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DAVID BUSTARD AND ASSOCIAT  
Fish population monitoring  
in Foxy and Buck Creeks, S  
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FISH POPULATION MONITORING IN  
FOXY AND BUCK CREEKS  
SEPTEMBER 1987

Prepared by

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for

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HOUSTON, B.C.

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## SUMMARY

Fish sampling was conducted at five locations in Foxy and Buck creeks for Equity Silver Mines Ltd. Results indicate very high juvenile rainbow populations continue to utilize lower Foxy Creek. Rainbow fry numbers were comparable to results from sampling these sites in 1984. Rainbow parr numbers were lower at the two sites, possibly reflecting lower water conditions resulting in less suitable parr habitat within the sample sites.

A site located in Buck Creek downstream of Bessemer Creek but above Goosly Lake had low rainbow trout abundance. The habitat in this low gradient section of stream is generally unsuitable for juvenile rainbow trout rearing. A site upstream of Bessemer Creek in the vicinity of good spawning habitat had healthy populations of juvenile rainbow trout, presumably the progeny of Goosly Lake fish.

Juvenile steelhead population estimates at a site in lower Buck Creek were comparable to past estimates conducted in the area by the Ministry of Environment staff. Fry densities fall within the mid-range of estimates from other productive steelhead streams in the Bulkley watershed.

The five index sites sampled in 1987 provide a background program describing fish populations in the Foxy and Buck watersheds. A systematic monitoring program should detect any potential major shifts in fish populations that may occur over time in these watersheds. Comparisons to index site sampling in other Bulkley tributaries conducted by the Ministry of Environment should help differentiate any changes from those occurring naturally within the system.

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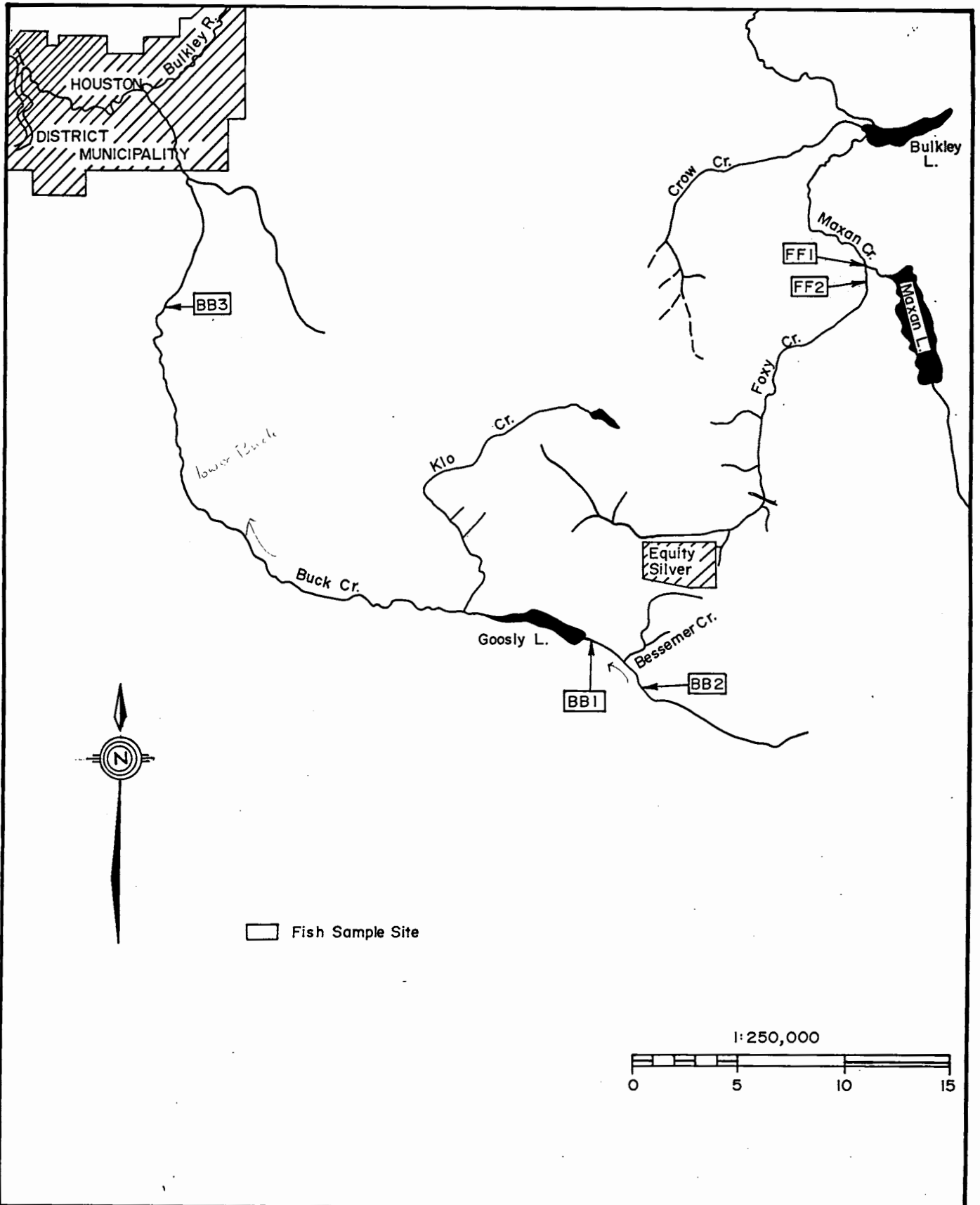
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## 1.0 INTRODUCTION

Field studies assessing fish populations were undertaken in Foxy and Buck creeks, two small streams located in north central British Columbia near Houston. These studies were conducted during early September 1987 for Equity Silver Mines Ltd. This work was undertaken as part of a monitoring program of fish populations in the vicinity of the mine's operation and was done in conjunction with an ongoing program to collect fish for analyses of metal content in tissues.

Previous detailed fish sampling has been conducted in Foxy Creek during 1984 (Bustard 1984). At that time, high numbers of juvenile rainbow trout (Salmo gairdneri), and limited numbers of chinook salmon (Onchorhynchus tshawytscha), Dolly Varden char (Salvelinus malma), and longnose dace (Rhinichthys cataractae) were present in Foxy Creek. Rainbow trout were present to a canyon section 10 to 12 km upstream from Maxan Creek, and were most numerous in the lower 3 km of the creek. It is assumed that juvenile rainbow trout in Foxy Creek are the progeny of resident rainbow trout (possibly from Maxan Lake) and are not steelhead trout, although this has not been verified.

Fish sampling in lower Buck Creek has been undertaken at a number of sites since 1981 as part of a steelhead (Salmo gairdneri) stock monitoring program by the Ministry of Environment (for most recent summary see Tredger 1987). Approximately 30 km of Buck Creek is accessible to steelhead trout. The lower end of Buck Creek also receives limited use by chinook and coho (Onchorhynchus kisutch) salmon. As well longnose dace, longnose suckers (Catostomus catostomus), and mountain whitefish (Prosopium williamsoni) are present in the



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## Location of Fish Sample Sites

FIGURE

1

lower creek. Fish sampling in Buck Creek upstream of Goosly Lake has been restricted to the collection of fish for tissue metal analyses with rainbow trout, longnose suckers, prickly sculpins (Cottus asper), and redbside shiners (Richardsonius balteatus) known to be present (Bustard 1984). Juvenile rainbow trout in this section are presumably the progeny of Goosly Lake fish. No resident adults were present in the stream during the fall sample period.

## 2.0 METHODS

Field studies were conducted by a crew of two from September 1 to 8, 1987. Access to four of the five sites sampled was by vehicle. Site BB1 in Buck Creek just upstream of Goosly Lake, was accessed by boat.

The detailed fish sample sites on Foxy Creek (Figure 1) were established at the same locations as the sampling conducted in 1984 (Bustard 1984). The detailed sites in upper Buck Creek were at the same locations that fish tissue sampling had been conducted during past years. One site was located approximately 200 m upstream of Goosly Lake (below the Bessemer Creek confluence) and a second site was located approximately 1.5 km upstream of the Bessemer Creek confluence with Buck Creek. A third detailed fish sample site was established on lower Buck Creek and corresponds to Site 3 of the Ministry of Environment steelhead index sites (Tredger 1987). \*

The sample sites were blocked with stopnets at their upstream and downstream ends and sampled using a gas-powered Coffelt electroshocker. Fish captured were anaesthetized with 2-phenoxyethanol, measured to the nearest millimeter and

returned to the stream at the end of sampling. A maximum of 30 fry were measured at any site. The two-step removal method (Seber and LeCren 1967) was used to estimate fish populations. Sample site areas were calculated from measurements of length and a series of width measurements made at 5-m intervals along the site. As well, water depths (maximum and mean), water temperature, substrate and cover characteristics were recorded at the sites.

Ten 20-gram samples of rainbow trout were retained at all of the sites except site FF1 for tissue analyses of heavy metals. Scales for aging were removed from these samples. Weights were collected from these rainbow as well as from a sample of rainbow fry and other species sampled for biomass estimates at the sites.

Each sample collected for metal analyses was placed in a separate bag, frozen and shipped to ASL Laboratories for metal analyses. The length, weight and age characteristics of these fish are presented in Appendix 1. The results of the heavy metal analyses were returned directly to Equity Silver Mines Ltd. and are not presented in this report.

### 3.0 RESULTS AND DISCUSSION

#### 3.1 Foxy Creek

A total of 531 m<sup>2</sup> or 104 m of stream length in Foxy Creek was sampled. The sample sites comprise approximately 3.5% of the main fish-producing section of Foxy Creek (lower 3 km). This represents approximately 15% less surface area than in these sample sites in 1984, indicating lower flow conditions in Foxy Creek in 1987.



A total of 908 fish were captured at the two sites in 1987 compared to 1398 fish in the same area in 1984 (Table 1). The detailed catch results for each site are presented in Appendix 2. Nearly 95% of the fish captured were rainbow

TABLE 1. . Catch Composition at Foxy Creek Fish Sample Sites in 1984 and 1987.

SPECIES	1984 .		1987	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
RAINBOW FRY	799	57.2	660	72.7
RAINBOW PARR	593	42.4	202	22.2
CHINOOK	4	0.3	0	0.0
DACE	2	0.1	36	4.0
WHITEFISH	0	0.0	6	0.7
SCULPINS	0	0.0	4	0.4
TOTAL	1398	100	908	100

trout with a small number of longnose dace, mountain whitefish and prickly sculpins comprising the remainder of the catch. No juvenile chinook salmon were captured in Foxy Creek in 1987 although chinook juveniles were present in Maxan Creek immediately downstream of Foxy Creek (Tom Pendray, pers. comm.). Sculpins and whitefish were not present in the 1984 sample and longnose dace numbers were lower than in this year's sample. A small number of Pacific lamprey ammocoetes were present in both years' sampling.

The biggest change between the two year's catch was a sharp

TABLE 2. Summary of Rainbow Trout Density Estimates in Foxy Creek in 1984 and 1987.

SAMPLE SITE	YEAR	DENSITY (fish m <sup>2</sup> )		
		0+	1+	2+
FF1	1984	0.88	0.63	0.21
	1987	0.66	0.30	0.09
FF2	1984	1.66	0.86	0.20
	1987	2.03	0.30	0.06

decline in the number of rainbow trout parr captured in the sample sites. The estimated number of parr in the two sites dropped from 593 (1984 catch) to 202 (1987 catch) -- a far larger decline than could be accounted for on the basis of reduced surface area in the sample sites. The decline in parr density and biomass occurred at both sites (Table 2). The low flow conditions in Foxy Creek in 1987 resulted in a noticeable decline in the deep, fast riffle sites preferred by parr and this may account for the decline of parr numbers within the sample sites.

The parr were comprised largely of age 1+ (79%) and age 2+ (20%) fish with less than 1% of the sample age 3+ (Appendix 2). This is nearly identical to the 1984 parr age composition.

Rainbow trout fry densities were very high in the 1987 catch, similar to the previous sampling at these sites (Table 2). Fry densities at site FF2 were particularly high

and indicate that this section of Foxy Creek provides very productive fry rearing habitat.

Rainbow trout fry were, on average, over 4 mm longer in 1987 than in 1984 (mean fork length of 38.8 mm compared to 34.3 mm). Similarly, the age 1+ parr in 1987 were larger than their 1984 counterparts (81.0 mm vs 77.6 mm). Presumably, warmer water temperatures during the dry summer of 1987 provided better growing conditions for fish compared to 1984.

Table 3 compares the density of rainbow fry and parr in Foxy Creek to density information collected during 1987 from five resident rainbow trout tributaries of Francois Lake. The Francois Lake tributary data is preliminary (On file with D. Bustard in Smithers). Fry densities in Foxy Creek were comparable to Ramsay Creek and only exceeded by those in the Nithi River - a productive rainbow system with very low flows in the summer of 1987. Parr densities were higher than all of the Francois tributaries except the Nithi River.

TABLE 3. Rainbow Trout Densities (Fish/m<sup>2</sup>) in Foxy Creek Compared to Adjacent Resident Rainbow Streams.

SYSTEM	FRY DENSITIES	PARR DENSITIES
ALLIN (1 site)	0.20	0.18
RAMSAY (2 sites)	1.34	0.12
PARROTT (3 sites)	0.32	0.18
NITHI (5 sites)	2.21	0.47
UNCHA (3 sites)	0.93	0.02
FOXY (2 sites)	1.34	0.38

### 3.2 Upper Buck Creek

In total, 828 m<sup>2</sup> of Buck Creek upstream of Goosly Lake was sampled comprising 142 m of stream margin. The lower site (BB1) was located approximately 200 m upstream of Goosly Lake in a low-gradient section of the stream impounded behind beaver dams. The site sampled was the first free-flowing stretch encountered in the creek upstream of the lake. Results from fish sampling during previous years for tissue sampling for metal analyses indicated that the stream below this point is not used by rainbow trout. The upper site was located in a slightly higher gradient (0.7%) section of Buck Creek possessing excellent spawning gravels, a good diversity of pool and riffle habitat, and abundant debris and bank cover.

Over 90% of the 363 fish captured in the two upper Buck Creek sites were rainbow trout. The remaining 10% of the catch was comprised of longnose suckers and prickly sculpins. Rainbow trout were the only species present at site BB2, the uppermost of the two sites (Table 4). Detailed catch results and habitat descriptions for the two sites are presented in Appendix 2.

The low gradient ponded areas in the vicinity of site BB1 do not offer suitable spawning or fry rearing habitat -- and this is reflected in the nearly total absence of fry in this section. Rainbow parr numbers are higher, but the area is generally poor habitat for rainbow trout.

Site BB2 provides excellent rainbow trout habitat and the high fry and parr numbers indicate healthy populations of juvenile rainbow trout. The fry densities of 0.6 fry/m<sup>2</sup>

TABLE 4. Catch Composition at Upper Buck Creek Fish  
Sample Sites - September 1987.

SPECIES	SITE BB1		SITE BB2	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
RAINBOW FRY	1	1.3	190	66.2
RAINBOW PARR	37	48.7	97	33.8
SUCKERS	13	17.1	0	0.0
SCULPINS	25	32.9	0	0.0
TOTAL	76	100	287	100

(Table 5) are within the mid-range of a sample of other resident rainbow streams, while the parr densities of 0.3 fish/m<sup>2</sup> are high and compare to those found in Foxy Creek and the Nithi River (Table 3).

Approximately 86% of the rainbow parr sampled in upper Buck Creek were age 1+. Of the remainder, 13% were age 2+ and less than 1% age 3+ and age 4+. Presumably, most rainbow trout in upper Buck Creek move down into Goosly Lake after rearing several years in this stream.

The sampling conducted in upper Buck Creek in 1987 is the first quantitative sampling undertaken in this section of stream, so no direct comparisons to other years can be made. In the past, it has been difficult to obtain an adequate sample of rainbow trout for tissue analysis at site BB1 suggesting that rainbow trout populations have been sparse in this section of the stream for at least 5 years. Based on these previous observations more trout were present

TABLE 5. Summary of Rainbow Trout Density Estimates in Upper Buck Creek.

SAMPLE SITE	DENSITY (fish m <sup>2</sup> )		
	0+	1+	2+
BB1	.00	0.07	0.02
BB2	0.59	0.27	0.03

in this section in 1987 than during past years.

### 3.3 Lower Buck Creek

Site BB3 sampled in lower Buck Creek was 413 m<sup>2</sup> and comprised 44 m of stream margin. Approximately 49% of the estimated fish population within the site was rainbow trout, predominantly rainbow fry (Table 6). These fish are assumed to be the progeny of steelhead trout known to spawn in lower Buck Creek (Tredger 1982). Longnose dace comprised 51% of the estimated population and mountain whitefish less than 1% of the total.

The main difference between the 1987 catch and the pooled catch for three previous years was the higher proportion of longnose dace in the 1987 sample, including a large number of very small dace fry caught along the margin of the site. As well, no longnose suckers were captured in the study area in 1987.

TABLE 6. Catch Composition at Lower Buck Creek Fish Sample Site in 1987 Compared to Other Years.

SPECIES	1987		OTHER YEARS <sup>1</sup>	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
RAINBOW FRY	217	39.7	79	46.5
RAINBOW PARR	49	9.0	24	14.1
DACE	279	51.0	60	35.3
WHITEFISH	2	0.3	4	2.4
SUCKERS	0	0.0	3	1.7
TOTAL	547	100	170	100

<sup>1</sup>Based on a combination of catch data for 1982, 1983, and 1986 (Tredger 1987). Summary reports for 1984 and 1985 did not include catch data.

Rainbow trout density estimates for this location have been collected since 1981 and are summarized in Table 7. Fry densities of just over 0.5 fry/m<sup>2</sup> were slightly lower than average for the past 7 years. This is surprising considering the good adult steelhead escapements to the Bulkley system in 1986-87. The highest fry densities at this site occurred in 1985 at 1.85 fry/m<sup>2</sup>. The age 1+ class was also slightly weaker than normal while the age 2+ class was slightly above average, possibly reflecting the strong fry recruitment from 1985.

It should be noted that although the 1987 sample site encompassed the same locations as the site sampled by Tredger (1987), the site was considerably larger and

TABLE 7. Summary of Steelhead Trout Densities at Site BB3 from 1981 to 1987<sup>1</sup>.

YEAR	DENSITY (fish/m <sup>2</sup> )		
	0+	1+	2+
1981	0.63	0.03	0.01
1982	0.14	0.05	0.01
1983	0.35	0.02	0.01
1984	0.13	0.14	0.05
1985	1.85	0.32	0.09
1986	0.77	0.31	0.01
1987	0.53	0.08	0.04
Mean	0.63	0.14	0.03

<sup>1</sup>Data from 1981 to 1986 from Tredger (1987).

presumably more representative of this section of Buck Creek. The 1987 sample consisted of nearly three times as many fish as the combined totals for the other years (Table 6).

Steelhead fry densities at site BB3 in lower Buck Creek were in the mid-range of densities reported for other known good steelhead trout rearing streams (Table 8). The average fry densities at index sites in Owen and McQuarrie are higher than this site on Buck Creek. At the same time, average fry densities for Buck (3 sites combined), Lamprey, and Texas creeks, and the mainstem Morice River are lower.



TABLE 8. Steelhead Fry Densities in Lower Buck Creek  
Compared to Other Bulkley River Steelhead Streams.

STREAM	FRY/M <sup>2</sup>	DATA SOURCE
LAMPREY CREEK (3 sites)	0.53	1980-1986 (Tredger 1987)
OWEN CREEK (5 sites)	1.08	1980-1986 "
MAINSTEM MORICE (4 sites)	0.27	1980-1986 "
MCQUARRIE CREEK (1 site)	1.18	1981-1986 "
TENAS CREEK (3 sites)	0.46	1983-1985 (Bustard 1985)
BUCK CREEK (3 sites)	0.44	1981-1986 (Tredger 1987)
SITE BB3 - LOWER BUCK	0.63	Table 7

4.0 LITERATURE CITED

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Tredger, C.D. 1982. Upper Bulkley River reconnaissance with reference to juvenile steelhead carrying capacity. Unpubl. MS, Fish and Wildlife Branch, Ministry of Environment, Victoria, B.C. 9 pp. and appendices.

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Appendix 1: Detailed Information Describing Rainbow Trout  
Collected for Analyses of Tissue.

TABLE 1. Foxy Creek rainbow trout samples collected for metal analyses of tissue, September 2, 1987.

SAMPLE #	LENGTH (mm)	AGE	WEIGHT (gm)	TOTAL WEIGHT
1a	111	2+	13.6	
1b	78	1+	5.6	19.2
2a	123	2+	20.0	20.0
3a	122	2+	19.6	19.6
4a	110	2+	12.4	
4b	97	1+	9.0	21.4
5a	109	2+	12.7	
5b	102	2+	11.1	23.8
6a	98	2+	10.5	
6b	98	2+	10.3	20.8
7a	110	2+	13.5	
7b	97	2+	8.9	22.4
8a	109	2+	12.8	
8b	98	1+	9.6	22.4
9a	90	1+	8.0	
9b	83	1+	6.8	
9c	88	1+	7.5	22.3
10a	87	1+	7.0	
10b	90	1+	7.1	
10c	94	1+	9.2	23.3

COMMENT: These samples were captured by electrofishing (250 v).  
Sample location was site FF2.

TABLE 2. Buck Creek above Bessemer Creek rainbow trout samples collected for metal analyses, September 8, 1987.

SAMPLE #	LENGTH (mm)	AGE	WEIGHT (gm)	TOTAL WEIGHT
1a	112	2+	14.8	
1b	84	1+	5.4	20.2
2a	174	4+	59.1	59.1
3a	147	3+	33.3	33.3
4a	109	2+	12.5	
4b	92	1+	7.8	20.3
5a	104	2+	12.3	
5b	81	1+	5.4	17.7
6a	103	2+	10.7	
6b	100	2+	10.4	21.1
7a	105	2+	12.3	
7b	102	2+	11.3	23.6
8a	94	2+	9.0	
8b	112	2+	12.5	21.5
9a	97	2+	10.0	
9b	80	1+	6.2	16.2
10a	90	1+	7.3	
10b	87	1+	6.3	
10c	86	-	6.2	19.8

COMMENT: These samples were captured by electrofishing at a site located approximately 1.2 km above Bessemer confluence.

TABLE 4. Buck Creek below Goosly Lake rainbow trout (steelhead) samples collected for metal analyses, September 1, 1987.

SAMPLE #	LENGTH (mm)	AGE	WEIGHT (gm)	TOTAL WEIGHT
1a	81	1+	8.5	
1b	86	1+	9.4	
1c	93	1+	10.1	28.0
2a	99	2+	13.8	
2b	91	1+	10.6	24.4
3a	98	2+	12.2	
3b	94	1+	10.6	22.8
4a	108	2+	18.1	18.1
5a	93	1+	12.2	
5b	90	1+	11.9	24.1
6a	92	1+	11.1	
6b	89	1+	10.3	21.4
7a	109	2+	16.2	
7b	91	1+	10.2	26.4
8a	84	1+	10.5	
8b	93	1+	11.6	22.1
9a	95	1+	12.6	
9b	89	1+	11.1	23.7
10a	88	1+	9.8	
10b	110	2+	16.7	26.5

COMMENT: These samples were captured by electrofishing at a site located approximately 200 m downstream of the 1st bridge crossing on Buck Flats

Appendix 2: Site Descriptions and Detailed Results of Fish  
Sampling in Foxy and Buck Creeks, September  
1987.

SITE DESCRIPTIONS - SITE FF1 DATE- SEPT3/87 TEMP. 10.5 C @1500 hr. SLOPE- 1.5%  
 This site starts approx. 10 m upstream of Maxan bridge in the channel closest to Maxan Lake.  
 This is a complex site - the upper portion of the site splits into 4 channels.  
 Estimate 60% pool and 40% riffle

POPULATION ESTIMATES:

SPECIES	AGE	PASS 1	PASS 2	U1&U2	NUMBER	S. E.	MORTS	N-CORR	N/M*M	N/LIN-M
Rainbow	0+	133	45	178	201.0	10.3	0	201	0.659	4.02
Rainbow	1+	74	15	89	92.8	3.0	0	93	0.304	1.86
Rainbow	2+	22	5	27	28.5	2.0	0	28	0.093	0.57
LN Dace	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Dace	1+	12	8	20	36.0	26.8	0	36	0.118	0.72
LN Sucker	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
P Sculpin	1+	1	1	2	2.0	0.0	0	2	0.007	0.04
M Whitefish	0+	4	1	5	5.3	0.0	0	5	0.017	0.11
M Whitefish	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
Lamprey		5	1							
TOTAL									1.199	7.313

LENGTH/WEIGHT DATA:

SPECIES	AGE	FL-RANGE (mm)	MEAN FL (mm)	MEAN WEIGHT (g)	BIOMASS (g/m*m)
Rainbow	0+	28-50	40.2	0.6	0.41
Rainbow	1+	61-97	79.6	4.6	1.40
Rainbow	2+	98-150	115.9	15.7	1.47
LN Dace	0+	0	0.0	0.0	0.00
LN Dace	1+	50-100	77.4	5.7	0.67
LN Sucker	0+	0	0.0	0.0	0.00
LN Sucker	1+	0	0.0	0.0	0.00
P Sculpin	1+	64-68	66.0	3.9	0.03
M Whitefish	0+	67-74	71.2	5.5	0.10
M Whitefish	1+	0	0.0	0.0	0.00
TOTAL					4.07

SITE MEASUREMENTS:

LOCATION (m)	WIDTH (m)	MEAN DEPTH(cm)	MAXIMUM DEPTH(cm)	BANK COVER	DEBRIS COVER	D50/D90 (cm)
0	5.3		80			10/35
5	5.0			Good debris cover throughout		
10	4.3			Estimate flow of 7-10 cfs		
15	7.4			Parr over 100 mm very fat		
20	5.4					
	9.3					
	7.0					
	5.2					

Plus 5 measurements

	6.1					
AREA (M*M)	305.0	MARGIN (M)	50.0			



SITE DESCRIPTIONS - SITE FF2 DATE-SEPT 2/87 TEMP. 10.5 C @1700 hr  
 This site is approximately 1 km upstream of Maxan at water sample site.  
 Channel characteristics appear similiar to 1984 measurements but depth  
 velocity, and surface area are less leading to less parr habitat.  
 There is more flow in the "secondary" channel than in sample site.  
 This is a low flow year - estimate 2-3 cfs in channel. Heavy algal mat.  
 POPULATION ESTIMATES:

SPECIES	AGE	PASS 1	PASS 2	U1&U2	NUMBER	S.E.	MORTS	N-CORR	N/M*M	N/LIN-M
Rainbow	0+	266	112	378	459.5	24.4	0	459	2.031	8.51
Rainbow	1+	44	15	59	66.8	6.0	0	67	0.295	1.24
Rainbow	2+	12	2	14	14.4	0.9	0	14	0.064	0.27
LN Dace	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Dace	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
P Sculpin	1+	2	0	2	2.0	0.0	0	2	0.009	0.04
M Whitefish	0+	1	0	1	1.0	0.0	0	1	0.004	0.02
M Whitefish	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
Lamprey		4	6							
TOTAL									2.403	10.067

LENGTH/WEIGHT DATA:

SPECIES	AGE	FL-RANGE (mm)	MEAN FL (mm)	MEAN WEIGHT (g)	BIDMASS (g/m*m)
Rainbow	0+	29-46	37.4	0.5	0.93
Rainbow	1+	68-97	82.3	5.4	1.60
Rainbow	2+	98-123	106.6	12.9	0.82
LN Dace	0+	0	0.0	0.0	0.00
LN Dace	1+	0	0.0	0.0	0.00
LN Sucker	0+	0	0.0	0.0	0.00
LN Sucker	1+	0	0.0	0.0	0.00
P Sculpin	1+	91-93	92.0	7.0	0.06
M Whitefish	0+	70	70.0	5.4	0.02
M Whitefish	1+	0	0.0	0.0	0.00
Lamprey					
TOTAL					3.44

SITE MEASUREMENTS:

LOCATION (m)	WIDTH (m)	MEAN DEPTH(cm)	MAXIMUM DEPTH(cm)	BANK COVER	DEBRIS COVER	D50/D90 (cm)
0	6.1					10/25
5	6.0			Debris cover in upper portion of site		
10	5.9			Debris and substrate measurements as in '84		
15	4.5					
20	4.3					
	4.6					
	3.2					
	3.6					

Plus 5 measurements

	4.2					
AREA (M*M)	226.3	MARGIN (M)	54.0			

SITE DESCRIPTIONS - SITE BB1 DATE-SEPT 7/87 TEMP. 11.5 C @1500hr SLOPE- 0.2%  
 This site on Buck Creek is located 300 m upstream of Goosly Lake.  
 This is the first section of the creek upstream of the lake with flowing riffles.  
 Estimate this site is 95% pool and 5% riffle.

POPULATION ESTIMATES:

SPECIES	AGE	PASS 1	PASS 2	U1&U2	NUMBER	S.E.	MORTS	N-CORR	N/M*M	N/LIN-M
Rainbow	0+	1	0	1	1.0	0.0	0	1	0.002	0.02
Rainbow	1+	15	7	23	28.4	6.6	0	28	0.070	0.43
Rainbow	2+	8	1	9	9.1	0.5	0	9	0.022	0.14
LN Dace	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Dace	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	0+	0	8	8	0.0	0.0	0	8	0.020	0.12
LN Sucker	1+	3	1	4	4.5	1.5	0	5	0.011	0.07
P Sculpin	1+	14	6	20	24.5	0.0	0	25	0.060	0.37
M Whitefish	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
M Whitefish	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
Lamprey										
TOTAL									0.185	1.15

LENGTH/WEIGHT DATA:

SPECIES	AGE	FL-RANGE (mm)	MEAN FL (mm)	MEAN WEIGHT (g)	BIOMASS (g/m*m)
Rainbow	0+	NM	0.0	1.0	.00
Rainbow	1+	69-97	89.1	7.5	0.52
Rainbow	2+	98-111	102.6	11.1	0.25
LN Dace	0+	0	0.0	0.0	0.00
LN Dace	1+	0	0.0	0.0	0.00
LN Sucker	0+	21-30	25.0	0.1	.00
LN Sucker	1+	160-190	171.2	54.7	0.60
P Sculpin	1+	54-103	74.0	4.9	0.29
M Whitefish	0+	0	0.0	0.0	0.00
M Whitefish	1+	0	0.0	0.0	0.00
TOTAL					1.663

SITE MEASUREMENTS:

LOCATION (m)	WIDTH (m)	MEAN DEPTH(cm)	MAXIMUM DEPTH(cm)	BANK COVER	DEBRIS COVER	D50/D90 (cm)
0	9.5	60	100			Silt/2
5	6.0					
10	6.5			Debris and log cover throughout		
15	6.5			Heavy brown algal growth		
20	5.5			Overhanging banks present		
	5.0			Beaver activity in the lower end		
	7.3			Suckers heavily infested with tapeworms		
	4.0			Large lesion on the flesh of one sucker		
	6.2					
	6.2					
AREA (M*M)	409.2	MARGIN (M)	66.0			

SITE DESCRIPTIONS - SITE BB2 DATE-SEPT 8/87 TEMP. 11.5 C 2 1430. SLOPE- 0.7%

This site on Buck Creek is located approximately 1 km upstream of the road crossing above Goosly Lake.

This section of the creek has good spawning potential in gravel riffles.

Estimate this site is 80% pool and 20% riffle.

POPULATION ESTIMATES:

SPECIES	AGE	PASS 1	PASS 2	U1&U2	NUMBER	S.E.	MORTS	N-CORR	N/M*M	N/LIN-M
Rainbow	0+	149	32	181	189.8	4.7	0	190	0.594	2.50
Rainbow	1+	66	16	82	87.1	3.8	0	87	0.273	1.15
Rainbow	2+	10	0	10	10.0	0.0	0	10	0.031	0.13
LN Dace	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Dace	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
P Sculpin	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
M Whitefish	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
M Whitefish	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
TOTAL									0.899	3.775

LENGTH/WEIGHT DATA:

SPECIES	AGE	FL-RANGE (mm)	MEAN FL (mm)	MEAN WEIGHT (g)	BIOMASS (g/m*m)
Rainbow	0+	32-53	43.9	0.8	0.50
Rainbow	1+	68-97	80.4	5.1	1.38
Rainbow	2+	100-174	116.8	15.0	0.47
LN Dace	0+	0	0.0	0.0	0.00
LN Dace	1+	0	0.0	0.0	0.00
LN Sucker	0+	0	0.0	0.0	0.00
LN Sucker	1+	0	0.0	0.0	0.00
P Sculpin	1+	0	0.0	0.0	0.00
M Whitefish	0+	0	0.0	0.0	0.00
M Whitefish	1+	0	0.0	0.0	0.00
TOTAL					2.35

SITE MEASUREMENTS:

LOCATION (m)	WIDTH (m)	MEAN DEPTH(cm)	MAXIMUM DEPTH(cm)	BANK COVER	DEBRIS COVER	D50/D90 (cm)
0	3.0	20	100			3/7
5	3.3			Spawning gravel throughout		
10	3.2			Lots of debris and overhanging banks		
15	3.8			Bank instability		
20	2.9			Algae in backwater areas		
6 other measurements				Estimate 2-3 cfs flow		

4.2

AREA (M\*M) 319.2 MARGIN (M) 76.0

SITE DESCRIPTIONS - SITE BB3 DATE- SEPT 1/87 TEMP. 15 C @ 16:30 hr SLOPE- 1.5%

This site is located on Buck Creek 150 m downstream of the 1st bridge crossing on Buck Flats Rd.

The site is marked with blue ribbon and orange paint.

Estimate site is 80 % riffle and 20 % glide.

POPULATION ESTIMATES:

SPECIES	AGE	PASS 1	PASS 2	U1&U2	NUMBER	S.E.	MORTS	N-CORR	N/M*M	N/LIN-M
Rainbow	0+	117	54	171	217.3	20.8	0	217	0.526	4.98
Rainbow	1+	19	8	27	32.8	6.5	0	33	0.080	0.75
Rainbow	2+	8	4	12	16.0	6.9	0	16	0.039	0.37
LN Dace	0+	20	12	32	50.0	21.2	0	50	0.121	1.15
LN Dace	1+	87	54	141	229.4	51.2	0	229	0.556	5.26
LN Sucker	0+	0	0	0	0.0	0.0	0	0	0.000	0.00
LN Sucker	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
P Sculpin	1+	0	0	0	0.0	0.0	0	0	0.000	0.00
M Whitefish	0+	1	0	1	1.0	0.0	0	1	0.002	0.02
M Whitefish	1+	1	0	1	1.0	0.0	0	1	0.002	0.02
Lamprey		5	7							
TOTAL									1.326	12.56

LENGTH/WEIGHT DATA:

SPECIES	AGE	FL-RANGE (mm)	MEAN FL (mm)	MEAN WEIGHT (g)	BIOMASS (g/m*m)
Rainbow	0+	32-60	47.8	1.1	0.56
Rainbow	1+	79-97	89.0	10.6	0.84
Rainbow	2+	98-134	106.0	15.7	0.61
LN Dace	0+	27-32	29.5	0.3	0.04
LN Dace	1+	41-105	62.5	2.0	1.13
LN Sucker	0+	0	0.0	0.0	0.00
LN Sucker	1+	0	0.0	0.0	0.00
P Sculpin	1+	0	0.0	0.0	0.00
M Whitefish	0+	66	66.0	5.0	0.01
M Whitefish	1+	160	160.0	51.4	0.12
TOTAL					3.326

SITE MEASUREMENTS:

LOCATION (m)	WIDTH (m)	MEAN DEPTH(cm)	MAXIMUM DEPTH(cm)	BANK COVER	DEBRIS COVER	D50/D90 (cm)
0	9.0					20/35
5	10.0					
10	9.6		Mainly cobble cover			
15	9.2		No debris			
20	10.7		Lots of attached algae			
	10.7		Unstable banks at high flows			
	9.4		Gravel bar development and debris downstream			
	8.8					
	7.8					
	9.5					
AREA (M*M)	412.7	MARGIN (M)	43.6			

TABLE 3. Buck Creek below Bessemer Creek rainbow trout samples collected for metal analyses of tissues, September 7, 1987.

SAMPLE #	LENGTH (mm)	AGE	WEIGHT (gm)	TOTAL WEIGHT
1a	101	2+	9.7	
1b	106	2+	11.8	21.5
2a	104	2+	10.8	
2b	97	1+	9.5	20.3
3a	101	2+	11.7	
3b	97	1+	9.7	21.4
4a	100	2+	9.6	
4b	111	2+	15.0	24.6
5a	86	1+	4.1	
5b	105	2+	12.3	
5c	95	2+	8.7	25.1
6a	91	1+	8.2	
6b	96	1+	9.5	17.7
7a	96	1+	9.9	
7b	88	1+	7.0	16.9
8a	89	1+	7.5	
8b	86	1+	6.2	
8c	90	1+	6.9	20.6
9a	95	1+	9.6	
9b	101	2+	9.1	18.7
10a	85	1+	6.2	
10b	83	1+	6.1	
10c	85	1+	6.8	19.1

COMMENT: These samples were captured by electrofishing at a site located approximately 150-250 m upstream of Goosley Lake.