Project No. AEM-07-01
March 2008

All-Weather Private Access Road (AWPAR) Fisheries Monitoring Report – 2006

Meadowbank Gold Project

Prepared for:

Agnico-Eagle Mines Ltd.
Meadowbank Division
375 - 555 Burrard Street
Two Bentall Centre
Vancouver, BC
V7X 1M8

Prepared by:

AZIMUTH
Azimuth Consulting Group Inc.
218-2902 West Broadway Vancouver BC V6K 2G8
Tel: 604-730-1220 * Fax: 604-739-8511

All-Weather Private Access Road (AWPAR) Fisheries Monitoring Report – 2006

Meadowbank Gold Project

Prepared for

Agnico-Eagle Mines Ltd.
Meadowbank Division
375 - 555 Burrard Street
Two Bentall Centre
Vancouver, BC
V7X 1M8

March 2008

Azimuth Consulting Group Inc.
218-2902 West Broadway
Vancouver, BC
V6K 2G8

Project No. AEM-07-01

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

ACKNOWLEDGEMENTS

We would gratefully like to thank Cumberland Resources, Vancouver, for their support of this program and especially Cumberland staff in Baker Lake and Meadowbank Camp for facilitating our work while in the field by providing logistical assistance and help whenever required.

A number of people assisted with the data collection including Ryan Vanengen and Joe Mota (North/South Consultants, Winnipeg), Judah Nasauyaituk (Baker Lake), Jamie Kataluk (Baker Lake), Larry Makayak (Baker Lake) and Tom Mannik (Baker Lake). Their assistance is greatly appreciated.

Ryan Vanengen, Randy Baker (Azimuth Consulting Group, Vancouver) and Joe Mota, North/South Consultants, Winnipeg, co-authored this report. Gary Mann (Azimuth) conducted technical peer review of the report.

PROFESSIONAL LIABILITY STATEMENT

This report has been prepared by Azimuth Consulting Group Inc. (Azimuth), for the use of Agnico-Eagle Mines Ltd. (AEM), who has been party to the development of the scope of work for this project and understands its limitations. The extent to which previous investigations were relied on is detailed in the report.

This report is intended to provide baseline environmental information to support the Aquatic Effects Management Program (AEMP) for AEM's Meadowbank Project. The AEMP monitoring scope and design was developed in consideration of a specific project development plan. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the proposed development may necessitate modification of the AEMP and may potentially reduce the utility of this baseline data.

Any use, reliance on, or decision made by a third party based on this report is the sole responsibility of such third party. Azimuth accepts no liability or responsibility for any damages that may be suffered or incurred by any third party as a result of the use of, reliance on, or any decision made based on this report.

The findings, conclusions and recommendations in this report reflect our best professional judgment and have been developed in a manner consistent with the level of skill normally exercised by environmental professionals currently practicing under similar conditions in the area. The findings contained in this report are based, in part, upon information provided by others and are valid only as of the date of this report. Azimuth has assumed the data or other information provided by others is factual and accurate. If any of the information is inaccurate, site conditions change, new information is discovered, and/or unexpected site conditions are encountered in future work, then modifications by Azimuth to the findings, conclusions and recommendations of this report may be necessary.

EXECUTIVE SUMMARY

Azimuth Consulting Group Inc. (Azimuth) was retained by Cumberland Resources (now owned by Agnico-Eagle Mines Ltd.) to continue monitoring habitat utilization of fish-bearing streams along the All-Weather Private Access Road (AWPAR). The 2006 effort was focused primarily on the six stream crossings (R02, R05, R06, R09, R15, and R19) where bridge abutments were predicted to potentially encroach into the stream channel and would result in harmful alteration, disruption or destruction of fish habitat (HADD), according to Department of Fisheries and Oceans (DFO) directives for stream crossings. Hoop nets and larval drift traps were used to document up- and downstream movements by adult fish and passive drift by larval fish to determine presence of spawning activity.

Total fish enumerated from all streams between 24 June and 19 July was 883 consisting primarily of arctic grayling (779), followed by round whitefish (67), lake trout (36) and a single arctic char. No other species were captured in hoop nets, which was consistent with results from 2005. Not all species were captured from all crossings. Round whitefish and lake trout were present at crossings R02, R05, and R09 while the single arctic char was captured at R09.

The greatest number of fish captured was from crossing R05 (540), followed by R02, the largest stream (146 fish), R09 (104), R19 (86) and R15 (5). Male and female arctic grayling that were either immature or ripe and running were collected moving upstream when water temperature was approximately 5 ºC. After spawning, grayling returned downstream following a brief resting stage. Small numbers of arctic grayling larvae were collected at crossings R02 (4), R05 (13), R06 (2), R09 (6), and R15 (34), despite the small number of adult grayling (5) captured at R15. Crossing R15 is a shallow diffuse channel with limited passability by fish throughout the open water season. Larvae were not captured at crossing R19, which does not necessarily mean that fish do not spawn here. Larvae were first captured from streams south of Whitehills Lake (R02 – R09) from July 6 to 13 at water temperatures ranging from 11 – 15°C. In streams north of R09, larvae were captured a few days later, from July 10 – 17. Other larvae collected included slimy sculpin (95) at all crossings except R15. R02 (52) and R06 (31) had the greatest number of larvae, indicating that these streams are also used for spawning by this species.

Length, weight, condition factor and diet statistics indicate that arctic grayling are in very good condition and that the system supports a healthy population of arctic grayling. Data from 2006 corroborate trends observed in 2005. As noted in the No-Net-Loss Plan (Azimuth, 2006), bridge abutments will likely encroach into the stream channel only at crossings R02, R06, R09, R15, and R19. The NNLP habitat

compensation strategy is to focus on R02, as only minimal encroachment was predicted for the other crossings and R02 stands to benefit most from introducing spawning habitat. In addition to routine construction-related monitoring of all AWPAR crossings in place, AWPAR-related studies in 2007 will also focus on finalizing the detailed compensation plan for R02 and monitoring fish passage at all HADD crossings.

1.0 INTRODUCTION

1.1 Background

In 2005, Azimuth Consulting Group Inc. (Azimuth) was commissioned by Cumberland Resources (now owned by Agnico-Eagle Mines Ltd. [Agnico-Eagle]) to assess at least 25 candidate stream crossings along the proposed All-Weather Private Access Road (AWPAR) between the Hamlet of Baker Lake and Meadowbank Camp. These crossings were evaluated to determine the relative importance and significance of fish movements and habitat utilization (Azimuth, 2005). The magnitude and timing of fish movements, habitat suitability, and importance to life history function were determined for ten (10) streams that contained fish. These 10 streams were re-visited in 2006 to continue baseline data collection and to evaluate the major crossings with respect to fisheries value to support development of the AWPAR No-Net-Loss Plan (Azimuth, 2006) where road-related structures encroached into fish-bearing stream channels.

The proposed 115 km AWPAR connects the Hamlet of Baker Lake with the Meadowbank Project site (**Figure 1.1**). Golder Associates (Golder) identified the optimal route for the proposed road based on a number of parameters including ease of construction, suitability of terrain, availability of borrow material for construction, and minimal stream crossings. Crossing locations were provided by Golder in June 2006 and in some cases, slightly altered in September 2006 following a constructability evaluation.

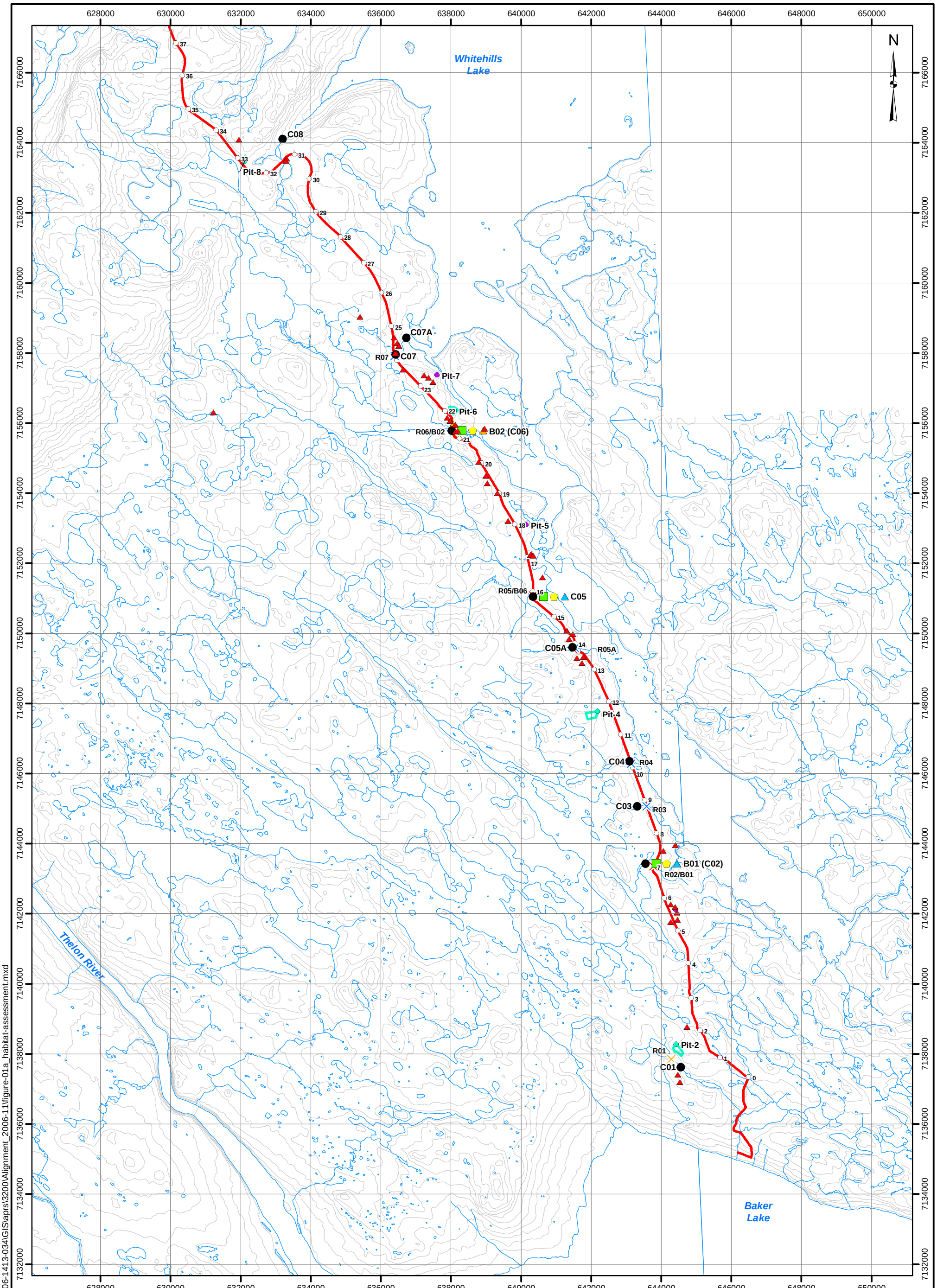
The major water system along the proposed all-weather road is the Prince River drainage, which includes Whitehills Lake and Amarulik Lake (Azimuth, 2005). This system lies to the southwest of the Quoich River system, of which Third Portage Lake is in the headwaters and is connected to Tehek Lake. Both of these basins ultimately discharge into Baker Lake and Chesterfield Inlet respectively.

The fish-bearing crossings evaluated in 2006 will be spanned by prefabricated steel logging type bridges and will be assembled in different lengths and supported on abutments constructed on each side of the stream channel. Roadway construction was planned to be completed during the winter season to reduce potential impacts to fisheries.

1.2 Objective

The objective of the 2006 survey was to determine the magnitude and timing of fish migrations and movements in all fish-bearing streams along the AWPAR. Particular

emphasis was placed on crossings R02, R05, R06, R09, R15, and R19, identified in Azimuth (2005) as having high fisheries significance as they support migrations and movements by arctic grayling (ARGR), and one or more of round whitefish (RNWH), lake trout (LKTR), slimy sculpin (SLSC), ninespine stickleback (NSST) and arctic char (ARCH) (species specific at each crossing). All remaining crossings along the AWPAR contained only stickleback or sculpin.



LEGEND

- Meadowbank Project
- Kilometre Marker
- Proposed Route
- Watercourse
- Waterbody
- Contour (10 m interval)
- Watershed Boundary

- Habitat Assessment (Spring and Fall)
- Hoop Net (Spring)
- Hoop Net (Fall)
- Larval Drift Trap
- Minnow Trap
- Rock Pit (investigated)
- Rock Pit (to be quarried)
- Archaeological Site

- Stream Crossing (30 m bridge)
- Stream Crossing (12 m bridge)
- Stream Crossing (multiple culverts at bottom)
- Stream Crossing (single culvert at bottom)

REFERENCE

Cumberland Resources Ltd.

Datum: NAD 83 Projection: UTM Zone 14

2,000 1,000 0 2,000 Metres

Scale - 1:100,000

PROJECT

CUMBERLAND RESOURCES LTD.

TITLE

ALL-WEATHER PRIVATE ACCESS ROAD
STREAM CROSSINGS SHOWING LOCATIONS OF HABITAT ASSESSMENT AND FISHING GEAR DEPLOYMENT
1:100,000 Mapsheet 1 of 3

Golder Associates
Burnaby, B.C.

PROJECT No. 06-1413-034			SCALE AS SHOWN	REV. 0
DESIGN	JH	21 Nov. 2006	FIGURE 1A	
GIS	CDB	13 Dec. 2006		
CHECK				
REVIEW				

N:\Bur-Graphics\Projects\2006\1413\06-1413-034\GIS\aprs\3200\Alignment_2006-11\figure-01a_habitat-assessment.mxd

PRINCE RIVER DRAINAGE

Amarulik Lake

Half Way Hills

Whitehills Lake

N

R15/B04 B04 (C15) Pit-16 R14 C14 R13 C13 C12 C11 Pit-13 C10 R09 B03 (C09) Pit-15 Pit-11B Pit-10 C08 Pit-8

73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26

620000 622000 624000 626000 628000 630000 632000 634000 636000 638000 640000 642000

7194000 7192000 7190000 7188000 7186000 7184000 7182000 7180000 7178000 7176000 7174000 7172000 7170000 7168000 7166000 7164000 7162000 7160000

LEGEND

- Meadowbank Project
- Kilometre Marker
- Proposed Route
- Watercourse
- Waterbody
- Contour (10 m interval)
- Watershed Boundary
- Habitat Assessment (Spring and Fall)
- Hoop Net (Spring)
- Hoop Net (Fall)
- Larval Drift Trap
- Minnow Trap
- Rock Pit (investigated)
- Rock Pit (to be quarried)
- Archaeological Site
- Stream Crossing (30 m bridge)
- Stream Crossing (12 m bridge)
- Stream Crossing (multiple culverts at bottom)
- Stream Crossing (single culvert at bottom)

REFERENCE

Cumberland Resources Ltd.

Datum: NAD 83 Projection: UTM Zone 14

2,000 1,000 0 2,000 Metres

Scale - 1:100,000

PROJECT: CUMBERLAND RESOURCES LTD.

TITLE: ALL-WEATHER PRIVATE ACCESS ROAD
STREAM CROSSINGS SHOWING LOCATIONS OF HABITAT ASSESSMENT AND FISHING GEAR DEPLOYMENT
1:100,000 Mapsheet 2 of 3

Golder Associates Burnaby, B.C.

PROJECT No. 06-1413-034			SCALE AS SHOWN	REV. 0
DESIGN	JH	21 Nov. 2006	FIGURE 1B	
GIS	CDB	13 Dec. 2006		
CHECK				
REVIEW				

N:\Bur-Graphics\Projects\2006\1413\06-1413-034\GIS\aprs\3200\Alignment_2006-11\figure-01b_habitat-assessment.mxd

BACK RIVER (ARCTIC) DRAINAGE

QUOICH RIVER DRAINAGE

PRINCE RIVER DRAINAGE

Vault Lake

Turn Lake

Drilltrail Lake

Second Portage Lake

Third Portage Lake

Inuggugayualik Lake

Amarulik Lake

N

C25 R25 103 102 104 105 Pit-23b 106 R26 107 108 R27 109 101 R24 C24 99 Pit-22 98 97 96 R23 95 C23 94 C22 93 92 91 90 Pit-20 C21 89 R21 88 C20A 87 R20 C20 86 Pit-19 C19A R19 84 B05 (C19) 83 R18A 82 C18A Pit-18 81 R18 C18 80 R17 79 C17 78 77 76 R16 75 C16 Pit-17 74 73 72 R15/B04 71 B04 (C15) Pit-16 70 R14 C14 69 68 67 66 Pit-15 65 64 R13 C13 63

620000 622000 624000 626000 628000 630000 632000 634000 636000 638000 640000 642000

7220000 7218000 7216000 7214000 7212000 7210000 7208000 7206000 7204000 7202000 7200000 7198000 7196000 7194000 7192000 7190000 7188000 7186000

LEGEND

- Meadowbank Project
- Kilometre Marker
- Proposed Route
- Watercourse
- Waterbody
- Contour (10 m interval)
- Watershed Boundary
- Habitat Assessment (Spring and Fall)
- Hoop Net (Spring)
- Hoop Net (Fall)
- Larval Drift Trap
- Minnow Trap
- Rock Pit (investigated)
- Rock Pit (to be quarried)
- Archaeological Site
- Stream Crossing (30 m bridge)
- Stream Crossing (12 m bridge)
- Stream Crossing (multiple culverts at bottom)
- Stream Crossing (single culvert at bottom)

REFERENCE

Cumberland Resources Ltd.

Datum: NAD 83 Projection: UTM Zone 14

2,000 1,000 0 2,000 Metres

Scale - 1:100,000

PROJECT: CUMBERLAND RESOURCES LTD.

TITLE: ALL-WEATHER PRIVATE ACCESS ROAD
STREAM CROSSINGS SHOWING LOCATIONS OF HABITAT ASSESSMENT AND FISHING GEAR DEPLOYMENT
1:100,000 Mapsheet 3 of 3

Golder Associates Burnaby, B.C.

PROJECT No. 06-1413-034			SCALE AS SHOWN	REV. 0
DESIGN	JH	21 Nov. 2006	FIGURE 1C	
GIS	CDB	18 Dec. 2006		
CHECK				
REVIEW				

N:\Bur-Graphics\Projects\2006\1413\06-1413-034\GIS\aprs\3200\Alignment_2006-11\figure-01c_habitat-assessment.mxd

2.0 METHODOLOGY

2.1 Equipment

Hoop nets set to capture juvenile and adult fish and larval drift traps (for emergent fry) were set at crossings R02, R05, R06, R09, R15, and R19 to determine overall movement of fish, collect length, weight and sexual maturity of arctic grayling and to determine direction (up- and downstream) movement of fish. Hoop nets consisted of either four-foot (1.22 m) or three-foot (0.9 m) diameter front hoop dimensions, 17 ft (4.9 m) long with a total width, including wings of either 9 m or 15 m. The hoop nets used in the monitoring consisted of a series of four hoops with 25 cm square size (1") mesh. Attached to the hoops are mesh extension "wings" that extended with variable length from the outside of the front hoop. Hoop nets were set with a particular orientation to trap either upstream- or downstream-migrating fish. Fish entering the hoop nets were retained alive within the nets until processed (i.e., measured and weighed) and released. Nets were checked daily, unless weather or other logistical considerations prevented access.

Where stream width was narrow and only able to accommodate one hoop net, a 1.92 cm (1.5") stretch mesh gill-net was set behind the hoop net after arriving at the stream. Fish impeded by the hoop net attempting to migrate in the opposite direction were trapped by the gill net and processed. To maximize collection, hoop nets were redirected in response to the direction of the highest abundance of migrating fish.

Larval drift traps were set at crossings R02, R05, R06, R09, R15, and R19 to investigate which of these streams supported spawning habitat. Traps were set near the hoop nets within constricted, riffle portions downstream of likely spawning substrate and orientated to passively collect drifting fish eggs and newly hatched fry. Larval drift traps consist of 0.5 mm nitex mesh traps attached to the back of a square, cone-shaped frame constructed of aluminum. The frame with trailing net and Nalgene collection jar was submerged into the stream and anchored between two aluminum rods. The volume of water sampled is directly related to the surface area of the trap (m^2) and stream velocity (m/s).

In total 10 drift traps and 8 hoop nets were used for data collection. **Tables 2.1 and 2.2** provide the UTM coordinates of hoop nets and drift traps, proximity of the sets to the most current bridge crossings, number of hoop nets, the hoop net sizes, the percent channel coverage and the date allocation of hoop nets and drift traps per crossing. (Note: on July 4 hoop nets from crossing R15 were pulled and re-allocated to crossing R05 and R06; as well, on July 4 the hoop net and drift trap location of R06A was moved downstream to R06B, near identified spawning habitat).

Table 2.1: UTM Coordinates of HN and DT (NAD 83 14W).

Crossing ID	Location	Drift Traps	Hoopnets	Proximity to Current Bridge Crossing
R02	a	643480 7143423	643511 7143452	~ 500m US
	b	643478 7143419		
R05		640354 7151074	640284 7151104	~ 35m US
R06A	a	638089 7155843	638106 7155835	At crossing
	b	638078 7155842		
R06B		638289 7155765	638219 7155750	~ 500m DS, at June Crossing Coordinates
R09		626118 7173846	626143 7173864	~ 1.0 km DS
R15		627651 7192059	627663 7192057	~ 200m DS
R19		627799 7203560	627832 7203523	~ 1.0 km DS

Notes: US = upstream, DS = downstream.

Table 2.2: Drift Trap and Hoop Net Allocation by Date, Size, and Channel Coverage, 2006.

Crossing ID	Date	Drift Traps	Hoop Nets	Channel Coverage
		n	n	
R02	June 24 to July 19	2	2	60%
R05	June 24 to July 4	2	1	70%
R06A	June 24 to July 4	2	1	50%
R09	June 24 to July 19	1	1	100%
R15	June 23 to July 4	2	2	66%
R19	June 23 to July 18	1	1	100%
R05	July 4 to July 19	2	2	100%
R06B	July 4 to July 18	2	2	50%
R15	July 4 to July 19	2	0	-

2.2 Data Collection

The locations for setting hoop nets were based on a number of factors including stream velocity, depth, substrate, repeatability for comparison to 2005 data, and practicality of set locations based on crossing locations provided by Golder Associates. Larval drift traps were usually set in tandem downstream of suspected arctic grayling spawning areas. Data were collected to determine if arctic grayling actually spawned within the stream channels, and if so, where and of what importance is the stream for this life history activity. This has bearing on quantifying habitat value to calculate habitat loss by bridge abutments in impacted streams. Ambient water temperature was collected at upon arrival at each channel.

2.2.1 Larval Drift Collection

Larval drift traps were checked at least every second day and fish eggs or fish larvae were collected and identified in the field lab following collection. Invertebrate species collected in the larval drift traps were also identified at least to order; no quantification was conducted. Larval fish samples were preserved in a diluted formalin solution for confirmation of taxonomic identification by North/South Consultants Inc. (Winnipeg, Manitoba) with the use of larval taxonomic keys (Auer, 1982; Konrad, 1985).

2.2.2 Hoop Net Collection

Fish were removed and evaluated from hoop nets nearly every day, depending on helicopter availability and weather. Fish were identified to species, measured for fork length (+/- 1 mm) using a standard measuring board, weighed (+/- 1g) using a battery operated top-loading field scale, and examined for external health. Arctic grayling were examined for sexual maturity and spawning condition (immature, waiting to spawn next year, ripe and spawning or spent) by evaluating dimorphic traits and gentle palpitation of the belly. Periodic autopsies on a small sample of fish were conducted to confirm sexual maturity, and to evaluate internal condition and diet.

3.0 RESULTS AND DISCUSSION

This section summarizes the data collected along the proposed 115 km all-weather-road (**Figure 1.1**) including: larval fish data, water temperature, all relevant species of fish movements, maturity and sex, diet and size distributions of arctic grayling. A brief comparison to the data collected in 2005 is also included in this section.

Table 3.2 outlines the daily in stream activity including fish data per species, larval collection and discrete water temperature changes at the respective crossings.

3.1 Larval Drift Collection

Larval drift traps were set and data were collected at crossings R02, R05, R06, R09, R15, and R19 from June 23 to July 19, 2006. Fish larval drift includes eggs and young of the year (YOY). **Table 3.1** summarizes the larval data collected and **Table 3.3** summarizes the invertebrates collected at the respective crossings.

Table 3.1: Fish Eggs and YOY Larval Drift Collection with Date(s), 2006.

Crossing ID	Eggs Collected		Young of the Year (YOY) per Species			
			ARGR		SLSC/ NSST	
	Date	N	Date	n	Date	n
R02	-	0	July 12-13	4	July 5-19	52
R05	-	0	July 6-11	13	July 8-12	3
R06	July 9	1	July 9 & 17	2	July 5 -18	31
R09	June 27 & 29	5	July 8-11	6	July 17	1
R15	-	0	July 10-17	34	-	0
R19	July 6	1	-	0	July 11-17	8
Total		**7**		**59**		**95**

Notes: ARGR = arctic grayling, SLSC = slimy sculpin, NSST = ninespine stickleback.

Table 3.2: Daily Enumeration of Upstream (US) and Downstream (DS) Movements by Fish Along the AWPAR, 2006.

Crossing ID			Date	6/24/2006	6/25/2006	6/26/2006	6/27/2006	6/28/2006	6/29/2006	6/30/2006	7/1/2006	7/2/2006	7/3/2006	7/4/2006	7/5/2006	7/6/2006	7/7/2006	7/8/2006	7/9/2006	7/10/2006	7/11/2006	7/12/2006	7/13/2006	7/14/2006	7/15/2006	7/16/2006	7/17/2006	7/18/2006	7/19/2006	Total
	Fish Species																												
	Juvenile/ Adult																												
	ARGR	US		19	11	0	4	0	13	3	3	1	2	3	1	8	0	2	6	2	2	8	6	-	0	-	6	2	0	**102**
		DS		0	0	0	0	0	0	0	0	0	1	8	6	2	0	7	0	2	0	1	0	-	4	-	0	0	3	**34**
	RNWH	US		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	-	0	-	0	0	0	**5**
		DS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	-	1	-	0	0	0	**4**
R2	*LKTR*	US		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	-	0	0	0	**0**
		DS		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	1	-	0	0	0	**1**
	Larvae																												
	ARGR			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	-	0	-	0	0	0	**4**
	SLSC / NSST			0	0	0	0	0	0	0	0	0	0	0	6	5	6	6	2	0	0	0	0	-	10	-	9	5	3	**52**
	Water Temperature			8.5	8.0	4.5	7.5	-	8.0	7.0	10.0	9.0	11.0	9.0	11.0	13.5	11.0	10.0	9.0	9.5	14.0	14.0	13.0	-	13.5	-	11.5	12.0	10.0	
	Fish Species																												
	Juvenile/ Adult																												
	ARGR	US		78	9	34	9	0	6	3	0	3	14	0	-	0	0	0	1	5	1	1	0	0	0	-	0	0	4	**168**
		DS		0	0	0	0	0	0	0	0	0	0	29	-	17	21	24	26	21	57	29	29	0	20	-	26	7	3	**309**
	RNWH	US		0	0	0	0	0	0	0	0	0	1	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	**1**
		DS		0	0	0	0	0	0	0	0	0	9	9	-	11	9	2	0	1	3	3	0	1	0	-	1	0	2	**51**
R5	*LKTR*	US		1	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	**1**
		DS		0	0	0	0	0	0	0	0	0	1	1	-	1	1	1	0	0	1	0	0	0	0	-	1	0	0	**7**
	Larvae																												
	ARGR			0	0	0	0	0	0	0	0	0	0	0	-	1	3	1	4	2	2	0	0	0	0	-	0	0	0	**13**
	SLSC / NSST			0	3*	0	0	0	0	0	0	0	0	0	-	0	0	2	0	0	0	1	0	0	0	-	0	0	0	**3**
	Water Temperature			6.5	9.5	5.0	7.5	-	8.0	9.0	13.0	13.0	13.5	15.0	-	16.0	10.0	9.0	10.0	10.0	9.5	15.0	13.5	-	15.0	-	12.5	12.0	10.0	

Crossing ID		Date	6/24/2006	6/25/2006	6/26/2006	6/27/2006	6/28/2006	6/29/2006	6/30/2006	7/1/2006	7/2/2006	7/3/2006	7/4/2006	7/5/2006	7/6/2006	7/7/2006	7/8/2006	7/9/2006	7/10/2006	7/11/2006	7/12/2006	7/13/2006	7/14/2006	7/15/2006	7/16/2006	7/17/2006	7/18/2006	7/19/2006	Total
R6	***Fish Species***																											
	Juvenile/ Adult																											
	ARGR	US	0	0	-	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	0	0	-	**0**
		DS	0	0	-	0	-	0	0	0	0	0	1	0	0	0	1	0	0	0	0				0	0	-	**2**
	Larvae																											
	ARGR		0	0	-	0	-	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	-	-	1	0	-	**2**
	SLSC / NSST		0	0	-	0	-	0	0	0	0	0	0	11	5	2	1	1	0	3	0	6			1	1	-	**31**
	Water Temperature		6.5	7.5	-	7.5	-	7.0	6.0	7.0	5.0	6.0	7.5	7.5	12.0	7.0	9.0	8.0	9.5	10.0	12.0	11.0	-	-	-	11.5	12.0	-	
R9	***Fish Species***																											
	Juvenile/ Adult																											
	ARGR	US	0	13	0	4	3	4	3	10	1	9	4	0	0	0	0	0	0	0	0	0	-	-	-	0	0	0	**51**
		DS	0	0	0	0	0	0	0	0	0	0	2	2	0	0	3	1	2	2	1	7	-	-	-	2	3	2	**27**
	RNWH	US	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	0	0	0	**0**
		DS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	-	-	-	0	0	0	**2**
	LKTR	US	0	3	0	1	2	0	0	0	0	1	0	0	0	0	1	1	1	0	2	2	-	-	-	0	0	0	**14**
		DS	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	0	0	0	**3**
	Larvae																											
	ARGR		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3	0	0	-	-	-	0	0	0	**6**
	SLSC / NSST		0	0	0	2*	0	3*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	1	0	0	**1**
	Water Temperature		6.0	7.5	-	7.5	9.0	11.0	9.0	11.0	11.5	14.0	14.0	13.0	15.0	11.0	10.5	9.0	10.5	16.0	16.0	13.5	-	-	-	12.0	12.0	10.0	
R15	***Fish Species***																											
	Juvenile/ Adult																											
	ARGR	US	0	3	0	0	1	1	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5**
		DS	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**
	Larvae																											
	ARGR		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	17	6	-	-	-	4	0	0	**34**
	SLSC / NSST		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	0	0	0	**0**
	Water Temperature		7.5	9.0	-	5.5	8.5	8.0	8.0	12.0	9.5	13.0	13.0	13.0	13.0	-	-	9.0	8.5	15.0	15.0	14.0	-	-	-	12.0	-	-	

Crossing ID		Date	6/24/2006	6/25/2006	6/26/2006	6/27/2006	6/28/2006	6/29/2006	6/30/2006	7/1/2006	7/2/2006	7/3/2006	7/4/2006	7/5/2006	7/6/2006	7/7/2006	7/8/2006	7/9/2006	7/10/2006	7/11/2006	7/12/2006	7/13/2006	7/14/2006	7/15/2006	7/16/2006	7/17/2006	7/18/2006	7/19/2006	Total
	Fish Species																											
	Juvenile/ Adult																											
	ARGR	US	4	0	0	4	5	0	3	5	4	0	4	7	0	0	7	3	0	0	0	0	-	-	-	0	0	-	**46**
		DS	0	0	0	0	0	0	4	0	7	1	1	1	3	0	5	2	1	0	4	0	-	-	-	0	0	-	**29**
R19	*LKTR*	US	0	0	0	0	0	1	2	0	0	1	0	1	0	0	0	0	0	0	0	0	-	-	-	0	0	-	**5**
		DS	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	-	-	-	1	0	-	**5**
	Larvae																											
	ARGR		0	0	0	0	0	0	0	0	0	0	0	0	1*	0	0	0	0	0	0	0	-	-	-	0	0	-	**0**
	SLSC / NSST		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-	-	-	7	0	-	**8**
	Water Temperature		8.0	-	-	8.0	11.0	11.5	11.0	12.0	12.0	14.0	15.0	15.0	15.0	-	10.5	8.0	10.0	16.0	15.5	14.0	-	-	-	12.5	12.0	-	

Notes:
If a particular species is not listed in the table it was not collected during the sampling period.
* indicates # eggs; eggs are not accounted for in fish larvae total.
ARGR = arctic grayling; LKTR = lake trout; SLSC = slimy sculpin; NSST = ninespine stickleback.
US = movement of fish upstream; DS = movement of fish downstream.

Table 3.3: Invertebrates Collected at Crossings R02 – R19, 2006.

	Crossing ID					
	R02	**R05**	**R06**	**R09**	**R15**	**R19**
Invertebrates Collected	Chironomidae, Hydracarina, Cladocera, Copepoda, Oligochaeta, Plecoptera, Tipulidae, Gastropoda, Hydroids	Cladocera, Copepoda, Trichoptera, Hydracarina, Plecoptera, Coleoptera	Hydracarina, Cladocera, Copepoda, Trichoptera, Oligochaeta, Coleoptera, Plecoptera, Hemiptera, Gastropoda	Copepoda, Cladocera, Hydracarina, Chironomidae, Hirudinae, Tilupidae, Plecoptera	Hydracarina, Plecoptera, Cladocera, Copepoda, Tipulidae	Hydracarina, Cladocera, Copepoda, Trichoptera, Oligochaeta, Chironomidae, Coleoptera, Tipulidae, Plecoptera, Hemiptera, Aranaea

A total of 59 fish larvae and 8 eggs of arctic grayling (*Thymallus arcticus*), and 95 larvae of slimy sculpin (*Cottus cognatus*) and/or ninespine stickleback (*Pungitius pungitius*) were collected during the spring/summer of 2006. All eggs captured in the drift traps were arctic grayling. Grayling are broadcast spawners, as opposed to slimy sculpin and ninespine stickleback, and are therefore more prone to drifting. Stickleback are nest builders, spawn in nearshore areas of lakes and actively defend their broods (Scott and Crossman, 1979). Consequently, it is unlikely that they would spawn within the connecting channels or streams themselves, so eggs from this species would not be captured in drift traps in streams.

Arctic grayling larvae were captured in drift traps from five of the six streams that were documented to contain grayling in 2005. R02 is by far the largest stream crossing yet only four grayling larvae were captured here. This suggests that although spawning occurs, the importance of this area may be small. However, given such large flows in the stream during freshet (35 m^3/s), it may be that it was difficult to collect larvae. Fifty-two larvae of what probably were slimy sculpin were collected here.

At crossing R05 larval drift traps were set downstream of a riffle-run cobble-boulder substrate area with pockets of pea-sized gravel. No eggs were collected here, although 13 arctic grayling larvae and three slimy sculpin were captured.

Only two grayling larvae were collected at R06, although sculpin larvae were much more common (31). Six arctic grayling larvae were collected from R09, with only one sculpin larvae.

The largest number of grayling larvae were captured at crossing R15 (34) of all streams monitored in 2006. Traps were set downstream of a small boulder-cobble dominated riffle-run, with small pockets of gravel. Peak drift occurred during the second week of July, suggesting that spawning by grayling had occurred in this stream during late June, with larvae emerging from the gravel approximately two weeks after spawning. No larvae from any other species was captured in drift traps.

At crossing R19 drift traps were set downstream of a riffle-run area dominated by cobble and gravel. One egg and eight slimy sculpin were collected here in 2006. No larval grayling were collected, which suggests that this stream is not used for spawning, but may only function as migratory habitat.

3.2 Fish Biology

Adult or juvenile arctic grayling (ARGR), round whitefish (RNWH), lake trout (LKTR) and arctic char (ARCH) fish were collected using hoop nets at crossings R02, R05, R06, R09, R15, and R19 from 24 June to 19 July 2006. These are the six crossings where the planned bridges may not completely span the stream channel, resulting in a HADD. The following section briefly discusses the riverine ecology of each fish and the significance of the data collected along the AWPAR for round whitefish, lake trout and arctic char and focuses on an evaluation and interpretation of the movements, sex and maturity, diet and size distribution data for arctic grayling.

The **Table 3.4** presents a summary of the adult and juvenile fish collected at the respective crossings.

Table 3.4: Number of Individual Fish Collected per Crossing.

Species	Site ID						
	R02	**R05**	**R06**	**R09**	**R15**	**R19**	**Total**
ARCH				1			1
ARGR	136	477	2	84	5	75	779
LKTR	1	7		17		11	36
RDWH	9	56		2			67
Total	**146**	**540**	**2**	**104**	**5**	**86**	**883**

Notes: ARCH = arctic char, ARGR = arctic grayling, LKTR = lake trout, RDWH = round whitefish.

3.2.1 Round whitefish (*Prosopium cylindraceum*)

Table 3.5 summarizes data collected along the all-weather-road for round whitefish including: number, size, weight, and condition factor, where data are available, at the respective crossings.

Table 3.5: Summary of Round Whitefish Length, Weight and Condition Factor, 2006.

Crossing ID	n	Length (mm)				Weight (g)				Condition Factor (K)			
		Mean	Max	Min	SD	Mean	Max	Min	SD	Mean	Max	Min	SD
R02	9	287	359	224	48.48	251	429	110	116	0.97	1.05	0.91	0.05
R05	62	323	378	240	32.14	347	522	127	101	1.00	1.32	0.86	0.09
R06	0												
R09	2	336				418				1.10			
R15	0												
R19	0												

Notes: Condition factor: $K = (\text{weight} \times 10^5) / (\text{length})^3$; unitless.

Round whitefish are commonly found in the project area and have been found to spawn in late fall (October) in lakes and periodically in rivers (Evans et al. 2002). Round whitefish were present in three of the six streams monitored in 2006. They were collected moving upstream (5) and downstream (4) from 8 July 8 to 15 July 2006 at crossing R02 and almost exclusively moving downstream (51 DS and 1 US) at crossing R05 from 3 July to 19 July 2006. Two (2) round whitefish were collected moving DS at crossing R09. It is likely that these fish are using R02, R05, and R09 as feeding and navigation corridors. This is most evident at crossing R05 as this channel connects a series of lakes upstream to the Prince River.

3.2.2 Lake trout (*Salvelinus namaycush*)

Table 3.6 summarizes the data collected along the all-weather-road for lake trout including: number, size, weight and condition factor, where data are available, at the respective crossings.

Table 3.6: Summary of Lake Trout Length, Weight and Condition Factor, 2006.

Crossing ID	n	Length (mm)				Weight (g)				Condition Factor (K)			
		Mean	Max	Min	SD	Mean	Max	Min	SD	Mean	Max	Min	SD
R02	1	389				560.0				0.95			
R05	8	507	605	420	75.0	1168.8	1670	668	540.4	0.97	1.04	0.87	0.07
R06	0												
R09	17	464	555	297	64.5	996.3	1501	496	312.6	0.89	1.06	0.68	0.09
R15	0												
R19	10	453											

Notes: Condition factor: $K = (\text{weight} \times 10^5) / (\text{length})^3$; unitless.

Lake trout are found throughout the north (Scott and Crossman, 1979). They are predominantly found in lakes but have been found to dwell in clear rivers, however their riverine biology has not been well studied (Evans et al., 2002). Lake trout were collected in few numbers at crossings R02, R05, R09, and R19. Movements by lake trout were fairly random and were not characteristic of dedicated movements in one direction or another.

One lake trout collected at crossing R02 moved downstream on 15 July. Seven of 8 trout at R05 moved downstream over a three week period between 25 June to 17 July 2006. Fourteen lake trout moved upstream and three moved downstream at R09 between 25 June and 15 July 2006. Five lake trout were collected moving upstream and five were collected moving downstream at R19 from 29 June to 17 July 2006. All of the lake trout collected were comparatively small with respect to those collected in lacustrine environments in previous studies (BAER, 2005). Lake trout use these streams opportunistically and randomly as migratory or feeding corridors between lakes during spring. There is insufficient flow in most streams beyond mid- to end July to allow fish passage between, or within streams during anytime except freshet.

3.2.3 Arctic char (*Salvelinus alpinus*)

Arctic char use channels, streams and rivers as movement corridors between lakes, usually during fall to access overwintering habitat (Evans et al., 2002). They spawn in the fall in lakes and only periodically have been found to spawn in areas of large rivers that provide open water. Only one arctic char was collected moving downstream at crossing R09 on 3 July 2006. It is unlikely that there are anadromous arctic char in this system, being several hundred kilometers from Chesterfield Inlet. Char are uncommon in the streams, but may be present in small numbers from time to time.

3.2.4 Arctic grayling (*Thymallus arcticus*)

Arctic grayling move upstream from lakes and larger rivers into smaller streams to spawn and then rest and feed in adjacent lakes (McPhail and Lindsey, 1970). Following spawning they return to larger lakes and streams to feed. This succession was found in streams along the AWPAR. Arctic grayling were collected migrating upstream and downstream in high abundance at four stream crossings R02, R05, R09, and R19. Few arctic grayling were collected at crossings R06 and R15 as water levels quickly dropped following freshet, preventing fish passage from early July through open water season. Stream crossing R15 is a shallow and diffuse channel with limited passability by fish throughout the open water season. Few arctic grayling were collected in both 2005 and the current study.

Table 3.7 summarizes arctic grayling data collected between 24 June and 9 July 2006 at all six crossings monitored. The following sections focus on data collected at crossings R02, R05, R09, and R19, as few fish were collected at crossings R06 and R15 to evaluate graphically.

Table 3.7: Summary of Arctic Grayling Length, Weight and Condition Factor, 2006.

Crossing ID	n	Length (mm)				Weight (g)				Condition Factor (K)			
		Mean	Max	Min	SD	Mean	Max	Min	SD	Mean	Max	Min	SD
R02	136	270	380	177	37.9	227	434	69	80.4	1.10	3.73	0.43	0.29
R05	477	290	390	196	44.0	283	656	91	114.4	1.08	1.84	0.35	0.12
R06	2	338	-	-	-	403	-	-	-	1.04	-	-	-
R09	84	278	484	188	49.3	259	970	82	126.8	1.13	2.07	0.86	0.22
R15	5	273	314	242	25.9	230	332	130	75.6	1.10	1.40	0.92	0.18
R19	75	301	545	191	53.2	293	886	82	120.7	1.06	2.01	0.26	0.19
Mean		292				282				1.1			

Notes: Condition factor: $K = (\text{weight} \times 10^5) / (\text{length})^3$; unitless.

3.2.4.1 Movements

Arctic grayling are found throughout the Northwest, Yukon, and Nunavut Territories. Maturing adults migrate from lakes and large rivers into smaller streams to spawn in early spring, usually during ice-off, over gravel or rocky bottoms (McPhail and Lindsey, 1970). Spawning occurs in areas with surface current velocities less than 1.4 m/s, varying water depths and relatively small, un-embedded gravels (Beauchamp, 1990). Arctic grayling spawn at the time that the ice-cover begins to break up (Evans et al., 2002). **Figures 3.1 to 3.4** depict daily up- and downstream migrations (with water temperature data) for streams R02, R05, R09, and R19 respectively. Only five fish were captured from R15 and these were not depicted.

Migrations were noted as soon as nets were installed during the third week of June, shortly after ice-off, so it is difficult to know when exactly they started. Substantial ice flow in the streams prevented earlier deployment of the hoop nets. Adult grayling were observed migrating upstream at R02 and R05 on 24 June 2006 with peak downstream migrations on 4 July 2006 and 11 July 2006, respectively (**Figures 3.1 and 3.2**). Peak migrations of arctic grayling at crossing R09 and R19 were on similar dates (25 June and 5 July). Peak downstream migrations were on 13 July and 2 July 2006 (**Figures 3.3 and 3.4**). Presence of larval arctic grayling were observed in most streams about two to three weeks after the first fish were observed migrating upstream, at water temperatures of about 10°C.

Figure 3.1: Frequency of Daily Upstream and Downstream Movements by Arctic Grayling (ARGR) at Crossing R02.

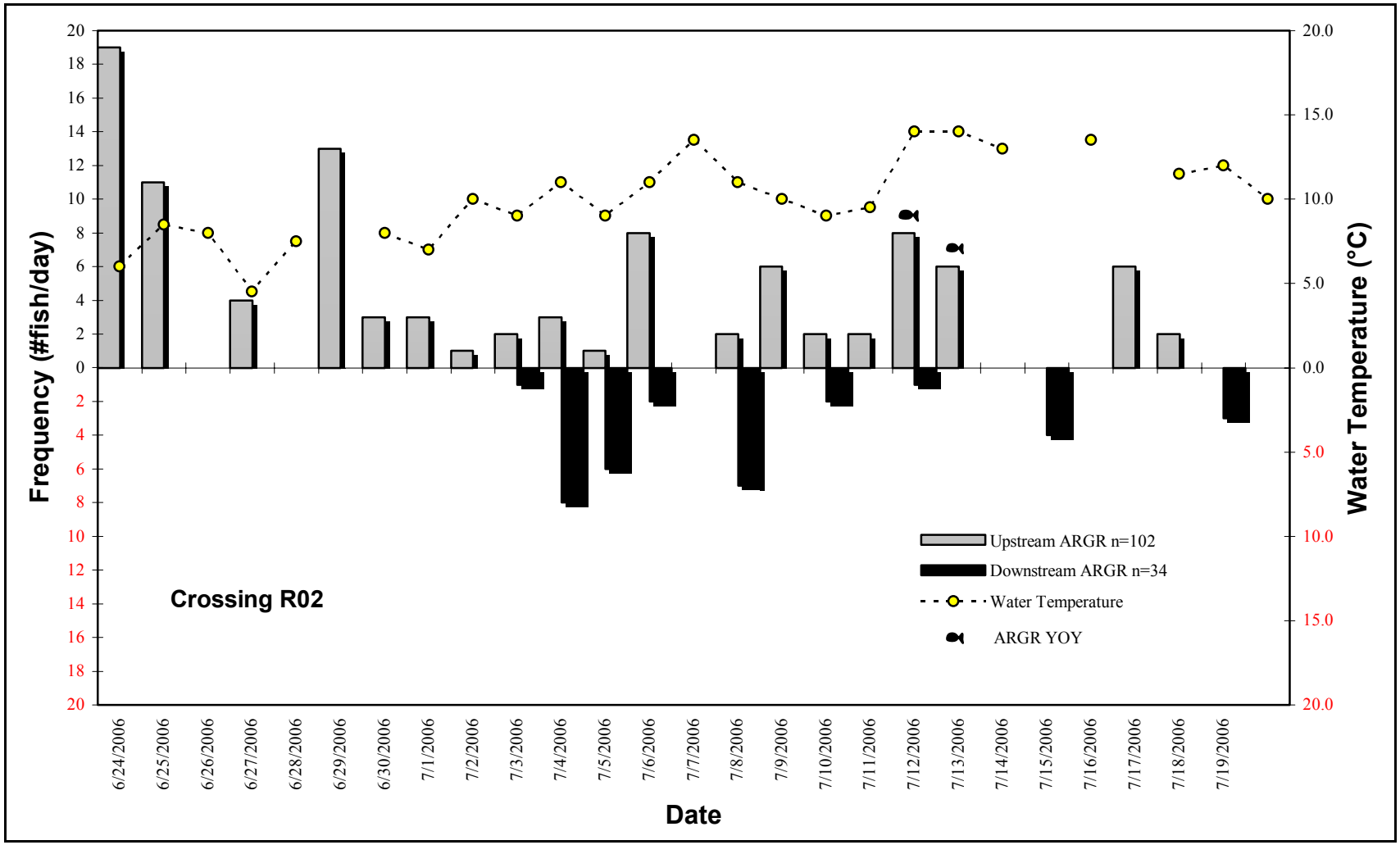


Figure 3.2: Frequency of Daily Upstream and Downstream Movement by Arctic Grayling (ARGR) at Crossing R05.

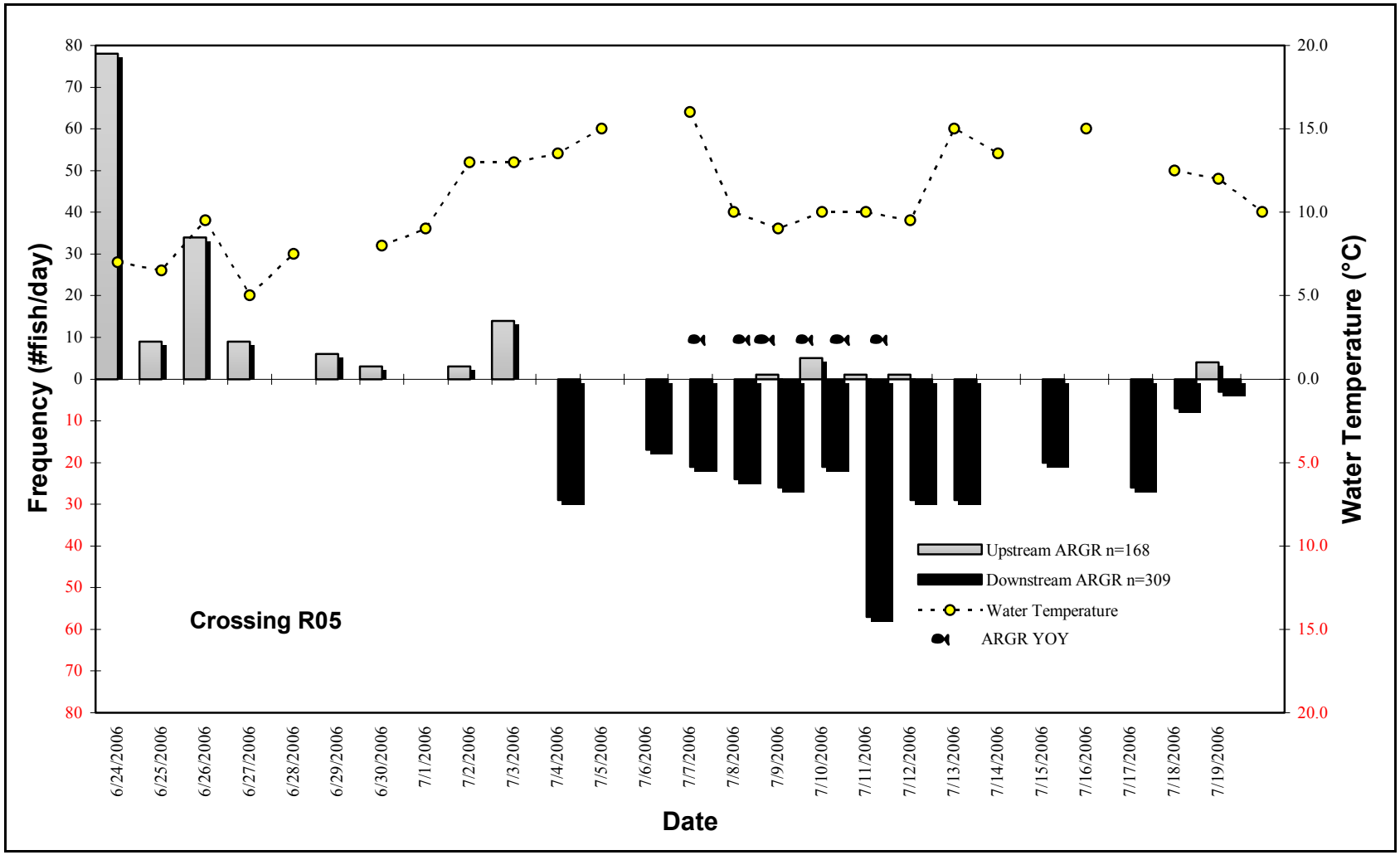


Figure 3.3: Frequency of Daily Upstream and Downstream Movement by Arctic Grayling (ARGR) at Crossing R09.

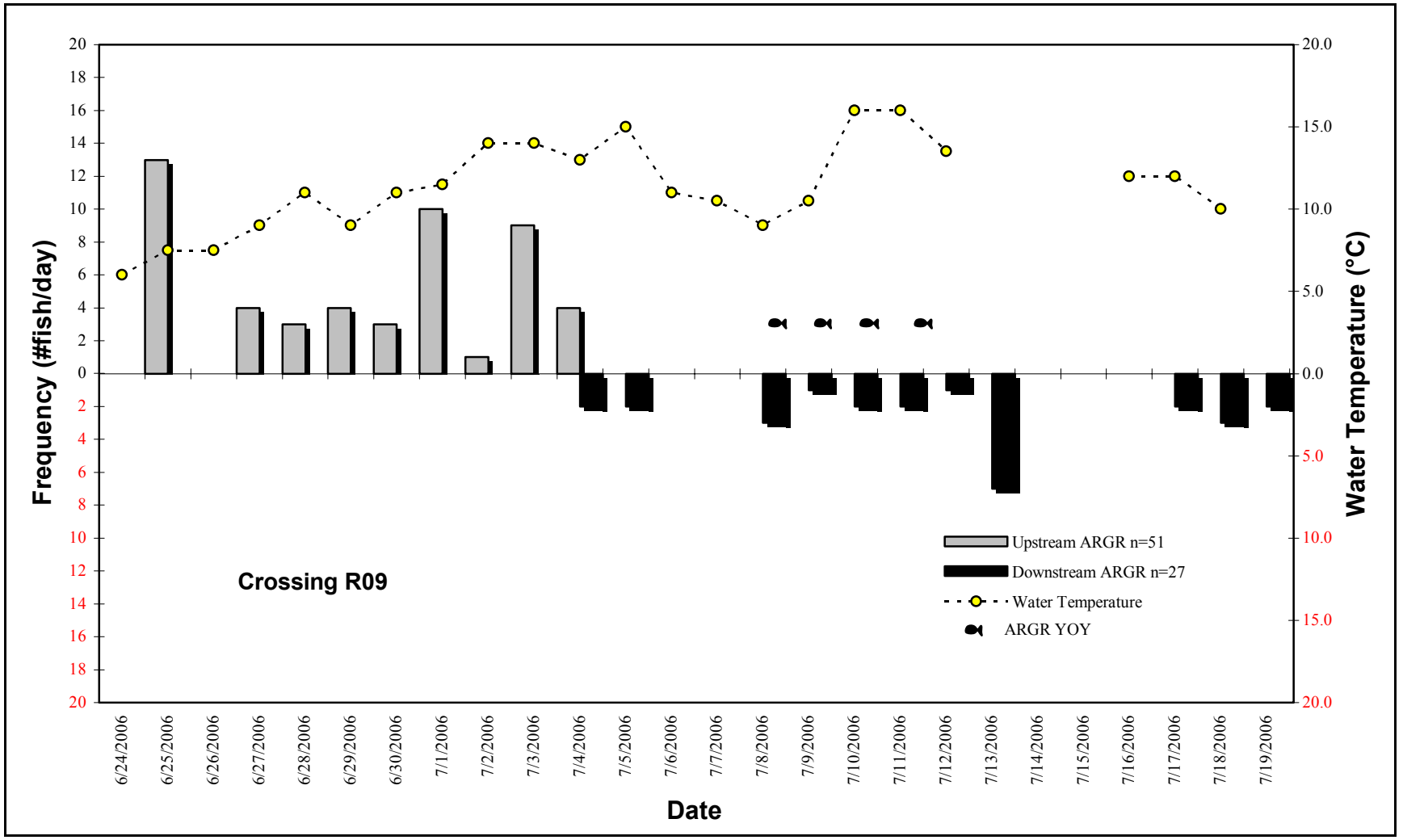
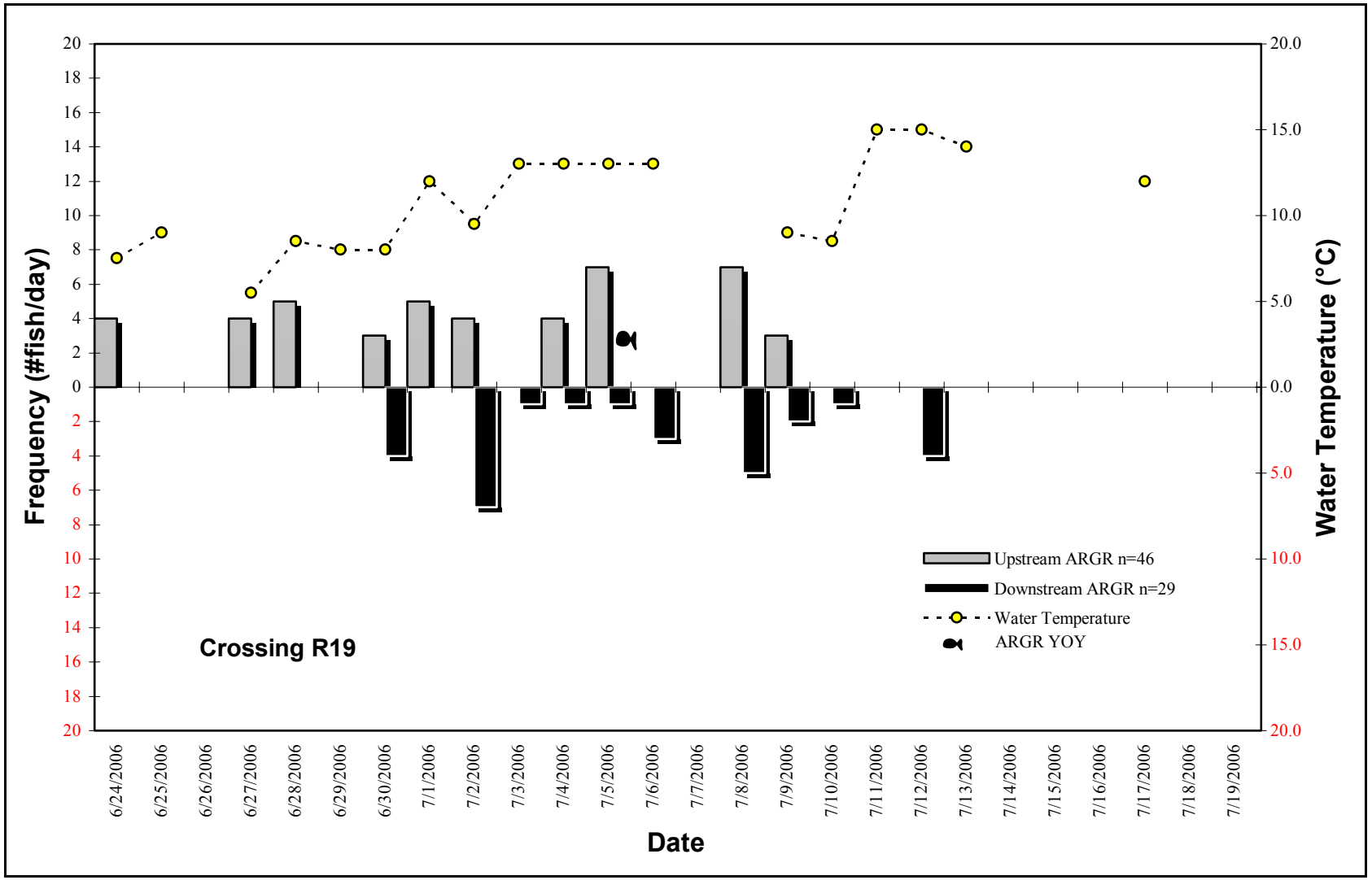


Figure 3.4: Frequency of Daily Upstream and Downstream Movement by Arctic Grayling (ARGR) at Crossing R19.



3.2.4.2 Maturity and Gender

Once sexually maturity is reached at 3 to 5 years of age, arctic grayling spawn nearly every year (Evans et al., 2002). Males arrive on the spawning grounds first and establish and defend a territory. Females pass through the male territories looking for mates, with act of spawning occurring during midday to late afternoon (Beauchamp, 1990). Peak upstream migrations by arctic grayling were on 24 and 29 June 2006; peak upstream female migration was on 25 June 2006 at R05 (**Table 3.8**). Peak downstream migration of male and female arctic grayling at R05 was on 11 July 2006. Arctic grayling male and female immature, ripe, and spawning male and female arctic grayling moved upstream between June 24 and July 4 at crossings R02, R05, R09, and R19. Immature and spent male and female arctic grayling were collected from July 8 to 19 at crossings R02, R05, R09, and R19.

Table 3.8: Number of Male, Female and Immature Arctic Grayling Captured from Stream Crossings.

Sex	Crossing ID						Total
	R02	R05	R06	R09	R15	R19	
F	73	236	1	37	1	36	384
M	50	245	1	42	3	35	376
Immature	13	43	0	7	1	4	68
Total	**136**	**524**	**2**	**86**	**5**	**75**	**828**

3.2.4.3 Diet

Diet of autopsied arctic grayling consisted predominantly of remains of stoneflies (*Plecoptera*), beetles (*Coleoptera*), chironomids and oligochaetes. From early July to late July, blackflies (Simulidae) and mosquitoes contributed to part of the diet. No other fish species were autopsied.

3.2.4.4 Size Distribution

Length-frequency distributions were plotted for arctic grayling at crossings R02, R05, R09, and R19 (See **Figures 3.5 to 3.8**). Statistics for length and weight for each stream are presented in **Table 3.7**. With the exception of crossing R02, which has a modal length distribution of 280 mm, crossings R05, R09, and R19 have bimodal distributions represented by a slight peak at length-frequencies of 220 to 240 mm and a higher frequency with a length of 300 to 320 mm, which probably correspond to a higher age class of fish.

Figure 3.5: Length – Frequency Distribution of Arctic Grayling at Stream Crossing R02.

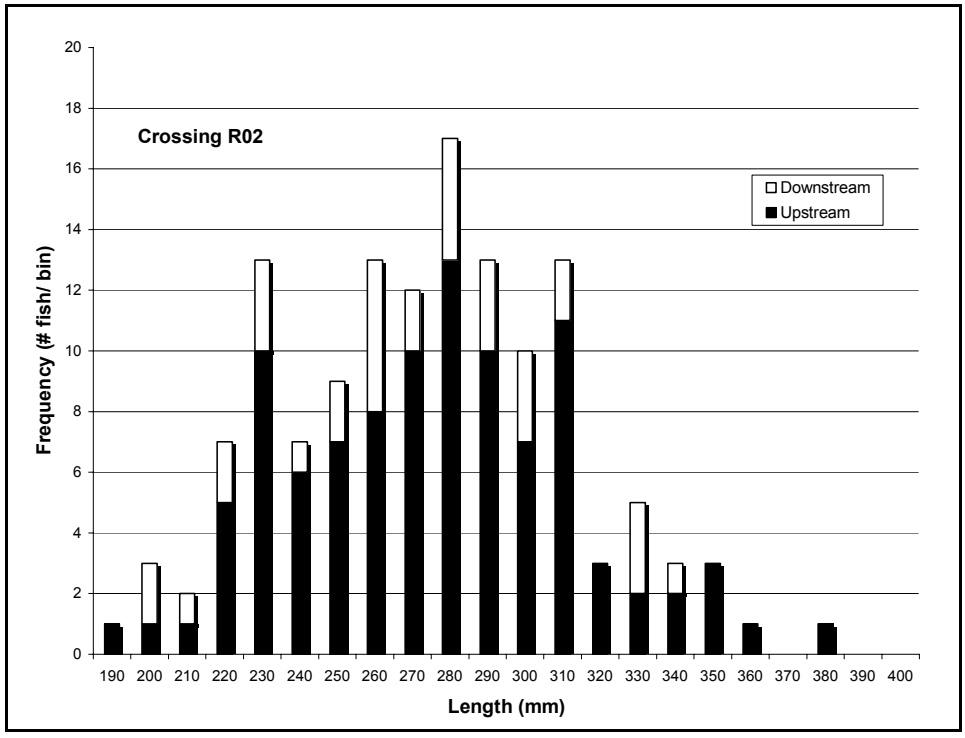


Figure 3.6: Length – Frequency Distribution of Arctic Grayling at Stream Crossing R05.

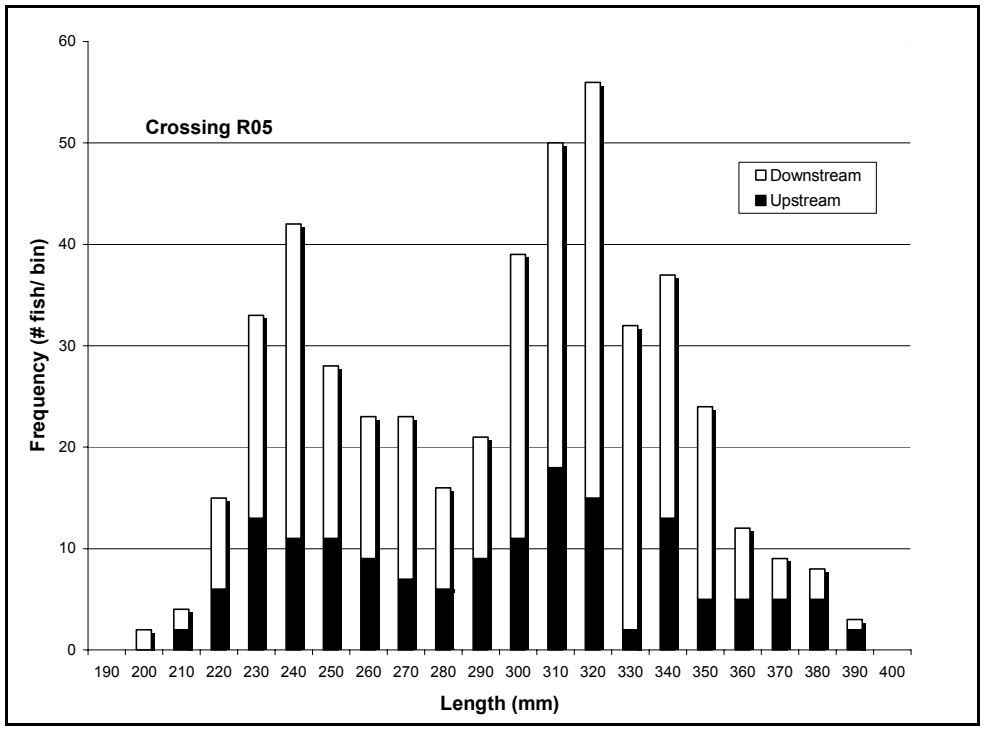


Figure 3.7: Length – Frequency Distribution of Arctic Grayling at Stream Crossing R09.

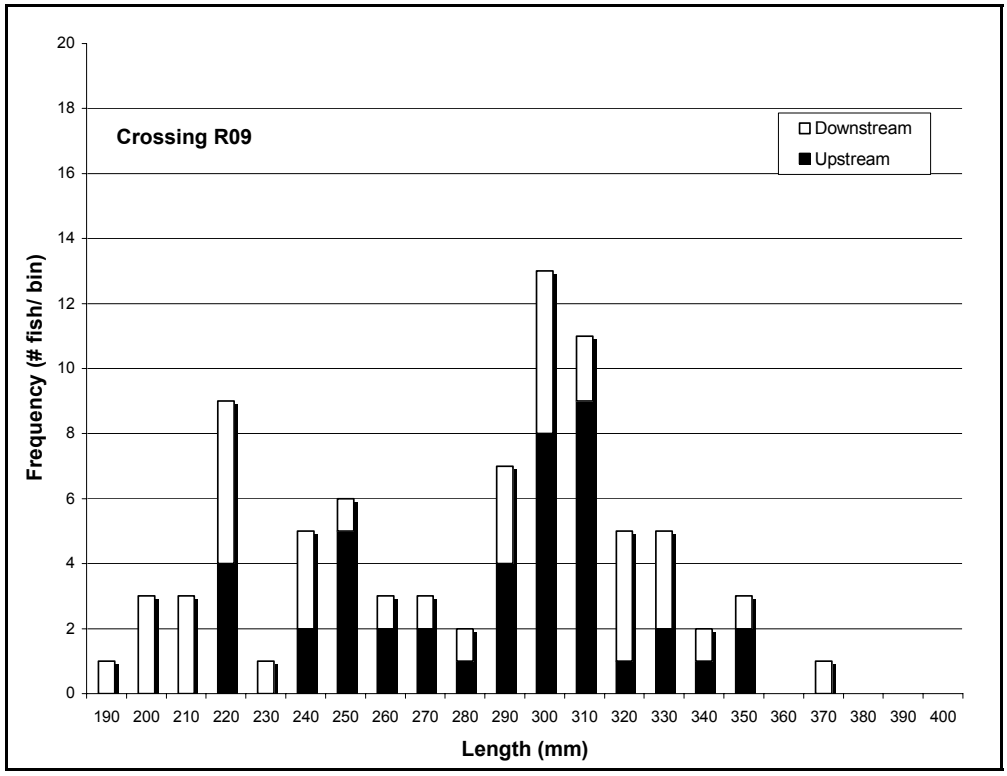
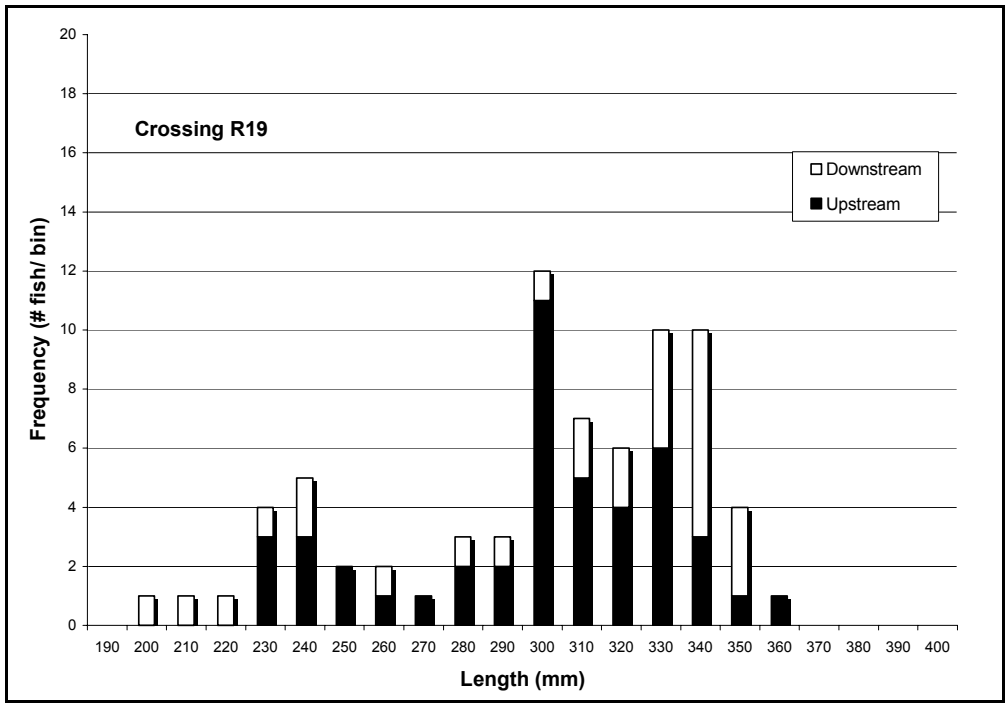


Figure 3.8: Length – Frequency Distribution of Arctic Grayling at Stream Crossing R19.



As presented in **Table 3.7**, the mean length, weight and condition factor of arctic grayling collected along the all weather road in 2006 was 292 mm, 282 g and 1.1, respectively. Lengths, weight and condition factors at crossings R02, R09, and R15 were quite similar or than or equal to the overall mean. Grayling size statistics from streams R06 and R19 were greater than or equal to the overall mean.

3.3 Discussion

Arctic grayling spawn near break-up of streams very early in spring. Adults migrate from lakes and larger rivers into smaller streams to spawn over gravel or rocky bottoms (McPhail and Lindsey, 1970). Spawning occurs in areas with surface current velocities less than 1.4 m/s, varying water depths and relatively small, un-embedded gravels (Beauchamp, 1990). These trends are evident in the data collected in 2006 along the all-weather road. The greatest occurrence of upstream migrations is suspected to have occurred prior to installation of hoop nets because of high flows and ice. Grayling will typically move upstream under ice to reach spawning grounds. However, as streams are frozen to the bottom in this region of the Keewatin, and freshet flow is on top of ice frozen to the bottom, opportunities and timing for spawning by grayling are limited. This may partially explain why there are no arctic grayling in the Quoich River watershed, due east of the Prince River watershed.

Based on hoop net collections, peak observed upstream migrations occurred during the first two days of collection at stream crossings R02, R05, R9, and R19. Peak upstream movements may have occurred at stream crossings R06 and R15 just before our surveys during the greatest water discharge. Peak downstream movements occurred in the second week of July. The total number of arctic grayling captured is not indicative of the true number of fish, as stream width at R02 and R09 was so wide that hoop nets could not span the entire channel. Also, some fish had moved within the stream prior to installation of nets.

Spawning by arctic grayling occurs with water temperatures between 7 and 10°C (Scott and Crossman, 1979). However, water temperatures at the northern extent of the distribution of grayling in this watershed are lower, around 4°C. Grayling do not construct a redd and eggs are broadcast over the surface of suitable size gravel where the eggs become attached. Once spawning is complete, grayling leave the streams to move back into lakes to over winter (Chang-Kue and Cameron, 1980). Young hatch and emerge from the gravel within 16-18 days at water temperatures of 9°C (McPhail and Lindsey, 1970). Fry than reside in semi-deep pools and side channels at water depths approximating 0.5 m, over boulder, cobble, silt and sand substrates (Ford et al., 1995).

Male and female arctic grayling either immature or ripe and running were collected moving upstream in approximately 5°C water, spawned and then returned downstream following a brief resting stage. These trends were especially evident at crossing R05. In streams along the AWPAR, arctic grayling larvae were collected in all streams south of Whitehills Lake at temperatures ranging from 11 to 15°C from July 6 to 13 and slightly later, from July 10 to17, in streams north of Whitehills Lake, where air temperatures tend to be several degrees cooler.

Although larvae were not captured at R19, this stream is likely used for spawning by grayling somewhere along its length, as 71 sexually mature fish were captured. The results of the 2006 AWPAR fish monitoring program show that all six of streams where road-related structures may encroach into the channels are used to some extent by arctic grayling as spawning streams, not only as corridors to move between adjoining lakes.

Length-frequency histograms demonstrate similar trends at all of the crossings with a bimodal distribution indicating overall recruitment success with immature males/ females represented by a slight peak around 230 mm and a mature spawning and running males/females represented by the secondary peak, at a greater age class. Length, weight, condition factor, and diet statistics indicate that arctic grayling are in very good condition and that the system is maintaining a healthy population of arctic grayling.

These data also illustrate that other species including round whitefish, lake trout, and arctic char opportunistically use the streams, but only as feeding corridors as each of these are fall spawners. Although round whitefish have been known to spawn in streams and clear rivers in fall (Evans et al., 2002), all streams along the AWPAR have very low water levels and flow in September and freeze completely to the bottom by October, thus preventing their use by fall spawning fish.

Ninespine stickleback and slimy sculpin may also use these streams for spawning, feeding and refuge from predators.

3.4 Comparison to 2005 Results

In general, results from 2006 were very similar to trends observed in 2005. Peak upstream migration by grayling occurred immediately during/after peak freshet, in the last two weeks of June. Stream crossing R05 was more thoroughly evaluated in 2006 than in 2005 and demonstrated higher habitat utilization, with obvious migratory and spawning trends. In 2005, crossing R06 had a greater number of migratory arctic grayling than in 2006. In both 2005 and 2006, stream crossing R15 was a shallow diffuse channel with limited fish passability throughout the open water season; few

arctic grayling were collected in either year. At stream crossing R19 in 2005, we recorded more migrating arctic grayling than in other streams; in 2006 however, few fish were collected from this same stream. These data indicate the inter-annual variability in stream utilization that can exist and demonstrates the value of multi-year studies to verify the importance of habitat utilization in light of this variation.

In 2005, larval arctic grayling and ninespine stickleback were collected at stream crossings R06 and R15. Young-of-the-year round whitefish and burbot were also collected in some streams, and may have been washed out of the nearshore region of some lakes during freshet. In 2006, only arctic grayling and ninespine stickleback larvae were collected from all streams except R19.

Differences between 2005 and 2006 data are representative of natural annual variation, but also normal efficiencies of fishing gear, water flow patterns and discharge, spawning patterns by fish (i.e., age class variation) and location of drift trap sets that may result in greater or fewer larvae captured from year to year in individual streams. The male/female migratory succession, larval results, and associated trends in 2005 and 2006 suggest that all of the crossings are used as migratory corridors by arctic grayling. The streams are primarily used to access spawning habitat that exists in discrete sections of the streams connecting fish-bearing lakes up- and downstream of the proposed crossing locations. Some of the channels may also be used opportunistically as feeding habitat by small numbers of round whitefish, lake trout, and arctic char. Although typically lake dwelling, a few fish may venture into streams during freshet. Slimy sculpin and ninespine stickleback also use these connecting channels as summer feeding habitat. There is no overwintering in these streams by any species.

There is predicted to be a small amount of peripheral habitat loss in five of the six streams monitored in 2006 due to encroachment of bridge abutments. These streams function as migratory, feeding, and spawning habitat. Relevant information regarding encroachment into these streams has been incorporated into the AWPAR No-Net-Loss Plan (Azimuth, 2006).

4.0 REFERENCES

Auer, N.A. 1982. Identification of larval fishes of the Great Lakes basin with emphasis on the Lake Michigan drainage. Great Lakes Fishery Commission, Ann Arbor, MI 48105. Special Publication 82-3: 744 pp.

Azimuth Consulting Group Inc. (Azimuth). 2005. Habitat and fisheries assessment: All Weather Private Access Road. Prepared for Cumberland Resources Ltd. Vancouver by Azimuth, Vancouver. October 2005.

Azimuth. 2006. Meadowbank Gold Project – No-Net-Loss Plan (NNLP). Prepared for Cumberland Resources Ltd., Vancouver, BC. Prepared by Azimuth Consulting Group Inc, Vancouver, BC. November 2006.

BAER. Baseline Aquatic Ecosystem Report. 2005. A report prepared by Azimuth Consulting Group, Vancouver for Cumberland Resources Ltd. October, 2005

Beauchamp, D.A. 1990. Movements, habitat use, and spawning strategies of arctic grayling in a subalpine lake tributary. Northwest Science 64: 195-207.

Burton, W., and J.F. Flannagan. 1976. An improved river drift sampler. Can. Fish. Mar. Serv. Tech. Rep. 641. 14 pp.

Chang-Kue, K.T.J., and R.A. Cameron. 1980. A survey of the fish resources of the Great Bear River, Northwest Territories, 1974. Can. Fish. Mar. Ser. Rep. No. 1510: 59 pp.

Evans, C.L, Reist, J.D. and Minns C.K. 2002. Life history characteristics of freshwater fishes occurring in the Northwest Territories and Nunavut, with major emphasis on riverine habitat requirements. DFO. Can. Manu. Report Fish. Aquat. Sci. 2614.

Ford, B.S., P.S. Higgins, A.F. Lewis, K.I. Cooper, T.A. Watson, C.M. Gee, G.L. Ennis, and R.L. Sweeting. 1995. Literature reviews of the life history, habitat requirements and mitigation/compensation strategies for thirteen sport fish species in the Peace, Liard and Columbia river drainages of British Columbia. Can. Man. Rep. Fish. Aquat. Sci. 2321: 342pp.

Konrad, S-L.R. 1985. A taxonomic key to the larval fish species which occur in the shelf waters and estuaries of the Canadian Beaufort Sea. Northern Oil and Gas Action Program Project B-: Critical Estuarine and Marine Habitats of the Canadian Arctic Ocean Shelf. Subproject B-2-3: Nearshore Benthic Monitoring, Beaufort Shelf Report No. B2-6. 128pp.

Krueger, S.W. 1981. Freshwater habitat relationships arctic grayling (*Thymallus arcticus).* Anchorage, Alaska, Alaska Department of Fish and Game. 65 pp.

McPhail, J.D., and C.C. Lindsey. 1970. Freshwater Fishes of Northwestern Canada and Alaska. Fisheries Research Board of Canada. Bulletin 173. 381 pp.

Scott, W.B. and E.J. Crossman. 1979. Freshwater fishes of Canada. Bulletin 184. Fisheries Research Board of Canada. 966 p.

APPENDICES

APPENDIX A

LENGTH, WEIGHT AND CONDITION OF FISH CAPTURED IN HOOP NETS ALONG THE AWPAR, 2006.

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R02-U	6/24/06	1	ARGR	298	248	M	7	0.94	US	HN set on 06/23/06 at
R02-U	6/24/06	2	ARGR	356	449	M	7	1.00	US	R02,R05,R15,R19
R02-U	6/24/06	3	ARGR	361	468	M	7	0.99	US	
R02-U	6/24/06	4	ARGR	379	522	M	8	0.96	US	
R02-U	6/24/06	5	ARGR	380	530	M	8	0.97	US	
R02-U	6/24/06	6	ARGR	274	209	--	--	1.02	US	
R02-U	6/24/06	7	ARGR	261	181	--	--	1.02	US	
R02-U	6/24/06	8	ARGR	249	152	--	--	0.98	US	
R02-U	6/24/06	9	ARGR	365	433	--	--	0.89	US	
R02-U	6/24/06	10	ARGR	308	329	--	--	1.13	US	
R02-U	6/24/06	11	ARGR	376	529	--	--	1.00	US	
R02-U	6/24/06	12	ARGR	319	329	--	--	1.01	US	
R02-U	6/24/06	13	ARGR	280	192	--	--	0.87	US	
R02-U	6/24/06	14	ARGR	341	391	M	8	0.99	US	
R02-U	6/24/06	15	ARGR	253	165	--	--	1.02	US	
R02-U	6/24/06	16	ARGR	309	291	--	--	0.99	US	
R02-U	6/24/06	17	ARGR	385	606	--	--	1.06	US	
R02-U	6/24/06	18	ARGR	240	141	--	--	1.02	US	
R02-U	6/24/06	19	ARGR	237	131	--	--	0.98	US	
R02-U	6/24/06	20	ARGR	306	309	M	8	1.08	US	
R02-U	6/24/06	21	ARGR	370	490	M	8	0.97	US	
R02-U	6/24/06	22	ARGR	331	408	F	3	1.13	US	
R02-U	6/24/06	23	ARGR	287	245	--	--	1.04	US	
R02-U	6/24/06	24	ARGR	340	365	M	7	0.93	US	
R02-U	6/24/06	25	ARGR	274	199	--	--	0.97	US	
R02-U	6/24/06	26	ARGR	260	173	--	--	0.98	US	
R02-U	6/24/06	27	ARGR	284	224	--	--	0.98	US	
R02-U	6/24/06	28	ARGR	343	440	--	--	1.09	US	
R02-U	6/24/06	29	ARGR	331	345	M	7	0.95	US	
R02-U	6/24/06	30	ARGR	345	343	M	7	0.84	US	
R02-U	6/24/06	31	ARGR	319	308	M	8	0.95	US	
R02-U	6/24/06	32	ARGR	252	177	F	2	1.11	US	
R02-U	6/24/06	33	ARGR	310	299	M	7	1.00	US	
R02-U	6/24/06	34	ARGR	295	258	M	7	1.00	US	
R02-U	6/24/06	35	ARGR	320	250	M	7	0.76	US	
R02-U	6/24/06	36	ARGR	366	334	M	7	0.68	US	
R02-U	6/24/06	37	ARGR	338	382	M	7	0.99	US	
R02-U	6/24/06	38	ARGR	369	509	M	7	1.01	US	
R02-U	6/24/06	39	ARGR	339	377	M	8	0.97	US	
R02-U	6/24/06	40	ARGR	310	284	--	--	0.95	US	
R02-U	6/24/06	41	ARGR	375	540	F	2	1.02	US	
R02-U	6/24/06	42	ARGR	245	189	--	--	1.29	US	
R02-U	6/24/06	43	ARGR	333	373	M	8	1.01	US	
R02-U	6/24/06	44	ARGR	298	235	M	8	0.89	US	
R02-U	6/24/06	45	ARGR	382	572	F	2	1.03	US	
R02-U	6/24/06	46	ARGR	300	271	--	--	1.00	US	
R02-U	6/24/06	47	ARGR	320	320	M	8	0.98	US	
R02-U	6/24/06	48	ARGR	326	316	--	--	0.91	US	
R02-U	6/24/06	49	ARGR	338	375	M	7	0.97	US	
R02-U	6/24/06	50	ARGR	210	93	--	--	1.00	US	
R02-U	6/24/06	51	ARGR	308	279	--	--	0.95	US	
R02-U	6/24/06	52	ARGR	240	150	--	--	1.09	US	
R02-U	6/24/06	53	ARGR	276	233	--	--	1.11	US	
R02-U	6/24/06	54	ARGR	334	404	--	--	1.08	US	
R02-U	6/24/06	55	ARGR	352	478	--	--	1.10	US	
R02-U	6/24/06	56	ARGR	303	285	F	2	1.02	US	
R02-U	6/24/06	57	ARGR	305	282	M	7	0.99	US	
R02-U	6/24/06	58	ARGR	303	324	--	--	1.16	US	
R02-U	6/24/06	59	ARGR	260	174	--	--	0.99	US	
R02-U	6/24/06	60	ARGR	329	352	M	8	0.99	US	
R02-U	6/24/06	61	ARGR	359	490	M	8	1.06	US	
R02-U	6/24/06	62	ARGR	308	348	F	2	1.19	US	
R02-U	6/24/06	63	ARGR	318	381	--	--	1.18	US	
R02-U	6/24/06	64	ARGR	285	234	--	--	1.01	US	
R02-U	6/24/06	65	ARGR	310	305	M	6	1.02	US	
R02-U	6/24/06	66	ARGR	338	391	M	7	1.01	US	
R02-U	6/24/06	67	ARGR	358	456	M	8	0.99	US	
R02-U	6/24/06	68	ARGR	335	335	--	--	0.89	US	
R02-U	6/24/06	69	ARGR	340	452	F	2	1.15	US	
R02-U	6/24/06	70	ARGR	275	219	--	--	1.05	US	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R02-U	6/24/06	71	ARGR	290	245	F	2	1.00	US	
R02-U	6/24/06	72	ARGR	305	280	M	7	0.99	US	
R02-U	6/24/06	73	ARGR	359	508	M	8	1.10	US	
R02-U	6/24/06	74	ARGR	334	391	M	8	1.05	US	
R02-U	6/24/06	75	ARGR	292	283	F	2	1.14	US	
R02-U	6/24/06	76	ARGR	309	321	M	7	1.09	US	
R02-U	6/24/06	77	ARGR	315	347	M	7	1.11	US	
R02-U	6/24/06	78	ARGR	292	253	--	--	1.02	US	
R02-U	6/24/06	79	ARGR	345	393	M	7	0.96	US	
R02-U	6/24/06	80	ARGR	275	215	--	--	1.03	US	
R02-U	6/24/06	81	ARGR	255	169	--	--	1.02	US	
R02-U	6/24/06	82	ARGR	320	301	M	7	0.92	US	
R02-U	6/24/06	83	ARGR	323	313	M	7	0.93	US	
R02-U	6/24/06	84	ARGR	351	430	M	8	0.99	US	
R02-U	6/24/06	85	ARGR	270	201	--	--	1.02	US	
R02-U	6/24/06	86	ARGR	230	110	--	--	0.90	US	
R02-U	6/24/06	87	ARGR	343	434	F	2	1.08	US	
R02-U	6/24/06	88	ARGR	275	206	F	2	0.99	US	
R02-U	6/24/06	89	ARGR	301	283	F	2	1.04	US	
R02-U	6/24/06	90	ARGR	330	342	M	8	0.95	US	
R02-U	6/24/06	91	ARGR	177	207	--	--	3.73	US	
R02-U	6/24/06	92	ARGR	350	428	M	8	1.00	US	
R02-U	6/24/06	93	ARGR	308	267	--	--	0.91	US	
R02-U	6/24/06	94	ARGR	290	251	F	2	1.03	US	
R02-U	6/24/06	95	ARGR	284	217	M	7	0.95	US	
R02-U	6/24/06	96	ARGR	303	291	M	7	1.05	US	
R02-U	6/24/06	97	ARGR	291	246	M	8	1.00	US	
R19-U	6/24/06	98	ARGR	298	357	F	3	1.35	US	
R19-U	6/24/06	99	ARGR	298	279	F	2	1.05	US	
R19-U	6/24/06	100	ARGR	325	309	M	8	0.90	US	
R19-U	6/24/06	101	ARGR	221	122	--	--	1.13	US	
R19-U	6/24/06	102	LKTR	425	668	--	--	0.87	US	
R15-U	6/25/2006	103	ARGR	314	332	M	7	1.07	US	HN set on 06/24/06 at
R15-U	6/25/2006	104	ARGR	242	130	--	--	0.92	US	R06 and R09
R15-U	6/25/2006	105	ARGR	273	205	M	7	1.01	US	
R05-U	6/25/2006	106	ARGR	235	138	F	1	1.06	US	
R05-U	6/25/2006	107	ARGR	290	254	M	6	1.04	US	
R05-U	6/25/2006	108	ARGR	305	294	F	3	1.04	US	
R05-U	6/25/2006	109	ARGR	320	315	M	8	0.96	US	
R05-U	6/25/2006	110	ARGR	262	130	F	1	0.72	US	
R05-U	6/25/2006	111	ARGR	290	264	M	6	1.08	US	
R05-U	6/25/2006	112	ARGR	250	153	M	6	0.98	US	
R05-U	6/25/2006	113	ARGR	285	240	F	1	1.04	US	
R05-U	6/25/2006	114	ARGR	379	470	M	9	0.86	US	
R02-U	6/25/2006	115	ARGR	289	247	M	7	1.02	US	
R02-U	6/25/2006	116	ARGR	304	299	M	7	1.06	US	
R02-U	6/25/2006	117	ARGR	275	207	--	--	1.00	US	
R02-U	6/25/2006	118	ARGR	276	225	F	1	1.07	US	
R02-U	6/25/2006	119	ARGR	303	290	F	2	1.04	US	
R02-U	6/25/2006	120	ARGR	273	205	--	--	1.01	US	
R02-U	6/25/2006	121	ARGR	306	310	M	8	1.08	US	
R02-U	6/25/2006	122	ARGR	268	205	F	1	1.06	US	
R02-U	6/25/2006	123	ARGR	290	264	M	7	1.08	US	
R02-U	6/25/2006	124	ARGR	276	222	F	1	1.06	US	
R02-U	6/25/2006	125	ARGR	295	247	--	--	0.96	US	
R09-U	6/25/2006	126	LKTR	540	1486	--	--	0.94	US	
R09-U	6/25/2006	127	LKTR	472	993	--	--	0.94	US	
R09-U	6/25/2006	128	LKTR	555	1501	--	--	0.88	US	
R09-U	6/25/2006	129	ARGR	310	--	M	7	--	US	
R09-U	6/25/2006	130	ARGR	307	260	M	7	0.90	US	
R09-U	6/25/2006	131	ARGR	338	415	M	8	1.07	US	
R09-U	6/25/2006	132	ARGR	305	307	M	7	1.08	US	
R09-U	6/25/2006	133	ARGR	298	271	F	1	1.02	US	
R09-U	6/25/2006	134	ARGR	277	272	F	3	1.28	US	
R09-U	6/25/2006	135	ARGR	305	267	M	8	0.94	US	
R09-U	6/25/2006	136	ARGR	327	404	M	7	1.16	US	
R09-U	6/25/2006	137	ARGR	303	319	F	3	1.15	US	
R09-U	6/25/2006	138	ARGR	350	451	M	7	1.05	US	
R09-U	6/25/2006	139	ARGR	349	454	M	8	1.07	US	
R09-U	6/25/2006	140	ARGR	284	270	M	7	1.18	US	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R09-U	6/25/2006	141	ARGR	310	300	M	8	1.01	US	
R05-U	6/26/2006	142	ARGR	240	--	F	1	--	US	No weight recorded
R05-U	6/26/2006	143	ARGR	234	--	M	6	--	US	on 06/26/2006 due to
R05-U	6/26/2006	144	ARGR	248	--	F	1	--	US	temperature causing
R05-U	6/26/2006	145	ARGR	292	--	M	?	--	US	scale misfunctioning
R05-U	6/26/2006	146	ARGR	308	--	M	7	--	US	
R05-U	6/26/2006	147	ARGR	242	--	F	1	--	US	
R05-U	6/26/2006	148	ARGR	222	--	F	1	--	US	
R05-U	6/26/2006	149	ARGR	220	--	M	6	--	US	
R05-U	6/26/2006	150	ARGR	245	--	F	1	--	US	
R05-U	6/26/2006	151	ARGR	222	--	F	1	--	US	
R05-U	6/26/2006	152	ARGR	230	--	F	1	--	US	
R05-U	6/26/2006	153	ARGR	235	--	F	1	--	US	
R05-U	6/26/2006	154	ARGR	220	--	F	1	--	US	
R05-U	6/26/2006	155	ARGR	225	--	F	1	--	US	
R05-U	6/26/2006	156	ARGR	320	--	F	2	--	US	
R05-U	6/26/2006	157	ARGR	255	--	F	1	--	US	
R05-U	6/26/2006	158	ARGR	267	--	M	6	--	US	
R05-U	6/26/2006	159	ARGR	350	--	M	7	--	US	
R05-U	6/26/2006	160	ARGR	222	--	F	1	--	US	
R05-U	6/26/2006	161	ARGR	228	--	M	6	--	US	
R05-U	6/26/2006	162	ARGR	320	--	M	7	--	US	
R05-U	6/26/2006	163	ARGR	237	--	M	6	--	US	
R05-U	6/26/2006	164	ARGR	230	--	M	6	--	US	
R05-U	6/26/2006	165	ARGR	306	--	M	7	--	US	
R05-U	6/26/2006	166	ARGR	317	--	M	7	--	US	
R05-U	6/26/2006	167	ARGR	290	--	F	2	--	US	
R05-U	6/26/2006	168	ARGR	218	--	F	1	--	US	
R05-U	6/26/2006	169	ARGR	262	--	M	6	--	US	
R05-U	6/26/2006	170	ARGR	248	--	M	6	--	US	
R05-U	6/26/2006	171	ARGR	240	--	F	1	--	US	
R05-U	6/26/2006	172	ARGR	290	--	M	?	--	US	
R05-U	6/26/2006	173	ARGR	234	--	F	1	--	US	
R05-U	6/26/2006	174	ARGR	223	--	F	1	--	US	
R05-U	6/26/2006	175	ARGR	264	--	M	6	--	US	
R09-U	6/27/2006	176	LKTR	297	--	--	--	--	US	
R09-U	6/27/2006	177	ARGR	297	280	F	2	1.07	US	
R09-U	6/27/2006	178	ARGR	283	218	--	--	0.96	US	
R09-U	6/27/2006	179	ARGR	298	269	F	2	1.02	US	
R09-U	6/27/2006	180	ARGR	297	272	M	8	1.04	US	
R19-U	6/27/2006	181	ARGR	323	314	F	1	0.93	US	
R19-U	6/27/2006	182	ARGR	316	380	F	2	1.20	US	
R19-U	6/27/2006	183	ARGR	294	281	M	6	1.11	US	
R19-U	6/27/2006	184	ARGR	225	128	M	6	1.12	US	Coleoptera,
R19-U	6/27/2006	185	ARGR	210	104	--	--	1.12	US	Chironimidae,
R19-U	6/27/2006	186	ARGR	246	124	--	--	0.83	US	Oligochaeta
R19-U	6/27/2006	187	ARGR	298	318	F	2	1.20	US	
R19-U	6/27/2006	188	ARGR	235	136	F	1	1.05	US	
R19-U	6/27/2006	189	ARGR	246	151	M	6	1.01	US	
R19-U	6/27/2006	190	ARGR	228	131	F	1	1.11	US	
R19-U	6/27/2006	191	ARGR	272	200	M	6	0.99	US	
R19-U	6/27/2006	192	ARGR	225	125	F	1	1.10	US	
R19-U	6/27/2006	193	ARGR	223	121	F	1	1.09	US	
R02-U	6/27/2006	194	ARGR	380	238	F	2	0.43	US	
R02-U	6/27/2006	195	ARGR	277	231	M	6	1.09	US	
R02-U	6/27/2006	196	ARGR	311	321	F	2	1.07	US	
R02-U	6/27/2006	197	ARGR	274	226	M	6	1.10	US	
R09-U	6/28/2006	198	LKTR	481	1184	--	--	1.06	US	
R09-U	6/28/2006	199	LKTR	458	941	--	--	0.98	US	
R09-U	6/28/2006	200	ARGR	291	265	F	3	1.08	US	
R09-U	6/28/2006	201	ARGR	270	210	M	6	1.07	US	
R09-U	6/28/2006	202	ARGR	300	298	M	7	1.10	US	
R15-U	6/28/2006	203	ARGR	268	270	F	2	1.40	US	
R15-U	6/28/2006	204	ARGR	345	434	M	7	1.06	US	
R15-U	6/28/2006	205	ARGR	305	276	F	3	0.97	US	
R15-U	6/28/2006	206	ARGR	315	357	M	7	1.14	US	
R15-U	6/28/2006	207	ARGR	291	281	F	3	1.14	US	
R15-U	6/28/2006	208	ARGR	471	886	--	--	0.85	US	
R19-U	6/29/2006	209	LKTR	--	--	--	--	--	US	
R19-U	6/29/2006	210	ARGR	260	177	F	2	1.01	US	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R19-U	6/29/2006	211	ARGR	309	323	M	9	1.09	US	
R19-U	6/29/2006	212	ARGR	325	409	F	2	1.19	US	
R19-U	6/29/2006	213	ARGR	300	277	F	2	1.03	US	
R02-U	6/29/2006	214	ARGR	305	294	--	--	1.04	US	
R02-U	6/29/2006	215	ARGR	271	226	M	7	1.14	US	
R02-U	6/29/2006	216	ARGR	264	199	M	7	1.08	US	
R02-U	6/29/2006	217	ARGR	270	267	M	8	1.36	US	
R02-U	6/29/2006	218	ARGR	294	300	M	8	1.18	US	
R02-U	6/29/2006	219	ARGR	340	400	M	8	1.02	US	
R02-U	6/29/2006	220	ARGR	277	218	M	7	1.03	US	
R02-U	6/29/2006	221	ARGR	250	147	F	1	0.94	US	
R02-U	6/29/2006	222	ARGR	255	160	M	6	0.96	US	
R02-U	6/29/2006	223	ARGR	292	254	--	--	1.02	US	
R02-U	6/29/2006	224	ARGR	310	295	--	--	0.99	US	
R02-U	6/29/2006	225	ARGR	305	300	F	2	1.06	US	
R02-U	6/29/2006	226	ARGR	262	216	M	6	1.20	US	
R05-U	6/29/2006	227	ARGR	298	--	--	--	--	US	
R05-U	6/29/2006	228	ARGR	310	--	M	8	--	US	
R05-U	6/29/2006	229	ARGR	319	--	F	4	--	US	
R05-U	6/29/2006	230	ARGR	244	--	--	--	--	US	
R05-U	6/29/2006	231	ARGR	319	--	F	2	--	US	
R05-U	6/29/2006	232	ARGR	339	--	F	2	--	US	
R15-U	6/29/2006	233	ARGR	270	215	M	9	1.09	US	
R05-U	6/30/2006	234	ARGR	228	116	F	1	0.98	US	
R05-U	6/30/2006	235	ARGR	275	208	M	6	1.00	US	
R05-U	6/30/2006	236	ARGR	248	160	F	1	1.05	US	
R05-U	6/30/2006	237	ARGR	270	187	F	4	0.95	US	
R05-U	6/30/2006	238	ARGR	225	112	M	6	0.98	US	
R05-U	6/30/2006	239	ARGR	225	123	M	6	1.08	US	
R09-U	6/30/2006	240	ARGR	220	100	M	6	0.94	US	
R09-U	6/30/2006	241	ARGR	240	140	--	--	1.01	US	
R09-U	6/30/2006	242	ARGR	312	--	F	4	--	US	
R19-U	6/30/2006	243	ARGR	245	--	M	6	--	US	
R19-U	6/30/2006	244	ARGR	318	--	F	3	--	US	
R19-U	6/30/2006	245	ARGR	295	--	M	9	--	US	
R19-U	6/30/2006	246	LKTR	490	--	--	--	--	US	
R19-U	6/30/2006	247	LKTR	642	--	--	--	--	US	
R19-D	6/30/2006	248	ARGR	310	--	M	9	--	DS	
R19-D	6/30/2006	249	ARGR	330	--	M	9	--	DS	
R19-D	6/30/2006	250	ARGR	340	--	M	9	--	DS	
R19-D	6/30/2006	251	ARGR	307	--	M	9	--	DS	
R02-U	7/1/2006	252	ARGR	290	--	M	9	--	US	
R02-U	7/1/2006	253	ARGR	260	--	F	1	--	US	
R02-U	7/1/2006	254	ARGR	240	--	--	--	--	US	
R09-U	7/1/2006	255	ARGR	308	--	F	4	--	US	
R09-U	7/1/2006	256	ARGR	247	--	M	6	--	US	
R09-U	7/1/2006	257	ARGR	290	214	M	9	0.88	US	
R09-U	7/1/2006	258	ARGR	310	292	F	3	0.98	US	
R09-U	7/1/2006	259	ARGR	300	265	M	9	0.98	US	
R09-D	7/1/2006	260	ARGR	241	159	F	1	1.14	US	
R09-D	7/1/2006	261	ARGR	295	281	M	9	1.09	DS	
R09-D	7/1/2006	262	ARGR	312	281	M	9	0.93	DS	
R09-D	7/1/2006	263	LKTR	530	1350	--	--	0.91	DS	
R09-D	7/1/2006	264	LKTR	503	1043	--	--	0.82	DS	
R09-D	7/1/2006	265	LKTR	469	921	--	--	0.89	DS	
R09-D	7/1/2006	266	ARGR	294	295	M	9	1.16	DS	
R09-D	7/1/2006	267	ARGR	332	383	M	9	1.05	DS	
R09-D	7/1/2006	268	ARGR	326	376	M	9	1.09	DS	
R09-D	7/1/2006	269	ARGR	330	371	M	9	1.03	DS	
R09-D	7/1/2006	270	ARGR	311	293	M	9	0.97	DS	
R09-D	7/1/2006	271	ARGR	311	295	M	9	0.98	DS	
R09-D	7/1/2006	272	ARGR	368	478	M	9	0.96	DS	
R09-D	7/1/2006	273	ARGR	210	93	M	9	1.00	DS	
R19-U	7/1/2006	274	ARGR	330	391	M	7	1.09	US	
R19-U	7/1/2006	275	ARGR	290	241	F	1	0.99	US	
R19-U	7/1/2006	276	ARGR	280	231	M	6	1.05	US	
R19-U	7/1/2006	277	ARGR	330	331	M	9	0.92	US	
R19-U	7/1/2006	278	ARGR	230	136	--	--	1.12	US	
R05-D	7/2/2006	279	ARGR	221	110	--	--	1.02	DS	
R05-D	7/2/2006	280	ARGR	226	111	--	--	1.36	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R05-D	7/2/2006	281	ARGR	228	117	M	6	0.96	DS	
R02-U	7/2/2006	282	ARGR	226	157	M	6	0.99	US	
R06-U	7/2/2006	283	ARGR	220	193	--	--	1.81	US	
R06-U	7/2/2006	284	ARGR	288	265	M	9	1.11	US	
R06-U	7/2/2006	285	ARGR	327	367	M	9	1.05	US	
R06-U	7/2/2006	286	ARGR	271	205	F	4	1.03	US	
R06-U	7/2/2006	287	ARGR	310	361	F	4	1.21	US	Empty Stomach
R19-D	7/2/2006	288	ARGR	332	305	F	4	0.83	DS	
R19-D	7/2/2006	289	ARGR	320	330	F	4	1.01	DS	
R19-D	7/2/2006	290	ARGR	321	328	F	4	0.99	DS	
R19-D	7/2/2006	291	ARGR	334	360	M	9	0.97	DS	
R19-D	7/2/2006	292	ARGR	334	327	F	4	0.88	DS	Autopsied: Plec,
R19-D	7/2/2006	293	ARGR	335	416	M	9	1.11	DS	Coleoptera
R19-D	7/2/2006	294	ARGR	233	129	F	1	1.02	DS	Autopsied:
R19-D	7/2/2006	295	LKTR	497	--	--	--	--	DS	Plecoptera,
R19-D	7/2/2006	296	LKTR	720	--	--	--	--	DS	Coleoptera
R05-U	7/3/2006	297	ARGR	264	194	F	4	1.05	US	
R05-U	7/3/2006	298	ARGR	215	105	F	1	1.06	US	
R05-U	7/3/2006	299	ARGR	244	154	F	1	1.06	US	
R05-U	7/3/2006	300	ARGR	215	102	F	1	1.03	US	
R05-U	7/3/2006	301	RDWH	240	127	--	--	0.92	US	
R05-D	7/3/2006	302	RDWH	250	164	--	--	1.05	DS	
R05-D	7/3/2006	303	RDWH	319	343	--	--	1.06	DS	
R05-D	7/3/2006	304	RDWH	325	341	--	--	0.99	DS	
R05-D	7/3/2006	305	RDWH	325	354	--	--	1.03	DS	
R05-D	7/3/2006	306	RDWH	350	419	--	--	0.98	DS	
R05-D	7/3/2006	307	RDWH	245	147	--	--	1.00	DS	
R05-D	7/3/2006	308	RDWH	315	319	--	--	1.02	DS	
R05-D	7/3/2006	309	LKTR	605	--	--	--	--	DS	
R05-D	7/3/2006	310	ARGR	230	126	F	1	1.04	DS	
R05-D	7/3/2006	311	ARGR	225	210	F	1	1.84	DS	
R05-D	7/3/2006	312	ARGR	330	365	M	9	1.02	DS	
R05-D	7/3/2006	313	ARGR	306	324	M	9	1.13	DS	
R05-D	7/3/2006	314	ARGR	328	343	M	9	0.97	DS	
R05-D	7/3/2006	315	ARGR	300	276	F	4	1.02	DS	
R05-D	7/3/2006	316	ARGR	380	586	M	9	1.07	DS	
R05-D	7/3/2006	317	ARGR	230	125	F	1	1.03	DS	
R05-D	7/3/2006	318	ARGR	240	154	M	9	1.11	DS	
R05-D	7/3/2006	319	ARGR	222	127	F	1	1.16	DS	
R05-D	7/3/2006	320	RDWH	302	292	--	--	1.06	DS	
R05-D	7/3/2006	321	RDWH	280	206	--	--	0.94	DS	
R02-U	7/3/2006	322	ARGR	230	132	F	1	1.08	US	
R02-U	7/3/2006	323	ARGR	255	167	F	1	1.01	US	
R02-D	7/3/2006	324	ARGR	291	154	M	9	0.62	DS	
R09-D	7/3/2006	325	ARGR	292	260	--	--	1.04	DS	
R09-D	7/3/2006	326	ARGR	350	434	M	9	1.01	DS	
R09-D	7/3/2006	327	ARGR	330	352	M	9	0.98	DS	
R09-D	7/3/2006	328	ARCH	485	1070	--	--	0.94	DS	
R09-U	7/3/2006	329	ARGR	220	220	F	1	2.07	US	
R09-U	7/3/2006	330	ARGR	244	244	--	--	1.68	US	
R09-U	7/3/2006	331	ARGR	246	246	--	--	1.65	US	
R09-U	7/3/2006	332	ARGR	252	252	F	1	1.57	US	
R09-U	7/3/2006	333	ARGR	234	234	F	1	1.83	US	
R09-U	7/3/2006	334	ARGR	285	285	M	9	1.23	US	
R09-U	7/3/2006	335	LKTR	510	1100	--	--	0.83	US	
R19-D	7/3/2006	336	ARGR	213	194	--	--	2.01	DS	
R19-D	7/3/2006	337	LKTR	727	--	--	--	--	US	
R02-U	7/4/2006	338	ARGR	240	151	F	1	1.09	US	
R02-U	7/4/2006	339	ARGR	250	169	F	1	1.08	US	
R02-U	7/4/2006	340	ARGR	291	252	M	9	1.02	US	
R02-D	7/4/2006	341	ARGR	310	288	M	9	0.97	DS	
R02-D	7/4/2006	342	ARGR	250	175	F	1	1.12	DS	
R02-D	7/4/2006	343	ARGR	328	355	M	9	1.01	DS	
R02-D	7/4/2006	344	ARGR	334	365	M	9	0.98	DS	
R02-D	7/4/2006	345	ARGR	294	255	F	4	1.00	DS	
R02-D	7/4/2006	346	ARGR	270	220	M	9	1.12	DS	
R02-D	7/4/2006	347	ARGR	290	270	F	4	1.11	DS	
R02-D	7/4/2006	348	ARGR	280	230	F	4	1.05	DS	
R05-D	7/4/2006	349	ARGR	351	447	F	4	1.03	DS	
R05-D	7/4/2006	350	ARGR	305	300	M	9	1.06	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R05-D	7/4/2006	351	ARGR	376	597	M	9	1.12	DS	
R05-D	7/4/2006	352	ARGR	318	315	M	9	0.98	DS	
R05-D	7/4/2006	353	ARGR	334	406	M	9	1.09	DS	
R05-D	7/4/2006	354	ARGR	308	321	M	9	1.10	DS	
R05-D	7/4/2006	355	ARGR	298	300	M	9	1.13	DS	
R05-D	7/4/2006	356	ARGR	315	346	M	9	1.11	DS	
R05-D	7/4/2006	357	ARGR	359	511	M	9	1.10	DS	
R05-D	7/4/2006	358	ARGR	324	337	M	9	0.99	DS	
R05-D	7/4/2006	359	ARGR	334	363	M	9	0.97	DS	
R05-D	7/4/2006	360	ARGR	310	319	M	9	1.07	DS	
R05-D	7/4/2006	361	ARGR	312	341	F	4	1.12	DS	
R05-D	7/4/2006	362	ARGR	319	365	F	4	1.12	DS	
R05-D	7/4/2006	363	ARGR	306	283	M	9	0.99	DS	
R05-D	7/4/2006	364	ARGR	302	319	M	9	1.16	DS	
R05-D	7/4/2006	365	ARGR	332	312	M	9	0.85	DS	
R05-D	7/4/2006	366	ARGR	325	316	M	9	0.92	DS	
R05-D	7/4/2006	367	ARGR	329	348	M	9	0.98	DS	
R05-D	7/4/2006	368	ARGR	291	263	F	4	1.07	DS	
R05-D	7/4/2006	369	ARGR	302	296	F	4	1.07	DS	
R05-D	7/4/2006	370	ARGR	343	361	M	9	0.89	DS	
R05-D	7/4/2006	371	ARGR	310	284	M	9	0.95	DS	
R05-D	7/4/2006	372	ARGR	305	301	M	9	1.06	DS	
R05-D	7/4/2006	373	ARGR	243	166	--	--	1.16	DS	
R05-D	7/4/2006	374	LKTR	511	--	--	--	--	DS	LPEL
R05-D	7/4/2006	375	RNWH	316	415	--	--	1.32	DS	
R05-D	7/4/2006	376	RNWH	320	334	--	--	1.02	DS	
R05-D	7/4/2006	377	RNWH	357	400	--	--	0.88	DS	
R05-D	7/4/2006	378	RNWH	334	377	--	--	1.01	DS	
R05-D	7/4/2006	379	RNWH	309	268	--	--	0.91	DS	
R05-D	7/4/2006	380	RNWH	310	270	--	--	0.91	DS	
R05-D	7/4/2006	381	RNWH	305	267	--	--	0.94	DS	
R05-D	7/4/2006	382	RNWH	250	150	--	--	0.96	DS	
R05-D	7/4/2006	383	RNWH	293	244	--	--	0.97	DS	
R05-D	7/4/2006	384	ARGR	243	210	--	--	1.46	DS	
R05-D	7/4/2006	385	ARGR	252	156	F	1	0.97	DS	
R05-D	7/4/2006	386	ARGR	238	162	M	6	1.20	DS	
R05-D	7/4/2006	387	ARGR	254	150	F	1	0.92	DS	
R06-D	7/4/2006	388	ARGR	330	356	F	3	0.99	DS	Ripe female, pulled
R06-D	7/4/2006	389	ARGR	300	292	M	9	1.08	DS	HN at B04 and set at
R06-D	7/4/2006	390	ARGR	300	317	M	9	1.17	DS	B02
R06-U	7/4/2006	391	ARGR	220	122	F	1	1.15	US	
R09-U	7/4/2006	392	ARGR	245	162	F	1	1.10	US	
R09-U	7/4/2006	393	ARGR	270	193	M	6	0.98	US	
R09-U	7/4/2006	394	ARGR	484	970	--	--	0.86	US	
R19-U	7/4/2006	395	ARGR	350	421	M	9	0.98	DS	
R19-U	7/4/2006	396	ARGR	300	280	F	5	1.04	US	
R19-U	7/4/2006	397	ARGR	336	395	F	5	1.04	US	
R19-U	7/4/2006	398	ARGR	300	282	M	9	1.04	US	
R19-U	7/4/2006	399	ARGR	332	346	M	9	0.95	US	
R02-U	7/5/2006	400	ARGR	230	229	F	1	1.88	US	
R02-U	7/5/2006	401	ARGR	215	112	F	1	1.13	DS	
R02-U	7/5/2006	402	ARGR	271	212	F	1	1.07	DS	
R02-U	7/5/2006	403	ARGR	323	343	M	9	1.02	DS	Autopsied:
R02-U	7/5/2006	404	ARGR	302	323	F	4	1.17	DS	Coleoptera, blackflies
R02-U	7/5/2006	405	ARGR	258	174	F	1	1.01	DS	(Simulidae)
R02-U	7/5/2006	406	ARGR	223	107	F	1	0.96	DS	Autopsied:
R09-D	7/5/2006	407	ARGR	225	121	F	1	1.06	DS	Coleoptera,
R09-D	7/5/2006	408	ARGR	255	179	F	1	1.08	DS	Simuliidae
R19-D	7/5/2006	409	LKTR	490	--	--	--	--	DS	LPEL
R19-D	7/5/2006	410	LKTR	575	--	--	--	--	DS	LPEL
R19-D	7/5/2006	411	ARGR	343	395	M	9	0.98	DS	
R19-U	7/5/2006	412	ARGR	245	154	F	1	1.05	US	
R19-U	7/5/2006	413	ARGR	300	313	F	4	1.16	US	
R19-U	7/5/2006	414	ARGR	294	276	F	4	1.09	US	
R19-U	7/5/2006	415	ARGR	310	302	F	4	1.01	US	
R19-U	7/5/2006	416	ARGR	340	388	M	9	0.99	US	
R19-U	7/5/2006	417	ARGR	309	292	F	4	0.99	US	
R19-U	7/5/2006	418	ARGR	317	300	F	4	0.94	US	
R19-U	7/6/2006	419	LKTR	410	581	--	--	0.84	US	
R19-D	7/6/2006	420	ARGR	333	381	M	9	1.03	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R19-D	7/6/2006	421	ARGR	545	417	M	9	0.26	DS	
R19-D	7/6/2006	422	ARGR	298	279	F	4	1.05	DS	
R02-D	7/6/2006	423	ARGR	281	262	F	4	1.18	DS	
R02-D	7/6/2006	424	ARGR	286	278	F	4	1.19	DS	
R02-U	7/6/2006	425	ARGR	265	218	F	4	1.17	US	
R02-U	7/6/2006	426	ARGR	251	184	F	1	1.16	US	
R02-U	7/6/2006	427	ARGR	286	250	M	9	1.07	US	
R02-U	7/6/2006	428	ARGR	320	323	M	9	0.99	US	
R02-U	7/6/2006	429	ARGR	336	404	F	4	1.07	US	
R02-U	7/6/2006	430	ARGR	251	174	F	1	1.10	US	
R02-U	7/6/2006	431	ARGR	225	123	F	1	1.08	US	
R02-U	7/6/2006	432	ARGR	276	222	F	4	1.06	US	
R05-D	7/6/2006	433	RNWH	335	350	--	--	0.93	DS	
R05-D	7/6/2006	434	RNWH	344	400	--	--	0.98	DS	
R05-D	7/6/2006	435	RNWH	334	385	--	--	1.03	DS	
R05-D	7/6/2006	436	RNWH	284	203	--	--	0.89	DS	
R05-D	7/6/2006	437	RNWH	336	435	--	--	1.15	DS	
R05-D	7/6/2006	438	RNWH	306	285	--	--	0.99	DS	
R05-D	7/6/2006	439	RNWH	340	496	--	--	1.26	DS	
R05-D	7/6/2006	440	RNWH	378	495	--	--	0.92	DS	
R05-D	7/6/2006	441	RNWH	333	390	--	--	1.06	DS	
R05-D	7/6/2006	442	RNWH	335	359	--	--	0.95	DS	
R05-D	7/6/2006	443	RNWH	345	391	--	--	0.95	DS	
R05-D	7/6/2006	444	ARGR	230	132	F	1	1.08	DS	
R05-D	7/6/2006	445	ARGR	339	362	M	9	0.93	DS	
R05-D	7/6/2006	446	ARGR	326	371	M	9	1.07	DS	
R05-D	7/6/2006	447	ARGR	280	234	F	4	1.07	DS	
R05-D	7/6/2006	448	ARGR	341	406	M	9	1.02	DS	
R05-D	7/6/2006	449	ARGR	305	306	F	4	1.08	DS	
R05-D	7/6/2006	450	ARGR	230	143	F	1	1.18	DS	
R05-D	7/6/2006	451	ARGR	318	304	M	9	0.95	DS	
R05-D	7/6/2006	452	ARGR	246	150	F	1	1.01	DS	
R05-D	7/6/2006	453	ARGR	235	139	F	1	1.07	DS	
R05-D	7/6/2006	454	ARGR	339	350	F	4	0.90	DS	
R05-D	7/6/2006	455	ARGR	252	164	M	6	1.02	DS	
R05-D	7/6/2006	456	ARGR	296	300	M	9	1.16	DS	
R05-D	7/6/2006	457	ARGR	321	364	M	9	1.10	DS	
R05-D	7/6/2006	458	ARGR	286	254	F	4	1.09	DS	
R05-D	7/6/2006	459	ARGR	330	378	F	4	1.05	DS	
R05-D	7/6/2006	460	ARGR	330	367	F	4	1.02	DS	
R05-D	7/6/2006	461	LKTR	542	1601	--	--	1.01	DS	LPEL
R05-D	7/7/2006	462	LKTR	586	--	--	--	--	DS	LPEL
R05-D	7/7/2006	463	RNWH	335	379	--	--	1.01	DS	
R05-D	7/7/2006	464	RNWH	352	408	--	--	0.94	DS	
R05-D	7/7/2006	465	RNWH	378	522	--	--	0.97	DS	
R05-D	7/7/2006	466	RNWH	322	295	--	--	0.88	DS	
R05-D	7/7/2006	467	RNWH	325	327	--	--	0.95	DS	
R05-D	7/7/2006	468	RNWH	349	452	--	--	1.06	DS	
R05-D	7/7/2006	469	RNWH	333	319	--	--	0.86	DS	
R05-D	7/7/2006	470	RNWH	337	368	--	--	0.96	DS	
R05-D	7/7/2006	471	RNWH	296	279	--	--	1.08	DS	
R05-D	7/7/2006	472	ARGR	279	232	M	9	1.07	DS	
R05-D	7/7/2006	473	ARGR	390	656	M	9	1.11	DS	
R05-D	7/7/2006	474	ARGR	292	277	F	4	1.11	DS	
R05-D	7/7/2006	475	ARGR	232	126	F	1	1.01	DS	
R05-D	7/7/2006	476	ARGR	261	238	M	9	1.34	DS	
R05-D	7/7/2006	477	ARGR	198	130	F	1	1.67	DS	
R05-D	7/7/2006	478	ARGR	312	307	M	9	1.01	DS	
R05-D	7/7/2006	479	ARGR	240	135	F	1	0.98	DS	
R05-D	7/7/2006	480	ARGR	296	282	M	9	1.09	DS	
R05-D	7/7/2006	481	ARGR	338	346	M	9	0.90	DS	
R05-D	7/7/2006	482	ARGR	266	279	M	9	1.48	DS	
R05-D	7/7/2006	483	ARGR	254	173	F	1	1.06	DS	
R05-D	7/7/2006	484	ARGR	317	317	F	4	1.00	DS	
R05-D	7/7/2006	485	ARGR	267	223	F	1	1.17	DS	
R05-D	7/7/2006	486	ARGR	272	269	M	6	1.34	DS	
R05-D	7/7/2006	487	ARGR	286	252	M	9	1.08	DS	
R05-D	7/7/2006	488	ARGR	237	129	F	1	0.97	DS	
R05-D	7/7/2006	489	ARGR	268	214	F	1	1.11	DS	
R05-D	7/7/2006	490	ARGR	241	138	F	1	0.99	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R05-D	7/7/2006	491	ARGR	261	212	M	6	1.19	DS	
R05-D	7/7/2006	492	ARGR	245	158	F	1	1.07	DS	
R05-D	7/8/2006	493	RNWH	336	423	--	--	1.12	DS	
R05-D	7/8/2006	494	RNWH	360	457	--	--	0.98	DS	
R05-D	7/8/2006	495	LKTR	543	1670	--	--	1.04	DS	LPEL
R05-D	7/8/2006	496	ARGR	345	454	M	9	1.11	DS	
R05-D	7/8/2006	497	ARGR	323	403	M	9	1.20	DS	
R05-D	7/8/2006	498	ARGR	329	367	M	9	1.03	DS	
R05-D	7/8/2006	499	ARGR	362	475	M	9	1.00	DS	
R05-D	7/8/2006	500	ARGR	307	323	M	9	1.12	DS	
R05-D	7/8/2006	501	ARGR	237	151	F	1	1.13	DS	
R05-D	7/8/2006	502	ARGR	350	464	M	9	1.08	DS	
R05-D	7/8/2006	503	ARGR	341	435	M	9	1.10	DS	
R05-D	7/8/2006	504	ARGR	316	342	F	4	1.08	DS	
R05-D	7/8/2006	505	ARGR	298	294	M	9	1.11	DS	
R05-D	7/8/2006	506	ARGR	293	275	M	9	1.09	DS	
R05-D	7/8/2006	507	ARGR	250	174	F	1	1.11	DS	
R05-D	7/8/2006	508	ARGR	240	159	F	1	1.15	DS	
R05-D	7/8/2006	509	ARGR	284	276	F	4	1.20	DS	
R05-D	7/8/2006	510	ARGR	291	269	M	9	1.09	DS	
R05-D	7/8/2006	511	ARGR	301	300	F	4	1.10	DS	
R05-D	7/8/2006	512	ARGR	300	299	M	9	1.11	DS	
R05-D	7/8/2006	513	ARGR	252	151	F	1	0.94	DS	
R05-D	7/8/2006	514	ARGR	239	134	F	1	0.98	DS	
R05-D	7/8/2006	515	ARGR	226	125	F	1	1.08	DS	
R05-D	7/8/2006	516	ARGR	228	130	F	1	1.10	DS	
R05-D	7/8/2006	517	ARGR	232	122	F	1	0.98	DS	
R05-D	7/8/2006	518	ARGR	218	108	F	1	1.04	DS	
R05-D	7/8/2006	519	ARGR	234	160	F	1	1.25	DS	
R02-U	7/8/2006	520	ARGR	298	264	F	1	1.00	US	
R02-U	7/8/2006	521	ARGR	227	192	F	1	1.64	US	
R02-D	7/8/2006	522	ARGR	260	227	M	9	1.29	DS	
R02-D	7/8/2006	523	ARGR	251	--	F	1	--	DS	
R02-D	7/8/2006	524	ARGR	225	--	F	1	--	DS	
R02-D	7/8/2006	525	ARGR	213	--	F	1	--	DS	
R02-D	7/8/2006	526	ARGR	225	--	F	1	--	DS	
R02-D	7/8/2006	527	ARGR	267	--	F	1	--	DS	
R02-D	7/8/2006	528	ARGR	251	--	M	6	--	DS	
R02-D	7/8/2006	529	RNWH	261	--	--	--	--	DS	
R09-D	7/8/2006	530	ARGR	302	188	M	9	0.68	DS	
R09-D	7/8/2006	531	ARGR	242	164	F	1	1.16	DS	
R09-D	7/8/2006	532	ARGR	218	104	F	1	1.00	DS	
R09-D	7/8/2006	533	LKTR	418	500	--	--	0.68	DS	LPEL
R19-D	7/8/2006	534	ARGR	346	440	M	9	1.06	DS	
R19-D	7/8/2006	535	ARGR	324	335	M	9	0.98	DS	
R19-D	7/8/2006	536	ARGR	278	232	F	4	1.08	DS	
R19-D	7/8/2006	537	ARGR	235	176	F	1	1.36	DS	
R19-D	7/8/2006	538	ARGR	338	387	M	9	1.00	DS	
R19-U	7/8/2006	539	ARGR	291	255	M	9	1.03	US	
R19-U	7/8/2006	540	ARGR	236	201	F	1	1.53	US	
R19-U	7/8/2006	541	ARGR	325	354	M	9	1.03	US	
R19-U	7/8/2006	542	ARGR	302	293	M	9	1.06	US	
R19-U	7/8/2006	543	ARGR	298	260	M	9	0.98	US	
R19-U	7/8/2006	544	ARGR	254	163	F	1	0.99	US	
R19-U	7/8/2006	545	ARGR	236	148	F	1	1.13	US	
R19-D	7/9/2006	546	ARGR	287	258	F	4	1.09	DS	
R19-D	7/9/2006	547	ARGR	191	82	F	1	1.18	DS	
R19-U	7/9/2006	548	ARGR	261	184	F	1	1.03	US	
R19-U	7/9/2006	549	ARGR	234	154	F	1	1.20	US	
R19-U	7/9/2006	550	ARGR	354	477	M	9	1.08	US	
R09-D	7/9/2006	551	RNWH	351	479	--	--	1.11	DS	
R09-D	7/9/2006	552	RNWH	320	356	--	--	1.09	DS	
R09-D	7/9/2006	553	ARGR	214	123	F	1	1.26	DS	
R09-D	7/9/2006	554	LKTR	500	1031	--	--	0.82	DS	LPEL
R06-D	7/9/2006	555	ARGR	345	449	M	9	1.09	DS	
R02-U	7/9/2006	556	ARGR	304	302	M	9	1.07	US	
R02-U	7/9/2006	557	ARGR	265	205	M	6	1.10	US	
R02-U	7/9/2006	558	ARGR	236	143	F	1	1.09	US	
R02-U	7/9/2006	559	ARGR	256	155	F	1	0.92	US	
R02-U	7/9/2006	560	ARGR	250	181	F	1	1.16	US	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R02-U	7/9/2006	561	ARGR	204	103	F	1	1.21	US	
R05-U	7/9/2006	562	ARGR	302	304	F	4	1.10	US	
R05-D	7/9/2006	563	RNWH	361	521	--	--	1.11	DS	
R05-D	7/9/2006	564	RNWH	344	444	--	--	1.09	DS	
R05-D	7/9/2006	565	RNWH	354	467	F	4	1.05	DS	
R05-D	7/9/2006	566	RNWH	282	210	--	--	0.94	DS	
R05-D	7/9/2006	567	ARGR	304	316	M	9	1.12	DS	
R05-D	7/9/2006	568	ARGR	320	361	M	9	1.10	DS	
R05-D	7/9/2006	569	ARGR	285	260	F	4	1.12	DS	
R05-D	7/9/2006	570	ARGR	302	300	F	4	1.09	DS	
R05-D	7/9/2006	571	ARGR	286	273	F	4	1.17	DS	
R05-D	7/9/2006	572	ARGR	322	350	M	9	1.05	DS	
R05-D	7/9/2006	573	ARGR	330	402	M	9	1.12	DS	
R05-D	7/9/2006	574	ARGR	336	368	M	9	0.97	DS	
R05-D	7/9/2006	575	ARGR	222	121	F	1	1.11	DS	
R05-D	7/9/2006	576	ARGR	245	167	F	1	1.14	DS	
R05-D	7/9/2006	577	ARGR	232	137	F	1	1.10	DS	
R05-D	7/9/2006	578	ARGR	230	130	F	1	1.07	DS	
R05-D	7/9/2006	579	ARGR	268	212	M	6	1.10	DS	
R05-D	7/9/2006	580	ARGR	239	151	M	6	1.11	DS	
R05-D	7/9/2006	581	ARGR	294	282	M	9	1.11	DS	
R05-D	7/9/2006	582	ARGR	324	380	M	9	1.12	DS	
R05-D	7/9/2006	583	ARGR	268	247	F	1	1.28	DS	
R05-D	7/9/2006	584	ARGR	345	433	M	9	1.05	DS	
R05-D	7/9/2006	585	ARGR	326	417	M	9	1.20	DS	
R05-D	7/9/2006	586	ARGR	340	467	M	9	1.19	DS	
R05-D	7/9/2006	587	ARGR	330	437	M	9	1.22	DS	
R05-D	7/9/2006	588	ARGR	334	385	M	9	1.03	DS	
R05-D	7/9/2006	589	ARGR	346	441	M	9	1.06	DS	
R05-D	7/9/2006	590	ARGR	312	327	F	4	1.08	DS	
R05-D	7/9/2006	591	ARGR	209	92	F	1	1.01	DS	
R05-D	7/9/2006	592	ARGR	319	309	M	9	0.95	DS	
R02-D	7/10/2006	593	ARGR	205	75	F	1	0.87	DS	
R02-D	7/10/2006	594	ARGR	274	230	M	9	1.12	DS	
R02-U	7/10/2006	595	ARGR	284	246	M	9	1.07	US	
R02-U	7/10/2006	596	ARGR	226	137	F	1	1.19	US	
R05-D	7/10/2006	597	RNWH	370	510	--	--	1.01	DS	
R05-U	7/10/2006	598	ARGR	319	344	F	4	1.06	US	
R05-U	7/10/2006	599	ARGR	251	160	F	1	1.01	US	
R05-U	7/10/2006	600	ARGR	214	164	F	1	1.67	US	
R05-U	7/10/2006	601	ARGR	297	294	M	9	1.12	US	
R05-U	7/10/2006	602	ARGR	260	202	F	1	1.15	US	
R05-D	7/10/2006	603	ARGR	300	300	M	9	1.11	DS	
R05-D	7/10/2006	604	ARGR	342	509	F	4	1.27	DS	
R05-D	7/10/2006	605	ARGR	350	500	F	4	1.17	DS	
R05-D	7/10/2006	606	ARGR	335	450	F	4	1.20	DS	
R05-D	7/10/2006	607	ARGR	311	341	F	4	1.13	DS	
R05-D	7/10/2006	608	ARGR	342	410	F	4	1.02	DS	
R05-D	7/10/2006	609	ARGR	312	311	F	4	1.02	DS	
R05-D	7/10/2006	610	ARGR	306	343	M	9	1.20	DS	
R05-D	7/10/2006	611	ARGR	315	377	M	9	1.21	DS	
R05-D	7/10/2006	612	ARGR	366	444	M	9	0.91	DS	
R05-D	7/10/2006	613	ARGR	273	242	F	4	1.19	DS	
R05-D	7/10/2006	614	ARGR	334	417	M	9	1.12	DS	
R05-D	7/10/2006	615	ARGR	319	369	F	4	1.14	DS	
R05-D	7/10/2006	616	ARGR	260	194	M	6	1.10	DS	
R05-D	7/10/2006	617	ARGR	258	205	F	1	1.19	DS	
R05-D	7/10/2006	618	ARGR	304	323	M	9	1.15	DS	
R05-D	7/10/2006	619	ARGR	313	330	M	9	1.08	DS	
R05-D	7/10/2006	620	ARGR	232	132	F	1	1.06	DS	
R05-D	7/10/2006	621	ARGR	280	246	F	4	1.12	DS	
R05-D	7/10/2006	622	ARGR	281	255	F	4	1.15	DS	
R05-D	7/10/2006	623	ARGR	227	139	F	1	1.19	DS	
R09-D	7/10/2006	624	ARGR	200	--	F	1	--	DS	Scale malfunctioning
R09-D	7/10/2006	625	LKTR	431	--	--	--	--	DS	LPEL
R09-D	7/10/2006	626	ARGR	280	--	F	4	--	DS	
R19-D	7/10/2006	627	ARGR	312	--	F	4	--	DS	
R05-U	7/11/2006	628	ARGR	260	185	F	1	1.05	US	
R05-D	7/11/2006	629	ARGR	212	98	F	1	1.03	DS	
R05-D	7/11/2006	630	ARGR	370	492	M	9	0.97	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R05-D	7/11/2006	631	RNWH	318	339	--	--	1.05	DS	
R05-D	7/11/2006	632	RNWH	332	376	--	--	1.03	DS	
R05-D	7/11/2006	633	RNWH	264	180	--	--	0.98	DS	
R05-D	7/11/2006	634	ARGR	332	362	M	9	0.99	DS	
R05-D	7/11/2006	635	ARGR	256	203	F	4	1.21	DS	
R05-D	7/11/2006	636	ARGR	341	445	M	9	1.12	DS	
R05-D	7/11/2006	637	ARGR	332	447	F	4	1.22	DS	
R05-D	7/11/2006	638	ARGR	302	301	F	4	1.09	DS	
R05-D	7/11/2006	639	ARGR	291	292	M	9	1.18	DS	
R05-D	7/11/2006	640	ARGR	243	160	F	1	1.12	DS	
R05-D	7/11/2006	641	ARGR	235	139	F	1	1.07	DS	
R05-D	7/11/2006	642	ARGR	362	501	M	9	1.06	DS	
R05-D	7/11/2006	643	ARGR	330	374	F	4	1.04	DS	
R05-D	7/11/2006	644	ARGR	358	469	F	4	1.02	DS	
R05-D	7/11/2006	645	ARGR	278	230	F	4	1.07	DS	
R05-D	7/11/2006	646	ARGR	328	357	M	9	1.01	DS	
R05-D	7/11/2006	647	ARGR	264	242	F	4	1.32	DS	
R05-D	7/11/2006	648	ARGR	243	163	M	6	1.14	DS	
R05-D	7/11/2006	649	ARGR	296	268	F	4	1.03	DS	
R05-D	7/11/2006	650	ARGR	238	148	F	1	1.10	DS	
R05-D	7/11/2006	651	ARGR	351	467	M	9	1.08	DS	
R05-D	7/11/2006	652	ARGR	246	169	F	1	1.14	DS	
R05-D	7/11/2006	653	ARGR	281	232	F	4	1.05	DS	
R05-D	7/11/2006	654	ARGR	310	340	M	9	1.14	DS	
R05-D	7/11/2006	655	ARGR	238	150	F	1	1.11	DS	
R05-D	7/11/2006	656	ARGR	330	386	F	4	1.07	DS	
R05-D	7/11/2006	657	ARGR	324	400	M	9	1.18	DS	
R05-D	7/11/2006	658	ARGR	306	304	M	9	1.06	DS	
R05-D	7/11/2006	659	ARGR	334	392	M	9	1.05	DS	
R05-D	7/11/2006	660	ARGR	330	381	M	9	1.06	DS	
R05-D	7/11/2006	661	ARGR	220	115	F	1	1.08	DS	
R05-D	7/11/2006	662	ARGR	321	362	F	4	1.09	DS	
R05-D	7/11/2006	663	ARGR	303	327	M	9	1.18	DS	
R05-D	7/11/2006	664	ARGR	335	403	M	9	1.07	DS	
R05-D	7/11/2006	665	ARGR	220	124	F	1	1.16	DS	
R05-D	7/11/2006	666	ARGR	329	402	F	4	1.13	DS	
R05-D	7/11/2006	667	ARGR	312	375	M	9	1.23	DS	
R05-D	7/11/2006	668	ARGR	262	180	M	6	1.00	DS	
R05-D	7/11/2006	669	ARGR	302	301	F	4	1.09	DS	
R05-D	7/11/2006	670	ARGR	236	147	F	4	1.12	DS	
R05-D	7/11/2006	671	ARGR	271	217	M	9	1.09	DS	
R05-D	7/11/2006	672	ARGR	339	382	M	9	0.98	DS	
R05-D	7/11/2006	673	ARGR	242	158	F	1	1.11	DS	
R05-D	7/11/2006	674	ARGR	298	263	F	4	0.99	DS	
R05-D	7/11/2006	675	ARGR	236	121	F	1	0.92	DS	
R05-D	7/11/2006	676	ARGR	317	339	F	4	1.06	DS	
R05-D	7/11/2006	677	ARGR	283	270	F	4	1.19	DS	
R05-D	7/11/2006	678	ARGR	283	290	M	9	1.28	DS	
R05-D	7/11/2006	679	ARGR	286	255	M	9	1.09	DS	
R05-D	7/11/2006	680	ARGR	229	125	F	1	1.04	DS	
R05-D	7/11/2006	681	ARGR	233	174	F	1	1.38	DS	
R05-D	7/11/2006	682	ARGR	254	179	F	1	1.09	DS	
R05-D	7/11/2006	683	ARGR	239	160	F	1	1.17	DS	
R05-D	7/11/2006	684	ARGR	274	242	F	4	1.18	DS	
R05-D	7/11/2006	685	ARGR	227	137	F	1	1.17	DS	
R05-D	7/11/2006	686	ARGR	232	136	F	1	1.09	DS	
R05-D	7/11/2006	687	ARGR	246	163	F	1	1.09	DS	
R05-D	7/11/2006	688	ARGR	220	112	F	1	1.05	DS	
R05-D	7/11/2006	689	LKTR	425	736	--	--	0.96	DS	LPEL
R02-D	7/11/2006	690	RNWH	307	279	--	--	0.96	DS	
R02-U	7/11/2006	691	RNWH	224	110	--	--	0.98	US	
R02-U	7/11/2006	692	RNWH	359	429	--	--	0.93	US	
R02-U	7/11/2006	693	ARGR	256	181	M	6	1.08	US	
R02-U	7/11/2006	694	ARGR	232	171	F	1	1.37	US	
R09-D	7/11/2006	695	ARGR	290	282	F	4	1.16	DS	
R09-D	7/11/2006	696	ARGR	284	281	M	9	1.23	DS	
R02-D	7/12/2006	697	ARGR	278	225	F	4	1.05	DS	
R02-D	7/12/2006	698	RNWH	340	365	--	--	0.93	DS	
R02-U	7/12/2006	699	RNWH	321	302	--	--	0.91	US	
R02-U	7/12/2006	700	RNWH	289	247	--	--	1.02	US	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R02-U	7/12/2006	701	RNWH	238	141	--	--	1.05	US	
R02-U	7/12/2006	702	ARGR	215	109	F	1	1.10	US	
R02-U	7/12/2006	703	ARGR	218	115	F	1	1.11	US	
R02-U	7/12/2006	704	ARGR	288	263	M	9	1.10	US	
R02-U	7/12/2006	705	ARGR	238	176	F	4	1.31	US	
R02-U	7/12/2006	706	ARGR	243	193	F	1	1.35	US	
R02-U	7/12/2006	707	ARGR	244	176	F	4	1.21	US	
R02-U	7/12/2006	708	ARGR	192	86	F	4	1.22	US	
R02-U	7/12/2006	709	ARGR	291	260	M	9	1.06	US	
R05-D	7/12/2006	710	ARGR	315	372	M	9	1.19	US	
R05-D	7/12/2006	711	RNWH	292	243	--	--	0.98	DS	
R05-D	7/12/2006	712	RNWH	319	313	--	--	0.96	DS	
R05-D	7/12/2006	713	RNWH	346	419	--	--	1.01	DS	
R05-D	7/12/2006	714	ARGR	332	418	M	9	1.14	DS	
R05-D	7/12/2006	715	ARGR	312	338	M	9	1.11	DS	
R05-D	7/12/2006	716	ARGR	301	294	M	9	1.08	DS	
R05-D	7/12/2006	717	ARGR	336	429	M	9	1.13	DS	
R05-D	7/12/2006	718	ARGR	294	303	M	9	1.19	DS	
R05-D	7/12/2006	719	ARGR	246	167	M	6	1.12	DS	
R05-D	7/12/2006	720	ARGR	244	179	M	6	1.23	DS	
R05-D	7/12/2006	721	ARGR	252	191	M	9	1.19	DS	
R05-D	7/12/2006	722	ARGR	218	120	F	1	1.16	DS	
R05-D	7/12/2006	723	ARGR	234	155	M	6	1.21	DS	
R05-D	7/12/2006	724	ARGR	202	101	F	1	1.23	DS	
R05-D	7/12/2006	725	ARGR	316	400	F	4	1.27	DS	
R05-D	7/12/2006	726	ARGR	314	339	M	9	1.09	DS	
R05-D	7/12/2006	727	ARGR	305	321	M	9	1.13	DS	
R05-D	7/12/2006	728	ARGR	320	365	F	4	1.11	DS	
R05-D	7/12/2006	729	ARGR	294	276	F	4	1.09	DS	
R05-D	7/12/2006	730	ARGR	316	345	M	9	1.09	DS	
R05-D	7/12/2006	731	ARGR	238	137	F	1	1.02	DS	
R05-D	7/12/2006	732	ARGR	310	343	M	9	1.15	DS	
R05-D	7/12/2006	733	ARGR	291	280	F	4	1.14	DS	
R05-D	7/12/2006	734	ARGR	356	515	F	4	1.14	DS	
R05-D	7/12/2006	735	ARGR	225	138	F	1	1.21	DS	
R05-D	7/12/2006	736	ARGR	196	91	F	1	1.21	DS	
R05-D	7/12/2006	737	ARGR	221	115	F	1	1.07	DS	
R05-D	7/12/2006	738	ARGR	237	151	M	6	1.13	DS	
R05-D	7/12/2006	739	ARGR	298	233	M	9	0.88	DS	
R05-D	7/12/2006	740	ARGR	262	207	M	6	1.15	DS	
R05-D	7/12/2006	741	ARGR	238	148	F	1	1.10	DS	
R05-D	7/12/2006	742	ARGR	296	261	M	9	1.01	DS	
R09-D	7/12/2006	743	ARGR	313	291	M	9	0.95	DS	
R09-D	7/12/2006	744	LKTR	503	1026	--	--	0.81	DS	LPEL
R09-D	7/12/2006	745	LKTR	387	496	--	--	0.86	DS	LPEL
R19-D	7/12/2006	746	ARGR	253	176	F	4	1.09	DS	
R19-D	7/12/2006	747	ARGR	325	323	M	9	0.94	DS	
R19-D	7/12/2006	748	ARGR	201	88	F	1	1.08	DS	
R19-D	7/12/2006	749	ARGR	224	111	M	6	0.99	DS	
R05-D	7/13/2006	750	ARGR	227	132	M	6	1.13	DS	
R05-D	7/13/2006	751	ARGR	243	162	M	6	1.13	DS	
R05-D	7/13/2006	752	ARGR	240	157	F	1	1.14	DS	
R05-D	7/13/2006	753	ARGR	334	131	M	6	0.35	DS	
R05-D	7/13/2006	754	ARGR	235	157	F	1	1.21	DS	
R05-D	7/13/2006	755	ARGR	265	222	F	4	1.19	DS	
R05-D	7/13/2006	756	ARGR	341	405	M	9	1.02	DS	
R05-D	7/13/2006	757	ARGR	304	335	M	9	1.19	DS	
R05-D	7/13/2006	758	ARGR	296	306	F	4	1.18	DS	
R05-D	7/13/2006	759	ARGR	245	187	F	1	1.27	DS	
R05-D	7/13/2006	760	ARGR	354	465	M	9	1.05	DS	
R05-D	7/13/2006	761	ARGR	340	406	M	9	1.03	DS	
R05-D	7/13/2006	762	ARGR	273	264	F	4	1.30	DS	
R05-D	7/13/2006	763	ARGR	334	336	M	9	0.90	DS	
R05-D	7/13/2006	764	ARGR	320	319	F	4	0.97	DS	
R05-D	7/13/2006	765	ARGR	294	296	M	9	1.16	DS	
R05-D	7/13/2006	766	ARGR	263	207	F	4	1.14	DS	
R05-D	7/13/2006	767	ARGR	333	368	M	9	1.00	DS	
R05-D	7/13/2006	768	ARGR	341	411	M	9	1.04	DS	
R05-D	7/13/2006	769	ARGR	315	366	F	4	1.17	DS	
R05-D	7/13/2006	770	ARGR	309	325	F	4	1.10	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R05-D	7/13/2006	771	ARGR	320	366	F	4	1.12	DS	
R05-D	7/13/2006	772	ARGR	330	373	M	9	1.04	DS	
R05-D	7/13/2006	773	ARGR	311	334	F	4	1.11	DS	
R05-D	7/13/2006	774	ARGR	328	384	M	9	1.09	DS	
R05-D	7/13/2006	775	ARGR	235	165	F	1	1.27	DS	
R05-D	7/13/2006	776	ARGR	320	353	M	9	1.08	DS	
R05-D	7/13/2006	777	ARGR	298	300	M	9	1.13	DS	
R05-D	7/13/2006	778	ARGR	295	280	M	9	1.09	DS	
R02-U	7/13/2006	779	ARGR	289	243	F	4	1.01	US	
R02-U	7/13/2006	780	ARGR	310	294	M	9	0.99	US	
R02-U	7/13/2006	781	ARGR	285	289	M	9	1.25	US	
R02-U	7/13/2006	782	ARGR	228	136	M	6	1.15	US	
R02-U	7/13/2006	783	ARGR	231	148	F	1	1.20	US	
R02-U	7/13/2006	784	ARGR	211	109	F	1	1.16	US	
R09-D	7/13/2006	785	ARGR	282	234	M	9	1.04	DS	
R09-D	7/13/2006	786	ARGR	240	154	F	1	1.11	DS	
R09-D	7/13/2006	787	ARGR	240	145	F	1	1.05	DS	
R09-D	7/13/2006	788	ARGR	302	264	M	9	0.96	DS	
R09-D	7/13/2006	789	ARGR	266	218	M	9	1.16	DS	
R09-D	7/13/2006	790	ARGR	212	112	F	1	1.18	DS	
R09-D	7/13/2006	791	ARGR	201	94	F	1	1.16	DS	
R09-D	7/13/2006	792	LKTR	418	698	--	--	0.96	DS	LPEL
R09-D	7/13/2006	793	LKTR	418	674	--	--	0.92	DS	LPEL
R05-D	7/15/2006	794	ARGR	311	339	F	4	1.13	DS	
R05-D	7/15/2006	795	ARGR	350	467	M	9	1.09	DS	
R05-D	7/15/2006	796	ARGR	331	353	F	4	0.97	DS	
R05-D	7/15/2006	797	ARGR	260	198	F	1	1.13	DS	
R05-D	7/15/2006	798	ARGR	300	304	F	4	1.13	DS	
R05-D	7/15/2006	799	ARGR	308	299	F	4	1.02	DS	
R05-D	7/15/2006	800	ARGR	260	226	F	4	1.29	DS	
R05-D	7/15/2006	801	ARGR	308	275	M	9	0.94	DS	
R05-D	7/15/2006	802	ARGR	312	320	F	4	1.05	DS	
R05-D	7/15/2006	803	ARGR	266	213	F	4	1.13	DS	
R05-D	7/15/2006	804	ARGR	342	370	M	9	0.92	DS	
R05-D	7/15/2006	805	ARGR	258	215	F	1	1.25	DS	
R05-D	7/15/2006	806	ARGR	310	339	F	4	1.14	DS	
R05-D	7/15/2006	807	ARGR	309	290	F	4	0.98	DS	
R05-D	7/15/2006	808	ARGR	330	330	F	4	0.92	DS	
R05-D	7/15/2006	809	ARGR	326	366	F	4	1.06	DS	
R05-D	7/15/2006	810	ARGR	280	228	F	4	1.04	DS	
R05-D	7/15/2006	811	ARGR	320	330	M	9	1.01	DS	
R05-D	7/15/2006	812	ARGR	295	281	M	9	1.09	DS	
R05-D	7/15/2006	813	ARGR	295	260	F	4	1.01	DS	
R05-D	7/15/2006	814	RNWH	320	292	--	--	0.89	DS	
R02-D	7/15/2006	815	ARGR	250	166	F	1	1.06	DS	
R02-D	7/15/2006	816	ARGR	298	298	F	4	1.13	DS	
R02-D	7/15/2006	817	ARGR	196	69	M	6	0.92	DS	
R02-D	7/15/2006	818	ARGR	251	162	F	1	1.02	DS	
R02-D	7/15/2006	819	RNWH	240	131	--	--	0.95	DS	
R02-D	7/15/2006	820	LKTR	389	560	--	--	0.95	DS	LPEL
R05-D	7/17/2006	821	ARGR	329	--	F	4	--	DS	
R05-D	7/17/2006	822	ARGR	293	--	F	1	--	DS	
R05-D	7/17/2006	823	ARGR	232	--	F	1	--	DS	
R05-D	7/17/2006	824	ARGR	269	--	F	1	--	DS	
R05-D	7/17/2006	825	ARGR	262	--	M	6	--	DS	
R05-D	7/17/2006	826	ARGR	336	--	M	9	--	DS	
R05-D	7/17/2006	827	ARGR	358	--	M	9	--	DS	
R05-D	7/17/2006	828	ARGR	228	--	F	1	--	DS	
R05-D	7/17/2006	829	ARGR	316	--	M	9	--	DS	
R05-D	7/17/2006	830	ARGR	270	--	F	1	--	DS	
R05-D	7/17/2006	831	ARGR	350	--	M	9	--	DS	
R05-D	7/17/2006	832	ARGR	344	--	M	9	--	DS	
R05-D	7/17/2006	833	ARGR	329	--	M	9	--	DS	
R05-D	7/17/2006	834	ARGR	249	--	F	1	--	DS	
R05-D	7/17/2006	835	ARGR	307	--	M	9	--	DS	
R05-D	7/17/2006	836	ARGR	312	--	F	4	--	DS	
R05-D	7/17/2006	837	ARGR	374	--	M	9	--	DS	
R05-D	7/17/2006	838	ARGR	317	--	M	9	--	DS	
R05-D	7/17/2006	839	ARGR	320	--	F	4	--	DS	
R05-D	7/17/2006	840	ARGR	317	--	F	4	--	DS	

Stream Crossing and Direction	Date	Fish No	Species	Length	Weight	Gender	Maturity	K	Orientation	Comments
R05-D	7/17/2006	841	ARGR	313	--	F	4	--	DS	
R05-D	7/17/2006	842	ARGR	344	--	M	9	--	DS	
R05-D	7/17/2006	843	ARGR	285	--	F	4	--	DS	
R05-D	7/17/2006	844	ARGR	255	--	F	1	--	DS	
R05-D	7/17/2006	845	ARGR	289	--	M	9	--	DS	
R05-D	7/17/2006	846	ARGR	313	--	M	9	--	DS	
R05-D	7/17/2006	847	RNWH	329	--			--	DS	
R05-D	7/17/2006	848	LKTR	420	--			--	DS	LPEL
R02-U	7/17/2006	849	ARGR	268	--	F	1	--	US	
R02-U	7/17/2006	850	ARGR	248	--	F	1	--	US	
R02-U	7/17/2006	851	ARGR	220	--	F	1	--	US	
R02-U	7/17/2006	852	ARGR	280	--	F	4	--	US	
R02-U	7/17/2006	853	ARGR	267	--	F	4	--	US	
R02-U	7/17/2006	854	ARGR	212	--	F	1	--	US	
R09-U	7/17/2006	855	ARGR	218	--	F	1	--	DS	
R09-D	7/17/2006	856	ARGR	211	--	F	1	--	DS	
R19-D	7/17/2006	857	LKTR	719	--	--	--	--	DS	LPEL
R02-U	7/18/2006	858	ARGR	264	205	F	4	1.11	US	
R02-U	7/18/2006	859	ARGR	225	123	F	1	1.08	US	
R05-D	7/18/2006	860	ARGR	213	114	M	6	1.18	DS	
R05-D	7/18/2006	861	ARGR	215	116	F	1	1.17	DS	
R05-D	7/18/2006	862	ARGR	217	122	M	6	1.19	DS	
R05-D	7/18/2006	863	ARGR	341	400	F	4	1.01	DS	
R05-D	7/18/2006	864	ARGR	234	167	M	6	1.30	DS	
R05-D	7/18/2006	865	ARGR	318	366	F	4	1.14	DS	
R05-D	7/18/2006	866	ARGR	315	365	M	9	1.17	DS	
R09-D	7/18/2006	867	ARGR	191	96	F	1	1.38	DS	
R09-D	7/18/2006	868	ARGR	197	91	F	1	1.19	DS	
R09-D	7/18/2006	869	ARGR	240	160	F	1	1.16	DS	
R05-U	7/19/2006	870	ARGR	345	373	M	9	0.91	US	
R05-U	7/19/2006	871	ARGR	254	176	M	9	1.07	US	
R05-U	7/19/2006	872	ARGR	298	294	M	9	1.11	US	
R05-U	7/19/2006	873	ARGR	313	345	M	9	1.13	US	
R05-D	7/19/2006	874	RNWH	346	448	--	--	1.08	DS	
R05-D	7/19/2006	875	RNWH	351	444	--	--	1.03	DS	
R05-D	7/19/2006	876	ARGR	308	336	F	4	1.15	DS	
R05-D	7/19/2006	877	ARGR	313	312	F	4	1.02	DS	
R05-D	7/19/2006	878	ARGR	324	352	M	9	1.03	DS	
R02-D	7/19/2006	879	ARGR	240	243	M	9	1.76	DS	
R02-D	7/19/2006	880	ARGR	323	403	M	9	1.20	DS	
R02-D	7/19/2006	881	ARGR	194	86	F	4	1.18	DS	
R09-D	7/19/2006	882	ARGR	206	107	F	4	1.22	DS	
R09-D	7/19/2006	883	ARGR	188	82	F	4	1.23	DS	

Notes:

ARGR = arctic grayling; RNWH = round whitefish; ARCH = arctic char; LKTR = lake trout; LPEL = left pelvic fin clip (when tags were NA).

Gender: F/M = female/male; US = upstream, DS = downstream.

Maturity: 1/6 = juvenile, 2/7 = will spawn this year, 3/8 = ripe and ready, 4/9 = spent, 5/10 = spawned in previous years, but not this year.

Condition factor: $K = (\text{weight} \times 10^5) / (\text{length})^3$; unitless.

APPENDIX B

PHOTOGRAPHS OF ALL-WEATHER ROAD CROSSINGS, 2006.

Appendix B: Stream Crossing R02 Photographs

July 2 - 2006 Aerial of C02 looking north west

June 25 - R02 looking upstream

Appendix B: Stream Crossing R02 Photographs

June 25 - Hoop net sets at stream crossing R02

July 9 - Confined channel on south side of R02 to be spanned by bridge

Appendix B: Stream Crossing R05 Photographs

July 2 - Aerial photograph of RO2 with hoop nets in foreground

June 27 - RO2 looking north

Appendix B: Stream Crossing R05 Photographs

July 7 - RO2 aerial looking north

July 7 - RO2 looking south with drift traps in background

Appendix B: Stream Crossing R06 Photographs

July 2 - Aerial photograph of R06 - middle of photo

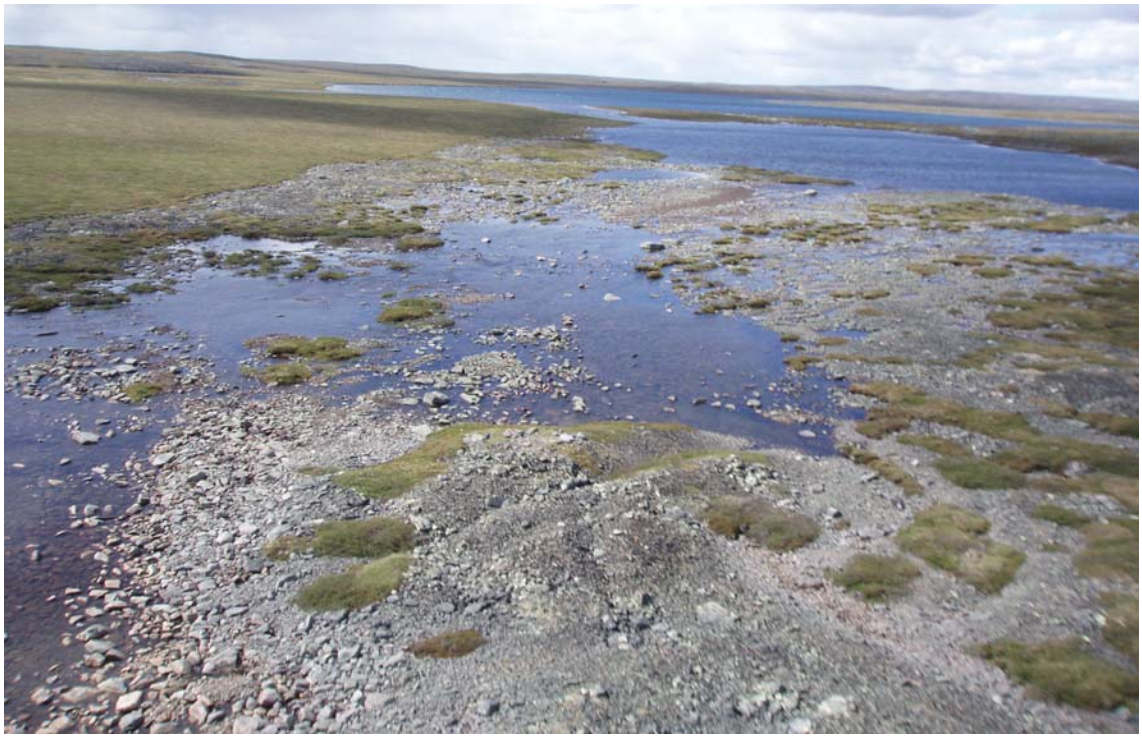
June 28 - looking upstream in main channel

Appendix B: Stream Crossing R06 Photographs

July 7 - J. Mota at Bridge Crossing RO6

July 19 - R06 Cobble Substrate

Appendix B: Stream Crossing R09 Photographs



July 7 - Aerial photograph bridge crossing R09

June 25 - Hoop nets set in R09 near crossing

Appendix B: Stream Crossing R09 Photographs

July 7 - Habitat Assessment R09

June 27 - Spring survey at crossing R09

Appendix B: Stream Crossing R12 Photographs

July 2 - Aerial photograph of R12 looking upstream (west)

July 2 - Aerial view of crossing R12 looking south

Appendix B: Stream Crossing R12 Photographs

June 25 - looking east at larval drift trap at crossing R12

July 6 - View upstream of crossing R12 looking east

Appendix B: Stream Crossing R19 Photographs

July 2 - Aerial photograph of stream crossing R19

July 2 - showing hoop net spanning creek at R19 looking upstream

Appendix B: Stream Crossing R19 Photographs

June 25 - hoop nets at stream crossing R19; looking downstream (east)

June 25 - showing hoop net at R19 looking downstream (east)