length frequencies of round whitefish caught by fyke net in eastern NPR-A, 2013.

Round Whitefish

Fork	**Station U0901**				**Station U1301**						**Station U1302**								
Length	Aug 29		Aug 30		Jul 26		Jul 28		Aug 25		Jun 17	Jul 21		Jul 27		Jul 28		Aug 26	
(mm)	DS	US	DS	US	DS	US	DS	US	DS	US	US	DS	US	DS	US	DS	US	DS	US
0																			
10																			
20																			
30																			
40																			
50																			
60																			
70																			
80								1											
90																			
100																			
110																			
120																			
130																			
140								2							1		1		
150																	1		
160										1					1				
170													1						
180																			
190																			1
200																			
210								1					1						
220		1						1											
230																			
240																			
250				1															
260				1									1						
270																			
280																			
290																			1
300											1		1						
310																			
320																			
330																			
340																			
350						1													
360																			
370																			
380																			
390				1															
400						1													
410																			
420																			
430																			
440																			
450																			
Total:	0	1	0	3	0	2	0	5	0	1	1	1	0	2	0	0	5	0	1

Appendix Table C-6. Length frequencies of burbot caught by fyke net in eastern NPR-A, 2013.

Burbot

Fork Length (mm)	**Ublutuoch River - Station U0901**													
	Jun 14	Jun 15	Aug 24		Aug 25		Aug 26		Aug 28		Aug 29		Aug 30	
	US	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
200														
210														
220														
230														
240														
250														
260														
270														
280														
290														
300														
310														
320														
330														
340														
350														
360														
370												1		
380														
390														
400														
410														
420		1	1											
430							1			1			1	
440	1						1							
450														
460	1													1
470													1	
480										1				
490							1			2				
500												1		
510			2		1					1				
520										1		1		
530													1	
540												1		1
550					1									
560														
570														
580														
590														
600														
610														
620														
630														
640														
650														
660														
670														
680														
690														
700														
Total:	2	1	3	0	2	0	3	0	0	6	0	4	3	2

Appendix Table C-6. Length frequencies of burbot caught by fyke net in eastern NPR-A, 2013.

Burbot

Fork Length (mm)	**Ublutuoch River - Station U1301**									
	Aug 25		Aug 26		Aug 28		Aug 29		Aug 30	
	DS	US	DS	US	DS	US	DS	US	DS	US
200										
210										
220										
230										
240										
250										
260										
270										
280										
290										
300										
310										
320										
330										
340										
350										
360										
370										
380										
390										
400										
410				1						
420										
430		1								
440		1								1
450										
460										
470					1					
480		1		1	1					1
490								1		
500										
510										
520		1			2					
530										
540								1		
550										
560										
570										
580										
590										
600										
610										
620										
630										
640										
650										
660										
670										
680										
690										
700										
Total:	0	4	0	2	4	0	0	2	0	2

Appendix Table C-7. Length frequencies of ninespine stickleback caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Barely Creek**										**Ublutuoch River - Station U0901**				
	Jun 13	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jul 21	Jul 22	Jul 24	Jun 13	Jun 14	Jun 14	Jun 15	
	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US	US	US	US	DS	US
0															
5															
10															
15															
20															
25															
30															
35				1			1		1						
40		1	2	1		1	1							2	1
45	2	2	2					1	1		1	1	1	1	
50	14	4	6	3	1	2	2		1		4	1	1		
55	25	17	10	3	1	2		1		1	4	8	1		
60	10	11	12	4	6	2	2		1		2	6			
65	13	9	4	3		4						1	1		
70	1	1										1			
75															
80															
85															
90															
95															
100															
105															
110															
115															
120															
125															
Total:	65	45	36	15	8	11	6	2	4	1	11	18	4	3	1

Appendix Table C-7. Length frequencies of ninespine stickleback caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U0901**																			
	Jun 16		Jun 17		Jun 19		Jul 21		Jul 22		Jul 23		Jul 24		Jul 25		Jul 26		Jul 27	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																				
5																				
10																				
15																				
20																				
25																				
30																				
35																				
40																				
45	2				1					1			1							
50	3				1	2	1			3	1		3				1			4
55	5		1	1		1	2			5			2		2				2	7
60	1						2			3			1		2					4
65					1		1			1			1				1			
70	1									1			1							
75																				
80																				
85																				
90																				
95																				
100																				
105																				
110																				
115																				
120																				
125																				
Total:	12	0	1	1	3	3	6	0	0	14	1	0	9	0	4	0	2	0	2	15

Appendix Table C-7. Length frequencies of ninespine stickleback caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	Station U0901				Ublutuoch River - Station U1301													
	Jul 28		Aug 29		Jul 26		Jul 27		Jul 28		Aug 25		Aug 28		Aug 29		Aug 30	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0																		
5																		
10																		
15																		
20																		
25																		
30																		
35																		
40											1							
45	1	4						2	1		1							
50	2	11		1			1	13		1	2			1	1	1	1	
55	7	12	1					26	2						1	1		1
60		4	1			1		3						1				
65		1	1					2	1		1							
70							1											
75																		
80																		
85																		
90																		
95																		
100																		
105																		
110																		
115																		
120																		
125																		
Total:	10	32	3	1	0	1	2	46	4	1	5	0	0	2	2	2	1	1

Appendix Table C-7. Length frequencies of ninespine stickleback caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Ublutuoch River - Station U1302**													
	Jun 15		Jun 16		Jul 21		Jul 22		Jul 24		Jul 25		Jul 27	
	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US	DS	US
0														
5														
10														
15														
20														
25														
30														
35														
40				2										
45								3						
50		1						8		2				
55		2		2		1		4						1
60		1				1		6		1	2			1
65					1									1
70								1						
75								1						
80														
85														
90														
95														
100														
105														
110														
115														
120														
125														
Total:	0	4	0	4	1	2	0	23	0	3	2	0	0	3

Appendix Table C-8. Length frequencies of Alaska blackfish caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	**Barely Creek**						
	Jun 14	Jun 15	Jun 16	Jun 17	Jun 18	Jun 19	Jul 21
	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US	DS/US
0							
5							
10							
15							
20							
25							
30							
35							
40							
45							
50	1						
55							
60						1	
65							
70							
75			1				
80		1					
85					1		
90				1		1	
95		1				2	1
100			1				
105						1	
110					2		
115					1		
120							
125							
130		1					
135							
140							
145							
150							
Total:	1	2	2	1	4	5	1

Appendix Table C-9. Length frequencies of slimy sculpin caught by fyke net in eastern NPR-A, 2013.

Fork Length (mm)	Ublutuoch River - Station U0901								Station U1301	
	Jun 16		Jun 18		Jun 19		Jul 22		Jul 27	
	DS	US	DS	US	DS	US	DS	US	DS	US
0										
5										
10										
15										
20										
25										
30										
35										
40									1	
45					1					
50			1							
55										
60	1		1		1					
65										
70										
75					1					
80										
85			1					1		
90										
95										
100										
105										
110										
115										
120										
125										
130										
135										
140										
145										
150										
Total:	1	0	3	0	3	0	0	1	1	0

APPENDIX D

Population estimates for Arctic grayling based on tag recaptures, 2013

Appendix Table D-1. Population estimates of Arctic grayling (180 mm or longer) using the Schnabel and Schumacher-Eshmeyer estimators.

Tingmiaqsiugvik (Ublutuoch) drainage - 2013

	C_i		M_i	R_i					
	Number	Tags	Cum	Tags	Schnabel	Schumacher-Eschmeyer			
Date	Caught	Released	Released	Recapped	Est.	C_iM_i	M_iR_i	CM^2	R^2/C
Jun 13	5	5	5		1	25	0	125	0.000
Jun 14	27	5	10	1	6	270	10	2,700	0.037
Jun 15	24	23	33	1	17	792	33	26,136	0.042
Jun 16	16	15	48	1	16	768	48	36,864	0.063
Jun 17	68	59	107	2	155	7,276	214	778,532	0.059
Jun 18	45	33	140	6	134	6,300	840	882,000	0.800
Jun 19	41	31	171	2	149	7,011	342	1,198,881	0.098
Jul 21	20	20	191	5	81	3,820	955	729,620	1.250
Jul 22	23	16	207	1	101	4,761	207	985,527	0.043
Jul 23	32	27	234	5	159	7,488	1,170	1,752,192	0.781
Jul 24	7	4	238	2	35	1,666	476	396,508	0.571
Jul 25	10	8	246		52	2,460	0	605,160	0.000
Jul 26	32	25	271	1	185	8,672	271	2,350,112	0.031
Jul 27	23	17	288	3	141	6,624	864	1,907,712	0.391
Jul 28	27	21	309	2	178	8,343	618	2,577,987	0.148
Aug 24	42	41	350	6	313	14,700	2,100	5,145,000	0.857
Aug 25	27	15	365	1	210	9,855	365	3,597,075	0.037
Aug 26	20	14	379	2	161	7,580	758	2,872,820	0.200
Aug 27	1	1	380		8	380	0	144,400	0.000
Aug 28	91	75	455	5	881	41,405	2,275	18,839,275	0.275
Aug 29	24	22	477		244	11,448	0	5,460,696	0.000
Aug 30	5	2	479		51	2,395	0	1,147,205	0.000
Totals:	610	479		46	3,277	154,039	11,546	51,436,527	5.683

Schnabel Estimate:		3,277	Schumacher-Eschmeyer Estimate:		4,455
-95%	61.3576	2,470	-95%	0.000336	2,979
+95%	33.6778	4,442	+95%	0.000113	8,833

from Poisson dist. Table at:
http://statpages.org/confint.html

s^2=	0.1472
s 1/n =	0.00005
df	21
t.95, 21df	2.0796

APPENDIX E

Releases and Recoveries of fish marked with Floy anchor tags

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
BDWF	MJM0101959	U0901	7/25/2013	382						
	MJM0101981	U0901	7/23/2013	365						
	MJM0101991	U0901	7/23/2013	382						
	MJM0102077	U0901	8/28/2013	347						
	MJM0102078	U0901	8/28/2013	339						
	MJM0102079	U0901	8/28/2013	353						
	MJM0102080	U0901	8/28/2013	331						
	MJM0102081	U0901	8/28/2013	404						
	MJM0102082	U0901	8/28/2013	373						
	MJM0102084	U0901	8/28/2013	303						
	MJM0102085	U0901	8/28/2013	334						
	MJM0102087	U0901	8/28/2013	350						
	MJM0102094	U0901	8/28/2013	327						
	MJM0102095	U0901	8/28/2013	377						
	MJM0102168	U0901	8/24/2013	462						
	MJM0102175	U0901	8/25/2013	475						
	MJM0102178	U0901	8/25/2013	404						
	MJM0102179	U0901	8/25/2013	376						
	MJM0102184	U0901	8/25/2013	461						
	MJM0102394	U0901	8/28/2013	429						
	MJM0102395	U0901	8/28/2013	504						
	MJM0102405	U0901	8/30/2013	406						
	MJM0102406	U0901	8/30/2013	344						
	MJM0102407	U0901	8/30/2013	377						
	MJM0102411	U0901	8/30/2013	384						
	MJM0102412	U0901	8/30/2013	284						
	MJM0102413	U0901	8/30/2013	359						
	MJM0102416	U0901	8/30/2013	468						
	MJM0102417	U0901	8/30/2013	551						
	MJM0102418	U0901	8/30/2013	476						
	MJM0102444	U0901	7/28/2013	315						
	MJM0102553	U0901	8/24/2013	325						
	MJM0102632	U0901	7/21/2013	358						
	MJM0102636	U0901	7/21/2013	392						
	MJM0102656	U0901	7/22/2013	324						
	MJM0102657	U0901	7/22/2013	300						
	MJM0102671	U0901	7/22/2013	334						
	MJM0102695	U0901	7/23/2013	338						
	MJM0102699	U0901	7/23/2013	380						
	MJM0102700	U0901	7/23/2013	365						
	MJM0102761	U0901	8/29/2013	349						
	MJM0102762	U0901	8/29/2013	400						
	MJM0102763	U0901	8/29/2013	398						
	MJM0102774	U0901	8/29/2013	418						
	MJM0103450	U0901	7/28/2013	313						
	MJM0103451	U0901	8/26/2013	365						
	MJM0103454	U0901	8/26/2013	408						
	MJM0103463	U0901	8/28/2013	362						
	MJM0103464	U0901	8/28/2013	474						
	MJM0103465	U0901	8/28/2013	351						
	MJM0103466	U0901	8/28/2013	364						
	MJM0103468	U0901	8/28/2013	375						
	MJM0103469	U0901	8/28/2013	390						
	MJM0103471	U0901	8/28/2013	304						
	MJM0103472	U0901	8/28/2013	358						
	MJM0103473	U0901	8/28/2013	367						
	MJM0103474	U0901	8/28/2013	307						
	MJM0103475	U0901	8/28/2013	355						
	MJM0104137	U0901	6/15/2013	525						
	MJM090800	U0901	8/24/2013	223						
BURB	MJM0102051	U0901	8/28/2013	435						
	MJM0102052	U0901	8/28/2013	520						
	MJM0102053	U0901	8/28/2013	483						
	MJM0102180	U0901	8/25/2013	514						
	MJM0102181	U0901	8/25/2013	555	U0901	8/29/2013	545	4	RECAP	
	MJM0102181	U0901	8/29/2013	545	U0901	8/30/2013	545	1	RECAP	
	MJM0102181	U0901	8/30/2013	545						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
BURB	MJM0102189	U1301	8/25/2013	442	U0901	8/26/2013	445	1	RECAP	
	MJM0102189	U0901	8/26/2013	445						
	MJM0102190	U1301	8/25/2013	436						
	MJM0102191	U1301	8/25/2013	486	U1301	8/29/2013	490	4	RECAP	
	MJM0102191	U1301	8/29/2013	490						
	MJM0102192	U1301	8/25/2013	529	U1301	8/29/2013	540	4	RECAP	
	MJM0102192	U1301	8/29/2013	540						
	MJM0102198	U0901	8/26/2013	490						
	MJM0102400	U1301	8/28/2013	521						
	MJM0102419	U0901	8/30/2013	464						
	MJM0102421	U0901	8/30/2013	432						
	MJM0102422	U0901	8/30/2013	476						
	MJM0102423	U0901	8/30/2013	533						
	MJM0102424	U1301	8/30/2013	444						
	MJM0102425	U1301	8/30/2013	482						
	MJM0102554	U0901	8/24/2013	422						
	MJM0102757	U1301	8/28/2013	489						
	MJM0102758	U1301	8/28/2013	476						
	MJM0102765	U0901	8/29/2013	373						
	MJM0102766	U0901	8/29/2013	520						
	MJM0102767	U0901	8/29/2013	502						
	MJM0103455	U1301	8/26/2013	418						
	MJM0103456	U1301	8/26/2013	482						
	MJM0104128	U0901A	6/14/2013	460						
	MJM0104130	U0901B	6/14/2013	441						
	MJM0104135	U0901	6/15/2013	423						
GRAY	MJM0101951	U0901	7/24/2013	327						
	MJM0101952	U0901	7/24/2013	289	U0901	7/28/2013	288	4	RECAP	
	MJM0101952	U0901	7/28/2013	288						
	MJM0101954	U0901	7/25/2013	328						
	MJM0101955	U0901	7/25/2013	342						PIT ID: 180574518
	MJM0101956	U0901	7/25/2013	291						
	MJM0101957	U0901	7/25/2013	283						
	MJM0101958	U0901	7/25/2013	271						PIT ID: 180574189
	MJM0101960	U0901	7/26/2013	290					adipose clip, no PIT	
	MJM0101961	U0901	7/26/2013	306						
	MJM0101963	U1301	7/26/2013	279						
	MJM0101964	U1301	7/26/2013	264						
	MJM0101965	U1301	7/26/2013	284						
	MJM0101966	U1301	7/26/2013	301					adipose clip, no PIT	
	MJM0101967	U1301	7/26/2013	342						
	MJM0101968	U1301	7/26/2013	316						
	MJM0101975	U1302	7/26/2013	258						
	MJM0101982	U0901	7/23/2013	344	U0901	7/27/2013	344	4	RECAP	
	MJM0101982	U0901	7/27/2013	344	U0901	8/28/2013	352	32	RECAP	
	MJM0101982	U0901	8/28/2013	352						
	MJM0101990	U0901	7/23/2013	302						
	MJM0101992	U0901	7/23/2013	257						
	MJM0101993	U0901	7/23/2013	320						
	MJM0101994	U0901	7/23/2013	350						
	MJM0101995	U0901	7/23/2013	288						
	MJM0101996	U1302	7/23/2013	305						
	MJM0101997	U1302	7/23/2013	260						
	MJM0101998	U1302	7/23/2013	336						
	MJM0101999	U1302	7/23/2013	289	U1302	7/26/2013	289	3	RECAP	adipose clip, no PIT
	MJM0101999	U1302	7/26/2013	289						
	MJM0102000	U0901	7/24/2013	348						
	MJM0102054	U0901	8/28/2013	280						
	MJM0102055	U0901	8/28/2013	265						
	MJM0102056	U0901	8/28/2013	258						
	MJM0102057	U0901	8/28/2013	279						
	MJM0102058	U0901	8/28/2013	293						PIT ID: 180574244
	MJM0102059	U0901	8/28/2013	300					adipose clip, no PIT	
	MJM0102061	U0901	8/28/2013	274						
	MJM0102062	U0901	8/28/2013	287						
	MJM0102063	U0901	8/28/2013	274						
	MJM0102064	U0901	8/28/2013	292						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM0102065	U0901	8/28/2013	279						PIT ID: 180547995
	MJM0102066	U0901	8/28/2013	315						
	MJM0102067	U0901	8/28/2013	255						
	MJM0102068	U0901	8/28/2013	260					adipose clip, no PIT	
	MJM0102069	U0901	8/28/2013	265						
	MJM0102070	U0901	8/28/2013	334						
	MJM0102071	U0901	8/28/2013	302						
	MJM0102072	U0901	8/28/2013	314						
	MJM0102073	U0901	8/28/2013	316					adipose clip, no PIT	
	MJM0102074	U0901	8/28/2013	279						
	MJM0102075	U0901	8/28/2013	281						
	MJM0102090	U0901	8/28/2013	356						
	MJM0102091	U0901	8/28/2013	372	U0901	8/29/2013	374	1	RECAP	
	MJM0102091	U0901	8/29/2013	374						
	MJM0102096	U0901	8/28/2013	357						
	MJM0102151	U0901	8/24/2013	252						
	MJM0102154	U0901	8/24/2013	291						
	MJM0102155	U0901	8/24/2013	275						
	MJM0102156	U0901	8/24/2013	275					adipose clip, no PIT	
	MJM0102157	U0901	8/24/2013	304						
	MJM0102158	U0901	8/24/2013	304						
	MJM0102159	U0901	8/24/2013	275						
	MJM0102160	U0901	8/24/2013	291	U0901	8/28/2013	291	4	RECAP	
	MJM0102160	U0901	8/28/2013	291	U1301	8/28/2013	292	0	RECAP	2.33 hrs
	MJM0102160	U1301	8/28/2013	292						
	MJM0102161	U0901	8/24/2013	266						
	MJM0102162	U0901	8/24/2013	264	U1301	8/26/2013	263	2	RECAP	adipose clip, no PIT
	MJM0102162	U1301	8/26/2013	263					RECAP	PIT ID: 180574149
	MJM0102163	U0901	8/24/2013	332						
	MJM0102165	U0901	8/24/2013	302						
	MJM0102166	U0901	8/24/2013	279						
	MJM0102167	U0901	8/24/2013	356						
	MJM0102169	U0901	8/24/2013	304	U0901	8/28/2013	305	4	RECAP	
	MJM0102169	U0901	8/28/2013	305						
	MJM0102170	U0901	8/24/2013	319	U1301	8/28/2013	320	4	RECAP	
	MJM0102170	U1301	8/28/2013	320						
	MJM0102171	U0901	8/24/2013	343						
	MJM0102172	U0901	8/24/2013	419						
	MJM0102182	U0901	8/25/2013	268						
	MJM0102183	U0901	8/25/2013	310						
	MJM0102185	U1301	8/25/2013	261						
	MJM0102186	U1301	8/25/2013	262						
	MJM0102187	U1301	8/25/2013	276						
	MJM0102188	U1301	8/25/2013	293						
	MJM0102193	U1301	8/25/2013	294						
	MJM0102195	U1302	8/25/2013	309						
	MJM0102378	U0901	8/28/2013	272						
	MJM0102379	U0901	8/28/2013	280						
	MJM0102380	U0901	8/28/2013	308						
	MJM0102381	U0901	8/28/2013	325						
	MJM0102382	U0901	8/28/2013	303						
	MJM0102384	U0901	8/28/2013	287						
	MJM0102385	U0901	8/28/2013	301						
	MJM0102386	U0901	8/28/2013	275						
	MJM0102387	U0901	8/28/2013	255						
	MJM0102388	U0901	8/28/2013	344						
	MJM0102389	U0901	8/28/2013	302						
	MJM0102390	U0901	8/28/2013	280						
	MJM0102391	U0901	8/28/2013	313						
	MJM0102393	U0901	8/28/2013	256						
	MJM0102396	U1301	8/28/2013	307						
	MJM0102397	U1301	8/28/2013	322						
	MJM0102398	U1301	8/28/2013	355						
	MJM0102399	U1301	8/28/2013	318						
	MJM0102401	U0901	8/29/2013	273						
	MJM0102402	U0901	8/29/2013	258						
	MJM0102403	U0901	8/29/2013	253						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM0102404	U0901	8/29/2013	251						
	MJM0102420	U0901	8/30/2013	342						
	MJM0102427	U0901	7/28/2013	354						
	MJM0102429	U0901	7/28/2013	314						
	MJM0102434	U0901	7/28/2013	274						
	MJM0102443	U0901	7/28/2013	302	U0901	8/24/2013	310	27	RECAP	
	MJM0102443	U0901	8/24/2013	310						
	MJM0102445	U1301	7/28/2013	289						
	MJM0102446	U1302	7/28/2013	311						
	MJM0102447	U0901	8/24/2013	294						
	MJM0102448	U0901	8/24/2013	321						
	MJM0102449	U0901	8/24/2013	285						
	MJM0102499	U0901	8/26/2013	261						PIT ID: 180574224
	MJM0102500	U0901	8/26/2013	332						
	MJM0102555	U0901	8/24/2013	252						
	MJM0102556	U0901	8/24/2013	263						
	MJM0102557	U0901	8/24/2013	265						
	MJM0102559	U0901	8/24/2013	330						
	MJM0102560	U0901	8/24/2013	250						
	MJM0102561	U0901	8/24/2013	252						
	MJM0102562	U0901	8/24/2013	285						
	MJM0102563	U0901	8/24/2013	274						
	MJM0102564	U0901	8/24/2013	296						
	MJM0102566	U0901	8/24/2013	324						
	MJM0102567	U0901	8/24/2013	286	U1301	8/28/2013	288	4	RECAP	
	MJM0102567	U1301	8/28/2013	288						
	MJM0102568	U0901	8/24/2013	275						
	MJM0102569	U0901	8/24/2013	297						
	MJM0102570	U0901	8/24/2013	263						
	MJM0102571	U0901	8/24/2013	324						
	MJM0102601	U1302	7/26/2013	327						PIT ID: 180597965
	MJM0102602	U1302	7/26/2013	304						
	MJM0102603	U1302	7/26/2013	307						
	MJM0102604	U1302	7/26/2013	298						
	MJM0102605	U1302	7/26/2013	311						
	MJM0102609	U0901	7/27/2013	310						
	MJM0102611	U0901	7/27/2013	315						
	MJM0102620	U0901	7/27/2013	270						
	MJM0102621	U0901	7/27/2013	385						
	MJM0102622	U0901	7/27/2013	418						
	MJM0102627	U1302	7/21/2013	290						
	MJM0102644	U0901	7/21/2013	271						
	MJM0102645	U0901	7/21/2013	326						
	MJM0102646	U0901	7/21/2013	316						
	MJM0102647	U0901	7/21/2013	335						
	MJM0102648	U0901	7/21/2013	404						
	MJM0102651	U1302	7/21/2013	268						
	MJM0102652	U1302	7/21/2013	258						
	MJM0102653	U1302	7/21/2013	299						
	MJM0102654	U1302	7/21/2013	323	U1302	7/23/2013	325	2	RECAP	
	MJM0102654	U1302	7/23/2013	325						
	MJM0102660	U0901	7/22/2013	273						
	MJM0102661	U0901	7/22/2013	330						
	MJM0102669	U0901	7/22/2013	288						
	MJM0102683	U0901	7/22/2013	395						
	MJM0102684	U0901	7/22/2013	261						
	MJM0102685	U0901	7/22/2013	300						
	MJM0102686	U0901	7/22/2013	301						
	MJM0102687	U0901	7/22/2013	298					adipose clip, no PIT	
	MJM0102688	U1302	7/22/2013	335						
	MJM0102689	U0901	7/23/2013	280						
	MJM0102690	U0901	7/23/2013	319						
	MJM0102692	U0901	7/23/2013	301						
	MJM0102693	U0901	7/23/2013	343	U1301	7/26/2013	347	3	RECAP	
	MJM0102693	U1301	7/26/2013	347						
	MJM0102751	U1301	8/28/2013	255						
	MJM0102752	U1301	8/28/2013	256						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM0102753	U1301	8/28/2013	268						
	MJM0102754	U1301	8/28/2013	283						
	MJM0102755	U1301	8/28/2013	279						
	MJM0102756	U1301	8/28/2013	275						
	MJM0102760	U0901	8/29/2013	298						
	MJM0102768	U0901	8/29/2013	300						
	MJM0102769	U0901	8/29/2013	258						
	MJM0102770	U0901	8/29/2013	278						
	MJM0102771	U0901	8/29/2013	285						
	MJM0102772	U0901	8/29/2013	303						
	MJM0102773	U0901	8/29/2013	329						
	MJM0102775	U0901	8/29/2013	269						PIT ID: 181700610
	MJM0103427	U1301	7/27/2013	324						
	MJM0103428	U1301	7/27/2013	281						
	MJM0103429	U1301	7/27/2013	285						
	MJM0103437	U0901	7/28/2013	286						
	MJM0103438	U0901	7/28/2013	354						
	MJM0103439	U0901	7/28/2013	322						
	MJM0103443	U0901	7/28/2013	298						PIT ID: 180574347
	MJM0103445	U0901	7/28/2013	319						
	MJM0103449	U0901	7/28/2013	258						
	MJM0103452	U0901	8/26/2013	315	U1301	8/28/2013	318	2	RECAP	
	MJM0103452	U1301	8/28/2013	318						
	MJM0103453	U0901	8/26/2013	318						
	MJM0103457	U1301	8/26/2013	261						
	MJM0103462	U0901	8/28/2013	353						
	MJM0104051	U0901	6/18/2013	269						
	MJM0104052	U1302	6/18/2013	296						
	MJM0104053	U1302	6/18/2013	252						
	MJM0104055	U1302	6/18/2013	301						
	MJM0104056	U1302	6/18/2013	264						
	MJM0104057	U1302	6/18/2013	280						
	MJM0104058	U1302	6/18/2013	328						
	MJM0104059	U1302	6/18/2013	258						
	MJM0104060	U1302	6/18/2013	255						
	MJM0104063	U1302	6/18/2013	315						
	MJM0104064	U1302	6/18/2013	327						
	MJM0104065	U1302	6/18/2013	312						
	MJM0104067	U0901	6/19/2013	253						
	MJM0104068	U0901	6/19/2013	283						
	MJM0104069	U0901	6/19/2013	284						
	MJM0104070	U0901	6/19/2013	284	U0901	8/28/2013	306	70	RECAP	
	MJM0104070	U0901	8/28/2013	306						
	MJM0104071	U0901	6/19/2013	332						
	MJM0104072	U0901	6/19/2013	340						
	MJM0104074	U1302	6/19/2013	268						
	MJM0104075	U1302	6/19/2013	275						
	MJM0104076	U1302	6/19/2013	285						
	MJM0104077	U1302	6/19/2013	391						
	MJM0104078	U1302	6/19/2013	283						
	MJM0104080	U1302	6/19/2013	321	U1301	7/26/2013	330	37	RECAP	
	MJM0104080	U1302	6/19/2013	321						
	MJM0104098	U0901	7/21/2013	313						
	MJM0104102	U1302	6/17/2013	305						
	MJM0104103	U1302	6/17/2013	300						
	MJM0104104	U1302	6/17/2013	298						
	MJM0104105	U1302	6/17/2013	277						
	MJM0104106	U1302	6/17/2013	286						
	MJM0104107	U1302	6/17/2013	274						
	MJM0104108	U1302	6/17/2013	397						
	MJM0104109	U1302	6/17/2013	299						
	MJM0104110	U1302	6/17/2013	347						
	MJM0104111	U1302	6/17/2013	330						
	MJM0104112	U1302	6/17/2013	310						
	MJM0104113	U1302	6/17/2013	398						PIT ID: 180574283
	MJM0104114	U1302	6/17/2013	278						
	MJM0104115	U1302	6/17/2013	260						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM0104116	U1302	6/17/2013	253						
	MJM0104117	U1302	6/17/2013	343						
	MJM0104118	U1302	6/17/2013	339						
	MJM0104120	U0901	6/18/2013	265						
	MJM0104122	U0901	6/18/2013	339						
	MJM0104123	U0901	6/18/2013	328						
	MJM0104124	U0901	6/18/2013	300						
	MJM0104125	U0901	6/13/2013	313						
	MJM0104125	U0901	6/18/2013	334						
	MJM0104127	U0901	6/13/2013	263						
	MJM0104131	U0901	6/15/2013	356						PIT ID: 180574388
	MJM0104132	U0901	6/15/2013	341						
	MJM0104133	U0901	6/15/2013	275						
	MJM0104134	U0901	6/15/2013	252						
	MJM0104136	U0901	6/15/2013	253						
	MJM0104138	U0901	6/15/2013	255						
	MJM0104139	U0901	6/15/2013	260						
	MJM0104140	U0901	6/15/2013	254						
	MJM0104141	U0901	6/15/2013	328						
	MJM0104142	U0901	6/15/2013	272						
	MJM0104143	U0901	6/15/2013	262						
	MJM0104144	U0901	6/15/2013	329						
	MJM0104145	U0901	6/15/2013	304						
	MJM0104146	U0901	6/16/2013	276						
	MJM0104147	U0901	6/16/2013	260						
	MJM0104148	U0901	6/16/2013	297						
	MJM0104149	U0901	6/16/2013	314						
	MJM0104150	U0901	6/16/2013	338	U1302	6/19/2013	339	3	RECAP	
	MJM0104150	U1302	6/19/2013	339						
	MJM0104427	U0901	6/16/2013	258						
	MJM0104428	U0901	6/16/2013	262						
	MJM0104429	U0901	6/16/2013	400						
	MJM0104431	U0901	6/17/2013	260						
	MJM0104432	U0901	6/17/2013	306						
	MJM0104433	U0901	6/17/2013	272						
	MJM0104435	U0901	6/17/2013	348						
	MJM0104436	U0901	6/17/2013	360	U1302	6/18/2013	360	1	RECAP	
	MJM0104436	U1302	6/18/2013	360						
	MJM0104437	U0901	6/17/2013	251	U0901	8/28/2013	285	72	RECAP	
	MJM0104437	U0901	8/28/2013	285	U0901	8/29/2013	286	1	RECAP	
	MJM0104437	U0901	8/29/2013	286						
	MJM0104438	U0901	6/17/2013	254						
	MJM0104439	U0901	6/17/2013	306						
	MJM0104440	U0901	6/17/2013	335						
	MJM0104441	U1302	6/17/2013	252						
	MJM0104442	U1302	6/17/2013	289						
	MJM0104443	U1302	6/17/2013	270						
	MJM0104444	U1302	6/17/2013	270						
	MJM0104445	U1302	6/17/2013	311						
	MJM0104447	U1302	6/17/2013	383						
	MJM0104448	U1302	6/17/2013	391						
	MJM0104449	U1302	6/17/2013	277						
	MJM0104450	U1302	6/17/2013	260						
	MJM090090	U1302	6/17/2013	349						PIT ID: 180574172
	MJM090193	U0901	6/13/2013	248						
	MJM090194	U0901	6/13/2013	205						
	MJM090195	U0901	6/13/2013	211						
	MJM090197	U0901B	6/14/2013	214	U1302	6/17/2013	217	3	RECAP	
	MJM090197	U1302	6/17/2013	217						
	MJM090198	U0901B	6/14/2013	215						
	MJM090199	U0901B	6/14/2013	208						
	MJM090200	U0901B	6/14/2013	239						
	MJM090301	U0901B	6/14/2013	201						
	MJM090303	U0901	6/15/2013	223						
	MJM090304	U0901	6/15/2013	212						
	MJM090305	U0901	6/15/2013	215						
	MJM090306	U0901	6/15/2013	223	U0901	6/18/2013	223	3	RECAP	

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM090306	U0901	6/18/2013	223						
	MJM090307	U0901	6/15/2013	231						
	MJM090308	U0901	6/15/2013	225						
	MJM090309	U0901	6/15/2013	232						
	MJM090310	U0901	6/15/2013	246						
	MJM090311	U0901	6/15/2013	248						
	MJM090312	U0901	6/15/2013	217						
	MJM090313	U0901	6/16/2013	184						
	MJM090314	U0901	6/16/2013	222						
	MJM090315	U0901	6/16/2013	211						
	MJM090316	U0901	6/16/2013	214						
	MJM090317	U0901	6/16/2013	227						
	MJM090319	U0901	6/16/2013	210						
	MJM090320	U0901	6/16/2013	237						
	MJM090321	U0901	6/17/2013	191						
	MJM090322	U0901	6/17/2013	192						
	MJM090323	U0901	6/17/2013	227						
	MJM090324	U0901	6/17/2013	203						
	MJM090325	U0901	6/17/2013	249						
	MJM090326	U0901	6/18/2013	231	U0901	7/28/2013	251	40	RECAP	
	MJM090326	U0901	7/28/2013	251						
	MJM090327	U0901	6/18/2013	238						
	MJM090328	U0901	6/18/2013	229						
	MJM090329	U0901	6/18/2013	229						
	MJM090330	U0901	6/18/2013	205						
	MJM090331	U1302	6/18/2013	204	U0901	8/29/2013	247	72	RECAP	
	MJM090331	U0901	8/29/2013	247						
	MJM090332	U1302	6/18/2013	218	U1302	7/23/2013	240	35	RECAP	
	MJM090332	U1302	7/23/2013	240						
	MJM090333	U1302	6/18/2013	223						
	MJM090334	U1302	6/18/2013	198						
	MJM090335	U1302	6/18/2013	194	U1302	7/21/2013	216	33	RECAP	
	MJM090335	U1302	7/21/2013	216	U1302	7/22/2013	216	1	RECAP	
	MJM090335	U1302	7/22/2013	216						
	MJM090337	U1302	6/18/2013	249	U1302	7/21/2013	261	33	RECAP	
	MJM090337	U1302	7/21/2013	261	U1302	7/22/2013	262	1	RECAP	
	MJM090337	U1302	7/22/2013	262	U1302	7/26/2013	262	4	RECAP	
	MJM090337	U1302	7/26/2013	262						
	MJM090338	U1302	6/18/2013	234	U0901	8/28/2013	267	71	RECAP	
	MJM090338	U0901	8/28/2013	267						
	MJM090339	U0901	6/19/2013	243						
	MJM090340	U0901	6/19/2013	216						
	MJM090341	U0901	6/19/2013	187						
	MJM090342	U0901	6/19/2013	228						
	MJM090343	U0901	6/19/2013	223						
	MJM090344	U1302	6/19/2013	202						
	MJM090345	U1302	6/19/2013	229						
	MJM090346	U1302	6/19/2013	196						
	MJM090347	U1302	6/19/2013	220						
	MJM090348	U1302	6/19/2013	194						
	MJM090350	U1302	6/19/2013	204						
	MJM090401	U0901	6/17/2013	245						
	MJM090402	U0901	6/17/2013	220						
	MJM090403	U0901	6/17/2013	230						
	MJM090404	U0901	6/17/2013	233						
	MJM090406	U0901	6/17/2013	215						
	MJM090407	U0901	6/17/2013	245						
	MJM090408	U1302	6/17/2013	200						
	MJM090409	U1302	6/17/2013	224						
	MJM090410	U1302	6/17/2013	242						
	MJM090412	U1302	6/17/2013	247						
	MJM090414	U1302	6/17/2013	272						
	MJM090415	U1302	6/17/2013	219						PIT ID: 180574355
	MJM090417	U1302	6/17/2013	224						
	MJM090418	U1302	6/17/2013	235						
	MJM090420	U1302	6/17/2013	209						
	MJM090421	U1302	6/17/2013	204						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM090422	U1302	6/17/2013	208						
	MJM090424	U0901	6/18/2013	193						
	MJM090425	U0901	6/18/2013	229						
	MJM090426	U1302	6/19/2013	237						
	MJM090427	U1302	6/19/2013	211						
	MJM090428	U1302	6/19/2013	234						
	MJM090429	U1302	6/19/2013	202						
	MJM090430	U1302	6/19/2013	245						
	MJM090502	U0901	7/21/2013	219						PIT ID: 180597899
	MJM090505	U1302	7/21/2013	189	U1302	7/22/2013	190	1	RECAP	
	MJM090505	U1302	7/22/2013	190						
	MJM090512	U1302	7/21/2013	228						
	MJM090515	U0901	7/22/2013	205						
	MJM090516	U0901	7/22/2013	226						
	MJM090519	U0901	7/22/2013	197						
	MJM090520	U1302	7/22/2013	238						
	MJM090522	U0901	7/23/2013	208						
	MJM090523	U0901	7/23/2013	235						
	MJM090525	U0901	7/23/2013	201						
	MJM090528	U0901	7/23/2013	239	U0901	8/28/2013	256	36	RECAP	
	MJM090528	U0901	8/28/2013	256						
	MJM090530	U0901	7/23/2013	197						
	MJM090531	U0901	7/23/2013	225	U0901	8/29/2013	242	37	RECAP	
	MJM090531	U0901	8/29/2013	242						
	MJM090532	U0901	7/23/2013	197						
	MJM090533	U0901	7/23/2013	239						
	MJM090534	U1302	7/23/2013	225						
	MJM090535	U1302	7/23/2013	210						
	MJM090536	U0901	7/24/2013	204	U0901	8/26/2013	206	33	RECAP	
	MJM090536	U0901	8/26/2013	206						
	MJM090538	U0901	7/25/2013	194						
	MJM090541	U0901	7/25/2013	194						
	MJM090542	U0901	7/25/2013	247						
	MJM090543	U0901	7/26/2013	187						
	MJM090545	U0901	7/26/2013	247						
	MJM090547	U1301	7/26/2013	215						
	MJM090548	U1301	7/26/2013	207	U1301	7/27/2013	209	1	RECAP	
	MJM090548	U1301	7/27/2013	209						
	MJM090549	U1301	7/26/2013	226						
	MJM090550	U1301	7/26/2013	243						
	MJM090583	U0901	7/21/2013	237	U1302	7/23/2013	230	2	RECAP	
	MJM090583	U1302	7/23/2013	230						
	MJM090585	U0901	7/21/2013	223						
	MJM090586	U0901	7/21/2013	248						
	MJM090593	U0901	7/21/2013	299						
	MJM090701	U0901	8/24/2013	210						
	MJM090702	U0901	8/24/2013	202	U0901	8/28/2013	205	4	RECAP	
	MJM090702	U0901	8/28/2013	205						
	MJM090705	U0901	8/24/2013	212						
	MJM090708	U0901	8/24/2013	203						
	MJM090709	U0901	8/25/2013	207						
	MJM090711	U0901	8/25/2013	247						
	MJM090712	U1301	8/25/2013	198						
	MJM090713	U1301	8/25/2013	233						
	MJM090714	U1301	8/25/2013	202						
	MJM090717	U0901	8/26/2013	218						
	MJM090718	U0901	8/26/2013	239						
	MJM090719	U0901	8/26/2013	244	U0901	8/29/2013	246	3	RECAP	
	MJM090719	U0901	8/29/2013	246						
	MJM090720	U0901	8/26/2013	239						
	MJM090721	U0901	8/26/2013	230						
	MJM090722	U0901	8/26/2013	248						
	MJM090723	U1301	8/26/2013	219						
	MJM090725	U1302	8/27/2013	241						
	MJM090734	U0901	8/28/2013	243						
	MJM090737	U0901	8/28/2013	180						
	MJM090738	U0901	8/28/2013	220	U1301	8/29/2013	219	1	RECAP	

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
GRAY	MJM090738	U1301	8/29/2013	219						
	MJM090739	U0901	8/28/2013	246						
	MJM090741	U0901	8/28/2013	244						
	MJM090742	U0901	8/28/2013	248						
	MJM090743	U0901	8/28/2013	230	U0901	8/29/2013	229	1	RECAP	
	MJM090743	U0901	8/29/2013	229						
	MJM090744	U0901	8/28/2013	246						
	MJM090745	U0901	8/28/2013	248						
	MJM090747	U0901	8/28/2013	248						
	MJM090748	U1301	8/28/2013	241						
	MJM090750	U1301	8/28/2013	229						
	MJM090751	U1301	8/28/2013	207						
	MJM090755	U0901	8/29/2013	199						
	MJM090756	U0901	8/29/2013	248						
	MJM090757	U1301	8/29/2013	240						
	MJM090758	U0901	8/30/2013	250						
	MJM090777	U1301	7/26/2013	210						
	MJM090778	U1302	7/26/2013	240						
	MJM090780	U1301	7/27/2013	189						
	MJM090781	U1301	7/27/2013	217						
	MJM090782	U1301	7/27/2013	232						
	MJM090784	U1301	7/27/2013	202						
	MJM090785	U1301	7/27/2013	225	U1301	8/25/2013	233	29	RECAP	
	MJM090785	U1301	8/25/2013	233						
	MJM090786	U1301	7/27/2013	239						
	MJM090787	U1301	7/27/2013	246	U1301	7/28/2013	250	1	RECAP	
	MJM090787	U1301	7/28/2013	250	U1301	8/25/2013	252	28	RECAP	
	MJM090787	U1301	8/25/2013	252	U1301	8/28/2013	253	3	RECAP	
	MJM090787	U1301	8/28/2013	253						
	MJM090788	U0901	7/28/2013	217						
	MJM090789	U0901	7/28/2013	221						
	MJM090792	U0901	7/28/2013	201						
	MJM090794	U1301	7/28/2013	248						
	MJM090796	U1301	7/28/2013	192						
	MJM090797	U1301	7/28/2013	225						
	MJM104079	U1302	6/19/2013	379						
HBWF	MJM0101962	U0901	7/26/2013	379						
	MJM0101973	U1301	7/26/2013	342						
	MJM0101974	U1301	7/26/2013	347	U1301	7/27/2013	346	1	RECAP	
	MJM0101974	U1301	7/27/2013	346						
	MJM0101976	U0901	7/23/2013	351						
	MJM0101977	U0901	7/23/2013	365						
	MJM0101978	U0901	7/23/2013	365						
	MJM0101979	U0901	7/23/2013	414						
	MJM0101980	U0901	7/23/2013	467						
	MJM0101987	U0901	7/23/2013	449						
	MJM0101988	U0901	7/23/2013	413						
	MJM0101989	U0901	7/23/2013	393						
	MJM0102076	U0901	8/28/2013	359						
	MJM0102083	U0901	8/28/2013	420						
	MJM0102088	U0901	8/28/2013	393						
	MJM0102089	U0901	8/28/2013	435						
	MJM0102092	U0901	8/28/2013	454						
	MJM0102093	U0901	8/28/2013	361						
	MJM0102097	U0901	8/28/2013	422						
	MJM0102098	U0901	8/28/2013	437						
	MJM0102099	U0901	8/28/2013	435						
	MJM0102100	U0901	8/28/2013	406						
	MJM0102173	U0901	8/25/2013	438						
	MJM0102174	U0901	8/25/2013	361						
	MJM0102177	U0901	8/25/2013	388						
	MJM0102414	U0901	8/30/2013	402						
	MJM0102415	U0901	8/30/2013	389						
	MJM0102428	U0901	7/28/2013	451						
	MJM0102430	U0901	7/28/2013	365						
	MJM0102431	U0901	7/28/2013	387						
	MJM0102433	U0901	7/28/2013	410						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
HBWF	MJM0102435	U0901	7/28/2013	409						
	MJM0102436	U0901	7/28/2013	404						
	MJM0102437	U0901	7/28/2013	408						
	MJM0102438	U0901	7/28/2013	406						
	MJM0102440	U0901	7/28/2013	436						
	MJM0102441	U0901	7/28/2013	397						
	MJM0102442	U0901	7/28/2013	453						
	MJM0102606	U0901	7/27/2013	375						
	MJM0102607	U0901	7/27/2013	427						
	MJM0102608	U0901	7/27/2013	422						
	MJM0102617	U0901	7/27/2013	328						
	MJM0102619	U0901	7/27/2013	424						
	MJM0102624	U0901	7/27/2013	418						
	MJM0102625	U0901	7/27/2013	368						
	MJM0102628	U0901	7/21/2013	388						
	MJM0102629	U0901	7/21/2013	345						
	MJM0102630	U0901	7/21/2013	380						
	MJM0102631	U0901	7/21/2013	410						
	MJM0102634	U0901	7/21/2013	337						
	MJM0102635	U0901	7/21/2013	375						
	MJM0102637	U0901	7/21/2013	413						
	MJM0102638	U0901	7/21/2013	390						
	MJM0102639	U0901	7/21/2013	363						
	MJM0102640	U0901	7/21/2013	410						
	MJM0102641	U0901	7/21/2013	442						
	MJM0102642	U0901	7/21/2013	400						
	MJM0102643	U0901	7/21/2013	395						
	MJM0102658	U0901	7/22/2013	435						
	MJM0102659	U0901	7/22/2013	423						
	MJM0102662	U0901	7/22/2013	408						
	MJM0102663	U0901	7/22/2013	404						
	MJM0102664	U0901	7/22/2013	397						
	MJM0102665	U0901	7/22/2013	398						
	MJM0102666	U0901	7/22/2013	406						
	MJM0102668	U0901	7/22/2013	436						
	MJM0102672	U0901	7/22/2013	356						
	MJM0102673	U0901	7/22/2013	388						
	MJM0102674	U0901	7/22/2013	383						
	MJM0102675	U0901	7/22/2013	430						
	MJM0102677	U0901	7/22/2013	417						
	MJM0102678	U0901	7/22/2013	367						
	MJM0102679	U0901	7/22/2013	417						
	MJM0102680	U0901	7/22/2013	374						
	MJM0102681	U0901	7/22/2013	400						
	MJM0102682	U0901	7/22/2013	430						
	MJM0102691	U0901	7/23/2013	370						
	MJM0102696	U0901	7/23/2013	358						
	MJM0102697	U0901	7/23/2013	390						
	MJM0102764	U0901	8/29/2013	401						
	MJM0103430	U1301	7/27/2013	391						
	MJM0103431	U1301	7/27/2013	397						
	MJM0103432	U1301	7/27/2013	376						
	MJM0103433	U1301	7/27/2013	383						
	MJM0103434	U1301	7/27/2013	409						
	MJM0103435	U0901	7/28/2013	400						
	MJM0103436	U0901	7/28/2013	434						
	MJM0103441	U0901	7/28/2013	394						
	MJM0103444	U0901	7/28/2013	393						
	MJM0103446	U0901	7/28/2013	377						
	MJM0103447	U0901	7/28/2013	375						
	MJM0103448	U0901	7/28/2013	378						
	MJM0104066	U1302	6/18/2013	436						
	MJM0104073	U0901	6/19/2013	367						
	MJM0104094	U0901	7/21/2013	366						
	MJM0104095	U0901	7/21/2013	363						
	MJM0104097	U0901	7/21/2013	335						
	MJM0104099	U0901	7/21/2013	393						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
HBWF	MJM0104100	U0901	7/21/2013	340						
	MJM0104430	U0901	6/16/2013	369						
	MJM0104446	U1302	6/17/2013	388						
LSCS	MJM0101953	U0901	7/25/2013	255						
	MJM01023655	U0901	7/22/2013	308						
	MJM0102626	U0901	7/21/2013	359						
	MJM0102649	U1302	7/21/2013	252						
	MJM0102670	U0901	7/22/2013	316						
	MJM0102698	U0901	7/23/2013	357						
	MJM0102759	U0901	8/29/2013	290						
	MJM0103426	U1301	7/27/2013	274						
	MJM0103442	U0901	7/28/2013	260						
	MJM0104061	U1302	6/18/2013	331						
	MJM090439	U0901	7/21/2013	199						
	MJM090440	U0901	7/21/2013	206						
	MJM090441	U0901	7/21/2013	214						
	MJM090442	U0901	7/21/2013	213						
	MJM090443	U0901	7/21/2013	206						
	MJM090445	U0901	7/21/2013	195						
	MJM090446	U0901	7/21/2013	198						
	MJM090448	U0901	7/21/2013	187						
	MJM090449	U0901	7/21/2013	208						
	MJM090450	U0901	7/21/2013	245						
	MJM090504	U0901	7/21/2013	222						
	MJM090506	U1302	7/21/2013	228						
	MJM090507	U1302	7/21/2013	247						
	MJM090510	U1302	7/21/2013	234						
	MJM090511	U1302	7/21/2013	184						
	MJM090514	U0901	7/22/2013	208						
	MJM090517	U0901	7/22/2013	235	U0901	7/23/2013	235	1	RECAP	
	MJM090517	U0901	7/23/2013	235						
	MJM090518	U0901	7/22/2013	187						
	MJM090521	U0901	7/23/2013	193						
	MJM090527	U0901	7/23/2013	190						
	MJM090529	U0901	7/23/2013	185						
	MJM090537	U0901	7/25/2013	183						
	MJM090546	U0901	7/26/2013	182						
	MJM090576	U0901	7/21/2013	195						
	MJM090577	U0901	7/21/2013	192						
	MJM090579	U0901	7/21/2013	223						
	MJM090580	U0901	7/21/2013	248						
	MJM090581	U0901	7/21/2013	202						
	MJM090582	U0901	7/21/2013	225						
	MJM090587	U0901	7/21/2013	200						
	MJM090588	U0901	7/21/2013	203						
	MJM090589	U0901	7/21/2013	207						
	MJM090590	U0901	7/21/2013	210	U0901	41477	209	1	RECAP	
	MJM090590	U0901	7/22/2013	209						
	MJM090591	U0901	7/21/2013	233	U0901	41478	234	2	RECAP	
	MJM090591	U0901	7/23/2013	234						
	MJM090592	U0901	7/21/2013	185						
	MJM090594	U0901	7/21/2013	183						
	MJM090595	U0901	7/21/2013	207						
	MJM090597	U0901	7/21/2013	195						
	MJM090598	U0901	7/21/2013	203						
	MJM090599	U0901	7/21/2013	233						
	MJM090600	U0901	7/21/2013	186						
	MJM090779	U1301	7/27/2013	206						
	MJM090783	U1301	7/27/2013	209						
RDWF	MJM0101969	U1301	7/26/2013	350						
	MJM0101972	U1301	7/26/2013	405						
	MJM0102060	U0901	8/28/2013	275						
	MJM0102086	U0901	8/28/2013	307						
	MJM0102152	U0901	8/24/2013	335						
	MJM0102153	U0901	8/24/2013	314						
	MJM0102196	U0901	8/26/2013	278						
	MJM0102197	U0901	8/26/2013	386						

Appendix E. Release and recaptures of fish tagged with Floy ancor tags during 2013 sampling in eastern NPR-A.

Species	Tag Number	Release Station	Release Date	Release Length (mm)	Recapture Station	Recapture Date	Recapture Length (mm)	Days at Large	Notes	Comments
RDWF	MJM0102376	U0901	8/28/2013	262						
	MJM0102377	U0901	8/28/2013	255						
	MJM0102383	U0901	8/28/2013	290						
	MJM0102408	U0901	8/30/2013	390						
	MJM0102409	U0901	8/30/2013	269						
	MJM0102410	U0901	8/30/2013	256						
	MJM0102450	U0901	8/24/2013	333						
	MJM0102551	U0901	8/24/2013	334						
	MJM0102552	U0901	8/24/2013	388						
	MJM0102558	U0901	8/24/2013	277						
	MJM0102572	U0901	8/24/2013	323						
	MJM0102573	U0901	8/24/2013	321						
	MJM0102574	U0901	8/24/2013	295						
	MJM0102575	U0901	8/24/2013	330						
	MJM0102610	U0901	7/27/2013	381						
	MJM0102623	U0901	7/27/2013	288						
	MJM0102650	U1302	7/21/2013	303						
	MJM0103458	U1301	8/26/2013	282						
	MJM0103459	U1302	8/26/2013	295						
	MJM0103460	U0901	8/28/2013	324						
	MJM0103461	U0901	8/28/2013	413						
	MJM0103467	U0901	8/28/2013	265						
	MJM0103470	U0901	8/28/2013	314						
	MJM0104101	U1302	6/17/2013	301						
	MJM090302	U0901B	6/14/2013	242						
	MJM090509	U1302	7/21/2013	211						
	MJM090513	U1302	7/21/2013	263						
	MJM090544	U0901	7/26/2013	191						
	MJM090703	U0901	8/24/2013	246						
	MJM090704	U0901	8/24/2013	239						
	MJM090715	U0901	8/26/2013	198						
	MJM090716	U0901	8/26/2013	204						
	MJM090724	U1302	8/26/2013	197						
	MJM090726	U1302	8/27/2013	248						
	MJM090727	U0901	8/28/2013	210						
	MJM090728	U0901	8/28/2013	207						
	MJM090729	U0901	8/28/2013	236						
	MJM090730	U0901	8/28/2013	185						
	MJM090731	U0901	8/28/2013	209						
	MJM090732	U0901	8/28/2013	203						
	MJM090733	U0901	8/28/2013	196						
	MJM090735	U0901	8/28/2013	215						
	MJM090736	U0901	8/28/2013	194						
	MJM090752	U0901	8/29/2013	223						
	MJM090754	U0901	8/29/2013	244						
	MJM090795	U1301	7/28/2013	228						
	MJM090799	U0901	8/24/2013	217						

BDWF - broad whitefish
BURB = burbot
GRAY = arctic grayling
HUMP = humpback whitefish
LSCS = least cisco
RDWF = round whitefish