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Appendix F3

Report: *2010 AWPAR Fisheries Report*

AGNICO-EAGLE MINES LTD: MEADOWBANK DIVISION

2010 ALL WEATHER PRIVATE ACCESS ROAD FISHERIES REPORT

FEBRUARY 2011

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SECTION 1 • INTRODUCTION

1.1 BACKGROUND

The construction of the 110 km All Weather Private Access Road (AWPAR) between the Hamlet of Baker Lake and Meadowbank Mine Camp was completed in the spring of 2008 under DFO authorization (NU-03-0190-2). Prior to AWPAR construction, baseline fisheries assessments found arctic grayling (*Thymallus arcticus*) to be the predominant fish species. Other fish species also found inhabiting the AWPAR streams included lake trout, arctic char, round whitefish, slimy sculpin and nine-spine stickleback. Many small ephemeral streams were defined as non-fish bearing; six of the proposed crossings were considered fish bearing and required follow-up monitoring. Follow-up monitoring in 2006 confirmed the predominance of arctic grayling in crossings R02, R06, R09, R15 and R19.

Similar to baseline data collection, in 2009, fisheries monitoring continued to focus on evaluating the fish passages at R02, R06, R09, and R15. In addition, habitat compensation area was constructed according to the design specifications that met biological criteria that were set to enhancing arctic grayling productivity at R02. The construction and engineering was focused on creating spawning and nursing habitat (high value habitat) which was to compensate for the loss of low/medium habitat. This loss of habitat was a result of bridge abutment construction that impeded on the footprint of the streams, causing minor `harmful, alteration, disruption or destruction' (HADD) at crossings (AEM 2010).

The 2009 data indicated that adult fish are able to pass by the bridge structures and access upstream habitat to spawn, forage and return to overwintering habitat. Furthermore the larval drift studies at R02 indicated an increase in larval drift collected downstream of the newly constructed habitat structures. There was an overall increase on a standardized CPUE of 215% from 2008 and 116% from 2007 arctic grayling larval collection.

As per the AWPAR DFO Authorization and under DFO Authorization S-10/11-1011-NU, the goal of the 2010 field season was to continue evaluating of the ability of arctic grayling movement beyond the bridge structures as part of the HADD fisheries monitoring and continue to evaluate the effectiveness of the R02 compensation habitat area. This report documents and discusses the results of the fisheries monitoring along the AWPAR in 2010.

1.2 OBJECTIVE

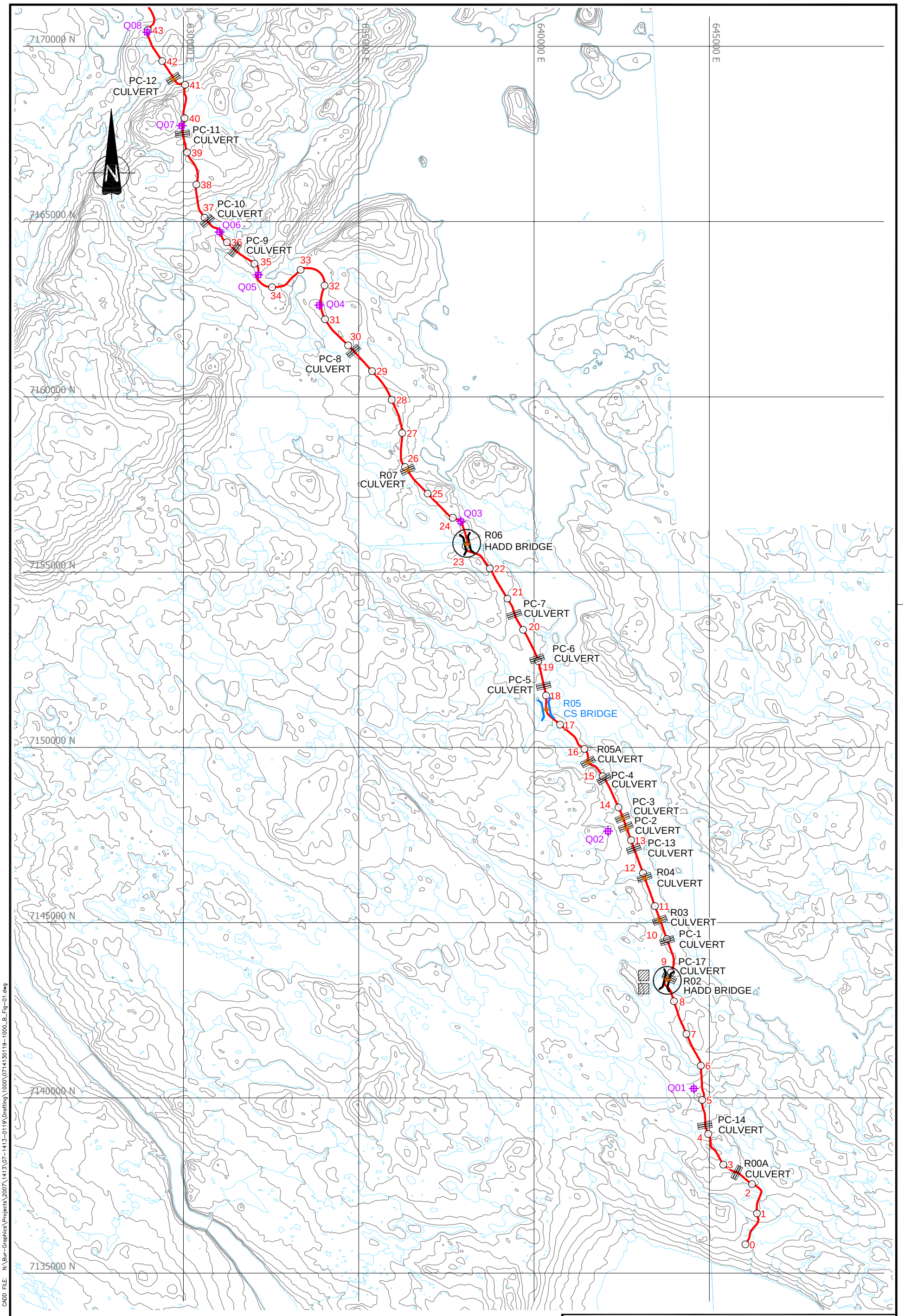
Similar to previous years, the three main objectives of the 2010 AWPAR fisheries monitoring program were to complete:

- Assessment of the fish passage at R02, R06, R09 and R15 (HADD crossings) - The field program continued from previous years' monitoring of in-stream fish migrations. Much of the effort was focused on capturing fish moving upstream and downstream (upstream of the bridge crossings); identifying, enumerating, and collecting biological data of fish captured to evaluate the health of the population; and collecting velocity measurements both upstream

and downstream of the crossings to measure the ability of fish to move beyond the bridge structures.

- R02 Habitat Compensation Structure Evaluation - Identical to 2009 data collection, larval drift traps were set upstream of the R02 compensation structures, and at representative locations downstream. In addition, electrofishing techniques and fish egg collection mats were introduced to provide more evidence of arctic grayling nursing and foraging near the Habitat Compensation Structure. In combination with strategically located hoopnets, current year fish tagging provided data to determine the tendencies, patterns and movements of arctic grayling near the R02 habitat compensation area.

- Creel Survey – Year 4 of creel survey to obtain information on the fishing habits in the vicinity of the AWPAR and general fishing patterns of Baker Lake residents. The information was collected by Gebauer (See Appendix D) but will be summarized in this report.



LEGEND

- CULVERT
- HADD BRIDGE
- CLEAR-SPAN BRIDGE
- HOOP NETS INSTALLED
- LARVAL DRIFT TRAP
- EXISTING QUARRY
- 10 KILOMETER MARKER

REFERENCES

1) ROAD ALIGNMENT, BRIDGE, CULVERT AND QUARRY LOCATIONS FROM NUNA M&T SERVICES Ltd.
2) BASE DRAWING FROM GOLDER ASSOCIATES Ltd.

PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK DIVISION

TITLE

ALL-WEATHER PRIVATE ACCESS ROAD MONITORING LOCATIONS

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FIGURE 1a

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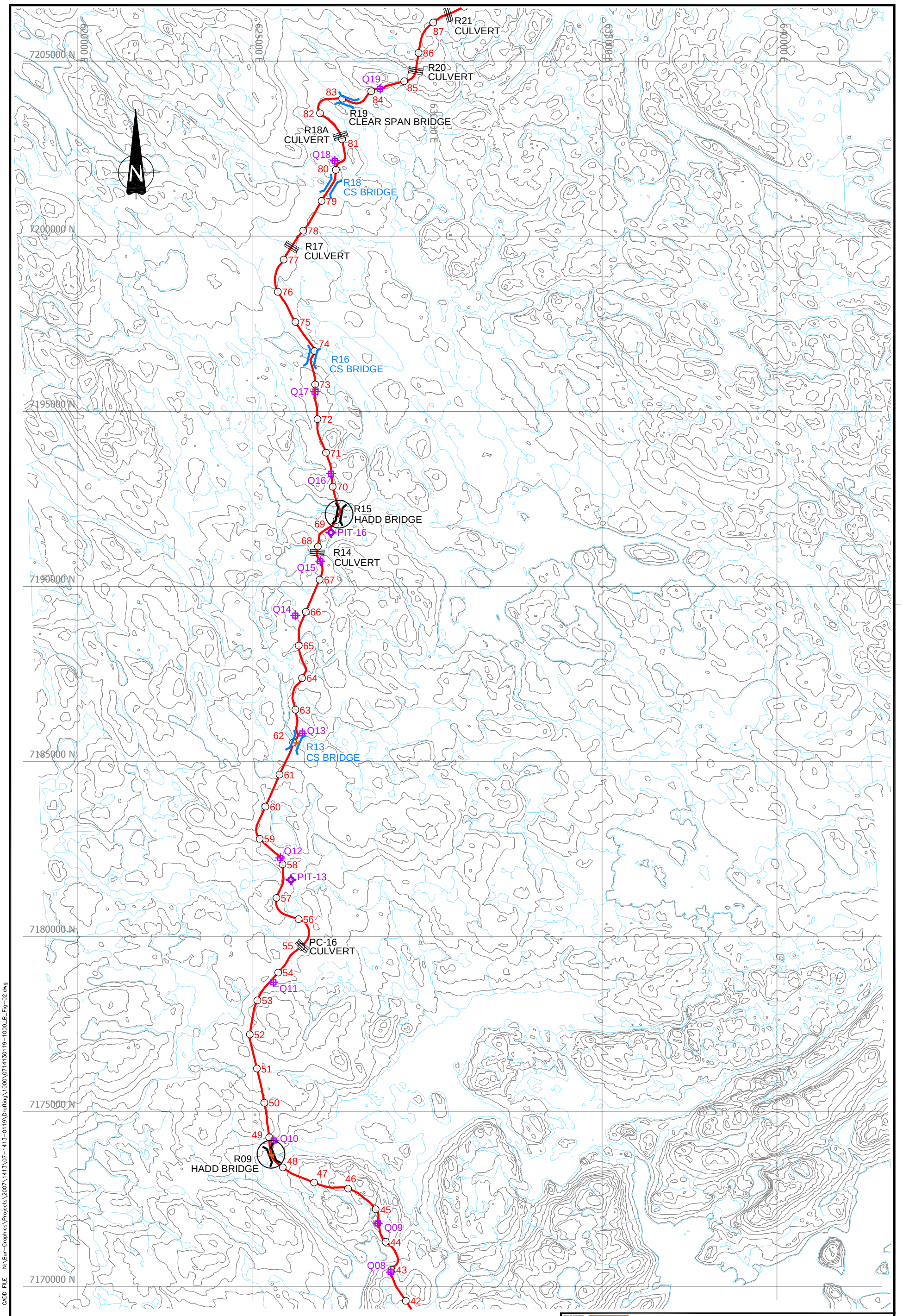

LEGEND

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AGNICO-EAGLE MINES LIMITED
MEADOWBANK DIVISION

TITLE

ALL-WEATHER PRIVATE ACCESS ROAD MONITORING LOCATIONS

PROJECT No.			FILE No.	0714130119-1000_B_Fig-02	
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7215000 N
7210000 N
7205000 N
7200000 N
N
101
R25 CULVERT
102
103
104
100
Q22
99
R26 CULVERT
R24 CULVERT
98
PIT-22
97
96
95
R23 CULVERT
94
Q21
93
92
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Q20
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R20 CULVERT
Q19
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R19 CLEAR SPAN BRIDGE
82
R18A CULVERT
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Q18
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R18 CS BRIDGE
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R17 CULVERT
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R16 CS BRIDGE

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PROJECT

AEM

AGNICO-EAGLE MINES LIMITED
MEADOWBANK DIVISION

TITLE

ALL-WEATHER PRIVATE ACCESS ROAD MONITORING LOCATIONS

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FIGURE 1c

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SECTION 2 • METHODOLOGY AND APPROACH

Similar to previous years, hoopnets were set upstream of the bridge crossings to evaluate the passage of fish beyond the bridge structures at crossings R02, R06, R09, and R15. Hoopnets were visited nearly daily to determine the overall movements and patterns of arctic grayling at respective crossings. At crossing R02 in addition to the hoopnets, larval drift traps, minnow traps, electrofishing and fish egg mats were also used. The focus of the study remained the use of larval drift traps that were placed to provide a comparison of historical arctic grayling larval drift collection and provide evidence of fish spawning within the habitat compensation area. Additionally, electrofishing, minnow traps were set and observational data were collected to capture young-of-the-year (year 0) arctic grayling to provide evidence of fish spawning and nursing. The following outlines the specific methodologies for the 2010 AWPAR fisheries field season.

2.1 HOOPNETS

In total, 14 hoopnets were set at crossings R02, R06, R09 and R15. Hoopnets consist of either a 4 ft (1.22 m) or 3 ft (0.9 m) diameter front hoop. Hoopnets have interior hoops and traps that prevent fish from escaping but provide enough space in the *cod* end for fish to survive. Wings were attached to the front hoop to direct fish into the hoopnet. The captured fish were gently removed by field technicians from the nets using dip nets, placed in large tubs for enumeration, biological processing and then placed in a recovery tub. The fish were released up or downstream of the hoopnets (depending on the fish's migration direction) following handling. Hoopnets were an effective, non-invasive method of fisheries monitoring that caused few injuries or deaths to the collected fish.

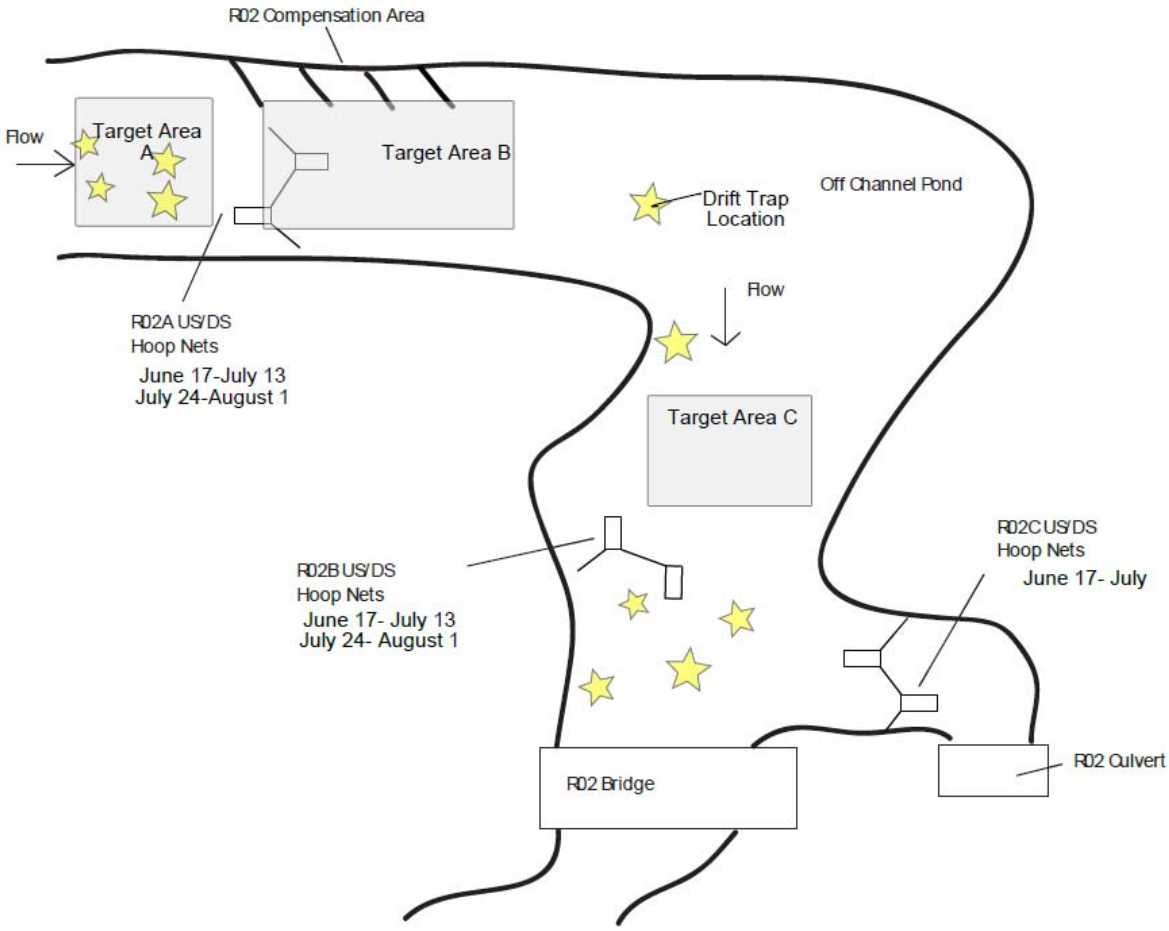
Biological processing included measuring the fork length of the fish, weighing the fish using Pesola field scale (+/-2 to 5 g) and classifying the maturity of the fish by gently palpitating the abdomen of the fish and visually identifying distinguishable male or female features (i.e. males have significantly larger dorsal fines with a greater number of rays). Relative water level measurements were taken using a staff gage (1.2 m measuring stick with 1-cm increments). Ambient temperature and water temperature measurements were recorded using a standard mercury thermometer.

The hoopnets were deployed on June 17, 2010 and pulled on July 13, 2010. Later on, nets were re-set at R02 and R06 on July 24, 2010 and pulled on August 1, 2010. An attempt was made to cover the majority of the stream width. Furthermore, without jeopardizing the safety of the field personnel, the nets were placed in the thalweg of the streams depending on ice-flow conditions and stream velocities, to ensure the maximum effort to capture migrating fish.

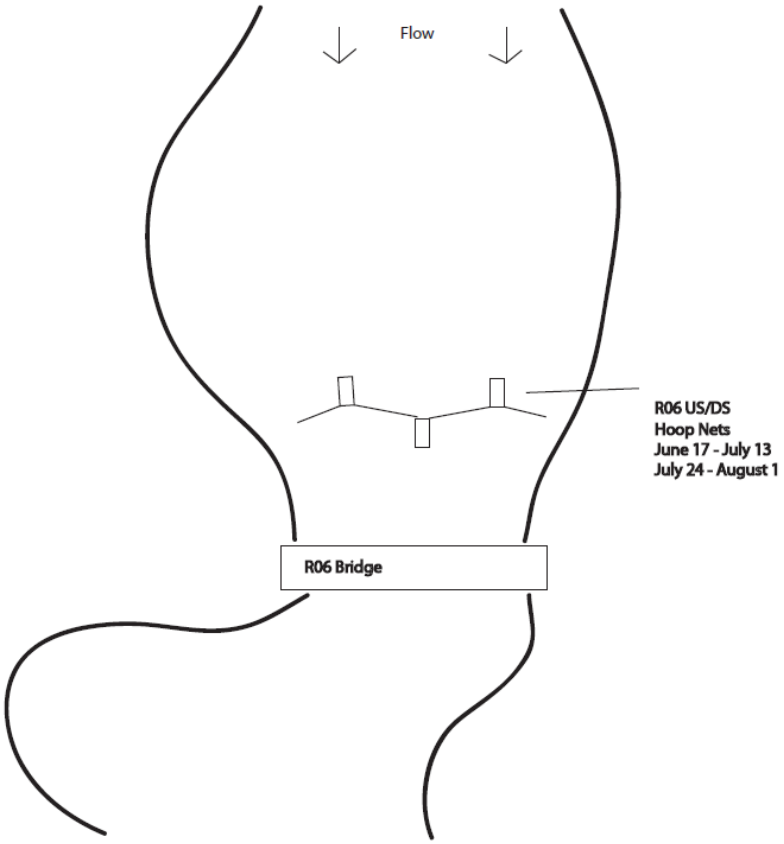
The locations of hoopnet placement were selected with the objective to provide evidence of the ability of the fish to move upstream past the bridge crossings as part of the HADD monitoring (i.e. hoopnets set to collect upstream moving fish, upstream of the bridge crossing). Hoopnets were also oriented to collect fish moving downstream to document the exodus or to document the post spawning run. As well, hoopnets were placed adjacent to the habitat compensation area (Hoopnets R02A), in a riffle/ side channel area upstream of the bridge and downstream of the compensation area (R02B), and immediately upstream of the culverts (R02C) (See Figure 2.1). These nets were set with the goal of

capturing the maximum number of fish moving beyond the R02 bridge crossing, but also to assist in determining fish tendencies, patterns and movements near the R02 habitat compensation area.

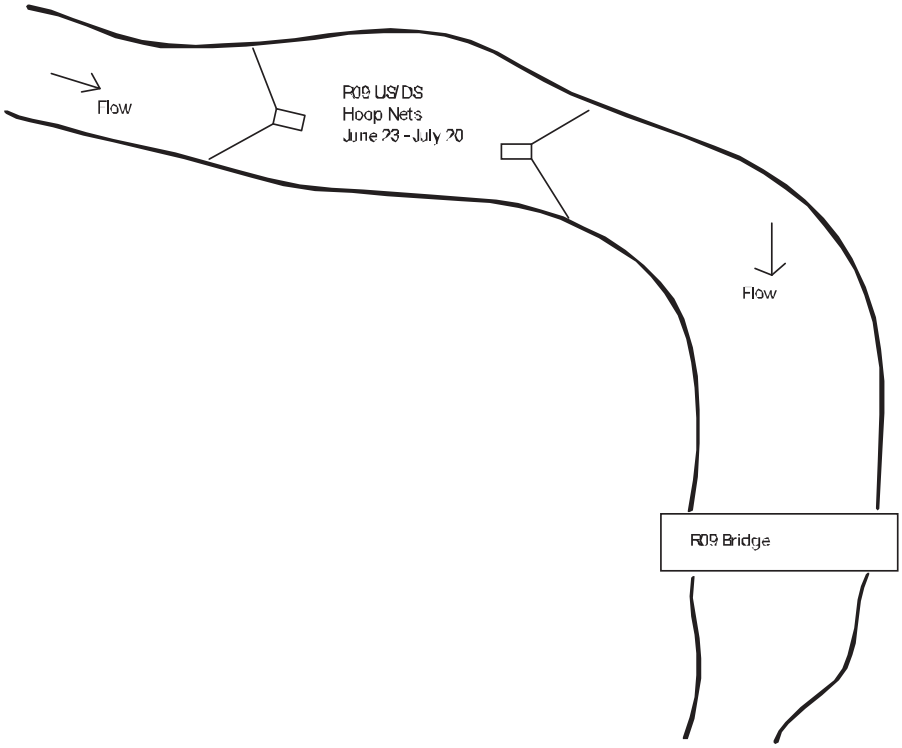
Figure 2.1: Location of Hoopnets at R02, R06, R09 and R15



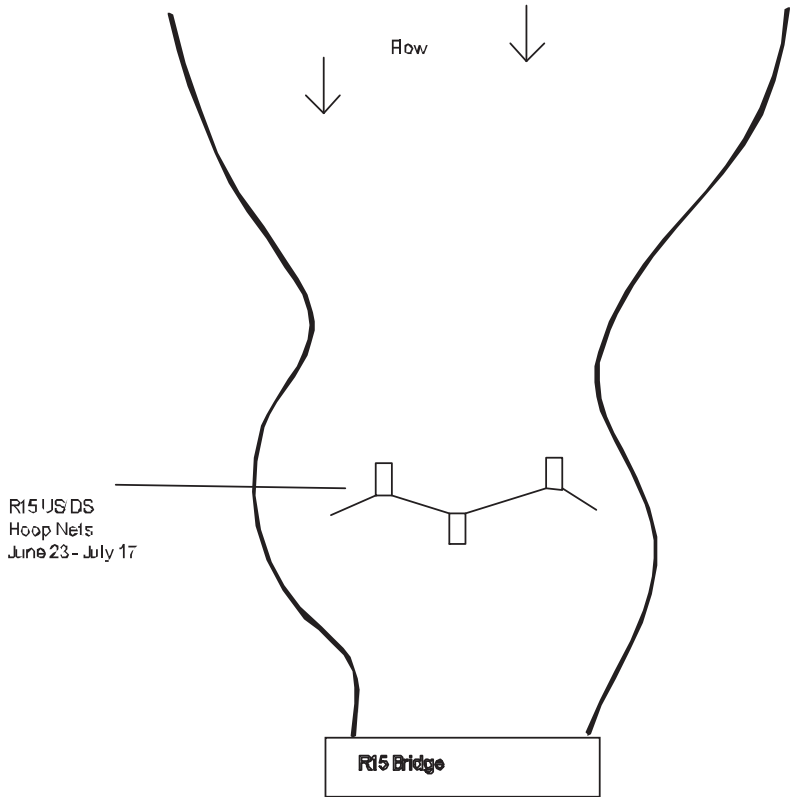
R02 Hoopnet and Drift trap location



R06 Hoopnet Location



R09 Hoopnet Location



R15 Hoopnet and Drift Trap location

Table 2.1 Hoopnet Locations, Net Orientation by Date and Approximate Stream Coverage

Location	GPS Co-ordinates	Orientation	Dates (2010)	Approximate Coverage
R02A	14 W 0643513	US	06/17/10 - 07/13/10	
	UTM 7143452		07/24/10 - 08/01/10	75%
R02A	14 W 0643502	DS	06/17/10 - 07/13/10	
	UTM 7143457		07/24/10 - 08/01/10	
R02B	14 W 0643746	US	06/17/10 - 07/13/10	
	UTM 7143430	DS	07/24/10 - 08/01/10	
R02B	14 W 0643753	US	06/17/10 - 07/13/10	
	UTM 7143436	DS	07/24/10 - 08/01/10	
R02 B	14 W 0643603	US	06/17/10 - 07/13/10	25%
	UTM 7143575		07/24/10 - 08/01/10	
R02 B	14W 0643607	DS	06/17/10 - 07/13/10	
	UTM 7143570		07/24/10 - 08/01/10	
R02C	14 W 0643844			
	UTM 7143428	US	0617/10 - 07/10/10	100%
R06	14 W 0638045	US	06/17/10 - 07/13/10	
	UTM 7155850		07/24/10 - 08/01/10	
R06	14 W 0638053	US	06/17/10 - 07/13/10	80%
	UTM 7155858		07/24/10 - 08/01/10	
R06	14 W 0638059	US	06/17/10 - 07/13/10	
	UTM 7155861	DS	07/24/10 - 08/01/10	
R09	14 W 0625523	US	06/17/10 - 07/13/10	
	UTM 7173745		07/24/10 - 08/01/10	100%
R09	14 W 0625519	DS	06/17/10 - 07/13/10	
	UTM 7173740		07/24/10 - 08/01/10	
R15	14 W 0627474	US	06/17/10 - 06/30/10	
	UTM 7192083	DS	06/30/10 - 07/08/10	
R15	14 W 0627429			
	UTM 7192102	US	06/17/10 - 07/08/10	75%
R15	14 W 0627435	US	06/17/10 - 06/30/10	
	UTM 7192114	DS	06/30/10 - 07/08/10	

2.2 MINNOW TRAPS AND OBSERVATION DATA

Twelve minnow traps (gee standard wire mesh minnow traps) were placed throughout the compensation area from July 24 to August 1, 2010. Three traps were deployed within each spawning and nursing areas between each berm. The uppermost berm area was identified as B1 and the traps set downstream of the last berm were identified as B4.

During minnow trap collection, field staff spent approximately 0.5 hour per day collecting observational data in the vicinity of the R02 habitat compensation area between July 24 and August 1, 2010. The data was collected to provide additional observational evidence of nursing and young-of-the-year (YOY) fish utilization at R02.

2.3 ELECTROFISHING

On July 25, 2010, electrofishing sampling was conducted as an extension of the effort to search for evidence that arctic grayling are utilizing the engineered habitat compensation areas. All of the procedures were based on the use of a Halltech model HT-2000 battery backpack electrofishing unit with an 18 inch anode ring. Electrofishing standard operating procedures were followed. The collections were undertaken by a certified electrofishing crew leader accompanied by two crew members.

The exact GPS coordinates were recorded in each sampling area. Water quality measurements such as water temperature, dissolved oxygen, water conductivity and pH were also recorded before each sampling. Trial run was conducted in low value habitat areas at crossing R06 before the actual sampling event in order to determine the appropriate voltage and frequency settings. During the trial run, an initial low voltage and low frequency setting was used. Voltage and frequency was increased as necessary. Total shocking time (in seconds) was recorded in each sampling area at the end of sampling.

All of the captured fish were measured for length and weighed, and later were released in the area proximate to where they were captured. .

2.4 LARVAL DRIFT TRAPS

In total, 12 larval drift traps (DT) were set at R02 from June 24 to August 1, 2010. Four traps upstream (DT A1-4) of the R02 habitat compensation area. Two traps immediately downstream of the R02 habitat compensation (DT B1-2), two traps (DT B3-4) were set between the R02 habitat compensation area and the R02B hoop nets. The four remaining traps (DT C1-4) were set slightly upstream of the bridge (See Figure 2.4). Eight of the larval drift traps consisted of a square sided cone with a ridged frame that funnelled into a 0.5 mm nitex mesh bag. Attached at the back of the nitex bag was a nalgene container where the drift was collected. The remaining traps (4) consisted of a ~60cm x 30cm square frame which has a 0.5 mm nitex mesh bag, attached to which was a nalgene type container where the drift was collected The frame was submerged at least halfway under water and secured by poles on each side.

Larval drift traps were placed in representative, high to moderate flow sections of the stream. The upstream DT A1-4 was placed to target a *previously identified spawning area* (high value habitat) documented in 2006, 2007, 2008 and 2009. Drift traps were checked at least every other day. Larval drift was identified in the field and preserved in vials of diluted formalin.

The exact UTM locations of the drift traps are presented in Table 2.4 and illustrated in Figure 2.1 and locations are indicated by yellow stars.

Table 2.4: Larval Drift Trap Location by Date

Drift Trap ID	GPS Coordinates	Dates	GPS Coordinates	Dates
A1	14 W 0643438 UTM 7143415	06/24/10 - 07/13/10	14W 0643438 UTM 7143415	07/24/10 - 08/01/10
A2	14 W 0643451 UTM 7143424	06/24/10 - 07/13/10	14 W 0643451 UTM 7143424	07/24/10 - 08/01/10
A3*	14 W 0643445 UTM 7143435	06/24/10 - 07/13/10	14 W 0643445 UTM 7143435	07/24/10 - 08/01/10
A4	14 W 0643449 UTM 7143429	06/24/10 - 07/13/10	14 W 0643449 UTM 7143429	07/24/10 - 08/01/10
B1	14 W 0643682 UTM 7143550	06/24/10 - 07/13/10	14 W 0643595 UTM 7143542	07/24/10 - 08/01/10
B2	14 W 0643699 UTM 7143505	06/24/10 - 07/13/10	14 W 0642592 UTM 7143553	07/24/10 - 08/01/10
B3	14 W 0643707 UTM 7143485	06/24/10 - 07/13/10	14 W 0643587 UTM 7143555	07/24/10 - 08/01/10
B4	14 W 0643714 UTM 7143470	06/24/10 - 07/13/10	14 W 0643714 UTM 7143470	07/24/10 - 08/01/10
C1	14 W 0643762 UTM 7143399	06/24/10 - 07/13/10	14 W 0643783 UTM 7143392	07/24/10 - 08/01/10
C2	14 W 0643773 UTM 7143409	06/24/10 - 07/13/10	14 W 0643788 UTM 7143397	07/24/10 - 08/01/10
C3	14 W 0643784 UTM 7143407	06/24/10 - 07/13/10	14 W 0643767 UTM 7143382	07/24/10 - 08/01/10
C4	14 W 0643790 UTM 7143412	06/24/10 - 07/13/10	14 W 0643790 UTM 7143412	07/24/10 - 08/01/10

2.5 FISH EGG COLLECTION MATS

The fish egg collection mats were constructed with latex coated fibreglass material measuring 45 cm x 30 cm. The fish egg collection mats were placed in each of the four compensation berms and small rocks were placed on each corner of the mat to hold it in place. The fish egg collection mats were scattered throughout the compensation area with each berm receiving two mats. The egg collection mats were pulled up every two to three days so that the air filters can be checked for evidence of eggs. Once the egg mats have been inspected, they are cleaned and re-set into a different location within the compensation area. GPS coordinates and depth measurements of each compensation berm were recorded.

2.6 VELOCITY

Current velocity data was collected weekly from June 19 to July 30, 2010 using a flow meter (Swoffer Model 2100). Velocity and depth data was recorded upstream and downstream of the bridges to determine the maximum and average water velocity to permit fish passage beyond bridge crossings.

2.7 DATA ANALYSIS

Data and statistical analysis was completed using Microsoft Excel 2010.

SECTION 3 • RESULTS AND DISCUSSION

3.1 ADULT FISH COLLECTION

3.1.1 Overview

As in the past, the predominant fish species collected along the All Weather Private Access Road was arctic grayling (*Thymallus arcticus*). Other fish species that were found inhabiting the streams included lake trout (*Salvelinus namaycush)*, round whitefish (*Prosopium cylindraceum*, arctic char *(Salvelinus alpinus alpinus),* pygmy whitefish (*Prosopium coulterii)* and slimy sculpin (*Cottus cognatus*). Table 3.1.1 provides a summary of the results of the fish collected per crossing. These data are representative of *all* of the fish collected per crossing. Results evaluated in the subsequent text may have varying sample sizes (n), as the field data were not always complete (i.e. fish mortality due to predation or fish lost in transfer, were not measured, sexed or weighed). In such cases, these data could not be used for statistical purposes in subsequent sections but are included in the totals (Table 3.1.1). The total number of arctic grayling collected at R02 in 2010 (n=244) is greater than 2006 (n=136), 2007 (n=195) and 2008 (n=34) but less then 2009 (n=387). The total number of fish collected in 2010 was substantial considering the water level and flow conditions for fish collection were difficult.

Table 3.1.1: Overview of the Results by Fish Species Collected per Crossing.

	Crossing ID				
	R02	**R06**	**R09**	**R15**	*Total*
Arctic Char	1	0	2	0	3
Arctic Grayling	244	124	56	13	437
Lake Trout	8	2	16	0	26
Pygmy Whitefish	1	0	0	0	1
Round Whitefish	8	1	0	0	9
Slimy Sculpin	1	0	0	0	1
Total	263	127	74	13	477

3.1.2 Arctic Grayling (Thymallus Arcticus) Size Distributions and Condition

The following section summarizes the size distribution of arctic grayling at crossings R02, R06, R09 and R15. The largest fish that was collected moving upstream at R02 was 403 mm in length and 830 g in weight. Many smaller fish were also collected in the hoopnets (minimum 165 mm length and 95 g weight). The condition factor, calculated as a function of length and weight demonstrate a very healthy population (K> 1.00). Table 3.1.2 provides a summary of the results of the average, maximum, and minimum length, and also the condition factor of arctic grayling collected per crossing.

At a population level all crossings saw an increase in condition factor of the arctic grayling in 2010 from the previous years (2007 – 2009). In 2010, the average condition factor at R02 was 1.24 (n= 244). Comparatively, the condition factor for arctic grayling at R02 in 2009 was 1.15 (n=387), 1.19 (n=34) in 2008, and 1.17 (n=195) in 2007. At R06 the average condition factor in 2010 was 1.16 (n=124) and comparatively in 2009 it was 1.16 (n=74), in 2008 was 1.19 (n=67), and in 2007 was

1.16 (n=85). At R09, the condition factor in 2009 was 1.16 (n=69) and in 2008 1.25 (n=59). At R15 in 2009 it was 1.09 (n=26) and in 2008 the average condition factor was 1.23 (n=9). In 2010 the condition factors had increased at R09 and R15 (1.34 and 1.54).

Comparatively the condition factor indicates that the population is healthy and that the baseline condition of the fish is variable (i.e. 2007 R02 data compared to 2010). This improvement in condition is likely natural variability which was skewed in favour of one length-weight class (200-219mm), many of which were collected as part of a post upstream run. Fewer fish were represented in the larger size classes as the main upstream arctic grayling spawning run was likely missed as conditions for setting nets in the thalweg were nearly impossible due to high flows.

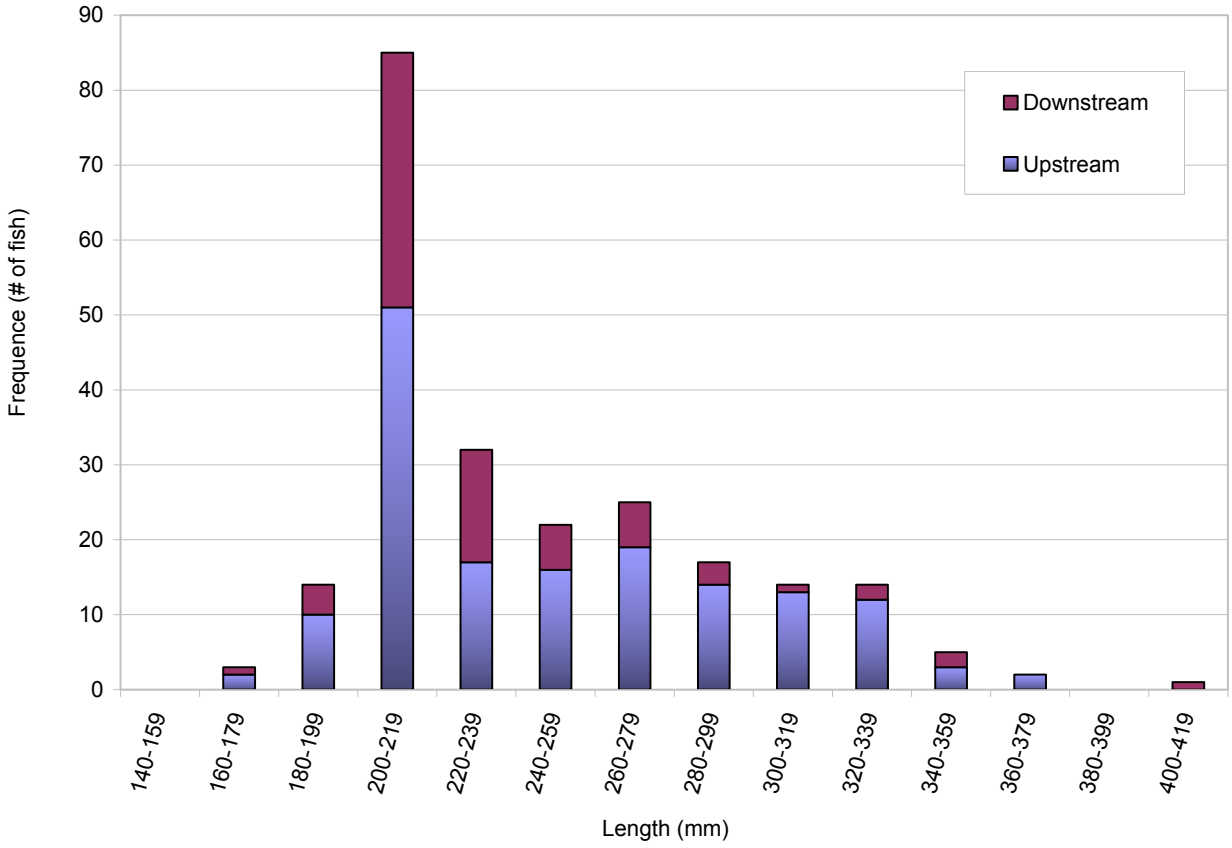
Table 3.1.2: Average, Maximum and Minimum Arctic Grayling Length, Weight and Condition Factor (K).

		Length (mm)				Weight (g)				K
	n	AVG	MAX	MIN	SD	AVG	MAX	MIN	SD	AVG
R02	244	244.13	403	165	45.31	191.85	830	95	106.65	1.24
R06	124	318.58	410	197	51.57	392.51	720	100	153.31	1.16
R09	56	253.29	345	187	47.89	231.40	460	100	110.95	1.34
R15	13	263.83	350	165	74.96	287.25	507	105	159.78	1.54

3.1.2.1 R02

As in the past, the length-frequency distributions (see Figure 3.1.2.1) of fish collected at R02 are normally distributed with the largest number of fish collected in the 200-219mm size class (n=85). With the exception of this size class, the data is clustered with nearly even distribution of lengths between the length-frequency of 160 to 380 mm. These data demonstrates that recruitment in all size classes is occurring and that the population is healthy. As represented in the length-frequency histogram, 159 of the arctic grayling were migrating upstream with 75 arctic grayling migrating downstream.

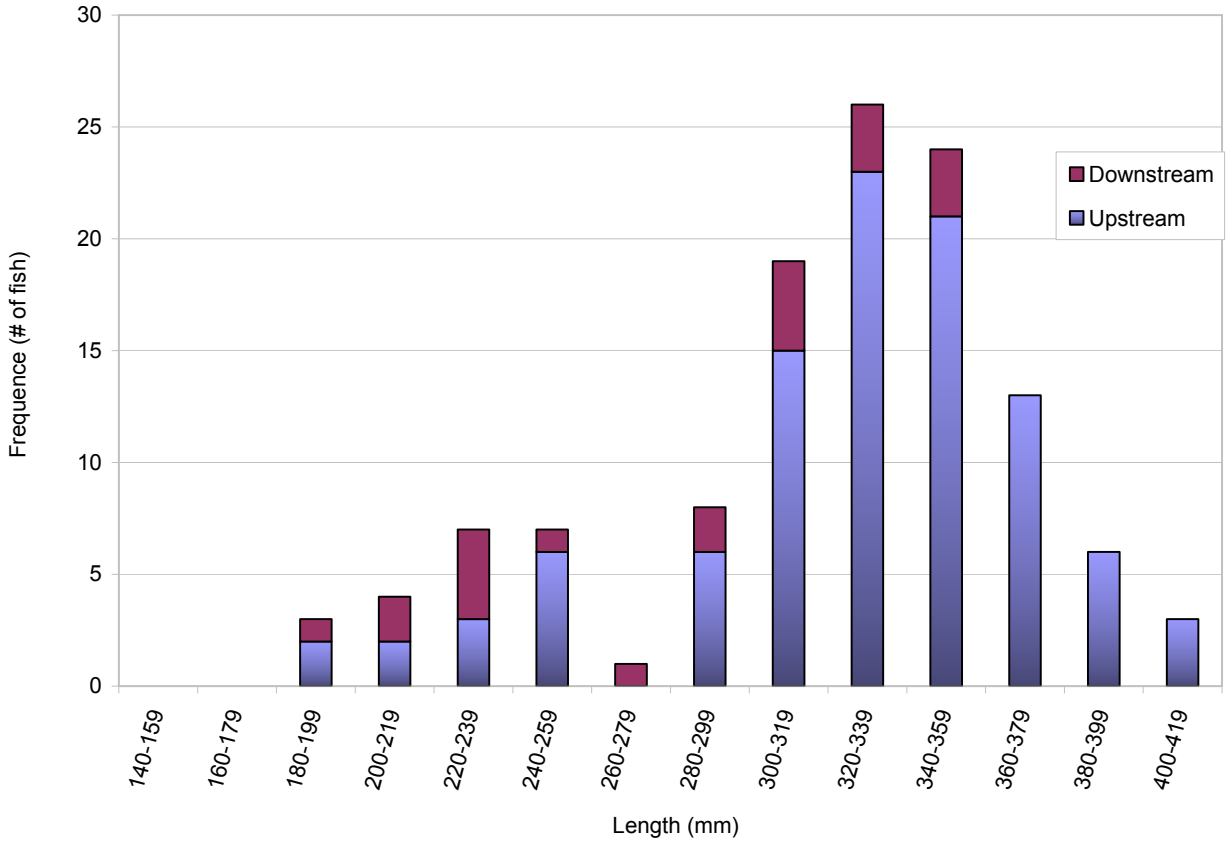
Figure 3.1.2.1: Length-Frequency Histogram of Arctic grayling at R02



3.1.2.2 R06

The length-frequency distribution at R06 is generally normally distributed around 320 mm with a larger portion of the fish moving upstream and fewer downstream. Similar to previous years the distribution is biomodal, demonstrating a healthy recruitment of immature fish and a greater number of adult fish moving upstream. The total number of fish, the size length-frequencies and general movements of the arctic grayling are similar to historical data and demonstrate that fish are able to pass by the bridge structure.

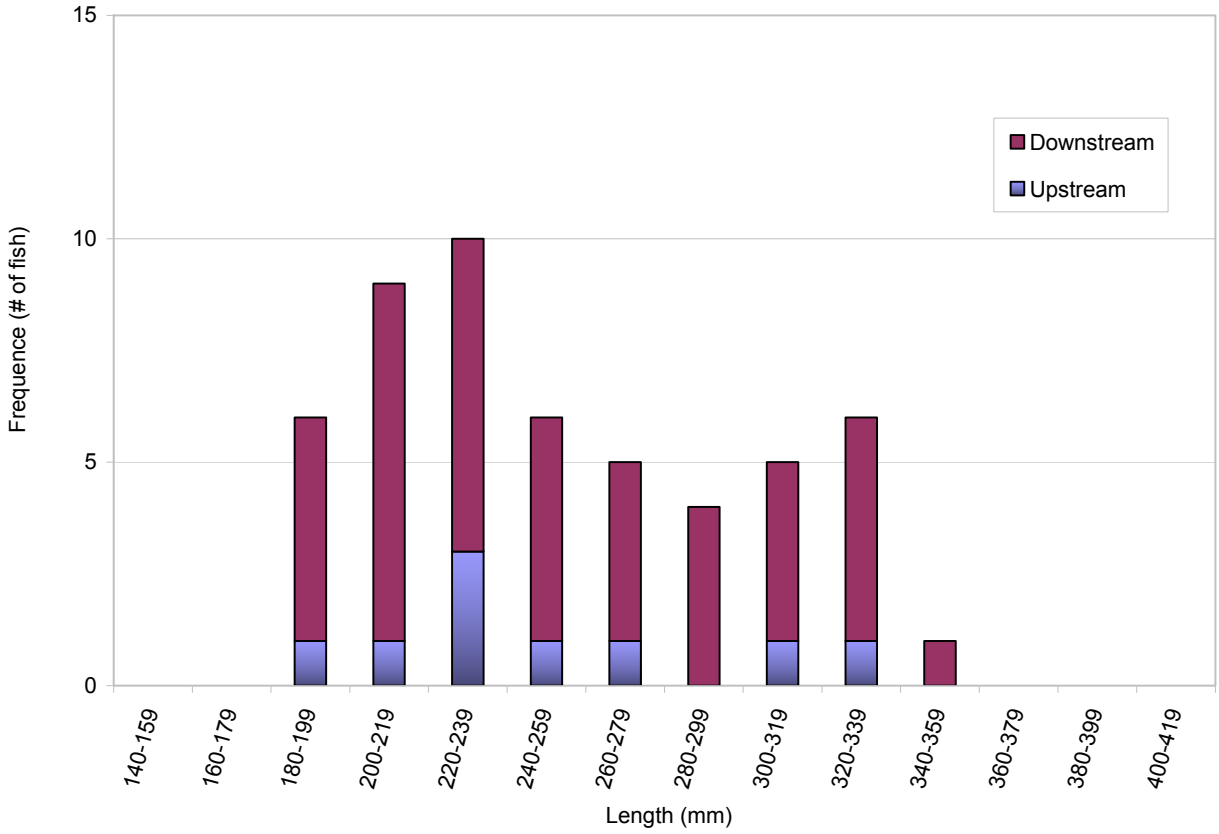
Figure 3.1.2.2: Length-Frequency Histogram of Arctic grayling at R06



3.1.2.3 R09

A similar total number of arctic grayling were caught at R09 as in the past, however, fewer arctic grayling were collected moving upstream in 2010 then in 2007 to 2009. This is likely a result of high water flows that did not permit net sets during peak upstream migration. As illustrated in Figure 3.1.2.3, the number of fish caught was generally similar across all size classes ranging from 180 to 320mm which demonstrates recruitment of all size classes and population health.

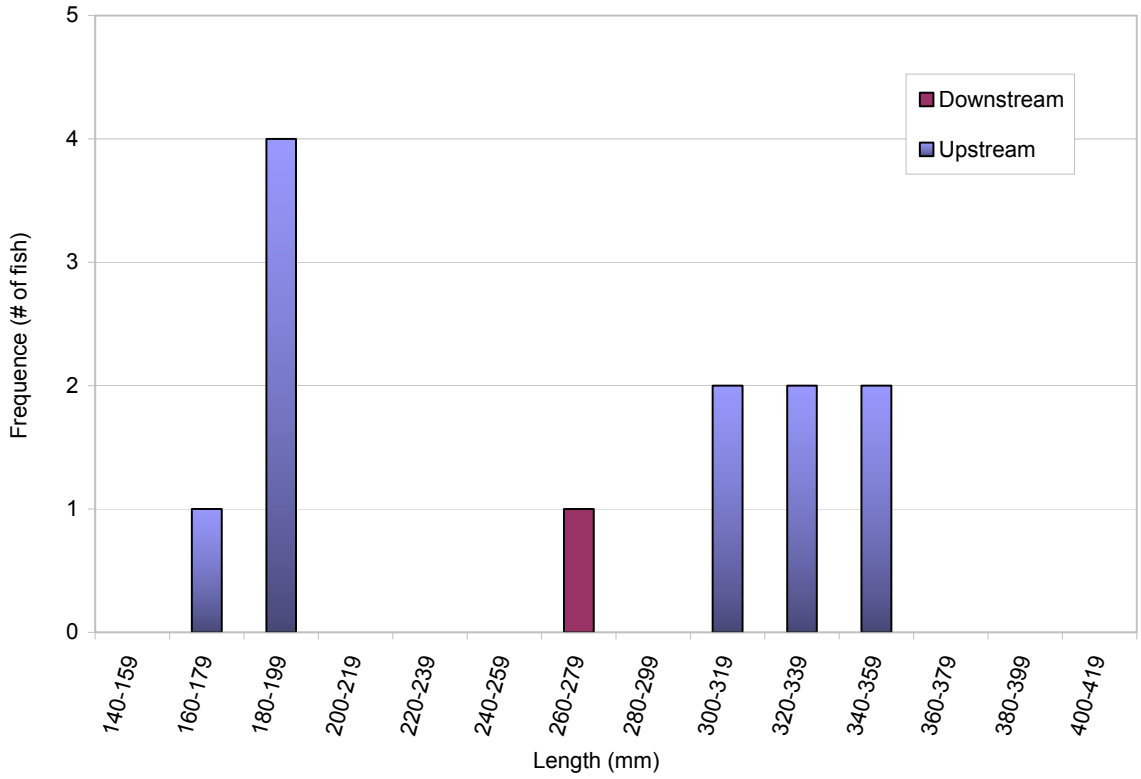
Figure 3.1.2.3: Length-Frequency Histogram of Arctic graying at R09



3.1.2.4 R15

Similar to 2007-2008 results, few fish were collected migrating at R15 and therefore length-frequency data (see Figure 3.1.2.4) of arctic grayling is difficult to interpret. Four arctic grayling were collected within the 180-199mm size class. The remainder of the fish collected were healthy mature Arctic grayling were able to pass by the bridge structures at R15.

Figure 3.1.2.4: Length-Frequency Histogram of Arctic grayling at R15



3.1.3 R02 Arctic Grayling Fish Movements

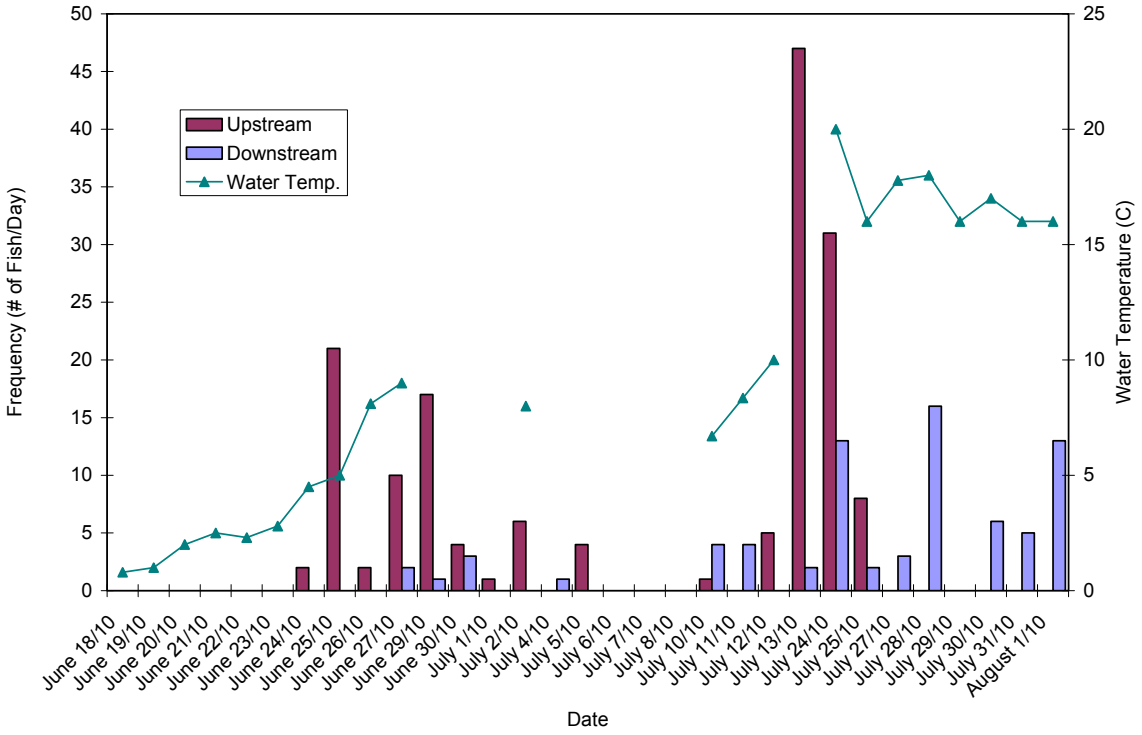
The following section evaluates the Arctic grayling movements at R02. This includes an evaluation of the upstream and downstream trends, the maturity and sex trends and the results of the current year flow tagging program or recaptures.

3.1.3.1 Arctic Grayling Upstream and Downstream Movements

A total of 244 Arctic grayling were collected at R02. One hundred and fifty nine arctic grayling were collected moving upstream with no fish collected at water temperatures at or below 5 °C (See Figure 3.1.3.1). This is due to the fact that water levels were very high at R02 (which is within the largest water shed along the AWPAR) and did not permit hoopnet sets within the thalweg. Although peak upstream is indicated to have occurred on July 13, 2010, most of these fish were smaller and are likely part of a post upstream migration. Similar to previous years, the *true* peak migration was likely prior to June 25th as water temperatures increased to 10°C. Few recorded downstream movements began shortly after the peak upstream migration on June 27th. Fewer fish (75) were collected moving downstream than were collected moving upstream, with peak downstream migration occurring on July 28th. Water temperatures increased steadily from 2°C to a maximum of 20°C on July 24th.

Although fewer fish were collected then in 2009, nearly identical trends with respect timing of the upstream and downstream runs and temperature changes were observed at R02. It is possible that the peak migration was missed due to high flows and that it is likely occurring below ice or immediately after ice-off. Similar to previous year findings, this is substantiated with the larval drift findings which collected maximum larval drift on June 24th and 25th. It is evident that the fish collected moving upstream were mostly smaller arctic grayling likely of the post migration and that the dominant larger grayling are migrating and spawning earlier.

Figure 3.1.3.1: R02 Arctic grayling US/ DS Migration Patterns



Nets were set within a riffle-run/glide reach approximately 450m in length. The R02 nets were set in 2 stream segments: adjacent to the first berm of the habitat compensation area (R02 A) and in locations downstream within 100m of the bridge crossing, (R02 B, C and D). In total, R02B collected the largest number of fish (197) moving upstream. With fewer collected at R02A (113) (See table 3.1.3.1 and Figure 2.1).

Similar to 2009, by comparing the number of fish captured at R02B to the number of fish collected at R02 A, the 2010 data demonstrates that many fish are using the R02 habitat compensation area as refuge, foraging and/or for spawning as part of the post-spawning migration. This is deduced by comparing the respective net coverage and accounting for the movements upstream and downstream. Given that fewer arctic grayling were collected moving upstream at R02A than R02B, the results suggest that the unaccounted for arctic grayling (approximately 40 fish) are using the area between the bridge crossing and the furthest upstream berm (R02 A), which includes the R02 habitat compensation area. Alternatively, these unaccounted for Arctic grayling may have avoided capture at hoopnets R02A, which is possible, given the high water flows and difficult conditions for net sets.

Table 3.1.3.1: Arctic Grayling Movement per Hoopnet placed at R02

R02 Hoopnet ID	Fish Movement	# of Arctic Grayling

A	US	61
	DS	58
B	US	103
	DS	8
C	US	3
	DS	11
TOTAL	US	167
	DS	77

3.1.3.2 Arctic Grayling Maturity and Sex Distributions at R02

Sex distributions at R02 indicate that 150 females were collected versus 85 male arctic grayling at an almost equal number of male and females moving upstream and equal male and female Arctic grayling moving downstream. Ninety five (95) female arctic grayling were collected moving upstream and 55 were moving downstream. Sixty four (64) males were moving upstream and 21 were moving downstream. Arctic grayling typically spawn between 7 and 10°C (Scott and Crossman, 1973). The males and females collected moving upstream were primarily immature or about to spawn from June 24th until June 30th at water temperatures below 10 °C. It was evident that most of the fish collected moving downstream were either spent or immature with a few that were still ripe (See Appendix A and current year recapture data).

3.1.3.3 Arctic Grayling Current Year Recaptures at R02

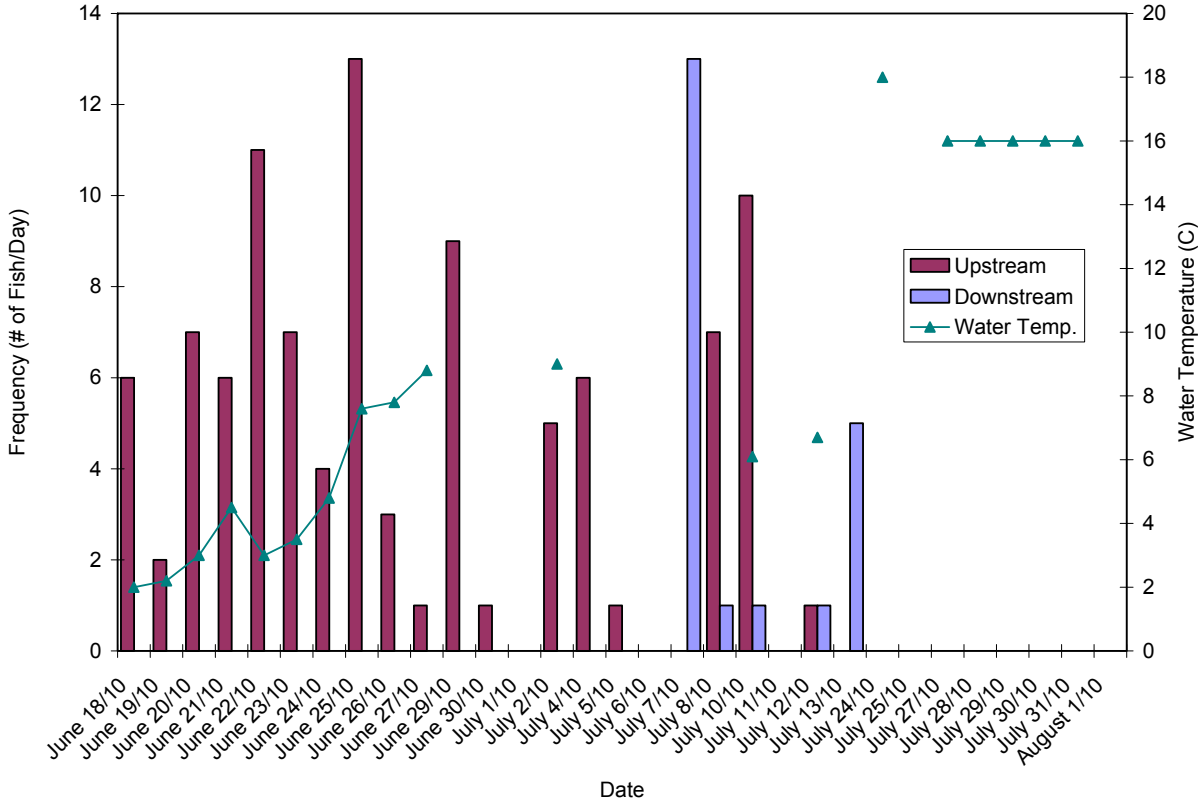
Flow tags are commonly used to provide population density measurements, however they are also very useful in tracking (similar to telemetry) the activities of migrating fish. As previously discussed, the location of the hoopnets were placed to capture the greatest number of fish moving beyond the bridge crossings and conjointly provide information on the localized movements and tendencies of the fish by tagging and tracking their activities.

In 2009, these data provided an interesting caption into the arctic grayling tendencies and movements at R02. No current year recaptures were collected at R02 in 2010.

R06 Arctic Grayling Fish Movements

A total of 124 arctic grayling were collected at R06. Most of the arctic grayling were collected moving upstream between June 18 and July 6th at or below 10 °C (See Figure 3.3.4). Peak upstream migration occurred on June 25th, identical to the 2009 data. Recorded downstream movements began on July 7nd. The data indicates that Arctic Grayling are able to pass the bridge at R06.

Figure 3.1.4: R06 Arctic Grayling US/DS Migration Patterns



In 2006 and 2007, the area immediately under the bridge and adjacent to the ice road at R06 was identified as likely spawning habitat. Many of the current year reacaptures (CYRC) were large males and females likely defending the area near the bridge (See Table 3.1.4). One female spawned in the vicinity of the hoopnets was recaptured in the same net, moving upstream and other males were collected as ripe and ready to spawn. The other, a male was recaptured moving downstream nearly 10 days after spawning upstream. In total, 62 females and 58 males were collected at R06.

Table 3.1.4: Data Summary of Current Year Recaptured Fish at Crossing R06

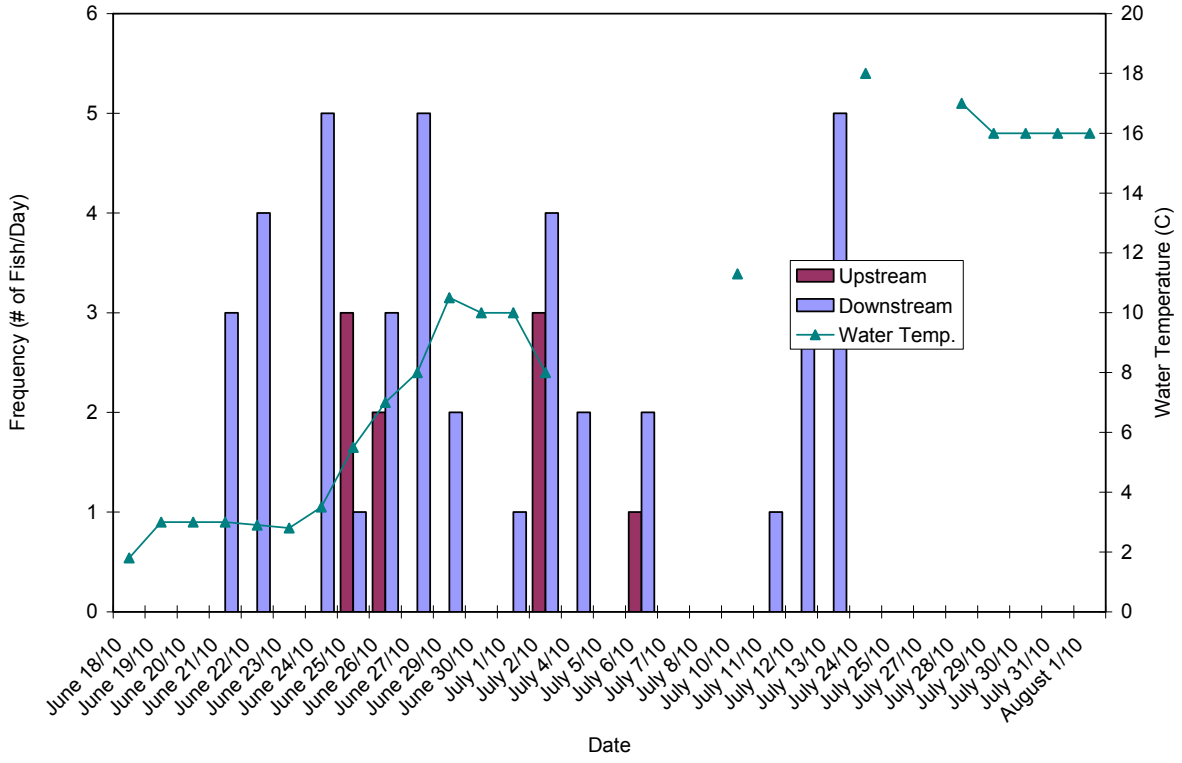
Date	Time	US or DS	Fish ID	Tagging #	Length	Weight	K	M or F	Maturity	Note
06/18/10		US	6	90063	349	450	1.06	M	7	
06/20/10	9:45	US	11	90063	349	450	1.06	M	7	CYRC
06/19/10		US	7	90782	302	310	1.13	F	3	
07/04/10	11:15	US	222	90782	297	340	1.30	F	2	CYRC
06/20/10	9:45	US	15	90788	405	685	1.03	M	7	
06/25/10	14:34	US	69	90788	405	685	1.03	M	7	CYRC
29/06/10	14:48	US	146	90788	410	700	1.02	M	7	CYRC

06/21/10	15:30	US	26	90798	335	435	1.16	M	7	
06/22/10		US	34	90798	335	435	1.16	M	7	CYRC
06/22/10		US	38	90810	348	455	1.08	M	7	
06/23/10	14:30	US	45	90810	340	455	1.16	M	7	CYRC
06/22/10		US	37	90809	340	435	1.11	F	2	
07/08/10	16:35	DS	262	90809	345	460	1.12	F	4	CYRC
07/10/10	15:06	US	273	90809	345	460	1.12	F	4	CYRC
06/23/10	14:30	US	50	90821	331	480	1.32	F	2	
6/25/10	14:34	US	70	90821	331	480	1.32	F	2	CYRC
06/23/10	14:30	US	51	90822	360	580	1.24	M	7	
06/29/10	14:48	US	148	90822	361	590	1.25	M	7	CYRC
07/02/10	15:45	US	206	90822	361	590	1.25	M	7	CYRC
06/26/10	14:09	US	115	78083	346	420	1.01	M	7	
07/02/10	15:45	US	208	78083	346	420	1.01	M	7	CYRC
07/07/10	14:00	DS	253	78083	335	460	1.22	M	7	CYRC
06/27/10	15:20	US	124	90778	310	285	0.96	F	4	
07/07/10	14:00	DS	256	90778	315	365	1.17	F	4	CYRC
06/29/10	14:48	US	143	78102	370	500	0.99	M	7	
07/02/10	15:45	US	205	78102	370	500	0.99	M	7	CYRC
06/29/10	14:48	US	140	78099	245	200	1.36	F	1	
07/02/10	15:45	US	207	78099	245	200	1.36	F	1	CYRC
07/04/10	11:15	US	221	78132	300	300	1.11	F	4	
07/07/10	14:00	DS	249	78132	300	310	1.15	F	4	CYRC
07/08/10		US	268	78155	355	510	1.14	M	9	
07/10/10		US	277	78155	355	510	1.14	M	9	CYRC

3.1.4 R09 Arctic Grayling Fish Movements

A total of 56 arctic grayling were collected at R09. Overall, there is no defined upstream or downstream migration at R09 in 2010. Although most of the fish were collected moving downstream, water levels did not permit consecutive net sets in the thalweg from late June until early July, therefore results are difficult to compare to historical data. Nonetheless, the data indicates that Arctic Grayling are able to pass the bridge at R06.

Figure 3.1.5: R09 Arctic Grayling US/DS Migration Patterns



The current year recaptures indicated that a few of the fish collected were bound by the high flows, were likely able to pass by the sets and in two cases when they were caught moving downstream they were re-caught in the same direction. Overall these data are difficult to interpret, however given the data does provide evidence that fish are able to pass by the bridge structure in very high flows.

Table 3.3.5: R09 Current Year Recapture

Table 3.1.5: Data Summary of Current Year Recaptured Fish at Crossing R09

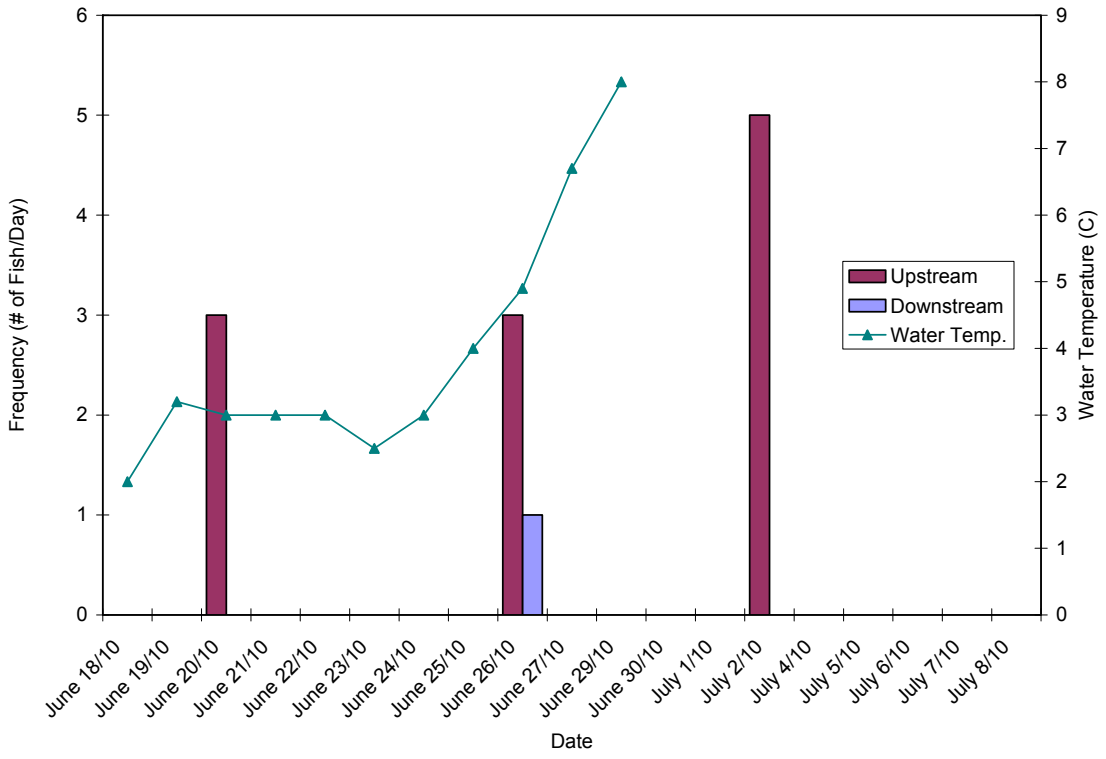
Date		US or DS	Fish ID	Tagging #	Length	Weight	K	M or F	Maturity	Note
06/21/10		DS	20	90792	305	395	1.39	F	2	
06/29/10	13:42	DS	137	90792	305	395	1.39	F	2	CYRC
06/25/10	12:45	US	64	90835	321	395	1.19	F	2	
06/27/10	14:07	DS	121	90835	321	395	1.19	F	4	CYRC
06/26/10	12:05	US	108	78077	247	192	1.27	F	1	

06/27/10	14:07	DS	120	78077	247	192	1.27	F	1	CYRC
06/29/10	17:44	DS	138	78098	282	280	1.25	F	4	
07/01/10	11:22	DS	185	78098	288	275	1.15	F	4	CYRC

3.1.5 R15 Arctic Grayling Fish Movements

In total, 13 arctic grayling were collected at R15 in 2010. As in the past, it is evident that few fish use this tributary as nearly all of the stream width was covered at R15. Arctic grayling are not impeded by the bridge structures at R15. No current year tagged fish were captured.

Figure 3.1.6: R15 Arctic grayling US/DS Migration Patterns



3.1.6 Previous Year Recaptures

3.1.6.1 R02

Twelve arctic grayling were recaptured having been tagged in previous years (one was originally tagged in 2007, another was tagged in 2008 and in 2009, the others were tagged in 2009 and recaptured). All of the previous year recaptures were moving upstream either ripe or immature between the dates of June 26th and July 1st. The grayling collected on July 1st had migrated upstream of the bridge having spawned prior to it's' collection. The previous year recapture indicates that arctic grayling are annually passing upstream and generally returning to the same stream to spawn.

The recaptured arctic grayling were in good condition (K>1.0). In a few cases, the condition factor had decreased from their preceding collection, however in other cases the condition factor has imporved. This follows the same variability represented at a population level, previously discussed in section 3.1.2. Of particular interest is the capture of arctic grayling tag # 86873. This fish was first captured in 2008 as an immature male and has shown great survival, has demonstrated great growth increases and slightly decreasing condition. As a subsample of the population, fish tag #86873 demonstrates the ability of arctic grayling to return to historical spawning and foraging grounds at/or upstream of R02.

Table 3.1.7.1: Data Summary of Previous Years Recaptured Fish (PYRC) at Crossing R02

Date	Location ID	US or DS	Fish ID	Tagging #	Length	Weight	K	M or F	Maturity	Note
6/25/2010	R02	US	82	90046	305	375	1.32	F	2	PYRC
6/28/2009	R02	US	204	90046	294	310	1.22	F	3	
6/25/2010	R02	US	94	90038	312	343	1.13	M	7	PYRC
7/12/2009	R02	US	551	90038	310	330	1.11	M	7	
6/26/2010	R02	US	116	90039	309	335	1.14	F	2	PYRC
6/28/2009	R02	US	193	90039	290	298	1.22	F	9	
6/27/2010	R02	US	129	90020	360	485	1.04	M	7	PYRC
6/29/2010	R02	US	163	90020	360	485	1.04	M	7	RYRC/ CYRC
6/27/2009	R02	US	164	90020	358	480	1.05	M	7	
6/27/2010	R02	US	130	86873	298	280	1.06	M	7	PYRC
7/1/2009	R02	US	312	86873	260	205	1.17	M	9	PYRC
6/29/2008	R02	US	80	86873	240	200	1.45	M	N/A	
6/29/2010	R02	US	150	20906	324	330	0.97	M	7	PYRC
No historic data available										
6/30/2010	R02	US	182	90962	315	300	.96	F	2	PYRC
6/29/2009	R02	US	222	90962	301	279	1.02	F*	9	

7/10/2010	R02	US	283	90906	254	195	1.19	F	1	PYRC
7/1/2009	R02	US	297	90906	238	155	1.15	F*	6	
7/12/2010	R02	US	308	90652	328	355	1.01	M	9	PYRC
7/4/2009	R02	US	408	90652	319	350	1.08	M	7	
7/13/2010	R02	US	315	90601	310	305	1.02	M	9	PYRC
7/3/2009	R02	US	368	90601	306	295	1.03	M	7	
7/24/2010	R02	US	386	90132	285	265	1.14	F	4	PYRC
6/26/2010	R02	US	110	90132	267	220	1.16	F	3	
7/24/2010	R02	US	389	85642	274	210	1.02	M	9	PYRC
7/12/2008	R02	US	199	85642	222	225	2.06	M	N/A	

*identified as Male in 2009 – changed the data to Female

3.1.6.2 R06

Seven (7) arctic grayling were previous year recaptures (PYRC) collected at R06. This data demonstrates that grayling are returning to the same tributaries and are not impeded by the bridge abutments. The recaptured arctic grayling were generally in good condition (K>1.0).

The bridge construction at R06 has altered the flow regime of this crossing the least of all the HADD crossings; similar to the other crossings, R06 has demonstrated little or no alterations to grayling migration patterns since 2007. Fish tag #85337 was first captured in 2007 and was recaptured in 2008 and in 2010. The growth of this fish appears steady with slightly decreasing condition, which follows the general trends of many of the previous year recaptures at all HADDs.

Table 3.1.7.2: Data Summary of Previous Years Recaptured Fish (PYRC) at Crossing R06

Date	Location ID	US or DS	Fish ID	Tagging #	Length	Weight	K	M or F	Maturity	Note
6/20/2010	R06	US	9	90063	349	450	1.06	M	7	PYRC
6/22/2010	R06	US	33	90063	349	450	1.06	M	7	PYRC/ CYRC
6/25/2010	R06	US	71	90063	349	450	1.06	M	7	PYRC/ CYRC
6/25/2009	R06	US	38	90063	345	300	0.73	M	7	
6/20/2010	R06	US	10	85028	327	370	1.06	M	7	PYRC
6/26/2009	R06	US	78	85028	287	260	1.10	M	7	
6/29/2010	R06	US	144	85337	332	420	1.15	M	9	PYRC
6/20/2008	R06	US	1	85337	315	375	1.20	M	7	PYRC
7/3/2007	R06	DS	224	85337	311	405	1.35	M	8	
7/7/2010	R06	DS	258	90656	282	285	1.27	F	4	PYRC

7/4/2009	R06	DS	422	90656	274	230	1.12	F	4	
7/8/2010	R06	US	310	85593	310	350	1.17	F	4	PYRC
6/23/2008	R06	US	50	85593	310	300	1.01	N/A	N/A	PYRC
7/2/2007	R06	DS	167	85593	309	350	1.19	F	4	
7/10/2010	R06	US	285	85624	285	265	1.14	F	4	PYRC
7/10/2008	R06	DS	179	85624	247	200	1.33	N/A	N/A	
7/10/2010	R06	US	328	85341	328	385	1.09	M	9	PYRC
7/3/2007	R06	DS	228	85341	305	365	1.29	M*	1	

*identified as Male in 2009 – changed the data to Female

3.1.6.3 R09

Three (3) arctic grayling were recaptured having been tagged in 2008 and 2009 at R09. These data demonstrates that arctic grayling are annually passing upstream of the bridge crossing. The recaptured arctic grayling were generally in good condition (K>1.0) and in two cases demonstrated an improvement in condition from the previous capture.

Table 3.1.7.3. Data Summary of Previous Years Recaptured Fish (PYRC) at Crossing R09

Date	Location ID	US or DS	Fish ID	Tagging #	Length	Weight	K	M or F	Maturity	Note
6/22/2010	R09	DS	29	86447	274	300	1.46	M	7	PYRC
7/2/2008	R09	US	120	86447	220	200	1.88	M	N/A	
6/24/2010	R09	DS	52	85817	331	445	1.23	M	7	PYRC
6/24/2009	R09	US	21	85817	330	380	1.06	M	7	PYRC
6/22/2008	R09	US	41.5	85817	325	500	1.46	N/A	N/A	
6/26/2010	R09	DS	110	90036	335	421	1.12	F	2	PYRC
6/28/2009	R09	DS	189	90036	329	385	1.08	F	2	

3.1.6.4 R15

One arctic grayling was a previous year recapture moving upstream at R15. The one fish was originally tagged in 2008. This demonstrates that grayling are returning to the same tributaries and are not impeded by the bridge abutments. The recaptured arctic grayling was generally in good condition (K>1.0), however its' condition factor has decreased from the 2008 collection.

Table 3.1.7.4: Data Summary of Previous Years Recaptured Fish (PYRC) at Crossing R15

Date	Location ID	US or DS	Fish ID	Tagging #	Length	Weight	K	M or F	Maturity	Note
6/20/2010	R15	US	16	85868	320	385	1.17	M	7	PYRC
6/21/2008	R15	US	17	85868	307	350	1.21	N/A	N/A	

3.2 MINNOW TRAP RESULTS AND DISCUSSION

Minnow traps were set throughout the R02 habitat compensation area from July 24 to August 1, 2010 (post spawning run). During minnow trap retrieval observational data (approximately 0.5 hr) was also collected to document areas where young-of-the-year (YOY) arctic grayling were nursing or foraging.

Zero arctic grayling YOY were collected using minnow traps. In total, 14 slimy sculpin and 9 nine-spine sticklebacks were collected using minnow traps. During observational data collection, minnows were observed swimming inside the spawning beds between the berms. The swimming tendencies and size of minnows appeared to be that of arctic grayling. On one occasion, an arctic grayling YOY was collected by hand downstream of the habitat structures, thus providing evidence of usage as rearing and foraging within the reach (see photos in Appendix A).

The minnow trap collection confirms that the constructed habitat is suitable for small bodied fish such as slimy sculpin and stickleback. Observational data and one captured YOY, confirmed that YOY arctic grayling were also present within the habitat compensation area; these data corroborate with the larval findings.

3.3 ELECTROFISHING RESULTS AND DISCUSSION

Electrofishing sampling was carried out in the R02 habitat compensation area on July 25, 2010. Before sampling a short trial run was conducted at R06 to determine the appropriate settings. No fish was caught at R06 crossing. One slimy sculpin and one lake trout were collected by electrofishing technique around R02 Habitat Compensation Area. The captured fish were field measured and then released at the proximate locations where they were captured.

3.4 LARVAL DRIFT TRAPS RESULTS AND DISCUSSION

3.4.1 Overview

In total, 1136 arctic grayling larvae (young-of-the-year) were collected within a reach of the R02 stream which is approximately 450m in length (See Figure 2.1). A total of 31 fish eggs and 2 Stickleback were also collected. Drift traps A1 to A4 were placed downstream of a previously identified high value habitat area (i.e. natural spawning and nursing habitat) and served as an internal reference that has been used since 2006 baseline data collection. In total, 384 arctic grayling larvae were collected at DT A1 to A4. Four drift traps (B1 to B4) were placed immediately downstream of the compensation area; these traps collected the greatest number of arctic grayling larvae (n=527). Lastly, C1 to C4 were placed further downstream of the B traps; a total of arctic grayling 225 YOY were collected in drift traps C1 to C4. These traps were placed in locations similar to 2007, 2008 and 2009 (Azimuth, 2008 and AEM, 2009).

Maximum collection occurred within the first two days (June 24th and 25th) of larval drift collection. On a relative basis drift traps set immediately downstream of the compensation berm collected the greatest amount of arctic grayling larvae.

Table 3.4.1: Results of the larval Drift Collection at R02

	R02 Habitat Compensation Drift Trap ID														R02 Total
	A1	A2	A3	A4	A Total	B1	B2	B3	B4	B Total	C1	C2	C3	C4	C Total	
TOTAL	106	116	75	93	**390**	309	125	70	33	**537**	59	60	50	78	**247**	**1174**
AVG*	4.08	4.46	2.89	3.58		11.89	4.81	2.69	1.27		2.27	2.31	1.92	3		
MAX	28	40	16	22		43	36	18	9		15	30	8	20		

* Average per day collection

3.4.2 Larval Collection: Timing and Temperature

Arctic grayling are spring spawners that migrate from lakes and large rivers to smaller streams to spawn over gravel or rocky bottoms (Evans et al. 2002). The literature suggests that spawning occurs between 7 and 10°C (Evans et al. 2002, McPhail and Lindsey, 1970, & Scott and Crossman, 1973). Young are thought to hatch within 16-18 days at water temperatures of 9°C or within 8 to 32 days of water temperature of 15.5°C (McPhail and Lindsey, 1970 and Krueger, 1981). As was found in previous studies at R02, contrary to the cited literature, the primary arctic grayling spawning period may be occurring prior to setting drift traps at temperature less than 5°C and that peak migration and spawning is occurring below the ice or immediately at ice off in temperatures between 1 and 5 °C . This will be further explored in future monitoring programs.

The 2010 larval drift trap results demonstrate that arctic grayling are successfully spawning near or within the R02 habitat compensation area (n=1174). The 2010 data suggests that a greater number of grayling were collected immediately downstream of the habitat structures (target area B) than immediately downstream of a previously identified high value habitat area (larval drift collection at target area b is 37% greater then target area A: a likely natural spawning area). It should be noted that larval drift collected could be drifting from locations upstream and may not be specifically linked to the targeted collection areas (as shown in Figure 2.1). For this reason, it is difficult to compare drift trap results between target areas within a single reach, however by pooling these results there is evidence that arctic grayling larval drift collected in the vicinity of the habitat compensation area has increased in 2010 from historical data.

In 2007, seven traps were set throughout R02 compensation area (COB DT 1,2,3) and downstream (COA DT 1 to 4). In total 292 Arctic grayling larvae were collected in 2007 with peak drift around June 30, 2007. In 2008, 6 drift traps were set upstream and 2 downstream of the compensation area. In total 158 arctic grayling were collected with peak drift collected on June 23 to 29 at 6°C. In 2009 a total of 508 YOY were collected at R02. It should be noted that only traps were used per target area in 2007 and 2008. In 2009, three traps were used per target area, however in 2010 all 12 drift traps were used (4 in each target area). Although, overall there was greater *effort* in 2010 compared to previous studies, we can compare identical historical by standardizing the *catch per unit efforts* by matching the location of the drift traps and number of drift traps[1]. If these data are standardized simply based on the number of drift traps used, there is a total of 765 YOY were collected at R02 in

[1] To assist in the standardization of the 2010 larval drift data, a random number generator was also used within each target area. The random number generator selected drift traps A3 and A2 = 222; B1 and B2=434; C1 and C3 = 109 total larvae per target area

2010, this is a 125% increase in larvae collected at R02 in 2009, 384% increase from 2008 and a 162% increase from 2007[2].

3.5 FISH EGG COLLECTION MATS

Zero fish eggs were collected in the mats. Based on poor results for this application, this method of collecting eggs is not recommended in future monitoring.

3.6 STREAM VELOCITIES

Stream velocities data were collected weekly from June 19 to July 30, 2010 at HADD crossings R02, R06, R09 and R15. The average and maximum velocities at measurements taken upstream and downstream of the bridge crossings are presented in Table 3.6. Staff gage measurements discussed in this section are presented in Appendix B.

Table 3.6 : AWPAR Average and Maximum Stream Velocity Data Summary (June 19– July 30) 2010

		Stream Crossing ID (Upstream/Downstream)									
		R02		R02 Culvert		R06		R09		R15	
		US	DS	US	DS	US	DS	US	DS	US	DS
June	AVERAGE	0.55	0.54	0.32	0.29	0.24	0.52	0.53	0.41	0.52	0.58
	MAXIMUM	1.40	1.90	0.92	1.92	0.54	0.85	0.95	0.95	0.93	0.87
July	AVERAGE	0.45	0.53	0.23*	0.36*	0.19	0.27	0.33	0.25	0.36	0.32
	MAXIMUM	0.99	1.92	0.46*	0.95*	0.51	0.93	0.75	0.74	0.93	0.98

3.6.1 R02

Velocity measurements were taken at R02 as soon as possible following ice-off, which occurred on approximately June 14, 20010. On June 19, the maximum velocity (1.90 m/sec) was measured at R02 downstream of the bridge; the maximum velocity (1.40 m/sec.) upstream of the bridge. Velocity measurements were taken at recorded peak freshet, as staff gage measurements on June 24th were at their highest (0.50m) and by July 4th, the water level had decreased to 0.42m (a decrease of 8cm). Following a rain event the maximum water level at R02 was 0.625m and then decreased by 40 cm by July 31, 2010.

Arctic grayling have a *sustained speed* of 0.8m/sec (maintained indefinitely), a *prolonged speed* of 0.8 - 2.1 m/s (can be maintained for up to 200 minutes) and a *burst speed* of 2.1 - 4.3 m/s (can be maintained for 15 seconds) (MOT, 2006). The field measurements indicate that the maximum velocities of the stream, at peak freshet, are within the lower range of the burst speed. The average speeds (0.55 US and 0.54 m/sec DS) were lower than cited arctic grayling sustained speeds. These velocity data suggest that arctic grayling migrations are not obstructed by the bridge structures that have increased currents at R02.

[2] Future studies will use the same number of traps at R02 on an annual basis to provide a better indication of success. In the past, fewer traps were used at R02 as larval studies were also being conducted at other tributaries along the AWPAR.

3.6.2 R06, R09 and R15

Average and maximum velocity measurements at R06, R09 and R15 are less than sustained speeds (MOT, 2006). These velocity data suggest that arctic grayling migrations are not obstructed due to bridge structures and road activities at R06, R09 and R15.

SECTION 4 • CREEL SURVEY

As in previous years, creel data suggests that the highest fishing rates occur during the spring and summer (April – August) peaking between May and June. Arctic Grayling catches continue to remain low across years and Arctic Char catches in 2010 are similar to the reported catches in 2009. Lake Trout and Lake Whitefish catches continue to vary widely between years and are confounded by the use of nets in some years. Based on the current dataset, the majority of participants continue to fish around the perimeters of Baker Lake and Whitehills Lake irrespective of the road. Thus, unless fishing trips are tied to hunting trips, it would appear that study participants are less willing to travel long distances to catch fish, regardless of AWPAR access, likely due to the abundance of fish in close proximity to the Hamlet of Baker Lake.

SECTION 5 • CONCLUSIONS

5.1 FISH PASSAGE AND MOVEMENTS

Similar to historical fisheries monitoring along the AWPAR, the 2010 results demonstrate that Arctic grayling (and a few other species) are able to pass by the bridge structures and complete their annual spawning migration. This is supported by the maximum and average stream velocities which are within the cited Arctic grayling *burst speed* and *sustained speed* (MOT, 2006).

Similar to 2009, peak migration likely occurred just prior to the installation of hoopnets or were missed due to high water flows from June 20th until July 15th at all crossings. With the exception of R06, compared to 2009, fewer fish were collected moving upstream at all of the crossings; however, in the total number of fish collected and movements are similar to 2007 and 2008 data. The larval drift findings at R02 suggest that there is an earlier spawning run (peak drift on June 24th and 25th ; which is identical to 2009) that was likely missed. According to Evans et al. (2002) arctic grayling commonly have a post spawning run, therefore it would seem logical to assume that many of the fish collected moving upstream were part of a post spawning migration.

In general, the arctic grayling populations appear to be healthy at R02, R06, R09 and R15 crossings. The length-frequency, maturity data and condition factor indicate a robust population with an even distribution of size classes and a healthy population recruitment of immature fish in the size class of 200 to 240mm (especially at R02). There was evidence of a slight increase in the condition factor of those fish captured in 2010 compared to 2009 which is simply natural variability between years. Overall, the population of arctic grayling appears to be healthy (K>1.00).

5.2 R02 HABITAT COMPENSATION

Based on the 2010 and historical data, it is likely that arctic grayling are beginning their spawning migration immediately at ice off (or possibly below ice). As per the habitat compensation design goals, the berms are decreasing the flows that provide refugia and depths suitable for arctic grayling spawning. This was especially evident in 2010 given the high volume of water that was sustained from late June until mid July at stream R02 and the observed 40cm decrease in water level (which is only a portion of the total water level change).

Although the effectiveness or success of the compensation area is difficult to quantify, the larval drift data provides some of the best evidence of Arctic grayling spawning utilization. By comparing *equal catch per unit efforts*, the data in 2010 shows an increase in arctic grayling larvae collected throughout the R02 stream reach and as a comparison, a greater number of larvae collected downstream of the berms as compared to upstream. Overall, the number of larval data indicates that the spawning substrate and water depth at R02 compensation area is suitable for spawning and nursery.

Additionally, observational data demonstrate that young-of-the-year (YOY) arctic grayling are using the R02 habitat compensation area as refuge and foraging as part of the post-spawning migration. Although minnow traps and electrofishing were unable to collect arctic grayling, observational data provided daily indications of YOY using the area and one arctic grayling YOY was collected

confirming that the minnows observed are in-fact arctic grayling YOY. Likely due to high flows and poor net sets no current year recaptures were made. In 2009, interesting observational data was provided based on these recaptures to confirm fish usage within the habitat structures, despite this the 2010 larvae and observational data confirms that fish are using the habitat compensation area as spawn grounds, refugia and foraging. Future monitoring will confirm the observed effectiveness of the habitat compensation area demonstrated in 2010.

SECTION 6 • REFERENCES

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APPENDIX A:

2010 PHOTOGRAPHIC DOCUMENTATION

FEBRUARY 2011

Photo No 1 : Daily Drift Trap Collection at R02

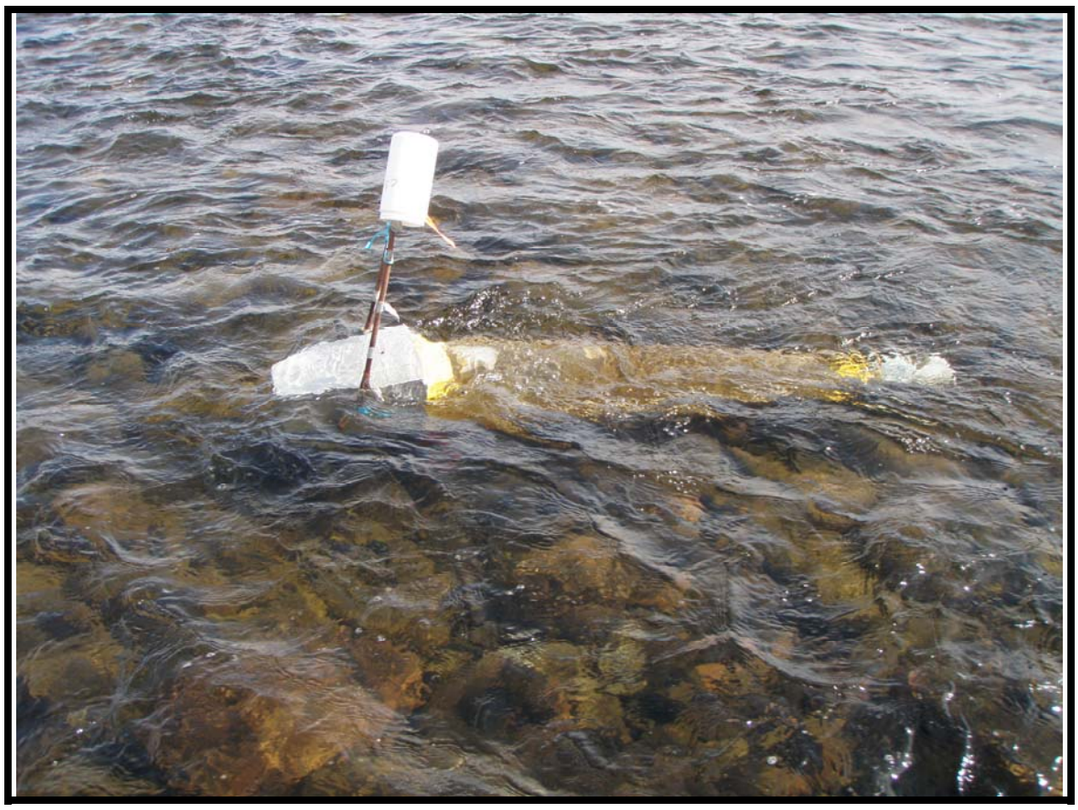


Photo No 2 : Example of drift trap used at R02.

Photo No 3: Large mature male collected (June 25, 2010)

Photo No 4: Large mature female collected at R06 (June 20, 2010)

Photo No 5 : Hoopnets set at R02A: immediately upstream of berms

Photo No 6: R09 hoopnets set to collect upstream and downstream moving fish.

Photo No 7 : Electrofishing within habitat compensation area.

Photo No 8 : Example of slimy sculpin collected in the minnow traps at R02

Photo No 9 : R02 berms post freshet- water level maintained from late June until mid July. Note water cascading over most of the berm

Photo No 10 : Water velocity measurements taken on June 25th, 2010.

APPENDIX B:

2010 RAW MONITORING DATA

FEBRUARY 2011

Minnow Trap Data Collection 2010 - R02 Compensation Area									
Date	**Time**	**Berm 1**	**Qty.**	**Berm 2**	**Qty.**	**Berm 3**	**Qty.**	**Berm 4**	**Qty.**
07/24/2010	2:00pm	NSST	1	-	-	SLSC	1	-	-
07/25/2010	5:00pm	SLSC	1	SLSC	1	-	-	-	-
07/26/2010	5:30pm	NSST	1	-	-	-	-	SLSC	1
07/27/2010	5:00pm	-	-	SLSC/NSST	1	-	-	SLSC	1
07/28/2010	4:00pm	-	-	-	-	-	-	-	-
07/29/2010	4:30pm	-	-	SLSC	1	-	-	-	-
07/30/2010	2:30pm	SLSC	1	-	-	SLSC/NSST	1	SLSC	1
07/31/2010	3:00pm	-	-	-	-	SLSC/NSST	1	-	-
1/8/2010	10:00am	SLSC	1	NSST	3	SLSC/NSST	1	SLSC	1
	Berm 1 Totals	SLSC	3						
		NSST	2						
	Berm 2 Totals	SLSC	3						
		NSST	4						
	Berm 3 Totals	SLSC	4						
		NSST	3						
	Berm 4 Totals	SLSC	4						
		NSST	0						
	R02 Totals	SLSC	14						
		NSST	9						

Drift Trap Collection Data- 2010

	June 24 2010			June 25 2010			June 26 2010			June 27 2010			June 29 2010		
Sample ID	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other
A1	13			9			10			3			8		
A2	40			21			8			5			10		
A3	10			15			11			5			7		
A4	19			22			4	1		5	4		12		
B1	34			19			37			20			18		1
B2	4			21			21			10			36		
B3	15			18			2			2			18		1
B4	9			7			2	1		2			2	2	
C1	6	1		1			0	12		0	1		1		
C2	30			11			2	1		3	1		5		
C3	7			8			5			7			4		
C4	No data - lost in trransfer			20			9			1			4		
Total	187	1		172	0		111	15		63	6		125	2	2

C4= compsite of samples from June 24-25 2010

Drift Trap Co

	June 30 2010			July 1 2010			July 2 2010			July 4 2010			July 5 2010		
Sample ID	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other
A1	0			3	1		5			12			0		
A2	5			8			6			4			3		
A3	6			0			3			0			0		
A4	4			0			1			0			0		
B1	20			21			13			43			17		
B2	7			0			3			0			1		
B3	6			0			1			1			0		
B4	0			0			0			0			0		
C1	1			2			4			4			7		
C2	0			0			0			0			1		
C3	0			0			0			0			0		
C4	0			0			0			0			1		
Total	49			34			36			64			30		

Composite of Samples from
July 3 & July 4

Drift Trap Co

	July 6 2010			July 7 2010			July 8 2010			July 9 2010			July 10 2010		
Sample ID	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other
A1	1			3			0			No drift collected			0		
A2	0			1			0						1		
A3	0			0			1						0		
A4	0			0			2						1		
B1	1			6			4						2		
B2	0			5			2						11		
B3	0			2			0						2		
B4	0			0			4						0		
C1	3			15			0						1		
C2	0			0			1						0		
C3	0			2			1						1		
C4	3			5	6		0						5		
Total	8			39			15						24		

Drift Trap Co

	July 11 2010			July 12 2010			July 13 2010			July 24 2010			July 25 2010		
Sample ID	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other
A1	28			8			2			0			0		
A2	1			0			3			0			0		
A3	1			0			16			0			0		
A4	0			0			18			0			0		
B1	0			17			36			0			0		
B2	4			0			0			0			0		
B3	0			0			1			0			0		
B4	0			0			4			0			0		
C1	0			0			0			0			0		
C2	2			1			2			0			0		
C3	5			6			4			0			0		
C4	15			9			0			0			0		
Total	56			41			86			0			0		

Drift Trap Co

	July 27 2010			July 28 2010			July 29 2010		
Sample ID	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other
A1	0			0			0		
A2	0			0			0		
A3	0			0			0		
A4	0			0			0		
B1	0			0			0		
B2	0			0			0		
B3	0			0			0		
B4	0			0			0		
C1	0			0			0		
C2	0			0			0		
C3	0			0			0		
C4	0			0			0		
Total	0			0			0		

Drift Trap Co

	July 30 2010			July 31 2010			Aug 1 2010		
Sample ID	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other	ARGR	Fish Egg	Other
A1	0			0			0		
A2	0			0			0		
A3	0			0			0		
A4	0			0			0		
B1	0			0			0		
B2	0			0			0		
B3	1			0			0		
B4	0			0			0		
C1	0			0			0		
C2	0			0			0		
C3	0			0			0		
C4	0			0			0		
Total	1			0			0		

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
06/18/10		R06		2		US	1	90776	327	390	F	3		
06/18/10		R06		2		US	2	90777	336	355	M	7		
06/18/10		R06		2		US	3	90778	310	285	F	3	PYRC - No Tag	
06/18/10		R06		2		US	4	90779	335	315	M	7		
06/18/10		R06		2		US	5	90780	335	265	F	3		
06/18/10		R06		2		US	6	90781	376	585	M	4		
06/19/10		R06		2.2	1.25	US	7	90782	302	310	F	3		
06/19/10		R06		2.2	1.25	US	8	90783	338	400	M	8		
06/20/10	9:45am	R06		3	1.1	US	9	90063	349	450	M	7	PYRC	
06/20/10	9:45am	R06		3	1.1	US	10	85028	327	370	M	7	PYRC	
06/20/10	9:45am	R06		3	1.1	US	11	90781	376	585	M	7	CYRC	
06/20/10	9:45am	R06		3	1.1	US	12	90785	365	530	F	2		
06/20/10	9:45am	R06		3	1.1	US	13	90786	365	505	M	7		
06/20/10	9:45am	R06		3	1.1	US	14	90787	364	520	M	7		
06/20/10	9:45am	R06		3	1.1	US	15	90788	405	685	M	7		
06/21/10	12:45pm	R09				DS	19	90791	269	285	F	2		
06/21/10	12:45pm	R09				DS	20	90792	305	395	F	2		
06/21/10	12:45pm	R09				DS	21	90793	205	125	F	1		
06/21/10	12:45pm	R09				DS	22	-	555	-	-	-	Lake Trout - 4lbs	
06/21/10	3:30pm	R06		4.5	1.065	US	23	90794	317	410	F	2		
06/21/10	3:30pm	R06		4.5	1.065	US	24	90795	336	440	F	2		
06/21/10	3:30pm	R06		4.5	1.065	US	25	90797	313	395	F	2		
06/21/10	3:30pm	R06		4.5	1.065	US	26	90798	335	435	M	7		
06/21/10	3:30pm	R06		4.5	1.065	US	27	90799	359	600	F	2		
06/21/10	3:30pm	R06		4.5	1.065	US	28	90800	380	680	M	7		
06/22/10	3:10pm	R09		2.9	0.52	DS	29	86477	274	300	M	7	PYRC	
06/22/10	3:10pm	R09		2.9	0.52	DS	30	90804	226	145	F	1		
06/22/10	3:10pm	R09		2.9	0.52	DS	31	90805	210	110	F	1		
06/22/10	3:10pm	R09		2.9	0.52	DS	32	90806	339	415	F	2		
06/22/10	4:30pm	R06		3	1.01	US	33	90063	349	450	M	7	PYRC	
06/22/10	4:30pm	R06		3	1.01	US	34	90798	335	435	M	7	CYRC	
06/22/10	4:30pm	R06		3	1.01	US	35	90783	341	430	M	7	CYRC	
06/22/10	4:30pm	R06		3	1.01	US	36	90808	339	475	F	3		
06/22/10	4:30pm	R06		3	1.01	US	37	90809	340	435	F	2		
06/22/10	4:30pm	R06		3	1.01	US	38	90810	348	455	M	7		
06/22/10	4:30pm	R06		3	1.01	US	39	90811	343	462	M	7		
06/22/10	4:30pm	R06		3	1.01	US	40	90812	393	720	M	7		
06/22/10	4:30pm	R06		3	1.01	US	41	90814	359	570	M	7		
06/22/10	4:30pm	R06		3	1.01	US	42	90815	360	515	M	7		
06/22/10	4:30pm	R06		3	1.01	US	43	90816	374	515	M	7		
6/22/2010	2:30pm	R15		3	0.575	US	16	85868	320	385	M	7	PYRC	
6/22/2010	2:30pm	R15		3	0.575	US	17	90789	318	355	F	2		
6/22/2010	2:30pm	R15		3	0.575	US	18	90790	311	375	F	4		
06/23/10	12:45pm	R09		2.8	0.5	DS	44	-	-	-	-	-	Lost in Transfer	
06/23/10	2:30pm	R06		3.5	1	US	45	90810	340	455	M	7	CYRC	
06/23/10	2:30pm	R06		3.5	1	US	46	90817	339	445	F	2		
06/23/10	2:30pm	R06		3.5	1	US	47	90818	322	360	F	2		
06/23/10	2:30pm	R06		3.5	1	US	48	90819	319	400	F	2		

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
06/23/10	**2:30pm**	R06		3.5	1	US	49	90820	336	400	F	2		
06/23/10	**2:30pm**	R06		3.5	1	US	50	90821	331	480	F	2		
06/23/10	**2:30pm**	R06		3.5	1	US	51	90822	360	580	M	7		
6/24/10	**1:25pm**	R09		3.5	0.489	DS	52	85817	331	445	M	7	PYRC	
6/24/10	**1:25pm**	R09		3.5	0.489	DS	53	90823	345	460	F	2		
6/24/10	**1:25pm**	R09		3.5	0.489	DS	54	90824	318	370	M	7		
6/24/10	**1:25pm**	R09		3.5	0.489	DS	55	90825	285	295	F	2		
6/24/10	**1:25pm**	R09		3.5	0.489	DS	56	90826	228	150	F	1		
6/24/10	**2:30pm**	R06		4.8	0.975	US	57	-	197	110	F	1		
6/24/10	**2:30pm**	R06		4.8	0.975	US	58	90827	340	430	M	7		
6/24/10	**2:30pm**	R06		4.8	0.975	US	59	90829	325	463	F	2		
6/24/10	**2:30pm**	R06		4.8	0.975	US	60	90830	353	540	M	7		
6/24/10	**3:30pm**	R02	B	4.5	0.5	US	61	90831	297	310	F	2		
6/24/10	**3:30pm**	R02	B	4.5	0.5	US	62	90832	209	135	M	6		
6/25/10	**12:45pm**	R09		5.5	0.465	US	63	90833	221	140	M	6		
6/25/10	**12:45pm**	R09		5.5	0.465	US	64	90835	321	395	F	2		
6/25/10	**12:45pm**	R09		5.5	0.465	US	65	90836	315	370	M	7		
6/25/10	**12:45pm**	R09		5.5	0.465	DS	66	90837	308	320	M	7		
6/25/10	**12:45pm**	R09		5.5	0.465	US	67	-	560	-	-	-	Lake Trout	
6/25/10	**12:45pm**	R09		5.5	0.465	US	68	-	625	-	-	-	Lake Trout	
6/25/10	**2:34pm**	R06		7.6	0.95	US	69	90788	405	685	M	7	CYRC	
6/25/10	**2:34pm**	R06		7.6	0.95	US	70	90821	331	480	F	2	CYRC	
6/25/10	**2:34pm**	R06		7.6	0.95	US	71	90063	349	450	M	7	PYRC	
6/25/10	**2:34pm**	R06		7.6	0.95	US	72	90838	248	185	M	6		
6/25/10	**2:34pm**	R06		7.6	0.95	US	73	90839	302	320	M	7		
6/25/10	**2:34pm**	R06		7.6	0.95	US	74	90840	315	345	M	7		
6/25/10	**2:34pm**	R06		7.6	0.95	US	75	90842	300	310	M	8		
6/25/10	**2:34pm**	R06		7.6	0.95	US	76	90844	357	455	M	7		
6/25/10	**2:34pm**	R06		7.6	0.95	US	77	90845	357	520	F	2		
6/25/10	**2:34pm**	R06		7.6	0.95	US	78	90847	347	507	M	7		
6/25/10	**2:34pm**	R06		7.6	0.95	US	79	90848	361	595	F	2		
6/25/10	**2:34pm**	R06		7.6	0.95	US	80	90849	384	650	M	7		
6/25/10	**2:34pm**	R06		7.6	0.95	US	81	90850	390	670	M	7		
6/25/10	**5:00pm**	R02	B	5	0.5	US	82	90046	305	375	F	2	PYRC	
6/25/10	**5:00pm**	R02	B	5	0.5	US	83	90851	287	275	M	7		
6/25/10	**5:00pm**	R02	B	5	0.5	US	84	90852	273	270	M	7		
6/25/10	**5:00pm**	R02	B	5	0.5	US	85	90853	305	307	M	7		
6/25/10	**5:00pm**	R02	B	5	0.5	US	86	90854	277	285	F	3		
6/25/10	**5:00pm**	R02	B	5	0.5	US	87	90855	293	265	F	3		
6/25/10	**5:00pm**	R02	B	5	0.5	US	88	90856	277	274	F	3		
6/25/10	**5:00pm**	R02	B	5	0.5	US	89	90857	300	290	M	7		
6/25/10	**5:00pm**	R02	B	5	0.5	US	90	90858	274	250	F	3		
6/25/10	**5:00pm**	R02	B	5	0.5	US	91	90859	305	360	F	2		
6/25/10	**5:00pm**	R02	B	5	0.5	US	92	90860	335	421	M	7		
6/25/10	**5:00pm**	R02	B	5	0.5	US	93	90861	328	415	M	7		
6/25/10	**5:00pm**	R02	A	5	0.5	US	94	90038	312	343	M	7	PYRC	
6/25/10	**5:00pm**	R02	A	5	0.5	US	95	90862	328	376	F	2		
6/25/10	**5:00pm**	R02	A	5	0.5	US	96	90863	298	289	M	7		

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
6/25/10	5:00pm	R02	A	5	0.5	US	97	90866	287	292	F	2		
6/25/10	5:00pm	R02	A	5	0.5	US	98	90868	278	240	F	2		
6/25/10	5:00pm	R02	A	5	0.5	US	99	90869	242	160	F	1		
6/25/10	5:00pm	R02	A	5	0.5	US	100	90870	289	255	F	3		
6/25/10	5:00pm	R02	A	5	0.5	US	101	90871	261	205	F	3		
6/25/10	5:00pm	R02	A	5	0.5	US	102	-	207	120	-		Pigmy Whitefish	
6/25/10	5:00pm	R02	A	5	0.5	US	103	90872	349	540	M	7		
06/26/10	12:05pm	R09		7	0.45	US	108	78077	247	192	F	1		
06/26/10	12:05pm	R09		7	0.45	US	109	78078	238	190	F	1		
06/26/10	12:05pm	R09		7	0.45	DS	110	90036	335	421	F	2	PYRC	
06/26/10	12:05pm	R09		7	0.45	DS	111	-	198	100	F	1		
06/26/10	12:05pm	R09		7	0.45	DS	112	78080	245	195	F	1		
06/26/10	2:34pm	R06		7.6	0.95	US	113	78081	330	300	F	4		
06/26/10	2:34pm	R06		7.6	0.95	US	114	78082	292	288	F	3		
06/26/10	2:34pm	R06		7.6	0.95	US	115	78083	346	420	M	7		
06/26/10	5:45pm	R02	A	8.1	0.45	US	116	90039	309	335	F	2	PYRC	
06/26/10	5:45pm	R02	A	8.1	0.45	US	117	78084	326	430	M	7		
06/26/10	10:46am	R15		4.9	0.475	US	104	90873	341	460	F	2		
6/26/2010	10:46am	R15		4.9	0.475	US	105	90874	350	507	M	7		
6/26/2010	10:46am	R15		4.9	0.475	US	106	90875	339	480	M	7		
6/26/2010	10:46am	R15		4.9	0.475	US	107	78076	277	280	M	7		
06/27/10	1:30pm	R15		6.7	0.457	US	118	-	-	-	-		Lost in Transfer	
06/27/10	2:07pm	R09		8	0.44	DS	119	-	245	195	F	1	Dead	
06/27/10	2:07pm	R09		8	0.44	DS	120	78077	247	192	F	1	CYRC	
06/27/10	2:07pm	R09		8	0.44	DS	121	90835	321	395	F	4	CYRC	
06/27/10	2:07pm	R09		8	0.44	DS	122	78085	213	155	F	1		
06/27/10	2:07pm	R09		8	0.44	DS	123	78086	321	380	M	7		
06/27/10	3:20pm	R06		8.8	0.925	US	124	90778	310	285	F	4		
06/27/10	3:51pm	R02	C	9	0.44	DS	125	78087	297	320	F	4		
06/27/10	3:51pm	R02	C	9	0.44	DS	126	78088	328	350	F	2		
06/27/10	4:26pm	R02	A	9	0.44	US	127	78090	322	382	F	2		
06/27/10	4:26pm	R02	A	9	0.44	US	128	78091	307	325	M	7		
06/27/10	5:44pm	R02	B	9	0.44	US	129	90020	360	485	M	7	PYRC	
06/27/10	5:44pm	R02	B	9	0.44	US	130	86873	298	280	M	7	PYRC	
06/27/10	5:44pm	R02	B	9	0.44	US	131	78092	273	215	M	7		
06/27/10	5:44pm	R02	B	9	0.44	US	132	78093	252	170	F	1		
06/27/10	5:44pm	R02	B	9	0.44	US	133	78094	279	235	F	3		
06/27/10	5:44pm	R02	B	9	0.44	US	134	78095	338	430	M	7		
06/27/10	5:44pm	R02	B	9	0.44	US	135	78096	320	370	F	4		
06/27/10	5:44pm	R02	B	9	0.44	US	136	78097	303	292	M	9		
06/29/10	1:42pm	R09		10.5	0.425	DS	137	90792	305	395	F	2	CYRC	
06/29/10	1:42pm	R09		10.5	0.425	DS	138	78098	282	280	F	4		
06/29/10	1:42pm	R09		10.5	0.425	DS	139	-	525	-	-	-	Lake Trout	
06/29/10	2:48pm	R06			0.9	US	140	78099	245	200	F	1		
06/29/10	2:48pm	R06			0.9	US	141	78100	216	130	F	1		
06/29/10	2:48pm	R06			0.9	US	142	78101	224	160	F	1		
06/29/10	2:48pm	R06			0.9	US	143	78102	370	500	M	7		
06/29/10	2:48pm	R06			0.9	US	144	85337	332	420	M	9	PYRC	

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes
06/29/10	**2:48pm**	R06			0.9	US	145	78103	328	400	F	2	
06/29/10	**2:48pm**	R06			0.9	US	146	90788	410	700	M	7	CYRC
06/29/10	**2:48pm**	R06			0.9	US	147	78104	335	420	M	9	
06/29/10	**2:48pm**	R06			0.9	US	148	90822	361	590	M	7	CYRC
06/29/10	**4:10pm**	R02	C			DS	149	-	-	-	-		Lost in Transfer
06/29/10	**4:10pm**	R02	C			DS	150	20906	324	330	M	7	PYRC
06/29/10	**4:35pm**	R02	A			US	151	78105	289	260	F	4	
06/29/10	**4:35pm**	R02	A			US	152	78106	261	220	F	3	
06/29/10	**4:35pm**	R02	A			US	153	78107	324	410	F	4	
06/29/10	**5:45pm**	R02	B			US	154	-	-	-	-		Lost in Transfer
06/29/10	**5:45pm**	R02	B			US	155	-	-	-	-		Lost in Transfer
06/29/10	**5:45pm**	R02	B			US	156	-	-	-	-		Lost in Transfer
06/29/10	**5:45pm**	R02	B			US	157	-	690	-	-		Lake Trout
06/29/10	**5:45pm**	R02	B			US	158	-	290	280	F	4	Dead
06/29/10	**5:45pm**	R02	B			US	159	78108	285	270	F	2	
06/29/10	**5:45pm**	R02	B			US	160	-	220	140	F	1	Dead
06/29/10	**5:45pm**	R02	B			US	161	78109	205	110	F	1	
06/29/10	**5:45pm**	R02	B			US	162	78110	290	300	F	2	
06/29/10	**5:45pm**	R02	B			US	163	90020	360	485	M	7	PYRC
06/29/10	**5:45pm**	R02	B			US	164	78111	215	110	F	1	
06/29/10	**5:45pm**	R02	B			US	165	78112	305	300	M	7	
06/29/10	**5:45pm**	R02	B			US	166	78113	320	350	M	7	
06/29/10	**5:45pm**	R02	B			US	167	78114	260	210	M	6	
06/29/10	**5:45pm**	R02	B			US	168	78118	320	350	M	7	
06/29/10	**5:45pm**	R02	B			US	169	78120	266	220	F	5	
06/29/10	**5:45pm**	R02	B			US	170	78121	350	460	M	7	
06/29/10	**5:45pm**	R02	B			US	171	78122	345	480	M	7	
06/29/10	**5:45pm**	R02	B			US	172	-	528	-	-		Lake Trout
06/30/2010	**10:45am**	R09		10	0.425	DS	173	-	-	-	-	-	Lost in Transfer
06/30/2010	**11:32am**	R06			0.89	US	174	78123	210	120	F	1	
06/30/2010	**11:32am**	R06			0.89	US	175	-	-	-	-		Lost in Transfer
06/30/2010	**11:32am**	R06			0.89	US	176	-	-	-	-		Lost in Transfer
06/30/2010	**12:00pm**	R02	C		0.41	DS	177	78124	269	245	M	6	
06/30/2010	**12:00pm**	R02	C		0.41	DS	178	78125	345	500	F	2	
06/30/2010	**12:00pm**	R02	C		0.41	DS	179	78126	349	450	M	7	
06/30/2010	**12:00pm**	R02	C		0.41	DS	180	-	-	-	-		Lost in Transfer
06/30/2010	**1:30pm**	R02	B		0.41	US	181	78127	220	130	F	1	
06/30/2010	**1:30pm**	R02	B		0.41	US	182	90962	315	300	F	2	PYRC
06/30/2010	**1:30pm**	R02	B		0.41	US	183	78128	288	360	F	3	
06/30/2010	**1:30pm**	R02	B		0.41	US	184	78129	260	200	M	8	
1/7/2010	**11:22am**	R09		10	0.425	DS	185	78098	288	275	F	4	CYRC
1/7/2010	**11:22am**	R09		10	0.425	DS	186	-	-	-	-	-	Lost in Transfer
1/7/2010	**12:45pm**	R02	C			DS	187	-	571	-	-		Lake Trout
1/7/2010	**2:00pm**	R02	A			US	188	78130	315	200	F	2	
1/7/2010	**2:00pm**	R02	A			US	189	-	-	-	-		Lake Trout - Lost in Transfer
2/7/2010	**1:20pm**	R15			0.435	US	190	-	185	120	F	1	
2/7/2010	**1:20pm**	R15				US	191	-	195	140	F	1	
2/7/2010	**1:20pm**	R15				US	192	-	185	120	F	1	
2/7/2010	**1:20pm**	R15				US	193	-	180	120	F	1	

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes
2/7/2010	1:20pm	R15				US	194	-	165	105	F	1	
2/7/2010	2:30pm	R09		8	0.415	US	195	-	-	-	-	-	Lost in Transfer
2/7/2010	2:30pm	R09		8	0.415	US	196	-	195	165	F	1	
2/7/2010	2:30pm	R09		8	0.415	US	197	-	205	150	F	1	Dead
2/7/2010	2:30pm	R09		8	0.415	US	198	-	230	205	F	1	Dead
2/7/2010	2:45pm	R09		8	0.415	DS	199	-	505	-	-	-	Lake Trout
2/7/2010	2:45pm	R09		8	0.415	DS	200	-	420	-	-	-	Lake Trout
2/7/2010	2:45pm	R09		8	0.415	DS	201	-	200	145	F	1	
2/7/2010	2:45pm	R09		8	0.415	DS	202	-	193	130	F	1	
2/7/2010	2:45pm	R09		8	0.415	DS	203	-	187	120	F	1	
2/7/2010	2:45pm	R09		8	0.415	DS	204	-	215	180	F	1	Dead
2/7/2010	3:45pm	R06		9	0.85	US	205	78102	370	500	M	7	CYRC
2/7/2010	3:45pm	R06		9	0.85	US	206	90822	361	590	M	7	CYRC
2/7/2010	3:45pm	R06		9	0.85	US	207	78099	245	200	F	1	CYRC
2/7/2010	3:45pm	R06		9	0.85	US	208	78083	346	420	M	7	CYRC
2/7/2010	3:45pm	R06		9	0.85	US	209	-	198	100	F	1	
2/7/2010	4:05pm	R02	C	8	0.425	DS	210	-	485	-	-		Lake Trout
2/7/2010	4:05pm	R02	C	8	0.425	US	211	-	178	105	F	1	
2/7/2010	4:05pm	R02	C	8	0.425	US	212	-	195	110	F	1	
2/7/2010	4:05pm	R02	C	8	0.425	US	213	-	199	115	F	1	
2/7/2010	5:25pm	R02	B	8	0.425	US	214	-	190	135	F	1	
2/7/2010	5:25pm	R02	B	8	0.425	US	215	-	189	125	F	1	
2/7/2010	5:25pm	R02	B	8	0.425	US	216	-	174	115	F	1	
4/7/2010	10:15am	R09			0.52	US	217	-	-	-	-	-	Lake Trout - Lost in Transfer
4/7/2010	10:15am	R09			0.52	DS	218	-	225	160	F	1	Dead
4/7/2010	10:15am	R09			0.52	DS	219	78131	240	190	F	2	
4/7/2010	10:15am	R09			0.52	DS	220	-	780	-	-		Lake Trout
4/7/2010	11:15am	R06			0.83	US	221	78132	300	300	F	4	
4/7/2010	11:15am	R06			0.83	US	222	90782	297	340	F	2	CYRC
4/7/2010	11:15am	R06			0.83	US	223	78133	345	405	F	2	
4/7/2010	11:15am	R06			0.83	US	224	78134	386	600	M	7	
4/7/2010	11:15am	R06			0.83	US	225	78135	396	650	M	9	
4/7/2010	11:15am	R06			0.83	US	226	-	250	180	F	1	Dead
4/7/2010	12:10pm	R02	C		0.425	DS	227	78136	319	325	M	7	
4/7/2010	1:15pm	R02	A		0.425	US	228	-	-	-	-		Dead - No Head
4/7/2010	1:15pm	R02	A		0.425	US	229	-	-	-	-		Dead - No Head
4/7/2010	1:15pm	R02	A		0.425	US	230	-	-	-	-		Dead - No Head
4/7/2010	1:15pm	R02	A		0.425	US	231	-	-	-	-		Dead - No Head
4/7/2010	1:15pm	R02	A		0.425	US	232	-	-	-	-		Dead - No Head
4/7/2010	1:15pm	R02	A		0.425	US	233	-	1000+	-	-		Arctic Char
4/7/2010	2:00pm	R02	B		0.425	US	234	-	650	-	-		Lake Trout
5/7/2010	11:35am	R06			0.87	US	235	78137	335	410	F	4	
5/7/2010	2:00pm	R02	B		0.475	US	236	78138	240	150	F	1	
5/7/2010	2:00pm	R02	B		0.475	US	237	78139	212	120	F	1	
5/7/2010	2:00pm	R02	B		0.475	US	238	78140	236	150	F	1	
5/7/2010	2:00pm	R02	B		0.475	US	239	78141	243	200	F	1	
6/7/2010	11:25	R09			0.575	US	240	90804	279	160	F	1	
6/7/2010	11:25	R09			0.575	DS	241		219	142	F	1	
6/7/2010	11:25	R09			0.575	DS	242		233	163	F	1	
6/7/2010	11:25	R09			0.575	DS	243		540				Lake Trout

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
7/7/2010	13:15	R09			0.7	US	244	-	405	-	-		Lake Trout	
7/7/2010	13:15	R09			0.7	DS	245	-	328	-	-		Lake Trout	
7/7/2010	14:00	R06			1	DS	246	-					Lost in Transfer	
7/7/2010	14:00	R06			1	DS	247	-	239	165			Dead	
7/7/2010	14:00	R06			1	DS	248	78142	325	400	F	4		
7/7/2010	14:00	R06			1	DS	249	78132	300	310	F	4	CYRC	
7/7/2010	14:00	R06			1	DS	250	78143	310	385	F	2		
7/7/2010	14:00	R06			1	DS	251	78144	350	475	F	2		
7/7/2010	14:00	R06			1	DS	252	78146	344	450	F	4		
7/7/2010	14:00	R06			1	DS	253	78083	335	460	M	7	CYRC	
7/7/2010	14:00	R06			1	DS	254	78147	306	390	F	4		
7/7/2010	14:00	R06			1	DS	255	78148	246	190	F	4		
7/7/2010	14:00	R06			1	DS	256	90778	315	365	F	4		
7/7/2010	14:00	R06			1	DS	257	78149	275	260	F	1	PYRC	
7/7/2010	14:00	R06			1	DS	258	90656	282	285	F	4		
7/7/2010	14:00	R06			1	DS	259	78150	221	160	F	1	PYRC	
7/7/2010	16:15	R02	B				260		333	335			Round Whitefish	
8/7/2010	13:30	R09			0.72	DS	261	-	400	-	-	-	Lake Trout-Dead;	Pulled Nets due to current
8/7/2010	16:35	R06			0.95	DS	262	90809	345	460	F	4	CYRC	
8/7/2010	16:35	R06			0.95	US	263	85593	310	350	F	4	PYRC	
8/7/2010	16:35	R06			0.95	US	264	78151	306	360	F	4		
8/7/2010	16:35	R06			0.95	US	265	78152	306	320	F	4		
8/7/2010	16:35	R06			0.95	US	266	78153	297	300	F	1		
8/7/2010	16:35	R06			0.95	US	267	78154	285	300	F	4		
8/7/2010	16:35	R06			0.95	US	268	78155	355	510	M	9		
8/7/2010	16:35	R06			0.95	US	269	78156	280	240	F	1		
10/7/2010	9:00	R02	B	6.7	0.625	DS	270	-	210	132	F	1		
10/7/2010	9:00	R02	B	6.7	0.625	US	271	78157	263	220	F	1		
7/10/2010	15:00	R06	let Rese	6.1	0.85	DS	272	78158	339	455	F	4	2 x 3ft downstream; 1 x 3ft US (80%)	
10/7/2010	15:00	R06		6.1	0.85	US	273	90809	345	460	F	4	CYRC	Gash on side
10/7/2010	15:00	R06		6.1	0.85	US	274	78160	315	320	F	4		
10/7/2010	15:00	R06		6.1	0.85	US	275	85624	285	265	F	4	PYRC	Gash on side
10/7/2010	15:00	R06		6.1	0.85	US	276	85341	328	385	M	9	PYRC	Gash on side
10/7/2010	15:00	R06		6.1	0.85	US	277	78155	355	510	M	9	CYRC	Gash on side
10/7/2010	15:00	R06		6.1	0.85	US	278	78161	250	200	M	6		
10/7/2010	15:00	R06		6.1	0.85	US	279	78162	335	425	F	4		
10/7/2010	15:00	R06		6.1	0.85	US	280	-	228	165	F	1		
10/7/2010	15:00	R06		6.1	0.85	US	281	-	221	125	F	1		
10/7/2010	15:00	R06		6.1	0.85	US	282	-	240	155	M	6		
10/7/2010	18:15	R02	B	6.7	0.625	DS	283	90906	254	195	F	1	PYRC	1 x 3ft US; 2 x 2ft DS; 1 x 3ft DS
10/7/2010	18:15	R02	C	6.7	0.625	DS	284	-	216	115	F	1		
10/7/2010	18:15	R02	C	6.7	0.625	DS	285	-	403	830	M	9	Dead	
10/7/2010	18:15	R02	C	6.7	0.625	DS	286	-	430	-			Lake Trout	
11/7/2010	8:45	R09			0.53	DS	287	78164	264	225	F	1		
11/7/2010	8:45	R09			0.53	DS	288	-	205	-			Dead	
11/7/2010	8:45	R09			0.53	DS	289	-	203	-			Dead	
11/7/2010	9:45	R06	ets Reset			DS	290	-	420	-			Lake Trout	1 x 3ft US, 1 x 3ft DS (50%)
11/7/2010	11:30	R02	B		0.57	DS	291	-	209	105	F	1	Dead	

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes
11/7/2010	**11:30**	R02	B		0.57	DS	292	-	214	110	F	1	
11/7/2010	**11:30**	R02	A		0.57	DS	293	-	230	130	M	6	
11/7/2010	**12:00**	R02	A		0.57	DS	294	78165	284	285	F	3	
11/7/2010	**12:00**	R02	A		0.57	DS	295						Slimy sculpin; lost in transfer
12/7/2010	**8:38**	R09		11.5	0.525	DS	296	78166	294	310	M	6	
12/7/2010	**8:38**	R09		11.5	0.525	DS	297	78168	245	170	F	1	
12/7/2010	**8:38**	R09		11.5	0.525	DS	298	-	224	140	F	1	
12/7/2010	**8:38**	R09		11.5	0.525	DS	299	-	430	-			Lake Trout
12/7/2010	**8:38**	R09		11.5	0.525	DS	300	-	-	-			Arctic Char; Lost in Transfer
12/7/2010	**9:30**	R06		6.7	0.82	DS	301	-	214	120	M	6	
12/7/2010	**9:30**	R06		6.7	0.82	US	302	78170	309	395	M	9	
12/7/2010	**12:00**	R02	B	10	0.525	DS	303	-	68	2.5	M	6	Year 1; caught by hand see photo
12/7/2010	**12:00**	R02	B	10	0.525	US	304	78171	253	190	F	1	
12/7/2010	**12:00**	R02	B	10	0.525	US	305	-	207	95	F	1	
12/7/2010	**12:00**	R02	B	10	0.525	US	306	-	208	100	F	1	
12/7/2010	**12:00**	R02	B	10	0.525	US	307	78172	324	350	M	8	
12/7/2010	**12:00**	R02	B	10	0.525	US	308	90652	328	355	M	9	PYRC
07/13/2010	**9:00**	R02	B		0.48	DS	309		222	140	F	1	
07/13/2010	**9:00**	R02	B		0.48	DS	310		260	195			Lake Trout
07/13/2010	**9:00**	R02	B		0.48	DS	311	78173	271	240	F	4	
07/13/2010	**9:00**	R02	B		0.48	DS	312		343	405			Round Whitefish
07/13/2010	**9:00**	R02	B		0.48	US	313	78174	318	350	F	4	
07/13/2010	**9:00**	R02	B		0.48	US	314	78176	273	220	F	3	
07/13/2010	**9:00**	R02	B		0.48	US	315	90601	310	305	M	9	PYRC
07/13/2010	**9:00**	R02	B		0.48	US	316		236	155	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	317		226	130	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	318		246	185	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	319		212	115	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	320		208	112	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	321		200	95	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	322		242	185	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	323		195	100	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	324		205	125	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	325		191	100	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	326		209	120	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	327		244	185	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	328		204	110	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	329		207	112	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	330		210	125	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	331		206	120	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	332		207	105	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	333	78177	260	195	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	334		206	105	M	6	
07/13/2010	**9:00**	R02	B		0.48	US	335		204	115	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	336		196	100	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	337		211	125	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	338		197	100	F	1	
07/13/2010	**9:00**	R02	B		0.48	US	339	78178	285	265	M	9	

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
07/13/2010	9:00	R02	B		0.48	US	340		227	135	M	6		
07/13/2010	9:00	R02	B		0.48	US	341		219	125	F	1		
07/13/2010	9:00	R02	B		0.48	US	342		201	105	M	6		
07/13/2010	9:00	R02	B		0.48	US	343	78179	267	240	M	6		
07/13/2010	9:00	R02	B		0.48	US	344		240	150	F	1		
07/13/2010	9:00	R02	B		0.48	US	345		227	142	F	1		
07/13/2010	9:00	R02	B		0.48	US	346		224	135	F	1		
07/13/2010	9:00	R02	B		0.48	US	347		203	110	F	1		
07/13/2010	9:00	R02	B		0.48	US	348		219	122	M	6		
07/13/2010	9:00	R02	B		0.48	US	349		215	122	M	6		
07/13/2010	9:00	R02	B		0.48	US	350		212	120	F	1		
07/13/2010	9:00	R02	B		0.48	US	351		221	130	M	6		
07/13/2010	9:00	R02	B		0.48	US	352		220	125	M	6		
07/13/2010	9:00	R02	B		0.48	US	353		206	125	M	6		
07/13/2010	9:00	R02	B		0.48	US	354		203	115	F	1		
07/13/2010	9:00	R02	B		0.48	US	355		198	105	M	6		
07/13/2010	9:00	R02	B		0.48	US	356		234	145	M	6		
07/13/2010	9:00	R02	B		0.48	US	357		206	107	F	1		
07/13/2010	9:00	R02	B		0.48	US	358		217	125	M	6		
07/13/2010	9:00am	R02	B		0.48	US	359		206	110	F	1		
07/13/2010	2:05pm	R06				DS	360		380	-	-	-	Whitefish	
07/13/2010	2:05pm	R06				DS	361		218	152	M	6		
07/13/2010	2:05pm	R06				DS	362		231	165	M	6		
07/13/2010	2:05pm	R06				DS	363	78180	297	340	M	9		
07/13/2010	2:05pm	R06				DS	364		232	172	M	6		
07/13/2010	2:05pm	R06				DS	365		197	115	F	1		
07/13/2010	3:06pm	R09			0.48	DS	366		522	-			Lake Trout	
07/13/2010	3:06pm	R09			0.48	DS	367		444	-			Artic Char	
07/13/2010	3:06pm	R09			0.48	DS	368	78181	271	225	M	6		
07/13/2010	3:06pm	R09			0.48	DS	369		194	110	F	1	Dead	
07/13/2010	3:06pm	R09			0.48	DS	370		199	110	F	1	Dead	
07/13/2010	3:06pm	R09			0.48	DS	371		228	135	M	6	Dead	
07/13/2010	3:06pm	R09			0.48	DS	372		238	150	M	6		
07/13/2010	3:06pm	R09			0.48	DS	373		500	-	-	-	Lake Trout	
07/13/2010	3:06pm	R09			0.48	DS	374		540	-	-	-	Lake Trout	
07/24/2010	4:00pm	R02	A		0.48	US	375		265	190	M	6		
07/24/2010	4:00pm	R02	A		0.48	US	376		194	95	F	1	Dead	
07/24/2010	4:00pm	R02	A		0.48	US	377		217	135	F	1	Dead	
07/24/2010	4:00pm	R02	A		0.48	US	378		221	120	F	1	Dead	
07/24/2010	4:00pm	R02	A		0.48	US	379		219	105			Dead - Whitefish	
07/24/2010	4:00pm	R02	A		0.48	US	380		208	110	M	6	Dead	
07/24/2010	4:00pm	R02	A		0.48	US	381		205	125	M	6	Dead	
07/24/2010	4:00pm	R02	A		0.48	US	382		203	105	F	1	Dead	
07/24/2010	4:00pm	R02	A		0.48	US	383		276	220			Dead - Whitefish	
07/24/2010	4:00pm	R02	A		0.48	US	384		331	385			Dead - Whitefish	
07/24/2010	4:00pm	R02	A		0.48	US	385		327	355			Dead - Whitefish	
07/24/2010	4:00pm	R02	A		0.48	US	386	90132	285	265	F	4	PYRC	
07/24/2010	4:00pm	R02	A		0.48	US	387		230	120	F	1		

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
07/24/2010	4:00pm	R02	A		0.48	US	388	78183	253	180	M	9		
07/24/2010	4:00pm	R02	A		0.48	US	389	85642	274	210	M	9	PYRC	
07/24/2010	4:00pm	R02	A		0.48	US	390		221	130	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	391		216	115	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	392		210	110	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	393		213	105	M	6		
07/24/2010	4:00pm	R02	A		0.48	US	394		225	140	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	395		254	195	M	9		
07/24/2010	4:00pm	R02	A		0.48	US	396		211	100	M	6		
07/24/2010	4:00pm	R02	A		0.48	US	397		213	125	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	398		209	120	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	399		245	175	M	9		
07/24/2010	4:00pm	R02	A		0.48	US	400		212	120	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	401		240	150	M	9		
07/24/2010	4:00pm	R02	A		0.48	US	402	78184	273	210	F	4		
07/24/2010	4:00pm	R02	A		0.48	US	403		209	115	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	404		235	135	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	405		218	110	M	6		
07/24/2010	4:00pm	R02	A		0.48	US	406		210	105	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	407		243	150	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	408		220	125	F	1		
07/24/2010	4:00pm	R02	A		0.48	US	409		214	120	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	410	78185	276	235	F	4		
07/24/2010	4:40pm	R02	A		0.48	DS	411		288	250			Whitefish	
07/24/2010	4:40pm	R02	A		0.48	DS	412	78187	260	195	F	4		
07/24/2010	4:40pm	R02	A		0.48	DS	413		238	150	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	414	78188	278	259	F	4		
07/24/2010	4:40pm	R02	A		0.48	DS	415	78189	284	245	M	9		
07/24/2010	4:40pm	R02	A		0.48	DS	416		220	125	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	417		214	115	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	418		215	125	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	419		228	120	M	6		
07/24/2010	4:40pm	R02	A		0.48	DS	420		214	130	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	421		216	120	F	1		
07/24/2010	4:40pm	R02	A		0.48	DS	422		214	130	F	1		
07/24/2010	5:25pm	R02	B	20	0.27	DS	423		245	150			Dead - Whitefish	
07/24/2010	5:25pm	R02	B	20	0.27	DS	424		220	105	F	1	Dead	
07/25/2010	8:15am	R02	B	16	0.26	DS	425		221	140	F	1		
07/25/2010	9:00am	R02	A	16	0.26	US	426		201	120	F	1		
07/25/2010	9:00am	R02	A	16	0.26	US	427		216	135	F	1		
07/25/2010	9:00am	R02	A	16	0.26	US	428		213	135	M	6		
07/25/2010	9:00am	R02	A	16	0.26	US	429		206	110	M	6		
07/25/2010	9:00am	R02	A	16	0.26	US	430		212	130	M	6		
07/25/2010	9:00am	R02	A	16	0.26	US	431		242	180	M	6		
07/25/2010	9:00am	R02	A	16	0.26	US	432		212	140	F	1		
07/25/2010	9:00am	R02	A	16	0.26	US	433		253	210	M	6		
07/25/2010	10:00am	R02	A	16	0.26	DS	434		198	120	F	1		
07/27/2010	1:22pm	R02	A	18	0.25	DS	435		200	110	F	1		

Date	Time	Crossing ID	ID	Water Temp	Staff Gauge	Direction (US or DS)	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity		Notes	
07/27/2010	**1:22pm**	R02	A	18	0.25	DS	436	78190	279	240	F	4		
07/27/2010	**1:22pm**	R02	A	18	0.25	DS	437		215	130	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	438		213	155	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	439		217	135	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	440		210	120	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	441		200	125	M	6		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	442		207	120	M	6		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	443		201	130	M	6		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	444		215	125	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	445		213	125	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	446		209	140	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	447		221	140	M	6		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	448		249	195	F	4		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	449		227	165	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	450		209	120	F	1		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	451		240	200	F	4		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	452		208	140	M	6		
07/28/2010	**4:00pm**	R02	A	16	0.235	DS	453		203	115	F	1		
07/30/2010	**10:00am**	R06		16		US	454	-	320	-	-	-	Lake Trout	
07/30/2010	**1:45pm**	R02	A	17	0.2	DS	455	-	214	125	M	6		
07/30/2010	**1:45pm**	R02	A	17	0.2	DS	456	-	197	105	F	1		
07/30/2010	**1:45pm**	R02	A	17	0.2	DS	457	-	203	110	M	6		
07/30/2010	**1:45pm**	R02	A	17	0.2	DS	458	-	211	140	M	6		
07/30/2010	**1:45pm**	R02	A	17	0.2	DS	459	-	221	155	M	6		
07/30/2010	**1:45pm**	R02	A	17	0.2	DS	460	-	223	160	F	1		
07/31/2010	**1:21pm**	R02	A	16	0.2	DS	461	-	212	135	F	1		
07/31/2010	**1:21pm**	R02	A	16	0.2	DS	462	-	232	155	M	6		
07/31/2010	**1:21pm**	R02	A	16	0.2	DS	463	-	219	150	F	1		
07/31/2010	**1:21pm**	R02	A	16	0.2	DS	464	-	197	105	F	1		
07/31/2010	**1:21pm**	R02	A	16	0.2	DS	465	-	250	205	M	9		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	466	-	210	110	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	467	-	205	110	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	468	-	185	100	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	469	-	165	95	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	470	-	240	140	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	471	-	220	120	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	472	-	230	140	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	473	-	215	150	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	474	-	205	130	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	475	-	210	140	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	476	-	210	145	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	477	-	220	150	F	1		
1/8/2010	**11:30am**	R02	A	16	0.2	DS	478	-	245	190	M	6		

AWR Velocity and Depth Measurements

Date: 19-Jun-10
Field Crew: RV, TT, and JF
Weather: 9 °C
General Description:

Crossing ID	US/ DS	Water Depth	Velocity (m/s)	Photo #	Comment:
R15	US	0.375	0.55		Average
R15	US	0.625	0.93		Max
R15	DS	0.365	0.57		Average
R15	DS	0.575	0.87		Max
R09	US	0.43	0.54		Average
R09	US	0.525	0.75		Max
R09	DS	0.31	0.5		Average
R09	DS	0.35	0.95		Max
R06	US	0.47	0.38		Average
R06	US	0.55	0.54		Max
R06 - US of the hoopnet	US	0.83	0.15		Average
R06 - US of the hoopnet	US	0.83	0.23		Max
R06	DS	0.42	0.34		Average
R06	DS	0.7	0.85		Max
R02	US	0.45	0.31		Average
R02	US	0.97	1.4		Max
R02	DS	0.49	0.56		Average
R02	DS	0.5	1.08	Max (Near the bridge reading	
R02 - Culvert	US	0.87	0.34		Average
R02 - Culvert	US	1.1	0.28		Max
R02 - Culvert	DS	0.34	0.31		Average
R02 - Culvert	DS	0.4	1.92		Max

AWR Velocity and Depth Measurements

Date: 25-Jun-10
Field Crew: JF TT
Weather: 12 °C
General Description:

Crossing ID	Time	US/ DS	Water Depth	Velocity (m/s)	Photo #	Comment:
R15	11:20	US	0.275	0.49	76	Average
R15		US	0.375	0.77	79	Max
R15		DS	0.44	0.59	77	Average
R15		DS	0.4	0.67	78	Max
R09	13:30	US	0.36	0.52	81	Average
R09		US	0.42	0.95	82	Max
R09		DS	0.225	0.31	83	Average
R09		DS	0.4	0.74	24-Mar	Max
R06	14:45	US	0.425	0.18	88	Average
R06		US	4	0.24	90	Max
R06		DS	0.225	0.7	89	Average
R06		DS	0.375	0.78	93	Max
R02	16:30	US	0.57	0.78	104	Average
R02		US	0.65	1.15	102	Max
R02		DS	0.36	0.51	103	Average
R02		DS	0.425	0.9	105	Max
R02 - Culvert	16:00	US	0.78	0.29	100	Average
R02 - Culvert		US	1.1	0.92		Max
R02 - Culvert		DS	0.425	0.26	99	Average
R02 - Culvert		DS	0.45	1.02		Max

AWR Velocity and Depth Measurements

Date: July 2/10
Field Crew: T.T & P.A
Weather: Overcast & Rainy
General Description: Velocity and Depth Measurements along AWPAR/HADD Crossings

Crossing ID	US/ DS	Water Depth	Velocity (m/s)	Photo #	Comment:
R15	US	0.32	0.68	144	Max
R15	US	0.21	0.46		Average
R15	DS	0.35	0.63	145	Max
R15	DS	0.2	0.36		Average
R09	US	0.34	0.75	148	Max
R09	US	0.23	0.44		Average
R09	DS	0.35	0.74	151	Max
R09	DS	0.21	0.39		Average
R06	US	0.28	0.51	154	Max
R06	US	0.28	0.26		Average
R06	DS	0.35	0.71	153	Max
R06	DS	0.24	0.29		Average
R02C	US	0.51	0.46	162	Max
R02C	US	0.42	0.16		Average
R02C	DS	0.43	0.95	163	Max
R02C	DS	0.28	0.45		Average
R02	US	0.48	0.99	165	Max
R02	US	0.28	0.48		Average
R02	DS	0.5	1.92	167	Max
R02	DS	0.34	0.7		Average

AWR Velocity and Depth Measurements

Date: July 9/10
Field Crew: RV
Weather: Sunny
General Description: Velocity and Depth Measurements along AWPAR/HADD Crossings

Crossing ID	US/ DS	Water Depth	Velocity (m/s)	Photo #	Comment:
R15	US Avg	0.35	0.63		
	US Max	0.5	0.93		
	DS Avg	0.5	0.58		
	DS Max	0.65	0.98		
R09	US Avg	0.45	0.5		
	US Max	0.45	0.66		
	DS Avg	0.5	0.25		
	DS Max	0.25	0.68		
R06	US Avg	0.25	0.29		
	US Max	0.6	0.39		
	DS Avg	0.4	0.41		
	DS Max	0.7	0.93		
R02 Culvert	US Avg	0.75	0.3		
	US Max	0.9	0.2		
	DS Avg	0.3	0.27		
	DS Max	0.4	0.85		
R02 Bridge	US Avg	0.45	0.3		
	US Max	0.85	1.01		
	DS Avg	0.47	0.45		
	DS Max	0.5	1.1		

AWR Velocity and Depth Measurements

Date: July 24/2010
Field Crew: Tom T & Patrick A
Weather: Sunny & Warm
General Description: Velocity & Depth Measurements at HADD Crossings

Crossing ID	US/ DS	Water Depth	Velocity (m/s)	Photo #	Comment:
R15	US	0.09	0.2		Average
R15	US	0.17	0.48		Max
R15	DS	0.2	0.23		Average
R15	DS	0.26	0.3		Max
R09	US	0.18	0.2		Average
R09	US	0.18	0.37		Max
R09	DS	0.2	0.22		Average
R09	DS	0.24	0.36		Max
R06	US	0.17	0.16		Average
R06	US	0.18	0.26		Max
R06	DS	0.14	0.19		Average
R06	DS	0.19	0.4		Max
R02	US	0.25	0.52		Average
R02	US	0.4	1.03		Max
R02	DS	0.34	0.61		Average
R02	DS	0.38	0.94		Max

AWR Velocity and Depth Measurements

Date: 30-Jul-10
Field Crew: Tom T & Patrick A
Weather: Sunny
General Description: Depth and Velocity Measurements along AWR HADD Crossings

Crossing ID	US/ DS	Water Depth	Velocity (m/s)	Photo #	Comment:
R15	US	0.17	0.15	323	Average
R15	US	0.2	0.27	326	Max
R15	DS	0.2	0.11	324	Average
R15	DS	24	0.23	325	Max
R09	US	0.11	0.17	329	Average
R09	US	0.16	0.32	330	Max
R09	DS	0.11	0.15	331	Average
R09	DS	0.15	0.4	332	Max
R06	US	0.15	0.04	336	Average
R06	US	0.16	0.22	337	Max
R06	DS	0.17	0.17	338	Average
R06	DS	0.19	0.25	339	Max
R02	US	0.35	0.49	340	Average
R02	US	0.31	0.62	341	Max
R02	DS	0.31	0.36	342	Average
R02	DS	0.32	0.6	343	Max

APPENDIX C:

DFO AUTHORIZATIONS

FEBRUARY 2011

Fisheries and Oceans Canada | Pêches et Océans Canada

Date: June 9, 2010

To: Ryan VanEngen
Agnico-Eagle Mines Ltd.
Baker Lake, Nunavut, X0C 0A0

Subject: Animal Use Protocol - Letter of Approval

Dear Ryan,

Your 2010 Animal Use Protocol (AUP), number FWI-ACC-2010-022 entitled **"**eadowbank Gold Project: Aquatic Ecosystem Monitoring Plan (AEMP) and All-Weather Private Access Road (AWPAR) HADD Crossing Monitoring ", has been reviewed and approved by the Freshwater Institute Animal Care Committee. This AUP will expire on **December 31, 2010**. (In the AUP it states that the proposed starting date is mid June 2009 to December 2009, but I will change that to be 2010)

Keep this signed letter of approval as well as the signed AUP for your records. Please be advised that should there be a need to revise the protocol you are requested to contact the Freshwater Institute Animal Care Committee and obtain approval prior to proceeding.

In addition, you are required to submit a brief report within 30 days of completion of the project outlining the unexpected changes to the protocol, the number of animals used and any unanticipated results or mortalities.

Feel free to contact me if you have any questions or concerns.

Sincerely,

_____

Kerri Pleskach FWISL-ACC Chairperson

Freshwater Institute Science Laboratories Animal Care Committee
Arctic Aquatic Research
Central & Arctic / Région du Centre et de l'Arctique
Fisheries and Oceans Canada / Pêches et Océans Canada
501 University Crescent
Winnipeg, Manitoba R3T 2N6
Phone:204 984-2532
Fax:204 984-2403

Fisheries and Oceans Canada | Pêches et Océans Canada

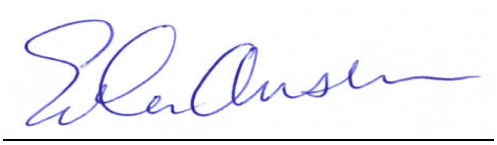
APPROVAL BY ANIMAL CARE COMMITTEE MEMBERS

AUP#: ACC-2010-022 Date: June 9, 2010

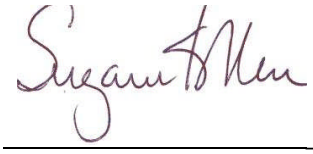
Signatures of ACC Members

Kerri Pleskach, Chair

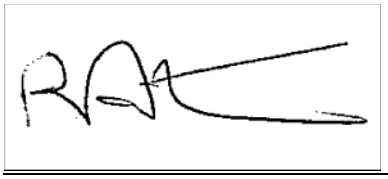
Brad Park



Dr. Ericka Anseeuw D.V.M.



Suzanne Mittermuller



Bob Artes

Magaly Chambellant

Interim Approval ☐ **Final Approval** ☒

APPROVAL BY THE FWI ANIMAL CARE COMMITTEE IS FOR THE PERIOD STATED ON YOUR ANIMAL USE PROTOCOL.

Canada

Licence #: S-10/11-1011-NU

Ryan VanEngen
Agnico-Eagle Mines Ltd. P.O. Box 540
Baker Lake, NU, CA X0C 0A0

Dear Ryan VanEngen,

Enclosed is your Licence to Fish for Scientific Purposes issued pursuant to Section 52 of the Fishery (General) Regulations.

Please be advised that this licence only permits those activities stated on your licence. Any other activity may require approval under the Fisheries Act or other legislation. It is the Project Authority's responsibility to obtain any other approvals.

Failure to comply with any of the conditions specified on the attached licence may result in a contravention of the Fishery (General) Regulations.

Please ensure that you include the licence number and project title in any future correspondence and that you complete the Summary Harvest Report upon completion of activities under this licence.

Yours truly,

Joanne Rose
Area Licencing Administrator
Eastern Arctic Area
Central and Arctic Region
Fisheries and Oceans Canada

21-June-2010
Date

Enclosure

LICENCE TO FISH FOR SCIENTIFIC PURPOSES

S-10/11-1011-NU

Pursuant to Section 52 of the Fishery (General) Regulations, the Minister of Fisheries and Oceans hereby authorizes the individual(s) listed below to fish for scientific purposes, subject to the conditions specified.

Project Authority: Ryan VanEngen
Agnico-Eagle Mines Ltd. P.O. Box 540
Baker Lake, NU, CA X0C 0A0

Other Personnel: Ryan VanEngen
Maggie McConnell
Tom Thomson
Jessica Fang
Gary Mann
Randy Baker

Objectives: Project Title: Meadowbank Gold Project: Aquatic Effects Monitoring and All-Weather Private Access Road HADD Crossing Monitoring
Project Objectives:
Agnico-Eagle Mines Ltd. has received a NIRB Project Certificate for its Meadowbank gold project, located 70km north of Baker Lake, Nunavut. Environmental monitoring has been ongoing at this site since 1999. The purpose of the monitoring program is to avoid or mitigate negative impacts from mine activities, and to meet the conditions and commitments of the NIRB Project Certificate and DFO Authorization (NU-03-0109) for the all-weather road and project lake area. Specific objectives of the aquatic sampling program are to:
- conduct annual water, sediment, plankton, periphyton and benthic sampling of lakes immediately surrounding the mine site to provide baseline and operational data to inform the mine environmental management program,
- monitor fish utilization of habitat structures (within project lakes and along AWPAR)
- evaluate spawning productivity in recently constructed habitat compensation area.
- monitor bridge and culvert installations along the all-weather road to avoid increased sedimentation that may directly or indirectly affect fish or fish habitat, and
- evaluate fisheries status of crossings along the all-weather road to avoid accidental occurrence of barriers to fish migration

CONDITIONS

Waters:

Water Body: Unnamed Stream Crossings
Point A: 64° 18' N, 96° 0' W

Species: Arctic Grayling
Sculpin, Slimy
Stickleback, Ninespine

Gear: Electroshocker

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
				500				

Water Body: Unnamed Stream Crossings
Point A: 64° 18' N, 96° 0' W

Species: Arctic Grayling
Sculpin, Slimy
Stickleback, Ninespine

Gear: Egg Mat

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
				500				

Water Body: Unnamed Stream Crossings
Point A: 64° 18' N, 96° 0' W

Species: Arctic Charr (SR OR LL)
Arctic Grayling
Sculpin, Slimy
Trout, Lake
Whitefish, Round

Gear: Hoop Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			400					

Water Body: Unnamed Lake (Wally Lake)
Point A: 65° 6' N, 95° 57' W

Species: Zooplankton

Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes

Water Body: Unnamed Lake (Wally Lake)
Point A: 65° 6' N, 95° 57' W

Species: Benthos

Gear: Ponar dredge

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						5		

Water Body: Tehek Lake
Point A: 64° 55' N, 95° 38' W

Species: Benthos

Gear: Ponar dredge

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						5		

Water Body: Tehek Lake
Point A: 64° 55' N, 95° 38' W

Species: Phytoplankton

Gear: Water Pump

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						1		

Water Body: Tehek Lake
Point A: 64° 55' N, 95° 38' W

Species: Arctic Charr (SR OR LL)
Burbot
Sculpin, Slimy
Trout, Lake
Whitefish, Round

Gear: 10 MM Mesh Gillnets and Larger
Electroshocker

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			50	25				

Water Body: Baker Lake
Point A: 64° 19' N, 96° 3' W

Species: Phytoplankton

Gear: Water Pump

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						3		

Water Body: Unnamed Lake (Pipedream Lake)
Point A: 65° 1' N, 96° 23' W

Species: Zooplankton

Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes

Water Body: Unnamed Lake (Pipedream Lake)
Point A: 65° 1' N, 96° 23' W

Species: Arctic Charr (SR OR LL)
Burbot
Sculpin, Slimy
Trout, Lake
Whitefish, Round

Gear: 10 MM Mesh Gillnets and Larger
Electroshocker

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			50	25				

Water Body: Unnamed Lake (Pipedream Lake)
Point A: 65° 1' N, 96° 23' W

Species: Benthos

Gear: Ponar dredge

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						5		

Water Body: Unnamed Lake & System (Portage Lake system)
Point A: 65° 0' N, 96° 5' W

Species: Zooplankton
Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes

Water Body: Unnamed Lake (Pipedream Lake)
Point A: 65° 1' N, 96° 23' W

Species: Phytoplankton
Gear: Water Pump

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						1		

Water Body: Unnamed Stream Crossings
Point A: 64° 18' N, 96° 0' W

Species: Arctic Grayling
Sculpin, Slimy
Stickleback, Ninespine
Gear: Larval Emergence Trap

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
				500				

Water Body: Unnamed Lake & System (Portage Lake system)
Point A: 65° 0' N, 96° 5' W

Species: Benthos
Gear: Ponar dredge

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						20		

Water Body: Unnamed Lake & System (Portage Lake system)
Point A: 65° 0' N, 96° 5' W

Species: Arctic Charr (SR OR LL)
Burbot
Sculpin, Slimy
Trout, Lake
Whitefish, Round
Gear: 10 MM Mesh Gillnets and Larger
Electroshocker

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			150	75				

Water Body: Tehek Lake
Point A: 64° 55' N, 95° 38' W

Species: Zooplankton
Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes

Water Body: Unnamed Lake (Inuggugayualik Lake)
Point A: 65° 1' N, 96° 23' W

Species: Benthos
Gear: Ponar dredge

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						5		

Water Body: Unnamed Lake (Inuggugayualik Lake)
Point A: 65° 1' N, 96° 23' W

Species: Zooplankton
Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes

Water Body: Unnamed Lake (Inuggugayualik Lake)
Point A: 65° 1' N, 96° 23' W

Species: Arctic Charr (SR OR LL)
Burbot
Sculpin, Slimy
Trout, Lake
Whitefish, Round

Gear: 10 MM Mesh Gillnets and Larger
Electroshocker

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			50	25				

Water Body: Unnamed Lake (Inuggugayualik Lake)
Point A: 65° 1' N, 96° 23' W

Species: Phytoplankton
Gear: Water Pump

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						1		

Water Body: Baker Lake
Point A: 64° 19' N, 96° 3' W

Species: Zooplankton
Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes

Water Body: Baker Lake
Point A: 64° 19' N, 96° 3' W

Species: Benthos Gear: Ponar dredge

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						15		

Water Body: Unnamed Lake & System (Portage Lake system)
Point A: 65° 0' N, 96° 5' W

Species: Phytoplankton Gear: Water Pump

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
						4		

Fishing Period: June 17, 2010 to October 15, 2010

A copy of this licence must be available at the study site and produced at the request of a fishery officer.

Live fish may not be retained unless specified in the conditions of this licence.

The licence holder shall immediately cease fishing when the total fish killed or live sampled reaches any of the maximums set for any of the species listed.

Transportation:

Other approvals/permits may be necessary to collect or transport certain species, such as Marine Mammal Transportation Permits. For marine mammal parts, products and derivatives a Marine Mammal Transportation Licence is required for domestic transport and, for international transport a Canadian CITES Export Permit is also required.

Disposal of Fish Caught:

Fish not required for the purpose of dead sampling and/or retention MUST be returned to the water at the site of capture. Retained fish may be made available to the nearest settlement for domestic consumption or sold commercially within the Territory. Any dead fish for commercial sale beyond the Territory in which it was caught requires authorization under the Fish Inspection Regulations. Disposal of any fish remains must be in accordance with local land use regulations.

Retention & Disposal of Fish Caught:

Fish not required for the purpose of dead sampling and/or retention MUST be returned to the water at the site of capture. Retained fish may be made available to the nearest settlement for domestic consumption or sold commercially within the Territory. Any dead fish for commercial sale beyond the Territory in which it was caught requires authorization under the Fish Inspection Regulations. Disposal of any fish remains must be in accordance with local land use regulations.

Report on Activities:

The Project Authority will submit to the Area Licensing Coordinator, Department of Fisheries and Oceans, within one month of the expiry date, a report stating:

i) whether or not the field work was conducted; and if conducted
ii) waterbody location, fishing coordinates, gear types used at each coordinate, numbers or amount of fish (by species) collected and/or marked and the date or period of collection.

A Summary Harvest Report template is provided by the Licensing Coordinator at time of issuance of this licence.

The Project Authority also will provide a copy of any published or public access documents which result from the project. Information supplied will be used for population management purposes by the Department of Fisheries and Oceans and becomes part of the public record.

All documents should be sent to:

Area Licensing Administrator
Fisheries and Oceans Canada
P.O. Box 358
Iqaluit, NU X0A 0H0
Email: XCA-NUpermit@dfo-mpo.gc.ca

Notification of Commencement:

Prior to the commencement of fishing the Project Authority will contact:

Area Licencing Administrator
Fisheries and Oceans Canada
Box 358
Iqaluit, NU X0A 0H0
email: XCA-NUpermit@dfo-mpo.gc.ca

Eric Kan

Eric Kan
Area Director, Eastern Arctic Area
Central and Arctic Region
Fisheries and Oceans Canada

2010. 06. 21.

Date

For the Minister of Fisheries and Oceans.
Pursuant to Section 52 of the Fishery (General) Regulations.

APPENDIX D:

GEBAUER AND ASSOCIATES: 2010 CREEL SURVEY SUMMARY

FEBRUARY 2011

MEMORANDUM

Gebauer & Associates
ENVIRONMENTAL CONSULTANTS

TO: Ryan Vanengen – Agnico-Eagle
Stéphane Robert – Agnico-Eagle
Rachel Gould – Agnico-Eagle

DATE: 11 March 2011

FROM: Chris Lee and Martin Gebauer

Subject: 2010 Hamlet of Baker Lake Harvest Study – Creel Results

Gebauer & Associates Ltd. (Gebauer & Associates) is pleased to provide Agnico-Eagle Mines Ltd. (Agnico-Eagle) with this brief memorandum summarizing the 2010 creel results from the annual harvest study conducted in the Hamlet of Baker Lake.

Background

In March 2007, a harvest study was initiated by Agnico-Eagle in association with the Baker Lake Hunters and Trappers Organization (HTO) in order to monitor and document the spatial distribution, seasonal patterns and harvest rates of hunter kills before and after construction of the Meadowbank All-Weather Private Access Road (AWPAR). The harvest study is conducted annually and is open to both Inuit and non-Inuit residents of Baker Lake who are at least 16 years of age. The harvest study focuses primarily on terrestrial wildlife harvests; however, creel results are also recorded by the harvest study administrator in support of on-going creel surveys. In previous years, the creel results were included in the annual Meadowbank Wildlife Monitoring Summary Report; however, since 2009, results have been provided in a standalone memorandum.

In late 2009, AREVA Resources Canada Inc. (AREVA) entered into a data and cost-sharing agreement with Agnico-Eagle; however, the implementation of the harvest study has remained the same. Both Agnico-Eagle and AREVA recognize that communication with participants is of utmost importance to ensure study success through adequate participation rates and accurate reporting.

Fish Species

The four species included in the harvest study are Arctic Char (*Salvelinus alpinus*), Arctic Grayling (*Thymallus arcticus*), Lake Trout (*Salvelinus namaycush*) and Lake Whitefish (*Coregonus clupeaformis*).

2010 Results

Participation

In 2010, creel results were collected from thirty (30) of the thirty-nine (39) study participants, which was up from twenty-two (22) participants in 2009 (a ~36 percent increase). The number of participants in the hunter harvest study has increased steadily since inception. Each year, new participants sign up for the study as a result of word-of-mouth, on-going marketing, radio-addresses and prize draws. The rate of increase in study participation is off-set slightly by the attrition of a small number of participants each year.

Fish Counts

2010 creel results are summarized in **Table 1**. Results from previous years are also provided for comparative purposes.

Table 1: 2010 Creel Results and Historical Results to Date.

Fish Species	2010 Counts	2009 Counts	2008 Counts	2007 Counts
Arctic Char	103	117	27	3
Arctic Grayling	3	1	-	-
Lake Trout	853	508	1035	210
Lake Whitefish	326*	54	192	-
TOTALS	**1285**	**680**	**1254**	**213**

* Single report of 300 Lake Whitefish captured via nets south of Baker Lake.

Discussion

As in previous years, creel data suggests that the highest fishing rates occur during the spring and summer (April – August) peaking between May and June (**Figure 1**). Data was standardized through the simple division of fish harvested by the number of participants (**Figure 2**). Standardized results also indicated that the majority of fishing occurred between April and August. Similar to 2009, the elevated standardized values in November was the result of a single participant using nets over an extended period near the Hamlet of Baker Lake. In 2010, the nets were used for a longer duration than in 2009 (i.e., the entire month, relative to a two week period).

Arctic Grayling catches continue to remain low across years and Arctic Char catches in 2010 are similar to the reported catches in 2009. Lake Trout and Lake Whitefish catches continue to vary widely between years and are confounded by the use of nets in some years. For example, without the reported net captures for Lake Whitefish in November, the total for 2010 would be twenty-six (26), the lowest total to-date. As such, additional years of data are required to evaluate fishing trends, if any, within the community of Baker Lake.

Figure 1: Fish Harvests per Month (2008 – 2010)

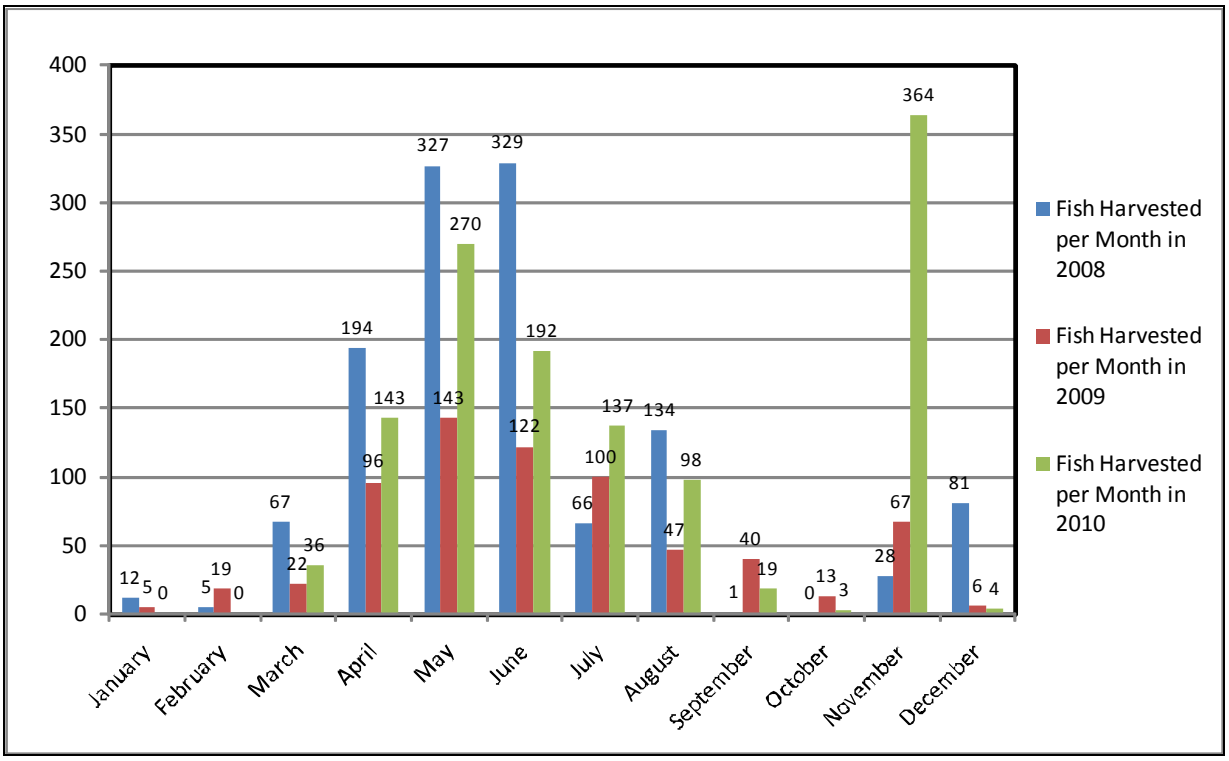
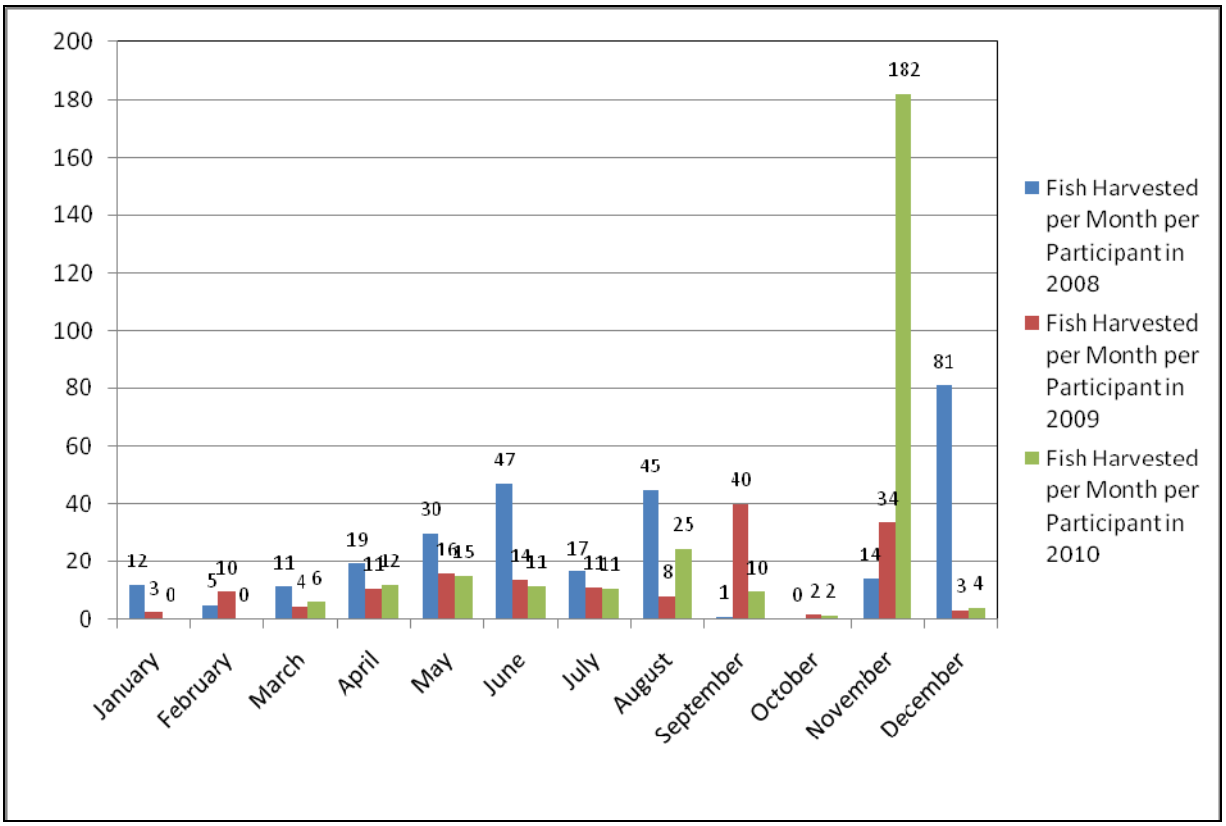


Figure 2: Fish Harvests per Month per Participant in (2008 – 2010)



Fish Harvest Distribution

Arctic Char

As in previous years, 2010 Arctic Char captures were widely distributed in the region including Whitehills Lake, Baker Lake, Schultz Lake and west of the Thelon River (**Figure 3**). A higher proportion of captures was also observed at Whitehills Lake relative to 2008 and 2009. Specifically, 2008 and 2009 Arctic Char captures were limited primarily to Baker Lake with the exception of two captures at Whitehills Lake and four captures north of Schultz Lake.

Arctic Grayling

Three Arctic Grayling captures were reported in 2010, two of which were from the shores of Baker Lake by net. One Arctic Grayling was captured west of Schultz Lake. In 2009, one capture was reported from Baker Lake (via nets). Prior to 2009, no Arctic Grayling captures had been reported.

Lake Trout

As in 2008 and 2009, Lake Trout capture densities were highest immediately south of the Hamlet of Baker Lake and at Whitehills Lake (**Figure 4**). Captures continued to be centred on the Hamlet of Baker Lake with fewer captures reported south of Baker Lake (Kazan River) and along the eastern shores of Baker Lake. Lake Trout captures were up by 68% relative to 2009. Approximately 39% of Lake Trout captures were from Whitehills Lake, down slightly from 2009 (48.6%) but up from 2008 (34.7%).

Lake Whitefish

Lake Whitefish captures continued to occur in relatively low densities, being limited primarily to Baker Lake and the Kazan River in 2010 (**Figure 5**). Captures were also reported west of Schultz Lake for the first time in 2010. Similar to 2008 and 2009, the majority of Lake Whitefish were caught via nets along the shores of Baker Lake immediately south of the Hamlet.

All Fish

Creel results between 2007 and 2010 are presented in **Figure 6**. The highest densities of fish captures continue to be Whitehills Lake and the shores of Baker Lake, which is driven primarily by the proportion of Lake Trout captures at these locations relative to other fish included in the study.

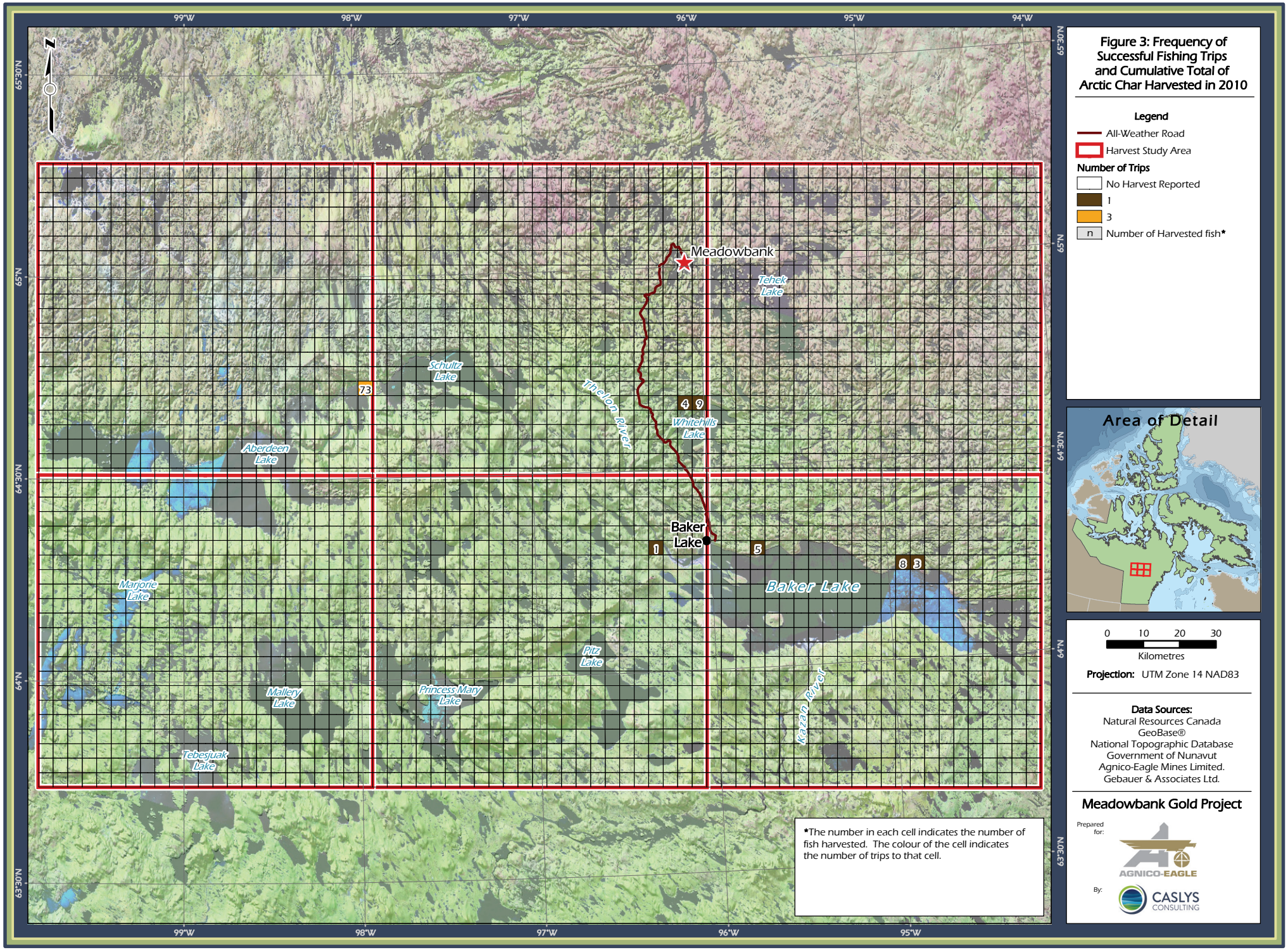


Figure 3: Frequency of Successful Fishing Trips and Cumulative Total of Arctic Char Harvested in 2010

Legend

- All-Weather Road
- Harvest Study Area

Number of Trips

- No Harvest Reported
- 1
- 3
- n — Number of Harvested fish*

0 10 20 30
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.

Meadowbank Gold Project

Prepared for: AGNICO-EAGLE

By: CASLYS CONSULTING

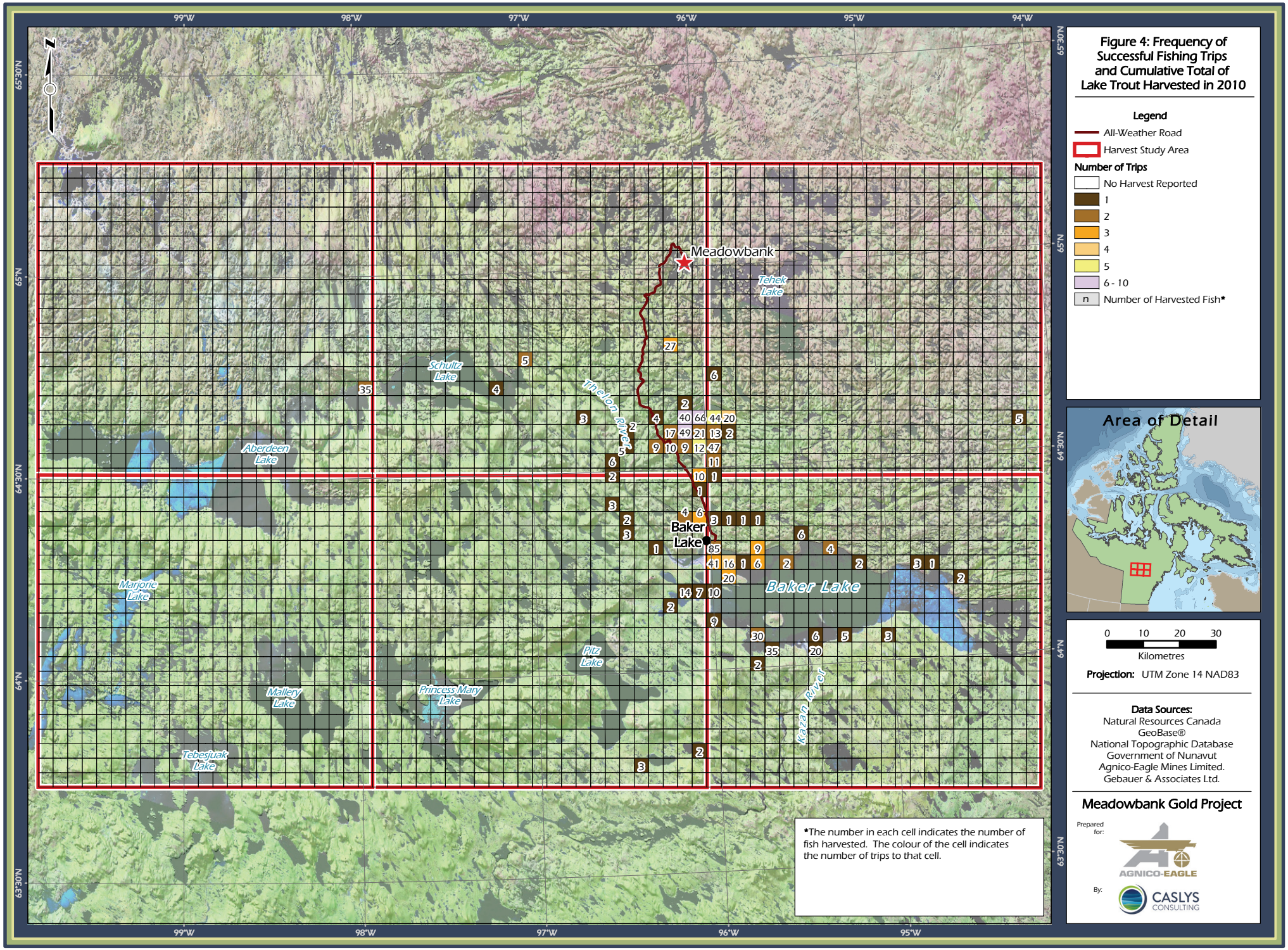


Figure 4: Frequency of Successful Fishing Trips and Cumulative Total of Lake Trout Harvested in 2010

Legend

- All-Weather Road
- Harvest Study Area

Number of Trips

- No Harvest Reported
- 1
- 2
- 3
- 4
- 5
- 6 - 10
- n — Number of Harvested Fish*

0 10 20 30

Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.

Meadowbank Gold Project

Prepared for: AGNICO-EAGLE

By: CASLYS CONSULTING

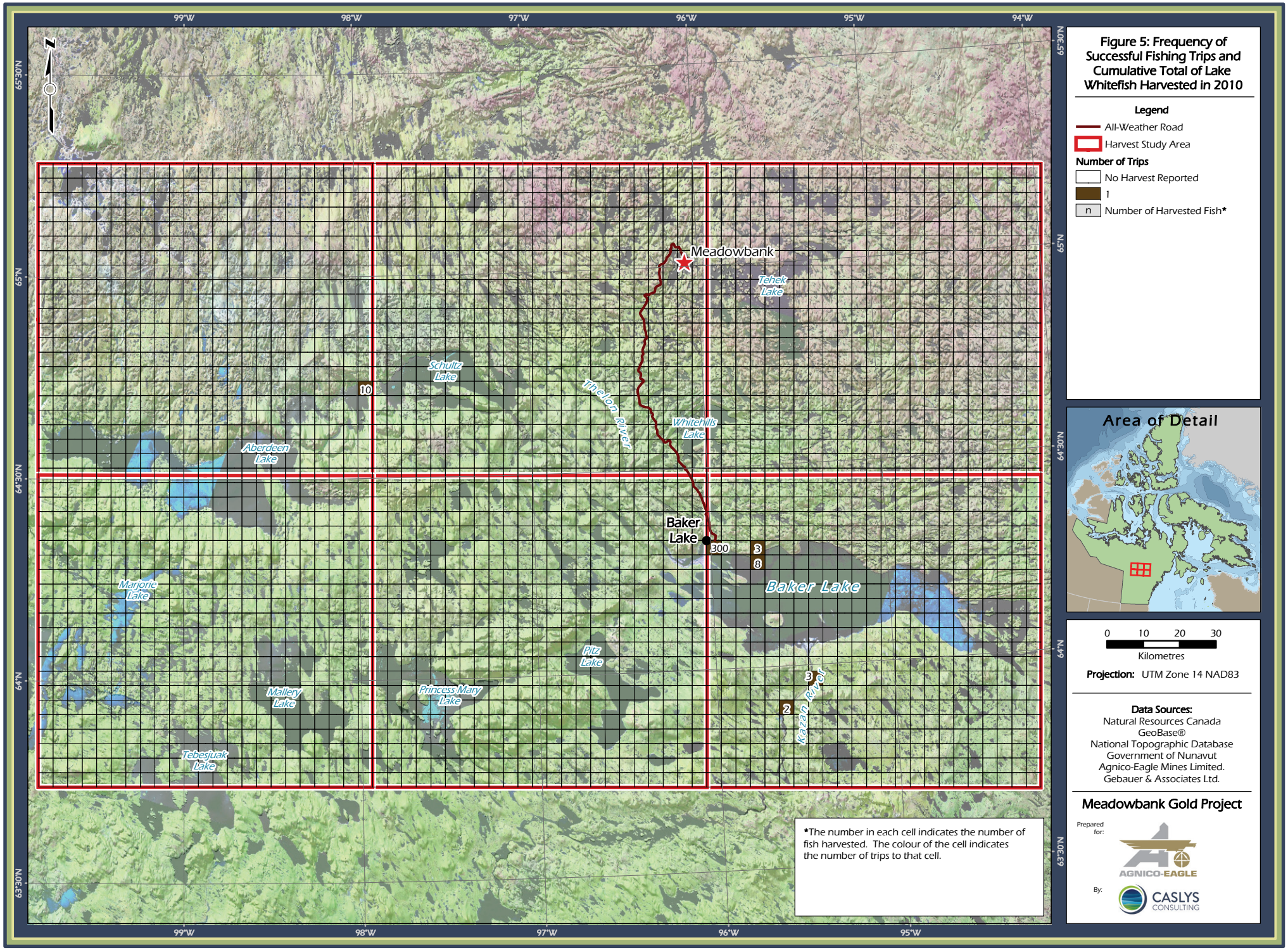


Figure 5: Frequency of Successful Fishing Trips and Cumulative Total of Lake Whitefish Harvested in 2010

Legend

- All-Weather Road
- Harvest Study Area

Number of Trips

- No Harvest Reported
- 1
- n — Number of Harvested Fish*

Area of Detail

0 10 20 30

Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.

Meadowbank Gold Project

Prepared for: AGNICO-EAGLE

By: CASLYS CONSULTING

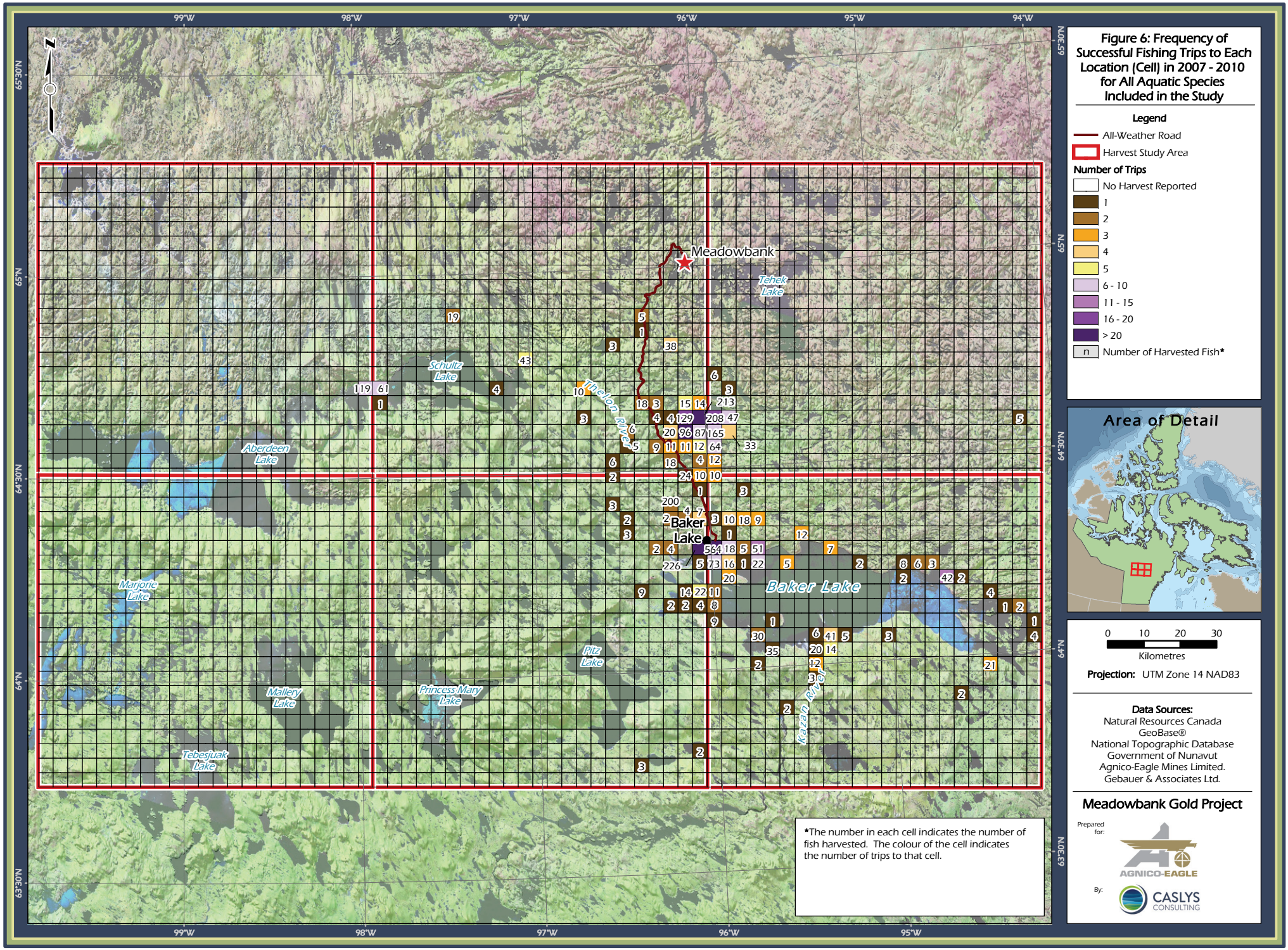


Figure 6: Frequency of Successful Fishing Trips to Each Location (Cell) in 2007 - 2010 for All Aquatic Species Included in the Study

Legend

- All-Weather Road
- Harvest Study Area

Number of Trips

- No Harvest Reported
- 1
- 2
- 3
- 4
- 5
- 6 - 10
- 11 - 15
- 16 - 20
- > 20
- n — Number of Harvested Fish*

Data Sources:
Natural Resources Canada
GeoBase®
National Topographic Database
Government of Nunavut
Agnico-Eagle Mines Limited.
Gebauer & Associates Ltd.

Meadowbank Gold Project

Prepared for: AGNICO-EAGLE

By: CASLYS CONSULTING

In 2009, an increased proportion of fishing was reported for the Whitehills Lake area; however, this proportion decreased in 2010. In previous years, the causative factors contributing to increased fishing rates in the vicinity of the AWPAR were largely unknown. Potential factors included improved access (as a result of AWPAR construction) as well as annual variation and hunter participation levels.

Based on the current dataset, the impetus of improved access as a result of the AWPAR appears to be limited to Whitehills Lake, beyond which no significant increases in fishing rates were observed. The majority of participants continue to fish around the perimeters of Baker Lake and Whitehills Lake irrespective of the road as high fishing rates were also reported for Whitehills Lake in 2007 and 2008. Thus, unless fishing trips are tied to hunting trips, it would appear that study participants are less willing to travel long distances to catch fish, regardless of AWPAR access, likely due to the abundance of fish in close proximity to the Hamlet of Baker Lake.

We trust this provides the information you currently require. Should you have any questions, please do not hesitate to contact the undersigned at 604-765-2993.

Respectfully submitted,

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Gebauer & Associates Ltd.