Appendix F3

Report: *2011 All Weather Private Access Road Fisheries Report*

AGNICO-EAGLE MINES LTD: MEADOWBANK DIVISION

2011 ALL WEATHER ACCESS ROAD FISHERIES REPORT

FEBRUARY 2012

EXECUTIVE SUMMARY

Monitoring of fish populations at stream crossings along the all-weather access road (AWAR, formerly AWPAR), between the Hamlet of Baker Lake and the Meadowbank Gold mine site has occurred annually since 2005.

The monitoring program in 2011 was similar to programs in previous years, and included field observations at four crossings (R02, R06, R09 and R15) from June 19 – July 19. The major component of the program consisted of length and weight measurements and maturity identifications of adult fish captured in hoopnets. Nets were set to capture both upstream and downstream movements, and were set as soon as ice conditions allowed. Flow speed and water temperature measurements were also conducted at each crossing. Additionally, larval drift catches have been collected at crossing R02 since 2005. In winter 2009, a spawning pad area for arctic grayling was constructed at that site, and changes to the arctic grayling population using that reach are assessed in this report.

Generally, condition factors of adult fish, population size distributions and timing of upstream and downstream movements were within the range of values seen in previous years. Flow speeds at all crossings were within published arctic grayling sustained or prolonged speeds, indicating the bridge structures likely did not physically affect ability of grayling to move upstream. It is suspected that the primary upstream migration occurs below ice cover or immediately at ice-off, since arctic grayling larval drift has been consistently caught within 1-3 days of study initiation. This coincides with lower temperatures than have been previously published.

An examination of the history of populations at R02 indicates that the constructed spawning pad may be allowing an increase in successful spawning runs, with increasing larval drift collected at all drift trap locations beginning in 2009. The increasing immature arctic grayling since that time compared to fairly consistent numbers of spawners in the population also suggests that more fish are being recruited into the population than pre-construction.

Overall, the information collected in 2011 and in previous years suggests that arctic grayling populations in the affected stream reaches are not being impacted by the bridge structures. Furthermore, the constructed spawning pads have not only increased the quantity of high-value habitat, but are effectively increasing production rates in the local population.

TABLE OF CONTENTS

LIST OF APPENDICES

Appendix A: 2011 Fisheries Data: Adult fish, larval drift trap and depth/velocity measurements.

Appendix B: DFO Authorizations and Animal Care Committee Letter of Approval

Appendix C: 2011 Hamlet of Baker Lake Harvest Study – Creel Results (Nunavut Environmental Consulting Ltd.)

Appendix D: Photographic Presentation

SECTION 1 • INTRODUCTION

1.1 BACKGROUND

The construction of the 110 km All Weather Access Road (AWAR) (formerly All Weather Private Access Road) 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 AWAR construction, baseline fisheries assessments found six proposed stream crossings to be fish bearing, with arctic grayling (*Thymallus arcticus*) as the predominant species. Other fish species found inhabiting the AWAR streams include lake trout, arctic char, round whitefish, slimy sculpin and nine-spine stickleback.

Since construction of the road, fisheries monitoring studies have evaluated fish migrations at four road crossings where minor "harmful alteration, disruption or destruction" (HADD) of fish habitat occurred (R02, R06, R09, and R15). The locations of all crossings along the road are shown in Figure 1a-c. In 2009, a habitat compensation project was constructed according to design specifications that met biological criteria aimed at enhancing arctic grayling productivity at R02. The construction focused on creating high value spawning and nursing habitat to compensate for the loss of the low and medium value habitat affected by bridge abutment construction at the four crossings (AEM, 2010).

After construction of this feature, monitoring 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 habitat compensation structures.

As per the AWAR DFO Authorization and under DFO Authorization S-11/12-1015-NU, the goal of the 2011 field season was to continue the evaluation of arctic grayling movement beyond the bridge structures at crossings R02, R06, R09 and R15 and to continue to evaluate the effectiveness of the R02 habitat compensation area. This report presents and discusses the results of the fisheries monitoring along the AWAR in 2011.

1.2 OBJECTIVE

Objectives in 2011 were similar to previous years as follows:

- Assessment of the fish passage at R02, R06, R09 and R15 (HADD crossings) - The field program for monitoring fish migrations continued as in previous years. Much of the effort was focused on capturing fish moving upstream and downstream (upstream of the bridge crossings); identifying, enumerating, and collecting biological data from 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 – As in previous years, larval drift traps were set upstream and downstream of the R02 compensation structures. 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. Since minnow traps, electrofishing techniques and fish egg collection mats were not

found to be effective monitoring methods in 2010, they were not included in the program in 2011. These methods were replaced with targeted angling and qualitative observations by the field crew.

- Creel Survey – As in the past, a 2011 survey was conducted with Baker Lake residents to assist in understanding of fishing habits. A summary of the information on the fishing locations in the vicinity of the AWPAR and general fishing patterns of Baker Lake residents is provided in this document. The information was collected by Gebauer and the memo is attached as Appendix C.

(Figure 1a-c)

SECTION 2 • METHODOLOGY

Hoopnets were set upstream of HADD crossings R02, R06, R09, and R15 to monitor and evaluate the passage of fish at these crossings. Hoop nets were monitored on a near daily basis to determine fish movements and population patterns at the four crossings. Larval drift traps, angling and personal observations were also used to quantitatively and qualitatively describe the effectiveness of the habitat compensation feature constructed there. The following outlines the specific methodologies for the 2011 AWAR 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 filled on location with stream water for 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 historically 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.

Hoopnets were first deployed on June 19, 2011 and were removed on July 19, 2011 (Table 2-1). An attempt was made where possible 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 (Figure 2-1, Figure 2-2, Figure 2-3, Figure 2-4) were selected 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 mainly set to collect upstream moving fish, upstream of the bridge crossing). Some hoopnets were also oriented to collect fish moving downstream to document the exodus or to document the post-spawning run. At R02, 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). 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 effectiveness of the R02 habitat compensation area.

Table 2-1. Hoopnet locations, net orientation, dates of deployment and approximate stream coverage at crossings R02, R06, R09 and R15 in 2011.

Location	GPS Coordinates	Orientation*	Dates	Approximate Coverage
R02A	14W 0643511 UTM 7143458	US	June 23 – July 19	75%
R02A	14W 0643502 UTM 7143455	US	June 23 – July 19	
R02A	14W 0643515 UTM 7143460	DS	June 23 – July 19	
R02A	14W 0643505 UTM 7143445	DS	July 8 – July 19	
R02B	14W 0643745 UTM 7143596	US	June 23 – July 19	25%
R02B	14W 0643609 UTM 7143575	US	June 23 – July 19	
R02B	14W 0643610 UTM 7143570	DS	June 23 – July 19	
R02C	14W 0643855 UTM 7143430	US	June 23 – July 19	75%
R02C	14W 0643842 UTM 7143328	DS	June 23 – July 19	
R06	14W 0638045 UTM 7155850	US	June 20 – July 19	80%
R06	14W 0638053 UTM 7155861	US	June 20 – July 19	
R06	14W 0638059 UTM 7155858	DS	June 20 – July 19	
R09	14W 0625523 UTM 7173745	US	June 19 – July 19	100%
R09	14W 0625519 UTM 7173740	DS	June 19 – July 19	
R15	14W 0627474 UTM 7192083	US	June 19 – July 8	75%
R15	14W 0627429 UTM 7192012	DS	June 19 – July 8	
R15	14W 0627435 UTM 7192114	US	June 19 – July 8	

* US = fish moving upstream; DS = fish moving downstream

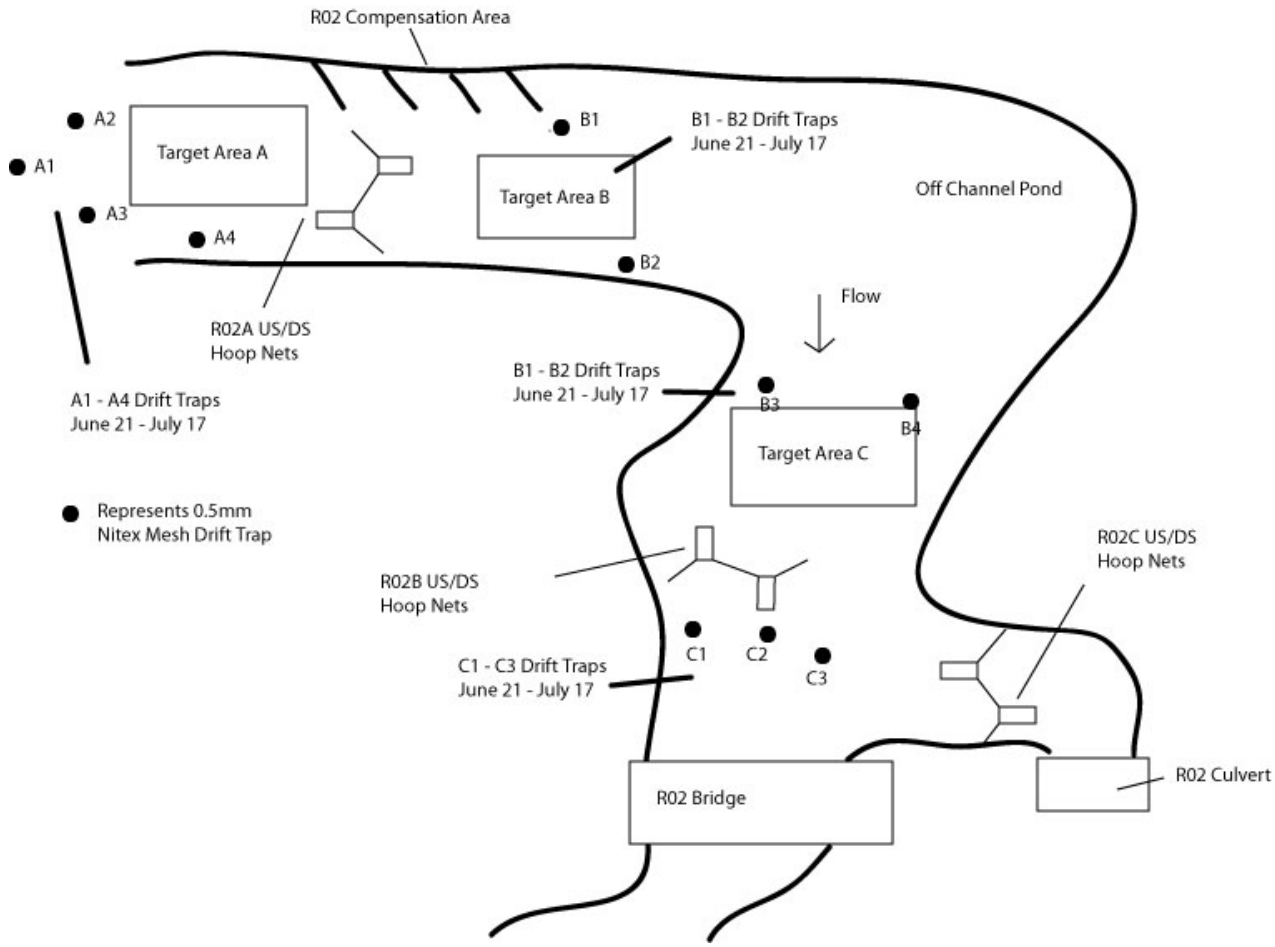

Figure 2-1: Locations and dates of hoopnets and drift traps set at R02, 2011.

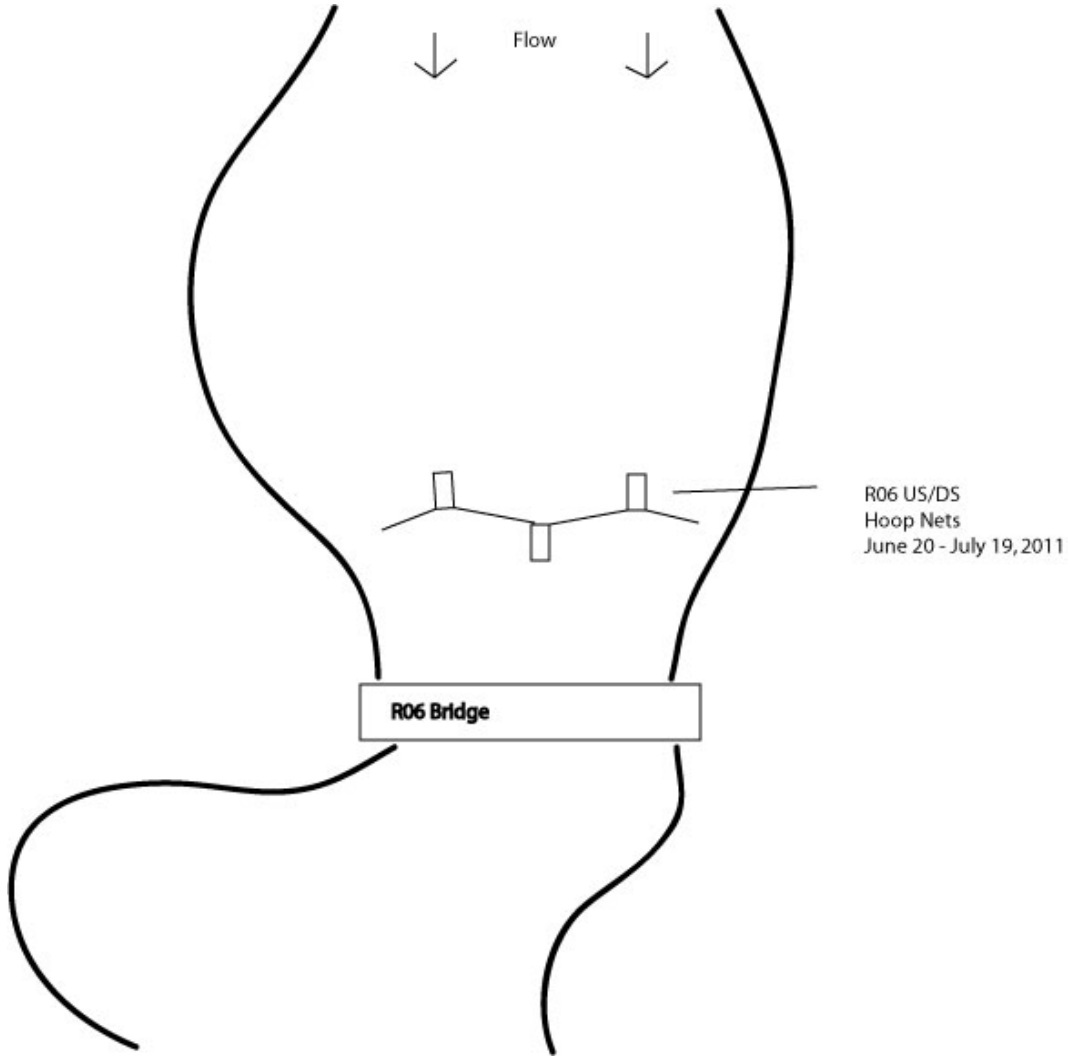

Figure 2-2: Locations and dates of hoopnets set at R06, 2011.

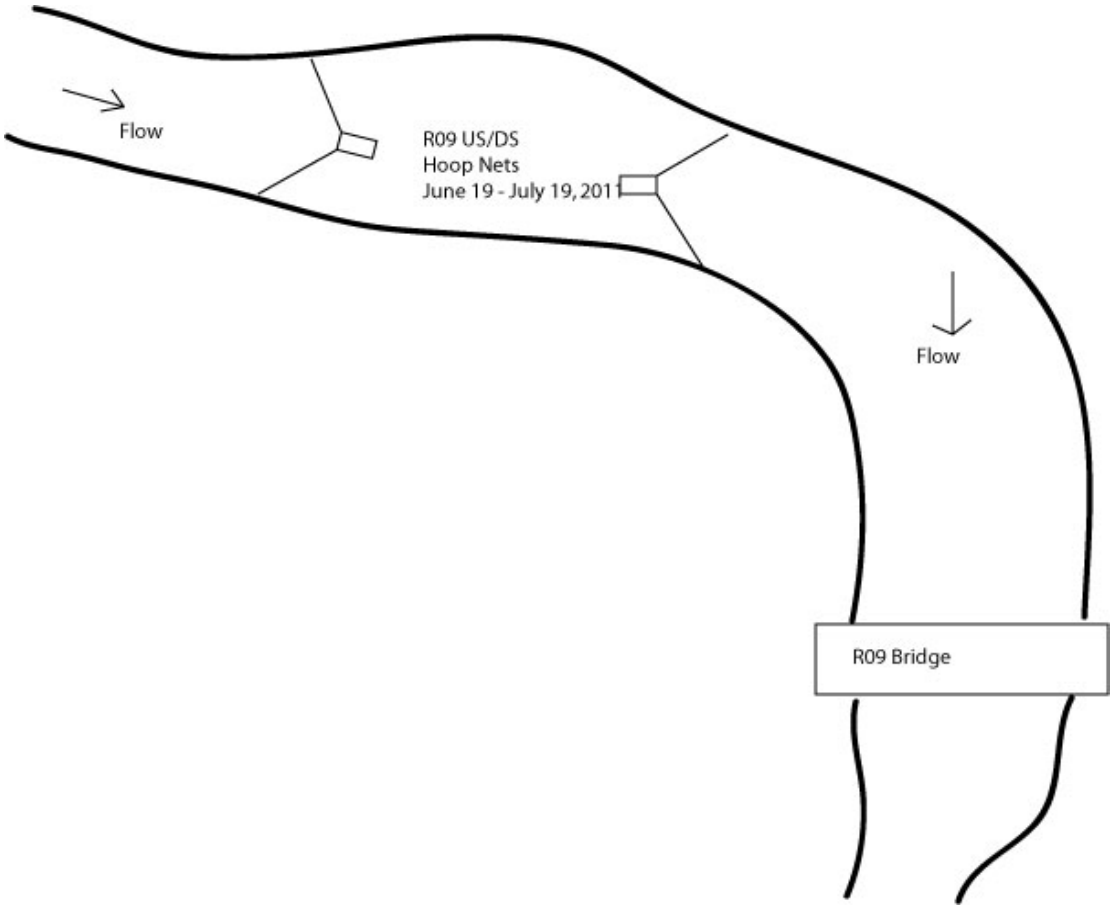

Figure 2-3: Locations and dates of hoopnets set at R09, 2011.

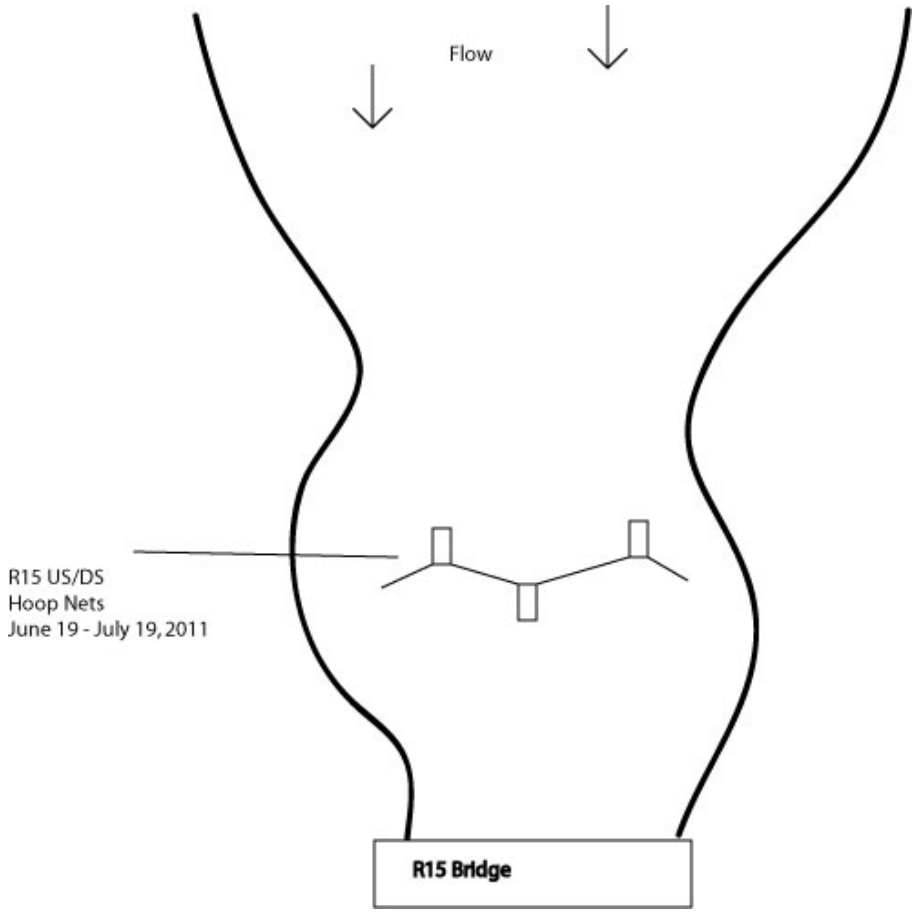

Figure 2-4: Locations and dates of hoopnets set at R15, 2011.

2.2 STREAM VELOCITY

Current velocity data was collected weekly from June 19 to July 19, 2011 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. These results were compared against published swimming speeds for arctic grayling.

2.3 CREEL SURVEY

Since March, 2007, a harvest study has been conducted by AEM in association with the Baker Lake Hunters' and Trappers' Organization in order to document changes in harvest patterns for both terrestrial wildlife and fish. The voluntary survey is open to all residents of Baker Lake over 16 years of age. Participation in the survey has increased each year, with 38 participants in 2011 (up from 30 in 2010). The four fish species included in the harvest study are Arctic char (*Salvelinus alpinus*), Arctic grayling (*Thymallus arcticus*), lake trout (*Salvelinus namaycush*) and lake whitefish (*Coregonus clupeaformis*).Information was collected on locations, dates and number of fish caught.

2.4 FURTHER DATA COLLECTION AT R02

2.4.1 Visual Surveys

During routine fisheries and larval drift collection, field staff spent approximately 30 minutes a day observing the R02 habitat compensation area between June 20, 2011 and July 19, 2011. This information was collected to provide qualitative evidence of spawning and young of the year (YOY) fish utilization at the R02 habitat compensation area.

2.4.2 Targeted Angling

Targeted angling techniques were used to describe the fish population near and within the habitat compensation area that were not captured by the hoopnets. This method was used to provide further evidence of fish using the habitat compensation area as a nursing ground. All of the fish caught using angling techniques were measured, sexed and released where they were caught.

2.4.3 Larval Drift Traps

In total, 11 larval drift traps (DT) were set at R02 from June 21 to July 17, 2011 (Figure 2-1,

Table 2-2). Four traps (DT A1 to A4) were upstream of the R02 habitat compensation area. Two traps (DT B1 and B2) were immediately downstream of the R02 habitat compensation, two traps (DT B3 and B4) were set between the R02 habitat compensation area and the R02B hoop nets. The four remaining traps (DT C1 to C4) were set slightly upstream of the bridge. Seven 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®-type 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 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 to A4 traps were placed to target a previously identified spawning area (high value habitat) documented each year from 2006 - 2010. Drift traps were checked at least every other day. Larval drift was identified in the field and preserved in vials of diluted formalin.

Table 2-2: UTM coordinates and set dates for drift traps at R02, 2011.

Drift Trap ID	GPS Coordinates	Dates (2011)
A1*	14W 0643438	June 21 - July 17
	UTM 7143416	
A2	14W 0643452	June 21 - July 17
	UTM 7143426	
A3	14W 0643444	June 21 - July 17
	UTM 7143432	
A4	14W 0643449	June 21 - July 17
	UTM 7143430	
B1*	14W 0643682	June 21 - July 17
	UTM 7143529	
B2	14W 0643699	June 21 - July 17
	UTM 7143520	
B3*	14W 0643716	June 21 - July 17
	UTM 7143574	
B4	14W 0633724	June 21 - July 17
	UTM 7143580	
C1*	14W 0643762	June 21 - July 17
	UTM 7143400	
C2	14W 0643770	June 21 - July 17
	UTM 7143406	
C3	14W 0643778	June 21 - July 17
	UTM 7143412	

* 60cm x 30cm Square Frame w/0.5mm Nitex Mesh

2.5 DATA ANALYSIS

Data summaries and statistical analyses were completed using SigmaPlot 11 (Systat Software) and 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 in 2011 along the AWAR was arctic grayling (*Thymallus arcticus*) (n = 288). A number of round whitefish (*Prosopium cylindraceum)* and lake trout (*Salvelinus namaycush)* were caught, but these together were less than 10% of the total catch. Unlike previous years, no other fish species (e.g. arctic char, pygmy whitefish, slimy sculpin) were collected in 2011. A summary of the total number of adult fish collected at each crossing is provided in Table 3-1. 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. Additionally, since arctic grayling are the primary species of potential concern in this study, the majority of the data analysis includes only individuals of that species.

Table 3-1. Total number of fish by species collected at each crossing in 2011.

	Crossing ID				
	R02	**R06**	**R09**	**R15**	*Total*
Arctic Grayling	255	205	67	6	531
Lake Trout	7	2	4	2	15
Round Whitefish	28	1	1	0	30
Total	290	208	72	8	576

3.1.2 Condition Factor

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 395 mm in length and 750 g in weight. Many smaller fish were also collected in the hoopnets (minimum 95 mm length and 75 g weight). The condition factor, calculated as a function of length and weight, demonstrates a very healthy population (K> 1.00).

Table 3-2 provides a summary of the results of the average, maximum, and minimum length and weight, and the average condition factor of arctic grayling collected at each crossing.

It should be noted that condition factors are expected to vary as a result of both natural and sampling variability. The latter occurs due to inter-annual changes in timing of ice-off and difficulty setting nets early enough in the season to catch fish during the primary upstream spawning run.

Table 3-2. Average, maximum and minimum arctic grayling length, weight and condition factor (K).

		Length (mm)				Weight (g)				K*
Crossing	n	AVG	MAX	MIN	SD	AVG	MAX	MIN	SD	AVG
R02	244	262.22	395	95	46.54	211.37	750	75	112.81	1.13
R06	193	262.23	400	190	52.82	216.81	610	17	128.10	1.11
R09	59	246.66	341	145	41.92	197.69	490	50	91.52	1.25
R15	5	272.00	356	217	70.94	247.00	420	120	153.77	1.15

* K = (weight/((length/10)^3)) x 100

3.1.3 Size Distribution

3.1.3.1 R02

As in the past, the length-frequency distributions (Figure 3-1) of fish collected at R02 are approximately normally distributed with the largest number of fish collected in the 220-239mm size class (n=47). With the exception of the 260-279 mm size class, the data follows a near-normal distribution between the length-frequencies of 180 – 399 mm (similar to past years). This data demonstrates that recruitment in all size classes is occurring and that the population is healthy. As represented in the length-frequency histogram, 163 of the arctic grayling were migrating upstream with 38 arctic grayling migrating downstream.

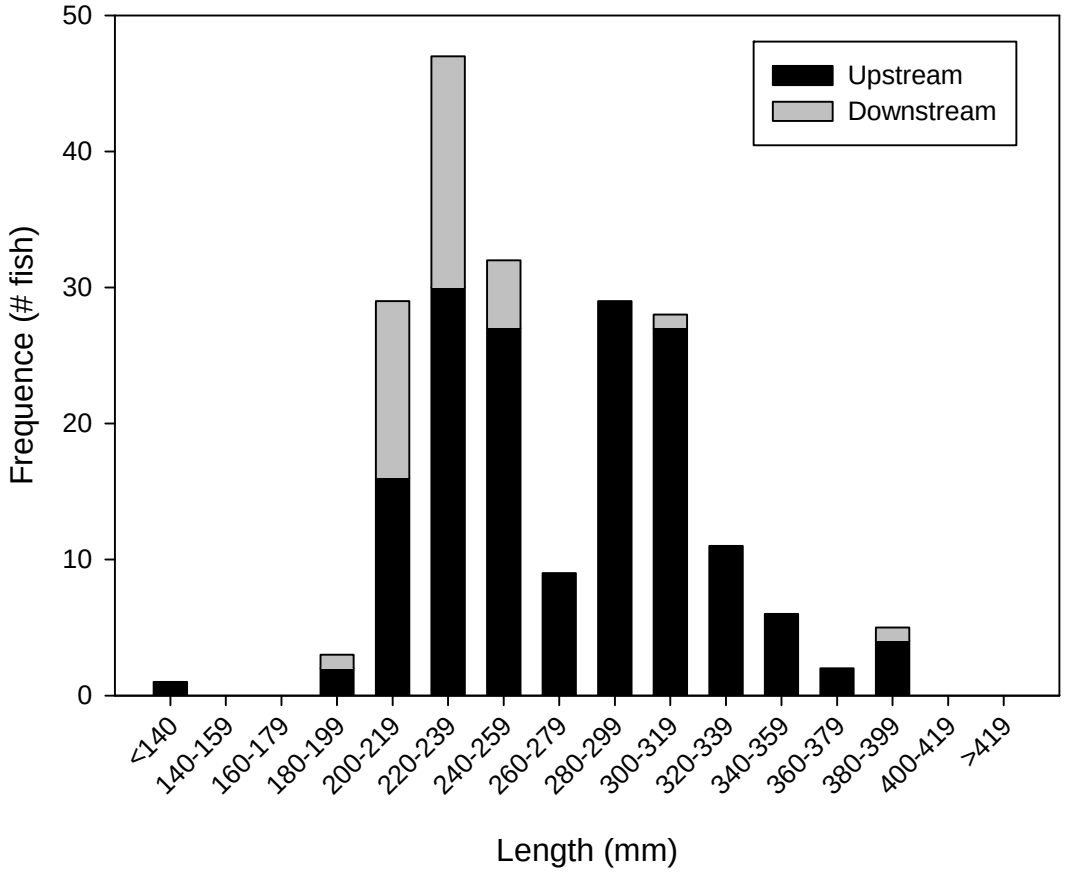

Figure 3-1. Length-frequency histogram for arctic grayling at R02, 2011.

3.1.3.2 R06

The length-frequency distribution at R06 is right-skewed with maximum frequencies occurring at the 200-219 mm and 220 – 239 mm size classes (n=34 each) (Figure 3-2). This is opposite to the trend observed in 2010, which was left-skewed with a peak at 320-339 mm, but similar to the distribution found in 2009. Distributions at R06 appear to alternate between right- and left-skewed patterns, with left-skews in 2007 and 2010, and right-skews in 2009 and 2011. Distributions in 2006 and 2008 are not comparable because groupings were on 10 cm size ranges rather than 20 cm ranges as in other years. This observation may be due to actual population dynamics (e.g. large spawning fish return to the reach only every other year), or may be due to inconsistent timing of sampling relative to peak migration. Since larval drift was not collected at R06, the timing of the actual peak migration relative to the start of monitoring cannot be verified, but in years with higher proportions of large fish, sampling may capture peak migration, whereas in years with more immature fish, sampling may be capturing the post-spawning run.

In 2011 a larger proportion of the fish were found moving upstream (n=137) than downstream (n=16), as previously. In general, the total number of fish, the 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 without apparent impact to population dynamics.

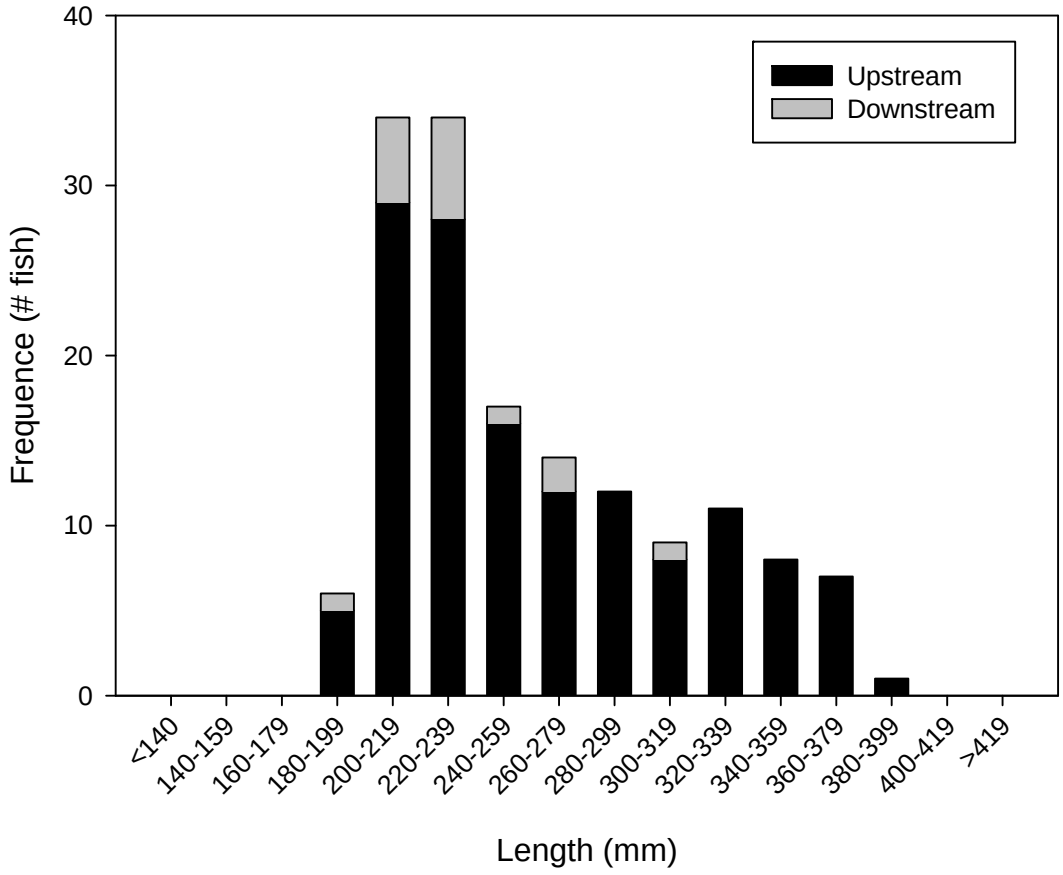

Figure 3-2. Length-frequency histogram for arctic grayling at R06, 2011.

3.1.3.3 R09

A similar total number of arctic grayling were caught at R09 in 2011 as in 2010. Unlike other sites, the same number of fish were caught moving upstream as moving downstream (n=26 each direction). This trend has been observed in the past, and is likely a result of high water flows that did not permit net sets during peak upstream migration. As illustrated in Figure 3-3, the fish population was normally distributed, with size classes ranging from 140 to 359 mm, which demonstrates typical recruitment patterns.

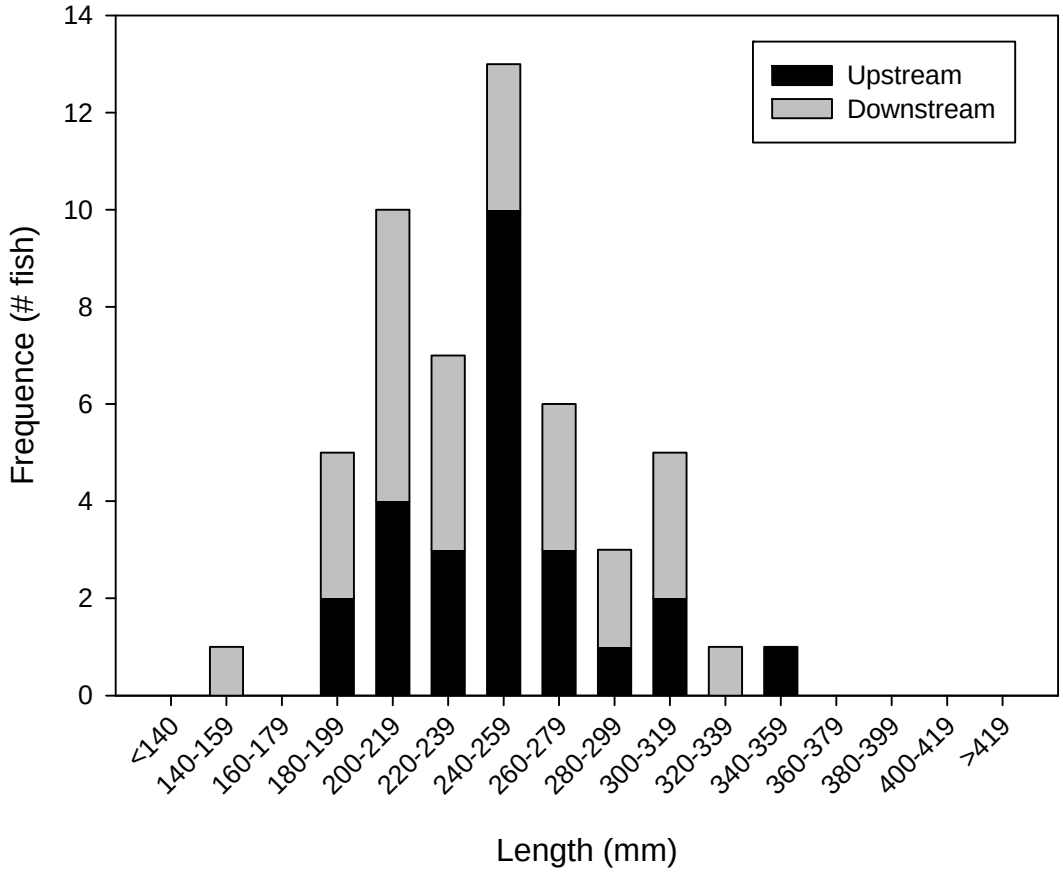

Figure 3-3. Length-frequency histograms for arctic grayling at R09, 2011.

3.1.3.4 R15

As in previous years, few fish were collected migrating at R15 and therefore length-frequency data (see Figure 3-4) of arctic grayling is difficult to interpret. Four arctic grayling were collected with sizes between 200 – 359 mm, and all were moving upstream. Since 2006 no more than 26 fish have been caught at this site in one year (2006- 2011 catches were 5, 0, 9, 26, 11, 4, respectively).The five-year history of low catches at this crossing indicates it is not an important migration route for arctic grayling in this region.

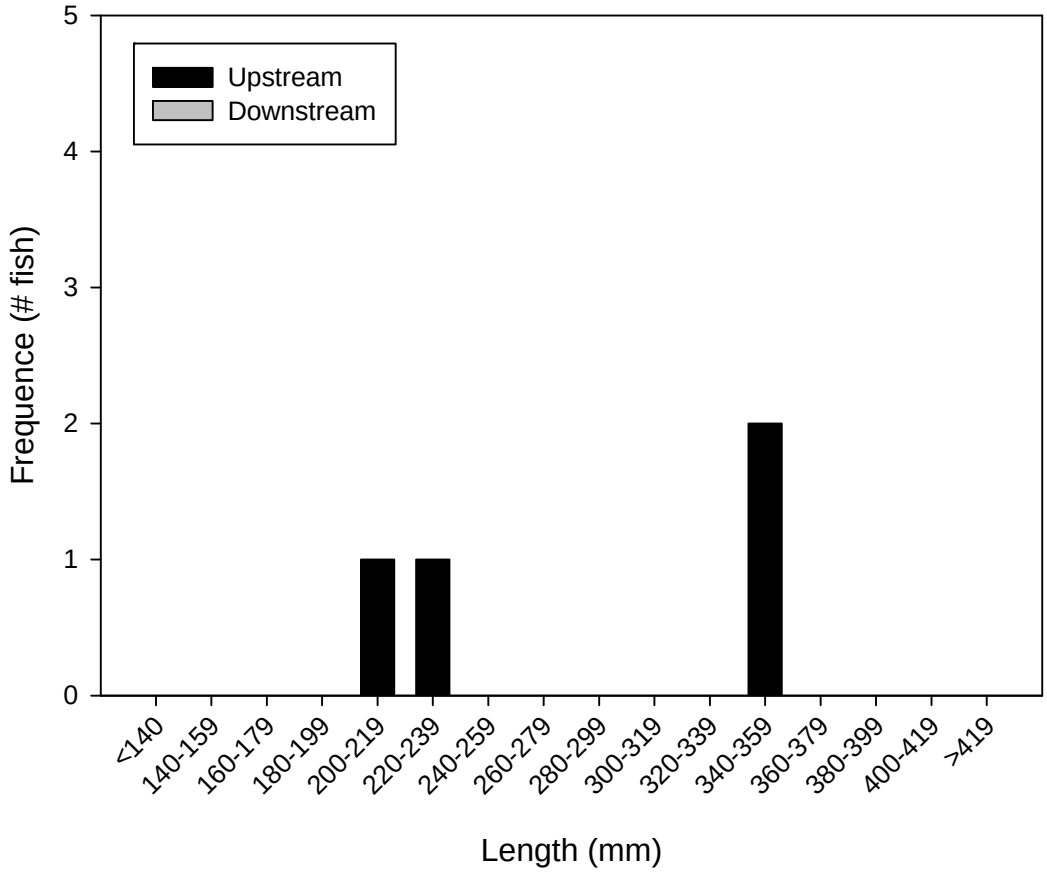

Figure 3-4. Length-frequency histogram for arctic grayling at R15, 2011.

3.1.4 Upstream and Downstream Movements

The following section evaluates the timing of arctic grayling movements at each crossing. For R02, this also includes an evaluation of the movements with respect to the constructed spawning pads.

3.1.4.1 R02

Upstream and Downstream Movements

A total of 255 arctic grayling were collected at R02. Two hundred and one arctic grayling were collected moving upstream and 54 were collected moving downstream. This year, fish were caught on the first sampling day (June 19), when temperatures were 4°C. The lowest water temperature observed was 3°C (July 3). The migration pattern observed in 2011 appeared bi-modal, with two peaks occurring at the same general time periods as in 2010. The first (and highest) upstream peak occurred on July 2, with 35 fish caught. The second, lower peak occurred on July 12 (13 fish). In previous years it has been suggested that the true peak migration likely occurred prior to sampling commenced, because fish at the first observed peak were generally small, immature grayling. In

2011, fish caught during the first peak on July 2 were 293 mm on average (standard deviation = 47 mm), which is greater than the observed mean of 262 mm. The largest fish captured (395 mm) was also found during this period. However, peak larval drift (Section 3.4.3) occurred four days prior to the observed peak adult migration (June 28), indicating that although the large mature fish were still moving upstream during the collection period, migration and spawning also occurred prior to the study initiation (likely under the ice, and at water temperatures <4°C).

Downstream movements coincided with the second upstream peak, starting on July 11. Many fewer fish (54) were collected moving downstream than upstream, with peak downstream movement on July 14 (20 fish). Water temperatures generally increased from 4°C to a maximum of 15°C over the sampling period.

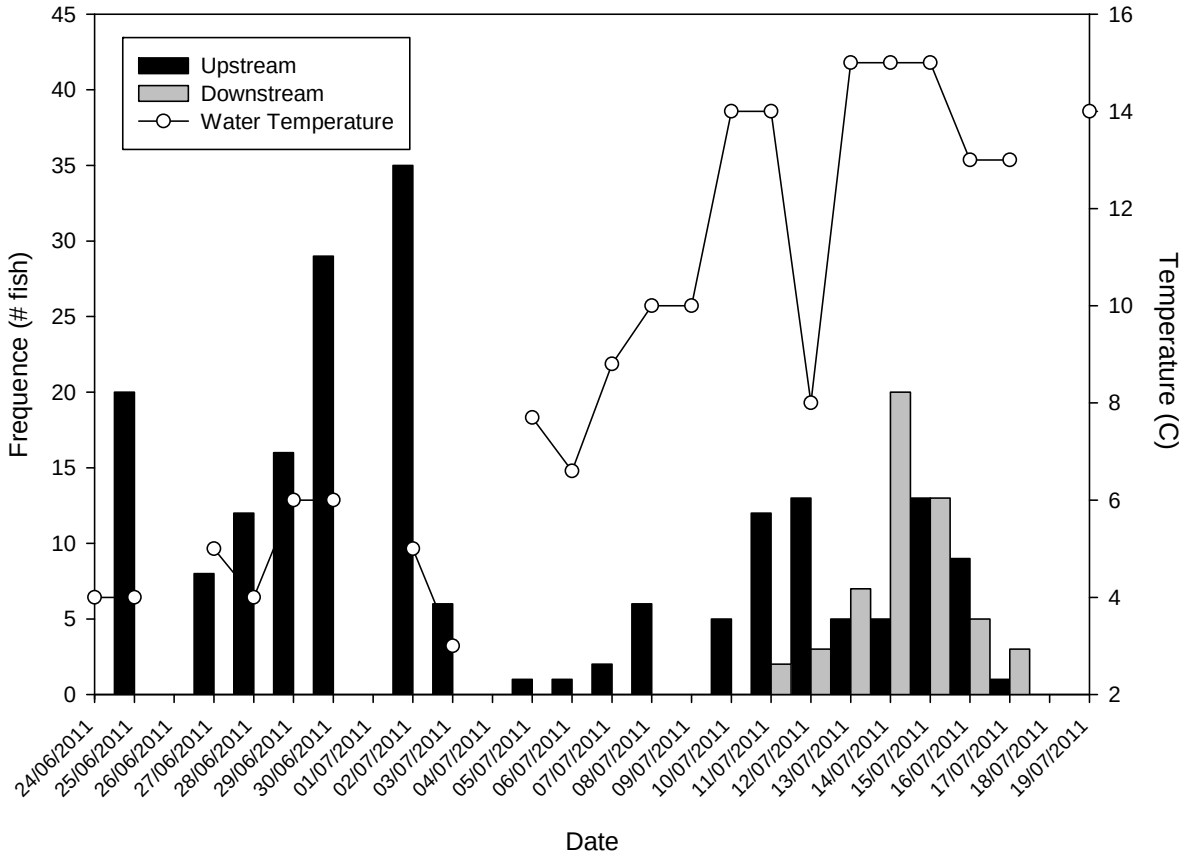

Figure 3-5: Upstream and downstream migration patterns of arctic grayling at crossing R02, 2011.

Movements with Respect to the Constructed Spawning Pads

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, R02 A collected the largest number of fish (175) moving upstream. Fewer were collected at R02 B (25), and only one upstream fish was collected at R02 C (Table 3-3).

Unlike 2009 and 2010, more fish were caught in nets set upstream of the compensation structures than immediately downstream of the structure. In the past it was suggested that lower numbers of fish at R02 A compared to R02 B indicated use of the constructed spawning pad area between sites A and B. Given the difficulty achieving adequate net coverage at all R02 locations (deep, swift and wide flow area), the change of the peak catch location in 2011 is likely due to catchability and does not reflect that the habitat features are not used. Although effort is placed to set nets in similar or in identical areas of the stream, the flow patterns in R02 change each year; this can dramatically change the catchability. Furthermore, it is possible that the construction of the compensation structures relieves pressure for the use of natural spawning areas further upstream, leading to increased migration and spawning rates overall. Both of these theories are supported by the larval drift data, which has steadily increased since installation of the spawning pads, as discussed in Section 4.2.

Table 3-3: Arctic grayling movement at each net location at crossing R02 in 2010 and 2011.

R02 Hoopnet ID	Fish Movement	# of Arctic Grayling 2010	# of Arctic Grayling 2011
A	US	61	175
	DS	58	13
B	US	103	25
	DS	8	16
C	US	3	1
	DS	11	25
Total	US	167	201
	DS	77	54

Maturity and Sex Distribution

Sex distributions at R02 indicate that 105 females and 137 males were collected. More males than females were collected moving upstream (120 male, 76 female) and more females than males were collected moving downstream (29 females, 17 males). It has been reported that arctic grayling typically spawn between 7 and 10°C (Scott and Crossman, 1973). In 2010, the males and females collected moving upstream were primarily immature or about to spawn during the first peak, from June 24th until June 30th, at water temperatures below 10 °C. In 2011, distributions were approximately equal between immature, ready to spawn and spent females early in the sampling period when water temperatures were <7°C (similar time frame as 2010). Males during this time were mainly classified as ready to spawn (53 of 81). When water temperatures were higher than 7°C (second peak), both females and males collected were mostly immature (53 of 61 females, 47 of 59 males). No ready-to-spawn females were collected after July 4. Spawning classifications as percent of total number collected at temperatures below and above 7°C are shown in Table 3-4.

Table 3-4: Spawning classifications for male and female arctic grayling as % of total collected at temperatures below and above 7°C, at R02.

Classification	% of Total	
	<7°C (Jun 19 – Jul 4)	**>7°C** (Jul 5 – Jul 24)
Female	*n=44*	*n=61*
Immature	25	87
Ready	27	0
Waiting	11	2
Spent	32	8
Unknown	5	3
Male	*n=81*	*n=59*
Immature	22	80
Ready	65	2
Waiting	2	3
Spent	0	15
Unknown	10	0

3.1.4.2 R06

A total of 205 arctic grayling were collected at R06 in 2011 (compared to 124 in 2010). When water temperatures reached 7°C around July 5, fish began to move downstream and when the temperature reached 10°C on July 12, the number of fish collected moving upstream declined to zero within a few days. Peak upstream migration occurred on July 1 (23 fish), which is six days later than 2009 and 2010. The data indicates that arctic grayling are able to pass the bridge at R06, and that population numbers are not being adversely impacted by its presence.

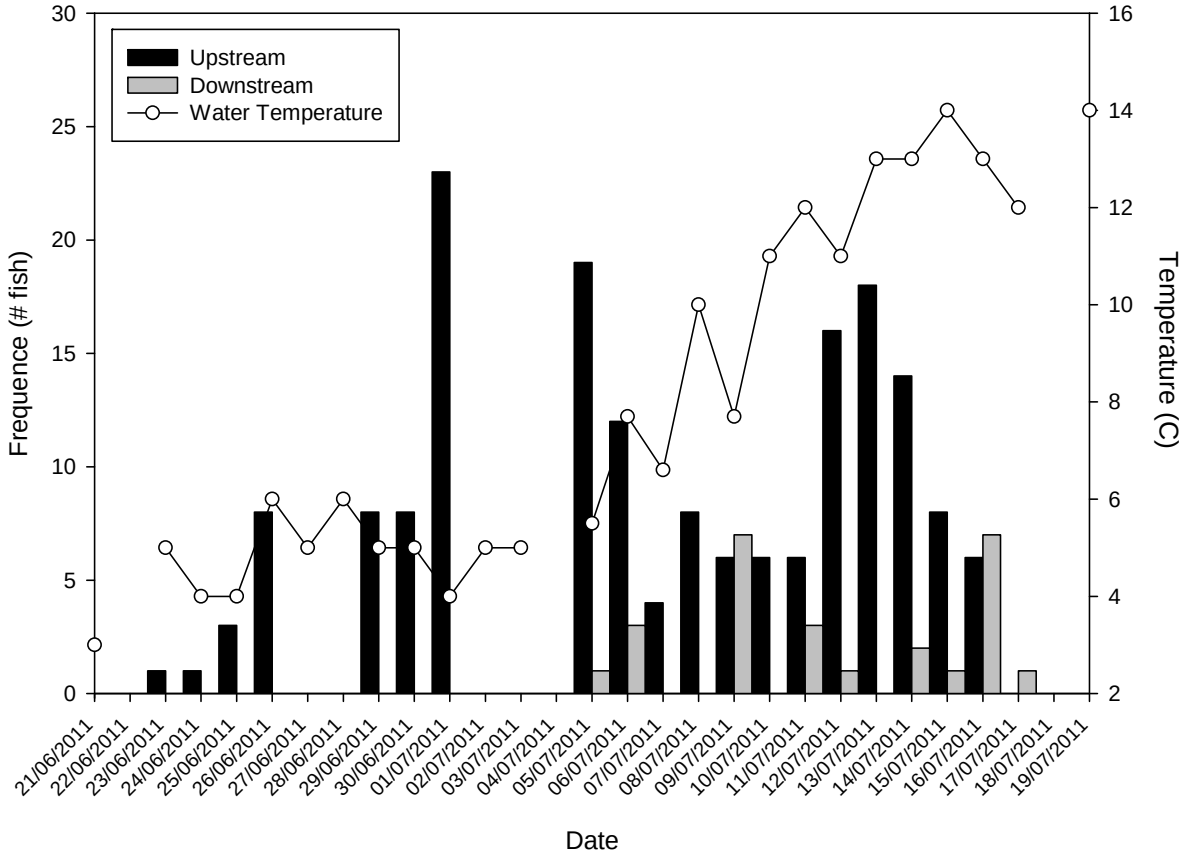

Figure 3-6: Upstream and downstream migration patterns of arctic grayling at crossing R06, 2011.

3.1.4.3 R09

A total of 67 arctic grayling were collected at R09 (compared to 56 in 2010). This included 31 males, 27 females and 9 of unknown sex. Overall, there was no defined upstream or downstream migration at R09 in 2011, as in 2010. Peak upstream movement (4 fish) occurred on June 24, at a water temperature of 6°C. As in 2010, peak upstream movement was lower than peak downstream movement (6 fish, July 12). Overall, an approximately equal number of fish were caught moving upstream (37) and downstream (35).

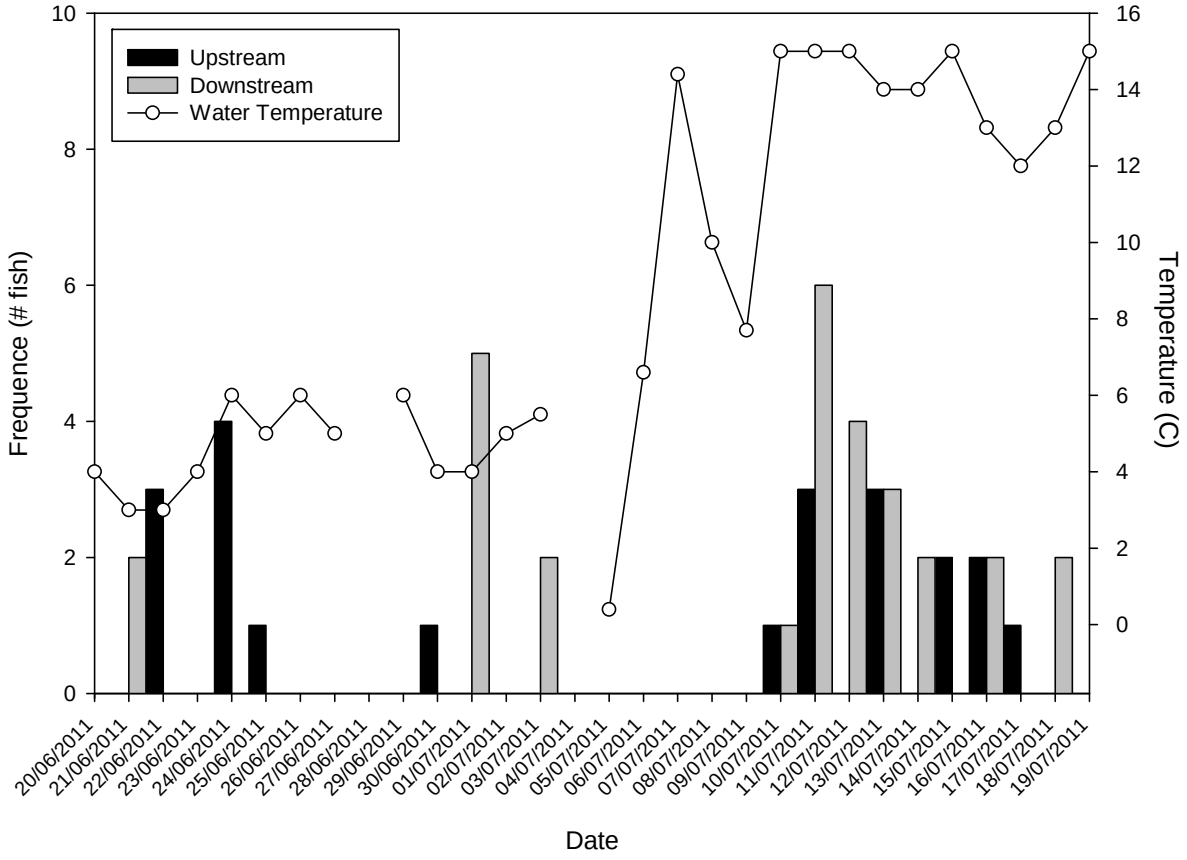

Figure 3-7: Upstream and downstream migration patterns of arctic grayling at crossing R09, 2011.

3.1.4.4 R15

In total, 6 arctic grayling were collected at R15 in 2011, compared to 13 in 2010. As in the past, it is evident that few fish use this tributary as nets achieve nearly 100% coverage of the stream. The number of fish captured in this area has not measurably decreased since 2006 (5 fish); it appears this bridge structure is not affecting the arctic grayling population using this small tributary.

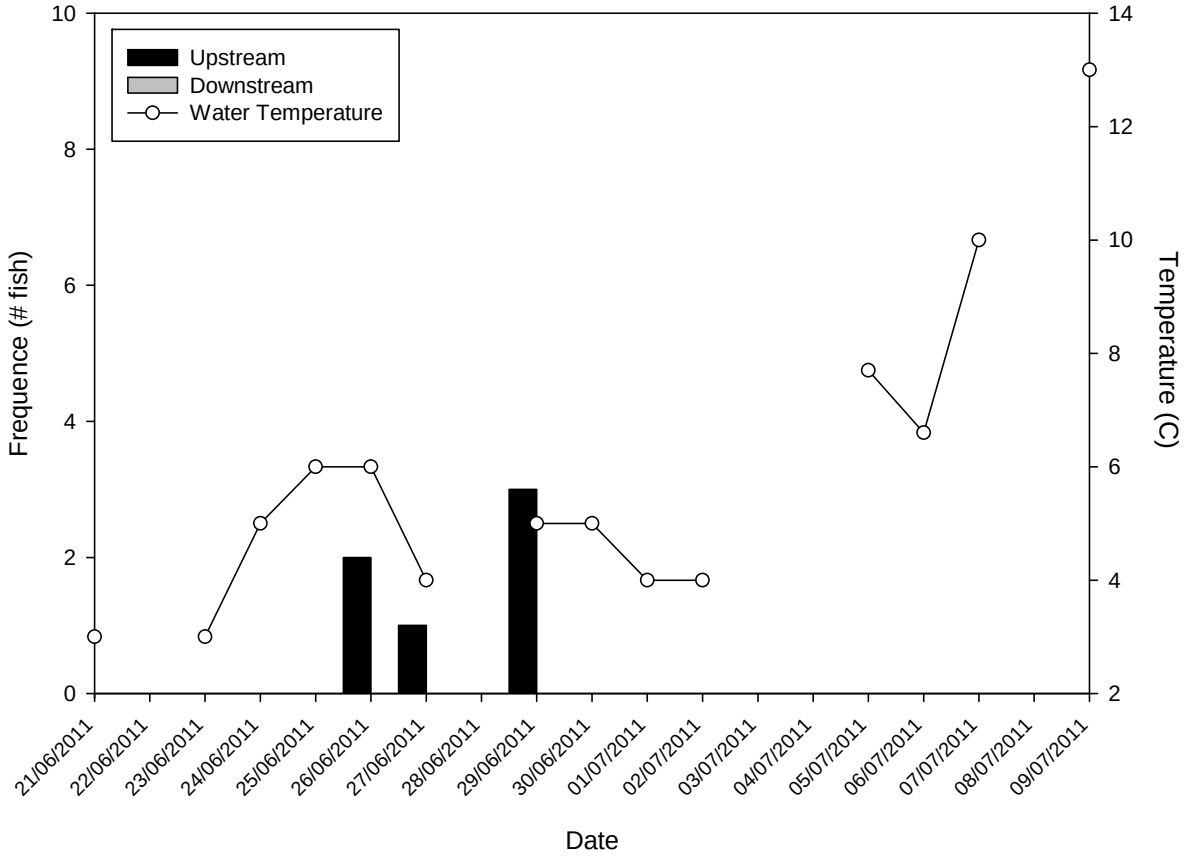

Figure 3-8: Upstream and downstream migration patterns of arctic grayling at crossing R15, 2011.

3.1.5 Current Year Recaptures

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. The following provides the results of the current year flow tagging program, or “recaptures” at each crossing.

3.1.5.1 R02

In 2009, recapture data provided an interesting caption into the arctic grayling tendencies and movements at R02, and indicated use of the constructed spawning area. No current year recaptures were collected at R02 in 2010. In 2011, 9 fish were recaptured. All were moving upstream and were caught or re-caught at hoopnets A and B. The majority of these fish were ready to spawn males. One male fish (#7, Table 3-5) was initially collected (twice) at R02B when it was ready to spawn, and then

re-captured at R02A after spawning, suggesting it may have used the spawning pads constructed between hoopnets A and B.

Table 3-5: Arctic grayling captured and re-captured in the current year at crossing R02.

Fish	Date Collected	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	25-Jun-11	R02B	US	90235	295	300	1.17	M	Ready
	28-Jun-11	R02A	US	90235	295	300	1.17	M	Ready
2	24-Jun-11	R02A	US	90212	350	420	0.98	M	Ready
	29-Jun-11	R02B	US	90212	350	420	0.98	M	Ready
3	29-Jun-11	R02A	US	90519	320	320	0.98	M	Ready
	30-Jun-11	R02A	US	90519	320	320	0.98	M	Ready
4	24-Jun-11	R02A	US	90209	331	405	1.12	F	Spent
	02-Jul-11	R02A	US	90209	330	420	1.17	F	Ready
5	25-Jun-11	R02A	US	90217	315	335	1.08	M	Ready
	02-Jul-11	R02A	US	90217	316	330	1.05	M	Ready
6	29-Jun-11	R02A	US	90520	310	300	1.01	M	Ready
	02-Jul-11	R02A	US	90520	309	300	1.02	M	Ready
7	29-Jun-11	R02B	US	90530	294	280	1.11	M	Ready
	03-Jul-11	R02B	US	90530	294	280	1.11	M	Ready
	13-Jul-11	R02A	US	90530	292	275	1.11	M	Spent
8	29-Jun-11	R02A	US	90521	303	250	0.9	M	Unknown
	10-Jul-11	R02A	US	90521	302	265	0.96	M	Spent
9	14-Jul-11	R02A	US	90769	242	150	1.06	M	Immature
	16-Jul-11	R02A	US	90769	240	140	1.01	M	Immature

3.1.5.2 R06

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 re-captures were large males and females likely defending the area near the bridge (

Table 3-6). One female and two males spawned in the vicinity of the hoopnets and were recaptured in the same net, moving upstream. Several other males and females were recaptured without changing maturity category, as ready to spawn or waiting. In total, 98 females, 94 males and 13 fish of unknown sex were collected at R06 (compared to 62 females and 58 males in 2010). These annual datasets demonstrate that gender partitioning is consistently in the range of 50:50.

Table 3-6: Arctic grayling captured and re-captured in the current year at crossing R06.

Fish	Date	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	26-Jun-11	R06	US	90237	295	250	0.97	M	Ready
	01-Jul-11	R06	US	90237	295	270	1.05	M	Ready
	08-Jul-11	R06	US	90237	295	260	1.01	M	Ready
2	30-Jun-11	R06	US	90541	316	310	0.98	F	Ready
	01-Jul-11	R06	US	90541	315	335	1.07	F	Ready
3	01-Jul-11	R06	US	90593	265	220	1.18	F	Waiting
	05-Jul-11	R06	US	90593	269	240	1.23	F	Spent
4	01-Jul-11	R06	US	90580	400	320	0.5	M	Ready
	05-Jul-11	R06	US	90580	400	320	0.5	M	Spent
5	01-Jul-11	R06	US	90589	320	310	0.95	M	Waiting
	05-Jul-11	R06	US	90589	320	330	1.01	M	Spent
6	30-Jun-11	R06	US	90543	260	190	1.08	M	Waiting
	05-Jul-11	R06	US	90543	260	205	1.17	M	Waiting
	15-Jul-11	R06	DS	90543	260	205	1.17	M	Waiting
7	30-Jun-11	R06	US	90545	240	160	1.16	F	Waiting
	08-Jul-11	R06	US	90545	245	170	1.16	F	Waiting
8	05-Jul-11	R06	US	78103	322	320	0.96	F	Spent
	09-Jul-11	R06	US	78103	320	310	0.95	F	Spent
	12-Jul-11	R06	US	78103	320	320	0.98	F	Spent
9	06-Jul-11	R06	DS	90682	305	320	1.13	F	Spent
	09-Jul-11	R06	US	90682	310	320	1.07	F	Spent
10	26-Jun-11	R06	US	90240	235	170	1.31	F	Immature
	12-Jul-11	R06	US	90240	234	170	1.31	F	Immature
11	15-Jul-11	R06	US	90770	229	130	1.08	M	Immature
	16-Jul-11	R06	DS	90770	233	140	1.11	M	Immature

3.1.5.3 R09

Two fish, both immature males, were recaptured in the current year at R09. One was first caught moving upstream and then downstream, and the other was moving upstream on both (consecutive) days.

Table 3-7: Arctic grayling captured and re-captured in the current year at crossing R09.

Fish	Date	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	11-Jul-11	R09	US	87476	251	215	1.36	M	Immature
	12-Jul-11	R09	DS	87476	254	210	1.28	M	Immature
2	12-Jul-11	R09	US	87493	265	235	1.26	M	Immature
	13-Jul-11	R09	US	87493	265	250	1.34	M	Immature

3.1.5.4 R15

No current year tagged fish were captured at R15 in 2011.

3.1.6 Previous Year Recaptures

In 2011, a total of 19 fish caught at crossings R02, R06, R09, and R15 were previous year recaptures. The previous year recapture data suggests that arctic grayling are annually passing upstream of the bridge and generally returning to same stream to spawn. Recaptured fish were captured anywhere from a few days up to two weeks of their original capture date indicating that movement of fish is not hampered by the bridge abutments. The recaptured fish were in good condition (K>1.0 or just slightly below 1.0). In most, cases the condition factor of the recaptured fish had decreased from the value at first capture, however in a few cases the condition factor has improved. Historical data would also suggest that the growth and overall condition of the fish collected are following the general trends of previous year recaptures at all HADD crossings.

3.1.6.1 R02

In 2011, 5 arctic grayling tagged in previous years were recaptured (3 of the 5 fish were originally caught in 2009 and 2 of the 5 were caught in 2010; see Table 3-8). All of the fish had a condition factor of 1 or more, and all were ready to spawn, waiting or spent when captured in 2011. The R02 crossing is the largest stream along the AWPAR, and only a small area can be effectively fished with hoopnets. Many parts of the stream are too shallow to deploy hoopnets but remain deep enough for fish to pass through, so population estimates were not made based on these data.

Table 3-8: Arctic grayling captured in previous years and recaptured in 2011 at crossing R02.

Fish	Date	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	27-Jun-09	R02B	US	90010	340	440	1.19	M	Ready
	24-Jun-11	R02A	US	90010	350	500	1.17	M	Ready
2	28-Jun-09	R02A	US	90037	278	250	1.16	M	Ready
	25-Jun-11	R02A	US	90037	304	310	1.10	M	Ready
3	1-Jul-09	R02B	US	90914	316	340	1.08	F	Spent
	25-Jun-11	R02B	US	90914	326	420	1.21	F	Spent
4	24-Jul-10	R02A	DS	78188	278	259	1.21	F	Spent
	29-Jun-11	R02B	US	78188	278	260	1.21	F	Waiting
5*	25-Jun-10	R02A	US	90863	298	289	1.09	M	Ready
	15-Jul-11	R02A	US	90876	304	280	1.00	M	Spent

**Was tagged #90863 but tag was coming out, so it was replaced with tag #90876*

3.1.6.2 R06

The construction of the bridge abutment at R06 has had the least effect on flow conditions when compared against all of the HADD crossings. In 2011, 12 arctic grayling were captured in previous years. Nine of the 12 fish were captured in 2010 while the remaining 3 recaptured fish were originally captured in 2007 or 2008. The recapture of fish that used the stream prior to bridge construction is another indication that it is not impeding migratory routes.

Table 3-9: Arctic grayling captured in previous years and recaptured in 2011 at crossing R06.

Fish	Date	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	10-Jul-10	R06	US	78162	335	425	1.13	F	Spent
	23-Jun-11	R06	US	78162	335	375	1	F	Waiting
2	10-Jul-10	R06	US	78161	250	200	1.28	M	Immature
	25-Jun-11	R06	US	78161	263	220	1.21	M	Immature
3	1-Jul-07	R06	DS	85199	351	499	1.15	-	Waiting
	25-Jun-11	R06	US	85199	369	600	1.19	F	Spent
4	7-Jul-10	R06	DS	78143	310	385	1.29	F	Ready
	30-Jun-11	R06	US	78143	310	350	1.17	F	Ready
5	2-Jul-07	R06	DS	85592	305	340	1.2	M	Spent
	1-Jul-11	R06	US	85592	328	380	1.08	M	Ready
6	8-Jul-10	R06	US	78151	306	360	1.18	M	Spent
	1-Jul-11	R06	US	78151	323	350	1.04	M	Ready
7	7-Jul-10	R06	DS	78144	350	475	1.11	F	Ready
	5-Jul-11	R06	US	78144	350	480	1.12	M	Ready
8	30-Jun-08	R06	US	86456	285	250	1.08	-	-
	5-Jul-11	R06	US	86456	319	300	0.92	F	Spent
9	29-Jun-10	R06	US	78103	328	400	1.13	F	Ready
	5-Jul-11	R06	US	78103	320	320	0.98	F	Spent
10	7-Jul-10	R06	DS	90656	282	285	1.27	F	Spent
	6-Jul-11	R06	US	90656	291	293	1.19	F	Unknown
11	7-Jul-10	R06	DS	78142	325	400	1.17	F	Spent
	12-Jul-11	R06	US	78142	325	350	1.02	F	Spent
12	30-Jun-10	R06	US	78123	210	120	1.3	F	Immature
	16-Jul-11	R06	US	78123	230	120	0.98	F	Immature

3.1.6.3 R09

At R09 crossing, the width of the stream is narrow enough to obtain 100% coverage with hoopnets. In 2011, 1 previous year recapture was caught. This same fish was originally captured and tagged in 2008 and then recaptured for the first time in 2009. This fish has shown good growth while maintaining a condition factor of over 1.0. This data provides supporting evidence that the HADD crossing at R09 is not affecting fish migration US of the bridge.

Table 3-10: Arctic grayling captured in previous years and recaptured in 2011 at crossing R09.

Fish	Date	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	5-Jul-08	R09	US	86875	240	175	1.27	M	-
	25-Jun-09	R09	US	86875	265	185	0.99	M	Waiting
	20-Jun-11	R09	US	86875	313	355	1.16	M	Ready

3.1.6.4 R15

The data collected at R15 in 2011 follows historical trends which indicate that few fish use this tributary. In 2011, one previous year recapture was collected. This fish was originally captured in 2010 and has maintained a fair condition factor with some growth in length and weight. It would appear that the few fish using R15 are not discouraged from returning to this reach by the bridge abutment.

Table 3-11: Arctic grayling captured in previous years and recaptured in 2011 at crossing R15.

Fish	Date	Crossing	US/DS	Tag #	Length	Weight	K	Sex	Maturity
1	26-Jun-10	R15	US	90874	350	407	0.95	M	-
	26-Jun-11	R15	US	90874	356	410	0.91	M	Ready

3.2 STREAM VELOCITY

Stream velocity data was collected weekly from June 18 – July 19, 2011 at HADD crossings R02, R06, R09, and R15. The average and maximum velocity measurements were taken upstream and downstream of the bridge crossing as presented in the following table (Table 3-12). Staff gage measurements discussed in this section are presented in Appendix A.

Abilities of arctic grayling to successfully navigate upstream are determined here based on published swimming speeds. Arctic grayling have a sustained speed of 0.8m/s (maintained indefinitely), a prolonged speed of 0.8 – 2.1m/s (can be maintained for up to 200 min), and a burst speed of 2.1 – 4.3m/s which can be maintained for up to 15 seconds (MOT, 2006).

Table 3-12: Average and maximum stream velocities measured upstream (US) and downstream(DS) of road crossings in 2011.

		R02		R06		R09		R15	
		US	DS	US	DS	US	DS	US	DS
June	**Avg.**	0.55	0.89	0.27	0.34	0.33	0.39	0.33	0.69
	Max.	1.15	1.91	0.55	0.68	0.8	1.01	0.23	0.59
July	**Avg.**	0.58	0.84	0.29	0.41	0.34	0.44	0.32	0.3
	Max.	0.89	1.24	0.92	0.82	0.69	0.59	1.12	0.59

3.2.1 R02

Velocity measurements were taken at R02 as soon as possible following ice – off, which occurred on approximately June 17, 2011. On June 18, 2011, the maximum velocity (1.91 m/s) was measured at R02 downstream of the bridge, and a velocity of 1.15 m/s was recorded upstream of the bridge. Velocity measurements were taken at recorded peak freshet, as staff gage measurements were at their highest recording (0.575 m) on June 24, 2011. On July 16, 2011 the water level had decreased 22.5 cm to a recorded measurement of 0.35 m.

The field measurements indicate that the maximum velocities of the stream at peak freshet are within the lower range of the arctic grayling's burst speed. The average speeds of 0.55 m/s upstream and 0.89 m/s downstream of the road crossing are below or very close to the cited arctic grayling sustained speed of 0.8 m/s. This velocity data suggests that arctic grayling migrations are not likely to be obstructed by the HADD crossing which has increased currents at R02.

3.2.2 R06

Average and maximum velocity measurements at R06 were less than or just above published sustained speeds (MOT, 2006). These velocity data suggest that the ability of arctic grayling to migrate upstream is not affected by the bridge structure at R06.

3.2.3 R09

Maximum velocity in June downstream of the bridge (1.01 m/s) was greater than reported sustained swimming speeds, but in the lower range of reported prolonged speeds. Average velocities at R09 were lower than reported sustained speeds, indicating that arctic grayling migrations are not likely inhibited by the bridge structure at R09.

3.2.4 R15

Maximum velocity in July upstream of the bridge (1.12 m/s) was greater than reported sustained swimming speeds, but in the lower range of reported prolonged speeds. Average velocities at R15 were lower than reported sustained speeds, indicating that arctic grayling migrations are not likely inhibited by the bridge structure at R15.

3.3 CREEL SURVEY

In 2011, the greatest fishing effort was found to occur at Whitehills Lake (accessible by the AWAR). This is in keeping with results from previous years. While fishing trips to alternate locations have apparently remained steady over time, an increase in fishing effort at lakes in close proximity to the AWAR has been observed each year. However, the increase in fishing trips to this area, likely as a result of improved access, appears to be limited to Whitehills Lake (and not beyond). The disinclination to travel further afield is likely due to an abundance of fish at locations close to the hamlet (e.g. Baker Lake, Whitehills Lake). Further information is available in the memorandum produced by Nunavut Environmental Consulting Ltd., (2011 Hamlet of Baker Lake Harvest Study – Creel Results, Appendix C).

3.4 FURTHER DATA COLLECTION AT R02

3.4.1 Visual Surveys

During larval drift trap retrieval at R02, visual observations (approximately 30 min/day on 10 days) at the constructed spawning pads documented minnows inside the spawning beds between the berms. The swimming tendencies and size of the minnows appeared to be arctic grayling YOY, however specimens were not collected so this could not be confirmed. Photo and video documentation was also attempted to provide visual evidence of usage and foraging by YOY within the habitat compensation area but the images cannot clearly identify the minnows as arctic grayling YOY. Minnows were observed on four of the 10 dates (July 5, 14, 15, 17), with the majority of sightings occurring approximately two weeks after peak larval drift. Since it was not possible to determine the species of minnows sighted, this method is not recommended for use in the next AWAR monitoring program.

3.4.2 Targeted Angling

Angling techniques within the habitat compensation area were also used (approximately 30 min/day on 10 days between June 19 and July 19) to help determine fish usage, nursing, and foraging within and near the spawning pads. Angling was done both upstream and downstream of the habitat compensation area, targeting locations where fish may pass by the hoopnets. A total of nine fish were captured by this method, including six arctic grayling and three round whitefish (Table 3-13). Each fish was measured, sexed and released. Arctic grayling caught by angling were in small-medium size classes (195mm – 232mm) and had a slightly higher condition factor compared to fish of the same size caught in hoopnet (K_{avg}=1.33, compared to 1.12 in nets). This data demonstrates that a number of fish are circumventing the hoopnets at R02, possibly because they are physically more fit. Due to the width and depth of this tributary, achieving greater coverage with hoopnets is not feasible, but these observations should be taken into account when interpreting the results of hoopnet catches.

Table 3-13: Fish caught by angling at R02 upstream (US) or downstream (DS) of the constructed spawning pad compensation area.

Date	US or DS	Species	Length (mm)	Weight (g)	Sex	Maturity	Condition Factor (K)
27-Jun-11	US	Arctic grayling	241	175	Male	Waiting	1.25
27-Jun-11	US	Arctic grayling	198	110	Female	Immature	1.42
13-Jul-11	US	Round whitefish	280	220	-	-	-
13-Jul-11	US	Arctic grayling	232	160	Male	Immature	1.28
13-Jul-11	DS	Round whitefish	262	130	-	-	-
15-Jul-11	US	Round whitefish	257	210	-	-	-
15-Jul-11	DS	Arctic grayling	217	140	Female	Immature	1.37
17-Jul-11	DS	Arctic grayling	210	125	Female	Immature	1.35
17-Jul-11	US	Arctic grayling	195	100	Female	Immature	1.35

3.4.3 Larval Drift Traps

3.4.3.1 Overview

In 2011, 1831 arctic grayling larvae (young of the year) along with 14 fish eggs were collected within the R02 reach studied (compared to 1136 larvae and 31 eggs in 2010). Larval drift traps (DT) A1 – A4

were placed downstream of a previously identified high value habitat area (natural spawning and nursing habitat). In total, 779 arctic grayling larvae were collected at DT A1 – A4 (Table 3-14). Drift traps B1 – B4 were placed downstream of the habitat compensation area. In total, 704 arctic grayling larvae were collected in these traps. Drift traps C1 – C3 were placed downstream of DT B1 – B4 but upstream of the R02 bridge abutment, and collected a total of 348 arctic grayling larvae. Larval drift traps A1 – A4, B1 – B4, and C1 – C3 were all placed in similar locations in 2007, 2008, 2009, 2010 and 2011. Maximum collection in one day occurred at drift trap A1, as in 2010.

Table 3-14: Total catch, average daily catch and maximum daily catch of arctic grayling larvae in drift traps at R02, 2011.

Drift Trap ID	Total	Average	Max
A1	248	10.33	109
A2	113	4.71	30
A3	186	7.75	34
A4	232	9.67	45
Total	779		
B1	235	9.79	74
B2	156	6.5	30
B3	117	4.88	19
B4	196	8.16	68
Total	704		
C1	98	4.08	24
C2	100	4.17	20
C3	150	6.25	37
C4	0	0	0
Total	348		

3.4.3.2 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). At R02, the peak larval drift catch occurred around June 27 in 2011, when the water temperature was 4-5°C (Figure 3-9). As was found in previous studies at R02, and 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, below the ice or immediately at ice off.

The 2011 larval drift trap results demonstrate that arctic grayling are successfully spawning near or within the R02 habitat compensation 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. 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 2011 from historical data (see Section 4.2.1).

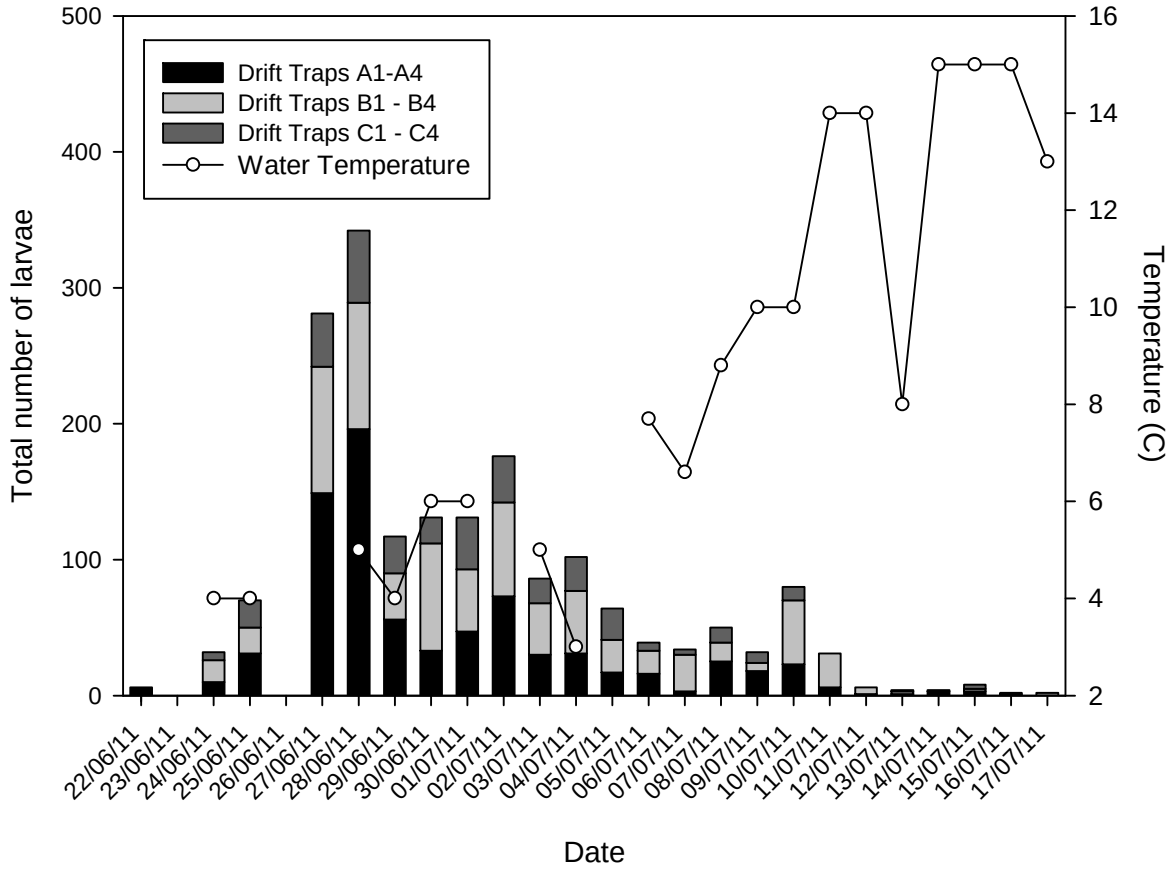

Figure 3-9: Water temperature and total number of arctic grayling larvae collected at drift trap areas A, B and C from June 22 – July 17, 2011.

SECTION 4 • HISTORICAL COMPARISON

4.1 ALL SITES

4.1.1 Adult Fish Population

By standardizing the catch at each crossing to the number of nets and number of days fished, trends of the expected population can be compared across years at each of the bridge crossings (Figure 4-1).Total relative catch at R02 generally declined from 2005 to 2008 (considered to be a poor catch year overall), and then increased to its highest observed catch in 2011, at 2.43 fish/net day. Total relative catch at R06 generally increased from 2005 to 2011, when it also achieved its highest observed catch at 2.36 fish/net day. Total relative catch at R09 declined from 2005 until 2008, and since then has remained constant at about 1 fish per net day. Population data was not collected at this site in 2007. The highest relative catch was recorded at R09 in 2005, with 103 arctic grayling caught in one net in 21 days from June 28 – July 19. Total relative catch at R15 has remained comparatively low and nearly constant since 2005, with a maximum value of 0.36 fish/net day in 2009. Overall, total fish migrations at all four crossings have either increased slightly or remained near constant since road construction in 2008, indicating that the HADDs that occurred in these areas are not significantly affecting fish populations.

It should be noted that in this case, longer study periods involve a greater proportion of days on which fewer fish are migrating. If the study continues beyond the actual migration period, the total number of fish per trap day is artificially low when compared with shorter studies conducted only while migration is occurring. This potentially confounding factor is not taken into account here.

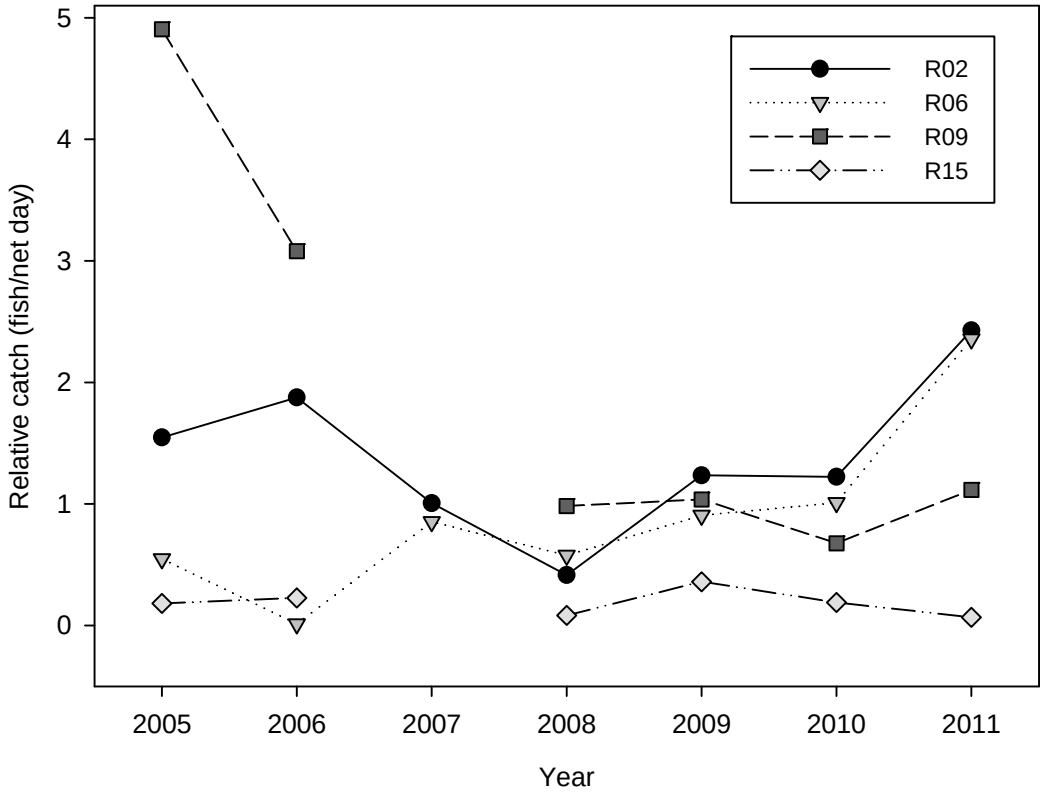

Figure 4-1: Total relative catch (fish caught per net per study day) at road crossings R02, R06, R09 and R15 from 2006 to 2011. Note that R09 and R15 were not assessed in 2007.

4.1.2 Condition Factor

Condition factors for years 2006 – 2011, sample size and results of the Tukey's test are shown in Figures 4-2 – 4-5. In 2011, a slight decrease in condition factor compared to 2010 was found at all crossings, but generally the values observed were within the range of variability seen since 2006. Statistically, condition factors in 2011 were not different from baseline values, except for crossing R09 where a significantly higher value was found in 2011 than in 2006 (Tukey's test, q=4.683, p=0.008), which only had a sample size of 2. At R02, the K-factor in 2010 was significantly higher than 2011 (Tukey's test, q=4.389, p=0.023), but 2011 was not different from any other year. At R06, there were no significant differences between any years (ANOVA, F=1.739, p=0.124). At R15, the K-factor in 2010 was significantly higher than the value found in 2006, 2009 and 2011 (Tukey's test, q = 4.676, 7.240, 4.169, respectively; p = 0.014, <0.001, 0.037, respectively), but 2011 was not different from 2006 or 2007.

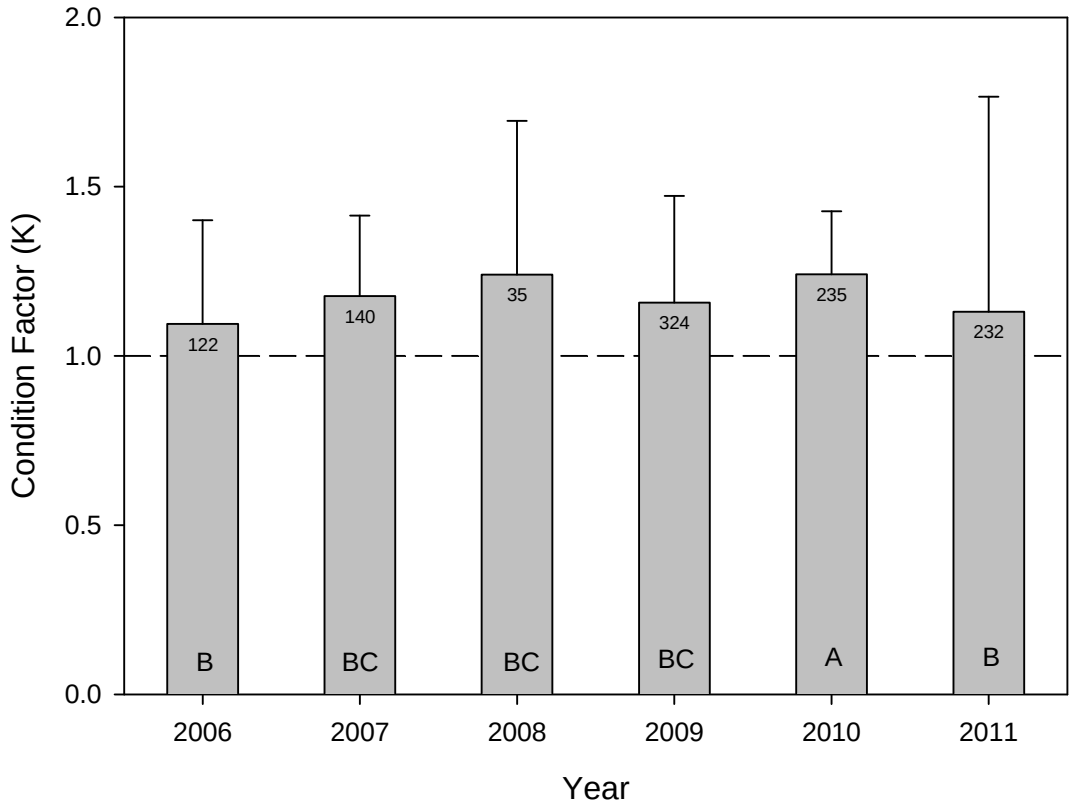

Figure 4-2: Average condition factor of arctic grayling at R02. Error bars are standard deviation. Values at top of bars are sample size. Letters at base of bars designate results of the Tukey's Test.

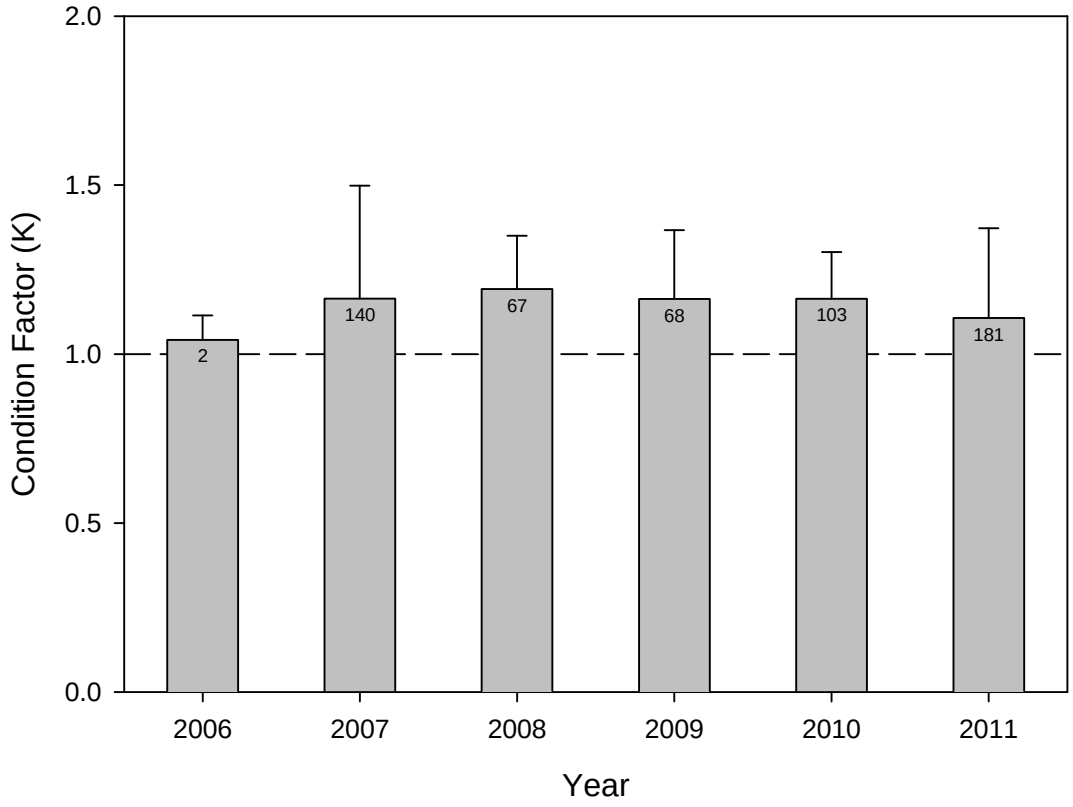

Figure 4-3: Average condition factor of arctic grayling at R06. Error bars are standard deviation. Values in bars are sample size. Tukey's Test found no significant differences between years.

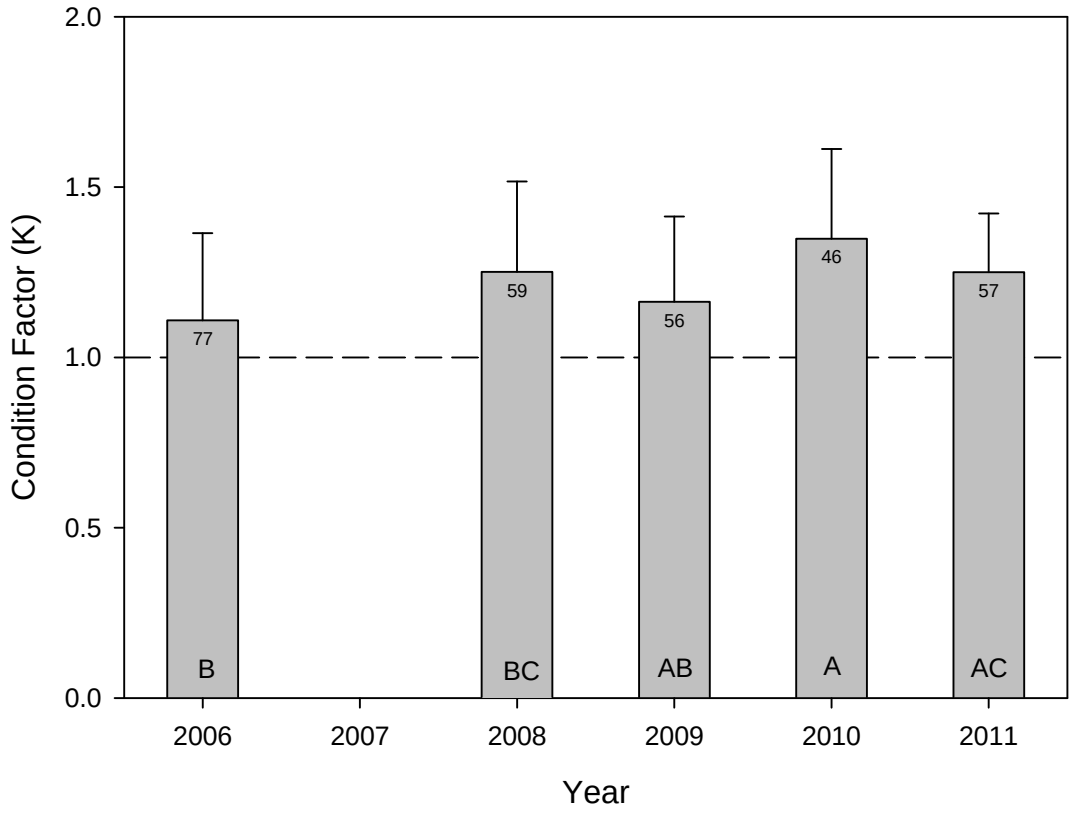

Figure 4-4: Average condition factor of arctic grayling at R09. Error bars are standard deviation. Values at top of bars are sample size. Letters at base of bars designate results of the Tukey's Test.

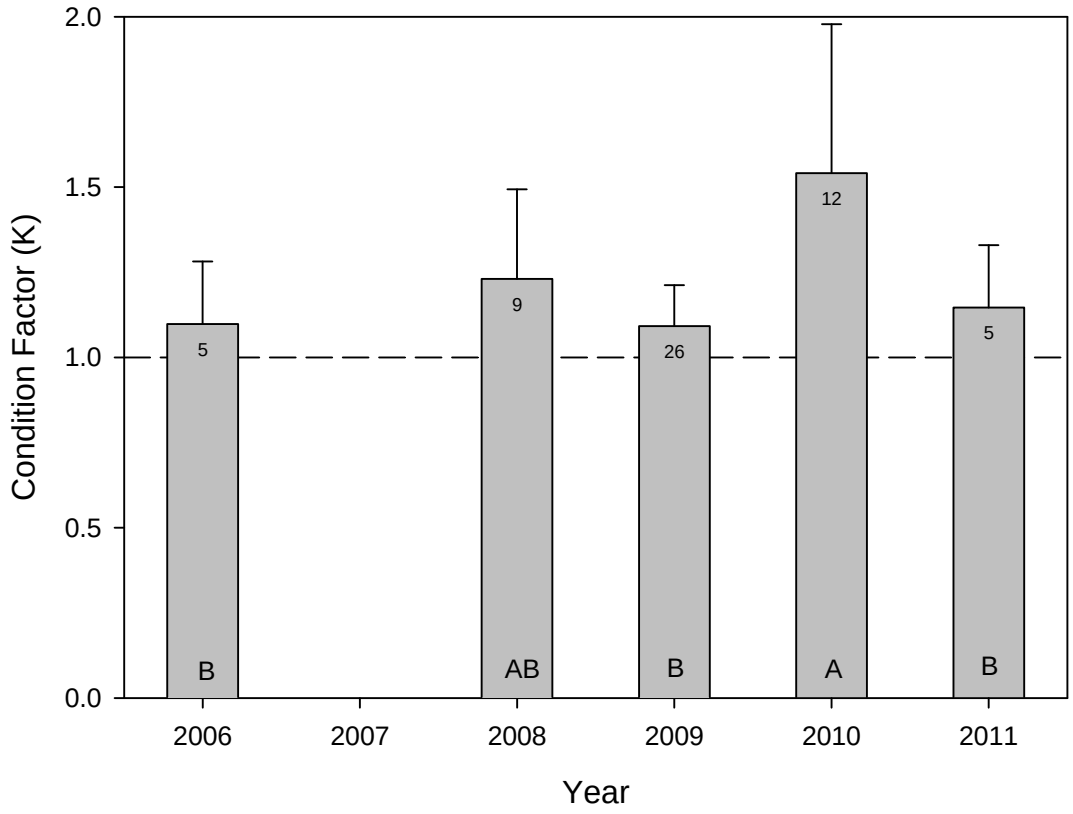

Figure 4-5: Average condition factor of arctic grayling at R15. Error bars are standard error. Values at top of bars are sample size. Letters at base of bars designate results of the Tukey's Test.

4.2 POPULATION TRENDS AT R02

Since 2005, various numbers of hoopnets, traps and dates of monitoring have been used at R02 (Table 4-1). As with the adult fish population, the larval drift observed at R02 in annual monitoring programs can be compared if values are standardized to the number of traps and number of days monitored. Although the effect of study duration was not taken into account for the adult population (as described in Section 4.1), its effect on relative larval drift counts is more pronounced. In 2006, 2008 and 2011, the larval drift monitoring period was about 24 days, from mid-late June to mid-late July (e.g. June 22 – July 17, 2011). However, in 2007, 2009 and 2010, the trapping period was extended to late July or early August, and was 37 – 45 days long. In late July of each year, larval drift was essentially reduced to nil, and including these days in the total relative count distorts values in 2007, 2009 and 2010 compared to other years. In order to make a more appropriate comparison, the first 24 days of each monitoring period were examined, because that was the shortest time frame studied. In 2005, no arctic grayling larvae were collected at R02, likely because only one drift trap was set and trapping began at least 5 days later than other years. This is not considered to be a representative sample, so is excluded from the comparison.

Table 4-1: Introduction and final removal dates of hoopnets and drift traps, maximum number of nets used during that time, and total number of net days (equivalent number of days if one net was used) at R02 from 2005 to 2011. Note that nets were not necessarily set continuously between the dates displayed, and that periods of removal are accounted for in determining # net days.

	2005	2006	2007	2008	2009	2010	2011
Hoopnets							
Date in	Jun 29	Jun 24	Jun 24	Jun 17	Jun 26	Jun 25	Jun 24
Date out	Jul 20	Jul 19	Jul 20	Jul 16	Aug 02	Aug 01	Jul 19
Max # nets	2	2	5	5	9	6	6
# net days	64	65	139	84	262	192	105
Drift Traps							
Date in	Jun 29	Jun 24	Jun 23	Jun 21	Jun 24	Jun 24	Jun 22
Date out	Jul 17	Jul 19	Jul 29	Jul 16	Aug 07	Aug 01	Jul 17
Max # traps	1	2	7	8	9	12	12
# trap days	19	46	259	160	405	468	288

4.2.1 Larval Arctic Grayling

In total, the number of arctic grayling larvae caught at R02 in 2009 – 2011 was higher than in any year before the compensation structure was built, indicating increased spawning within this stream reach (Figure 4-6).

Although it is difficult to justify a comparison between drift trap sites due to the size of the stream relative to the size of the traps and the larvae, larval drift trap collection upstream and downstream of the constructed spawning pad is presented in Figure 4-6. Drift traps A and B were situated immediately downstream of a natural spawning area (A) and the constructed spawning area (B), while drift trap area C was further downstream. As expected, drift trap area C had the lowest catch of arctic grayling larvae (95, 225 and 348 larvae total (day 1-24) in 2009, 2010 and 2011, respectively), although the total catch here did increase from 2009 – 2011. Lower catches likely occur at this trap site because larvae hatched upstream are dispersed across the width of the channel by the time they reach this point. Drift trap area B (immediately downstream of the constructed spawning pad), had the highest catch of the reach in 2009 and 2010 (233 and 531 larvae, respectively, for day 1-24). It is suggested that these data demonstrates successful use of the constructed spawning area. In 2011, drift trap A, which is upstream of the constructed spawning pad, had the highest catch for the year at 779 larvae (day 1-24). Since the catch at area B also increased in 2011 compared to 2010, the higher catch at area A does not necessarily indicate a reduction in use of the constructed spawning pad, but rather an increase in use of the natural spawning area. This may have been due to a reduction in competition for spawning sites in the vicinity as a result of spawning pad construction.

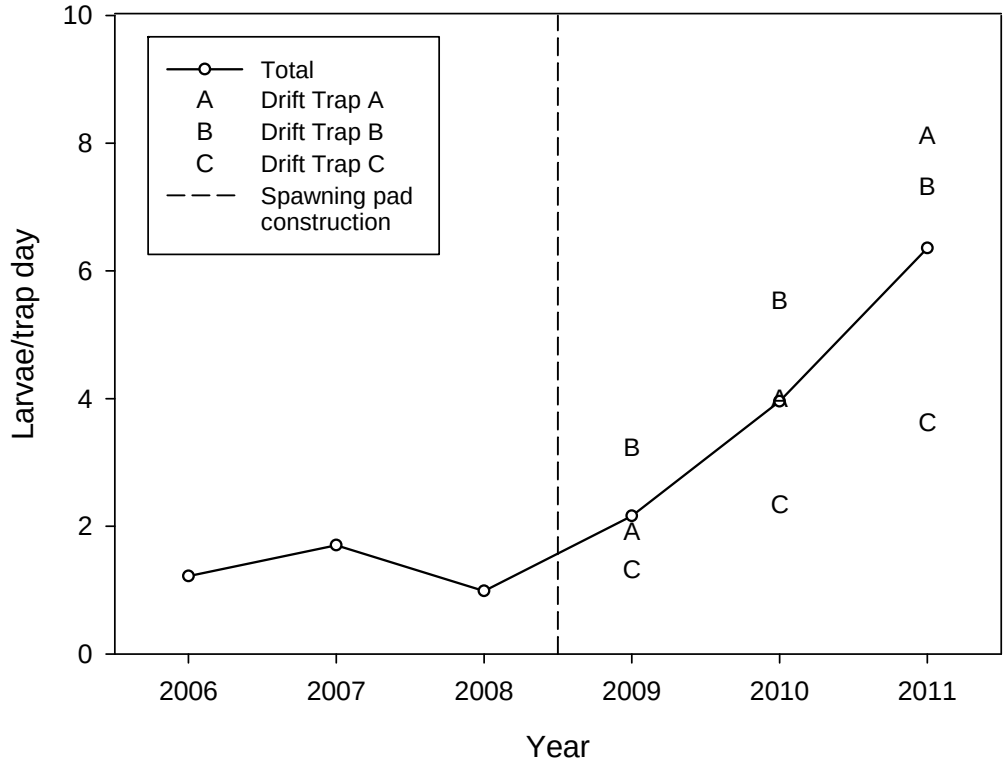

Figure 4-6: Total relative larval drift count (# larvae/trap day for the first 24 study days), and relative larval drift count upstream and downstream of the constructed spawning pad area at R02 from 2006 to 2011.

4.2.2 Population Structure Pre- and Post-construction

Relative counts (fish/net day) of larvae, immature fish and spawning fish from 2006 to 2011 are shown in Figure 4-7. In 2008 only 38 adult arctic grayling were caught at R02 and maturity information was not recorded, so data from this year is not available. As described above, the number of larvae caught per trap day increased steadily from 2008 to 2011. The total relative number of immature fish also increased annually from 2009 to 2011. Interestingly, while the number of spawning fish (ready or spent) caught per net day was greater than the number of immature fish from 2006 to 2009, this relationship was reversed in 2010 and 2011 (with no change in monitoring equipment). These observations may indicate that the construction of the spawning pad compensation area is allowing an increase in the number of successful spawning events, leading to higher numbers of larvae, and more immature fish returning to this reach.

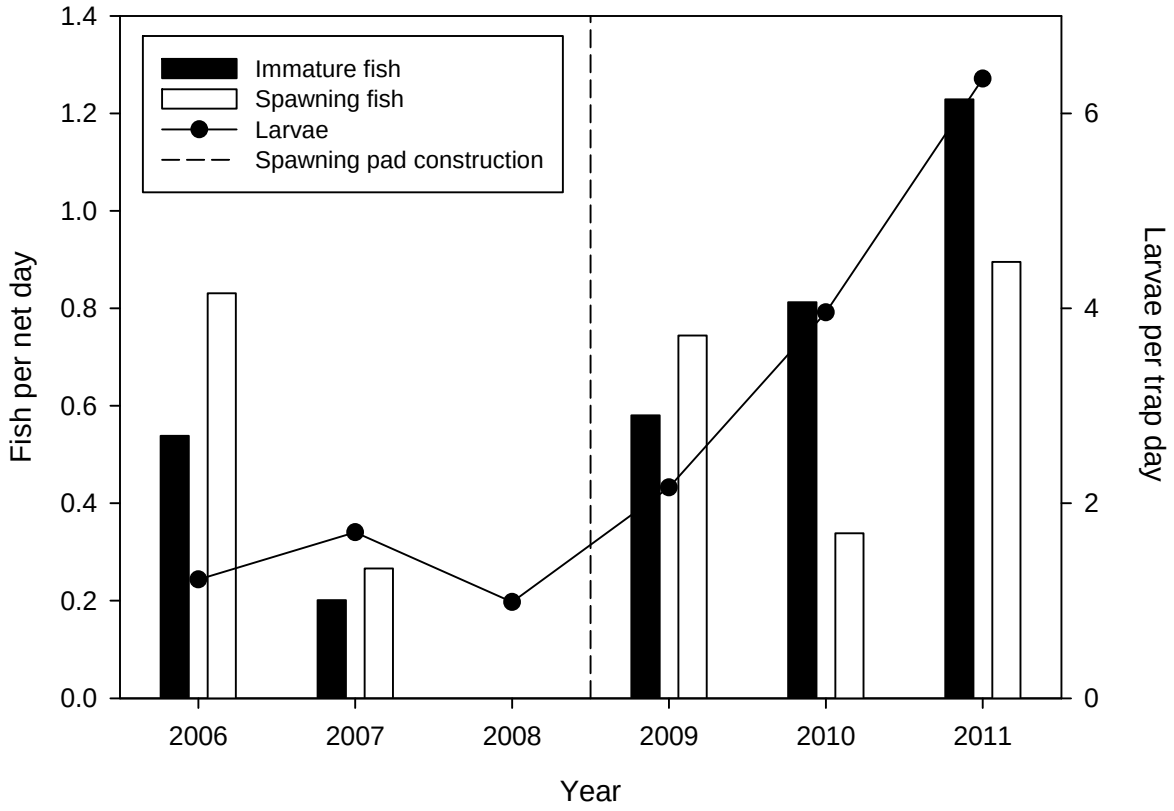

Figure 4-7: Number of immature fish and spawning fish (maturity = ready or spent) per net day, and number of larvae per trap day from 2005 – 2011 at R02.

SECTION 5 • CONCLUSIONS

5.1 FISH PASSAGE AND MOVEMENTS

Similar to historical fisheries monitoring along the AWPAR, the 2011 data demonstrates that arctic grayling pass by the bridge to complete their annual spawning migration and a few individuals of other species opportunistically pass within the study reaches.

Measurements of water velocity continue to demonstrate that the bridge structures have not increased flow to speeds beyond recognized swimming capabilities of grayling. Maximum and average stream velocities are within cited arctic grayling burst speeds and sustained speeds, respectively (MOT, 2006).

As in previous years, actual peak spawning migration likely occurred just prior to the installation of hoopnets on June 19th, because peak larval drift at R02 occurred four days after hoopnet installation and four days before the observed peak adult upstream migration. According to Evans et al. (2002) arctic grayling commonly complete a post-spawning run, which is likely the event observed in the AWAR monitoring each year. Due to ice and weather conditions, nets cannot be set earlier, and is suspected that the peak migration occurs under ice cover when the thalwag is nearly entirely thawed. However, the post-spawning run data can still be compared across years to determine relative growth of the population. The relative numbers of arctic grayling captured at R02 and R06 were higher in 2011 than in any year since monitoring began, including the years before road construction. Relative catch has been steady at R09 since 2008, and at R15 since monitoring began in 2005.

Based on condition factors and length-frequency histograms, the arctic grayling populations appear to be healthy at R02, R06, R09 and R15. In 2011, condition factors at all crossings were lower than 2010, but none were significantly different from baseline values. The length-frequency histograms were near-normally distributed at crossings R02 and R06, and right-skewed (a greater number of smaller fish) at R09. Very low catches (4 grayling) occurred at R15. All of these distributions are in accordance with historical patterns and indicate that recruitment of juveniles into upper size classes is occurring.

5.2 R02 HABITAT COMPENSATION

Based on observations from 2011 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 spawning pad berms are providing refugia from swift currents and depths suitable for arctic grayling spawning.

Although the success of the compensation area is difficult to quantify and provide statistical validation, however the larval drift data provides evidence of increased arctic grayling spawning in this reach since the spawning pads were constructed. Comparing equal catch per unit effort, the number of larvae caught throughout the R02 reach has increased every year since 2009 at both natural and constructed spawning areas. Moreover, the increasing number of larvae caught immediately downstream of the spawning pads indicates growing use and suitable spawning conditions at the R02 compensation area. This conclusion is supported by the increasing numbers of immature fish in the R02 reach since spawning pad construction.

SECTION 6 • REFERENCES

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APPENDIX A:

2010 RAW MONITORING DATA

FEBRUARY 2012

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
24-Jun-10	**5:36pm**	R02A	4	0.575	US	ARGR	36	90214	304	295	M7	-	-
24-Jun-10	**5:36pm**	R02A	4	0.575	US	ARGR	35	90213	310	340	M7	-	-
24-Jun-10	**5:36pm**	R02A	4	0.575	US	ARGR	32	90209	331	405	F4	-	-
24-Jun-10	**5:36pm**	R02A	4	0.575	US	ARGR	33	90211	338	450	F4	-	-
24-Jun-10	**5:36pm**	R02A	4	0.575	US	ARGR	31	90010	350	500	M7	PYRC	-
24-Jun-10	**5:36pm**	R02A	4	0.575	US	ARGR	34	90212	350	420	M7	-	-
24-Jun-10	**5:36pm**	R02B	4	0.575	US	-	-	-	-	-	-	-	No fish
24-Jun-10	**9:56am**	R06	4	0.64	US	ARGR	26	90201	295	320	F2	-	-
25-Jun-10	**2:24pm**	R15	6	0.75	US	-	-	-	-	-	-	-	No fish
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	8	90186	241	165	F3	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	7	90185	242	191	F3	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	3	90178	249	175	M7	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	6	90183	254	203	F3	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	1	90176	257	215	F3	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	2	90177	258	219	F4	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	4	90179	259	225	F4	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	5	90180	263	210	M7	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	10	86875	313	355	M7	PYRC	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	11	90188	314	370	M7	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	9	90187	341	490	F4	-	-
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	12	-	-	-	-	-	Lost in Transfer
20-Jun-11	**12:00pm**	R09	4	0.49	US	ARGR	13	-	-	-	-	-	Lost in Transfer
21-Jun-11	**10:20am**	R06	3	0.7	US	ARGR	16	90191	317	390	M7	-	-
21-Jun-11	**10:20am**	R06	3	0.7	US	ARGR	18	90194	347	590	F4	-	-
21-Jun-11	**10:20am**	R06	3	0.7	US	ARGR	17	90192	372	600	M7	-	-
21-Jun-11	**10:20am**	R06	3	0.7	US	ARGR	19	90196	378	610	M7	-	-
21-Jun-11	**10:20am**	R09	3	0.425	US	-	-	-	-	-	-	-	-
21-Jun-11	**10:20am**	R09	3	0.425	DS	ARGR	15	90190	288	280	M7	-	-
21-Jun-11	**10:20am**	R09	3	0.425	DS	ARGR	14	90189	318	375	M7	-	-
21-Jun-11	**9:30am**	R15	3	0.845	US	-	-	-	-	-	-	-	No fish

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
22-Jun-11	**10:15am**	R09	3	0.39	US	ARGR	21	-	189	100	F1	-	-
22-Jun-11	**10:15am**	R09	3	0.39	US	ARGR	22	-	205	110	F1	-	-
22-Jun-11	**10:15am**	R09	3	0.39	US	ARGR	20	90198	254	220	M8	-	-
22-Jun-11	**12:20pm**	R06	3	0.675	US	ARGR	23	90200	367	470	M7	-	-
22-Jun-11	**12:20pm**	R06	3	0.675	US	ARGR	24	-	-	-	-	-	Lost in Transfer
22-Jun-11	**9:30am**	R15	3	0.8	US	-	-	-	-	-	-	-	-
23-Jun-11	**11:45am**	R15	3	0.78	US	-	-	-	-	-	-	-	No fish
23-Jun-11	**12:30pm**	R09	4	0.315	US	-	-	-	-	-	-	-	No fish
23-Jun-11	**12:30pm**	R09	4	0.315	DS	-	-	-	-	-	-	-	No fish
23-Jun-11	**2:45pm**	R06	5	0.65	US	ARGR	25	78162	334	375	M10	PYRC	-
24-Jun-11	**2:52pm**	R15	5	0.75	US	-	-	-	-	-	-	-	No fish
24-Jun-11	**4:04pm**	R09	6	0.28	US	ARGR	27	90203	244	220	F2	-	-
24-Jun-11	**4:04pm**	R09	6	0.28	US	ARGR	28	90205	300	281	M7	-	-
24-Jun-11	**4:11pm**	R09	6	0.28	US	ARGR	30	90208	262	240	F3	-	-
24-Jun-11	**4:11pm**	R09	6	0.28	US	ARGR	29	90206	283	300	M7	-	-
25-Jun-11	**3:00pm**	R09	5	0.25	US	ARGR	38	-	262	250	M10	-	-
25-Jun-11	**3:00pm**	R09	5	0.25	DS	ARGR	39	-	-	-	-	-	Lost in Transfer
25-Jun-11	**3:00pm**	R09	5	0.25	US	LT	37	-	562	-	-	-	-
25-Jun-11	**4:14pm**	R06	4	0.61	US	ARGR	40	78161	263	220	F5	PYRC	-
25-Jun-11	**4:14pm**	R06	4	0.61	US	ARGR	42	90215	299	280	M8	-	-
25-Jun-11	**4:14pm**	R06	4	0.61	US	ARGR	41	85199	369	600	F4	PYRC	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	53	-	221	140	F1	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	54	-	243	160	F1	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	47	90220	275	220	M7	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	52	90227	279	260	F4	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	48	90223	280	280	M8	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	51	90226	281	250	F3	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	50	90225	285	280	M7	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	49	90224	291	300	M8	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	55	90228	301	300	M7	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	45	90219	304	340	M7	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	46	90037	304	310	M7	PYRC	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	43	90217	315	335	M7	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	44	90218	315	450	F4	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	56	90229	320	365	F2	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	58	90231	335	500	F4	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	57	90230	340	450	F4	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	59	90232	349	500	F4	-	-
25-Jun-11	**5:18pm**	R02A	4	0.525	US	ARGR	60	90234	381	690	F4	-	-
25-Jun-11	**6:25pm**	R02B	4	0.525	US	ARGR	62	90235	295	300	M7	-	-
25-Jun-11	**6:25pm**	R02B	4	0.525	US	ARGR	61	90914	326	420	F2	PYRC	-
26-Jun-11	**2:45pm**	R15	6	0.72	US	ARGR	63	90238	343	420	M7	-	-
26-Jun-11	**2:45pm**	R15	6	0.72	US	ARGR	64	90874	356	410	M7	PYRC	-
26-Jun-11	**3:30pm**	R09	6	0.25	US	-	-	-	-	-	-	-	No fish
26-Jun-11	**3:30pm**	R09	6	0.25	DS	LT	65	-	562	-	-	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	69	90240	235	170	F1	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	66	90237	295	250	M7	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	70	90241	320	420	M7	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	71	90242	329	370	M7	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	68	90239	339	425	F2	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	72	90243	340	490	F2	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	67	90238	342	450	M7	-	-
26-Jun-11	**4:30pm**	R06	6	0.61	US	ARGR	73	90244	365	590	M7	-	-
27-Jun-11	**1:30pm**	R15	4	0.7	US	ARGR	82	-	217	135	M6	-	-
27-Jun-11	**10:00am**	R02B	5	0.51	US	ARGR	78	90248	266	205	F3	-	-
27-Jun-11	**10:00am**	R02B	5	0.51	US	ARGR	80	90250	302	300	F4	-	-
27-Jun-11	**10:00am**	R02B	5	0.51	US	ARGR	79	90249	303	315	M7	-	-
27-Jun-11	**10:00am**	R02B	5	0.51	US	ARGR	77	90247	310	305	F2	-	-
27-Jun-11	**10:00am**	R02B	5	0.51	US	ARGR	81	90501	356	505	M7	-	-
27-Jun-11	**12:05pm**	R06	5	0.59	US	-	-	-	-	-	-	-	No fish

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
27-Jun-11	**12:40pm**	R09	5	0.228	US	-	-	-	-	-	-	-	No fish
27-Jun-11	**12:40pm**	R09	5	0.228	DS	-	-	-	-	-	-	-	No fish
27-Jun-11	**8:45am**	R02A	5	0.51	US	ARGR	74	90245	286	250	F3	-	-
27-Jun-11	**8:45am**	R02A	5	0.51	US	ARGR	75	90246	312	330	M7	-	-
27-Jun-11	**8:45am**	R02A	5	0.51	US	ARGR	76	-	-	-	-	-	Lost in Transfer
28-Jun-11	**1:10pm**	RO6	6	0.552	US	-	-	-	-	-	-	-	No fish
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	84	90503	286	240	M7	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	85	90504	290	318	M7	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	86	90505	295	326	M7	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	87	90235	295	300	M7	CYRC	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	83	90502	299	285	F4	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	89	90508	309	335	M7	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	90	90511	341	465	M7	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	88	90507	390	395	F2	-	-
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	ARGR	-	-	-	-	-	-	Lost in Transfer
28-Jun-11	**2:00pm**	RO2A	4	0.45	US	RWF	91	-	305	255	-	-	-
28-Jun-11	**2:00pm**	RO2B	4	0.45	US	-	-	-	-	-	-	-	No fish
28-Jun-11	**2:00pm**	RO2C	4	0.45	US	-	-	-	-	-	-	-	-
29-Jun-11	**10:00am**	R15	5	0.66	US	ARGR	93	-	220	120	F1	-	-
29-Jun-11	**10:00am**	R15	5	0.66	US	ARGR	92	-	224	150	M6	-	-
29-Jun-11	**10:00am**	R15	5	0.66	US	ARGR	94	-	-	-	-	-	Lost in Transfer
29-Jun-11	**11:05am**	R09	6	0.21	DS	-	-	-	-	-	-	-	No fish
29-Jun-11	**11:05am**	R09	6	0.21	US	LT	95	-	417	-	F3	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	101	-	203	100	M6	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	102	-	219	130	F1	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	98	-	225	120	M6	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	96	90512	265	205	F1	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	99	90516	273	240	F1	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	100	90517	275	250	F1	-	-
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	97	90514	283	250	M6	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
29-Jun-11	**12:20pm**	R06	5	0.552	US	ARGR	103	90518	341	380	M7	-	-
29-Jun-11	**2:00pm**	R02C	6	0.45	US	-	-	-	-	-	-	-	No fish
29-Jun-11	**2:30pm**	R02A	6	0.45	US	ARGR	106	90521	303	250	M10	-	-
29-Jun-11	**2:30pm**	R02A	6	0.45	US	ARGR	105	90520	310	304	M7	-	-
29-Jun-11	**2:30pm**	R02A	6	0.45	US	ARGR	104	90519	320	320	M7	-	-
29-Jun-11	**2:30pm**	R02A	6	0.45	US	ARGR	107	90522	325	320	F4	-	-
29-Jun-11	**2:30pm**	R02A	6	0.45	US	LT	108	-	376	500	M10	-	-
29-Jun-11	**2:30pm**	R02A	6	0.45	US	LT	109	-	423	-	M10	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	114	90525	240	160	F5	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	112	90523	248	160	M10	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	113	90524	258	170	F1	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	111	78188	278	260	F1	PYRC	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	115	90526	285	250	M6	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	116	90529	294	290	F2	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	117	90530	294	280	M7	-	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	110	90212	350	420	M7	CYRC	-
29-Jun-11	**3:00pm**	R02B	6	0.45	US	ARGR	118	90531	378	600	M7	-	-
30-Jun-11	**10:00am**	R15	5	0.64	US	-	-	-	-	-	-	-	No fish
30-Jun-11	**11:00am**	R09	4	0.21	DS	-	-	-	-	-	-	-	No fish
30-Jun-11	**11:00am**	R09	4	0.21	DS	ARGR	119	90533	312	350	M7	-	-
30-Jun-11	**11:00am**	R09	4	0.21	DS	ARGR	-	-	-	-	-	-	Lost in Transfer
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	127	90545	240	160	F3	-	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	123	90539	246	180	M6	-	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	122	90538	247	155	M6	-	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	126	90543	260	190	M8	-	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	124	90540	294	280	M10	-	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	120	78143	310	350	F2	PYRC	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	125	90541	316	310	F2	-	-
30-Jun-11	**12:20am**	R06	5	0.55	US	ARGR	121	90536	340	375	F2	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	128	-	222	100	M6	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	139	-	223	140	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	150	-	226	100	F1	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	138	-	228	145	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	145	-	228	120	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	142	-	229	145	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	144	-	229	110	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	136	-	234	150	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	146	90562	234	120	F1	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	152	90568	242	160	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	151	90567	244	150	F1	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	149	90566	246	150	F1	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	129	90547	249	160	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	135	90553	257	190	M10	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	147	90564	258	200	F1	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	130	90548	261	210	M6	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	148	90565	265	215	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	131	90550	274	220	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	141	90558	280	220	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	133	90551	283	220	F4	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	153	90569	285	230	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	134	90552	291	290	F2	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	137	90555	300	250	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	143	90559	304	320	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	154	90571	310	270	F3	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	156	90573	310	290	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	140	90556	314	320	F2	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	155	90572	318	330	M7	-	-
30-Jun-11	**2:00pm**	R02A	6	0.44	US	ARGR	132	90519	320	320	M7	CYRC	-
30-Jun-11	**2:00pm**	R02B	6	0.44	US	ARGR	-	-	-	-	-	-	No fish
30-Jun-11	**2:00pm**	R02C	6	0.44	US	ARGR	-	-	-	-	-	-	No fish

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
01-Jul-11	**2:30pm**	R15	4	0.65	US	-	-	-	-	-	-	-	No fish
01-Jul-11	**3:00pm**	R09	4	0.29	US	-	-	-	-	-	-	-	No fish
01-Jul-11	**3:00pm**	R09	4	0.29	DS	ARGR	160	-	221	120	M6	-	-
01-Jul-11	**3:00pm**	R09	4	0.29	DS	ARGR	158	90575	236	170	M10	-	-
01-Jul-11	**3:00pm**	R09	4	0.29	DS	ARGR	159	90576	249	180	M10	-	-
01-Jul-11	**3:00pm**	R09	4	0.29	DS	ARGR	157	90574	279	250	M7	-	-
01-Jul-11	**3:00pm**	R09	4	0.29	DS	ARGR	161	90577	319	400	M7	-	-
01-Jul-11	**3:00pm**	R09	4	0.29	DS	ARGR	-	-	-	-	-	-	Lost in Transfer
01-Jul-11	**4:00pm**	R06	4	0.58	DS	-	-	-	-	-	-	-	No fish
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	184	-	213	110	M6	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	181	90593	265	220	F3	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	178	90590	290	280	M10	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	182	90594	291	280	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	163	90237	295	270	M7	CYRC	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	176	90588	304	310	F3	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	169	90581	311	340	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	166	90541	315	335	F3	CYRC	
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	177	90589	320	310	M8	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	183	90595	320	300	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	165	78151	323	350	M7	PYRC	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	162	90578	324	400	F2	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	180	90592	325	345	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	164	85592	328	380	M7	PYRC	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	179	90591	334	390	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	171	90583	336	420	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	167	90579	342	390	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	170	90582	348	415	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	173	90585	351	460	F2	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	174	90586	359	510	M7	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	172	90584	366	440	M7	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	175	90587	368	510	F2	-	-
01-Jul-11	**4:00pm**	R06	4	0.58	US	ARGR	168	90580	400	320	M7	-	-
02-Jul-11	**1:00pm**	R02C	5	0.48	US	-	-	-	-	-	-	-	No fish
02-Jul-11	**1:30pm**	R02B	5	0.48	US	ARGR	185	90596	240	110	M6	-	-
02-Jul-11	**1:30pm**	R02B	5	0.48	US	ARGR	186	90597	268	200	F2	-	-
02-Jul-11	**10:00am**	R15	4	0.65	US	-	-	-	-	-	-	-	No fish
02-Jul-11	**10:45am**	R09	5	0.29	US	-	-	-	-	-	-	-	No fish
02-Jul-11	**10:45am**	R09	5	0.29	DS	ARGR	-	-	-	-	-	-	Lost in Transfer
02-Jul-11	**12:15pm**	R06	5	0.58	US	-	-	-	-	-	-	-	No fish
02-Jul-11	**12:15pm**	R06	5	0.58	DS	-	-	-	-	-	-	-	No fish
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	220	-	217	100	M6	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	218	-	219	100	F1	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	221	-	221	140	M6	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	215	90747	234	150	M6	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	219	-	240	140	M6	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	211	90743	250	165	M10	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	217	-	250	150	M6	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	213	90745	255	180	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	216	90748	260	170	F1	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	206	90738	263	155	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	205	90737	285	310	F5	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	209	90741	285	250	M10	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	212	90744	285	260	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	207	90739	289	250	F2	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	208	90740	290	250	F4	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	214	90746	293	260	F2	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	194	90600	298	270	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	200	90731	298	260	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	210	90742	299	270	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	198	90729	300	270	M7	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	203	90734	300	265	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	197	90728	305	350	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	199	90730	305	310	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	192	90520	309	300	M7	CYRC	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	191	90217	316	300	M7	CYRC	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	201	90732	316	340	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	193	90599	323	360	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	202	90733	325	310	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	196	90727	329	360	F4	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	190	90209	330	420	F2	CYRC	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	195	90726	334	400	F2	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	204	90736	370	430	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	ARGR	188	90598	395	750	M7	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	LT	187	-	443	-	-	-	-
02-Jul-11	**3:15pm**	R02A	5	0.48	US	WF	189	-	316	320	-	-	-
03-Jul-11	**2:30pm**	R09	5.5	0.26	US	-	-	-	-	-	-	-	No fish
03-Jul-11	**2:30pm**	R09	5.5	0.26	DS	ARGR	223	-	219	110	M6	-	-
03-Jul-11	**2:30pm**	R09	5.5	0.26	DS	ARGR	222	90749	295	300	M7	-	-
03-Jul-11	**3:30pm**	R06	5	0.6	US	-	-	-	-	-	-	-	No fish
03-Jul-11	**3:30pm**	R06	5	0.6	DS	ARGR	-	-	-	-	-	-	Lost in Transfer
03-Jul-11	**4:30pm**	R02B	5	0.48	US	ARGR	225	-	254	215	-	-	Dead in net
03-Jul-11	**4:30pm**	R02B	5	0.48	US	ARGR	224	90530	294	280	M7	CYRC	-
03-Jul-11	**5:15pm**	R02A	5	0.48	US	ARGR	229	-	212	110	M6	-	-
03-Jul-11	**5:15pm**	R02A	5	0.48	US	ARGR	228	90685	234	140	M6	-	PYRC/CYRC
03-Jul-11	**5:15pm**	R02A	5	0.48	US	ARGR	227	90686	254	190	M10	-	PYRC/CYRC
03-Jul-11	**5:15pm**	R02A	5	0.48	US	ARGR	226	90750	285	250	F3	-	-
05-Jul-11	**3:56pm**	R15	7.7	0.63	US	-	-	-	-	-	-	-	No fish
05-Jul-11	**3:56pm**	R15	7.7	0.63	DS	-	-	-	-	-	-	-	No fish
05-Jul-11	**3:56pm**	R15	7.7	0.63	US	-	-	-	-	-	-	-	No fish
05-Jul-11	**4:27pm**	R09	9.4	0.2	US	-	-	-	-	-	-	-	No fish

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
05-Jul-11	**4:27pm**	R09	9.4	0.2	DS	-	-	-	-	-	-	-	No fish
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	241	-	209	285	F4	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	249	-	222	95	-	-	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	DS	ARGR	230	-	231	135	F1	-	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	244	-	232	345	M9	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	246	-	253	145	M4	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	237	90543	260	205	M8	CYRC	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	247	-	260	190	M4	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	231	90593	269	240	F4	CYRC	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	236	-	270	220	M9	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	248	-	271	220	M7	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	245	-	280	260	F4	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	242	-	298	320	M9	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	239	-	306	300	M9	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	235	86456	319	300	F4	PYRC	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	240	-	319	325	M9	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	233	90589	320	330	M9	CYRC	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	238	78103	322	320	F4	PYRC	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	234	78144	345	380	M7	PYRC	-
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	243	-	398	270	M9	-	Tag gun broke
05-Jul-11	**5:23pm**	R06	5.5	0.55	US	ARGR	232	90580	400	320	M9	CYRC	-
05-Jul-11	**6:39pm**	R02A	7.7	0.5	US	ARGR	250	-	247	180	M6	-	Tag gun broke
05-Jul-11	**6:39pm**	R02B	7.7	0.5	US	-	-	-	-	-	-	-	No fish
05-Jul-11	**6:39pm**	R02B	7.7	0.5	US	-	-	-	-	-	-	-	No fish
05-Jul-11	**6:39pm**	R02B	7.7	0.5	DS	-	-	-	-	-	-	-	No fish
05-Jul-11	**6:39pm**	R02C	7.7	0.5	-	-	-	-	-	-	-	-	-
06-Jul-11	**10:30am**	R15	6.6	0.62	-	-	-	-	-	-	-	-	No fish
06-Jul-11	**11:45am**	R09	6.6	0.19	-	-	-	-	-	-	-	-	No fish
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	264	-	220	120	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	257	-	228	130	M6	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	263	-	233	140	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	258	90680	236	260	F2	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	261	-	240	150	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	262	-	240	150	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	256	-	244	140	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	DS	ARGR	251	90681	245	180	F1	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	255	-	250	160	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	254	90656	291	293	F5	PYRC	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	DS	ARGR	252	90682	305	320	F4	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	259	90679	336	430	F2	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	ARGR	260	90678	343	440	M6	-	-
06-Jul-11	**12:44pm**	R06	7.7	0.55	US	LT	265	-	396	205	-	-	
06-Jul-11	**12:44pm**	R06	7.7	0.55	DS	RWF	253	-	262	125	-	-	-
06-Jul-11	**2:20pm**	R02C	6.6	0.5	US	-	-	-	-	-	-	-	No fish
06-Jul-11	**2:30pm**	R02B	6.6	0.5	US	-	-	-	-	-	-	-	No fish
06-Jul-11	**3:12pm**	R02A	6.6	0.5	US	ARGR	266	-	204	80	F1	-	-
07-Jul-11	**1:30pm**	R02A	8.8	0.5	US	ARGR	275	-	231	130	M6	-	-
07-Jul-11	**1:30pm**	R02A	8.8	0.5	US	ARGR	273	87977	318	330	M9	-	-
07-Jul-11	**1:30pm**	R02A	8.8	0.5	US	RWF	274	-	320	300	-	-	-
07-Jul-11	**10:27am**	R15	10	0.61	US	LT	267	-	375	-	-	-	-
07-Jul-11	**10:27am**	R15	10	0.61	DS	LT	266	-	415	-	-	-	-
07-Jul-11	**11:00am**	R09	14.4	0.165	DS	-	-	-	-	-	-	-	No fish
07-Jul-11	**11:00am**	R09	14.4	0.165	US	-	-	-	-	-	-	-	No fish
07-Jul-11	**12:00pm**	R06	6.6	0.525	US	ARGR	272	-	238	120	M9	-	-
07-Jul-11	**12:00pm**	R06	6.6	0.525	US	ARGR	271	-	254	100	M9	-	-
07-Jul-11	**12:00pm**	R06	6.6	0.525	US	ARGR	270	90676	275	218	M9	-	-
07-Jul-11	**12:00pm**	R06	6.6	0.525	US	ARGR	269	90677	288	240	M9	-	-
07-Jul-11	**12:00pm**	R06	6.6	0.525	DS	LT	268	-	415	-	-	-	-
08-Jul-11	**1:30pm**	R15	-	-	-	-	-	-	-	-	-	-	Net Pulled
08-Jul-11	**2:24pm**	R09	10	0.15	-	-	-	-	-	-	-	-	No fish

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	283	-	220	100	M6	-	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	276	-	235	140	M6	-	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	280	90545	245	170	M9	CYRC	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	282	89987	250	180	F1	-	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	281	87986	261	200	M9	-	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	277	87982	266	200	M9	-	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	279	90237	295	260	M7	CYRC	-
08-Jul-11	**3:13pm**	R06	10	0.55	US	ARGR	278	87985	320	350	F4	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	ARGR	291	-	196	80	M6	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	ARGR	290	-	235	140	M6	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	ARGR	287	87989	248	190	F1	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	ARGR	289	-	250	140	M6	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	ARGR	286	87988	285	220	M8	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	ARGR	288	87990	289	250	M8	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	RWF	285	-	232	207	-	-	-
08-Jul-11	**4:26pm**	R02A	10	0.5	US	RWF	284	-	289	210	-	-	-
09-Jul-11	**10:11am**	R09	7.7	0.15	DS	-	-	-	-	-	-	-	No Fish
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	298	-	199	80	M6	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	299	-	205	100	M6	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	303	-	208	100	F1	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	300	-	215	100	M6	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	304	-	219	120	F1	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	US	ARGR	292	-	221	110	M6	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	302	-	239	100	F1	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	US	ARGR	297	87994	241	160	M6	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	US	ARGR	295	87993	245	160	F4	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	DS	ARGR	301	87995	264	180	F4	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	US	ARGR	293	87992	280	220	F4	-	-
09-Jul-11	**11:00am**	R06	7.7	0.475	US	ARGR	296	90682	310	320	F4	CYRC	-
09-Jul-11	**11:00am**	R06	7.7	0.475	US	ARGR	294	78103	320	310	F4	CYRC	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
09-Jul-11	**2:45pm**	R02A	10	0.475	US	RWF	305	-	250	130	-	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	ARGR	321	-	217	120	M6	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	ARGR	319	-	232	155	F1	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	ARGR	322	87996	242	175	F4	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	ARGR	320	-	244	180	M6	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	ARGR	318	90521	302	265	M9	CYRC	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	RWF	317	-	242	110	-	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	RWF	316	-	259	165	-	-	-
10-Jul-11	**1:30pm**	R02A	14	0.475	US	RWF	315	-	270	190	-	-	-
10-Jul-11	**11:00am**	R15	13	0.58	-	-	-	-	-	-	-	-	No fish
10-Jul-11	**11:50am**	R09	15	0.13	US	ARGR	306	-	205	100	M6	-	-
10-Jul-11	**11:50am**	R09	15	0.13	DS	ARGR	308	-	226	160	M6	-	-
10-Jul-11	**11:50am**	R09	15	0.13	US	RWF	307	-	326	240	-	-	-
10-Jul-11	**12:30pm**	R06	11	0.475	US	ARGR	314	-	204	80	F1	-	Dead in net
10-Jul-11	**12:30pm**	R06	11	0.475	US	ARGR	313	-	206	105	M8	-	-
10-Jul-11	**12:30pm**	R06	11	0.475	US	ARGR	309	-	210	100	F1	-	-
10-Jul-11	**12:30pm**	R06	11	0.475	US	ARGR	310	-	216	120	F1	-	-
10-Jul-11	**12:30pm**	R06	11	0.475	US	ARGR	311	-	225	130	F1	-	-
10-Jul-11	**12:30pm**	R06	11	0.475	US	ARGR	312	-	245	160	M6	-	-
11-Jul-11	**11:00am**	R06	12	0.45	US	ARGR	337	-	202	85	M6	-	-
11-Jul-11	**11:00am**	R06	12	0.45	US	ARGR	336	-	210	95	M6	-	-
11-Jul-11	**11:00am**	R06	12	0.45	US	ARGR	340	-	215	100	M1	-	-
11-Jul-11	**11:00am**	R06	12	0.45	US	ARGR	335	-	225	150	F1	-	-
11-Jul-11	**11:00am**	R06	12	0.45	US	ARGR	339	-	229	135	F1	-	-
11-Jul-11	**11:00am**	R06	12	0.45	DS	ARGR	334	87479	235	140	F1	-	-
11-Jul-11	**11:00am**	R06	12	0.45	DS	ARGR	332	-	237	120	M6	-	-
11-Jul-11	**11:00am**	R06	12	0.45	US	ARGR	338	87481	243	170	F1	-	-
11-Jul-11	**11:00am**	R06	12	0.45	DS	ARGR	333	87478	263	200	F1	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	356	-	208	100	M6	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	357	-	208	100	F1	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	353	-	212	100	F1	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	354	-	220	120	M6	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	358	-	222	120	M6	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	355	-	238	160	F1	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	351	87490	240	140	F1	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	352	-	240	140	F1	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	350	87489	250	180	M6	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	346	87488	257	175	M6	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	ARGR	345	87487	321	300	M9	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	DS	ARGR	344	87485	391	260	F3	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	RWF	347	-	240	75	-	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	RWF	349	-	263	185	M9	-	-
11-Jul-11	**12:00pm**	R02A	14	0.45	US	RWF	348	-	280	170	-	-	-
11-Jul-11	**12:00pm**	R02B	14	0.45	DS	ARGR	342	-	221	90	-	-	-
11-Jul-11	**12:00pm**	R02B	14	0.45	US	ARGR	341	87482	390	201	M7	-	-
11-Jul-11	**12:00pm**	R02C	14	0.45	DS	ARGR	343	-	225	120	M6	-	Dead in net
11-Jul-11	**9:30am**	R09	15	0.125	DS	ARGR	328	-	145	50	F1	-	-
11-Jul-11	**9:30am**	R09	15	0.125	DS	ARGR	327	-	191	80	F1	-	-
11-Jul-11	**9:30am**	R09	15	0.125	DS	ARGR	326	-	215	120	F1	-	-
11-Jul-11	**9:30am**	R09	15	0.125	US	ARGR	325	-	220	140	F1	-	-
11-Jul-11	**9:30am**	R09	15	0.125	DS	ARGR	329	-	230	140	F1	-	-
11-Jul-11	**9:30am**	R09	15	0.125	US	ARGR	324	-	232	140	F1	-	-
11-Jul-11	**9:30am**	R09	15	0.125	US	ARGR	323	87476	251	215	M9	-	-
11-Jul-11	**9:30am**	R09	15	0.125	DS	ARGR	330	87477	277	220	F4	-	-
11-Jul-11	**9:30am**	R09	15	0.125	DS	ARGR	331	-	327	220	-	-	-
12-Jul-11	**10:50am**	R02B	8	0.425	DS	ARGR	381	-	238	150	F1	-	-
12-Jul-11	**10:50am**	R02B	8	0.425	US	ARGR	385	-	240	120	M6	-	-
12-Jul-11	**10:50am**	R02B	8	0.425	US	ARGR	383	-	243	130	M6	-	-
12-Jul-11	**10:50am**	R02B	8	0.425	US	ARGR	384	-	255	170	F4	-	-
12-Jul-11	**10:50am**	R02B	8	0.425	DS	ARGR	380	87498	314	330	F4	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
12-Jul-11	**10:50am**	R02B	8	0.425	US	LT	382	-	355	440	-	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	389	-	95	90	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	397	-	212	100	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	393	-	220	110	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	396	-	220	110	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	DS	ARGR	386	-	228	115	M6	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	390	-	232	120	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	387	-	233	170	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	391	-	240	140	F1	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	394	-	240	90	M6	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	395	87500	245	180	F4	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	ARGR	392	87499	290	250	F4	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	LT	388	-	355	420	-	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	RWF	398	-	312	290	-	-	-
12-Jul-11	**11:33am**	R02A	8	0.425	US	RWF	399	-	325	260	-	-	-
12-Jul-11	**8:57am**	R09	15	0.11	DS	ARGR	361	-	217	130	F1	-	Dead in net
12-Jul-11	**8:57am**	R09	15	0.11	DS	ARGR	359	87476	254	210	M9	CYRC	-
12-Jul-11	**8:57am**	R09	15	0.11	DS	ARGR	362	87493	265	250	M9	-	-
12-Jul-11	**8:57am**	R09	15	0.11	DS	ARGR	360	87491	314	335	M9	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	375	-	200	17	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	374	-	204	80	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	377	-	208	80	M6	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	376	-	210	90	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	379	-	215	80	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	372	-	220	140	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	373	-	223	90	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	378	-	225	120	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	DS	ARGR	364	-	230	140	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	365	90240	234	170	F1	CYRC	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	371	-	235	150	M6	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	370	87497	236	220	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	363	-	241	150	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	368	87494	254	200	F1	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	369	87496	295	270	F4	-	-
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	367	78103	320	320	F4	PYRC	CYRC
12-Jul-11	**9:45am**	R06	11	0.45	US	ARGR	366	78142	323	350	F4	PYRC	-
13-Jul-11	**1:42pm**	R02A	15	0.41	US	ARGR	424	-	213	90	M6	-	Dead in net
13-Jul-11	**1:42pm**	R02A	15	0.41	US	ARGR	426	-	217	85	M6	-	-
13-Jul-11	**1:42pm**	R02A	15	0.41	US	ARGR	425	-	223	90	F1	-	-
13-Jul-11	**1:42pm**	R02A	15	0.41	DS	ARGR	429	-	239	165	M6	-	-
13-Jul-11	**1:42pm**	R02A	15	0.41	US	ARGR	427	90760	240	160	M6	-	-
13-Jul-11	**1:42pm**	R02A	15	0.41	US	ARGR	428	90530	292	275	M9	CYRC	-
13-Jul-11	**1:42pm**	R02A	15	0.41	DS	RWF	430	-	280	-	-	-	Dead in net
13-Jul-11	**1:42pm**	R02A	15	0.41	DS	RWF	431	-	315	-	-	-	Dead in net
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	412	-	196	75	M6	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	418	-	200	80	M6	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	409	-	203	100	F1	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	416	-	204	95	F1	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	414	-	205	110	F1	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	417	-	205	90	F1	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	411	-	207	90	F1	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	407	90753	228	145	F1	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	415	90759	235	145	M6	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	413	90758	241	155	M10	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	410	90757	251	170	F4	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	408	90756	264	185	M9	-	-
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	419	-	-	-	-	-	Lost in Transfer
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	420	-	-	-	-	-	Lost in Transfer
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	421	-	-	-	-	-	Lost in Transfer
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	422	-	-	-	-	-	Lost in Transfer

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
13-Jul-11	**10:50am**	R06	13	0.45	US	ARGR	423	-	-	-	-	-	Lost in Transfer
13-Jul-11	**3:18pm**	R02B	15	0.41	DS	ARGR	433	-	206	120	F1	-	-
13-Jul-11	**3:18pm**	R02B	15	0.41	DS	ARGR	434	-	221	130	F1	-	-
13-Jul-11	**3:18pm**	R02B	15	0.41	DS	ARGR	432	-	225	130	F1	-	-
13-Jul-11	**3:18pm**	R02B	15	0.41	DS	ARGR	435	-	240	150	M6	-	-
13-Jul-11	**3:18pm**	R02B	15	0.41	DS	ARGR	436	-	-	-	-	-	Lost in Transfer
13-Jul-11	**3:18pm**	R02B	15	0.41	DS	ARGR	437	-	-	-	-	-	Lost in Transfer
13-Jul-11	**9:06am**	R09	14	0.105	DS	ARGR	404	-	202	90	F1	-	Dead in net
13-Jul-11	**9:06am**	R09	14	0.105	US	ARGR	403	-	210	120	M6	-	Dead in net
13-Jul-11	**9:06am**	R09	14	0.105	US	ARGR	401	-	222	120	F1	-	-
13-Jul-11	**9:06am**	R09	14	0.105	US	ARGR	400	90751	251	180	F5	-	-
13-Jul-11	**9:06am**	R09	14	0.105	DS	ARGR	406	90752	256	190	F4	-	-
13-Jul-11	**9:06am**	R09	14	0.105	DS	ARGR	405	87493	265	250	M9	CYRC	-
13-Jul-11	**9:06am**	R09	14	0.105	US	LT	402	-	414	-	-	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	448	-	198	59	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	DS	ARGR	440	-	201	90	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	442	-	201	85	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	443	-	201	89	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	445	-	208	105	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	452	-	215	105	M6	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	450	-	216	130	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	DS	ARGR	441	-	220	130	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	444	-	223	135	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	446	-	223	110	M6	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	449	-	223	125	F1	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	447	-	230	140	M6	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	451	90761	237	178	M6	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	453	90762	260	205	M9	-	-
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	454	-	-	-	-	-	Lost in Transfer
14-Jul-11	**10:35am**	R06	13	0.425	US	ARGR	455	-	-	-	-	-	Lost in Transfer

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	459	-	209	110	F1	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	461	-	210	105	F1	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	467	-	210	125	M6	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	466	-	211	105	F1	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	458	-	217	135	M6	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	456	-	220	105	M6	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	460	-	224	110	M6	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	463	90766	227	150	F1	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	462	90764	229	155	M6	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	457	90763	246	150	M6	-	-
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	464	-	-	-	-	-	Lost in Transfer
14-Jul-11	**11:45am**	R02C	14	0.39	DS	ARGR	465	-	-	-	-	-	Lost in Transfer
14-Jul-11	**12:42pm**	R02B	15	0.39	DS	ARGR	470	-	210	110	F1	-	-
14-Jul-11	**12:42pm**	R02B	15	0.39	DS	ARGR	469	-	220	130	F1	-	-
14-Jul-11	**12:42pm**	R02B	15	0.39	DS	ARGR	468	-	235	140	M6	-	-
14-Jul-11	**12:42pm**	R02B	15	0.39	DS	LT	472	-	460	-	-	-	-
14-Jul-11	**12:42pm**	R02B	15	0.39	DS	RWF	471	-	356	-	-	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	DS	ARGR	473	-	203	110	M6	-	Dead in net
14-Jul-11	**2:20pm**	R02A	15	0.39	US	ARGR	483	-	214	120	M6	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	US	ARGR	482	-	216	130	M6	-	Dead in net
14-Jul-11	**2:20pm**	R02A	15	0.39	US	ARGR	486	-	217	115	F1	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	DS	ARGR	475	-	221	140	F1	-	Dead in net
14-Jul-11	**2:20pm**	R02A	15	0.39	DS	ARGR	476	-	221	90	M6	-	Dead in net
14-Jul-11	**2:20pm**	R02A	15	0.39	DS	ARGR	477	-	228	150	M6	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	DS	ARGR	474	-	239	150	F1	-	Dead in net
14-Jul-11	**2:20pm**	R02A	15	0.39	US	ARGR	485	90769	242	150	M6	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	US	ARGR	484	90768	260	180	F5	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	US	RWF	478	-	223	-	-	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	US	RWF	479	-	309	-	-	-	-
14-Jul-11	**2:20pm**	R02A	15	0.39	US	RWF	480	-	326	-	-	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
14-Jul-11	**2:20pm**	R02A	15	0.39	US	RWF	481	-	327	-	-	-	-
14-Jul-11	**9:17am**	R09	14	0.1	DS	ARGR	439	-	204	90	F1	-	-
14-Jul-11	**9:17am**	R09	14	0.1	DS	ARGR	438	-	217	145	F1	-	Dead in net
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	504	-	200	110	F1	-	-
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	500	-	210	110	F1	-	Dead in net
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	498	-	215	110	F1	-	Dead in net
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	499	-	218	130	F1	-	Dead in net
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	501	-	232	130	F1	-	-
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	503	90772	232	150	F1	-	-
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	502	90771	242	156	F1	-	-
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	ARGR	505	-	-	-	-	-	Dead in net
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	LT	506	-	-	-	-	-	Dead in net
15-Jul-11	**1:09pm**	R02C	15	0.375	DS	RWF	507	-	-	-	-	-	Dead in net
15-Jul-11	**10:42am**	R09	15	0.09	US	ARGR	487	-	-	-	-	-	Dead in net
15-Jul-11	**10:42am**	R09	15	0.09	US	ARGR	488	-	-	-	-	-	Lost in Transfer
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	495	-	200	95	F1	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	494	-	205	85	F1	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	490	-	212	90	F1	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	493	-	216	100	F1	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	492	-	217	115	F1	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	497	-	217	110	M6	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	491	-	222	120	F1	-	-
15-Jul-11	**12:02am**	R06	14	0.425	US	ARGR	496	90770	229	130	M6	-	-
15-Jul-11	**12:02am**	R06	14	0.425	DS	ARGR	489	90543	260	205	M8	CYRC	-
15-Jul-11	**2:40pm**	R02A	15	0.375	DS	ARGR	508	-	215	110	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	519	-	216	115	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	523	-	220	120	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	512	-	222	120	M6	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	520	-	228	130	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	513	-	231	130	F1	-	-

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	516	90775	235	155	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	518	90877	235	150	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	521	90878	239	160	M6	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	515	90774	240	160	F5	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	DS	ARGR	509	-	243	155	F1	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	524	90880	246	180	M6	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	522	90879	250	180	M6	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	514	90773	265	190	M9	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	ARGR	517	90863	304	280	M9	PYRC	New Tag - 90876
15-Jul-11	**2:40pm**	R02A	15	0.375	US	RWF	511	-	300	-	-	-	-
15-Jul-11	**2:40pm**	R02A	15	0.375	US	RWF	510	-	322	-	-	-	-
15-Jul-11	**3:55pm**	R02B	15	0.375	DS	ARGR	526	-	200	100	F1	-	-
15-Jul-11	**3:55pm**	R02B	15	0.375	DS	ARGR	525	-	210	110	F1	-	Dead in net
15-Jul-11	**3:55pm**	R02B	15	0.375	DS	ARGR	527	90881	248	180	M6	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	US	ARGR	539	-	190	80	F1	-	Dead in net
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	535	-	192	110	F1	-	Dead in net
16-Jul-11	**2:53pm**	R06	13	0.41	US	ARGR	540	-	195	100	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	US	ARGR	542	-	198	100	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	533	-	200	120	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	US	ARGR	541	-	200	90	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	532	-	208	100	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	US	ARGR	543	78123	230	120	F1	PYRC	-
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	536	90770	233	140	M6	CYRC	Dead in net
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	534	-	234	156	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	US	ARGR	544	90882	240	160	F1	-	-
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	537	-	-	-	-	-	Lost in Transfer
16-Jul-11	**2:53pm**	R06	13	0.41	DS	ARGR	538	-	-	-	-	-	Lost in Transfer
16-Jul-11	**3:54pm**	R02C	13	0.36	DS	ARGR	546	-	220	110	F1	-	-
16-Jul-11	**3:54pm**	R02C	13	0.36	DS	ARGR	545	-	225	100	M6	-	-
16-Jul-11	**3:54pm**	R02C	13	0.36	DS	ARGR	547	-	-	-	-	-	Lost in Transfer

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	555	-	193	85	F1	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	554	-	200	75	F1	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	556	-	206	115	M6	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	552	-	212	100	M6	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	551	-	223	120	M6	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	548	-	224	110	M6	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	549	90884	226	135	M6	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	553	90769	240	140	M6	CYRC	-
16-Jul-11	**4:33pm**	R02A	13	0.36	US	ARGR	557	90885	299	285	M9	-	-
16-Jul-11	**4:33pm**	R02A	13	0.36	DS	ARGR	558	-	-	-	-	-	Lost in Transfer
16-Jul-11	**4:33pm**	R02A	13	0.36	US	RWF	550	-	312	-	-	-	-
16-Jul-11	**5:15pm**	R02B	13	0.36	DS	ARGR	559	-	200	120	F1	-	-
16-Jul-11	**9:29am**	R09	13	0.07	DS	ARGR	531	-	180	100	F1	-	-
16-Jul-11	**9:29am**	R09	13	0.07	US	ARGR	529	-	197	115	F1	-	-
16-Jul-11	**9:29am**	R09	13	0.07	DS	ARGR	530	-	197	105	F1	-	-
16-Jul-11	**9:29am**	R09	13	0.07	US	ARGR	528	-	216	140	M6	-	-
17-Jul-11	**2:35pm**	R09	12	0.06	US	ARGR	560	90886	231	190	F1	-	-
17-Jul-11	**3:39pm**	R06	12	0.39	DS	ARGR	561	-	-	-	-	-	Lost in Transfer
17-Jul-11	**4:00pm**	R02C	13	0.35	DS	ARGR	562	-	192	100	F1	-	-
17-Jul-11	**4:34pm**	R02A	13	0.35	DS	ARGR	563	-	225	125	F1	-	-
17-Jul-11	**4:34PM**	R02A	13	0.35	US	ARGR	565	90888	231	145	F1	-	-
17-Jul-11	**4:34PM**	R02A	13	0.35	DS	ARGR	564	90887	258	160	M9	-	-
17-Jul-11	**4:34PM**	R02A	13	0.35	US	RWF	568	-	309	-	-	-	-
17-Jul-11	**4:34PM**	R02A	13	0.35	US	RWF	567	-	341	-	-	-	-
17-Jul-11	**4:34PM**	R02A	13	0.35	US	RWF	566	-	343	-	-	-	-
17-Jul-11	**5:14pm**	R02B	13	0.35	US	-	-	-	-	-	-	-	No Fish
17-Jul-11	**5:14pm**	R02B	13	0.35	DS	-	-	-	-	-	-	-	No Fish
18-Jul-11	**9:05am**	R09	13	0.06	DS	ARGR	569	-	195	100	F1	-	-
18-Jul-11	**9:05am**	R09	13	0.06	DS	ARGR	570	-	215	145	F1	-	-
19-Jul-11	**12:51pm**	R09	15	0.06	US	-	-	-	-	-	-	-	No Fish

2011 Hoopnet Data

Date	Time	Crossing ID	Water Temp	Staff Gauge cm	Direction (US or DS)	Species	Fish #	Tag #	Fork Length (mm)	Weight (g)	Sex and Maturity	PYRC/ CYRC	Notes
19-Jul-11	**12:51pm**	R09	15	0.06	DS	-	-	-	-	-	-	-	No Fish
19-Jul-11	**2:04pm**	R06	14	0.375	US	-	-	-	-	-	-	-	No Fish
19-Jul-11	**3:15pm**	R02C	14	0.35	DS	-	-	-	-	-	-	-	No Fish
19-Jul-11	**4:00pm**	R02A	14	0.35	US	-	-	-	-	-	-	-	No Fish
19-Jul-11	**4:00pm**	R02A	14	0.35	DS	-	-	-	-	-	-	-	No Fish
19-Jul-11	**4:30pm**	R02B	14	0.35	DS	-	-	-	-	-	-	-	No Fish

*****Nets Pulled - July 19, 2011 Due to low water conditions*****

2011 Drift Trap Data

		Drift Trap ID												
Date		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	Total
22/06/2011	ARGR	0	0	3	3	0	0	0	0	0	0	0	0	6
	Fish Egg													
	Other													
24/06/2011	ARGR	0	5	1	4	0	0	3	13	1	5	0		32
	Fish Egg													
	Other								1					
25/06/2011	ARGR	4	9	1	17	1	0	3	15	0	9	11		70
	Fish Egg					1					2			
	Other													
27/06/2011	ARGR	85	14	17	33	32	20	12	29	12	20	7		281
	Fish Egg		1								1			
	Other													
28/06/2011	ARGR	109	30	12	45	1	5	19	68	6	10	37		342
	Fish Egg	4												
	Other													
29/06/2011	ARGR	4	12	24	16	17	8	2	7	1	6	20		117
	Fish Egg	1	1											2
	Other													
30/06/2011	ARGR	1	3	11	18	74	2	0	3	0	1	18		131
	Fish Egg													
	Other													
01/07/2011	ARGR	3	4	25	15	31	7	1	7	3	17	18		131
	Fish Egg													
	Other													
02/07/2011	ARGR	3	14	34	22	40	15	0	14	8	16	10		176
	Fish Egg													
	Other													
03/07/2011	ARGR	5	3	12	10	16	4	12	6	15	3	0		86
	Fish Egg													
	Other													
04/07/2011	ARGR	7	0	10	14	18	7	16	5	24	1	0		102
	Fish Egg	1												1
	Other													
05/07/2011	ARGR	1	1	6	9	0	9	12	3	18	5	0		64
	Fish Egg	1	1											2
	Other													
06/07/2011	ARGR	8	6	2	0	0	0	12	5	2	2	2		39
	Fish Egg													
	Other													
07/07/2011	ARGR	3	0	0	0	0	17	5	5	2	0	2		34
	Fish Egg													
	Other													
08/07/2011	ARGR	9	0	8	8	0	5	3	6	0	2	9		50
	Fish Egg													
	Other													
09/07/2011	ARGR	2	3	6	7	0	3	3	0	0	1	7		32
	Fish Egg													

2011 Drift Trap Data

		Drift Trap ID												
Date		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	Total
	Other													
10/07/2011	ARGR	1	2	14	6	5	30	5	7	2	0	8		80
	Fish Egg													
	Other													
11/07/2011	ARGR	1	4	0	1	0	16	8	1	0	0	0	0	31
	Fish Egg													
	Other													
12/07/2011	ARGR	1	0	0	0	0	5	0	0	0	0	0	0	6
	Fish Egg													
	Other													
13/07/2011	ARGR	1	0	0	0	0	2	0	0	0	0	1	0	4
	Fish Egg													
	Other													
14/07/2011	ARGR	0	3	0	0	0	0	0	1	0	0	0	0	4
	Fish Egg													
	Other													
15/07/2011	ARGR	0	0	0	3	0	1	1	0	3	0	0	0	8
	Fish Egg													
	Other													
16/07/2011	ARGR	0	0	0	1	0	0	0	0	1	0	0	0	2
	Fish Egg													
	Other													
17/07/2011	ARGR	0	0	0	0	0	0	0	0	0	2	0	0	2
	Fish Egg													
	Other													

APPENDIX B:

DFO AUTHORIZATIONS

FEBRUARY 2012

Licence #: S-11/12-1015-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,

Chris Lewis

Chris Lewis
Fisheries Management Biologist
Eastern Arctic Area
Central and Arctic Region
Fisheries and Oceans Canada

June 15/11
Date

Enclosure

LICENCE TO FISH FOR SCIENTIFIC PURPOSES

S-11/12-1015-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
Philip Roy
Martin Theriault
Tom Thomson
Jessica Fang

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: Specific locations for unnamed stream crossings include:
R02 - 64d18'42"N; 96d00'04"W
R06 - 64d54'08"N; 96d21'30"W
R09 - 65d04'40"N; 96d07'41"W
R15 - 64d39'86"N; 96d22'16"W

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
		2.00						

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
		2.00						

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 (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
		2.00						

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: 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
		2.00						

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: 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: Zooplankton — Gear: Plankton Net

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
		2.00						

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
		2.00				5		

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

Gear: Hoop Net

Species: Whitefish, Round

Gear:

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

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

Species: Arctic Grayling
Sculpin, Slimy
Stickleback, Ninespine

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

Gear: 10 MM Mesh Gillnets and Larger

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			100					

Fishing Period: June 15, 2011 to October 15, 2011

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.

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

2011.06.16

Date

For the Minister of Fisheries and Oceans.

Pursuant to Section 52 of the Fishery (General) Regulations.

Canada

Date: June 17, 2011

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

Subject: Animal Use Protocol - Letter of Approval

Dear Ryan,

Your 2011 Animal Use Protocol (AUP), number FWI-ACC-2011-025 entitled **"**Meadowbank Mine: 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, 2011.

Keep this signed letter of approval as well as the signed AUP approval form 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. The report form is enclosed.

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

Sincerely,

Bernard LeBlanc

_____

Bernard LeBlanc 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:204 983-1327
Fax:204 984-2403

Enclosure

APPROVAL BY ANIMAL CARE COMMITTEE MEMBERS

AUP#: ACC-2011-025 Date: June 17, 2011

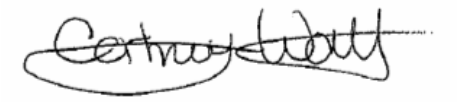
Signatures of ACC Members

Bernard LeBlanc, Chair

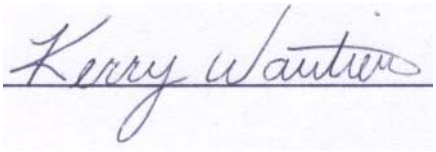
Theresa Carmichael

Dr. Ericka Anseeuw D.V.M.

Bob Artes



Cortney Watt



Kerry Wautier

Megan Desai

Interim Approval ☐ **Final Approval** ☒

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

WHEN IS AN ANIMAL USE PROTOCOL REQUIRED?

Any project that involves handling and/or euthanizing live fish or marine mammals requires an approved Animal Use Protocol to ensure that the relevant project methods conform to the guidelines established by the Canadian Council on Animal Care (CCAC). (http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GDLINES/Guidelis.htm)

Activities requiring Animal Use Protocols include the following:

1. Holding (even for very short periods of time) of all living vertebrates, including those that are or have been genetically modified, for research, display, teaching or testing.

2. All activities that involve physical tagging or chemical restraint and/ or the taking of measurements or tissue samples.

3. All tagging/identification activities including insertion/attachment of transmitters on fish or mammals.

4. All lethal field sampling for research, teaching or testing purposes.

5. Dosing of animals and/or their habitats with toxic or hazardous chemicals, including those studies administering non-lethal concentrations or doses of analgesics or other pharmaceuticals.

Activities not requiring Animal Use Protocols include the following:

1. Projects involving fish eggs or larvae that have not yet reached the first life cycle in which reasonable survival is expected or developed beyond exclusive reliance on their own yolk nutrients.

2. Hatchery fish reared for release, unless specifically used in experiments or displays.
3. Lethal sampling of fish required for regulated or legislated routine scheduled monitoring of contaminant/toxin burdens, disease, abundance and other population parameters by government agencies such as Canadian Food Inspection Agency, Health Canada, DFO, Environment Canada, and provincial or territorial departments.

4. Fish already killed in the course of an established aquaculture industry.
5. Sampling from commercial operations or subsistence fisheries where the animals are already dead as a result of standard commercial practices or subsistence catch.

For any concerns or assistance in completing the Animal Use Protocol form, contact the Freshwater Institute Animal Care Committee Science Laboratories directly, at fwisl-acc@dfo-mpo.gc.ca or Kerri Pleskach at (204) 984-2532 (before Feb 20th, 2009) or Melanie Toyne at (204) 983-5137 (after February 20th, 2009).

FRESHWATER INSTITUTE ANIMAL CARE COMMITTEE
ANIMAL USE PROTOCOL

Guidelines from the Canadian Council on Animal Care can be accessed at:
www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GDLINES/Guidelis.htm

Protocol Number (ACC use):
FWI-ACC-2009-2010-000

Note: provide full information for all sections, reviewers will not cross reference.

1. Project Title: Meadowbank Mine: Aquatic Ecosystem Monitoring Plan (AEMP) and All-Weather Private Access Road (AWPAR) HADD Crossing Monitoring

2. Keywords: Environmental and Fisheries Monitoring, Routine Field Study

www.ccac.ca/en/CCAC_Programs/Assessment/AUDFen.htm#keywords

3. This application is the: *(double click to activate a square)*

a) New AUP ☐
Amendment to the original ☐

OR

b) Renewal* ☒ (highlight any changes made from last years AUP)
Original year of start date of the study _2009_____
Previous AUP Number: FWI-ACC-2010-022_
***renewals will not be approved unless last years report has been submitted**

4. Location of the Study (Give geographic name and coordinates):
Stream crossings to be monitored along the road include sites (UTM NAD 83)
R02: 14 W 0643513 7143452
R06: 14 W 0638045 7155850
R09: 14 W 0625523 7173745
and R15: 14W 0627474 7192083
(see HADD crossings in attached maps)
Project Lake Habitat Monitoring locations include:
Second Portage Lake: 14 W 639663 7213395
Third Portage Lake: 14 W 639454 721393
Dogleg Pond: 14W 639592 7214608
(See attached CREMP maps)

5. Proposed Starting Date: mid June 2011; Finishing Date: December 2011

6. Contact Person for AUP: Ryan VanEngen (Environmental Biologist)

Affiliation: Agnico-Eagle Mines Ltd.
Address: Baker Lake, Nunavut, X0C 0A0
Phone number: 519.400.7979
E-mail: rvanengen@agnico-eagle.com

Project Authority: Ryan VanEngen
Affiliation: same as above
Phone number:
E-mail:

7. Names, Affiliations and Descriptions of the Qualifications* of The Project Members Who Will Be Handling Animals

**list any technical training/relevant experience/courses in ethical use and handling of animals in research. DO NOT SUBMIT CVs for each person*:

Ryan VanEngen- AEM- 7 years in mining and fisheries related research. Certified in Electroshocking, BC
Jessica Fang- AEM- 5 years in fisheries related research, Certified in Electroshocking, ON.
Philip Roy- 2 years in mining and aquatic ecology research
Martin Theriault- 3 years in mining research
Tom Thomson- AEM- 2 years in fisheries related research
Field Assistants – will be trained in the field in the proper handling and care of captured fish.
All personnel involved in this project have training in fisheries biology and have extensive knowledge in fisheries data collection (netting, trapping and tagging fish). Methods used in these studies will be considered best practice and are consistent with those outlined in the CCAC guidelines for fish. For those participants not trained in AUP the "Experimental Fish" online course will be completed.

8. Summary Description of the Study *(the nature of the procedures conducted on the animals in 40 words or less)*:

The field monitoring for 2010 has two components: AWPAR monitoring and AEMP. The purpose of the AWPAR is to evaluate the presence of fish at four stream crossings using hoopnets, larval/minnow traps and electrofishing. Fish will be identified, measured (length and weight) and returned to the stream immediately. No adult fish samples will be collected. Larval drift will be collected and analyzed in the on-site laboratory to species. Specifically, electroshock fishing will be used to evaluate the success of the compensation features on the

AWPAR. Fish habitat and utilization monitoring as part of the AEMP Habitat Monitoring will be conducted in Second Portage Lake, Third Portage Lake and Dogleg Pond for purposes of evaluating compensation under DFO authorization.

9. Category of Invasiveness: **A**☐ **B**☐ **C**☒ **D***☐ **E***☐
see 'CCAC Categories of Invasiveness' file;
www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/POLICIES/CATEG.HTM
**see section 25*

10. Species to be used *(include scientific names)**:***
Species present in the streams and project lakes are Arctic Graying (Thymallus arcticus) (not found in project lakes), Round whitefish (Prosopium cylindraceum), Lake Trout (Salvelinus Namaycush), Arctic Char (Salvelinus alpinus), Slimy sculpin (Coitus cogatus), Ninespine stickleback (Pungitius pungitius), and burbot (lotus lotus).

11. Supplier/source of animals:
NA

12. Maximum number of animals:
-to be handled/released/unharmed:
-to be sacrificed:
Several hundred live fish will be will be captured and released as part of the AWPAR work. In 2010, we handled approximately 350 adult size fish as part of the AWPAR fisheries study. We anticipate near-zero mortality rates for road fisheries monitoring. For the fisheries habitat monitoring on the project lakes, we will be conducting short indexed gill net study to collect fish to determine habitat utilization. There is no expected mortality and none of the fish will intentionally be sacrificed; few mortalities are expected.

13. Permit for field capture *(please send a copy if you already have one)***:**

Rose, Joanne [Joanne.Rose@dfo-mpo.gc.ca]
XCA-NUpermit [XCA-NUpermit@DFO-MPO.GC.CA]

Renewal of S-10/11-1011-NU in progress.

14. Study Objectives *(provide background, rationale for study, primary objective(s) and expected contribution to knowledge. Try to be brief.)***:**
The objective of the study along the All Weather Road is to evaluate the fisheries status of the crossing and the ability of the constructed bridge crossings to permit upstream passage of fish and to evaluate the no-net-loss habitat compensation structures at R02. As well, fish monitoring studies will be conducted in the project lakes to evaluate fish utilization of habitat features and provide baseline for future habitat monitoring.

15. Summary of Project: *(methods, including description of the procedures to be used involving live animals, time frame for procedures, and **end points of the procedure(s)**)*
www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GDLINES/ENDPTS/APPOPEN.HTM

There are 2 components to this application related to: the AWPAR fisheries work & AEMP habitat monitoring:

Hoop nets and drift traps will be used to determine fish presence at stream crossings along the all-weather private access road (AWPAR). The field program will last for approximately 5 weeks. Hoop nets will be checked daily. Adult fish will be removed from nets, identification, tagging and measurements will be done quickly, and fish will be immediately released. Handling will be minimal. Drift traps will target newly emerged larvae at R02 to evaluate the no-net-loss fisheries compensation structures. As in the past, small-sterilized- numbered floy tags (T-bar) approximately 20mm in length x 2mm in diameter will be used to tag all adult arctic grayling for the AWPAR study. Adult fish will be transferred from the hoopnet holding area to a freshwater filled tub, where the adult fish will be quickly removed from the tub, tagged and immediately returned to the another tub. Following fish tagging (which takes about 30sec per fish) the fish will be monitored for recovery and released back into the stream following field data collection. Electro-fishing will also be used to conduct presence/ absence studies within the habitat compensation features. These studies have been completed since 2005 in fulfillment of DFO file No: NU-03-0190 referral no. 03-HCAA-CA7-000-000109

Fish monitoring studies throughout the project lakes will be conducted to evaluate fish habitat usage (part of the AEMP). Gill nets will be set in areas along habitat structures and in reference areas in Second Portage Lake, Third Portage Lake and Dogleg pond. Gill nets will be checked regularly (ideally hourly, as permitted by weather conditions). Adult lake trout and arctic char will be tagged using the same method and floy tags as the AWPAR study for the project lake habitat monitoring. This study is a continuation from a study that began in 2009 as per DFO authorization.

16. How are animals intended for laboratory work transported from supplier/source to project/housing site:
NA

17. Describe the capture, restraint, transportation and/or housing of animals used in field studies.
Adult fish will be captured in hoopnets for a brief period of time (less than 24hrs). The fish will remain in the cold water, aerated, recovery tubs and fish data will be collected daily unless prevented by weather or logistical constraints. Fewer than 25 fish will be held in a single tub. Fish will be handled using wet gloves for less

than 30 seconds in total. The total time in the tub will be less than 10 minutes, or until the fish appear healthy and fully recovered. No injuries or mortality are expected during the hoopnet data collection (based on previous experiences at Meadowbank). Larval drift will be collected using drift traps and identified in the lab (for the purposes of the AUP, larval drift are exempt from inclusion). Gillnets will also be used for habitat monitoring studies as part of the AEMP on the project lakes. These fish will be captured measured and released as quickly as possible; few mortalities are expected as net sets will be short in duration. To reduce by-catch, targeted angling may also be used for larger bodied fish. Gloves will be used to handle all adult fish.

The electrofishing fishing study along the AWPAR is to provide presence/ absence near to the habitat compensation. The electroshock crew leader will be followed by dip netters who will collect stunned fish. Fish will be handled for less than 30 seconds. Fewer than 25 fish will be placed in cold water, aerated, recovery tubs and returned to the water body immediately following the study. The total time in the tub will be less than 10 minutes, or until the fish appear healthy and fully recovered.

18. What protocol will be followed for non-target species captured during the course of study

Based on the objectives of the AWPAR and habitat monitoring study all species are relevant.

19. Describe potential mortality or injury that may occur during capture and transportation:

Based on previous experience (2005-2010) there is near zero potential for mortality or injury during the AWPAR study. Few mortalities occur due to stress or predation within the hoopnets and holding area. This is avoided as nets will be checked at least daily. If a fish is deemed un-releasable by a qualified technician, the fish will be euthanized (concussive, followed by pithing). In this case, euthanized fish will be dissected and examined for biological purposes. Few incidental mortalities are expected as a result of short gill netting (nets will be checked hourly) for habitat monitoring within the project lakes.

20. Anaesthetics and Analgesics used *(indicate dosage and methods)***:**

NA

21. Euthanasia: NA

a. Method of euthanasia (if required):

N/A.

b. Provide justification for use of physical forms of euthanasia or for any methods that deviate from those described in the CCAC Guidelines
(www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GDLINES/Guidelis.htm)
or the Report of the AVMA Panel guidelines on Euthanasia, 2007 (http://www.avma.org/issues/animal_welfare/euthanasia.pdf)

22. Justification:

a. Why is it necessary to use vertebrates in this study?

This study has been designed to meet the goals of the DFO authorization and requires the use of adult fish to determine their ability to migrate past bridge crossings and use of habitat compensation area. The habitat monitoring and fish utilization study is part of a broader study to evaluate fisheries compensation, also under DFO authorization.

b. What is the rationale for using this particular species?
Arctic grayling and other species identified above are commonly found in these waterways. Lake Trout, White fish, Arctic char and other project lake species are commonly found in the project lakes and for the purposes of the fish utilization study, all species are significant.
.

c. What is the rationale for the number of animals used?
NA

d. Have you considered the CCAC's "Three R Principles" of: REDUCTION of number of animals required; REFINEMENT of procedures so as to minimize the stress placed on animals and REPLACEMENT of animals with alternatives whenever possible in the design of this project?

YES ☒ **NO** ☐ **If NO, explain why not.**

23. Source of funding:
Agnico-Eagle Mines: Meadowbank Division

24. Provide evidence that the research project involving animals has been subjected to peer review for scientific merit: *(this means; has it been judged as a scientifically valid study by other research scientists? Are the methods based on published studies?)*
The study has been designed to meet regulatory requirements (DFO Authorization NU-03-0109)

25. Detailed Scientific Justification (only necessary if category of invasiveness falls into D or E, or if CCAC Guidelines are not being followed):

NA

26. Are you using any Biohazardous; Infectious Substances; Biological/Chemical Agents; Radioisotopes in living animals *(if so, provide an indication of institutional approval of this use)***:**

NA

27. Disposition of animals following termination of the project:
(check all that apply)

- ☐ Euthanasia
- ☐ Kept for future projects
- ☒ Released into the wild
- ☐ Other, specify:

28. Your signature below indicates:

a. That techniques employed during the execution of this project are in accordance with the Guidelines of the Canadian Council on Animal Care and that animals used in this research project will be cared for in accordance with the principles contained in the "Guide to the Care and Use of Experimental Animals, Canadian Council on Animal Care", and the "Guidelines for the Use of Fish in Field Research"

b. That alternative procedures that do not involve the use of living animals have been considered

c. That the minimum number of animals consistent with the objectives of your research/teaching program will be used

d. That the species proposed for use in this project have been carefully selected,

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

_ _____ May 31,2011_____

Project Authority **Date**

APPENDIX C:

GEBAUER AND ASSOCIATES: 2011 CREEL SURVEY SUMMARY DOCUMENT

FEBRUARY 2012

Nunavut ENVIRONMENTAL CONSULTING LTD

MEMORANDUM

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

DATE: 23 February 2012

FROM: Martin Gebauer

Subject: 2011 Hamlet of Baker Lake Harvest Study – Creel Results

Nunavut Environmental Consulting Ltd. is pleased to provide Agnico-Eagle Mines Ltd. (Agnico-Eagle) with this brief memorandum summarizing the 2011 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*).

2011 Results

Participation

In 2011, creel results were collected from thirty-eight (38) of the fifty-one (51) study participants, which was up from thirty (30) participants in 2010 (an almost 30% 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, ongoing 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

2011 creel results are summarized in **Table 1**. Results from previous years are also provided for comparative purposes.

Table 1: 2011 Creel Results and Historical Results to Date.

Fish Species	Counts				
	2011	**2010**	**2009**	**2008**	**2007**
Arctic Char	113	103	117	24	3
Arctic Grayling	1	3	1	-	-
Lake Trout	1,710	860	525	825	210
Lake Whitefish	460	326*	52	192	-
TOTALS	**2,284**	**1,292**	**694**	**1,041**	**213**

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

Discussion

As in previous years, creel data suggest that fish catch remains high in the spring and summer (especially in May and June), but winter (November/December) fish catch totals were higher in 2011 (November 2011 recorded the highest total catch for the year) (**Figure 1**). This marks the first year of the creel survey where winter fish harvest monthly totals exceeded spring and summer totals. Total fish catch in both seasons was higher in 2011 than in other years (**Table 1**). Data were standardized through the simple division of fish harvested by the number of participants (**Figure 2**). Standardized results indicate that the highest number of catches per participant occurred in May and August, when more participants were fishing, except for in November and December, when fewer participants were fishing but catches were higher. The majority of fishing (i.e., most number of participants) occurred between May and August. Similar trends have been seen in past years; however, winter fishing in 2011 involved more participants than in previous years. In November 2011, nine (9) participants recorded fish catch, compared to three (3) participants reporting in November 2010.

Figure 1: Fish Harvests per Month (2008 – 2011)

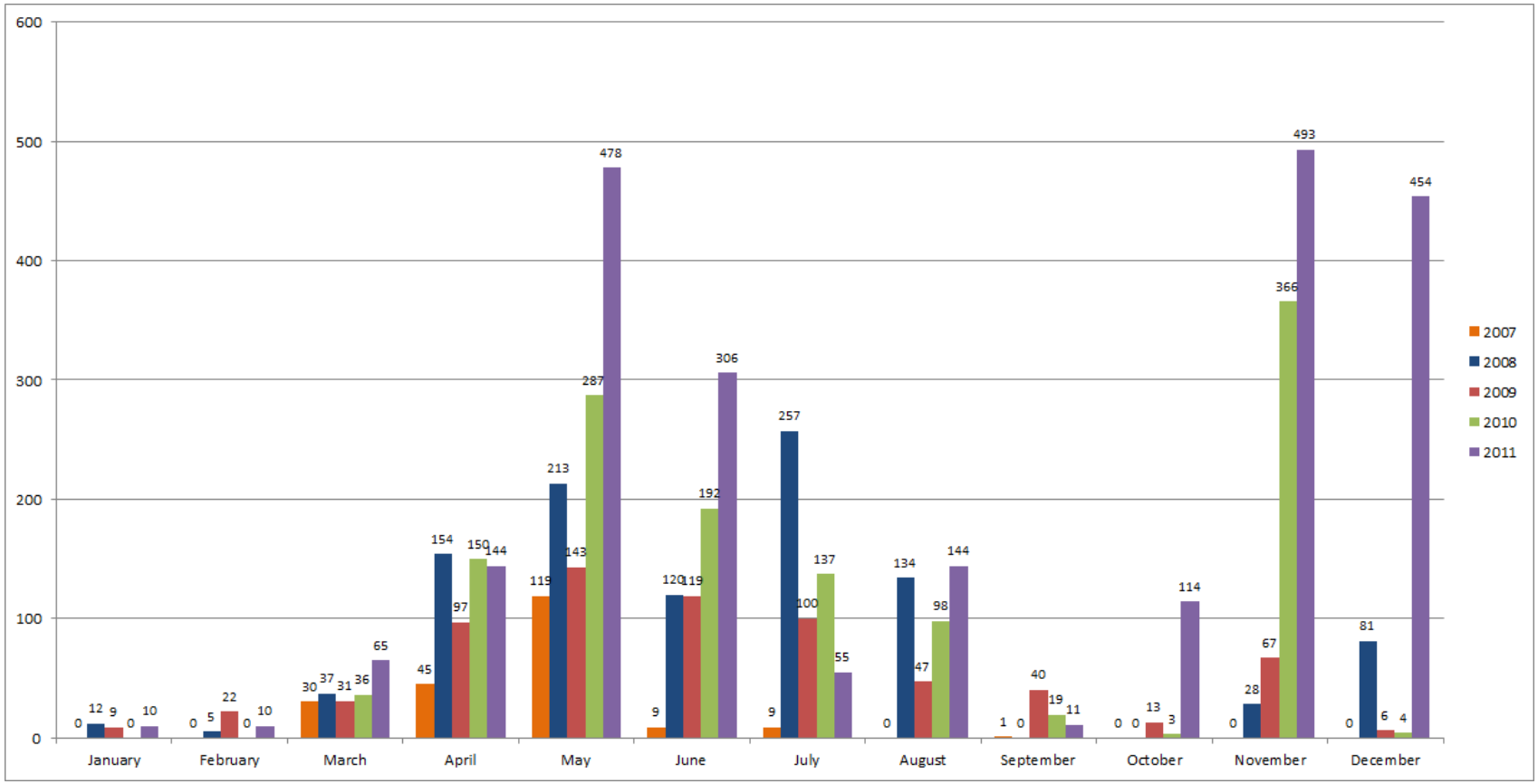
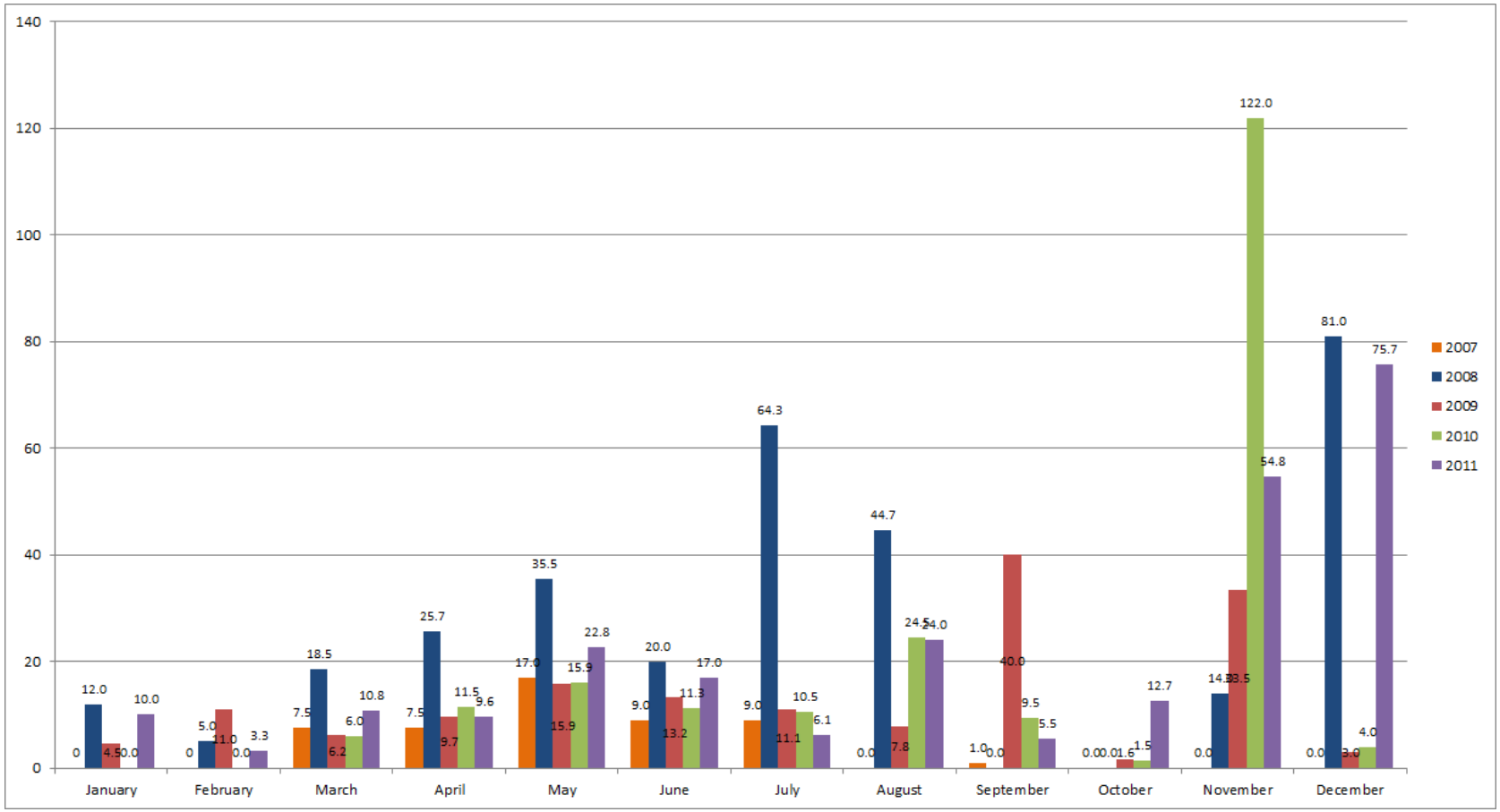


Figure 2: Fish Harvests per Month per Participant in (2008 – 2011)



Arctic Grayling catches continue to remain low across years and Arctic Char catches in 2011 are similar to the reported catches in 2010 and 2009. Lake Trout and Lake Whitefish catches continue to vary widely between years, generally increasing, and may be confounded by the use of nets in some years (e.g., 2011). Lake Trout catch in 2011 was almost 100% higher than in 2010. While there is one instance of a single fishing trip yielding 180 fish, half of the fish harvested were from trips that yield 14 fish or less. In 2010, net captures of Lake Whitefish in November increased the total annual catch for that species from a low of twenty-six (26) to a high of 326; however, Lake Whitefish catch was even higher in 2011, with the highest single catch day yielding 80 fish. Creel survey data help to evaluate these types of fishing trends in the community of Baker Lake.

Fish Harvest Distribution

Arctic Char

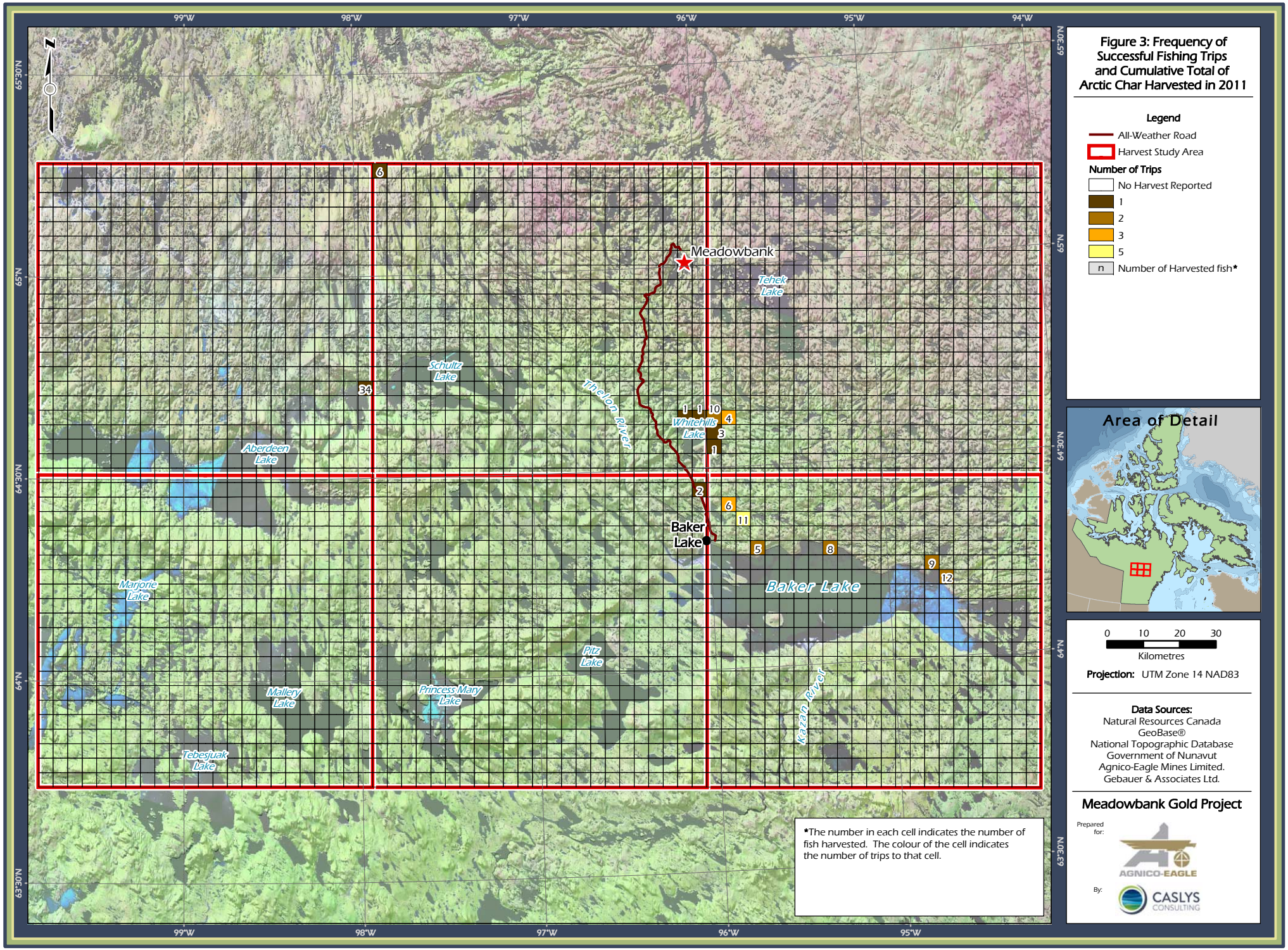
As in previous years, 2011 Arctic Char captures were distributed around Whitehills Lake, Baker Lake and Schultz Lake, but there appeared to be more fishing trips to the east of the AWPAR than in the past (**Figure 3**). More fishing trips were observed at Whitehills Lake, and more fishing areas around this lake seemed to be targeted than in past years. In 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

Only one (1) Arctic Grayling capture was reported in 2011. In previous years, Arctic Grayling has most often been caught along the shores of Baker Lake by net. Prior to 2009, no Arctic Grayling captures were reported.

Lake Trout

As in previous years, Lake Trout capture densities were highest immediately south of the Hamlet of Baker Lake and at Whitehills Lake (**Figure 4**). However, the number of fishing trips to both of these areas was much higher in 2011, with correspondingly higher catches. Some fishing spots were visited more than 10 times, up to 20 times for specific locations. Increased fishing activity and use of nets in winter may explain why Lake Trout captures were up by almost 100% relative to 2010. Fewer trips and lower catches were recorded in farther afield areas such as the Thelon River, Schultz Lake and north of Whitehills Lake with most Lake Trout fishing in closer proximity to the AWPAR than in previous years. As in 2010, Lake Trout catches were still recorded all around the shores of Baker Lake.



*****The number in each cell indicates the number of fish harvested. The colour of the cell indicates the number of trips to that cell.

Figure 3: Frequency of Successful Fishing Trips and Cumulative Total of Arctic Char Harvested in 2011

Legend

- All-Weather Road
- Harvest Study Area

Number of Trips

- No Harvest Reported
- 1
- 2
- 3
- 5
- 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

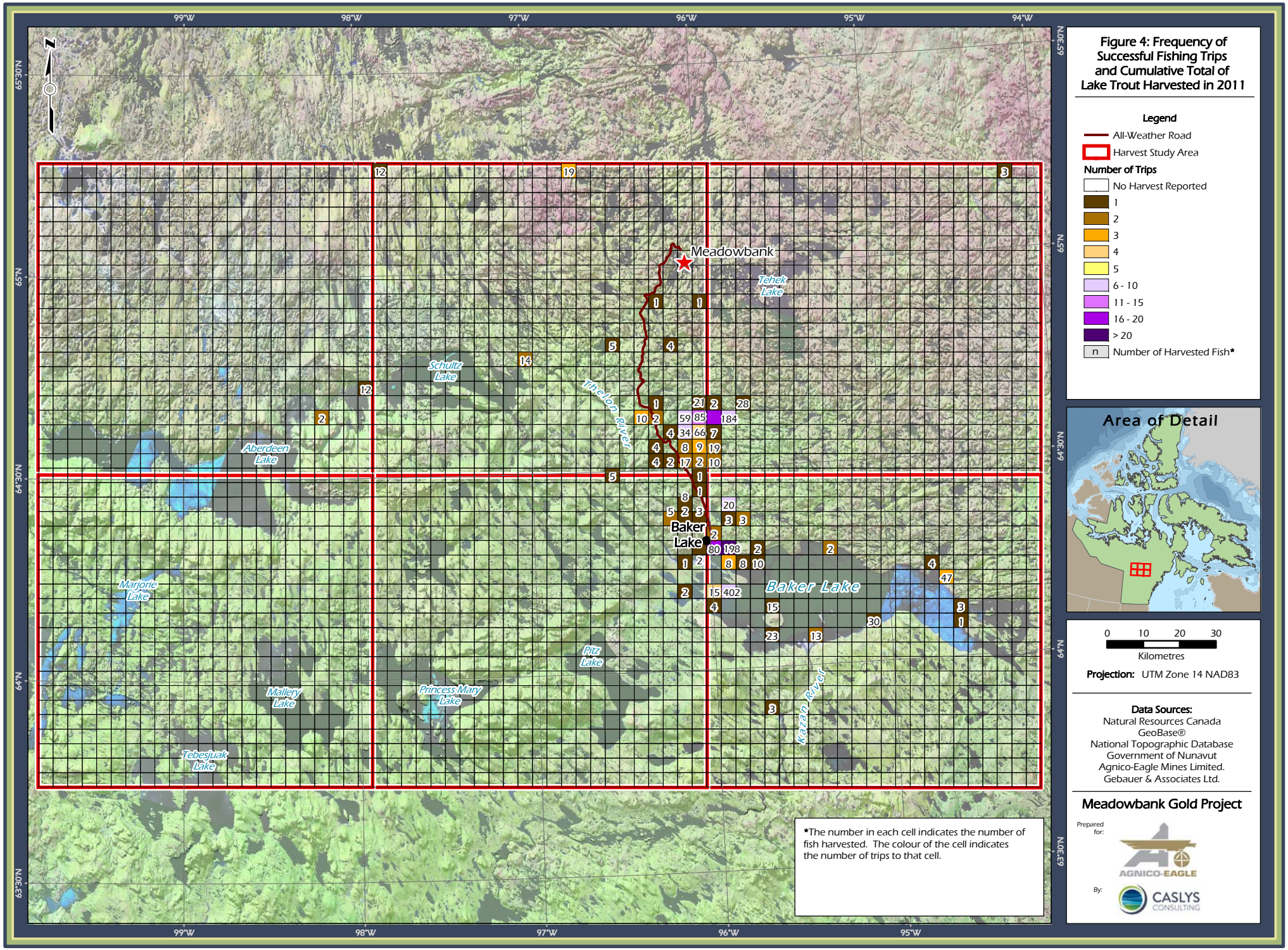


Figure 4: Frequency of Successful Fishing Trips and Cumulative Total of Lake Trout Harvested in 2011

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

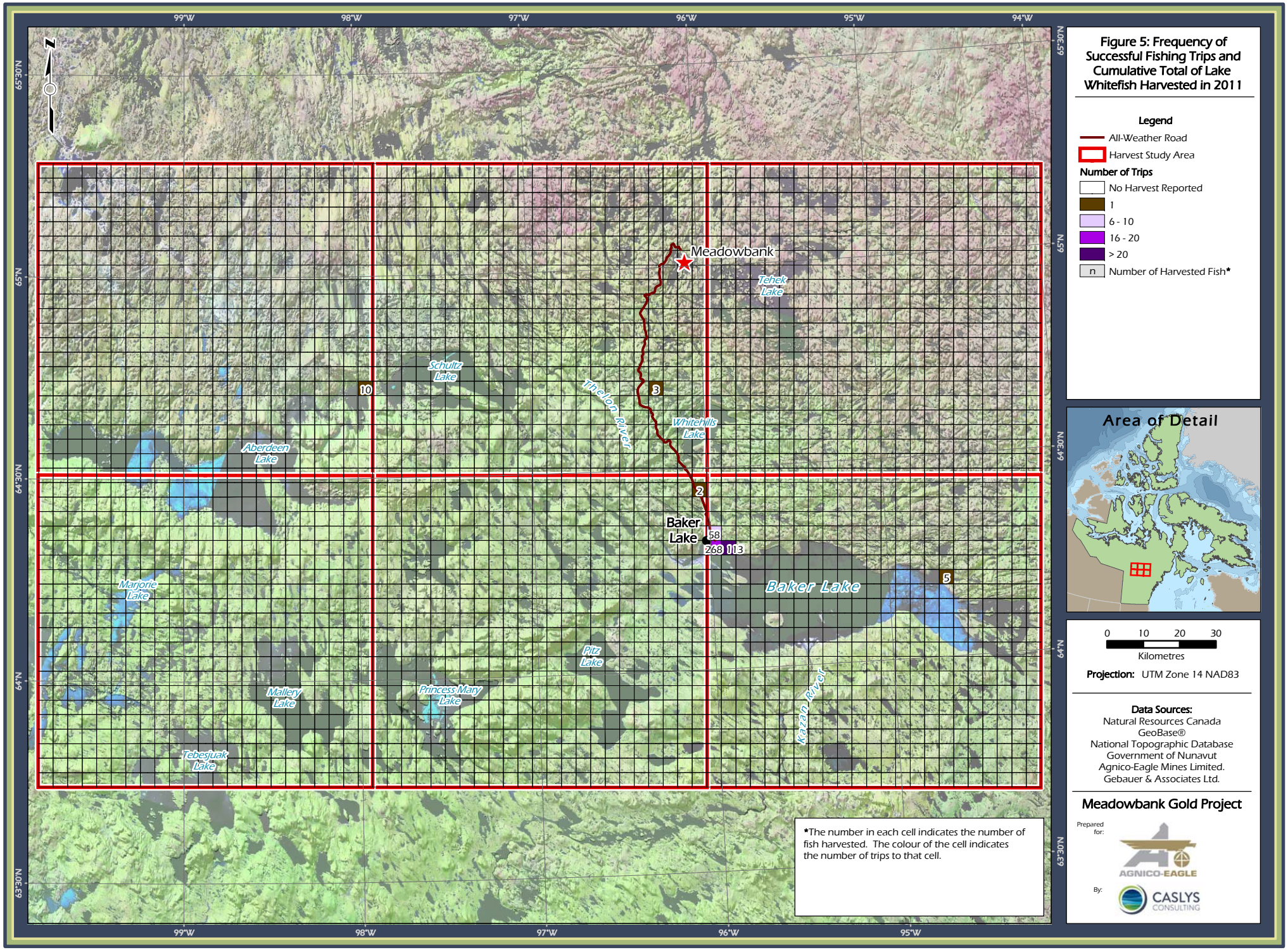


Figure 5: Frequency of Successful Fishing Trips and Cumulative Total of Lake Whitefish Harvested in 2011

Legend

- All-Weather Road
- Harvest Study Area

Number of Trips

- No Harvest Reported
- 1
- 6 - 10
- 16 - 20
- > 20
- 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

Lake Whitefish

Lake Whitefish captures continued to occur in relatively low densities with fishing effort centred south of the Hamlet of Baker Lake in 2011 (**Figure 5**). Most Lake Whitefish were caught in this area along the shores of Baker Lake via nets, as in previous years. No visits to the Kazan River were recorded in 2011. Captures were also reported west of Schultz Lake, as in 2010.

All Fish

Creel results between 2007 and 2011 are presented in **Figure 6**. The highest densities of fish captures continue to be Whitehills Lake and the shores of Baker Lake. While the fishing effort in areas such as the Thelon River, north of Whitehills Lake, and along the eastern, western and southern shores of Baker Lake does not appear to have changed greatly over the duration of the creel survey, an increased number of fishing trips appears to be occurring in areas along the AWPAR over time (i.e., Whitehills Lake, close to the Hamlet of Baker Lake).

Project-related Effects

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. Larger catches of fish in 2011, particularly Lake Trout, may well have been due to improved fishing success by several individuals using nets.

We trust this provides the information you currently require. Should you have any questions, please do not hesitate to contact the undersigned at 604-261-2716.

Respectfully submitted,

Martin Gebauer, M.Sc., R.P.Bio.
Nunavut Environmental Consulting Ltd.

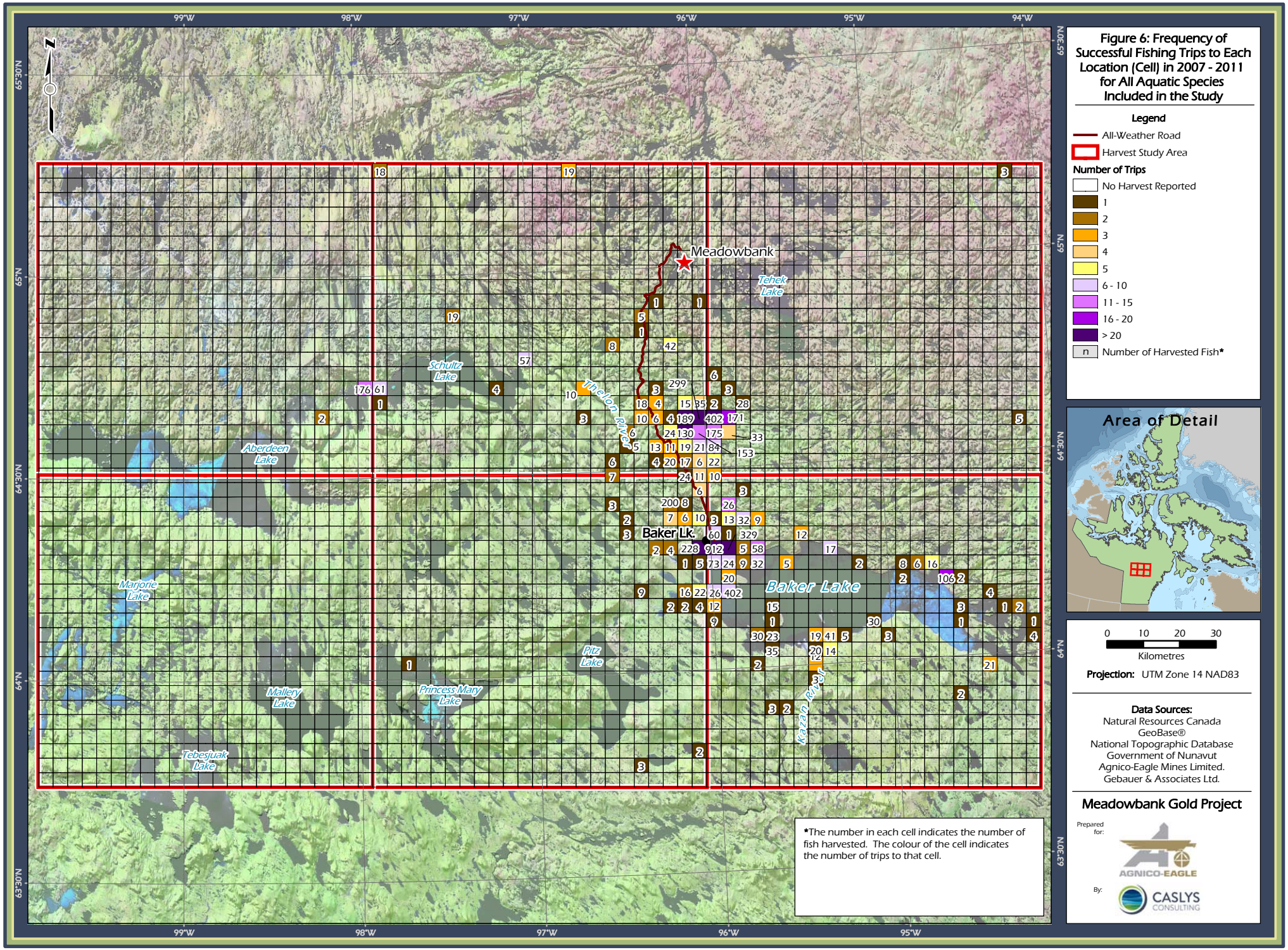


Figure 6: Frequency of Successful Fishing Trips to Each Location (Cell) in 2007 - 2011 for All Aquatic Species Included in the Study

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*

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

APPENDIX D:

2010 PHOTOGRAPHIC DOCUMENTATION

FEBRUARY 2012

Photo No 1 : Berms during freshet peak flows- June 17,2011

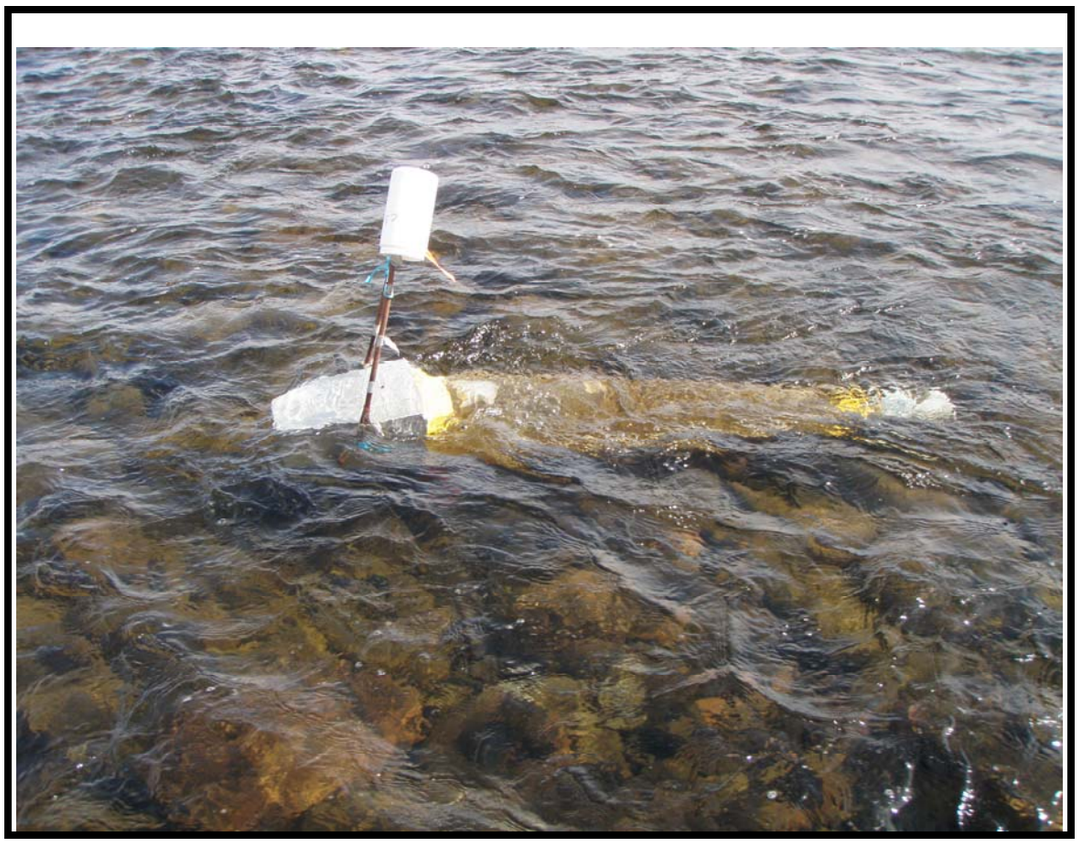


Photo No 2 : Daily Drift Trap Collection at R02

Photo No 3: R02A Hoopnets

Photo No 4: R02 C Hoopnets in foreground, R02 B in background

Photo No 5 : Young of the year observed at R02 in spawning pads

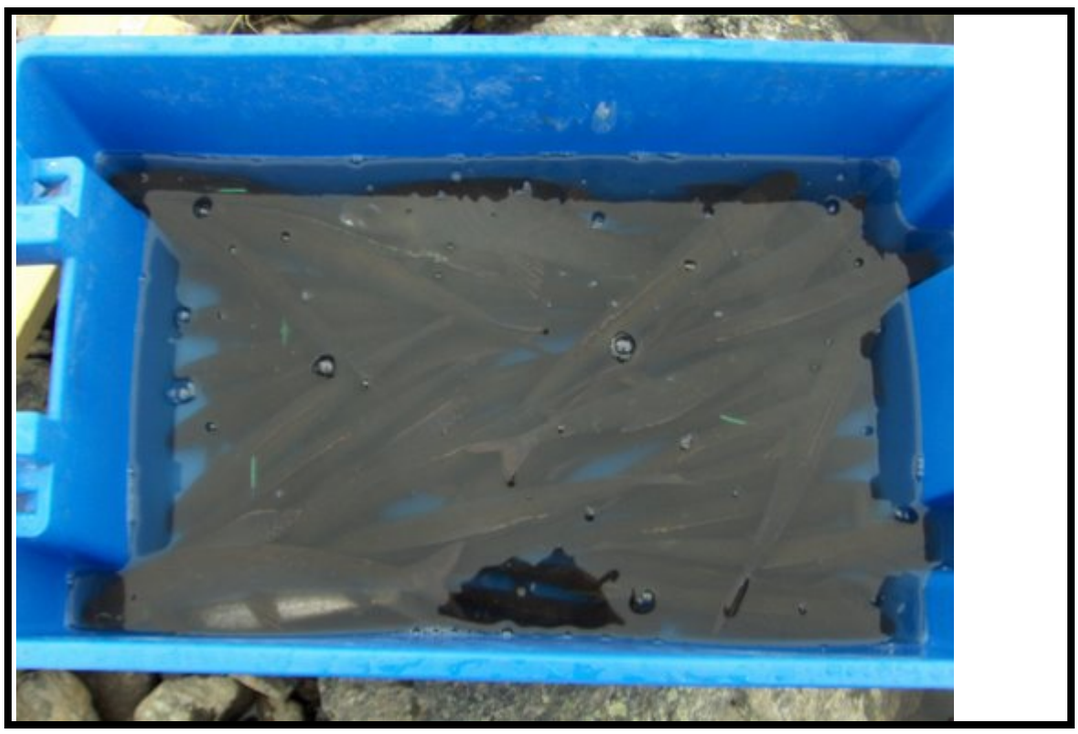


Photo No 6: Arctic grayling collected at R02 July 2nd