ASSESSING THE IMPACT OF THE CLOSURE OF THE NORTH FORK OF ROSE CREEK

- PRELIMINARY REPORT -

Submitted to:

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Table of Contents

INTRODUCTION

Curragh Resources has applied to close off the North Fork of Rose Creek to fish passage, in order to access the Vangorda deposit. This closure will occur because the access path to the new deposit will be constructed of waste rock dumped from the original mine site, across the creek. In a preliminary survey conducted by Leverton and Associates, it was identified that the bog-like lakes in the headwaters of the north fork of Rose Creek, do, in fact, contain a sizeable Arctic grayling population. The intent of this study is to determine whether or not this grayling population is a fulltime resident of the area. The study will also attempt to establish whether the north fork of Rose Creek is a navigable fishway, used as a route to access spawning habitats in the headwater lakes region.

METHODOLOGY

The study identified three major sampling periods. The first took place following initial freeze-up. The second will commence in late April while the third will occur following spring break-up. The different sampling periods provide baseline information on the physical and biological environment of the north fork of Rose Creek.

In early November, sampling stations were established along the north fork (refer to Figure 1). The first station is located in a small alpine pond

at the head of the north fork (refer to Photo 1, Appendix A). The second station is located in a small alpine lake (refer to Photo 2). The third sample site is just beyond the outflow of the lake where station 2 is located (refer to Photo 3). The fourth station is established in a much larger and deeper headwater lake in a tributary arm of the north fork (refer to Photo 4). The fifth station is located upstream of the proposed stream crossing (refer to Photo 5). The final station is located in the vicinity of the existing road crossing.

The following information is collected at each location:

1. Ice thickness (cm)
2. Water depth (m)
3. Creek velocity (cm/sec)
4. Water temperature (surface and bottom, ^{0}C)
5. Conductivity (umhos)
6. Turbidity (NTUs)
7. Water pH
8. DO_2 (ppm)
9. H_2S (mg/l)
10. Zooplankton (grab sample)
11. Fish species

Results of the first field survey are presented in Table 1 and Table 2.

DISCUSSION

A preliminary review of the initial survey data indicates that there is a certain amount of physical and biological variation between sampling locations. Station A is shallow, very acidic and contains high numbers of *Diaptomus pribiloffensis*. These small free-swimming calanoids are often an important food item of grayling fry; however, no grayling were caught. Dissolved oxygen levels are also low at this site. Given its shallow nature, this lake will likely freeze to the bottom in winter.

Station B is approximately 3 metres deep, very acidic and contains relatively high numbers of cyclopods (*Euchclops sp.*) which are often consumed by grayling. Dissolved oxygen levels are relatively low. It is unlikely that this water body will freeze to the bottom; however, it is quite probable that any over-wintering fish population would winter-kill.

Station C is approximately 0.4 m deep and streamflow is at a rate of 15 cm per sec. This location was still unfrozen at the time of sampling and contained Arctic grayling fry and slimy sculpin. The water is slightly acidic and dissolved oxygen levels are lower than expected.

Station D is approximately 3 m deep, has a neutral pH and contains the highest invertebrate diversity within the water column. Dissolved oxygen

levels are higher at this site than any of the other upper watershed sampling locations.

Station E and Station F were both partially open during the November sampling period. The stream flows are at a rate of 30 cm per sec and 25 cm per sec, respectively. No fish were sampled for at either location due to instability of the creek ice.

SUMMARY

No adult Arctic grayling were caught during the November survey period; however, no extensive fish sampling was undertaken in several locations, due to ice conditions. Electroshocking was conducted at Station C and grayling fry were identified. Depending on ice depth and oxygen levels, it may be necessay to set gill nets in late April, in an attempt to determine the presence / absence of adult grayling.

SAMPLING LOCATIONS
NORTH FORK WATERSHED
OF ROSE CREEK

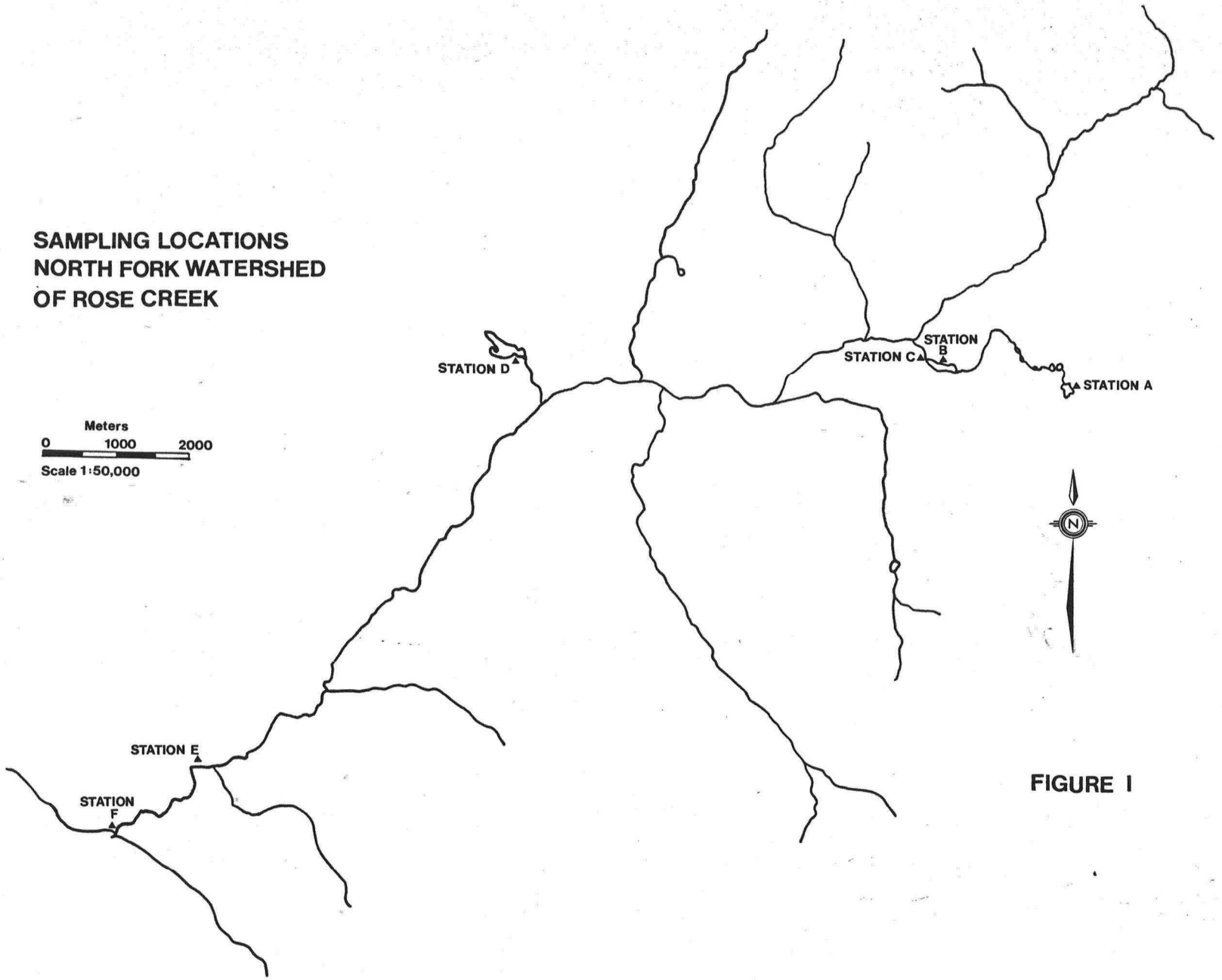

FIGURE I

Table 1: **NORTH FORK FISHERIES IMPACT STUDY**

Field Data

STATION	ICE THICKNESS	WATER COLUMN		TEMPERATURE		CONDUCT	TURBIDITY	WATER QUALITY				FISH	
		Depth	Velocity	Surface	Bottom	(umhos)	NTU's	pH	DO_2 ppm		H_2S	Species	No.
	(cm)	(m)	(cm/sec)	°C					Surface	Bottom	(mg/l)		
A	6.5	0.86	Pond	0.5°	2.7°	145	3.8	3.0	6.5	3.7	0.5	None	
B	8.7	3.3	Lake	0.1°	1.9°	152	1.7	2.2	6.1	4.9	0.5	None	
C	Open Water	0.4	15	1.0°	0.5°	150	2.3	5.7	4.9	4.9	N|A	Grayling fry, Slimy Sculpin	1 2
D	7.2	3.1	Lake	0.1°	3.8°	103	1.0	7.0	7.4	6.0	0.5	None	
E	Open Water	0.92	30	0.1°	0.1°	154	1.0	6.8	7.9	7.7	N|A	No Sample	
F	Open Water	1.1	25	0.1°	0.4°	100	1.0	5.4	-	-	N|A	No Sample	

TABLE 2

INVERTEBRATE SAMPLING -NORTH FORK, ROSE CREEK

	Station					
Taxonomic Group	A	B	C	D	E	F
Calanoida	92	-	2	2	-	-
Cyclopoida	-	2	-	19	-	3
Ephemeroptera	1	-	-	-	-	-
Diptera	-	-	-	1	-	-
Chironomidae	-	-	1	-	1	-
Simulidae	-	-	-	-	-	1
Gammaridae	-	-	-	7	-	-
Plecoptera	-	-	-	-	-	1
Number of Taxonomic Groups per Station	2	1	2	4	1	3

Appendix A

PHOTOGRAPHS
OF
SAMPLING STATIONS

PHOTO 1: Station A

PHOTO 2: Station B

PHOTO 3: Station C

PHOTO 4: Station D

PHOTO 5: Station E