REPORT

Back River Project Rascal Stream West Arctic Grayling Monitoring

2024 Field Summary Report and Fish Passage Characterization

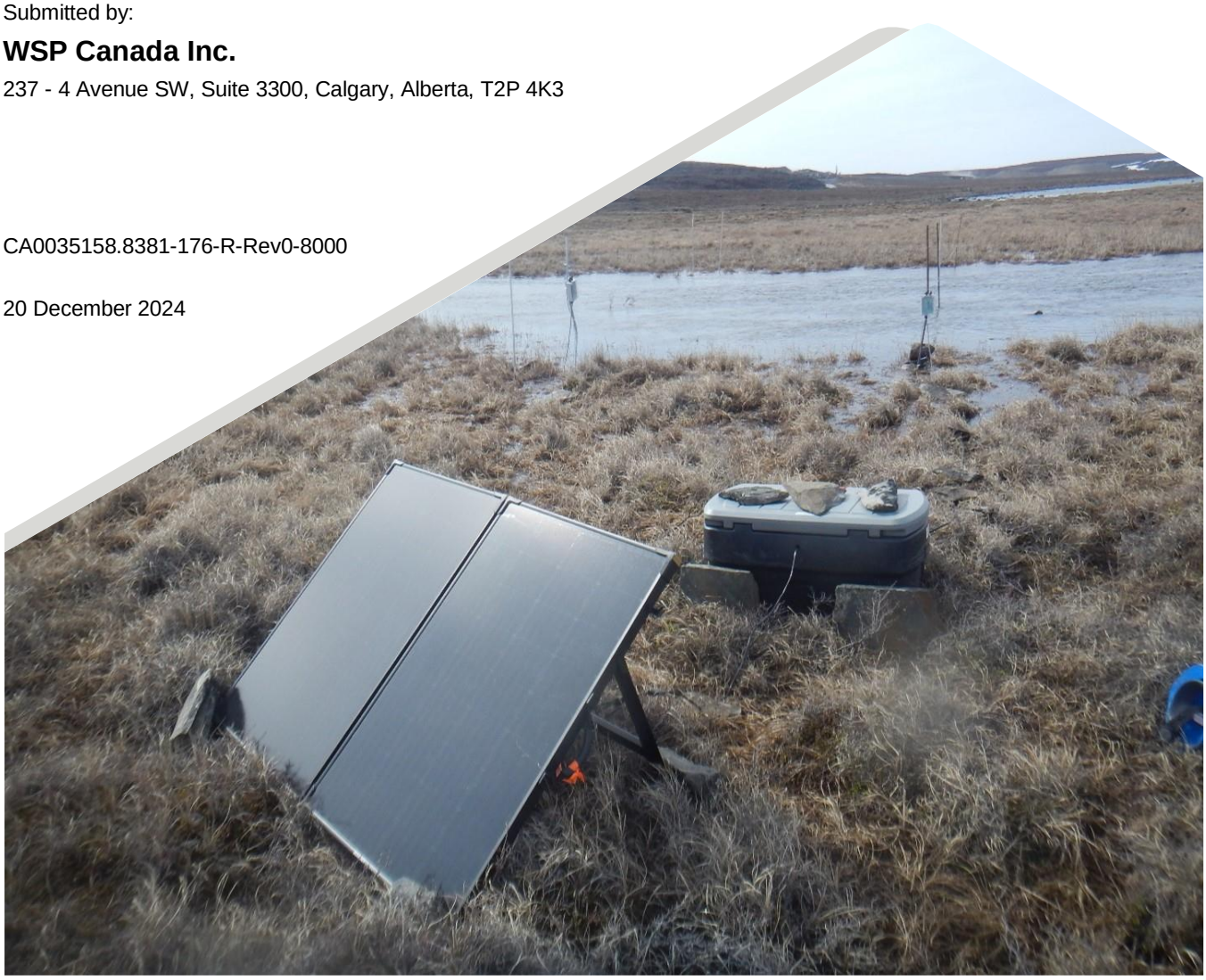
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1.0 INTRODUCTION

WSP Canada Inc. (WSP) was contracted by B2Gold Back River Corp. (B2Gold Nunavut) to conduct a monitoring program for Arctic Grayling (*Thymallus arcticus*) and their habitat within Rascal Stream West during spring and summer 2024. The program is intended to meet with the requirements of Fisheries Act Authorization (FAA) 12-HCAA-CA7-00007). Data on existing conditions will be used as a reference for identifying environmental changes, and for quantitative and qualitative assessments of effects on fish and fish habitat to confirm environmental assessment predictions and that mitigation on Rascal Stream West is performing as intended. Specifically, data collected under this scope of work will supplement historical information to provide a reference to inform a future assessment of planned in-water construction, specifically diversion works (i.e., fishway) associated with the airstrip extension.

The proposed monitoring objectives and methods for the 2024 program were directed by the monitoring plan reviewed and approved by Fisheries and Oceans Canada (DFO) (Golder 2020a,b). The 2024 program was a continuation of monitoring conducted in 2022 (Golder 2023).

Program objectives for the 2024 program included the following:

- Deploy a fish trap below the haul road crossing to monitor the abundance of spawning Arctic Grayling originating from Goose Lake in Rascal Stream West during spring freshet conditions.
- Implant captured fish with a Passive Integrated Transponder (PIT) tag to enable future fish movement tracking across radio frequency identification detection (RFID) antenna arrays through the spring and summer.
- Monitor and characterize movements of tagged Arctic Grayling through Rascal Stream West, including the chute in lower Reach 1, using RFID antenna arrays at two locations on Rascal Stream West through the spring and summer.
- Collect and summarize flow data at the previously constructed weir mitigation structures to assess their performance within Reach 1 of Rascal Stream West (Golder 2021).
- Conduct a summer study to collect and summarize data on the recruitment of age-0 young-of-the-year (YOY) Arctic Grayling in Rascal Stream West.

This report provides a summary of information collected in 2024, with a focus on fish movements and habitat use by Arctic Grayling within Rascal Stream West and includes recommendations for monitoring methods going forward.



LEGEND

- CHUTE LOCATION
- CULVERT CROSSING
- SAMPLING LOCATION
- WATERCOURSE
- JUNE 2024 AS-BUILT FOOTPRINT
- PROPOSED AIRSTRIP EXTENSION
- PROPOSED GOOSE INFRASTRUCTURE
- WATERBODY

0 250 500

1:12,500 METRES

REFERENCE(S)

FOOTPRINT OBTAINED FROM CLIENT. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. UPDATED BY WSP. 2023 GOOSE ORTHOPHOTO IMAGERY PROVIDED BY B2GOLD. IMAGERY OBTAINED FROM ESRI WORLD IMAGERY COPYRIGHT © 20200616 ESRI AND ITS LICENSORS. SOURCE: MAXAR. USED UNDER LICENSES, ALL RIGHTS RESERVED.
PROJECTED COORDINATE SYSTEM: NAD 1983 UTM ZONE 13N

CLIENT
B2GOLD BACK RIVER CORP.

PROJECT
BACK RIVER PROJECT RASCAL STREAM WEST ARCTIC GRAYLING MONITORING

TITLE
RASCAL STREAM WEST 2024 STUDY AREA AND SURVEY LOCATIONS

CLIENT	CONSULTANT		
B2GOLD NUNAVUT	wsp	YYYY-MM-DD	2024-11-06
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		PREPARED	PMT
		REVIEWED	
		APPROVED	

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2.0 METHODS

The primary goal of the program was to characterize the movement of spawning Arctic Grayling throughout Rascal Stream West. Fish capture and tagging for the spring field study was conducted from 1 to 9 June 2024, with RFID arrays in place to monitor movements through 07 August 2024. The spatial scope of the spring sampling and fishing efforts spanned the mouth of the stream to the outlet of Rascal Lake (Reach 1 to 6). Follow-up sampling efforts were conducted from August 6 to 8 to document the abundance and distribution of young-of-year Arctic Grayling in Reach 1, 2, and 3. Fish were captured according to the methods approved in the DFO Licence to Fish for Scientific Purposes (Licence #: S-24/25-1005-NU-A1). The following methods were used:

- Two-Way Fish Trap (Section 2.1.1)
- Angling Surveys (Section 2.1.2)
- Dip Netting (Section 2.1.2)
- Fyke Nets (Section 2.1.2)
- Individual Fish Data and PIT Tagging (Section 2.1.3)
- Fish Tracking (Section 2.2)
- YOY Surveys (Section 2.3)

2.1 Spring Surveys

2.1.1 Fish Fence Trap

A bi-directional (two-way) trap box connected to a fish fence was installed immediately downstream from the culvert crossing on the primary channel of Rascal Stream West Reach 1 (Figure 1-1). The trap box measured 2-m long x 1-m wide x 1.5-m high with each trap section (upstream and downstream) containing 1 m^2 of holding area. The trap materials consisted of a wood frame and conduit with the fish fence wings erected using vexar, block nets and rebar. One trap opening faced upstream and the other downstream, with the two tap-boxes situated back-to-back. The trap-box and fencing were anchored in place using rebar, boulders and sandbags where needed along the bottom and corners to fill any remaining gaps so that fish would be funneled into the trap. The field crew made two modifications and location changes to the trap setup to allow for safe and adequate fish holding conditions during high flow periods. The fish trap was in operation from 1 to 7 June, with the final setup below in Photo 2-1. Additional photos are provided in Appendix B. Additional details related to the operation of the fish trap are provided in Section 4.1, including recommendations for future monitoring.



Photo 2-1: Two-Way Fish Trap Below the Culvert Crossing in Rascal Stream West Reach 1

2.1.2 Supplemental Fishing Methods

To supplement data collected by the fish fence trap, angling was conducted throughout Rascal Stream West from the confluence with Goose Lake upstream to Rascal Lake outlet (Reach 1 to 6). All angling surveys were conducted by two anglers using fly fishing gear with small nymphs to target Arctic Grayling. Spatial coordinates were marked for each fish captured by angling. Effort was recorded as hours fished and stream distance (kilometres) surveyed.

Small fyke nets (5-mm mesh, 1-m square frame, 1-m hoop, with 5 m wings) were also used to capture and tag fish. One fyke net was set at the mouth of Rascal Stream West, where the stream enters Goose Lake, with another net set just upstream of RFID array 2 in Reach 3 (upstream movement trap) (Figure 1-1). Both fyke nets were set on 4 June and removed on 7 June.

Dip netting was also deployed when stream flow conditions were suitable to allow for visual location of fish in the shallow portions of the stream. Dip netting surveys were combined with a block net to contain and capture fish. All dip netting occurred within lower Rascal Stream West, between the fish trap and the upstream chute (located 195 m upstream from the Goose Lake confluence).

2.1.3 Individual Fish Data and PIT Tagging

Captured fish were identified to species, enumerated, and measured for length (±1 mm; fork length or total length for fish without a fork caudal fin) and weight (± 0.1 g for large-bodied fish and ± 0.01 g for small-bodied fish). Where possible, sex, life stage, and maturity were also recorded. After measurements, captured fish were scanned for previously inserted PIT tags using the hand-held scanner Oregon RFID full Duplex (FDX)/half duplex (HDX) scanner to detect fish that were tagged. If no tag was found, a uniquely coded 12 or 23 mm HDX PIT tag was implanted. All fish tagging was done according to the protocols outlined in the Fisheries and Oceans Canada stand operating procedure for fin fish tagging (DFO 2019). Individual fish that were 150 to 249 mm in length had a 12 mm PIT tag inserted into the abdominal cavity of the fish, while fish greater than 250 mm had a 23 mm PIT tag inserted into the abdominal cavity of the fish. The latter size class was considered spawning size adults, however, size at sexual maturity for Arctic Grayling can vary and individuals as small as 170 mm in length may be sexually mature (Clark 1992, Stewart et al 2007; McPherson et al. 2022). All captured fish, both tagged and untagged, were released (unharmed) at the location where they were captured.

2.2 Fish Movement Tracking

Arctic Grayling habitat-use and movement monitoring were conducted using the following methods:

- Scanning all fish captured throughout the creek using a handheld PIT tag reader and recording the date, time and location of any previously captured and tagged fish (recaptures).
- Continuous monitoring of PIT tagged fish movements with RFID antenna arrays.
- An assessment of fish passage potential was completed in a section of Reach 1 of Rascal Stream West where a series of flow mitigation (weir) structures were previously installed.

RFID antenna arrays were deployed at two locations in Rascal Stream West (Figure 1-1) to monitor movements of PIT-tagged Arctic Grayling from 3 June to 7 August 2024. One array was deployed in Reach 1 just upstream from the bridge and approximately 150 m upstream from the Goose Lake confluence. This array was installed with one antenna above the chute and one below to evaluate the navigability of the chute. The second array was deployed just downstream of Gosling Pond 1 near the end of the airstrip (top end of Reach 3). Each RFID array consisted of an Oregon RFID data logger (multiplex design), a tuner box, a power source, and two antennas to record directionality of movement (upstream/downstream). Antennas were constructed as single or multiple loops of 12 AWG wire (depending on inductance) and were oriented vertically to increase PIT tag reception range. The bottom of the antenna loop was embedded in the creek substrate and the top of the loop suspended approximately 30 centimetres (cm) above the water surface. This configuration ensured that fish passed through the loop perpendicular to the antenna field. Antennas were connected to individual tuner boxes located creek-side, with twinax cable extending from the tuner boxes to a multiple antenna reader box that recorded the date, time and PIT number of any tagged fish swimming by. The arrays were powered by deep-cycle 130 ampere marine batteries which were kept charged using solar panels. An example of the RFID array setup for array is shown below (Photo 2-2).

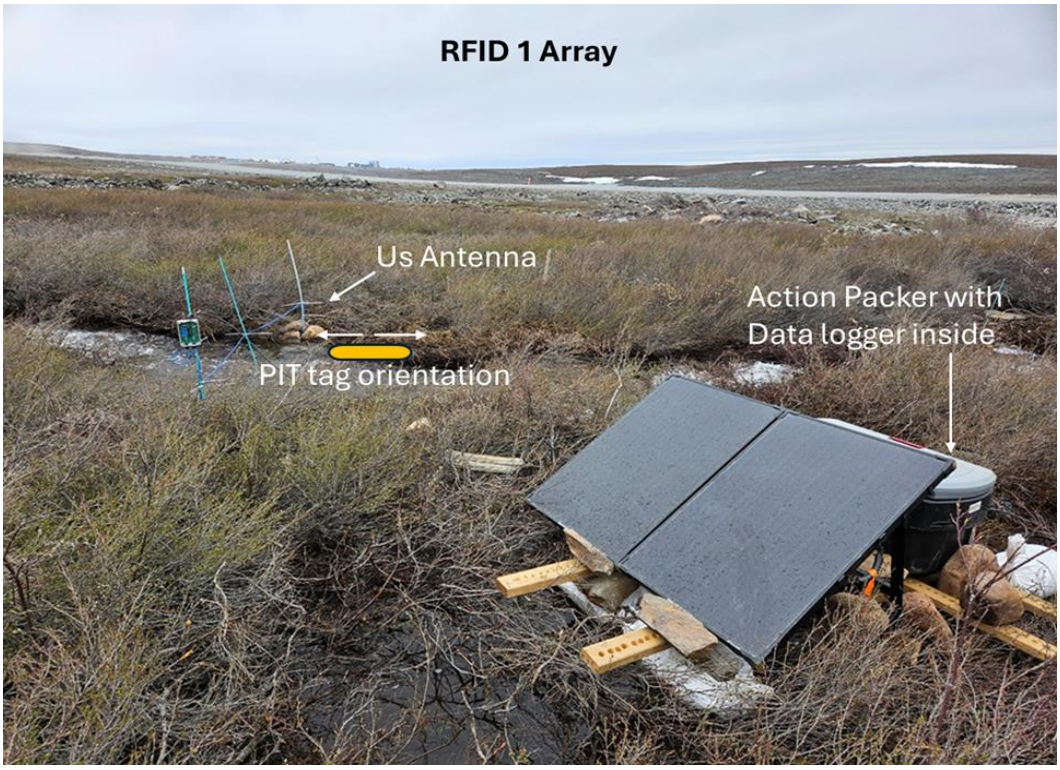


Photo 2-2: Functional Setup of the RFID 1 Array in Rascal Stream West

An assessment of fish passage conditions was also completed in a section of Reach 1 of Rascal Stream West where a series of flow mitigation (weir) structures were previously installed (Golder 2021). Each weir structure was assessed for type of habitat present (e.g., shallow cascade, riffle, chute) (O'Neil and Hildebrand 1986). In addition to habitat type, point velocity and depth measurements were measured at three representative locations (equally spaced apart at approximately 25%, 50% and 75% of the width of the stream) along a cross-sectional transect positioned above and below each weir structure. An overall qualitative assessment was conducted to assess the potential for adult Arctic Grayling to move upstream past each weir structure based on a low to high movement potential rating.

2.3 Young-of-the-Year (YOY) Surveys

A summer program was conducted from 6 to 8 August to document abundance and distribution of YOY Arctic Grayling in Rascal Stream West. The survey effort was conducted in Reach 1, Reach 2, and Reach 3 of Rascal Stream West using visual surveys and backpack electrofishing. Visual surveys were conducted as longitudinal passes along the entire length of each reach with one observer on each stream bank (two observers total). Backpack electrofishing was conducted in two 100-m sections of each reach. Electrofishing sections chosen were representative of the overall reach and spaced far enough apart to minimize the influence of one survey on another on catch results.

Electrofishing was conducted using a Smith-Root LR-24 backpack electrofisher. Captured fish were enumerated, weighed, measured, and released. Electrofishing effort (seconds), distance (m), and any fish observed but not captured were also documented. All fish observed (but not captured) were enumerated and identified to species, and size class were estimated. Arctic Grayling observations were assigned the following size classes during visual surveys: 0 to 100 mm (young-of-the-year), >100 to 200 mm, and > 200 mm (McPherson et al. 2022).

2.4 Supporting Environmental Data

Point estimates of physico-chemical water quality data were collected at least once per day in Reach 1 during the spring and summer 2024 programs. These measurements were recorded with a YSI meter during the spring program and a Hanna multiparameter tester during the summer program and included pH, temperature (°C), dissolved oxygen (milligrams per litre [mg/L] and percent saturation), and specific conductivity (microsiemens per centimetre [µS/cm]). Water temperatures in Reach 1, Reach 2, and Reach 3 were measured continuously during the summer program from August 6 to 8 using HOBO Tidbit data loggers. Loggers were set to collect temperature data at 15-minute intervals.

Daily manual discharge measurements were recorded in Reach 1 of Rascal Stream West during the field programs. Discharge measurements for depths (m) and velocities (m/s) were recorded using a wading rod with a Marsh McBirney flow meter in the spring and a Hach FH950 flow meter in the summer. Discharge measurements were taken 50 meters downstream from the single span bridge where banks constrict flows. Measurements were used to calculate discharge for interpretation of potential flow restrictions for Arctic Grayling movement during the spring freshet migration.

3.0 RESULTS

3.1 Spring Capture and Tagging Data

A total of 144 fish were captured during the spring surveys, of which 129 were Arctic Grayling (89.6% of the catch total) and 15 were Lake Trout (10.4% of the catch total) (Figure 3-1). Most of the Arctic Grayling were caught in the lower portion of Reach 1 (below the chute) (54.3% of Arctic Grayling catch), with the upper portion of Reach 1 (above the chute) having the next highest catch total (27.9%), followed by Reach 6 (13.2% of the Arctic Grayling catch), and small numbers of fish captured in Reach 2, 3, and 4 (Figure 3-2). Reach 5 was surveyed but no fish were caught. Arctic Grayling mean fork length was 207 mm and mean weight was 132 g (n = 129), with 29% of fish captures (i.e., 38 fish, including mortalities) at 250 mm FL or larger. A total of 15 Lake Trout were caught at the mouth of Rascal Stream West, including two floy-tagged recaptures from a previous study. Lake Trout mean fork length was 517 mm (n = 15) and mean weight was 833 g (n = 3).

Angling surveys accounted for approximately 50% of the total catch, including every Lake Trout captured. Angling CPUE was 0.63 fish/hr for Arctic Grayling and 0.79 fish/hr when including lake Trout. Dip netting captured 35% of the Arctic Grayling catch with a CPUE of 5.63 fish/hr. The fish trap caught a total of 22 Arctic Grayling (17% of Arctic Grayling catch) with 15 mortalities reported over 159 hours of operation. The total fish trap CPUE was 0.14 fish/hr. The trap was moved and modified twice in response to incidental mortalities of Arctic Grayling and removed on June 7 when the last four mortalities were recorded. Fyke netting yielded few fish (only four Arctic Grayling), with a combined CPUE = 0.026 fish/hr. No fish were caught in the fyke net at the mouth of Rascal Stream West.

Detailed information on fish capture and tagging data can be found in Appendix A (Tables A-1 to A-5).

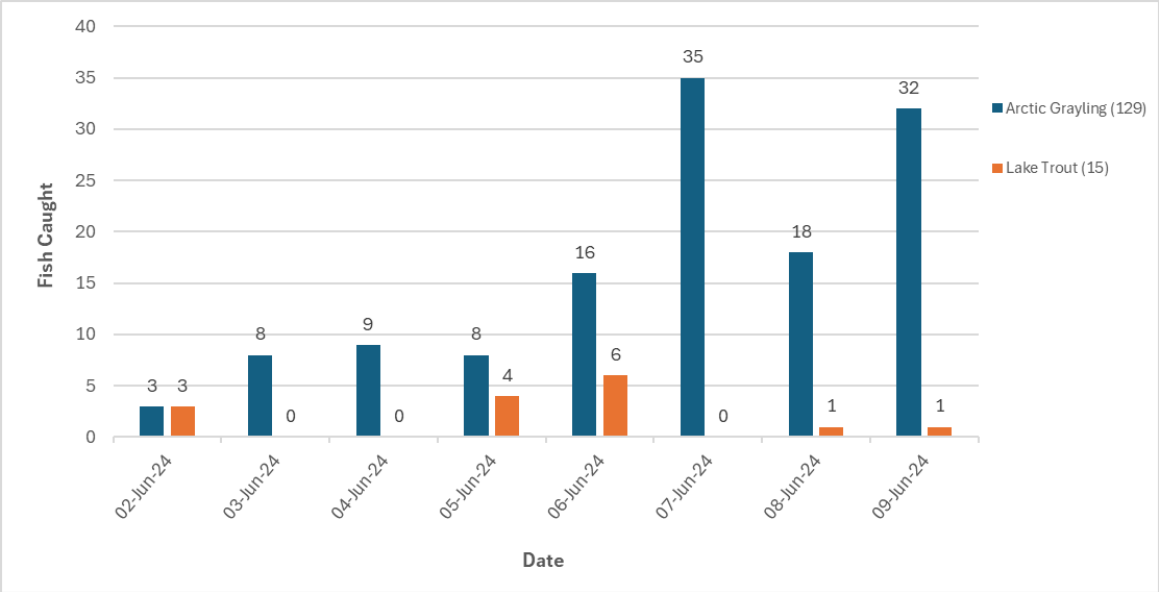


Figure 3-1: Total Daily Fish Catch (including Recaptures) for the 2024 Rascal Stream West Spring Study

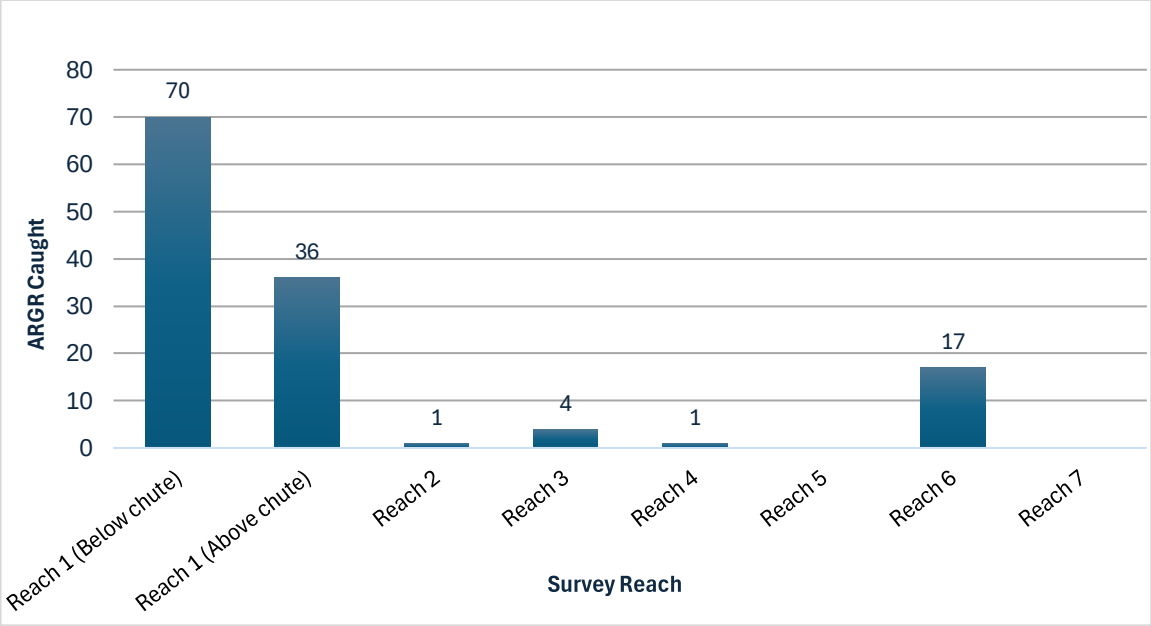


Figure 3-2: Arctic Grayling Captures by Reach During the 2024 Rascal Stream West Spring Study

Arctic Grayling; mm = millimetres

3.2 Arctic Grayling Movements

A total of 78 Arctic Grayling were PIT tagged during the 2024 spring study (Table 3-1). Tagged fish included spawning size fish (30 fish 250 mm in length or longer) and smaller fish with the potential to be sexually mature. None of the previously tagged Arctic Grayling (n = 5) from 2022 program were recaptured. Of the 78 fish tagged in 2024, 58 were tagged in Reach 1 (29 above the chute, 29 below the chute), 1 in Reach 2, 2 in Reach 3, 1 in

Reach 4 and the remaining 16 fish were tagged in Reach 6. Mean fork length of tagged Arctic Grayling was 207 mm. Sizes of tagged fish declined over the sampling period, with the largest fish captured and tagged on 2 June and 4 June, and the smallest fish captured and tagged on 8 June.

Of the 78 tagged fish, 34 were recaptured during the June surveys or detected by the RFID arrays, where RFID Array 1 operated from 3 June at 14:45 to 5 August at 16:00 and RFID Array 2 operated from 1 June at 14:44 to 7 August at 14:00. Summaries of the movement histories of the tagged fish are provided further below. Of the tagged fish that were not recaptured or detected by the RFID arrays, 23 were tagged in Reach 1 below the chute (below RFID Array 1), three fish were tagged in Reach 1 above the chute, two fish were tagged in Reach 3 (above Array 2) and 16 fish were tagged in Reach 6.

Table 3-1: Arctic Grayling PIT Tagging Summary (All Reaches), Spring 2024

Date	Total tags	23 mm tags	12 mm tags	Size range (mm)	Mean Length (mm)	No. of Fish Recaptured or Detected at RFID arrays
02-Jun	3	3	0	298-360	336	0
03-Jun	0	0	0	-	-	0
04-Jun	5	5	0	250-336	278.2	2
05-Jun	7	6	1	234-360	302.4	4
06-Jun	13	8	5	192-345	261.7	5
07-Jun	19	4	15	161-295	221	17
08-Jun	16	4	12	160-288	208.3	4
09-Jun	15	0	15	161-226	198	6
Total	**78**	**30**	**48**	**161-360**	**207.0**	**-**

A total of 14 PIT tagged Arctic Grayling were recaptured during the spring study (Table 3-2). All recaptures were Arctic Grayling tagged in 2024, with one of these fish recaptured on two separate fishing occasions during the spring survey. Every recaptured Arctic Grayling was originally tagged in Reach 1. Distance travelled, on average, between capture and recapture locations was 50 meters. Two fish were recaptured less than 3 hours after first being caught, both moving 0.05 km. Four fish did not move or travelled less than 0.01 km from first capture. Eight fish made short distance movements of 0.01 to 0.10 km upstream or downstream. Only two fish moved relatively moderate or long distances based on fishing recaptures. One of these fish was caught and recaptured above the chute in Reach 1 via angling, then swam 0.25 km downstream through the chute (recorded by RFID Array 1) and was recaptured a second time 24 hours later via dip netting in the lower section of Reach 1. The other fish was caught above the chute in Reach 1 and swam 1.35 km upstream in 9.25 hours (after being tagged) before being detected on RFID Array 2, then recaptured in the Reach 3 fyke net. This second fish was not recaptured or detected on any RFID array after recapture in Reach 3.

Nine of the recaptured fish were eventually detected on the arrays (including the two previously mentioned). Of these fish, seven were last detected swimming downstream towards Goose Lake from above the chute with one (previously mentioned above) swimming upstream past RFID Array 2. One fish recaptured via dip netting below the chute swam upstream and was detected on the Antenna 1 of RFID Array 1 but did not ascend the chute to Antenna 2. The five recaptures not detected on the RFID Array were all caught via dip netting or the fish trap below the chute and it is assumed these fish also eventually swam downstream to Goose Lake.

Table 3-2: Arctic Grayling Recapture Summary, Spring 2024

PIT Tag Number (90022 series)	Length (mm)	First Capture (all within Reach 1)		Recapture (all within Reach 1)			Movement	
		Date/Time	(UTM, NAD 83, Zone 13W)	Date/Time	(UTM, NAD 83, Zone 13W)	Time Between Captures (hrs)	Distance Traveled (km)	Direction
6001378333[A]	230	06-07 14:58	432867 E 7269939 N	06-08 10:50	432920 E 7269887 N	19.9	0.07	US
6001378334[B]	205	06-06 15:45-16:00	432809 E 7270145 N	06-07 7:15-10:00	432809 E 7270145 N	18	0	-
6001378336[B]	206	06-06 8:00	432829 E 7270081 N	06-07 7:15-10:00	432809 E 7270145 N	24	0.08	DS
6001378348[A]	240	06-07 12:20	432891 E 7269901 N	06-07 14:55	432867 E 7269939 N	2.5	0.05	DS
6001378399[A]	215	06-08 10:50	432920 E 7269887 N	06-09 13:00	432927 E 7269876 N	26.2	0.01	DS
8000152693[B]	325	06-06 6:45	432829 E 7270081 N	06-07 7:15-10:00	432809 E 7270145 N	25	0.08	DS
8000152834[A]	266	06-07 12:35	432891 E 7269901 N	06-08 10:30	432882 E 7269931 N	22	0.04	DS
8000152931[B]	263	06-06 15:45-16:00	432809 E 7270145 N	06-07 7:15-10:00	432809 E 7270145 N	18	0	-
8000153108	357	Unk/Lost tag	Unk/Lost tag	06-06 8:00	432829 E 7270081 N	-	-	-
8000153172[A]	336	06-04 12:17	432900 E 7269888 N	06-07 14:45	432891 E 7269901 N	74.5	0.02	DS
8000153218[A]	350	06-02 9:30	432920 E 7269887 N	06-07 14:45	432923 E 7269884 N	127	<0.01	US
8000658007[B]	264	06-06 15:45-16:00	432809 E 7270145 N	06-07 7:15-10:00	432809 E 7270145 N	18	0	-
8000658056[A]	251	06-04 15:32	432882 E 7269931 N	06-05 0:45	433730 E 7269045 N	9.25	1.35	US
8000152988[A]	310	06-06 8:51	432877 E 7269945 N	06-06 11:30	432884 E 7269906 N	2.6	0.05	US
8000152988*	310	06-06 8:51	432877 E 7269945 N	06-07 7:15-10:00	432809 E 7270145 N	24	0.25	DS

Km = Kilometres; ARGR = Arctic Grayling; mm = Millimeters; g = grams US = Upstream; DS = Downstream; *second recapture, [A] = caught above chute, [B] = caught below chute

A total of 409 detection records from 25 Arctic Grayling were logged on RFID Array 1. No fish were detected at RFID Array 1 after June 23. RFID 2 logged a total of 36 detection records from four Arctic Grayling. No fish were detected at RFID Array 2 after June 18. No individual Arctic Grayling were detected at both RFID arrays (i.e., no fish detected at RFID Array 1 and then again at RFID Array 2). The peak movement period at both RFID Arrays occurred from 5 to 10 June. Table 3-3 provides a summary of detection records at each RFID Array site.

Movement histories for fish recorded at the RFID arrays are provided in Table 3-4 and 3-5. All 25 Arctic Grayling detected at RFID Array 1 were originally tagged in Reach 1 (2 fish below the chute and 23 fish above the chute) in Reach 1). Four fish were detected at RFID Array 2, of which three were tagged in Reach 1 above the chute and one in Reach 3. Arctic Grayling tagged in any of the other stream reaches were not detected at either of the RFID arrays.

Movement patterns differed between RFID array sites based on daily antennae detections alone. Most Arctic Grayling (19) detected at RFID Array 1 were last recorded moving in a downstream direction (Table 3-4). Only one of these 19 fish was recorded making any upstream movement during the study period and the last detection record for this fish indicated a final movement downstream towards Goose Lake. Of note, most fish (92%) were captured and tagged above the chute where it is assumed that these fish had ascended the chute at some point prior to, or during the study. In contrast to RFID Array 1, the Arctic Grayling (n = 4) detected at RFID Array 2 were all last recorded moving in an upstream direction towards Rascal Lake (Table 3-5).

Time between original capture in Reach 1 and detection at RFID Array 1 varied from just over 3 hours to almost 5 days. Time between original capture in Reach 1 and detection at RFID Array 2 ranged from just under 6 hours to 2 days. A complete list of detection and operation records for both RFID Arrays is provided in Appendix A (Table A-6, Table A-7).

Table 3-3: Rascal Stream West RFID Array Detection Record Summary, Spring 2024

Date	RFID Array 1			RFID Array 2		
	ARGR Detected	A1 Detection Records	A2 Detection Records	ARGR Detected	A1 Detection Records	A2 Detection Records
2024-06-04	2	7	32	0	0	0
2024-06-05	1	3	0	2	2	9
2024-06-06	2	150	2	1	0	2
2024-06-07	7	23	9	1	5	1
2024-06-08	2	2	5	0	0	0
2024-06-09	5	8	24	0	0	0
2024-06-10	5	10	5	0	0	0
2024-06-11	1	2	1	0	0	0
2024-06-12	1	1	1	0	0	0
2024-06-13	1	18	1	0	0	0
2024-06-14	0	0	0	1	2	3
2024-06-15	0	0	0	0	0	0
2024-06-16	0	0	0	0	0	0
2024-06-17	1	2	1	0	0	0
2024-06-18	1	1	1	1	4	8
2024-06-19	1	84	0	0	0	0
2024-06-20	0	0	0	0	0	0
2024-06-21	1	8	3	0	0	0
2024-06-22	0	0	0	0	0	0
2024-06-23	1	1	4	0	0	0

Table 3-4: Rascal Stream West Arctic Grayling Movement Tracking Summary- RFID Array 1, Spring 2024

PIT Tag # (Series 900_22)	Length (mm)	Tagging Location	Tagging Date and Time	First/Last Detection by Date	Antenna	Movement Summary
6001378313	226	Above chute, below Gander Pond	2024-06-09 13:00	2024-06-10 19:57	A2	Last detected moving DS towards Goose Lake
				2024-06-10 20:31	A1	
6001378320	196	Above chute, below Gander Pond	2024-06-08 15:50	2024-06-13 6:24	A2	Last detected moving DS towards Goose Lake
				2024-06-13 11:34	A1	
6001378324	197	Above chute, below Gander Pond	2024-06-09 12:40	2024-06-10 22:29	A2	Last detected moving DS towards Goose Lake
				2024-06-10 22:30	A1	
6001378325	225	Above chute, below Gander Pond	2024-06-09 13:00	2024-06-10 2:17	A2	Last detected moving DS towards Goose Lake
				2024-06-10 2:19	A1	
6001378332	237	Below Chute	2024-06-07 7:15-10:00	2024-06-07 14:44	A1	Tagged below the chute, ascended and descended the chute on three separate occasions, last detected moving DS towards Goose Lake
				2024-06-07 15:35	A2	
				2024-06-17 21:11	A2	
				2024-06-17 21:21	A1	
				2024-06-18 23:12	A1	
				2024-06-18 23:34	A2	
				2024-06-21 0:53	A2	
				2024-06-21 1:18	A1	
				2024-06-21 19:49	A2	
				2024-06-23 21:20	A2	
				2024-06-23 21:24	A1	
6001378333	230	Above chute, Below Gander Pond	2024-06-07 14:58	2024-06-09 18:21	A2	Recaptured 70 m US of tagging location, last detected moving DS towards Goose Lake
				2024-06-09 18:22	A1	
6001378334	205	Below Chute	2024-06-06 15:15-16:00	2024-06-07 23:16	A1	Recaptured in same location as tagged, last detected moving US towards chute, did not ascend
6001378335	234	Above chute, Below Gander Pond	2024-06-08 15:45	2024-06-09 21:21	A2	Last detected moving DS towards Goose Lake
				2024-06-09 21:22	A1	
6001378344	218	Above chute, Below Gander Pond	2024-06-07 11:55	2024-06-08 13:53	A1	Last detected moving DS towards Goose Lake; missed detection at A2 antenna
6001378348	240	Above chute, Below Gander Pond	2024-06-07 12:20	2024-06-07 17:20	A2	Recaptured 50 m DS of tagging location, last detected moving DS towards Goose Lake
				2024-06-07 17:22	A1	
6001378349	234	Above chute, Below Gander Pond	2024-06-05 12:19	2024-06-06 2:51	A2	Last detected above chute, did not leave stream
6001378351	196	Above chute, Below Gander Pond	2024-06-09 13:00	2024-06-09 23:06	A2	Last detected moving DS towards Goose Lake
				2024-06-09 23:14	A1	
6001378363	214	Above chute, Below Gander Pond	2024-06-09 13:00	2024-06-10 2:18	A1	Last detected moving DS towards Goose Lake; missed detection at A2 antenna
6001378389	206	Above chute, Below Gander Pond	2024-06-09 16:05	2024-06-10 19:58	A2	Last detected above chute, did not leave stream

PIT Tag # (Series 900_22)	Length (mm)	Tagging Location	Tagging Date and Time	First/Last Detection by Date	Antenna	Movement Summary
6001378399	215	Above chute, Below Gander Pond	2024-06-08 10:50	2024-06-09 21:12	A2	Recaptured 10 m DS of tagging location, last detected moving DS towards Goose Lake
				2024-06-09 21:13	A1	
8000152834	266	Above chute, Below Gander Pond	2024-06-07 12:35	2024-06-12 15:38	A2	Recaptured 40 m DS of tagging location, last detected moving DS towards Goose Lake
				2024-06-12 15:41	A1	
8000152988	310	Above chute, Below Gander Pond	2024-06-06 8:51	2024-06-07 0:47	A2	Recaptured twice, detected by Array moving DS towards Goose Lake, 2nd recapture 250 m DS of tagging location near fish trap
				2024-06-07 0:48	A1	
8000153132	256	Above chute, Below Gander Pond	2024-06-08 10:30	2024-06-09 0:23	A2	Last detected moving DS towards Goose Lake
				2024-06-09 0:29	A1	
8000153172	336	Above chute, Below Gander Pond	2024-06-04 12:17	2024-06-07 20:38	A2	Recaptured 20 m DS of tagging location, last detected moving DS towards Goose Lake
				2024-06-07 20:39	A1	
8000153215	300	Above chute, Below Gander Pond	2024-06-04 12:15	2024-06-04 23:06	A2	Detected moving DS towards Goose Lake, last detected moving US below the chute, did not ascend chute
				2024-06-04 23:07	A1	
				2024-06-05 20:23	A1	
				2024-06-06 21:23	A1	
8000153218	350	Above chute, Below Gander Pond	2024-06-02 9:30	2024-06-07 18:46	A2	Recaptured just US of tagging location, last detected moving DS towards Goose Lake
				2024-06-07 18:46	A1	
8000153258	260	Above chute, Below Gander Pond	2024-06-08 10:30	2024-06-11 14:03	A2	Detected moving DS towards Goose Lake, last detected moving US below the chute, did not ascend chute
				2024-06-11 14:06	A1	
				2024-06-19 21:26	A1	
8000153260	254	Above chute, Below Gander Pond	2024-06-04 15:17	2024-06-04 23:06	A2	Last detected moving DS towards Goose Lake
				2024-06-04 23:07	A1	
8000153286	250	Above chute, Below Gander Pond	2024-06-08 10:30	2024-06-08 13:46	A2	Last detected moving DS towards Goose Lake
				2024-06-08 13:46	A1	
8000658020	295	Above chute, Below Gander Pond	2024-06-07 13:00	2024-06-07 18:46	A2	Last detected moving DS towards Goose Lake
				2024-06-07 18:46	A1	

A2 = Upstream antenna; A1 = Downstream antenna; US = Upstream; DS = Downstream

Table 3-5: Rascal Stream West Arctic Grayling Movement Tracking Summary- RFID Array 2, Spring 2024

PIT Tag # (Series 900_22)	Length (mm)	Tagging Location	Tagging Date and Time	First/Last Detection by Date	Antenna	Movement Summary
8000658056	251	Above chute, Below Gander Pond	2024-06-04 15:32	2024-06-05 0:34	A1	Recaptured 1.35 km US of tagging location, last detected moving US towards Rascal Lake
				2024-06-05 0:42	A2	
8000152835	250	Above chute, Below Gander Pond	2024-06-04 15:40	2024-06-05 17:16	A1	Moved 1.25 km US from tagging location, moved back downstream past RFID Array 2 and was last detected moving US from RFID Array 2
				2024-06-05 17:17	A2	
				2024-06-14 1:42	A2	
				2024-06-14 2:26	A1	
				2024-06-14 2:26	A2	
				2024-06-18 4:21	A2	
				2024-06-18 4:23	A1	
				2024-06-18 4:24	A2	
				2024-06-18 4:51	A1	
				2024-06-18 4:52	A2	
6001378365	235	Above chute, Below Gander Pond	2024-06-06 11:10	2024-06-06 17:58	A2	Moved 1 km US from tagging location, last detected moving US from RFID Array 2; missed antennae detection at A1
8000152739	273	Just US of Gander Pond, start of Reach 2	2024-06-05 12:38	2024-06-07 13:52	A1	Moved 700 km US from tagging location, last detected Moving US from RFID Array 2
				2024-06-07 13:52	A2	

A2 = Upstream antenna; A1 = Downstream antenna; US = Upstream; DS = Downstream

3.3 Flow Mitigation (Weir) Assessment

Fish passage and flow conditions at previously installed weir structures are summarized in Table 3-6. On average, weirs reduced velocities on the downstream side of the weir relative to the upstream side by 34%. Three weirs (#6, 8, 10) were ineffective in providing velocity refugia, in part, because flows were relatively high and overtopping the weir structures. One weir was blown out (#11). Based on visual assessments and flow conditions through the time of the spring survey (5 June 2024), unrestricted passage was possible for adult Arctic Grayling from Goose Lake upstream to the chute. The chute was the only segment of the surveyed reach deemed to have low passage potential (relative to other sections of Reach 1) at the time of assessment.

Table 3-6: Weir Assessment Results, Spring 2024

Weir Structure Number	Distance from Mouth (m)	Location	Habitat Type[a]	Velocity at Weir (m/s)			Depth at Weir (m)			Maximum Vertical Height (m)			Passage Potential	Photo
				25%	50%	75%	25%	50%	75%	25%	50%	75%		
1	100	US	Riffle	0.56	1.3	0.65	0.19	0.24	0.05	0.29	0.33	0.24	High	B-19
		DS		0.43	0.41	0.71	0.16	0.32	0.22					
2	106	US	Riffle	-0.27	NA	1.09	0.2	Dry	0.26	0.29	NA	0.26	High	B-20
		DS		-0.06	NA	0.5	0.36	Dry	0.28					
3	110	US	Riffle	0.09	0.95	1.68	0.1	0.05	0.22	0.38	0.15	0.34	High	B-21
		DS		0.16	0.24	0.85	0.21	0.05	0.3					
4	130	US	Riffle	0.47	1.03	1.23	0.1	0.3	0.3	0.24	0.17	0.24	High	B-22
		DS		0.48	0.21	0.94	0.16	0.15	0.28					
5	140	US	Chute/ Cascade	1.45	1.52	1.29	0.18	0.26	0.2	0.65	0.74	0.72	Low	B-23 to B-35
		DS		0.15	1.57	-3.3	0.2	0.51	0.35					
6	146	US	Riffle	1.28	1.2	0.6	0.22	0.4	0.3	0.21	0.15	0.12	High	B-26
		DS		0.8	1.64	1.47	0.25	0.2	0.28					
7	170	US	Riffle	0.76	1.04	0.46	0.3	0.25	0.33	0.25	0.4	0.37	High	B-27
		DS		0.03	1.03	0.69	0.28	0.3	0.36					
8	175	US	Riffle	0.7	0.94	0.05	0.32	0.5	0.3	0.18	0.26	0.18	High	B-28
		DS		0.99	1.15	0.08	0.4	0.36	0.32					
9	190	US	Riffle/Small Chute	1.22	1.78	1.58	0.22	0.22	0.2	0.49	0.38	0.41	High	B-29 to B-30
		DS		-0.19	-0.05	0.53	0.33	0.32	0.45					
10	195	US	Riffle	0.69	0.95	0.87	0.46	0.31	0.22	0.1	0.1	0.1	High	B-31
		DS		1.02	1.26	1.19	0.26	0.32	0.35					
11	202	US	No Further Rock Weir Found											B-32-B33

ARGR = Arctic Grayling; US = Upstream; DS = Downstream.

a) Riffle = High velocity/gradient relative to run habitat; surface broke due to submerged or exposed bed material; shallow relative to other channel units; coarse substrate; usually limited instream or overhead cover for juvenile or adult fish (generally <0.50 m). Cascade = Extremely high gradient and velocity; extremely turbulent with entire water surface broken; may have short vertical sections, but overall is passable to fish; armoured substrate; may be associated with chute. Chute = Area of channel constrictions, usually due to bedrock intrusions, associated with channel deepening and increased velocity (Golder 2005, R.L&L 1994).

3.4 YOY Abundance and Distribution

Visual surveys were conducted by two observers in Reach 1, 2, and 3 of Rascal Stream West; one pass was conducted along Reach 1, two passes were conducted along Reach 2, and one pass was conducted along Reach 3. One pass of Reach 1 constituted 400 m of stream length, each pass of Reach 2 was 450 m long, and one pass of Reach 3 was 300 m long.

There were 1,031 visual observations of Arctic Grayling and a total length of 1600 m was surveyed (Table 3-7; Appendix A, Table A-8). All but one Arctic Grayling observed was estimated as having a length under 100 mm. Ninespine Stickleback (*Pungitius pungitius*) were also observed in Reach 1 and Reach 3. Visual surveys were generally deemed effective in Rascal Stream West due to the stream being shallow, narrow, and clear. Portions of Reach 3 were braided and densely vegetated, decreasing efficacy of the visual survey (Appendix B, Photo B-38). Arctic Grayling YOY were observed in greater numbers further upstream (i.e., observations were highest in Reach 3 and lowest in Reach 1; Figure 3-3). Only 14 Arctic Grayling YOY were observed below the chute in Reach 1.

Table 3-7: Summary of Fish Observations During Visual Surveys, Summer 2024

Date	Reach of Rascal Stream West	Coordinates (UTM NAD 83, Zone 13W)		Length (m)	Duration (hrs)	Fish Observations by Species and Size					
		Start	End			ARGR		NNST		Unknown	
						< 100 mm	100 - 200 mm	< 100 mm	100 - 200 mm	< 100 mm	100 - 200 mm
06-Aug	1	432959 E 7269853 N	432779 E 7270140 N	400	0.72	49	1	1		0	1
06-Aug	2	433556 E 7269264 N	433264 E 7269531 N	450	0.58	312	0	0	-	0	0
07-Aug	2	433555 E 7269257 N	433264 E 7269531 N	450	0.62	251	0	0	-	0	0
07-Aug	3	433752 E 7268997 N	433609 E 7269139 N	300	0.37	418	0	1	-	0	0
Totals				**1600**	**2.28**	**1030**	**1**	**2**	**0**	**0**	**1**

ARGR = Arctic Grayling; NNST = Ninespine Stickleback; < = less than.



Figure 3-3: Location of Visual Observations of Arctic Grayling YOY, August 2024

Six backpack electrofishing efforts were conducted in Rascal Stream West, with a total of 88 Arctic Grayling YOY captured and an additional 74 observed (Table 3-8). Fork lengths of Arctic Grayling ranged from 33 to 105 mm (Table 3-9; Appendix A, Table A-9). Ninespine Stickleback, Burbot (*Lota lota*), and Slimy Sculpin (*Cottus cognatus*) were also captured. Most fish in Reach 1 were captured downstream of the chute. CPUE was highest in the 100-m survey section in upper Reach 2 (4.27 fish/100 sec) and lowest in the 100-m section above the chute in Reach 1 (0.16 fish/100 sec).

Additional details on backpack electrofishing efforts and results are provided in Appendix A, Table A-9. Photos of captured fish are provided in Appendix B. Of note, in the wider and deeper sections of the stream, the crew observed several schools of YOY Arctic Grayling that swam away without being shocked by the backpack electrofisher.

Table 3-8: Summary of Backpack Electrofishing Catch, Summer 2024

Species	Reach 1			Reach 2			Reach 3		
	Released	Mortality	Observed	Released	Mortality	Observed	Released	Mortality	Observed
ARGR	4	0	18	43	0	26	38	3	30
NNST	3	0	1	0	0	0	1	0	0
BURB	3	0	0	0	0	0	0	0	0
SLSC	2	0	1	0	0	0	0	0	0

ARGR = Arctic Grayling; NNST = Ninespine Stickleback; BURB = Burbot; SLSC = Slimy Sculpin.

Table 3-9: Backpack Electrofishing Effort and Catch Data in Rascal Stream West, August 2024

Date	Reach of Rascal Stream West	UTM Coordinates (NAD 83, Zone 13W)		Effort		Fish Species Caught								CPUE[(a)]
						ARGR		BURB		NNST		SLSC		
		Start	End	Seconds	Distance (m)	Total	Size Range (mm)	Total	Size Range (mm)	Total	Size Range (mm)	Total	Size Range (mm)	
06-Aug	1[(b)]	432861 E 7270035 N	432875 E 7269940 N	706	100	3	65-105	3	79-91	3	50-62	2	79-82	1.56
06-Aug	1	432892 E 7269921 N	432957 E 7276980 N	630	100	1	68	0	-	0	-	0	-	0.16
07-Aug	2	433292 E 7269475 N	433371 E 7269435 N	650	100	14	49-66	0	-	0	-	0	-	2.15
07-Aug	2	433446 E 7269406 N	433525 E 7269352 N	679	100	29	42-65	0	-	0	-	0	-	4.27
07-Aug	3	433613 E 7269133 N	433685 E 7269154 N	649	100	25	33-64	0	-	0	-	0	-	3.85
07-Aug	3	433719 E 7269137 N	433742 E 7269058 N	633	100	16	40-57	0	-	1	34	0	-	2.69
Totals						**88**	**33-105**	**3**	**79-91**	**4**	**34-62**	**15**	**79-82**	**2.45**

(a) CPUE calculated as number of fish captured per 100 seconds of effort
(b) Below the chute
Note: Fork length for Arctic Grayling and total length for Burbot, Ninespine Stickleback, and Slimy Sculpin.
ARGR =Arctic Grayling; BURB = Burbot; NNST = Ninespine Stickleback; SLSC = Slimy Sculpin; CPUE = catch per unit effort.

3.5 Stream Environmental Data

3.5.1 Water Quality

Water quality readings for the spring study are provided in the Table 3-10 below. The measured seasonal water quality parameters were within ranges expected for this stream. Other than the last few days the daily mean water temperature overlapped with the optimal range for spawning for Arctic Grayling (6°C to 10°C range; Stewart et al. 2007) during the field program. These temperatures indicate that the study period corresponded with the temperatures at which Arctic Grayling would be expected to spawn.

During the summer program, the average daily water temperature was 16.1ºC in Reach 1, 16.6ºC in Reach 2, and 15.2ºC in Reach 3. Water temperatures throughout the day ranged from 10.9ºC to 21.4ºC in Reach 1, from 10.6ºC to 23.3ºC in Reach 2, and from 10.8ºC to 19.7ºC in Reach 3.

Table 3-10: Water Quality Data for Reach 1, Spring and Summer 2024

Stream/Reach Location	Date	Time	Effective Depth (m)	Temperature (◦C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	pH	Specific Conductivity (us/cm)
Rascal Stream West – R1 (UTM, NAD 83, Zone 13W) 432826 E 7270094 N	01-Jun-24	16:45	0.35	8.4	10.47	95.4	-	39.6
	02-Jun-24	16:30	0.35	7.7	10.63	96.2	-	40.2
	04-Jun-24	16:15	0.37	6.8	10.41	94.7	-	38.3
	05-Jun-24	16:00	0.34	9.9	10.37	93.2	-	35.4
	06-Jun-24	16:10	0.35	11.7	10.36	94.3	-	36.8
	07-Jun-24	16:10	0.34	-	11.14	96.8	-	37.0
	08-Jun-24	16:00	0.30	-	9.75	94.9	6.54	36.4
	09-Jun-24	16:30	0.32	-	10.50	98.1	6.61	36.8
	07-Aug-24	15:36	-	20.5	-	-	7.25	158
	08-Aug-24	11:00	-	15.1	-	-	7.28	298

M = metres; ◦C = degrees Celsius; mg/L = milligrams per litre; % = percent; us/cm = microsiemens per centimetre; - = not collected.

3.5.2 Discharge Conditions

A summary for the flow data collected during the spring and summer 2024 field programs is summarized in Table 3-11. Manual discharge measurements were collected eight times throughout the spring program and twice during the summer program. There was a noticeable drop in flow over the course of the spring program from a high of 0.702 to 0.248 m/s. For comparison the maximum daily average velocity for June at this location was previously estimated as 0.47 m/s (Golder 2020a).

Table 3-11: Discharge Values in Rascal Stream West - Reach 1, Spring and Summer 2024

Stream/Reach Location	Date	Time	Discharge (m^3/s)	Staff gauge (cm)
Rascal Stream West – R1 (UTM, NAD 83, Zone 13W) 432826 E 7270094 N	01-Jun-24	16:15	0.676	28.5
	02-Jun-24	16:20	0.702	28
	03-Jun-24	-	-	-
	04-Jun-24	16:30	0.504	31.5
	05-Jun-24	16:30	0.369	30
	06-Jun-24	16:15	0.374	28
	07-Jun-24	15:45	0.32	27.2
	08-Jun-24	16:05	0.284	27
	09-Jun-24	14:30	0.248	26
	06-Aug-24	14:40	0.002	-
	07-Aug-24	15:00	0.002	-
	08-Aug-24	11:10	<0.001	-

M^3/s = metres cubed per second.

4.0 SUMMARY

The combined data collection efforts from this program suggest that spawning fish originating from Goose Lake can successfully navigate upstream through the existing crossing structure and the chute to spawning areas in Reach 1 and beyond (25 fish over 250 mm FL and up to 55 spawning adults if assuming all tagged fish were mature adults). Most of the young of year observations and captures were above Reach 1, and the combined dataset suggests that key spawning habitats in Rascal Stream West are above the chute in Reach 1, and potentially further upstream. The largest number of young-of year observations were in Reach 2 and 3.

Although movement tracking identified that 28 of 29 tagged fish remained below the chute at RFID Array 1, some or most these fish may have been post-spawning individuals on their outmigration to Goose Lake. Two of the fish tagged below the chute that moved upstream included one fish (tag# 6001378332) that migrated upstream through the chute on multiple occasions and one fish (tag# 6001378334) that may have attempted to migrate upstream without success. Of the 29 fish tagged in Reach 1 above the chute, three fish were not detected by the RFID arrays, three fish moved upstream past RFID Array 2, and 23 fish were detected moving downstream by RFID Array 1 towards Goose Lake. These results, combined with the relatively large number of fish that were captured above the chute in Reach 1, suggest that fish were missed during their upstream migration in lower Reach 1 and/or that the upstream migration was underway before the start of monitoring.

The deployment of the RFID arrays through the summer also suggests that some fish do hold within the refugia provided by Gander/Gosling Ponds or the deep pools and runs just downstream of Gander Pond. Of tagged fish (above the chute) that exhibited such behaviour were those not recaptured or detected by the RFID arrays, including 3 of 29 fish tagged above the chute in Reach 1, both fish tagged in Reach 3, the only fish tagged in Reach 4, and all 16 fish tagged in Reach 6. Therefore, the RFID Array data points to some limited movement for fish between the stream reaches during the period of array deployment, where these fish may be foraging and then holding until fall precipitation events that allow ease of passage. The lack of detections or recaptures for the 19 Arctic Grayling tagged above RFID Array 2 (located immediately below Gosling Pond 1, top of Reach 3) also suggest that these fish may have not originated from Goose Lake. Consistent with this result, three of the 29 fish

tagged above the chute in Reach 1 and the one fish tagged in Reach 2 were recorded moving upstream at RFID Array 2 towards Rascal Lake. Therefore, it is likely that Rascal Stream West supports spawning populations that originate from both Goose Lake and Rascal Lake and then return to those lakes where they overwinter.

Although there were challenges with the operation of the trap box in lower Reach 1, the 2024 monitoring program was deemed successful in meeting the monitoring objectives for Rascal Stream West. A key learning from the spring program was that angling with fly gear and opportunistic dip netting were both effective and less stressful methods for catching Arctic Grayling due to, in part, flow conditions and channel geometry below the bridge and related trouble finding suitable holding water for fish in the trap box. While opportunistic dip netting had the highest catch per unit effort (CPUE), angling was the most effective means for distributing tagging effort across stream reaches. A description of challenges encountered during the field spring study is provided below.

4.1 Challenges

Challenging conditions in the small, incised stream included very high flows, carrying extensive amounts of small organic debris. The flows, narrow channel and debris made the conditions unfavorable to setting nets, fish fences and traps in the stream section below the chute. The combination of these factors makes finding suitable holding water for fish entering a trap or net difficult, as adult Arctic Grayling moving upstream out of Goose Lake seemed lethargic and unable to sustain holding for more than a short period of time in most areas of the stream channel under high flow conditions. This subsequently resulted in the previously mentioned mortalities (Section 3.1) despite multiple modifications to the trap and relocations within the stream channel. Although the final modifications and trap placement did reduce the occurrence of mortalities at the trap and associated fence (see Appendix B, photographs), recommendations for improvements to the monitoring design are provided below.

4.2 Recommendations

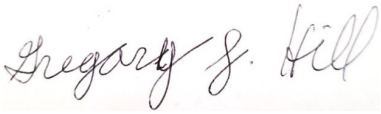
Based on the outcome of the spring program, the following recommendations are provided in Rascal Stream West:

- If possible, initiate the spring monitoring earlier in the year to ensure the entirety of the peak spawning run is captured.
- Related to the trap box deployment, use finer and softer mesh material within the trap box, and move the trap box upstream of the chute to water that is slower moving and provides more suitable holding conditions for fish.
- Fishing methods below the chute should include the use of a combination of daily dip netting, temporary block nets, and angling.
- Ongoing monitoring and maintenance of the rock weir velocity mitigation, including modifications or enhancements to the weir immediately below the chute.

5.0 CLOSURE

We trust the above meets your needs as a summary report for the 2024 Rascal Stream West Arctic Grayling monitoring surveys. Should you have any further questions, please contact the undersigned.

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APPENDIX A

Detailed Fish Data

Table A-1: Detailed Fish Capture and Tagging Data, Spring 2024

Date	Method	UTM (NAD 83, Zone 13W)	Species	Count	Fork Length (mm)	Weight (g)	Sex	Stage	Maturity	PIT Tag number (series 90022)	Recapture (Y/N)	Comments
02-Jun	Angling	432919 E 7269886 N	ARGR	1	350	417	U	A	U	8000153218	N	-
02-Jun	Angling	433939 E 7268204 N	ARGR	1	298	261	U	A	U	000000181701109	N	-
02-Jun	Angling	433939 E 7268204 N	ARGR	1	360	480	U	A	U	8000153235	N	-
02-Jun	Angling	433939 E 7268204 N	LKTR	1	460	698	U	A	U	NA	N	-
02-Jun	Angling	433939 E 7268204 N	LKTR	1	530	820	U	A	U	NA	N	-
02-Jun	Angling	433939 E 7268204 N	LKTR	1	710	-	U	A	U	NA	N	-
03-Jun	Trap	432826 E 7270091 N	ARGR	1	131	25	U	U	U	NA	N	Too small to tag
03-Jun	Trap	432826 E 7270091 N	ARGR	1	370	637	M	A	Ripe	NA	N	Mortality, otolith and pec fin ray collected
03-Jun	Trap	432826 E 7270091 N	ARGR	1	285	382	F	A	Ripe	NA	N	Mortality, otolith and pec fin ray collected
03-Jun	Trap	432826 E 7270091 N	ARGR	1	340	539	F	A	Ripe	NA	N	Mortality, otolith and pec fin ray collected
03-Jun	Trap	432826 E 7270091 N	ARGR	1	137	30	F	J	IM	NA	N	Mortality, otolith and pec fin ray collected
03-Jun	Trap	432826 E 7270091 N	ARGR	1	95	11.2	F	J	IM	NA	N	Mortality, otolith and pec fin ray collected
03-Jun	Trap	432826 E 7270091 N	ARGR	1	270	238	F	A	IM	NA	N	Mortality, otolith and pec fin ray collected
03-Jun	Trap	432826 E 7270091 N	ARGR	1	255	218	M	J	IM	NA	N	Mortality, otolith and pec fin ray collected
04-Jun	Trap	432828 E 7270081 N	ARGR	1	330	347	F	A	Ripe	NA	N	Mortality, otolith and pec fin ray collected
04-Jun	Trap	432828 E 7270081 N	ARGR	1	310	350	F	A	Ripe	NA	N	Mortality, otolith and pec fin ray collected
04-Jun	Trap	432828 E 7270081 N	ARGR	1	242	145	M	J	IM	NA	N	Mortality, otolith and pec fin ray collected
04-Jun	Trap	432828 E 7270081 N	ARGR	1	242	145	M	J	IM	NA	N	Mortality, otolith and pec fin ray collected
04-Jun	Trap	432828 E 7270081 N	ARGR	1	250	176	M	J	IM	NA	N	Mortality, otolith and pec fin ray collected
04-Jun	Angling	432899 E 7269888 N	ARGR	1	300	297	U	A	U	8000153215	N	-
04-Jun	Angling	432899 E 7269888 N	ARGR	1	336	402	U	A	U	8000153172	N	-
04-Jun	Angling	432886 E 7269910 N	ARGR	1	254	183	U	A	U	8000153260	N	-
04-Jun	Angling	432882 E 7269931 N	ARGR	1	251	178	U	A	U	8000658056	N	-
04-Jun	Angling	432882 E 7269931 N	ARGR	1	250	159	U	A	U	8000152835	N	-
05-Jun	Trap	432828 E 7270081 N	ARGR	1	329	-	U	A	U	8000152665	N	Release waypoint 387
05-Jun	Angling	432880 E 7269934 N	ARGR	1	234	133	U	U	U	6001378349	N	-
05-Jun	Angling	432923 E 7269881 N	ARGR	1	360	478	U	A	U	8000153261	N	-
05-Jun	Angling	433278 E 7269481 N	ARGR	1	273	187	U	A	U	8000152739	N	-
05-Jun	Fyke	433730 E 7269045 N	ARGR	1	251	167	U	A	U	8000658056	Y	Release waypoint 407
05-Jun	Fyke	433730 E 7269045 N	ARGR	1	309	284	U	A	U	8000152686	N	Release waypoint 407
05-Jun	Angling	432808 E 7270143 N	ARGR	1	333	363	U	A	U	8000658057	N	-
05-Jun	Angling	432808 E 7270143 N	ARGR	1	279	237	U	A	U	8000153067	N	-
05-Jun	Angling	432808 E 7270143 N	LKTR	1	452	-	U	A	U	NA	N	-
05-Jun	Angling	432808 E 7270143 N	LKTR	1	520	-	U	A	U	NA	N	-
05-Jun	Angling	432808 E 7270143 N	LKTR	1	455	-	U	A	U	NA	N	-
05-Jun	Angling	432808 E 7270143 N	LKTR	1	485	981	U	A	U	NA	Y	Floy tag # 0766
06-Jun	Trap	432828 E 7270081 N	ARGR	1	325	248	M	A	Ripe	8000152693	N	Release waypoint 387
06-Jun	Trap	432828 E 7270081 N	ARGR	1	206	93	U	U	U	6001378336	N	Release waypoint 387
06-Jun	Trap	432828 E 7270081 N	ARGR	1	357	415	U	A	U	8000153108	Y	Release waypoint 405, tag loss/previous tagging scar, new tag implanted

Date	Method	UTM (NAD 83, Zone 13W)	Species	Count	Fork Length (mm)	Weight (g)	Sex	Stage	Maturity	PIT Tag number (series 90022)	Recapture (Y/N)	Comments
06-Jun	Trap	432828 E 7270081 N	ARGR	1	332	342	U	A	U	8000152787	N	Release waypoint 405
06-Jun	Angling	432795 E 7270153 N	LKTR	1	660	-	U	A	U	NA	N	Maxed out 2000 g scale
06-Jun	Angling	432877 E 7269945 N	ARGR	1	310	282	U	A	U	8000152988	N	-
06-Jun	Fyke	433730 E 7269045 N	ARGR	1	192	72.4	U	U	U	6001378357	N	Release waypoint 407
06-Jun	Fyke	433730 E 7269045 N	ARGR	1	75	3.9	U	J	U	NA	N	Release waypoint 407, Too small too tag
06-Jun	Angling	432926 E 7269879 N	ARGR	1	235	142	U	U	U	6001378365	N	-
06-Jun	Angling	432884 E 7269906 N	ARGR	1	-	-	-	A	U	8000152988	Y	Caught earlier the same day
06-Jun	Angling	432795 E 7270153 N	LKTR	1	453	-	U	U	U	NA	N	-
06-Jun	Angling	432795 E 7270153 N	LKTR	1	506	-	U	U	U	NA	N	-
06-Jun	Angling	432795 E 7270153 N	LKTR	1	575	-	U	A	U	NA	Y	Floy tag # 0777
06-Jun	Angling	432795 E 7270153 N	ARGR	1	345	346	F	A	Ripe	8000152944	N	-
06-Jun	Trap	432828 E 7270081 N	ARGR	1	276	183	U	A	U	8000658019	N	Release waypoint 405
06-Jun	Angling	434344 E 7269832 N	LKTR	1	585	-	U	A	U	NA	N	Maxed out 2000 g scale, RSE outlet
06-Jun	Dip Net	432808 E 7270145 N	ARGR	1	195	67	U	U	U	6001378314	N	Release waypoint 405
06-Jun	Dip Net	432808 E 7270145 N	ARGR	1	205	95	U	U	U	6001378334	N	Release waypoint 405
06-Jun	Dip Net	432808 E 7270145 N	ARGR	1	263	208	U	A	U	8000152931	N	Release waypoint 405
06-Jun	Dip Net	432808 E 7270145 N	ARGR	1	264	210	U	A	U	8000658007	N	Release waypoint 405
06-Jun	Dip Net	432808 E 7270145 N	ARGR	1	254	183	U	A	U	8000153620	N	Release waypoint 405
06-Jun	Angling	432795 E 7270153 N	LKTR	1	390	-	U	U	U	NA	N	-
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	-	-	U	A	U	8000658007	Y	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	-	-	U	U	U	6001378334	Y	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	-	-	U	A	U	8000152931	Y	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	-	-	U	A	U	8000152693	Y	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	-	-	U	A	U	8000152988	Y	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	165	43.6	U	U	U	6001378326	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	146	28.4	U	U	U	NA	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	95	7.1	U	J	U	NA	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	172	44.3	U	U	U	6001378390	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	196	71.2	U	U	U	6001378388	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	135	21.8	U	U	U	NA	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	180	59.5	U	U	U	6001378343	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	161	41.5	U	U	U	6001378377	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	191	66.8	U	U	U	6001378339	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	207	90.4	U	U	U	6001378346	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	209	80.6	U	U	U	6001378311	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	-	-	U	U	U	6001378336	Y	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	223	109.8	U	U	U	6001378345	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	280	239	U	A	U	8000658002	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	252	169.3	U	A	U	8000153207	N	Release waypoint 405
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	237	144.3	U	U	U	6001378384	N	Release waypoint 405

Date	Method	UTM (NAD 83, Zone 13W)	Species	Count	Fork Length (mm)	Weight (g)	Sex	Stage	Maturity	PIT Tag number (series 90022)	Recapture (Y/N)	Comments
07-Jun	Dip Net	432808 E 7270145 N	ARGR	1	237	134.5	U	U	U	6001378332	N	Release waypoint 405, caught DS of fence
07-Jun	Angling	432881 E 7269933 N	ARGR	1	218	107	U	U	U	6001378344	N	-
07-Jun	Angling	432890 E 7269900 N	ARGR	1	240	161.9	U	U	U	6001378348	N	-
07-Jun	Angling	432922 E 7269883 N	ARGR	1	240	160.8	U	U	U	6001378366	N	-
07-Jun	Angling	432890 E 7269900 N	ARGR	1	266	-	U	A	U	8000152834	N	Scale error
07-Jun	Angling	432890 E 7269900 N	ARGR	1	295	-	U	A	U	8000658020	N	Scale error
07-Jun	Angling	432922 E 7269883 N	ARGR	1	-	-	U	A	U	8000153218	Y	-
07- Jun	Angling	432890 E 7269900 N	ARGR	1	-	-	U	A	U	8000153172	Y	-
07-Jun	Angling	432867 E 7269938 N	ARGR	1	-	-	U	U	U	6001378348	Y	Caught earlier the same day
07-Jun	Angling	432867 E 7269938 N	ARGR	1	230	-	U	U	U	6001378333	N	Old tag scar, possible tag loss from previous tagging effort
07-Jun	Trap	432828 E 7270081 N	ARGR	1	175	51.1	F	J	IM	NA	N	Mortality (Impinged on hardware cloth wing) otolith and pec fin ray collected
07-Jun	Trap	432828 E 7270081 N	ARGR	1	129	20	F	J	IM	NA	N	Mortality (Impinged on hardware cloth wing) otolith and pec fin ray collected
07-Jun	Trap	432828 E 7270081 N	ARGR	1	80	6.2	M	J	IM	NA	N	Mortality (Impinged on hardware cloth wing) otolith and pec fin ray collected
07-Jun	Trap	432828 E 7270081 N	ARGR	1	79	5.9	F	J	IM	NA	N	Mortality (Impinged on hardware cloth wing) otolith and pec fin ray collected
08-Jun	Angling	432795 E 7270153 N	LKTR	1	457	-	U	U	U	NA	N	-
08-Jun	Angling	432882 E 7269931 N	ARGR	1	-	-	U	A	U	8000152834	Y	-
08-Jun	Angling	432882 E 7269931 N	ARGR	1	256	179.9	U	A	U	8000153132	N	-
08-Jun	Angling	432882 E 7269931 N	ARGR	1	260	185.4	U	A	U	8000153258	N	-
08-Jun	Angling	432882 E 7269931 N	ARGR	1	250	173.5	U	A	U	8000153286	N	-
08-Jun	Angling	432919 E 7269886 N	ARGR	1	-	-	U	U	U	6001378333	Y	-
08-Jun	Angling	432919 E 7269886 N	ARGR	1	215	128.8	U	U	U	6001378399	N	-
08-Jun	Angling	433924 E 7268867 N	ARGR	1	178	53.2	U	U	U	6001378318	N	-
08-Jun	Angling	433907 E 7268311 N	ARGR	1	174	52.1	U	U	U	6001378367	N	-
08-Jun	Angling	433907 E 7268311 N	ARGR	1	160	38.5	U	U	U	6001378386	N	-
08-Jun	Angling	433907 E 7268311 N	ARGR	1	174	52.3	U	U	U	6001378398	N	-
08-Jun	Angling	433907 E 7268311 N	ARGR	1	229	121.9	U	U	U	6001378338	N	-
08-Jun	Angling	433947 E 7268190 N	ARGR	1	178	46.3	U	U	U	6001378393	N	-
08-Jun	Angling	433947 E 7268190 N	ARGR	1	180	55.7	U	U	U	6001378356	N	-
08-Jun	Angling	433947 E 7268190 N	ARGR	1	182	63.5	U	U	U	6001378362	N	-
08-Jun	Angling	433947 E 7268190 N	ARGR	1	288	252.5	U	A	U	8000153009	N	-
08-Jun	Angling	433947 E 7268190 N	ARGR	1	178	57.1	U	U	U	6001378373	N	-
08-Jun	Angling	432919 E 7269886 N	ARGR	1	234	130.8	U	U	U	6001378335	N	-
08-Jun	Angling	432919 E 7269886 N	ARGR	1	196	75	U	U	U	6001378320	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	161	40.2	U	U	U	6001378305	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	171	47.4	U	U	U	6001378302	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	186	66	U	U	U	6001378360	N	-

Date	Method	UTM (NAD 83, Zone 13W)	Species	Count	Fork Length (mm)	Weight (g)	Sex	Stage	Maturity	PIT Tag number (series 90022)	Recapture (Y/N)	Comments
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	96	8.7	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	55	3	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	100	9.2	U	U	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	99	8.6	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	71	3.2	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	64	2.6	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	60	2	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	87	5.4	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	95	7.4	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	86	5.1	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	72	3	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	68	2.7	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	54	1.5	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	90	6.3	U	J	IM	NA	N	-
09-Jun	Dip Net	432828 E 7270081 N	ARGR	1	100	8.1	U	J	IM	NA	N	-
09-Jun	Angling	432795 E 7270153 N	LKTR	1	517	-	U	U	U	NA	N	Lots of parasites (leeches)
09-Jun	Angling	432926 E 7269875 N	ARGR	1	197	77.1	U	U	U	6001378324	N	-
09-Jun	Angling	432926 E 7269875 N	ARGR	1	220	120.4	U	U	U	6001378337	N	-
09-Jun	Angling	432926 E 7269875 N	ARGR	1	-	-	U	U	U	6001378399	Y	-
09-Jun	Angling	432926 E 7269875 N	ARGR	1	196	74.1	U	U	U	6001378351	N	-
09-Jun	Angling	432926 E 7269875 N	ARGR	1	214	123.2	U	U	U	6001378363	N	-
09-Jun	Angling	432926 E 7269875 N	ARGR	1	225	133	U	U	U	6001378325	N	-
09-Jun	Angling	432926 E 7269875 N	ARGR	1	226	130	U	U	U	6001378313	N	-
09-Jun	Angling	433933 E 7268219 N	ARGR	1	168	48.3	U	U	U	6001378323	N	-
09-Jun	Angling	433933 E 7268219 N	ARGR	1	130	19	U	U	U	NA	N	Too small to tag
09-Jun	Angling	433933 E 7268219 N	ARGR	1	175	56.3	U	U	U	6001378306	N	-
09-Jun	Angling	433933 E 7268219 N	ARGR	1	162	48.2	U	U	U	6001378312	N	-
09-Jun	Angling	433933 E 7268219 N	ARGR	1	177	45.8	U	U	U	6001378301	N	-
09-Jun	Angling	433933 E 7268219 N	ARGR	1	210	102.3	U	U	U	6001378382	N	-
09-Jun	Angling	432882 E 7269931 N	ARGR	1	206	98.5	U	U	U	6001378389	N	-

ARGR = Arctic Grayling; LKTR = Lake Trout; U = Unknown; A = Adult; J = Juvenile; F = Female; M = Male; IM = Immature; NA = Not Applicable.

Table A-2: Fish Fence Trap Catch and Directional Movement in Rascal Stream West, Spring 2024

Trap Location	UTM Coordinates (NAD 83, Zone 13W)	Total Effort (hrs)	Date	Fish Species Caught					CPUE
				ARGR					
				Direction of Movement		Size Range (mm)	Recaps	Mortalities	
				US	DS				
1	432826 E 7270092 N	68.75	1-Jun	0	0	-	0	0	0.12
			2-Jun	0	0	-	0	0	
			3-Jun	8	0	95-370	0	7	
2	432826 E 7270092 N	13	4-Jun	4	0	242-330	0	4	0.31
3	432829 E 7270081 N	77.25	5-Jun	1	0	329	0	0	0.13
			6-Jun	2	3	206-357	1	0	
			7-Jun	0	4	79-175	0	4	
Totals		**-**	**159**	**15**	**7**	**79-370**	**1**	**15**	**0.14**

ARGR = Arctic Grayling; US = Upstream; DS = Downstream; Recaps = Recaptures; CPUE = Catch Per Unit Effort.

Table A-3: Angling Survey Catch in Rascal Stream West, Spring 2024

Date	UTM Coordinates (NAD 83, Zone 13W)		Effort		Fish Species Caught						CPUE (ARGR)
					ARGR			LKTR			
	Start	End	Time (hrs)	Distance (km)	Total	Recaps	Size Range (mm)	Total	Recaps	Size Range (mm)	
2-Jun	432812 E 7270158 N	433953 E 7268177 N	8.75	3	3	0	298-360	3	0	460-710	0.17
4-Jun	432809 E 7270144 N	433749 E 7269046 N	3.75	3	5	0	250-336	0	-	-	0.67
5-Jun	432809 E 7270144 N	433939 E 7268205 N	5	6	5	0	234-360	4	1	452-520	0.50
6-Jun	432795 E 7270154 N	432795 E 7270154 N	8.75	3	4	1	235-345	6	1	390-660	0.23
7-Jun	432829 E 7270081 N	433749 E 7269046 N	8	3	9	3	218-295	0	-	-	0.56
8-Jun	432809 E 7270144 N	434124 E 7267822 N	7	6.5	18	2	160-288	1	0	457	1.29
9-Jun	432809 E 7270144 N	433939 E 7268205 N	4.75	6	14	1	130-226	1	0	517	1.47
Totals			**46**	**30.5**	**58**	**7**	**130-360**	**15**	**2**	**390-710**	**0.63**

ARGR = Arctic Grayling; LKTR = Lake Trout; Recaps = Recaptures; CPUE = Catch Per Unit Effort.

Table A-4: Dip Netting Survey Catch in Rascal Stream West, Spring 2024

Date	UTM Coordinates (NAD 83, Zone 13W)		Effort		Fish Species Caught			CPUE
					ARGR			
	Start	End	Time (hrs)	Distance (km)	Total	Recaps	Size Range (mm)	
6-Jun	432853 E 7270079 N	432829 E 7270082 N	0.25	0.1	5	0	192-264	10
7-Jun	432861 E 7270027 N	432809 E 7270145 N	2.75	0.3	22	6	95-280	4
9-Jun	432829 E 7270082 N	432827 E 7270070 N	1	0.3	18	0	54-186	9
Totals			**4**	**0.7**	**45**	**6**	**54-280**	**5.6**

ARGR = Arctic Grayling; Recaps = Recaptures; CPUE = Catch Per Unit Effort.

Table A-5: Fyke Net Catch and Directional Movement in Rascal Stream West, Spring 2024

Trap Location	UTM Coordinates (NAD 83, Zone 13W)	Total Effort (hrs)	Date	Fish Species Caught			CPUE
				ARGR			
				Total	Recaps	Size Range (mm)	
1	432802 E 7270158 N	77	5-Jun	0	NA	NA	0
			6-Jun	0	NA	NA	
			7-Jun	0	NA	NA	
2	433730 E 7269045 N	71.5	5-Jun	2	1	251-309	0.056
			6-Jun	2	0	75-192	
			7-Jun	0	NA	NA	
Totals		**148.5**	**-**	**4**	**1**	**75-309**	**0.027**

ARGR = Arctic Grayling; Recaps = Recaptures; CPUE = Catch Per Unit Effort.

Table A-6: Complete Fish Detection Records at RFID Array 1 (Not including test PIT tags)

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-04	23:00:29	U	00h00m01.200s	A	A2	900_228000153215	AAA	7	0.7
2024-06-04	23:00:54	U	00h00m35.400s	A	A2	900_228000153215	AAA	143	1
2024-06-04	23:01:32	U	00h00m03.400s	A	A2	900_228000153215	AAA	9	0.7
2024-06-04	23:01:47	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	0.7
2024-06-04	23:01:56	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	1
2024-06-04	23:01:59	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	1
2024-06-04	23:02:04	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	1
2024-06-04	23:02:08	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	1
2024-06-04	23:02:12	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	0.7
2024-06-04	23:02:16	U	00h00m00.600s	A	A2	900_228000153215	AAA	2	0.7
2024-06-04	23:02:18	U	00h00m00.000s	A	A2	900_228000153215	AAA	1	0.7
2024-06-04	23:03:17	U	00h00m40.800s	A	A2	900_228000153215	AAA	167	0.7
2024-06-04	23:04:41	U	00h00m00.600s	A	A2	900_228000153215	AAA	2	0.7
2024-06-04	23:05:05	U	00h00m00.400s	A	A2	900_228000153215	AAA	2	0.7
2024-06-04	23:05:23	U	00h00m00.400s	A	A2	900_228000153215	AAA	3	1

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-04	23:06:05	U	00h00m04.600s	A	A2	900_228000153215	AAA	17	1
2024-06-04	23:06:14	U	00h00m04.400s	A	A2	900_228000153215	AAA	20	0.7
2024-06-04	23:06:20	U	00h00m03.600s	A	A2	900_228000153215	AAA	16	0.7
2024-06-04	23:06:30	U	00h00m03.400s	A	A2	900_228000153215	AAA	18	0.7
2024-06-04	23:07:02	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	1
2024-06-04	23:07:06	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	1
2024-06-04	23:07:12	U	00h00m01.400s	A	A1	900_228000153215	AAA	8	1
2024-06-04	23:00:27	U	00h00m00.600s	A	A2	900_228000153260	AAA	2	1
2024-06-04	23:00:31	U	00h00m03.200s	A	A2	900_228000153260	AAA	14	1
2024-06-04	23:00:38	U	00h00m13.400s	A	A2	900_228000153260	AAA	63	1
2024-06-04	23:02:32	U	00h00m00.400s	A	A2	900_228000153260	AAA	3	1
2024-06-04	23:02:35	U	00h00m00.000s	A	A2	900_228000153260	AAA	1	0.7
2024-06-04	23:02:42	U	00h00m15.200s	A	A2	900_228000153260	AAA	71	0.7
2024-06-04	23:04:05	U	00h00m14.000s	A	A2	900_228000153260	AAA	68	0.7
2024-06-04	23:04:21	U	00h00m03.800s	A	A2	900_228000153260	AAA	11	1
2024-06-04	23:05:14	U	00h00m00.000s	A	A2	900_228000153260	AAA	1	1
2024-06-04	23:05:15	U	00h00m01.000s	A	A2	900_228000153260	AAA	3	0.7
2024-06-04	23:05:53	U	00h00m02.400s	A	A2	900_228000153260	AAA	3	1
2024-06-04	23:06:35	U	00h00m06.000s	A	A2	900_228000153260	AAA	26	1
2024-06-04	23:06:42	U	00h00m00.000s	A	A2	900_228000153260	AAA	1	0.7
2024-06-04	23:06:56	U	00h00m03.200s	A	A1	900_228000153260	AAA	10	1
2024-06-04	23:07:10	U	00h00m01.200s	A	A1	900_228000153260	AAA	4	1
2024-06-04	23:07:18	U	00h00m05.800s	A	A1	900_228000153260	AAA	20	1
2024-06-04	23:07:27	U	00h00m08.800s	A	A1	900_228000153260	AAA	32	1
2024-06-05	20:07:22	U	00h00m01.400s	A	A1	900_228000153215	AAA	8	1
2024-06-05	20:23:07	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	1
2024-06-05	20:23:11	U	00h00m03.600s	A	A1	900_228000153215	AAA	16	1
2024-06-06	2:51:04	U	00h00m00.000s	A	A2	900_226001378349	AAA	1	0.9
2024-06-06	2:51:05	U	00h00m07.600s	A	A2	900_226001378349	AAA	24	0.9
2024-06-06	1:13:25	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:13:26	U	00h00m05.600s	A	A1	900_228000153215	AAA	24	0.9
2024-06-06	1:13:34	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:13:40	U	00h00m02.200s	A	A1	900_228000153215	AAA	10	0.9
2024-06-06	1:27:39	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:28:08	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:28:13	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:29:55	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:30:52	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:31:30	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:32:03	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:32:30	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:32:31	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-06	1:32:44	U	00h00m01.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	1:32:47	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:32:50	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	1:33:00	U	00h00m03.000s	A	A1	900_228000153215	AAA	13	0.9
2024-06-06	1:33:04	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	20:25:20	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	1
2024-06-06	20:31:00	U	00h00m02.000s	A	A1	900_228000153215	AAA	6	1
2024-06-06	20:34:33	U	00h00m00.400s	A	A1	900_228000153215	AAA	2	1
2024-06-06	20:34:35	U	00h00m12.600s	A	A1	900_228000153215	AAA	29	1
2024-06-06	20:34:49	U	00h00m03.400s	A	A1	900_228000153215	AAA	12	1
2024-06-06	20:34:54	U	00h00m07.200s	A	A1	900_228000153215	AAA	28	1
2024-06-06	20:36:23	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	20:45:02	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	20:46:22	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	1
2024-06-06	20:47:46	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	20:51:21	U	00h00m00.800s	A	A1	900_228000153215	AAA	5	0.9
2024-06-06	20:51:23	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	1
2024-06-06	21:00:57	U	00h00m00.600s	A	A1	900_228000153215	AAA	4	0.9
2024-06-06	21:01:02	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:01:07	U	00h00m02.200s	A	A1	900_228000153215	AAA	10	0.9
2024-06-06	21:01:10	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:01:45	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:03:38	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:05:29	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:06:17	U	00h00m04.000s	A	A1	900_228000153215	AAA	11	0.9
2024-06-06	21:06:39	U	00h00m01.600s	A	A1	900_228000153215	AAA	7	0.9
2024-06-06	21:12:51	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:12:55	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:12:59	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:01	U	00h00m01.600s	A	A1	900_228000153215	AAA	4	0.9
2024-06-06	21:13:08	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:09	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:13	U	00h00m01.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:13:21	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:27	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:44	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:47	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:51	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:13:52	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:13:58	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:05	U	00h00m01.200s	A	A1	900_228000153215	AAA	4	0.9
2024-06-06	21:14:08	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-06	21:14:12	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:15	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:20	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:25	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:28	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:34	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:37	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:14:39	U	00h00m00.600s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:14:49	U	00h00m01.000s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:15:00	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:02	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:08	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:18	U	00h00m00.600s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:15:21	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:15:23	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:38	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:44	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:48	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:51	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:15:59	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:16:02	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:16:14	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:16:24	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:16:26	U	00h00m00.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:16:29	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:16:32	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:16:48	U	00h00m02.000s	A	A1	900_228000153215	AAA	4	0.9
2024-06-06	21:16:53	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:16:59	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:00	U	00h00m00.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:17:03	U	00h00m03.000s	A	A1	900_228000153215	AAA	6	0.9
2024-06-06	21:17:07	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:17:15	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:18	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:22	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:27	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:30	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:38	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:17:41	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:46	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:53	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:17:56	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-06	21:17:58	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:01	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:02	U	00h00m02.600s	A	A1	900_228000153215	AAA	5	0.9
2024-06-06	21:18:07	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:08	U	00h00m01.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:18:12	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:14	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:29	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	1
2024-06-06	21:18:32	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:18:38	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:18:41	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:45	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:47	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:18:55	U	00h00m05.800s	A	A1	900_228000153215	AAA	21	0.9
2024-06-06	21:19:04	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:19:23	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:19:34	U	00h00m01.000s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:19:37	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:19:39	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:19:43	U	00h00m00.800s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:19:46	U	00h00m00.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:19:50	U	00h00m00.800s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:19:54	U	00h00m02.200s	A	A1	900_228000153215	AAA	5	0.9
2024-06-06	21:19:58	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:20:01	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:20:08	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:20:10	U	00h00m01.200s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:20:12	U	00h00m01.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:20:15	U	00h00m01.000s	A	A1	900_228000153215	AAA	2	1
2024-06-06	21:20:19	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:20:26	U	00h00m10.200s	A	A1	900_228000153215	AAA	38	0.9
2024-06-06	21:20:38	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:20:39	U	00h00m00.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:20:41	U	00h00m01.200s	A	A1	900_228000153215	AAA	5	0.9
2024-06-06	21:20:47	U	00h00m00.600s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:20:49	U	00h00m01.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:20:53	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:21:01	U	00h00m01.800s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:21:05	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:21:07	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:21:27	U	00h00m03.800s	A	A1	900_228000153215	AAA	6	0.9
2024-06-06	21:21:35	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-06	21:21:40	U	00h00m00.400s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:21:48	U	00h00m00.200s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:21:50	U	00h00m00.800s	A	A1	900_228000153215	AAA	3	0.9
2024-06-06	21:21:55	U	00h00m21.400s	A	A1	900_228000153215	AAA	102	0.9
2024-06-06	21:22:22	U	00h00m00.600s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:22:29	U	00h00m01.400s	A	A1	900_228000153215	AAA	5	0.9
2024-06-06	21:22:33	U	00h00m00.000s	A	A1	900_228000153215	AAA	1	0.9
2024-06-06	21:22:41	U	00h00m04.800s	A	A1	900_228000153215	AAA	22	0.9
2024-06-06	21:22:47	U	00h00m00.600s	A	A1	900_228000153215	AAA	2	0.9
2024-06-06	21:23:01	U	00h00m05.400s	A	A1	900_228000153215	AAA	27	0.9
2024-06-06	21:23:26	U	00h00m05.200s	A	A1	900_228000153215	AAA	21	0.9
2024-06-07	14:04:26	U	00h00m00.000s	A	A1	900_226001378332	AAA	1	1.1
2024-06-07	14:12:36	U	00h00m00.200s	A	A1	900_226001378332	AAA	2	1.1
2024-06-07	14:44:27	U	00h00m00.600s	A	A1	900_226001378332	AAA	4	1.1
2024-06-07	15:35:05	U	00h00m16.200s	A	A2	900_226001378332	AAA	79	0.7
2024-06-07	15:35:32	U	00h00m00.800s	A	A2	900_226001378332	AAA	2	1.1
2024-06-07	15:35:35	U	00h00m10.600s	A	A2	900_226001378332	AAA	41	1.1
2024-06-07	22:51:44	U	00h00m00.000s	A	A1	900_226001378334	AAA	1	0.9
2024-06-07	22:52:12	U	00h00m01.800s	A	A1	900_226001378334	AAA	5	0.9
2024-06-07	23:10:41	U	00h00m01.600s	A	A1	900_226001378334	AAA	3	0.9
2024-06-07	23:10:48	U	00h00m01.400s	A	A1	900_226001378334	AAA	3	0.9
2024-06-07	23:10:55	U	00h00m00.000s	A	A1	900_226001378334	AAA	1	0.9
2024-06-07	23:11:01	U	00h00m02.200s	A	A1	900_226001378334	AAA	3	0.9
2024-06-07	23:11:06	U	00h00m00.000s	A	A1	900_226001378334	AAA	1	0.9
2024-06-07	23:14:01	U	00h00m00.000s	A	A1	900_226001378334	AAA	1	0.9
2024-06-07	23:14:04	U	00h00m00.000s	A	A1	900_226001378334	AAA	1	0.9
2024-06-07	23:14:10	U	00h00m01.600s	A	A1	900_226001378334	AAA	8	0.9
2024-06-07	23:14:18	U	00h00m00.000s	A	A1	900_226001378334	AAA	1	0.9
2024-06-07	23:16:09	U	00h00m01.000s	A	A1	900_226001378334	AAA	6	0.9
2024-06-07	23:16:27	U	00h00m00.200s	A	A1	900_226001378334	AAA	2	0.9
2024-06-07	17:20:54	U	00h00m00.200s	A	A2	900_226001378348	AAA	2	1.1
2024-06-07	17:21:13	U	00h00m00.600s	A	A1	900_226001378348	AAA	4	1.1
2024-06-07	17:22:06	U	00h00m00.000s	A	A1	900_226001378348	AAA	1	1.1
2024-06-07	0:47:58	U	00h00m07.600s	A	A2	900_228000152988	AAA	34	0.9
2024-06-07	0:48:17	U	00h00m01.400s	A	A1	900_228000152988	AAA	8	0.9
2024-06-07	20:38:19	U	00h00m26.000s	A	A2	900_228000153172	AAA	119	0.7
2024-06-07	20:38:55	U	00h00m05.600s	A	A2	900_228000153172	AAA	21	0.9
2024-06-07	20:39:19	U	00h00m05.400s	A	A1	900_228000153172	AAA	26	0.9
2024-06-07	20:39:26	U	00h00m05.200s	A	A1	900_228000153172	AAA	14	0.9
2024-06-07	18:46:25	U	00h00m00.800s	A	A2	900_228000153218	AAA	5	1.1
2024-06-07	18:46:38	U	00h00m03.400s	A	A1	900_228000153218	AAA	18	1.1
2024-06-07	18:46:22	U	00h00m01.800s	A	A2	900_228000658020	AAA	9	0.7

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-07	18:46:36	U	00h00m01.200s	A	A1	900_228000658020	AAA	7	1.1
2024-06-08	13:53:22	U	00h00m00.000s	A	A1	900_226001378344	AAA	1	1.1
2024-06-08	13:44:44	U	00h00m18.400s	A	A2	900_228000153286	AAA	82	0.7
2024-06-08	13:45:13	U	00h00m19.600s	A	A2	900_228000153286	AAA	85	1.1
2024-06-08	13:45:34	U	00h00m00.200s	A	A2	900_228000153286	AAA	2	0.7
2024-06-08	13:45:37	U	00h00m00.000s	A	A2	900_228000153286	AAA	1	0.7
2024-06-08	13:46:29	U	00h00m03.000s	A	A2	900_228000153286	AAA	14	1.1
2024-06-08	13:46:47	U	00h00m00.600s	A	A1	900_228000153286	AAA	4	1.1
2024-06-09	18:20:08	U	00h00m00.200s	A	A2	900_226001378333	AAA	2	0.7
2024-06-09	18:21:02	U	00h00m00.800s	A	A2	900_226001378333	AAA	2	0.7
2024-06-09	18:21:05	U	00h00m03.200s	A	A2	900_226001378333	AAA	9	1
2024-06-09	18:21:12	U	00h00m04.600s	A	A2	900_226001378333	AAA	10	1
2024-06-09	18:21:18	U	00h00m03.000s	A	A2	900_226001378333	AAA	10	0.7
2024-06-09	18:21:29	U	00h00m02.000s	A	A2	900_226001378333	AAA	7	0.7
2024-06-09	18:22:33	U	00h00m00.400s	A	A1	900_226001378333	AAA	2	1
2024-06-09	18:23:00	U	00h00m00.600s	A	A1	900_226001378333	AAA	3	1
2024-06-09	21:21:53	U	00h00m04.800s	A	A2	900_226001378335	AAA	21	0.9
2024-06-09	21:22:20	U	00h00m00.200s	A	A1	900_226001378335	AAA	2	0.9
2024-06-09	22:59:37	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.9
2024-06-09	22:59:38	U	00h00m02.600s	A	A2	900_226001378351	AAA	5	0.9
2024-06-09	22:59:42	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.7
2024-06-09	22:59:48	U	00h00m01.400s	A	A2	900_226001378351	AAA	3	0.7
2024-06-09	22:59:56	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.9
2024-06-09	22:59:59	U	00h00m05.400s	A	A2	900_226001378351	AAA	10	0.9
2024-06-09	23:01:21	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.7
2024-06-09	23:01:23	U	00h00m00.200s	A	A2	900_226001378351	AAA	2	0.7
2024-06-09	23:01:41	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.9
2024-06-09	23:01:42	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.7
2024-06-09	23:02:28	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.7
2024-06-09	23:05:08	U	00h00m06.800s	A	A2	900_226001378351	AAA	31	0.9
2024-06-09	23:05:30	U	00h00m21.800s	A	A2	900_226001378351	AAA	89	0.9
2024-06-09	23:06:14	U	00h00m07.400s	A	A2	900_226001378351	AAA	22	0.9
2024-06-09	23:06:24	U	00h00m00.000s	A	A2	900_226001378351	AAA	1	0.7
2024-06-09	23:14:18	U	00h00m00.000s	A	A1	900_226001378351	AAA	1	0.9
2024-06-09	23:14:34	U	00h00m01.800s	A	A1	900_226001378351	AAA	7	0.9
2024-06-09	21:12:38	U	00h00m14.000s	A	A2	900_226001378399	AAA	46	0.7
2024-06-09	21:13:14	U	00h00m00.600s	A	A1	900_226001378399	AAA	4	0.9
2024-06-09	0:23:48	U	00h00m04.600s	A	A2	900_228000153132	AAA	19	0.9
2024-06-09	0:29:44	U	00h00m03.200s	A	A1	900_228000153132	AAA	13	0.9
2024-06-09	0:29:51	U	00h00m00.000s	A	A1	900_228000153132	AAA	1	0.9
2024-06-10	19:57:22	U	00h00m03.400s	A	A2	900_226001378313	AAA	14	1
2024-06-10	19:57:30	U	00h00m05.800s	A	A2	900_226001378313	AAA	15	0.7

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-10	20:10:20	U	00h00m01.200s	A	A1	900_226001378313	AAA	5	1
2024-06-10	20:22:50	U	00h00m01.800s	A	A1	900_226001378313	AAA	4	1
2024-06-10	20:23:10	U	00h00m00.000s	A	A1	900_226001378313	AAA	1	1
2024-06-10	20:23:21	U	00h00m00.800s	A	A1	900_226001378313	AAA	3	1
2024-06-10	20:23:24	U	00h00m01.000s	A	A1	900_226001378313	AAA	6	1
2024-06-10	20:29:42	U	00h00m00.000s	A	A1	900_226001378313	AAA	1	1
2024-06-10	20:31:05	U	00h00m00.600s	A	A1	900_226001378313	AAA	4	1
2024-06-10	22:29:50	U	00h00m11.800s	A	A2	900_226001378324	AAA	43	1
2024-06-10	22:30:27	U	00h00m00.000s	A	A1	900_226001378324	AAA	1	1
2024-06-10	2:17:41	U	00h00m00.000s	A	A2	900_226001378325	AAA	1	0.7
2024-06-10	2:19:18	U	00h00m00.600s	A	A1	900_226001378325	AAA	4	0.8
2024-06-10	2:18:06	U	00h00m00.000s	A	A1	900_226001378363	AAA	1	0.8
2024-06-10	19:58:07	U	00h00m09.400s	A	A2	900_226001378389	AAA	41	0.7
2024-06-11	14:03:01	U	00h00m14.200s	A	A2	900_228000153258	AAA	68	0.7
2024-06-11	14:06:43	U	00h00m00.200s	A	A1	900_228000153258	AAA	2	1.1
2024-06-11	14:06:46	U	00h00m03.000s	A	A1	900_228000153258	AAA	11	1.2
2024-06-12	15:38:22	U	00h01m28.600s	A	A2	900_228000152834	AAA	423	1.1
2024-06-12	15:41:09	U	00h00m03.000s	A	A1	900_228000152834	AAA	14	1.1
2024-06-13	6:24:17	U	00h00m00.000s	A	A2	900_226001378320	AAA	1	1.1
2024-06-13	8:27:08	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	8:28:14	U	00h00m00.000s	A	A1	900_226001378320	AAA	1	1.2
2024-06-13	9:10:13	U	00h00m01.200s	A	A1	900_226001378320	AAA	6	1.2
2024-06-13	9:18:40	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	9:19:03	U	00h00m00.000s	A	A1	900_226001378320	AAA	1	1.2
2024-06-13	10:44:54	U	00h00m00.000s	A	A1	900_226001378320	AAA	1	1.2
2024-06-13	10:48:06	U	00h00m01.400s	A	A1	900_226001378320	AAA	6	1.2
2024-06-13	10:50:00	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	10:50:13	U	00h00m00.800s	A	A1	900_226001378320	AAA	5	1.2
2024-06-13	10:51:37	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	10:51:57	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	10:52:32	U	00h00m00.800s	A	A1	900_226001378320	AAA	5	1.2
2024-06-13	10:56:29	U	00h00m00.400s	A	A1	900_226001378320	AAA	3	1.2
2024-06-13	10:57:16	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	10:59:22	U	00h00m02.400s	A	A1	900_226001378320	AAA	12	1.2
2024-06-13	11:00:10	U	00h00m00.200s	A	A1	900_226001378320	AAA	2	1.2
2024-06-13	11:34:15	U	00h00m00.800s	A	A1	900_226001378320	AAA	3	1.2
2024-06-13	11:34:17	U	00h00m02.000s	A	A1	900_226001378320	AAA	11	1.2
2024-06-17	21:11:47	U	00h00m01.600s	A	A2	900_226001378332	AAA	8	1
2024-06-17	21:19:24	U	00h00m00.000s	A	A1	900_226001378332	AAA	1	1
2024-06-17	21:21:48	U	00h00m00.000s	A	A1	900_226001378332	AAA	1	1
2024-06-18	23:12:11	U	00h00m00.000s	A	A1	900_226001378332	AAA	1	1
2024-06-18	23:34:52	U	00h00m05.200s	A	A2	900_226001378332	AAA	16	0.7

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-19	21:03:19	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:03:36	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:03:40	U	00h00m00.800s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:03:45	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:04:05	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:04:17	U	00h00m01.800s	A	A1	900_228000153258	AAA	8	1
2024-06-19	21:04:21	U	00h00m01.200s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:04:27	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:04:32	U	00h00m02.000s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:04:35	U	00h00m00.200s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:04:41	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:04:49	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:05:02	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:05:12	U	00h00m00.600s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:05:16	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:05:28	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:05:31	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:05:38	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:05:53	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:06:00	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:06:03	U	00h00m00.800s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:06:05	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:07:04	U	00h00m01.200s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:07:09	U	00h00m02.200s	A	A1	900_228000153258	AAA	6	1
2024-06-19	21:07:26	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:07:29	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:07:33	U	00h00m00.200s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:07:35	U	00h00m01.600s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:07:39	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:07:41	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:07:56	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:08:56	U	00h00m02.800s	A	A1	900_228000153258	AAA	10	1
2024-06-19	21:09:02	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:09:30	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:09:42	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:09:44	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:09:46	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:09:50	U	00h00m01.600s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:09:57	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:10:35	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:10:39	U	00h00m01.400s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:10:44	U	00h00m02.000s	A	A1	900_228000153258	AAA	5	1

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-19	21:11:21	U	00h00m00.400s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:11:25	U	00h00m00.800s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:12:25	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:12:30	U	00h00m05.200s	A	A1	900_228000153258	AAA	14	1
2024-06-19	21:13:05	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:13:28	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:13:30	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:13:31	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:13:42	U	00h00m07.800s	A	A1	900_228000153258	AAA	24	1
2024-06-19	21:15:04	U	00h00m02.200s	A	A1	900_228000153258	AAA	5	1
2024-06-19	21:15:09	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:15:10	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:15:12	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:15:51	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:15:53	U	00h00m01.000s	A	A1	900_228000153258	AAA	4	1
2024-06-19	21:15:55	U	00h00m00.400s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:16:35	U	00h00m06.200s	A	A1	900_228000153258	AAA	15	1
2024-06-19	21:16:43	U	00h00m06.200s	A	A1	900_228000153258	AAA	26	1
2024-06-19	21:23:15	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:23:21	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:23:27	U	00h00m01.200s	A	A1	900_228000153258	AAA	2	1
2024-06-19	21:23:44	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:23:50	U	00h00m01.600s	A	A1	900_228000153258	AAA	7	1
2024-06-19	21:23:55	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:24:26	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:24:46	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:25:29	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:25:33	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:25:36	U	00h00m00.800s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:25:40	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:25:51	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:25:53	U	00h00m02.000s	A	A1	900_228000153258	AAA	5	1
2024-06-19	21:25:59	U	00h00m01.400s	A	A1	900_228000153258	AAA	7	1
2024-06-19	21:26:02	U	00h00m09.400s	A	A1	900_228000153258	AAA	26	1
2024-06-19	21:26:13	U	00h00m15.000s	A	A1	900_228000153258	AAA	41	1
2024-06-19	21:26:30	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:26:31	U	00h00m00.600s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:26:33	U	00h00m00.000s	A	A1	900_228000153258	AAA	1	1
2024-06-19	21:26:36	U	00h00m00.800s	A	A1	900_228000153258	AAA	3	1
2024-06-19	21:26:40	U	00h00m08.800s	A	A1	900_228000153258	AAA	16	1
2024-06-19	21:26:50	U	00h00m03.600s	A	A1	900_228000153258	AAA	7	1
2024-06-19	21:26:56	U	00h00m15.200s	A	A1	900_228000153258	AAA	46	1

Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
2024-06-21	0:53:03	U	00h00m00.000s	A	A2	900_226001378332	AAA	1	0.7
2024-06-21	0:54:03	U	00h00m00.000s	A	A1	900_226001378332	AAA	1	1
2024-06-21	1:03:31	U	00h00m00.400s	A	A1	900_226001378332	AAA	2	0.9
2024-06-21	1:05:17	U	00h00m01.000s	A	A1	900_226001378332	AAA	6	1
2024-06-21	1:07:53	U	00h00m00.800s	A	A1	900_226001378332	AAA	4	0.9
2024-06-21	1:11:14	U	00h00m00.000s	A	A1	900_226001378332	AAA	1	1
2024-06-21	1:16:02	U	00h00m00.600s	A	A1	900_226001378332	AAA	3	0.9
2024-06-21	1:18:43	U	00h00m00.600s	A	A1	900_226001378332	AAA	3	1
2024-06-21	1:18:47	U	00h00m01.600s	A	A1	900_226001378332	AAA	5	1
2024-06-21	19:49:36	U	00h00m00.000s	A	A2	900_226001378332	AAA	1	1
2024-06-21	19:49:41	U	00h00m01.400s	A	A2	900_226001378332	AAA	6	1
2024-06-23	12:08:00	U	00h00m01.600s	A	A2	900_226001378332	AAA	5	0.7
2024-06-23	12:08:35	U	00h00m01.600s	A	A2	900_226001378332	AAA	9	1.2
2024-06-23	12:14:08	U	00h00m02.400s	A	A2	900_226001378332	AAA	11	1.2
2024-06-23	21:20:33	U	00h00m01.000s	A	A2	900_226001378332	AAA	6	1
2024-06-23	21:24:42	U	00h00m00.200s	A	A1	900_226001378332	AAA	2	1

Table A-7: Complete Fish Detection Records at RFID Array 2 (Not including test PIT tags)

Detection Type	Arrival Date	Arrival Time	Time Reference	Duration	Tag Type	Antenna #	Tag ID #	Site Code	Consecutive detections	Effective Amps
S	2024-06-05	17:16:53	U	00h00m00.600s	A	A1	900_228000152835	AAA	4	0.7
S	2024-06-05	17:17:13	U	00h00m02.400s	A	A2	900_228000152835	AAA	9	0.7
S	2024-06-05	17:17:17	U	00h00m00.600s	A	A2	900_228000152835	AAA	4	0.7
S	2024-06-05	0:34:27	U	00h00m04.200s	A	A1	900_228000658056	AAA	14	0.6
S	2024-06-05	0:34:51	U	00h00m01.000s	A	A2	900_228000658056	AAA	6	0.6
S	2024-06-05	0:34:53	U	00h00m01.000s	A	A2	900_228000658056	AAA	6	0.7
S	2024-06-05	0:42:40	U	00h00m00.400s	A	A2	900_228000658056	AAA	3	0.6
S	2024-06-05	0:42:42	U	00h00m00.000s	A	A2	900_228000658056	AAA	1	0.7
S	2024-06-05	0:42:50	U	00h00m02.000s	A	A2	900_228000658056	AAA	11	0.6
S	2024-06-05	0:42:54	U	00h00m00.000s	A	A2	900_228000658056	AAA	1	0.7
S	2024-06-05	0:42:58	U	00h00m00.800s	A	A2	900_228000658056	AAA	5	0.6
S	2024-06-06	17:58:33	U	00h00m00.000s	A	A2	900_226001378365	AAA	1	0.7
S	2024-06-06	17:58:35	U	00h00m00.000s	A	A2	900_226001378365	AAA	1	0.7
S	2024-06-07	13:27:58	U	00h00m00.600s	A	A1	900_228000152739	AAA	4	0.7
S	2024-06-07	13:28:00	U	00h00m00.000s	A	A1	900_228000152739	AAA	1	0.7
S	2024-06-07	13:28:29	U	00h00m00.200s	A	A1	900_228000152739	AAA	2	0.7
S	2024-06-07	13:28:46	U	00h00m00.000s	A	A1	900_228000152739	AAA	1	0.7
S	2024-06-07	13:52:29	U	00h00m00.600s	A	A1	900_228000152739	AAA	4	0.7
S	2024-06-07	13:52:39	U	00h00m02.000s	A	A2	900_228000152739	AAA	6	0.7
S	2024-06-14	1:42:02	U	00h00m00.400s	A	A2	900_228000152835	AAA	3	1.1
S	2024-06-14	1:42:09	U	00h00m02.200s	A	A1	900_228000152835	AAA	11	1.1
S	2024-06-14	2:26:10	U	00h00m04.200s	A	A1	900_228000152835	AAA	19	1.1
S	2024-06-14	2:26:25	U	00h00m01.400s	A	A2	900_228000152835	AAA	7	1.1
S	2024-06-14	2:26:30	U	00h00m01.000s	A	A2	900_228000152835	AAA	6	1.1
S	2024-06-18	4:21:05	U	00h00m00.000s	A	A2	900_228000152835	AAA	1	1.2
S	2024-06-18	4:21:06	U	00h00m00.400s	A	A2	900_228000152835	AAA	3	1.2
S	2024-06-18	4:21:17	U	00h00m01.600s	A	A1	900_228000152835	AAA	9	1.2
S	2024-06-18	4:23:22	U	00h00m03.000s	A	A1	900_228000152835	AAA	16	1.2
S	2024-06-18	4:23:41	U	00h00m02.200s	A	A2	900_228000152835	AAA	12	1.2
S	2024-06-18	4:23:46	U	00h00m00.600s	A	A2	900_228000152835	AAA	4	1
S	2024-06-18	4:24:23	U	00h00m00.400s	A	A2	900_228000152835	AAA	3	1.2
S	2024-06-18	4:24:25	U	00h00m00.600s	A	A2	900_228000152835	AAA	2	1.2
S	2024-06-18	4:24:33	U	00h00m01.200s	A	A1	900_228000152835	AAA	6	1.2
S	2024-06-18	4:51:36	U	00h00m03.600s	A	A1	900_228000152835	AAA	15	1.2
S	2024-06-18	4:51:58	U	00h00m00.800s	A	A2	900_228000152835	AAA	5	1.2
S	2024-06-18	4:52:01	U	00h00m00.800s	A	A2	900_228000152835	AAA	5	1.2

Table A-8: Visual Survey Detailed Data, August 2024

Date	Survey Method	Reach of Rascal Stream West	Location Relative to Chute (US or DS)	Pass Number	UTM Coordinates (NAD 83, Zone 13W)		Species	Count	Size Class[a]	Life Stage[b]
					Easting	Northing				
06-Aug-24	Visual	1	DS	1	432779	7270140	ARGR	2	S	YOY
06-Aug-24	Visual	1	DS	1	432828	7270115	ARGR	1	S	YOY
06-Aug-24	Visual	1	DS	1	432828	7270092	NNST	1	S	U
06-Aug-24	Visual	1	DS	1	432828	7270092	ARGR	1	S	YOY
06-Aug-24	Visual	1	DS	1	432860	7270027	ARGR	5	S	YOY
06-Aug-24	Visual	1	DS	1	432860	7270027	Unkown	1	M	U
06-Aug-24	Visual	1	DS	1	432864	7270013	ARGR	2	S	YOY
06-Aug-24	Visual	1	DS	1	432859	7270009	ARGR	3	S	YOY
06-Aug-24	Visual	1	US	1	432857	7269989	ARGR	1	S	YOY
06-Aug-24	Visual	1	US	1	432857	7269989	ARGR	1	S	YOY
06-Aug-24	Visual	1	US	1	432866	7269955	ARGR	1	S	YOY
06-Aug-24	Visual	1	US	1	432888	7269926	ARGR	3	S	YOY
06-Aug-24	Visual	1	US	1	432888	7269926	ARGR	1	M	U
06-Aug-24	Visual	1	US	1	432888	7269926	ARGR	1	S	YOY
06-Aug-24	Visual	1	US	1	432894	7269889	ARGR	5	S	YOY
06-Aug-24	Visual	1	US	1	432907	7269886	ARGR	10	S	YOY
06-Aug-24	Visual	1	US	1	432929	7269878	ARGR	3	S	YOY
06-Aug-24	Visual	1	US	1	432945	7269874	ARGR	10	S	YOY
06-Aug-24	Visual	2	US	1	433274	7269486	ARGR	12	S	YOY
06-Aug-24	Visual	2	US	1	433280	7269477	ARGR	4	S	YOY
06-Aug-24	Visual	2	US	1	433314	7269464	ARGR	6	S	YOY
06-Aug-24	Visual	2	US	1	433325	7269465	ARGR	3	S	YOY
06-Aug-24	Visual	2	US	1	433334	7269461	ARGR	8	S	YOY
06-Aug-24	Visual	2	US	1	433350	7269446	ARGR	2	S	YOY
06-Aug-24	Visual	2	US	1	433354	7269443	ARGR	2	S	YOY
06-Aug-24	Visual	2	US	1	433375	7269428	ARGR	4	S	YOY
06-Aug-24	Visual	2	US	1	433395	7269417	ARGR	1	S	YOY
06-Aug-24	Visual	2	US	1	433411	7269409	ARGR	14	S	YOY
06-Aug-24	Visual	2	US	1	433421	7269398	ARGR	25	S	YOY
06-Aug-24	Visual	2	US	1	433445	7269402	ARGR	10	S	YOY
06-Aug-24	Visual	2	US	1	433447	7269394	ARGR	5	S	YOY
06-Aug-24	Visual	2	US	1	433446	7269379	ARGR	30	S	YOY
06-Aug-24	Visual	2	US	1	433461	7269357	ARGR	6	S	YOY
06-Aug-24	Visual	2	US	1	433478	7269356	ARGR	10	S	YOY
06-Aug-24	Visual	2	US	1	433488	7269356	ARGR	7	S	YOY
06-Aug-24	Visual	2	US	1	433502	7269348	ARGR	8	S	YOY
06-Aug-24	Visual	2	US	1	433525	7269339	ARGR	10	S	YOY

Date	Survey Method	Reach of Rascal Stream West	Location Relative to Chute (US or DS)	Pass Number	UTM Coordinates (NAD 83, Zone 13W)		Species	Count	Size Class[a]	Life Stage[b]
					Easting	Northing				
06-Aug-24	Visual	2	US	1	433537	7269332	ARGR	40	S	YOY
06-Aug-24	Visual	2	US	1	433555	7269319	ARGR	30	S	YOY
06-Aug-24	Visual	2	US	1	433566	7269303	ARGR	20	S	YOY
06-Aug-24	Visual	2	US	1	433568	7269288	ARGR	20	S	YOY
06-Aug-24	Visual	2	US	1	433556	7269264	ARGR	35	S	YOY
07-Aug-24	Visual	2	US	2	433277	7269484	ARGR	10	S	YOY
07-Aug-24	Visual	2	US	2	433314	7269464	ARGR	4	S	YOY
07-Aug-24	Visual	2	US	2	433334	7269461	ARGR	12	S	YOY
07-Aug-24	Visual	2	US	2	433365	7269438	ARGR	8	S	YOY
07-Aug-24	Visual	2	US	2	433375	7269428	ARGR	4	S	YOY
07-Aug-24	Visual	2	US	2	433395	7269417	ARGR	4	S	YOY
07-Aug-24	Visual	2	US	2	433411	7269409	ARGR	12	S	YOY
07-Aug-24	Visual	2	US	2	433421	7269398	ARGR	20	S	YOY
07-Aug-24	Visual	2	US	2	433445	7269402	ARGR	6	S	YOY
07-Aug-24	Visual	2	US	2	433446	7269379	ARGR	26	S	YOY
07-Aug-24	Visual	2	US	2	433452	7269361	ARGR	8	S	YOY
07-Aug-24	Visual	2	US	2	433461	7269357	ARGR	8	S	YOY
07-Aug-24	Visual	2	US	2	433478	7269356	ARGR	6	S	YOY
07-Aug-24	Visual	2	US	2	433488	7269356	ARGR	12	S	YOY
07-Aug-24	Visual	2	US	2	433502	7269348	ARGR	8	S	YOY
07-Aug-24	Visual	2	US	2	433525	7269339	ARGR	2	S	YOY
07-Aug-24	Visual	2	US	2	433537	7269332	ARGR	12	S	YOY
07-Aug-24	Visual	2	US	2	433543	7269316	ARGR	40	S	YOY
07-Aug-24	Visual	2	US	2	433555	7269319	ARGR	8	S	YOY
07-Aug-24	Visual	2	US	2	433566	7269303	ARGR	5	S	YOY
07-Aug-24	Visual	2	US	2	433569	7269297	ARGR	6	S	YOY
07-Aug-24	Visual	2	US	2	433556	7269264	ARGR	30	S	YOY
07-Aug-24	Visual	3	US	1	433611	7269132	ARGR	15	S	YOY
07-Aug-24	Visual	3	US	1	433626	7269135	ARGR	10	S	YOY
07-Aug-24	Visual	3	US	1	433637	7269140	ARGR	12	S	YOY
07-Aug-24	Visual	3	US	1	433644	7269159	ARGR	39	S	YOY
07-Aug-24	Visual	3	US	1	433663	7269159	ARGR	6	S	YOY
07-Aug-24	Visual	3	US	1	433682	7269158	ARGR	11	S	YOY
07-Aug-24	Visual	3	US	1	433725	7269123	ARGR	33	S	YOY
07-Aug-24	Visual	3	US	1	433722	7269110	ARGR	12	S	YOY
07-Aug-24	Visual	3	US	1	433720	7269099	ARGR	30	S	YOY
07-Aug-24	Visual	3	US	1	433728	7269100	ARGR	15	S	YOY
07-Aug-24	Visual	3	US	1	433723	7269091	ARGR	20	S	YOY

Date	Survey Method	Reach of Rascal Stream West	Location Relative to Chute (US or DS)	Pass Number	UTM Coordinates (NAD 83, Zone 13W)		Species	Count	Size Class[a]	Life Stage[b]
					Easting	Northing				
07-Aug-24	Visual	3	US	1	433729	7269090	ARGR	35	S	YOY
07-Aug-24	Visual	3	US	1	433728	7269080	ARGR	25	S	YOY
07-Aug-24	Visual	3	US	1	433735	7269076	ARGR	13	S	YOY
07-Aug-24	Visual	3	US	1	433736	7269067	ARGR	22	S	YOY
07-Aug-24	Visual	3	US	1	433736	7269060	ARGR	47	S	YOY
07-Aug-24	Visual	3	US	1	433728	7269046	ARGR	18	S	YOY
07-Aug-24	Visual	3	US	1	433740	7269011	ARGR	15	S	YOY
07-Aug-24	Visual	3	US	1	433752	7268997	ARGR	40	S	YOY
07-Aug-24	Visual	3	US	1	433752	7268997	NNST	1	S	U

(a) S = Small (under 100 mm); M = Medium (100 to 200 mm). Sizes estimated.

(b) Arctic Grayling with a length under 100 mm classified as young-of-the-year (McPherson et al. 2022).

US = Upstream; DS = Downstream; ARGR =Arctic Grayling; NNST = Ninespine Stickleback; YOY = Young-of-the-Year; U = Unknown.

Table A-9: Catch Data for Fish Captured Backpack Electrofishing in Rascal Stream West, August 2024

Date	Method	Reach of Rascal Stream West	Species	Count	Length (mm)	Weight (g)	Life Stage[a]	Released/Observed/Mortality
06-Aug-24	Backpack Electrofishing	1	NNST	1	57	1.2	U	Released
06-Aug-24	Backpack Electrofishing	1	ARGR	1	105	12.3	U	Released
06-Aug-24	Backpack Electrofishing	1	NNST	1	62	1.4	U	Released
06-Aug-24	Backpack Electrofishing	1	BURB	1	79	3.0	U	Released
06-Aug-24	Backpack Electrofishing	1	SLSC	1	79	4.4	U	Released
06-Aug-24	Backpack Electrofishing	1	ARGR	1	67	2.8	YOY	Released
06-Aug-24	Backpack Electrofishing	1	BURB	1	82	2.5	U	Released
06-Aug-24	Backpack Electrofishing	1	NNST	1	50	0.8	U	Released
06-Aug-24	Backpack Electrofishing	1	BURB	1	91	4.5	U	Released
06-Aug-24	Backpack Electrofishing	1	SLSC	1	82	4.5	U	Released
06-Aug-24	Backpack Electrofishing	1	ARGR	1	65	2.7	YOY	Released
06-Aug-24	Backpack Electrofishing	1	ARGR	6	-	-	YOY	Observed
06-Aug-24	Backpack Electrofishing	1	NNST	1	-	-	U	Observed
06-Aug-24	Backpack Electrofishing	1	SLSC	1	-	-	U	Observed
06-Aug-24	Backpack Electrofishing	1	ARGR	1	68	3.5	YOY	Released
06-Aug-24	Backpack Electrofishing	1	ARGR	12	-	-	YOY	Observed
07-Aug-24	Backpack Electrofishing	2	ARGR	1	55	1.4	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	55	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	65	2.2	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	66	2.6	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	54	1.3	YOY	Released

Date	Method	Reach of Rascal Stream West	Species	Count	Length (mm)	Weight (g)	Life Stage[(a)]	Released/Observed/Mortality
07-Aug-24	Backpack Electrofishing	2	ARGR	1	66	3.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	54	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	49	1.0	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	62	2.5	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	58	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	57	1.6	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	52	1.2	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	50	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	55	1.5	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	11	-	-	YOY	Observed
07-Aug-24	Backpack Electrofishing	2	ARGR	1	63	2.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	63	2.5	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	50	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	63	2.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	50	1.2	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	65	3.0	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	59	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	52	1.5	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	59	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	52	1.5	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	42	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	59	2.2	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	47	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	45	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	49	1.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	64	2.3	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	50	1.2	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	48	1.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	60	2.0	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	62	2.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	49	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	52	1.4	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	50	1.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	59	1.5	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	60	1.9	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	51	1.7	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	51	1.2	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	43	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	49	1.1	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	1	50	1.3	YOY	Released

Date	Method	Reach of Rascal Stream West	Species	Count	Length (mm)	Weight (g)	Life Stage[(a)]	Released/Observed/Mortality
07-Aug-24	Backpack Electrofishing	2	ARGR	1	63	2.4	YOY	Released
07-Aug-24	Backpack Electrofishing	2	ARGR	15	-	-	YOY	Observed
07-Aug-24	Backpack Electrofishing	3	ARGR	1	55	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	58	2.4	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	53	1.7	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	50	1.6	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	52	1.7	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	53	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	60	2.5	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	55	1.4	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	50	1.1	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	63	2.6	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	61	2.2	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	56	1.9	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	49	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	47	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	55	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	47	1.4	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	47	1.4	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	55	1.9	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	47	1.2	YOY	Mortality
07-Aug-24	Backpack Electrofishing	3	ARGR	1	55	1.7	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	52	1.5	YOY	Mortality
07-Aug-24	Backpack Electrofishing	3	ARGR	1	47	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	64	2.3	YOY	Mortality
07-Aug-24	Backpack Electrofishing	3	ARGR	1	33	0.7	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	48	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	50	1.3	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	10	-	-	YOY	Observed
07-Aug-24	Backpack Electrofishing	3	ARGR	1	50	1.1	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	49	0.9	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	47	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	46	0.9	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	57	1.6	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	45	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	55	2.0	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	45	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	50	1.2	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	51	1.1	YOY	Released

Date	Method	Reach of Rascal Stream West	Species	Count	Length (mm)	Weight (g)	Life Stage[(a)]	Released/Observed/Mortality
07-Aug-24	Backpack Electrofishing	3	ARGR	1	41	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	57	1.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	NNST	1	34	0.2	U	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	40	0.5	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	54	1.5	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	40	0.8	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	1	45	-	YOY	Released
07-Aug-24	Backpack Electrofishing	3	ARGR	20	-	-	YOY	Observed

(a) Arctic Grayling with a fork length under 100 mm classified as young-of-the-year (McPherson et al. 2022).

Note: Fork length for Arctic Grayling and total length for Burbot, Ninespine Stickleback, and Slimy Sculpin.

NNST = Ninespine Stickleback; ARGR = Arctic Grayling; BURB = Burbot; SLSC = Slimy Sculpin; U = Unknown; YOY = Young-of-the-Year.

APPENDIX B

Photo Log



Photo B-1: Looking at flow station from RDB



Photo B-2: Looking downstream from flow station at LDB.



Photo B-3: Looking upstream at flow station from LDB.



Photo B-4: Looking downstream at first fish fence trap setup from mid-channel.



Photo B-5: Looking downstream at first fish fence trap setup from RDB.



Photo B-6: Looking upstream at first fish fence trap setup from RDB.



Photo B-7: Looking upstream at first fish fence trap setup from mid-channel.



Photo B-8: Looking upstream at first fish fence trap setup from LDB.



Photo B-9: Looking across at first fish fence trap setup from LDB.



Photo B-10: Fish trap frame and funnel mouths w/o conduit.



Photo B-11: Fish trap frame and funnel mouths w/o conduit.



Photo B-12: Fish trap frame and funnel mouths w/o conduit.



Photo B-13: Lake Trout recapture, Floy tag # 0766



Photo B-14: Lake Trout recapture, Floy tag # 0777



Photo B-15: Looking downstream at Fyke Net set above RFID array 2.



Photo B-16: Looking cross channel at Fyke Net set above RFID array 2 from RDB.



Photo B-17: RFID Array 2 from RDB.



Photo B-18: Action packer with Data logger, battery and solar panel setup at RFID Array 1.



Photo B-19: Rock weir structure 1, facing left downstream bank, 5 June 2024.



Photo B-20: Rock weir structure 2, facing left downstream bank, 5 June 2024.



Photo B-21: Rock weir structure 3, facing left downstream bank, 5 June 2024.



Photo B-22: Rock weir structure 4, facing left downstream bank, 5 June 2024.



Photo B-23: Rock weir structure 5, facing left downstream bank, 5 June 2024.



Photo B-24: Rock weir structure, looking upstream at chute, 5 June 2024.



Photo B-25: Rock weir structure 5, looking downstream, 5 June 2024.



Photo B-26: Rock weir structure 6, facing left downstream bank, 5 June 2024.



Photo B-27: Rock weir structure 7, facing left downstream bank, 5 June 2024.



Photo B-28: Rock weir structure 8, facing left downstream bank, 5 June 2024.



Photo B-29: Rock weir structure 9, facing upstream, 5 June 2024.



Photo B-30: Rock weir structure 9, facing downstream, 5 June 2024.



Photo B-31: Rock weir structure 10, facing left downstream bank, 5 June 2024.



Photo B-32: Looking downstream from final weir structure, 5 June 2024.



Photo B-33: Looking upstream from final weir structure, 5 June 2024.

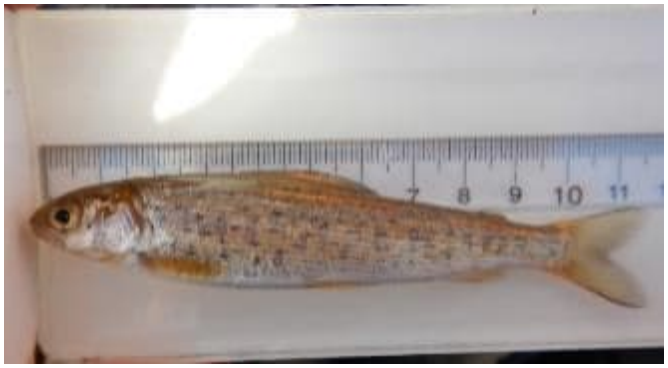


Photo B-34: Arctic Grayling YOY captured in Rascal Stream West, 7 August 2024.



Photo B-35: Burbot captured in Rascal Stream West, 7 August 2024.



Photo B-36: Ninespine Stickleback captured in Rascal Stream West, 7 August 2024.



Photo B-37: Slimy Sculpin captured in Rascal Stream West, 7 August 2024.



Photo B-38: Dense vegetation in Rascal Stream West Reach 3, facing downstream, 7 August 2024.



Photo B-39: Potential barrier from culverts downstream due to limited flow, facing upstream, 6 August 2024.



Photo B-40: Potential barrier to movement due to limited flow, facing upstream, 6 August 2024.



Photo B-41: Modifications made to improve fish passage, facing upstream, 8 August 2024.



Photo B-42: Modifications made to improve fish passage, facing upstream, 8 August 2024.



Photo B-43: Location of discharge measurement, facing downstream, 6 August 2024.



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