調査に当 B_ 2 1

Upper Bulkley River and Toboggan Creek Overwintering Study 2000-2001

prepared by

Brenda Donas Department of Fisheries and Oceans Smithers, B.C.

and

Regina Saimoto SKR Consultants Ltd. Smithers, B.C.

for

Fisheries Renewal B.C. Smithers, B.C.

July 2001

Executive Summary

An overwintering study was conducted over three winters (November 1998 to March 2001) in the Upper Bulkley and Toboggan Creek watersheds in north-central British Columbia. The study area includes the lower portion of the Upper Bulkley watershed upstream of the confluence of the Morice and Bulkley rivers near Houston, B.C. to Richfield Creek, and the portion of Toboggan Creek from the Toboggan Creek hatchery to Toboggan Lake. This study focused on establishing indicators of overwintering habitat quality, particularly cover, and determining physical and biological factors which may influence overwintering habitat quality in the Upper Bulkley and Toboggan Creek watersheds by sampling a variety of habitat types. Fish densities (CPUE), fork length, and condition factor data were collected when possible, allowing for comparisons of fish densities, size and condition over time and between sites. This report focuses primarily on the analysis of data collected in the third year of the study (November 2000 to March 2001), and includes a cursory summary and comparison of data collected over the three years of the overwintering study.

Coho contributed 43.5% of the total catch (total catch = 1522 fish) at sites sampled during the overwintering study, and was the main species at Toboggan Creek sites. No coho were captured in Upper Bulkley side channel sites sampled, while coho were present in one of the two side channels sampled in Toboggan Creek. The side channels sampled in the Upper Bulkley had low cover and no substrate cover, were relatively shallow, and had low dissolved oxygen concentrations. Coho densities at Toboggan Creek sites are likely higher than at Upper Bulkley sites due to notable higher escapements of spawners in the parent generations to this comparatively productive system. Coho CPUE declined drastically between December and February at Toboggan Creek sites, while the gradual decline in coho CPUE at Upper Bulkley sites was not significant. The decline of coho CPUE, particularly at Toboggan Creek sites, is speculated to be due to emigration or mortality related to high densities in this system. Fork length did not change significantly over the winter at most sites, but condition factor declined significantly during the winter, and especially between February and March. Within sites sampled in the Upper Bulkley, coho were commonly captured in tributary sites with cobble pool habitat and some organic cover, rather than in mainstem sites, or side channel sites. In Toboggan Creek, coho CPUE was high in mainstem and side channel sites, all of which offered cobble substrate, and coho CPUE was highest at a mainstem site which offered both substrate and organic cover. Coho were commonly captured in cobble pool (>50 cm deep) habitat with some organic cover in each of the three years of the overwintering study, and also likely utilize side channel and off channel habitat that provide good cover, and adequate water quality throughout the winter.

Rainbow trout contributed 43.5% of the total catch (total catch = 1522 fish) at sites sampled during the overwintering study, and rainbow trout CPUE did not differ significantly between Upper Bulkley and Toboggan Creek sites. Rainbow trout were not captured in Upper Bulkley side channel sites, or in Toboggan Lake, both of which had low overall CPUE, and appeared to offer generally poor overwintering habitat due to poor cover, and low concentrations of dissolved oxygen. Rainbow trout CPUE declined gradually over the winter, but this decline is not statitistically significant except in Upper Bulkley tributary sites. Fork length did not differ significantly over the winter, but condition factor decreased significantly, particularly at the end

of winter (between February and March). Rainbow trout were commonly captured in Toboggan Creek mainstem and side channel sites, as well as Upper Bulkley mainstem and tributary sites, particularly at sites with pools offering substrate cover in the form of cobble, rip rap or boulders. Higher rainbow trout CPUE at sites offering pool habitat with substrate cover was noted during all three years of the overwintering study.

The third most common species captured was chinook, which accounted for 10.9% of the total catch (total catch = 1522 fish), but was only captured in Upper Bulkley tributary and mainstem sites. As with coho and rainbow trout, chinook were not captured in Upper Bulkley side channel sites, which appeared to be unsuitable for any salmonid overwintering. The lack of chinook from Toboggan Creek is consistent with historic records on the distribution of the species in the Skeena watershed. Chinook condition factor declined significantly over the winter, similar to trends in condition factor for both rainbow trout and coho. Chinook were captured at all mainstem sites, and were also common in Buck Creek and Richfield Creek, two of the larger tributaries to the Upper Bulkley.

Other species captured during the study include Dolly Varden, cutthroat trout, longnose dace, suckers and peamouth chub. Of these species, Dolly Varden was only captured in the Toboggan Creek system, and the other four species were only captured in the Upper Bulkley system, with non-salmonid species predominating catches at the three Upper Bulkley side channel sites. Capture rates of these species was low, and total numbers of fish captured were insufficient for data analysis.

During the three years of the overwintering study, cobble pools greater than 50 cm deep with sufficient flow to maintain water quality (particularly dissolved oxygen) throughout the winter were found to be most suitable for overwintering of rainbow trout and coho. Among cobble pool sites, coho capture rates were generally higher at sites, with organic cover (e.g. large or small organic debris). Rainbow trout and chinook were frequently captured in tributary and mainstem sites, while coho appear to be more common at tributary sites, particularly in the Upper Bulkley. In all three years of the study, coho CPUE was significantly higher at Toboggan Creek at the onset of winter, and this is likely due to higher numbers of spawners resulting in greater seeding of available spawning habitat. Coho CPUE declined drastically at the beginning of winter at Toboggan Creek in all three years of the study, while decreases in coho CPUE at Upper Bulkley sites are not significant. The more rapid decline of coho CPUE at Toboggan Creek to levels that are not statistically different from Upper Bulkley CPUE is speculated to be due to emigration or mortality, both of which indicate that winter has a significant influence on coho capture rates and potentially distribution. The results of this three year study support that overwintering habitat is important since it appears to play a role in limiting fish production in interior streams.

 \square

and a state of the

A STATE

İ

Table of Contents

	tive Summary	
Table	of Contents	iv
	f Tables	
	f Figuresv	
List of	f Appendices	ix
Ackno	owledgements	ix
1.0	INTRODUCTION	. 1
2.0	STUDY AREA	.1
2.1	Upper Bulkley River	
2.2	Toboggan Creek	
3.0	MATERIALS AND METHODS	
3.1	Habitat Assessment	
3.	1.1 FALL ASSESSMENTS	
-	1.2 WINTER ASSESSMENTS	
3.2		
	2.1 SPECIES DISTRIBUTION AND DIVERSITY	
	2.2 DENSITY INDICES	
	2.3 FISH AGE, SIZE, AND CONDITION	
	2.4 INDICATORS OF HABITAT SUITABILITY	
4.0	RESULTS	
4.1		
4.	1.1 FALL ASSESSMENTS	
	4.1.1.1 Upper Bulkley Sites	
	4.1.1.1.1 Surface Area, Width and Depth	
	4.1.1.1.2 Habitat Composition and Substrate	
	4.1.1.1.3 Cover	
	4.1.1.2 Toboggan Creek Sites	
	4.1.1.2.1 Surface Area, Width and Depth	
	4.1.1.2.2 Habitat Composition and Substrate	
	4.1.1.2.3 Cover	10
	4.1.1.3 Comparisons of Fall Habitat Assessments at Upper Bulkley and Toboggan Creek	17
1	1.2 WINTER ASSESSMENTS	
4.	4.1.2.1 Upper Bulkley Sites	
	4.1.2.1 Opper Burkley Sites	
	4.1.2.3 Comparisons of Winter Assessments at Upper Bulkley and Toboggan Creek.	
4	1.3 Changes in Habitat During the Winter	
1.	4.1.3.1 Upper Bulkley Sites	
	4.1.3.1.1 Upper Bulkley Mainstem	
	4.1.3.1.2 Upper Bulkley Side channels	
	4.1.3.1.3 Upper Bulkley Tributaries	
	4.1.3.2 Toboggan Creek Sites	
	4.1.3.2.1 Toboggan Creek Mainstem	
	4.1.3.2.2 Toboggan Creek Side Channels	

7.1	3.2.3 Toboggan Lake	
4.1.3.3	Comparisons of Changes in Habitat During the Winter at Upper Bulkley and	
	Toboggan Creek	
4.2 Fish	Sampling	
4.2.1	SPECIES DISTRIBUTION AND DIVERSITY.	25
4.2.2	DENSITY INDICES	27
4.2.2.1		
4.2.2.2	Rainbow Trout/Steelhead	32
4.2.2.3	Other Species	33
4.2.3	FISH AGE, SIZE, AND CONDITION	34
4.2.3.1	Coho	34
4.2.3	8 8	
4.2.3	3.1.2 Condition	
4.2.3.2		
4.2.3	0 0	
	3.2.2 Condition	
4.2.3.3	F	
4.2.3	0 0	
	3.3.2 Condition	
	and Fish Habitat	
4.3.1	UPPER BULKLEY	
4.3.2	TOBOGGAN CREEK	
	JSSION	
	itat Assessment	
5.2 Fish	Sampling	53
5.2 Fish 5.2.1	Sampling	53 54
5.2 Fish 5.2.1 5.2.2	Sampling	53 54 55
5.2 Fish 5.2.1 5.2.2 5.2.3	Sampling Species Distribution and Diversity Density Indices Fish Size, Age and Condition	53 54 55 57
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size	53 54 55 57 57
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2	Sampling Species Distribution and Diversity Density Indices Fish Size, Age and Condition Fish Size Age	53 54 55 57 57 58
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.2 5.2.3.3	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor	53 54 55 57 57 58 58
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat	 53 54 55 57 57 58 58 58 60
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY	 53 54 55 57 57 58 58 60 60
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK	 53 54 55 57 57 58 58 60 60 62
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA	 53 54 55 57 57 58 58 60 60 62 65
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons	 53 54 55 57 57 58 58 60 60 62 65 65
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen 6.1.1	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK. EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS	 53 54 55 57 57 58 58 60 62 65 65 65
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen 6.1.1 6.1.2	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY. TOBOGGAN CREEK. EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS FISH SAMPLING	 53 54 55 57 57 58 58 60 62 65 65 67
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen 6.1.1 6.1.2 6.1.2.1	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS FISH SAMPLING Species Distribution and Diversity	 53 54 55 57 57 58 58 60 62 65 65 67 67
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1.1 6.1.2 6.1.2.1 6.1.2.2	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS. FISH SAMPLING Species Distribution and Diversity Density Indices	 53 54 55 57 58 60 62 65 65 67 68
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1.1 6.1.2 6.1.2.1 6.1.2.2 6.1.2.3	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS FISH SAMPLING Species Distribution and Diversity Density Indices Fish Size and Condition	 53 54 55 57 58 60 60 62 65 65 67 67 68 72
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen 6.1.1 6.1.2 6.1.2.1 6.1.2.2 6.1.2.3 6.1.2.3 6.1.2.3	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish SizeAge Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK. EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS FISH SAMPLING. Species Distribution and Diversity Density Indices Fish Size and Condition 2.3.1 Coho	53 54 55 57 57 58 60 60 62 65 65 65 67 67 68 72 72
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1.1 6.1.2 6.1.2.1 6.1.2.2 6.1.2.3 6.1.2.5 6.1.2.3 6.1.2.5 6.1.5	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS FISH SAMPLING. Species Distribution and Diversity Density Indices Fish Size and Condition 2.3.1 Coho. 1.2.3.1.1 Fork Length	 53 54 55 57 58 60 62 65 65 67 68 72 72 72
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen 6.1.1 6.1.2.2 6.1.2.3 6.1.3	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS. FISH SAMPLING Species Distribution and Diversity Density Indices Fish Size and Condition 2.3.1 Coho 1.2.3.1.1 Fork Length 1.2.3.1.2 Condition	53 54 55 57 57 58 60 60 62 65 65 65 67 67 68 72 72 73
5.2 Fish 5.2.1 5.2.2 5.2.3 5.2.3.1 5.2.3.2 5.2.3.3 5.3 Fish 5.3.1 5.3.2 6.0 A BRI 6.1 Gen 6.1.2 6.1.2.1 6.1.2.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.2 6.1.2.3 6.1.3 6	Sampling SPECIES DISTRIBUTION AND DIVERSITY DENSITY INDICES FISH SIZE, AGE AND CONDITION Fish Size Age Condition Factor and Fish Habitat UPPER BULKLEY TOBOGGAN CREEK EF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA eral Comparisons HABITAT ASSESSMENTS FISH SAMPLING. Species Distribution and Diversity Density Indices Fish Size and Condition 2.3.1 Coho. 1.2.3.1.1 Fork Length	53 54 55 57 57 58 60 62 65 65 65 67 67 68 72 72 73 74

「「「ない」のの

.

6

6.1.2.3.2.2 Condition	74
6.2 General Discussion	76
6.2.1 HABITAT AND WINTER ASSESSMENTS	76
6.2.2 FISH SAMPLING	77
6.2.2.1 Species Distribution and Diversity	
6.2.2.2 Density Indices	77
6.2.2.2.1 Coho	78
6.2.2.2.2 Rainbow Trout/Steelhead	
6.2.2.3 Fish Size and Condition	80
6.2.3 Fish and Fish Habitat	81
6.2.3.1 Coho	81
6.2.3.2 Rainbow Trout/Steelhead	82
7.0 RECOMMENDATIONS	83
8.0 LITERATURE CITED	85

List of Tables

Table 1.	Site description sampling times during the upper Bulkley River overwintering study, November 2000 to April 2001
Table 2.	Physical parameters recorded in the field for each site sampled prior to freeze up in the Upper Bulkley River overwintering study
Table 3.	Physical and chemical parameters recorded on a monthly basis for each site sampled prior in the Upper Bulkley River overwintering study
Table 4.	Summary of winter assessment results at sites in the Upper Bulkley Watershed 18
Table 5.	Summary of winter assessment results at sites in Toboggan Creek drainage
Table 6.	Mean species richness, species diversity and evenness at tributary, side channel and mainstem sites in the Upper Bulkley watershed, and lake, side channel and mainstem sites in Toboggan Creek
Table 7.	Summary of trap catches of juvenile salmonids at each of the sites sampled during the overwintering study. $C = \text{total catch}$, $\% = \text{proportion of the total catch}$, $CPUE = \text{mean catch of each species using monthly CPUE data}$. Upper Bulkley sites are indicated in regular text and Toboggan Creek sites are indicated in italics
Table 8.	Mean coho catch per unit effort and percent of catch estimated to be age 0+ (excluding hatchery origin coho) for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March
Table 9.	Mean coho catch per unit effort estimated to be age 0+ and coho older than 0+ for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March
Table 10.	Mean rainbow trout catch per unit effort and percent of catch estimated to be age 0+ for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March
Table 11.	Mean rainbow catch per unit effort estimated to be age 0+ and older than 0+ for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March
Table 12.	Summary of adult escapement estimates at weirs in the Upper Bulkley and Toboggan Creek systems (Ewasiuk 1998, Glass 1999, 2000, SKR 2000, O'Neil pers. comm.).

26

i. Ma

()²²

Car

(inter

List of Figures

Figure 1.	Locations of sites sampled in the Upper Bulkley watershed between November 2000 and March 2001
Figure 2.	Locations of sites sampled in the Toboggan Creek watershed between November 2000 and March 2001
Figure 3.	Pie chart illustrating the proportion of sites with varying levels of in-stream cover, rated as none, trace, moderate and abundant. Inset histograms illustrate the proportion of in-stream cover elements among sites with varying amounts of cover (white bars = none, diagonal bars = trace, cross hatched bars = moderate, solid bars = abundant cover). Also see Appendix 1b for enlarged histogram shown in this Figure
Figure 4.	Comparisons of rates between Upper Bulkley sites and Toboggan Creek sites (CO = coho, RB = rainbow, CH = chinook, DV = Dolly Varden, other = cutthroat trout, longnose dace, suckers and peamouth chub)
Figure 5.	Estimated CPUE of 0+ coho and coho estimated to be older than 0+ at sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Ages are estimated from fork length distributions (see Tables 8 and 9)
Figure 6.	Mean Condition factor for coho captured at sites sampled in the Upper Bulkley Watershed (above) and at Toboggan Creek (below). Bars indicate standard errors. 40
Figure 7.	Estimated CPUE of 0+ rainbow trout and rainbow trout estimated to be older than 0+ at sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Ages are estimated from fork length distributions (see Tables 10 and 11)
Figure 8.	Mean condition factor for rainbow trout captured at sites sampled in the Upper Bulkley Watershed (above) and at Toboggan Creek (below). Bars indicate standard errors
Figure 9.	Mean condition factor for chinook captured at sites sampled in the Upper Bulkley Watershed. Bars indicate standard errors
Figure 10.	Mean Condition factor for Dolly Varden captured at sites sampled at Toboggan Creek (below). Bars indicate standard errors
Figure 11.	Total CPUE for the three years of the study. Toboggan Creek was not sampled in December 1998. Error bars indicate standard errors of catch per unit effort between the sites sampled
Figure 12.	Coho CPUE for the three years of the study. Toboggan Creek was not sampled in December 1998. Error bars indicate standard errors of coho catch per unit effort between the sites sampled
Figure 13.	Rainbow CPUE for the three years of the study. Toboggan Creek was not sampled in December 1998. Error bars indicate standard errors of rainbow catch per unit effort between the sites sampled

List of Appendices

Appendix 1. Fall Habitat Assessments	
Appendix 1a. Fall Assessment Data Summary Table and Graphs	
Appendix 1b. Fall Habitat Assessments Forms	
Appendix 2. Winter Sampling Data	
Appendix 2a. Winter Sampling Data and Graphs	129
Appendix 2b.Winter Sampling Data Forms	
Appendix 3. Species Richness, Diversity and Evenness	
Appendix 4. Density Indices	
Appendix 5. Fork Length, Weight and Condition Factor Data	

Please note: Appendices are found in Volume 2, which accompanies this report.

Acknowledgements

The Upper Bulkley River overwintering study was funded by Fisheries Renewal B.C. In kind donations were provided by the Department of Fisheries and Oceans (DFO), Smithers, B.C.. Brenda Donas (DFO) and Regina Saimoto (SKR Consultants Ltd.) designed the project. Doug Steventon (Ministry of Forests) provided helpful input on statistical analysis and study design during the second year of the project, and Allan Johnson (Northwest Community College) provided some input on data analysis for the third year of the project. Field sampling was conducted by Brenda Donas, Trace Joe, Tracey De La Mare and Jim De La Mare. Data was entered by Trace Joe. Regina Saimoto conducted data analysis and reporting. Ron Saimoto (SKR Consultants Ltd.), Greg Tamblyn (Community Futures Development Corporation of Nadina) and Brenda Donas provided helpful editorial comments on the report.

1.0 INTRODUCTION

During this three - year study in the Upper Bulkley River watershed, overwintering habitat was assessed as a potential limiting factor to fish production. The Upper Bulkley River watershed is utilized by several species of pacific salmon (coho, chinook, sockeye, pink salmon), which have been in decline (Houston Chapter of the Steelhead Society of B.C. 1990, BCCF 1997, 1998, Holtby and Finnegan 1998). Declines in salmon stocks are generally attributed to over-exploitation of the stocks, decreased ocean or freshwater survival or a combination of these (Hillborn and Walters 1992, Walters 1995, Slaney *et al.* 1996, Slaney and Zaldokas 1997, Bradford and Irvine 2000). Decreased survival of juveniles in freshwater is often attributed to habitat degradation (National Research Council 1992, Johnston and Slaney 1996, Slaney and Zaldokas 1997, BCCF 1998). Winter survival has been considered to be one potential bottleneck in salmonid production in several systems (Bustard and Narver 1975, Swales *et al.* 1986, Dolloff 1987, Koning and Keeley 1997) since winter is generally a more stressful time for fish with resultant starvation, energy loss, declines in fish health and survival (Bustard and Narver 1975, Dolloff 1987, Cagnelli and Gross 1997).

The long term objectives of the Upper Bulkley overwintering studies are to:

- > determine changes in species abundance and densities during the winter,
- > document changes in weight, length and condition of species at sites examined,
- > identify potential factors which may determine overwintering habitat quality,
- identify potential restoration or habitat enhancement techniques that may improve overwintering habitat quality and/or quantity, and
- > present results in a format suitable for use in public education and awareness.

This report documents the results of the overwintering study from November 2000 to April 2001, and summarizes the results obtained during all three years of the overwintering study. The Appendices, which accompany this report, are bound separately in Volume 2. A report that will document the overall state of the Upper Bulkley watershed, and will analyse the results of the overwintering study in the context of other studies conducted in the upper Bulkley watershed, has been proposed (Donas pers. comm.).

2.0 STUDY AREA

100

Ì.

106

199

The Bulkley River is a major tributary to the Skeena River, located in north-central British Columbia (Figure 1). The Bulkley River drains into the Skeena River near the village of Hazelton, B.C.. However, the main portion of this study area is within the lower portion of what is known as the upper Bulkley River or the little Bulkley River (i.e. the portion of the Bulkley River upstream of the Morice River confluence, near Houston, B.C.). Toboggan Creek drains into the Bulkley River near Smithers (downstream of Houston), but was included in this study as an index stream due to relatively high juvenile coho densities, and more extensive background knowledge on coho escapement (O'Neill pers. comm.) and smolt production (SKR 1995,1996,1997,1998,1999, 2000a).

2.1 UPPER BULKLEY RIVER

The upper Bulkley watershed drains an area of approximately 2400 km² from the Nechako Plateau to its confluence with the much larger Morice River. Elevations of the upper Bulkley River vary from 1640 m in the headwaters on the Nechako Plateau to 570 m at the confluence with the Morice River just west of the village of Houston. The Bulkley River is classified as a Class II water and offers exceptional angling experience (B.C. Environment 2000). Coho (Oncorhynchus kisutch), chinook (O. tsawytscha), sockeye (O. nerka), pink (O. gorbusha), rainbow trout and steelhead (O. mykiss), cutthroat trout (O. clarki), Dolly Varden (Salvelinus malma), bull trout (S. confluentus), lake trout (S. namyacush), mountain whitefish (Prosopium williamsoni), burbot (Lota lota), lake chub (Couesius plumbeus), longnose dace (Rhinichthys cataractae), longnose sucker (Catostomus catostomus), and redside shiner (Richardsonius balteatus) have been reported in the drainage (FISS). The upper Bulkley watershed is characterized by a low abundance of lakes, and a low gradient, meandering mainstem (BCCF 1997). Tributaries are generally moderate to steep gradient systems, many of which are lake headed (Tredger 1982, BCCF 1997). The upper Bulkley River drainage is characterized by a variety of land use activities, namely forestry, mining, agriculture and urbanization (BCCF 1997, 1998, Remington 2000, SKR in prep.). In fact, the upper Bulkley watershed is one of the oldest settlement areas in the area (Morice reprinted in 1978, Hols 1999). An adult migration fence has been operated annually on the upper Bulkley River at the community of Houston since 1987 (Houston Chapter of the Steelhead Society of B.C. 1990, Tamblyn 2000). Smolt releases to the Upper Bulkley began in 1989 (1987 brood year) (Holtby et al. 1999). Relatively small numbers of juvenile coho are released into the upper Bulkley watershed on an annual basis, primarily through the "salmonids in the classroom" program (Donas pers. comm.), but a significant number of juvenile coho have been released into Buck Creek (the largest tributary to the upper Bulkley system) since 1998 (MacKay 1999, SKR 2000b, Tamblyn 2000).

2.2 TOBOGGAN CREEK

Toboggan Creek drains into the lower Bulkley River approximately 19 km northwest of the town of Smithers, B.C. Toboggan Creek drains an area of 111.6 km² from its headwaters (elevation 1500 m) to its confluence with the Bulkley River (elevation 430 m). The Toboggan Creek drainage is a productive, glacial system influenced somewhat by land use activities, primarily agriculture and forestry (Gibson 1997, Remington and Donas 1999). Toboggan Creek is a relatively unique drainage within the Bulkley watershed since the Toboggan Creek coho stock has been augmented since 1988. Coho smolts are released from the Toboggan Creek hatchery on an annual basis (O'Neill pers. comm.). In addition, an adult counting fence has been utilized for detailed enumeration of coho and steelhead spawners since 1989. Coho smolt enumeration projects have been conducted on Toboggan Creek since 1995 (SKR 1995, 1996, 1997, 1998, 1999, 2000a). Toboggan Creek was chosen for comparison to the upper Bulkley drainage, due to the relatively high abundance of coho and the long term studies (e.g. adult and smolt enumeration) conducted in this system.

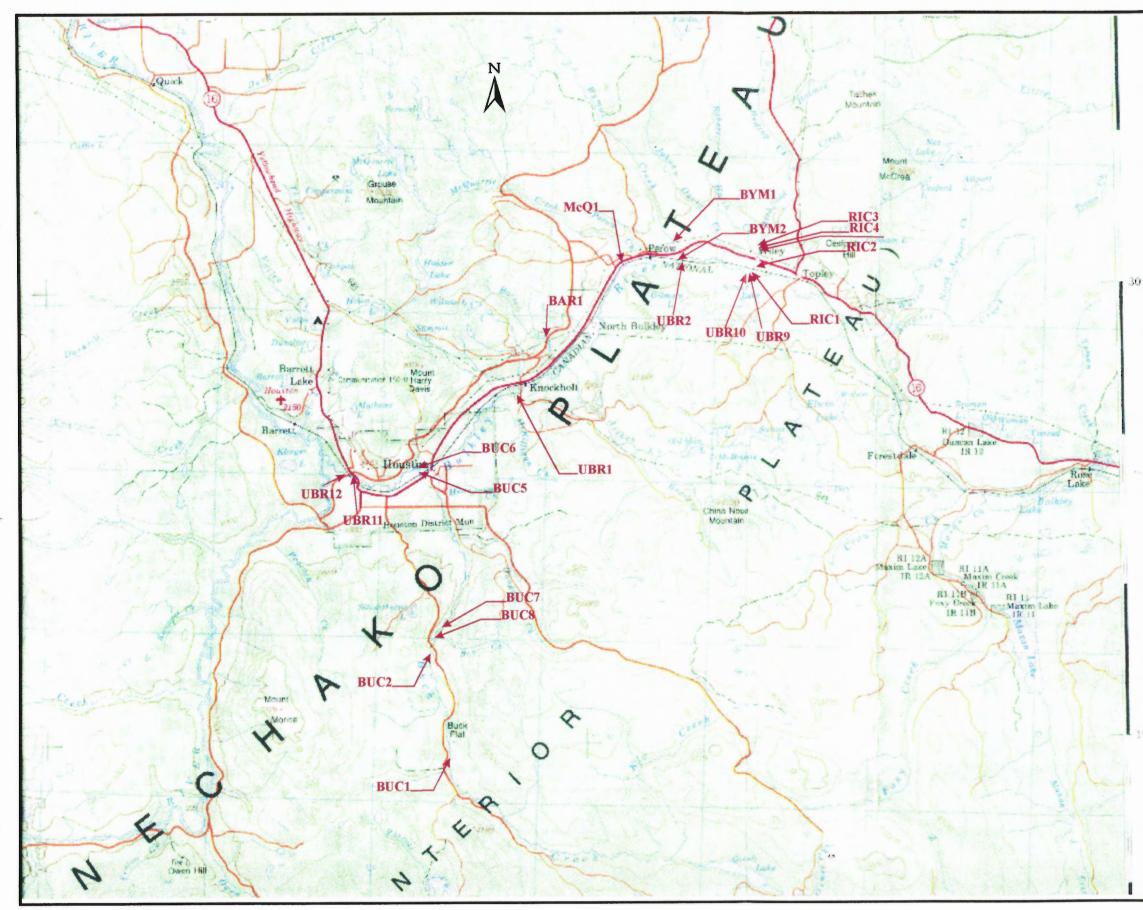


Figure 1. Locations of sites sampled in the

Upper Bulkley Watershed during the Upper Bulkley Overwintering Study

conducted

November 2000 to March 2001

(Mission and Toboggan creek sites are not shown on the map)

Sample Sites

BUC Buck Creek BAR Barren Creek BYM Byman Creek McQ McQuarrie Creek RIC Richfield Creek UBR Upper Bulkley River

1:200,000 Scale excerpt from 1:250,000 Scale NTS Map 93L

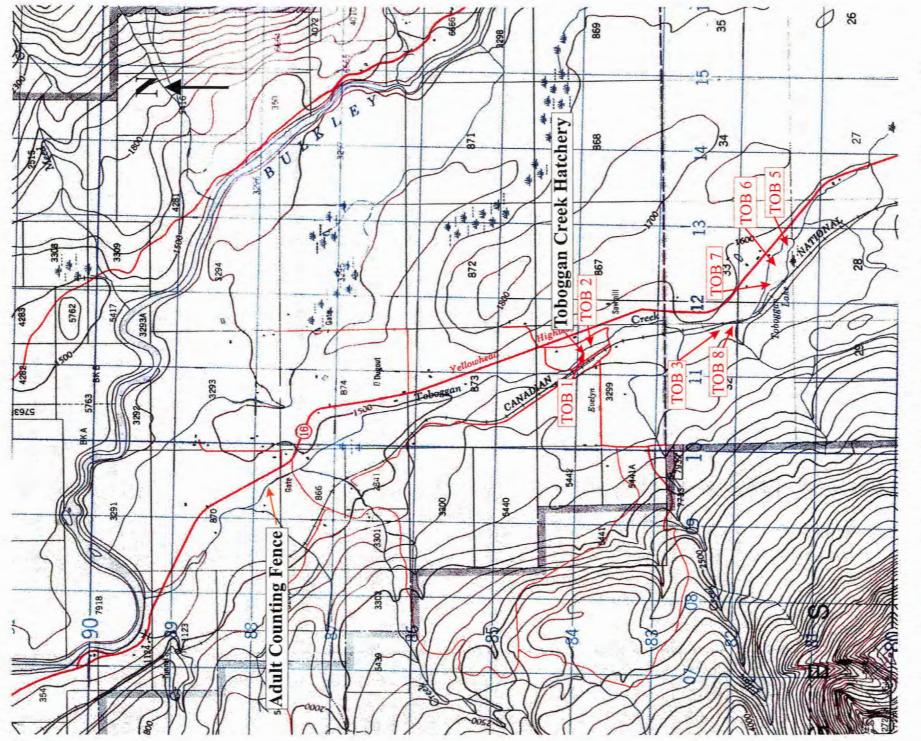


Figure 2. Locations of sites sampled in the Toboggan Creek watershed between November 2000 and March 2001 (approx. Scale = 1:50,000).

3.0 MATERIALS AND METHODS

3.1 HABITAT ASSESSMENT

Sites to be sampled in the winter of 2000/2001 were selected based on diversity of in-stream cover elements, accessibility of sites to salmonids, and ease of access during winter sampling. Sampling focused on pools habitat with a variety in-stream cover elements such as cutbanks, small woody debris (SWD), large woody debris (LWD), cobble substrate, boulders or boulder clusters and sites with no habitat complexity. Sample site locations are illustrated in Figures 1 and 2, and summarized in Table 1. All sites located on the mainstem Upper Bulkley River, Barren Creek, Byman Creek, Buck Creek, McQuarrie, and Richfield Creek are drained by the Upper Bulkley River watershed, and are found within the portion of the watershed accessible to salmonids (downstream of falls). Sites in Toboggan Creek (near Smithers) and Mission Creek (near Hazelton) are not located in the Upper Bulkley watershed, but were sampled for continuity with the previous two years of the study (Donas and Saimoto 1999, 2000). Data for the Mission Creek sites are summarized in a seperate report (Saimoto in prep.). Several of the sites from the 1998/1999 and/or the 1999/2000 overwintering study were sampled in the winter of 2000/2001 (Table 1), but some sites were deleted others were added.

3.1.1 Fall Assessments

Fall assessments included an evaluation of physical characteristics at each site. These assessments were conducted in November, using a data form designed for the project (Appendix 1). In-stream cover was documented in detail for most sites (Table 2). Fall assessments were not conducted at two of the upper Bulkley mainstem sites (UBR 1 and UBR 2), the two Toboggan Lake sites (TOB 5 and TOB 6), the site at the outlet of Toboggan Lake which was only sampled in March 2001 (TOB 7), and the Toboggan Creek side channel sites (TOB 8). Fall assessments were completed at all other sites (25 of 31 sites).

Fall assessment data between sites in the Upper Bulkley watershed and sites in Toboggan Creek were compared statistically where numeric data was available. These data include surface area, wetted width, mean and maximum wetted depth, percent pool, glide, riffle and edge habitat. A Kolmogornov-Smirnoff test was used to assess normality of the data, and where the data was normally distributed, a student's t-test was used to compare means between sites in the Upper Bulkley and Toboggan Creek. Pooled variances were used in cases where the variances were not statistically different between the two samples.

Department of Fisheries and Oceans & SKR Consultants Ltd.

e.

1.11

	Site #	Location	Habitat	Surface Area	Dates (00/01)
Upper	UBR 1 ⁺	just downstream of McKilligan Road crossing	Cobble pool	fall assessment not	December - March
Bulkley	UBR 2*	at confluence with Byman Creek	LWD, cobble pool	conducted	December - March
River	UBR 9	20 m downstream of confluence with Richfield Creek	SWD pool	234 m^2	December - March
	UBR 10	50 m downstream of confluence with Richfield Creek	SWD pool	103 m ²	December - March
	UBR 11	just downstream of North Road bridge crossing	Rip Rap pool	76 m ²	December - March
	UBR 12	60 m downstream of CNR crossing west of Houston	cobble, boulder pool	67.7 m ²	December - March
	SID 1	downstream of HYW 16 rest area between Houston and Topley	side channel	240 m^2	December - March
	SID 2	just downstream of Bill Watson's driveway	side channel	104 m^2	December - March
	SID 3	about 300 m downstream of SID 2, at HWY 16 crossing	side channel	156 m ²	December - March
Richfield	RIC 1 ⁺	250 m upstream of Bulkley River, downstream of CNR	SWD, cobble, pool	72 m^2	December - March
	RIC 2	50 m upstream of CNR crossing	cobble, SWD, veg.	72 m^2	December - March
	RIC 3	400 m upstream of highway crossing	Cobble, pool	96.3 m^2	December - March
	RIC 4 ⁺	about 50 m downstream of RIC 3	boulder, cobble pool	112 m^2	December - March
	RIC 5	15 m downstream of RIC 4	cobble, SWD	149 m ²	December - March
McQuarrie	McQ 1 ^{+*}	just downstream of hwy 16, upstream of CNR crossing	moderate cobble pool	50.4 m^2	December - March
Byman	BYM 1 ⁺	downstream side of highway 16 crossing	culvert pool, cobble	146 m ²	December - March
	BYM 2 ⁺	just downstream of CNR crossing, 750 m u/s of Bulkley River	SWD, boulder, cobble	52.8 m^2	December - March
	BYM 3 ⁺	150 m downstream of CNR crossing; d/s of Perrow Cr.	Cobble pool	82 m ²	December - March
Barren			culvert pool, cobble	16 m^2	December - March
Buck	BUC 1 ⁺	2 km upstream of second Bridge	boulder, cobble glide	135 m^2	December - March
	BUC 2 ⁺	100 m upstream of first bridge	LWD, SWD, cobble	188 m^2	December - March
	BUC 5 ⁺	just downstream of 4 th Avenue, downstream of CNR	boulder, cobble	174 m^2	December - March
	BUC 6 ⁺	150 m downstream of BUC 5	LWD, SWD, cobble	120 m^2	December - March
	BUC 7	Buck Creek release pond	LWD pool	28 m^2	December - March
	BUC 8	Buck Creek release pond	cobble, trace LWD pool	30.3 m^2	December - March
Tobog-	TOB 1 ⁺	just downstream of hatchery near start of Nature Trail	SWD, cobble pool	70 m^2	December - March
gan	TOB 2 ⁺	upstream of Brandt Brook (at smolt fence location)	LWD, SWD, cobble	103 m ²	December - March
	TOB 3	at CNR bridge	side channel		December, January
	TOB 8	at train bridge at Eric Johnson's	side channel	fall assessment not	December - March
	TOB 5	100 m in front of Jill Storey's	Lake	conducted	December - March
	TOB 6	50 m to the right of TOB 5	Lake		December - March
	TOB 7	at outlet of Toboggan Lake at CNR crossing	Lake outlet	1	March

 Table 1.
 Site description and sampling times during the upper Bulkley River overwintering study, November 2000 to April 2001.

(¹ also see Figure 1 for site locations; Mission and Toboggan Creek sites are not indicated on Figure 1

+ indicates sites also sampled in the winter of 1999 - 2000; * indicates sites also sampled in the winter of 1998 - 1999)

ŗ

1

1

L.

1

Table 2.Physical parameters recorded in the field for each site sampled prior to freeze
up in the Upper Bulkley River overwintering study.

	Parameter	Unit/Categories	Methods
	channel width	meter	tape
channel	wetted width	meter	tape
	max. wetted depth	centimeter	meter stick
	max. bankful depth	centimeter	meter stick
	interval between channel measurements	meter	tape
	percent of site	percent	visual estimate
s	Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
pools	Sub-Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
Đ,	D90	centimeter	tape
	% embeddedness	percent	visual
	percent of site	percent	visual estimate
s	Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
glides	Sub-Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
60	D90	centimeter	tape
	% embeddedness	percent	visual
đ	percent of site	percent	visual estimate
dee	Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
edge) cm d	Sub-Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
edge < 10 cm deep	D90	centimeter	tape
V	% embeddedness	percent	visual
	percent of site	percent	visual estimate
ss	Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
riffles	Sub-Dominant Substrate	fines, gravel, cobbles, larges, boulders	visual estimate
. E	D90	centimeter	tape
	% embeddedness	percent	visual
	Total Instream Cover	None, Trace, Moderate, Abundant	visual estimate
	Out of stream Cover	None, Trace, Moderate, Abundant	visual estimate
	LWD	None, Trace, Moderate, Abundant	visual estimate
	# LWD pieces < 20 cm	number	count
	# LWD pieces 20-50 cm	number	count
	# LWD pieces > 50 cm	number	count
	SWD	None, Trace, Moderate, Abundant	visual estimate
ы	Boulder	None, Trace, Moderate, Abundant	visual estimate
cover	Single boulder > 30 cm	number	count
ပ	Boulder clusters	number	count
	cobble	None, Trace, Moderate, Abundant	visual estimate
	cobble proportion of site	percent	visual estimate
	undercut banks	None, Trace, Moderate, Abundant	visual estimate
	undercut bank length	meter	tape
	average undercut bank width	meter	tape
	aquatic vegetation	None, Trace, Moderate, Abundant	visual estimate
	overhanging vegetation	None, Trace, Moderate, Abundant	visual estimate
	distance to nearest upstream pool	meter	tape
ger	distance to nearest downstream pool	meter	tape
other	site length	meter	tape
	gradient	percent	clinometer

ñ

3.1.2 Winter Assessments

Changes in physical and chemical parameters (Table 3) were recorded monthly for each sample site using a data form designed for overwintering sampling (Appendix 2). Monthly physical and chemical data were collected by removing ice from the limnological station using a chain saw or by hand. Winter assessment data between sites in the Upper Bulkley watershed and sites in Toboggan Creek were compared statistically where numeric data was available. These data include air temperature, water temperature, ice thickness, snow depth, conductivity, dissolved oxygen, and water depth. A Mann-Whitney U-test was used to compare data collected in the Upper Bulkley to data collected at Toboggan Creek.

	Parameter	Unit/Categories	Method	
general site description	weather	description	visual	
	air temperature	Celsius	alcohol thermometer	
eral sript	Ice Cover percent		visual estimate	
general site description	Stream Flow None, Low, Moderate, High		visual estimate	
	Potential for fish migration	None, Low, Moderate, High	visual estimate	
	water depth	centimeters	meter stick	
a	ice thickness	centimeters	meter stick	
atio	clarity of ice	None, Low, Moderate, High	visual estimate	
l st	snow depth	centimeters	meter stick	
gica	water temperature Celsius		alcohol thermometer	
Limnological station	turbidity	None, Low, Moderate, High	visual estimate	
	conductivity	μS/cm	Hanna	
L	Dissolved Oxygen	ppm	Oxyguard	
	pH	pH units	Hanna H 19812	

Table 3.Physical and chemical parameters recorded on a monthly basis for each site
sampled prior in the Upper Bulkley River overwintering study.

3.2 FISH SAMPLING =

Low water temperatures precluded the use of electroshockers, since electroshocking at water temperatures below 4°C can be harmful to salmonids. Fish sampling was conducted by setting minnow traps baited with roe at each of the sample sites during each sampling period (once per month). Due to considerable ice thickness, a chain saw was used to remove sections of ice large enough to allow setting of minnow traps. The minnow traps were left for 24 hours. Fish were recovered from the traps, anesthetized with Alka Seltzer, identified to species, measured (fork length ± 1.0 mm), weighed (± 0.1 g using an Acculab V1200 electronic balance) and released back into the habitat. Due to difficulties encountered with estimates of population size in the winter of 1998/1999 (Donas and Saimoto 1999), no mark-recapture estimates were conducted in the winter of 2000/2001. Attempts were made to standardize the trapping intensity by considering the surface area of the site (a cluster of three traps/ 50 m² surface area). Difficulties in setting traps under the ice resulted in a reduction in trapping intensity at most sites to a cluster to three traps / 150 m^2 surface area. Trapping intensity at each site did not change during the winter. Total catch and particularly catch per unit effort (i.e. catch per trap) was used as an indicator of fish abundance, as suggested in previous studies (Swales et al. 1986). Sites were grouped as Upper Bulkley tributary, Upper Bulkley mainstem, Upper Bulkley side channel, Toboggan Creek mainstem, Toboggan Creek sidechannel and Toboggan Lake sites based on watershed and habitat type sampled, for comparisons of fish data.

Difficulties in sampling during the winter in interior systems is a major constraint on study design and data collection. Thick ice cover increases time requirements for sampling, and limits the number of traps that can be set at a site without significant disturbance to the winter conditions at that site. Fish handling is difficult at cold water temperatures, and during inclement weather. Fish behaviour and microhabitat selection are difficult to determine when ice covers the site. While snorkel surveys have been conducted to document microhabitat selection in some systems with ice cover (e.g. Cunjak 1986), most sites sampled during this study were in streams that are generally too small, and ice cover was complete, making sites not suitable for snorkel surveys in the winter. All these factors limit methodologies suitable for the study, and influence the ability of determining microhabitat selection of fish.

Minnow traps have been shown to be effective in providing relative estimates of juvenile salmonid abundance (Swales 1987), but minnow traps are known to be size and, to a lesser extent, species selective (Swales *et al.* 1986). In addition, minnow traps may be less effective at capturing fish at lower water temperatures since bait in the traps may be less likely to attract fish hiding in the substrate or near cover. Minnow traps are likely effective within a certain radius at a given temperature, but are less effective at attracting fish outside of this radius. Hence, attempts were made to standardize trapping intensity to reflect different sizes of the sites sampled. Most of the comparisons conducted in this overwintering study within and between sites and drainages were based on comparisons of density indices derived from minnow traps. The data must be viewed in light of the limitations of the sampling design, which may not give an accurate reflection of species densities at the sites. However, despite limitations of the capture technique used, we feel that minnow trapping is the only feasible sampling methodology for most of the sites sampled.

Department of Fisheries and Oceans & SKR Consultants Ltd.

4

à

3.2.1 Species Distribution and Diversity

Species diversity was determined using the log_{10} Shannon index of diversity (Zar 1984) (equation 1). The number of potential categories (k) was chosen as the number of species captured among all sites (seven for this study).

Equation 1: $H' = -\Sigma p_i \log p_i$

where H' is the Shannon diversity index, and p_i is the proportion of observations found in category i

Since the Shannon index is dependent on the number of potential categories (k) (Zar 1984), evenness was also calculated, as shown in equation 2.

Equation 2: $J' = H' / H'_{max}$

where	J' is evenness
	H' is the Shannon diversity index (equation 1)
	H'_{max} is the maximum possible diversity calculated as $H'_{max} = \log k$

Species Richness was determined by counting the number of species captured at the site.

3.2.2 Density Indices

Several indices of abundance and density were considered in this study. The total catch by minnow trapping over a standardized time period (overnight) was used as an indicator of abundance for each species, as suggested in previous studies (Swales *et al.* 1986). In addition, catch per trap was calculated for each species to facilitate comparisons of the data collected in the current study to data collected in this and previous studies (Donas and Saimoto 1999, 2000). An index of density (catch/m³) was determined for each species to compensate for the differences in volume at each site. Since pool depth has been identified as an important factor for overwintering habitat in other studies (Swales *et al.* 1986, Dolloff 1987), we felt that a measure of density per unit volume would be more comparable between sites than a measure of density per unit surface area. Volume was estimated using Equation 3.

Equation 3:
$$V = 0.5 (W) (D_{max})(L)$$

where: V = estimated site volume (m^3) W = mean wetted width (m)D_{max} = mean maximum depth of transects (m)L = site length (m)

Volume estimates were adjusted by adjusting the mean maximum depth by the change in depth at the limnological station at each sampling interval.

Catch per unit effort and the number of fish per cubic meter were used to compare fish densities for each month. Catch per unit effort and fish per cubic meter were compared for each month among the different categories of sites using ANOVA.

3.2.3 Fish Age, Size, and Condition

Fulton's condition factor was calculated for sampling dates where both length and weight of the fish were recorded. Fulton's condition factor (equation 4) is useful where growth is isometric, and/or if the fish to be compared are of approximately the same length (Ricker 1975, Bagenal 1978). Fulton's condition factor provides a measure of fatness of the fish, which is expected to reflect a fish's health.

Equation 4:

 $K = 10^5 (w / l^3)$

where: K = Fulton's condition factor w = weight (g)l = length (mm)

Fork length data were compared statistically with ANOVA on ranked data due to unequal variances and non-normality (Conover and Iman 1981). Condition factor data were compared using ANOVA and t-tests on unranked data due to the lack of significant departures from normality.

3.2.4 Indicators of Habitat Suitability

The two main indicators of habitat suitability used in this study were species density indices, and fish size (fork length and condition factor). In order for habitat quality to have a significant impact on these measures, it is generally assumed that the fish at a given habitat are at or near carrying capacity (Dolloff 1987). If the density of fish is well below carrying capacity, habitat quality will likely have little influence on density or fish size unless fish actively select different quality overwintering habitat. Fish densities, particularly for coho, in the upper Bulkley watershed have been depressed from historic levels. It is unlikely that upper Bulkley densities are near carrying capacity. Densities of coho at Toboggan Creek are generally higher, and are likely to be closer to carrying capacity than densities in the Upper Bulkley watershed. Hence, differences in coho density and condition are likely clearer between and within sites at Toboggan Creek than in the upper Bulkley system.

In the absence of densities near carrying capacity, differences in habitat quality may still be documented provided that habitat of better quality is actively selected for by fish. This requires fish to move to different habitat prior to or during winter, as has been reported for rainbow trout (Narver and Bustard 1975, Swales *et al.* 1986). Several researchers have suggested a lack of movement of salmonids during winter (Envirocon 1986, Heifetz *et al.* 1986, Dolloff 1987, Swales *et al.* 1986, Giannico and Healey 1998) while others report extensive movements of salmonids during winter (Cunjak 1996, Heggersen *et al.* in prep.). Dolloff (1987) argues that extensive movement and active habitat selection in winter is unlikely since fish have no prior knowledge of habitat distribution, and since fish are vulnerable during and after movement. If

-

ŝ

fish are unable to actively select overwintering habitat, differences in density indices are likely primarily due to overwinter mortality at different sites.

Overwintering habitat characteristic has been linked to different rates of survival and growth of salmonids in several systems (e.g. Swales *et al.* 1986, Cunjak 1996). However, in determining if overwintering habitat quality limits fish production, particularly of coho and rainbow trout/steelhead in Toboggan Creek and the upper Bulkley system it is important to consider limitations of data collected, study design, and underlying assumptions. Capture methodology, and fish densities that are likely below carrying capacity at several sites, particularly in the upper Bulkley system are the main limitations to the study. Capture methods may influence the validity of density indices (due to unknown capture efficiency), size distribution (size selectivity) and to a lesser extent species composition (species selectivity). However, consistency in sampling methodologies over the three years of the overwintering study facilitated data comparisons between the three winters during which overwinter sampling was conducted. In addition, the affects of habitat quality on species densities may not be detectable since species densities at most sites is likely below carrying capacity. Any speculations on the limitations of overwintering habitat quality based on data collected must be viewed in light of the limitations and assumptions of the study, and should not be taken at face value.

i,

4.0 RESULTS

4.1 HABITAT ASSESSMENT

Sites chosen in the fall of 2000 represented a diversity of habitats, most of which were expected to be suitable for overwintering based. Twenty-three sites were located in the Upper Bulkley watershed. Six of these sites were located in the Upper Bulkley main channel (6 sites), 3 sites were located in Upper Bulkley side channel areas, and 14 sites were located in Upper Bulkley tributaries (14 sites). Two sites in the Buck Creek release pond created in the fall of 1999 (SKR 2000) were also sampled. For comparison, Toboggan Lake (3 sites), side channel (1 site) and mainstem habitats (2 sites) were represented among the six sites in Toboggan Creek. The distribution of sites among these general habitat types is summarized in Table 1 (section 3.1). Fall habitat assessment forms are located in Appendix 1.

4.1.1 Fall Assessments

4.1.1.1 UPPER BULKLEY SITES

Fall assessments were conducted at a total of 25 sites in the Upper Bulkley watershed, including 24 sites sampled throughout the winter, and at one additional site sampled in the winter of 1999-2000. The additional site is located on Richfield Creek, and is the old RIC 3 site, which was moved for sampling in 2000-2001 due to significant infilling. Twenty-three of the 25 sites can be characterized as fluvial habitat, while two sites (BUC 7 and 8) are unique in that they are located on the recently constructed release pond on Buck Creek (SKR 2000).

4.1.1.1.1 SURFACE AREA, WIDTH AND DEPTH

A total of 23 sites were sampled in November 2000 in the Upper Bulkley River. Sites ranged in surface area between 16 and 240 m², with a mean of 107.1 m² (SE = 61.0). Barren Creek site BAR 1 had the smallest surface area (16 m), while side channel site SID 1 had the largest surface area (240 m). Wetted width averaged 8.3 m (SE =3.5) at Upper Bulkley sites, while mean depth and maximum depth averaged 83.2 cm and 102.8 cm respectively (SE = 22.4 and 23.5 respectively). The mainstem site UBR 11 and Barren Creek site BAR 1 had the smallest wetted width (4.0 m), while side channel site SID 1 had the largest wetted width (16 m) along with the largest estimated surface area. Buck Creek site BUC 2 had the largest mean wetted depth (121 cm), while site SID 2, a side channel site, had the lowest mean and maximum wetted depth (39.7 cm and 50 cm respectively). The upper Bulkley mainstem site (UBR 9) had the highest maximum wetted depth recorded as 147 cm. Of the sites sampled, none had a surface area smaller than 15 m², and none had a maximum wetted depth shallower than 50 cm.

4.1.1.1.2 HABITAT COMPOSITION AND SUBSTRATE

The majority of habitat sampled consisted of pools, with some glide, and riffle habitat. Sites sampled exhibited low gradients, ranging between 0-2% (96% of sites had a gradient of 0%). Pool habitat accounted for an average of 61% at the sites sampled in the upper Bulkley (range = 10-100%, SE = 0.26). Glides accounted for an average of 25% of the habitat (range 0-70%, SE

ŝ

A

= 0.22), riffles accounted for an average of 4.6% (range = 0-70%, SE = 0.141) and edge habitat accounted for an average of 8.7% (range = 0-20%, SE = 0.063). Of the 23 sites sampled in the upper Bulkley watershed, nine (36%) had less than 50% pool habitat. The old Richfield Creek site RIC 3 previously sampled in the winter of 1999-2000 (SKR 2000) had the lowest percentage of pool (10%), since infilling at this site has caused a shift in habitat from pool to riffle. Glide habitat was most prevalent at McQuarrie Creek, where this type of habitat accounted for 70% of the site. Edge habitat did not exceed 20% at any of the sites, due to the preferential selection of sites with water depths greater than 50 cm. Substrate at most of the sites consisted predominantly of cobbles (17 sites, 71%), with some sites having fines or mud as the dominant substrate (6 sites, 25%). The three Bulkley River side channel sites (SID 1, 2 and 3) all exhibited fines or mud substrate. Two of the Bulkley River mainstem sites (UBR 9 and 10) also had predominantly fines in the pool and glide habitat represented at these sites. Fines was the dominant substrate in pool and glide portions of the old RIC 3 site, which showed signs of infilling. Site UBR 11, a Bulkley River mainstem site, was the only site where boulders were the dominant substrate in pools, due to the presence of artificially placed rip rap. Embeddedness of substrate in pools and glides ranged between 0 and 50% among pools and glides with cobble substrate. Embeddedness was highest at the McOuarrie Creek site (McO) with a score of 50%. Bank erosion upstream, cattle activity and abundant periphyton were noted at this site during fall assessments. The majority of upper Bulkley sites where cobbles was the dominant substrate exhibited embeddedness below 10% (13 of 17 sites). Most of the habitat sampled in the upper Bulkley watershed consisted of cobble substrate within pools with some glides and a low proportion of edge and riffle habitat.

4.1.1.1.3 COVER

In-stream cover was evaluated at a total of 25 sites, including the 24 sites sampled throughout the winter and the old RIC 3 site on Richfield Creek. In-stream and out of stream cover recorded at sites sampled in the Upper Bulkley watershed varied between none and abundant amounts. All but one site sampled in the Upper Bulkley watershed offered at least trace amounts of in-stream cover, and most (17, 68%) (Figure 3) had some out-stream cover. The only site with no instream cover was McOuarrie Creek site McO1. While some cobble was present at this site, it was embedded to such a degree that it did not offer suitable habitat. This site also lacked overhanging vegetation cover, or other in-stream cover elements. Cobble was the most common cover element at all sites examined, regardless of the estimated total in-stream cover (Figure 3). LWD and SWD also added to the total instream cover at sites with trace, moderate and abundant total in-stream cover. Boulders were a notable in-stream cover element at sites with trace and moderate in-stream cover, but none of the sites with abundant total in-stream cover had boulder cover. Cutbanks and instream vegetation appeared to be relatively rare in-stream cover elements at sites sampled, while overhanging vegetation was noted as a source of out of stream cover at more than 68% of the sites sampled. Sites with cutbanks were purposely not selected for sampling since declines in water levels throughout the winter renders cutbank cover increasing unaffective. Varying amounts of in-stream cover were present at the sites sampled, however, the majority of sites (84%) exhibited trace or moderate amounts of cover. Cobble appeared to be the most common in-stream cover element at sites sampled between November 2000 and March 2001.

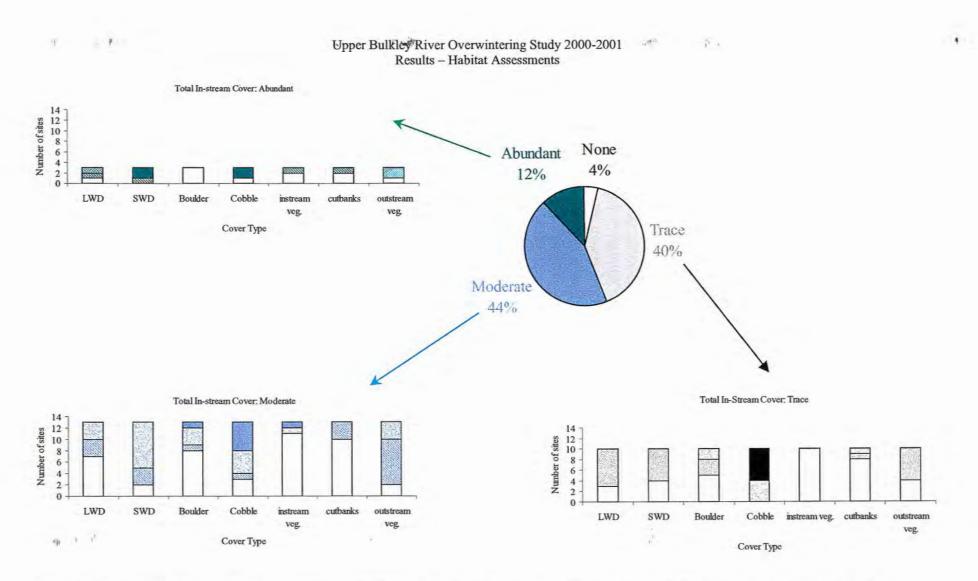


Figure 3. Pie chart illustrating the proportion of sites with varying levels of in-stream cover, rated as none, trace, moderate and abundant. Inset histograms illustrate the proportion of in-stream cover elements among sites with varying amounts of cover (white bars = none, diagonal bars = trace, cross hatched bars = moderate, solid bars = abundant cover). Also see Appendix 1b for enlarged histogram shown in this Figure.

Department of Fisheries and Oceans & SKR Consultants Ltd.

4.1.1.2 TOBOGGAN CREEK SITES

Fall habitat assessments were conducted at two of the six sites sampled during the winter in the Toboggan Creek drainage (Appendix 1). Both of these sites (TOB 1 and TOB 2) are characterized by fluvial habitat, and are located near the Toboggan Creek fish hatchery. Sites TOB 8 (side channel habitat) and TOB 7 (Toboggan Lake outlet) were added part way through the winter, and no fall habitat assessments were conducted at these sites due to the presence of ice. An additional side channel site (TOB 3) was visited in December and January, but was not suitable for sampling due to low water depth. The remaining two sites (TOB 5 and 6) are located on Toboggan Lake. Fall habitat assessments for Toboggan Creek sites are therefore limited to sites TOB 1 and TOB 2.

4.1.1.2.1 SURFACE AREA, WIDTH AND DEPTH

Site length, wetted width and wetted depth measurements were obtained for the two fluvial sites assessed in November 2000 in Toboggan Creek (TOB 1 and TOB 2). Surface area was calculated to be 70 m² and 103 m² for sites TOB 1 and TOB 2 respectively (mean = 86.3, SE = 23.1). Wetted width at site TOB 1 averaged 5 meters, and wetted width at site TOB 2 averaged 9.3 meters (mean = 7.2, SE = 3.1). Mean wetted depth averaged 64.5 cm (SE = 6.6), while maximum depth averaged 81 cm (SE = 8.49). Of the two sites sampled, site TOB 2 was deeper (mean wetted depth = 69.2 cm, max. wetted depth = 87 cm) than site TOB 1 (mean wetted depth = 59.8 cm, max wetted depth = 75 cm). Of the two fluvial sites sampled in Toboggan Creek, site TOB 2 was larger in both width and surface area, and deeper than site TOB 1.

4.1.1.2.2 HABITAT COMPOSITION AND SUBSTRATE

Sites sampled in Toboggan Creek represent lake, fluvial and side channel habitat. All six of the sites sampled had a gradient of 0%. The majority of habitat at the two fluvial sites was comprised of pools (75% at site TOB 1 and 50% at site TOB 2), but both sites also had some edge habitat (10% at both sites) and riffle habitat (15% at site TOB 1 and 40% at site TOB 2), but no glide habitat. Substrate at both fluvial sites consisted primarily of cobbles, with fines as subdominant substrate in pools and riffles, except for pebbles, which were the sub-dominant substrate in the riffle portion of site TOB 1. Substrate size was on average larger at site TOB 2 as indicated by the larger D_{90} at this site (28 cm) than at site TOB 1 (7 cm). Embeddedness was estimated as 5% at both sites. Fluvial habitat sampled at Toboggan Creek consisted of two cobble pools with low gradient.

4.1.1.2.3 COVER

In-stream and out of stream cover was evaluated for the two fluvial sites sampled in Toboggan Creek. Total in-stream cover at both sites was rated as moderate. In-stream cover elements at site TOB 1 consisted of LWD (moderate), SWD (moderate), cobble (moderate), and cut banks (trace). In-stream cover at site TOB 2 was comprised of SWD (moderate), boulder (moderate), and cobble (abundant). Substrate appears to be a more important portion of instream cover at site TOB 1, although the presence of boulder cover is somewhat in disagreement with substrate composition observed at this site (section 4.1.1.2.2, Appendix 1b).

-, 7

:=

4.1.1.3 COMPARISONS OF FALL HABITAT ASSESSMENTS AT UPPER BULKLEY AND TOBOGGAN CREEK

Fall habitat assessments for sites sampled in the Upper Bulkley and Toboggan Creek watersheds indicate that these sites are similar. Surface area, wetted width, mean and maximum wetted depth of the two Toboggan Creek sites fall within the range reported for Upper Bulkley sites. indicating that fluvial sites were similar in these dimensions, and should be comparable in terms of fish density indices (CPUE, catch/m² and catch/m³). No statistically significant difference was found between Toboggan Creek and Upper Bulkley sites in terms of surface area (t = 0.472, p = 0.641), wetted width (t = 12.706, p = 0.715), mean wetted depth (t = 1.160, p = 0.257) or maximum wetted depth (t = 1.286, p = 0.210). Percent pool habitat is also similar between sites sampled in the Upper Bulkley watershed and fluvial habitat in Toboggan Creek (t = 0.082, p =(0.935). While some sites had a low amount of glide habitat (mean = 25%) and edge habitat (mean = 8.7%), no glide habitat was present in the two Toboggan Creek sites, and edge habitat was also rare (mean = 10%). The low number of sites with these types of habitat decreased sample size, and did not allow for statistical comparisons between percent glide and edge habitat. On average, riffle habitat was significantly more common at the two sites in Toboggan Creek (mean = 25%) compared to the 23 sites in the upper Bulkley (mean = 4.6%). The higher proportion of riffle habitat at Toboggan Creek sites when compared to Upper Bulkley sites, may compensate for the lack of glide and edge habitat at these sites. Cobble was the dominant substrate in both the upper Bulkley and Toboggan Creek sites, and formed an important part of in-stream cover. Among sites sampled in the Upper Bulkley and Toboggan Creek, the three upper Bulkley side channel sites (SID 1, 2, and 3), the two sites in the Buck Creek release pond (BUC 7 and 8), the Toboggan Creek side channel site (TOB 8) and the three Toboggan Lake sites (TOB 5, 6 and 7) are unique from the remaining 22 sites.

4.1.2 Winter Assessments

4.1.2.1 UPPER BULKLEY SITES

Notable variability in water temperature, ice cover, conductivity, dissolved oxygen, turbidity, ice thickness and snow depth were observed among upper Bulkley sites during the winter. Quantitative data recorded during winter sampling at Upper Bulkley sites are summarized in Table 4. Ranges, means and variability of conditions recorded during winter assessments at sites in the Upper Bulkley watershed are summarized in Table 4. The highest air temperature (9°C) during the study was recorded at sites BUC 7 and 8 on December 6th, 2000, while the lowest air temperature (-16°C) was recorded at site BYM 2 on December 15th and at sites BYM3 and UBR 2 on December 14th, 2000. Water temperature was highest (3.8°C) at site SID 2 on March 6, 2001, and lowest (0°C) at sites BYM 3 (February 8th, 2000), RIC 3 (December 18th, 2000) and UBR 12 (December 18th, 2000). The highest conductivity measurement was obtained at site BYM 1 and McQ 1 on February 5th, 2001. Dissolved oxygen was generally greater than 10 ppm at most sites, with a high of 13 ppm recorded at site RIC 2 (January 8th, February 5th, and March 5th sampling). The three side channel sites (SID 1, SID, 2 and SID 3) were the only sites where dissolved oxygen was consistently less than 10 ppm, and was as low as 6 ppm (site SID 2,

Department of Fisheries and Oceans & SKR Consultants Ltd.

December 6th, 2000). Most of the Upper Bulkley tributary and mainstem sites exhibited ice cover of 100% for at least part of the winter, except site BYM 1, which had a maximum ice cover of 80% on December 5th, 2000. Two of the side channel sites (SID 2 and SID 3) had ice cover of 0% on December 6th, 2000. Water depth decreased to 0 cm at site SID 2 on December 6th, 2000, but was higher than 10 cm at all other sites for the duration of the winter. Ice thickness reached up to 73 cm (RIC 2 on March 5th, 2001). Ice thickness was variable, but was generally lower in side channel sites SID 2 and SID 3 (0-8 cm) than at other sites sampled. Snow depth was highest at site RIC 3 (45 cm on February 14th, 2001), and was generally lower at the channel sites SID 2 and 3 (0 cm) and a Byman Creek site BYM 2 (0-4 cm). Water was clear at all sites at all sampling events. Stream flow ranged from low to high, with most sites having moderate flow at most sampling events. High water flow was observed at sties BUC 6, BYM 1, RIC 2, UBR 9 and UBR 10. Low flow conditions were reported on more than one occasion at the side channel sites and all of the Richfield Creek sites. While some of these differences are due to changing environmental conditions during the winter, some of the variability appears to be due to differences between sites, particularly differences between side channel sites and tributary or mainstem sites sampled in the Upper Bulkley watershed.

Variable	N	Minimum	Maximum	Mean	Standard Error
Air Temperature	99	-16°C	9°C	-4.3°C	0.51
Water Temperature	100	0°C	3.8°C	0.65°C	0.069
Conductivity	71	40µS/cm	320µS/cm	117μ S/cm ¹	4.43 ¹
Dissolved Oxygen	100	6.0 ppm	13.0 ppm	11.15 ppm	0.142
Water Depth	100	26 cm	151 cm	78.2 cm	2.728
Ice Thickness	100	0 cm	73 cm	25.87 cm	1.682
Ice Cover	100	0%	100%	92.58%	1.987
Snow Depth	99	0 cm	45 cm	15.26 cm	1.396

¹ mean and SE for conductivity excludes outliers of 310 and 320 μ S/cm at the Buck Creek release pond.

4.1.2.2 TOBOGGAN CREEK SITES

Within sites sampled in the Toboggan Creek watershed, sites differed in water temperature, ice cover, conductivity, dissolved oxygen, ice thickness, water clarity, water flow and snow depth during the winter. Quantitative data recorded during winter sampling at Toboggan Creek sites are summarized in Table 5. Air temperature was highest at site TOB 6 (March 19th, 2001), and consistently low (-12°C) among all Toboggan Creek sites sampled on December 20th, 2000. Water temperature was lowest (0.1 °C) at sites TOB 5 and TOB 6 on January 22nd, 2001, while the highest water temperatures of 2.0°C was recorded at site TOB 7 on March 9th, 2001. The lowest water temperatures were recorded at the lake sites (TOB 5 and 6) while the highest water temperatures were recorded at the lake sites (100 ± 5 and 6) while the highest water temperatures were recorded at fluvial sites (TOB 1, 2 and 8). Conductivity was lowest (30 μ S/cm) at site TOB 8 (December 20th, 2000), and highest (110 μ S/cm) at site TOB 6 (January 22nd, 2001). Dissolved oxygen was lowest (2 ppm) at site TOB 6 on March 19th 2000. In fact, dissolved oxygen was consistently low at this site (mean = 5.5 ppm, SE = 1.71). Dissolved oxygen was also relatively low at site TOB 7 (6 ppm on March 9th, 2001), and at site TOB 5 (3

ppm on March 19th, 200[‡]). The highest dissolved oxygen readings (13 ppm) were obtained at site TOB 1. The three fluvial sites (TOB 1, TOB 2 and TOB 8) had dissolved oxygen readings greater than 10 ppm for the winter sampling period. All sites sampled throughout the winter (TOB 1, TOB 2, TOB 5, TOB 6 and TOB 8) had ice cover of 100% on at least one occasion. Ice thickness appeared to be greater at the lake sites (TOB 5 and 6), where ice thickness varied between 30 and 92 cm, than at the fluvial sites (TOB 1, 2 and 8) where ice thickness varied between 0 and 17 cm. The lowest water depth (30 cm) was recorded at site TOB 5 (March 19th, 2001), one of the lake sites, while the highest water depth (130 cm) was recorded at site TOB 7 at the lake outlet. Low water depth at a side channel site (TOB 3) visited on December 20th, 2000 and January 22nd, 2001, was insufficiently deep for sampling by minnow traps. Snow depth was highest at lake site TOB 5 (26 cm on January 22nd, 2001), and lowest at the fluvial sites (TOB1, 2 and 8) where snow depth ranged between 0 and 14 cm. Water was clear at all fluvial sites for the majority of sampling, but was moderately turbid for most sampling events at the lake sites (TOB 5 and 6). Stream flow ranged between low and high at fluvial sites, with high stream flow observed at sites TOB 2 and TOB 8 (March 19th, 2001), while no flow was observed at the lake sites (TOB 5 and 6). Although part of the variability in winter assessment data is attributable to seasonal differences in sampling, some of the variability appears to stem from differences between sites, particularly when comparing the lake sites (TOB 5 and 6) to the fluvial sites sampled in Toboggan Creek.

Variable	N	Minimum	Maximum	Mean	Standard Error	
Air Temperature	21	-12°C	-2°C	-5.57°C	0.827	
Water Temperature	20	0.1°C	2.0°C	0.77°C	0.122	
Conductivity	10	30µS/cm	110µS/cm	77.0µS/cm	7.157	
Dissolved Oxygen	20	2.0 ppm	13.0 ppm	9.12 ppm	0.738	
Water Depth	20	30 cm	130 cm	71.15 cm	5.409	
Ice Thickness	21	0 cm	53 cm	20.91 cm	4.428	
Ice Cover	21	0%	100%	69.0%	9.139	
Snow Depth	21	0 cm	26 cm	5.714 cm	1.810	

 Table 5. Summary of winter assessment results at sites in Toboggan Creek drainage.

4.1.2.3 COMPARISONS OF WINTER ASSESSMENTS AT UPPER BULKLEY AND TOBOGGAN CREEK

Winter sampling data between the Toboggan Creek and Upper Bulkley sites were compared to establish if there are distinct differences between the two drainages sampled. Air temperature is not statitistically different between the two drainages (U=922.00, p=0.414), indicating that the two drainages are subject to similar ambient conditions. However, snow depth is significantly greater in the Upper Bulkley watershed than at sites sampled in Toboggan Creek (U=615.5, p=0.003). The percent ice cover is significantly less at Toboggan Creek sites than at Upper Bulkley sites (U=771.5, p=0.013), while the thickness of the ice cover is similar between sites sampled in the two drainages (U=863.50, p=0.202). Higher snow levels and greater ice thickness at Upper Bulkley mainstem and tributary sites compared to Toboggan Creek sites may be due to differences in elevation between the two watersheds, and the slightly more interior climate experiences in the Upper Bulkley watershed when compared to Toboggan Creek. There is no statistically significant difference between water temperature in sites sampled in Toboggan

19

22

Ξ.

-

Creek or the Upper Bulkley River (U=1186.5, p=0.186). Conductivity and dissolved oxygen concentrations were significantly higher at Upper Bulkley sites than at Toboggan Creek sites (U=133.5, p = 0.002 excluding outliers in Buck Creek, and U = 607.0, p=0.004 respectively). Comparisons of dissolved oxygen between Upper Bulkley mainstem, tributary, and side channel sites, and Toboggan Creek mainstem, side channel and lake sites indicate that there is significant difference between these different categories of sites (ANOVA F = 71.297, p = 0.000). Dissolved oxygen at Toboggan Lake is significantly lower than of any site sampled (Tukey HSD \geq 1.817, p \leq 0.001). Similarly, dissolved oxygen is significantly lower in Upper Bulkley side channel sites than oxygen concentrations at other Upper Bulkley sites or fluvial habitat at Toboggan Creek (Tukey HSD \geq 2.583, p \leq 0.002). Dissolved oxygen concentrations are significantly lower at Upper Bulkley mainstem sites than in Upper Bulkley tributary sites (Tukey HDS = 1.240, p = 0.000), but there is no statistical difference in dissolved oxygen between Upper Bulkley mainstem sites or Toboggan Creek mainstem and side channel sites. Nor is there a statistical difference between Toboggan Creek fluvial sites (mainstem and side channel) and Upper Bulkley tributary sites. There was no statistical difference in water depth between the sites sampled in Toboggan Creek and the Upper Bulkley River (U=917.0, p = 0.559). While winter assessment data recorded for sites in the Upper Bulkley and Toboggan Creek watersheds are similar in many respects, there are statistically significant differences in snow depth, percent ice cover, conductivity, and dissolved oxygen.

4.1.3 Changes in Habitat During the Winter

Previous comparisons have indicated that the sites sampled during the Bulkley overwintering study can be grouped into six distinct categories based on geographical and physical features. Sites in the Upper Bulkley watershed can be grouped into mainstem, side channel and tributary sites (including fluvial sites and two sites at the Buck Creek release pond), and sites in the Toboggan Creek watershed can be grouped into lake, side channel and mainstem sites. These broad categories are used for comparisons of the remainder of the data.

4.1.3.1 UPPER BULKLEY SITES

Temporal trends in ambient temperature, water temperature, percent ice cover, ice thickness, water depth, snow depth, dissolved oxygen and conductivity were graphed for each site (Appendix 2b). These data were recorded at all sites during each sampling interval, except conductivity, which was not recorded in March due to meter malfunction. Ambient temperature is affected more by sampling date than by the type of site sampled (side channel, mainstem or tributary). Ambient temperature was most variable in December, as some sites were sampled during a warm spell in the first week of December. Ambient temperatures in January, February and March were less variable, and were generally lowest in January and February, with a marginal increase in March. Other temporal trends appear to be affected by both sampling dates and the type of site sampled. Temporal trends in water temperature, percent ice cover, ice thickness, water depth, snow depth, dissolved oxygen and conductivity are discussed separately for mainstem, side channel and tributary sites.

17

- 5

i.

3

4.1.3.1.1 UPPER BULKLEY MAINSTEM

Temporal trends at Upper Bulkley mainstem sites differed from side channel and tributary sites sampled in the Upper Bulkley watershed. Water temperatures at Upper Bulkley mainstem sites were generally lower than side channel or tributary sites, especially in December and January, although water temperatures at sites UBR 11 and 12 downstream of Houston increased to among the highest recorded in the Upper Bulkley watershed by March (1.7 and 2.2 respectively compared to 0.1 - 0.5 at other Upper Bulkley mainstem sites, except for a temperature reading at UBR 1 of 1.3 on March 14 the latest of the three sites sampled). Ice cover was complete at all mainstem sites except for site UBR 9 in the first week in December (all sites sampled on the same day had incomplete ice cover), and site UBR 1 during the March sampling period. Ice thickness generally increased at the Upper Bulkley sites throughout the winter. Water depth fluctuated, but did not show a clear temporal trend, although it is interesting to note that the increase in water temperatures at sites UBR 11 and 12 between February and March coincides with an increase in water depth at site UBR 12, and a decrease in water depth at site UBR 11, despite the fact that these two sites were sampled on the same sampling dates in both February and March. Snow depth at Upper Bulkley mainstem sites appear to peak slightly during the January sampling period, and gradually declines to March while snow depth at tributary sites (particularly Richfield and Buck Creek sites) does not peak until February. Conductivity remained relatively consistent throughout the sampling period, but no conductivity readings were recorded in March due to meter malfunction. Dissolved oxygen also did not show any clear declines or increases during the winter, but remained relatively consistent and intermediate between side channel sites and tributary sites in the watershed. Overall, several of the data collected during the winter indicated that water quality remained relatively consistent at the mainstem sites in terms of water temperature, percent ice cover, conductivity, and dissolved oxygen, and that ice thickness generally increases throughout the winter at the Upper Bulkley mainstem sites.

4.1.3.1.2 UPPER BULKLEY SIDE CHANNELS

The three side channel sites sampled in the Upper Bulkley were distinct from other sites sampled in the Upper Bulkley. These sites had consistently higher water temperatures than those observed at either Upper Bulkley mainstem sites or Upper Bulkley tributary sites. Water temperatures decreased at side channel sites between December and January, but subsequently increased to the end of March. Ice cover was incomplete at side channel sites in December, and remained incomplete at site SID 2 for the duration of the winter. Incomplete ice thickness in December is likely a result of the sampling dates, which fell within the warm spell at the beginning of December, resulting in incomplete ice formation, while other sites were sampled a few days later at notably colder ambient temperature. Similarly, ice thickness at site SID 2 and 3 were among the lowest observed in the study, while ice thickness at site SID 1 was similar to that at other sites in the Upper Bulkley watershed. The low water depth (0 cm) at site SID 2 in December is likely a data error since water quality measures were taken, and subsequent water depth measurements were consistently between 40 and 45 cm. The relatively high water temperature at this site likely resulted in low percent ice cover, low ice thickness and low snow thickness. No clear temporal trends in percent ice cover, ice thickness, snow depth, water depth, dissolved oxygen or conductivity were found at the side channel sites sampled.

Department of Fisheries and Oceans & SKR Consultants Ltd.

-12

<u>___</u>

÷

1

4.1.3.1.3 UPPER BULKLEY TRIBUTARIES

Water temperature, water depth, percent ice cover, ice thickness, snow depth, dissolved oxygen and conductivity were recorded at each of the 16 Upper Bulkley tributary sites throughout the winter. Water temperatures in tributaries were variable, and variation existed within and among tributary streams sampled. Water temperature at BYM 1 and 2 were generally higher than at BYM 3, which exhibited among the lowest water temp observed, and was consistently lower than most other tributary sites sampled. Water temperatures at the Buck Creek release pond were among the highest recorded, and were higher than temperatures in other Buck Creek sites. Water temp at RIC 1 generally increased over the sampling periods, while water temperature at RIC 2 decreased from December to January and remained low for the remainder of the study. similar to trends observed at most Buck Creek sites. Water temperature at all Richfield Creek and Buck Creek sites increased from February to March except at site RIC 5 where water temp decreased from 1.1 to 0.7 C. Water temperature at McQuarrie varied little over the winter and ranged between 0.2 to 0.4 C. Similar to Upper Bulkley mainstem sites, tributary sites sampled on December 6th, 2000 had incomplete ice cover due to high ambient temperature on that sampling date. Ice cover was incomplete (50% to 80%) at sites BYM 1 and BYM 3 for the duration of the winter while all other tributary sites had complete ice cover after the first week of December until the March sampling period. Flow levels at site BYM 1 appeared to be higher than at most other Upper Bulkley tributary sites. Similarly, Byman Creek sites had consistently lower ice thickness than other tributaries sampled, particularly when compared to Richfield Creek. Ice thickness generally increased at sampling sites during the winter. Snow depth was generally greater at Richfield Creek and Buck Creek sites than at Byman Creek, McQuarrie Creek or Barren Creek sites. Snow depth at tributary sites peaked in the February sampling period. Water depth generally declined at tributary sites, but conductivity and dissolved oxygen concentrations remained relatively consistent except for a peak in conductivity in the Buck Creek released pond in February. These unusually high conductivity readings were obtained after the field meter was submersed in water, causing the meter to become inoperable. Similar to Upper Bulkley mainstem sites, several of the data collected during the winter indicated that conditions remained relatively consistent at the mainstem sites in terms of water temperature, percent ice cover, conductivity, and dissolved oxygen. Ice thickness generally increases throughout the winter at the Upper Bulkley tributary sites, while water depth generally decreases.

4.1.3.2 TOBOGGAN CREEK SITES

Temporal trends in ambient temperature, water temperature, percent ice cover, ice thickness, water depth, snow depth, dissolved oxygen and conductivity were graphed for each site sampled in the Toboggan Creek watershed (Appendix 2b). These data were recorded at all sites during each sampling interval, except conductivity, which was not recorded in February or March. Ambient temperature is affected more by sampling date than by the type of site sampled (side channel, mainstem or lake). Ambient temperature was lowest in December, as sites were sampled during a relatively cold week in December (less than -10° C). Ambient temperature remained between 0 and -10° C for the remainder of the sampling period. Other temporal trends appear to be affected by both sampling dates and the type of site sampled. Temporal trends in water temperature, percent ice cover, ice thickness, water depth, snow depth, dissolved oxygen and conductivity are discussed separately for mainstem, side channel and lake sites.

<u>~</u>

25

÷.,

4.1.3.2.1 TOBOGGAN CREEK MAINSTEM

Water temperature, water depth, percent ice cover, ice thickness, snow depth, dissolved oxygen and conductivity were recorded at each of the two Toboggan mainstem sites throughout the winter. Since the two sites sampled at Toboggan Creek were in close proximity to each other, these sites may not represent the variation in environmental conditions at Toboggan mainstem sites. Water temperature at site TOB 1 was relatively consistent throughout the winter, while water temperature at site TOB 2 fluctuated considerably. Ice cover also fluctuated at site TOB 2 between 0 and 100%, while ice cover at site TOB 1 was complete after the December sampling period. Ice thickness at the two Toboggan Creek mainstem sites. Water depth at both Toboggan Creek mainstem sites was relatively consistent, and snow depth was low at both sites. Dissolved oxygen and conductivity did not fluctuate notably during the winter. Toboggan Creek mainstem sites show no temporal trends in water depth, ice cover, ice thickness, dissolved oxygen, conductivity, or water temperature over the winter.

4.1.3.2.2 TOBOGGAN CREEK SIDE CHANNELS

Two side channels were sampled in the Toboggan Creek watershed (sites TOB 3 and TOB 8), but only site TOB 8 was sampled throughout the entire winter. This was due to the fact that site TOB 3 did not have sufficient water depth to allow for trapping. Water temperature at site TOB 8 was relatively high at the onset of winter (likely due to mild fall and delayed winter conditions), but declined in January and then increased in February and March. The side channel site did not freeze completely until the February sampling period, and ice thickness did not show any clear temporal trends. Water depth remained relatively consistent at the side channel site throughout the winter, and snow depth was only noted in December. Conductivity at the Toboggan side channel site was low when compared to the mainstem sites. Dissolved oxygen remained relatively consistent over the winter (10 or 11 ppm). Overall, environmental conditions measured at the Toboggan Creek side channel site TOB 8 fluctuated little over the winter, and did not show any clear temporal trends.

4.1.3.2.3 TOBOGGAN LAKE

Two sites were sampled in Toboggan Lake throughout the winter, and a third site was added in March at the lake outlet since water depth at the two established Toboggan Lake sites was insufficient for trapping. Water temperatures at the Toboggan Lake sites were consistently lower than water temperature at Toboggan mainstem or side channel sites throughout the winter. Complete ice cover was present at the lake sites at all sampling intervals, and the ice was generally thicker than at the Toboggan mainstem or side channel sites. Ice thickness at the lake sites increased gradually but consistently throughout the winter sampling periods. Snow depth was also greater at the lake sites than at fluvial sites in Toboggan Creek in December, January and February (no snow was noted at any Toboggan sites in March). While conductivity remained relatively consistent decline at the two Toboggan Lake sites sampled throughout the winter. Dissolved oxygen concentrations decreased from 10 ppm at both sites in December to 2 or 3 ppm in March. The lake outlet sampled only in March also exhibited a relatively low oxygen concentration of 6 ppm, although this concentration was intermediate between the lake

Department of Fisheries and Oceans & SKR Consultants Ltd.

12

4.10

....

ŝ

Upper Bulkley River Overwintering Study 2000-2001 Results – Habitat Assessments

and fluvial sites sampled in the system. Toboggan Lake sites show clear declines in dissolved oxygen, and increase in ice thickness over the winter.

4.1.3.3 COMPARISONS OF CHANGES IN HABITAT DURING THE WINTER AT UPPER BULKLEY AND TOBOGGAN CREEK

÷...

Fluvial habitat sampled in both the Upper Bulkley and Toboggan Creek watersheds appear to show few consistent temporal trends in water depth, temperature, snow depth, ice thickness and cover, conductivity or dissolved oxygen. However, side channel sites in the Upper Bulkley watershed, and Toboggan Lake sites show declines in dissolved oxygen, and declines in water depth were noted in Upper Bulkley tributary sites. Most sites exhibit an increase in ice thickness over the winter, including Toboggan Lake, upper Bulkley mainstem and tributary sites, but this trend was not noted at sites were ice cover was incomplete in the winter (e.g. Upper Bulkley side channel sites, Toboggan Creek mainstem and side channel sites).

4.2 FISH SAMPLING =

į.

Eight species of fish were-recorded in the fish data obtained in the Upper Bulkley and Toboggan Creek overwintering study. These species include coho, rainbow trout/steelhead (herein after referred to as rainbow trout), Dolly Varden, chinook, cutthroat trout, longnose dace, suckers and peamouth chub. Of the sites sampled, Buck Creek and Toboggan Creek are enhanced coho stocks with annual releases of coho. The following sections present fish sampling results for the Upper Bulkley and Toboggan Creek sites sampled between December 2000 and March 2001.

4.2.1 Species Distribution and Diversity

Species distribution and diversity varied between watersheds and between sites within watersheds. Of the eight species recorded in the study, three (coho, rainbow trout, and DollyVarden) were captured in the Toboggan Creek watershed. No non-salmonids were captured at the Toboggan Creek sites sampled. Seven species (coho, rainbow trout, chinook, longnose dace, suckers, peamouth chub and cutthroat trout) were recorded at sites in the Upper Bulkley watershed. The two cutthroat trout reported for the Upper Bulkley watershed may have been a misidentified rainbow trout, although this is unclear, and the data analysis assumed that the fish had been correctly identified. A greater variety of species was captured in the Upper Bulkley watershed than in the Toboggan Creek watershed.

Of the 1522 fish captured most were rainbow trout and coho, with each of these species contributing 43.5% of the catch. The remainder of the species were chinook (10.9%), Dolly Varden (0.7%), suckers (0.5%), longnose dace (0.5%), peamouth chub (0.3%) and cutthroat trout (0.1%). Most of the 662 coho were captured in the Toboggan Creek watershed (83%). Fourtyfive percent of the 662 coho were captured in the two Toboggan Creek mainstem sites (TOB 1 and 2), 27% were captured in the Toboggan Creek side channel site (TOB 8) and 11% were captured in the two Toboggan Lake sites (TOB 5 and 6) and the outlet of Toboggan Lake (TOB 7). No coho were captured in the Upper Bulkley side channel sites (SID 1, 2 and 3), while 13% were captured in the 22 tributary sites, and 4% were captured in the six Upper Bulkley mainstem sites. The majority of the 662 rainbow trout sampled during the study were captured in the Upper Bulkley watershed, with 49% captured in the Upper Bulkley tributary sites, 20% in the Upper Bulkley mainstem-sites, and none in the Upper Bulkley side channel sites. An additional 22% of the 662 rainbow trout were captured in Toboggan Creek mainstem sites, 7% were captured in the Toboggan side channel site, and 2% in the Toboggan Lake and outlet sites. All of the 166 chinook were captured in the Upper Bulkley watershed, with 59% captured in Upper Bulkley tributaries (Richfield and Buck Creek sites), and 41% in Upper Bulkley mainstem sites. All of the ten Dolly Varden were captured in the Toboggan Creek watershed, and were present in Toboggan mainstem (30%), Toboggan Lake and Toboggan Lake outlet (50%) and Toboggan side channel sites (20%). Cutthroat trout, longnose dace, suckers and peamouth chub were only captured in the Upper Bulkley watershed (Upper Bulkley mainstem, side channel, Buck Creek, Richfield Creek and Byman Creek).

Species richness, diversity and evenness was determined for each site, and averaged for the four sampling intervals during the winter (Appendix 3). Up to four different species were captured at the sites sampled during the winter. Sites with higher species richness tended to have higher

Ť

......

species diversity and exenness. No fish were captured at some Upper Bulkley tributary, mainstem and side channel sites during some sampling periods, but fish were captured at the Toboggan Creek side channel and mainstem site during each of the four sampling intervals. This decreased the range of species diversity, evenness and richness for the Toboggan Creek mainstem and side channel sites when compared to other sites.

Species richness, diversity and evenness were compared between drainages and between different categories of sites within the drainages. Average species richness, diversity and evenness of sites sampled in Upper Bulkley mainstem, side channel and tributaries, as well as in Toboggan Creek mainstem, side channel and lake sites are summarized in Table 6. On average, species richness, evenness and diversity did not differ significantly between Toboggan Creek and Upper Bulkley mainstem sites (Mann-Whitney U = 0.653, 1166.5 and 1166, p = 0.653, 0.078 and 0.078 respectively) despite the fact that a greater variety of species was captured among Upper Bulkley sites. Species richness differed significantly between tributary, side channel, mainstem and lake sites in the two drainages (KS = 22.711, p = 0.000), as did species diversity and evenness (KS = 11.253, p = 0.047). Species richness, diversity and evenness were highest in Upper Bulkley tributary sites, and lowest in Upper Bulkley side channel sites where few fish were captured. Toboggan mainstem and side channel also had among the highest species richness, diversity and evenness, which were just slightly lower than those observed at Upper Bulkley tributary sites. Toboggan Lake had relatively low species diversity, richness and evenness, similar to sites in the Upper Bulkley mainstem. Overall, average species richness, diversity and evenness was influenced more by the type of sites sampled (e.g. lacustrine versus fluvial) than by the drainage in which the sites were located. Species richness, diversity and evenness were highest in Upper Bulkley tributary sites, followed by Toboggan Creek mainstem and side channel sites, Upper Bulkley mainstem and Toboggan Lake sites, and Upper Bulkley side channel sites.

mainstem sites in Toboggan Creek.										
	Spec	cies Rich	ness	Species Diversity			Evenness			
	Range_	Mean	SE	Range	Mean	SE	Range	Mean	SE	
Upper Bulkley Tributaries ¹	0-4	2.25	0.114	0.00-0.577	0.252	0.020	0.00-0.683	0.298	0.023	
Upper Bulkley	0-2	0.667	0.284	0.00-0.301	0.100	0.043	0.00-0.356	0.119	0.051	

Table 6.	Mean species richness, species diversity and evenness at tributary, side channel
	and mainstem sites in the Upper Bulkley watershed, and lake, side channel and
	mainstem sites in Toboggan Creek.

	Range_	Mean	SE	Range	Mean	SE	Range	Mean	SE
Upper Bulkley Tributaries ¹	0-4	2.25	0.114	0.00-0.577	0.252	0.020	0.00-0.683	0.298	0.023
Upper Bulkley Sidechannels	0-2	0.667	0.284	0.00-0.301	0.100	0.043	0.00-0.356	0.119	0.051
Upper Bulkley	0-3	1.682	0.232	0.00- 0.439	0.192	0.037	0.00-0.520	0.227	0.043
Mainstem Toboggan Lake	0-3	1.286	0.421	0.00-0.308	0.112	0.054	0.00-0.364	0.133	0.064
Toboggan Sidechannel	2-3	2.250	0.250	0.132-0.217	0.190	0.020	0.157-0.257	0.225	0.024
Toboggan Creek Mainstem	2-3	2.125	0.125	0.141-0.287	0.212	0.018	0.167-0.340	0.252	0.022

5

÷ą.

In summary, species distribution, diversity, richness and evenness were found to differ somewhat between and within habitat types sampled in Toboggan Creek and the Upper Bulkley watershed. Coho is the dominant species at sites sampled in Toboggan Creek, while rainbow trout dominates catches at sites sampled in the Upper Bulkley watershed. Chinook, cutthroat trout and non-salmonid species (longnose dace, suckers and peamouth chub) were only encountered in the Upper Bulkley, while Dolly Varden were only captured in Toboggan Creek. Species richness, diversity and evenness does not differ significantly between the watersheds, but differs significantly between sites sampled. Upper Bulkley tributary sites had the highest and Upper Bulkley side channel the lowest average species diversity, richness and evenness.

4.2.2 Density Indices

Fish capture data and fall assessment data were used to calculate catch per unit effort (CPUE), and the number of fish by unit area and unit volume of habitat. All of these estimates of density are related, and are strongly correlated, generally showing the same temporal trends (Appendix 4). Fall assessments were not conducted at all sites (e.g. UBR 1 and UBR 2, TOB 5, TOB 6, TOB 7 and TOB 8), and these sites did not have sufficient data to determine catch per unit area or volume. Since comparisons of CPUE are able to include data for all sites, while catch per unit area and volume are limited to the sites for which fall assessments were conducted, the majority of the data analysis focuses on comparisons of CPUE data. This section present CPUE data, and compares CPUE and fish/cubic meter over time as well as between sites.

Total catch and CPUE for the four sampling intervals are summarized for each of the 31 sites in Table 7. Total catch was highest at Richfield Creek site (RIC 3), and lowest in the Upper Bulkley side channel sites (SID 1, SID 2, SID 3). Similarly, CPUE was highest at site RIC 3 and lowest in Upper Bulkley side channel sites. Total catch over the winter exceeded 100 fish over the four months of the study at five of the 31 sites (16.1%). These sites include Upper Bulkley mainstem site UBR 2, Upper Bulkley tributary sites BUC 5, RIC 2, RIC 3 and Toboggan Creek sites TOB 1. Two of the six Upper Bulkley mainstem sites (33%), and none of the Upper Bulkley side channel sites had CPUE greater than 1.5 fish / trap. However, 14 of the 22 Upper Bulkley tributary sites (63.6%) had CPUE greater than 1.5 fish / trap. CPUE in Toboggan Creek sites was lower than 1.5 fish / trap for the winter, but CPUE in the Toboggan Lake outlet, sampled in March was greater than 1.5 fish / trap. Over the winter, most of the fish were captured in the Upper Bulkley tributary sites, and the Toboggan Creek mainstem and side channel sites, while few fish were captured in to Upper Bulkley side channel and Toboggan Lake sites.

5

Table 7. Summary of trap catches of juvenile salmonids at each of the sites sampled during the overwintering study. C = total catch, % = proportion of the total catch, CPUE = mean catch of each species using monthly CPUE data. Upper Bulkley sites are indicated in regular text and Toboggan Creek sites are indicated in italics.

	# Coho Salmon			R	ainbow		Ch	inook S	Chinook Salmon		Dolly V	arden	All Species			
	Site	Traps Set		0/	CPUE	С	steelh		С	%	CPUE	С	%	CPUE	С	CPUE
	LIDD 1	12	C 0	% 0.0	0.00	3	% 30.0	CPUE 0.25	7	70.0	0.58	0	0.0	0.00	10	0.83
	UBR1	12	29	27.1	2.42	44	41.1	3.67	34	31.8	2.83	0	0.0	0.00	107	8.92
ley	UBR2	12		4.2	0.08	10	41.1	0.83	13	54.2	1.08	0	0.0	0.00	24	2.00
BE	UBR9	12	1	4.2	0.08	2	28.6	0.83	3	42.9	0.25	0	0.0	0.00	- 24	0.58
er H	UBR10 UBR11	12	2	13.3	0.00	2	46.7	0.17	6	42.9	0.23	0	0.0	0.00	15	1.25
Upper Bulkley mainstem	UBR12	12	2	0.0	0.17	0	40.7	0.00	4	100	0.30	0	0.0	0.00	4	0.33
		- 15	5	35.7	0.63	9	64.3	1.13	4	0.0	0.00	0	0.0	0.00	14	1.75
	BAR1 BUC1	20	35	70.0	1.75	15	30.0	0.75	0	0.0	0.00	0	0.0	0.00	50	2.50
	BUC2	20	3	8.6	0.11	29	82.9	1.04	2	5.7	0.00	0	0.0	0.00	35	1.25
	BUC2 BUC5	28	19	16.4	0.68	<u>91</u>	78.4	3.25	5	4.3	0.18	0	0.0	0.00	116	4.14
1 -	BUC5 BUC6	20	19	² 2.2	0.05	36	80.0	1.80	7	15.6	0.35	0	0.0	0.00	45	2.25
	BUC7	12	24	- 49.0	2.00	17	34.7	1.42	7	14.3	0.58	0	0.0	0.00	49	4.08
	BUC8	12	11	28.9	0.92	14	36.8	1.12	12	31.6	1.00	0	0.0	0.00	38	3.17=
	BYM1	24	1	2.9	0.04	33	94.3	1.38	0	0.0	0.00	0	0.0	0.00	35	1.46
<i>"</i>	BYM2	12	32	39.5	2.67	46	56.8	3.83	3	3.7	0.25	0	0.0	0.00	81	6.75
arie	BYM3	12	15	35.7	1.25	26	61.9	2.17	1	2.4	0.08	0	0.0	0.00	42	3.50
Upper Bulkley Tributaries	McQ1	12	2	5.6	0.17	34	94,4	2.83	0	0.0	0.00	0	0.0	0.00	36	3.00
L L	RIC1	12	9	34.6	0.75	16	61.5	1.33	1	3.8	0.08	0	0.0	0.00	26	2.17
Ikle	RIC2	12	85	68.0	7.08	30	24.0	2.50	10	8.0	0.83	0	0.0	0.00	125	10.42
B.	RIC3	16	83	47.4	5.19	73	41.7	4.56	17	9.7	1.06	0	0.0	0.00	175	10.94
ber	RIC4	16	30	30.3	1.88	35	35.4	2.19	33	33.3	2.06	0	0.0	0.00	99	6.19
5	RIC5	28	27	32.9	0.96	53	64.6	1.89	1	1.2	0.04	0	0.0	0.00	82	2.93
1	SID1	24	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	4	0.17
	SID2	12	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	2	0.17
	SID3	24	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	4	0.17
2	TOB1	12	108	85.0	9.00	19	15.0	1.58	0	0.0	0.00	0	0.0	0.00	127	10.58
	TOB2	12	64	80.0	5.33	13	16.3	1.08	0	0.0	0.00	3	3.8	0.25	80	6.67
3	TOB5	12	9	75.0	0.75	0	0.0	0.00	0	0.0	0.00	3	25.0	0.25	12	1.00
	TOB6	12	4	-100.0	0.33	0	0.0	0.00	0	0.0	0.00	0	0.0	0.00	4	0.3
	TOB7	4	13	76.5	3.25	2	11.8	0.50	0	0.0	0.00	2	11.8	0.50	17	4.25
4	TOB8	12	50	87.7	4.17	5	8.8	0.42	0	0.0	0.00	2	3.5	0.17	57	4.75

1 =Upper Bulkley side channel sites, 2 =Toboggan Creek mainstem sites, 3 =Toboggan Lake sites, 4 =Toboggan side channel sites

1

÷2

122

. Alest

Upper Bulkley River Overwintering Study 2000-2001 Results – Fish Sampling

Combined catch for all species varied during the sampling period (Appendix 4). CPUE for all species combined in Toboggan Creek was high in December, with a subsequent decline in CPUE in January (Figure 4). Compared to Toboggan Creek, CPUE for all species combined in the Upper Bulkley sites remained relatively consistent throughout the winter. CPUE for all species combined at Toboggan Lake and Upper Bulkley side channel sites were low throughout the winter, and no temporal trends were noted, although the inability to set traps in the two Toboggan Lake sites in March suggests that Toboggan Lake habitat sampled may not be suitable for overwintering. Total CPUE for all species did not change significantly over time at Toboggan Creek sites (ANOVA F = 3.842, p = 0.057), but the trend suggests a decline, particularly from December to January. Variability in the catch data may have been too large to detect a significant difference in the catch. Similarly, CPUE for all species combined did not change significantly over time at Upper Bulkley mainstem sites (ANOVA F = 0.324, p = 0.808) or at Upper Bulkley tributary sites (ANOVA F = 0.917, p = 0.438). CPUE for all species combined appears to decline somewhat, particularly when comparing CPUE in December and March, but this decline is not statistically significant. The lack of statistically significant temporal trends in CPUE for all species combined at sites sampled in the Upper Bulkley mainstem, tributaries, and Toboggan Creek mainstem and side channels may be due to the relatively large variability in the data.

CPUE for all species combined and the number of fish per unit volume were compared between Upper Bulkley mainstem and tributary sites, and Toboggan Creek mainstem and side channel sites for each of the four months sampled in the overwintering study. Toboggan Lake and outlet sites (TOB 5, 6 and 7) and Upper Bulkley side channel sites (SID 1, 2 and 3) were not included in this analysis since few fish were captured in these sites. CPUE differed significantly (ANOVA F = 3.391, p = 0.036), while the number of fish per cubic meter did not differ significantly between the Toboggan mainstem, Toboggan side channel, Upper Bulkley mainstem or Upper Bulkley tributary sites sampled in December. CPUE for all species combined was significantly higher at the Toboggan Creek mainstem sites than the Upper Bulkley tributary sites (Tukey HSD = 10.307, p = 0.040) and Upper Bulkley mainstem sites (Tukey HSD = 12.028, p = 0.032). CPUE for all species combined in Toboggan Creek side channel was also greater than at UBR mainstem and tributaries, but this difference was not statistically significant, probably due to the high variance. There was no statistically significant difference in CPUE for all species combined, or total catch per unit volume in January (ANOVA F = 1.728, p = 0.192 and ANOVA F = 0.849, p = 0.444 respectively), February (ANOVA F = 0.365, p = 0.779 and ANOVA F = 0.0001.572, p = 0.236 respectively) or March (ANOVA F = 1.058, p = 0.388 and ANOVA F = 1.024, p = 0.379 respectively). The high CPUE for all species combined at Toboggan Creek mainstem sites in December resulted in the significant difference between these sites and Upper Bulkley mainstem and tributary sites in December.

In summary, CPUE for all species combined and catch per unit volume did not differ statistically over time, although the trend data suggest a decline in overall catch in both Toboggan Creek and the Upper Bulkley watershed. This decline is most pronounced in Toboggan Creek, where total catch was high in December, drastically declined in January and remained relatively low in February and March. Catch per unit effort was relatively low in the Upper Bulkley watershed when compared to Toboggan Creek, particularly in December. CPUE for all species combined was significantly higher at mainstem sites in Toboggan Creek than at sites in the Upper Bulkley

÷.,

Upper Bulkley River Overwintering Study 2000-2001 Results – Fish Sampling

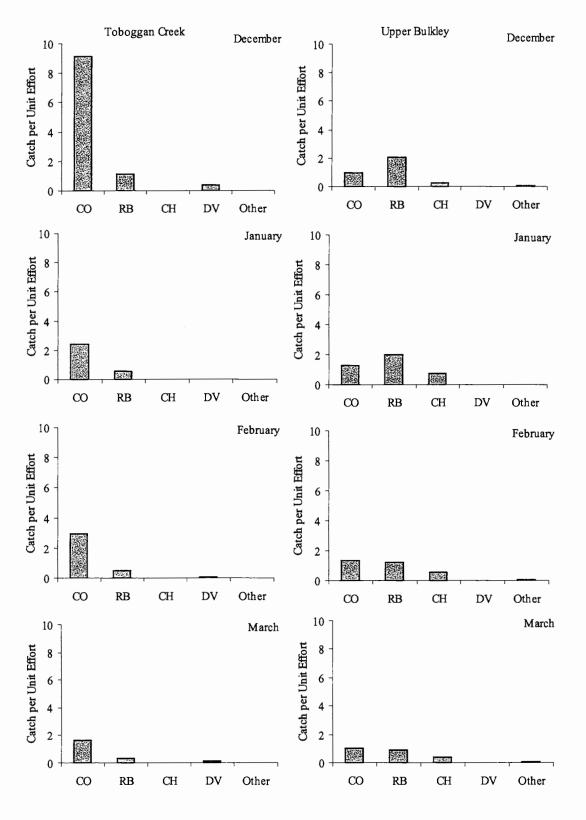


Figure 4. Comparisons of rates between Upper Bulkley sites and Toboggan Creek sites (CO = coho, RB = rainbow, CH = chinook, DV = Dolly Varden, other = cutthroat trout, longnose dace, suckers and peamouth chub).

30

(tributary and mainstem), CPUE for all species combined was not statistically different between sites in the Upper Bulkley mainstem and tributaries, Toboggan Creek mainstem and side channel. CPUE for all species combined was lowest in Toboggan Lake and Upper Bulkley side channels.

4.2.2.1 COHO

Most of the coho sampled in the study were captured in the Toboggan Creek watershed, despite the lower number of sites sampled in this watershed. Overall, 83% of all coho captured were captured in Toboggan Creek, which constituted 19.4% of the sites (one of these site was only sampled in March). On average, CPUE for coho was highest at Toboggan mainstem sites (TOB 1 and TOB 2). In fact, most the catch at these sites (> 80%) consisted of coho (Table 7). Most of the coho were captured in December at these sites (Figure 4). Among Upper Bulkley sites, coho CPUE was high in Richfield Creek sites (RIC 2 and 3) where coho comprised between 47 and 68% of the catch. Generally, coho CPUE was higher in Upper Bulkley tributary sites than in mainstem sites, except for site UBR 2, which is located near the mouth of Byman Creek. In tributary sites, 31.7% of the catch was comprised of coho, while in Upper Bulkley mainstem sites 7.4% of the catch was comprised of coho. Coho CPUE was lowest at Upper Bulkley side channel sites, Toboggan Lake sites (TOB 5 and 6) and Upper Bulkley mainstem sites (except UBR 2).

Coho CPUE varied over the four months of the overwintering study. Temporal variations in coho CPUE were not assessed for Toboggan Lake and Upper Bulkley side channel sites due to the low number of fish captured at these sites. Coho CPUE at Toboggan Creek mainstem and tributary sites changed significantly over the winter (ANOVA F = 4.049, p = 0.050). Coho CPUE was significantly higher in December than in March (Tukey HSD = 12.889, p = 0.049), but coho CPUE for all other months are statistically similar. The notable decline in coho CPUE at Toboggan Creek sites between December and January is not statistically significant (Tukey HSD = 1.0556, p = 0.111). Coho CPUE at Upper Bulkley mainstem sites did not change significantly over the sampling period (ANOVA F = 0.792, p = 0.513). The decline in coho CPUE that appears to be present in the data from February to March is not statistically significant at Upper Bulkley mainstem sites. Similarly, coho CPUE at Upper Bulkley tributary sites did not change significantly over the sampling period (ANOVA F = 0.390, p = 0.761). While significant declines in coho CPUE were found at Toboggan Creek mainstem and side channel sites, temporal changes in coho CPUE at Upper Bulkley mainstem and tributary sites were not significant.

Coho CPUE was compared between Upper Bulkley mainstem and tributary sites, and Toboggan Creek mainstem and side channel sites. Toboggan Lake and Upper Bulkley side channel sites were not included in the analysis due to the low number of fish captured at these sites in the winter. Coho catch per unit effort differed significantly between Upper Bulkley mainstem, Upper Bulkley tributary, Toboggan Creek mainstem and Toboggan Creek side channel sites in December (ANOVA F = 21.735, p = 0.000) and January (ANOVA F = 4.288, p = 0.016), but did not differ significantly in February (ANOVA F = 1.082, p = 0.378) and March (ANOVA F = 2.754, p = 0.068). Coho CPUE was significantly higher at Toboggan mainstem sites than in Toboggan side channel sites (Tukey HSD = 16.831 p = 0.000) and Upper Bulkley mainstem sites

đ

(Tukey HSD = 17.722, p = 0.000) in December. However, Upper Bulkley mainstem and tributary sites and Toboggan Creek side channel sites had similar coho CPUE in December. Coho CPUE remained significantly higher than Upper Bulkley mainstem sites in January (Tukey HSD = 5.000, p = 0.010). However, there was no statistically significant difference between coho CPUE in Toboggan mainstem and Upper Bulkley tributary sites (Tukey HSD = 3.286, p = 0.085) or between Toboggan Creek mainstem and Toboggan Creek side channel sites (Tukey HSD = 3.833, p = 0.300). The lack of significant difference in coho CPUE in January between Toboggan Creek mainstem and Upper Bulkley tributary site is due to the decline in coho CPUE between December and January in Toboggan mainstem sites. Coho CPUE in Toboggan Creek mainstem sites was significantly higher than at Upper Bulkley mainstem and tributary sites in December, and at Upper Bulkley mainstem sites in January, but was similar in February and March as coho CPUE declined during the winter in Toboggan Creek mainstem sites.

Overall, coho CPUE was highest in Toboggan Creek mainstem and side channel sites and in Upper Bulkley tributary sites. Most of the Toboggan Creek coho were captured in the two mainstem sites (TOB 1 and 2), with the highest CPUE in December. Coho CPUE in Toboggan Creek declined significantly between December and March, with the most notable decrease between December and January. Coho CPUE at Upper Bulkley sites did not show strong temporal trends, although there was a slight (but not significant) decline in coho CPUE between December and March. No coho were captured in the Upper Bulkley side channel sites, and coho CPUE was relatively low in Toboggan Lake and Upper Bulkley mainstem sites.

4.2.2.2 RAINBOW TROUT/STEELHEAD

Most of the rainbow trout sampled in the study were captured in the Upper Bulkley watershed. Overall, 69% of all rainbow trout were captured in the Upper Bulkley watershed, where 80.6 % of the sites were located. On average, CPUE for rainbow trout was highest at Upper Bulkley tributary sites (Table 7), and in one of the six Upper Bulkley mainstem sites (UBR 2). No Rainbow trout were captured in Upper Bulkley side channel sites (SID 1, SID 2, and SID 3) or in Toboggan Lake sites, except the Toboggan Lake outlet sampled in March (site TOB 7). Catch per unit effort was low at five of the six Upper Bulkley mainstem sites, averaging less than one rainbow trout/trap. Rainbow trout accounted for 58.9% of the species captured at Upper Bulkley tributary sites, and for 37.3% of the catch at Upper Bulkley mainstem sites. As for coho, rainbow trout CPUE was lowest at Upper Bulkley side channel sites, Toboggan Lake sites (TOB 5 and 6) and Upper Bulkley mainstem sites (except UBR 2).

Rainbow trout CPUE generally declined over the four months of the overwintering study. Temporal variations in rainbow trout CPUE were not assessed for Toboggan Lake and Upper Bulkley side channel sites since no rainbow trout were captured at these sites. Rainbow trout CPUE at Toboggan Creek mainstem and tributary sites did not change significantly over the winter (ANOVA F = 0.719, p = 0.568). The apparent decline of rainbow trout CPUE during the winter at Upper Bulkley mainstem sites was not statistically significant (ANOVA F = 0.979, p = 0.424). However, rainbow trout CPUE differs significantly between sampling periods in Upper Bulkley tributary sites (ANOVA F = 4.716, p = 0.005). Rainbow trout CPUE did not change significantly between December and January (Tukey HSD – 0.154, p = 0.992), or January and February (Tukey HSD = 1.12, p = 0.192), but rainbow trout CPUE declined significantly

Ŧ

between February and March (Tukey HSD = 1.767, p = 0.010) at Upper Bulkley tributary sites. While significant declines in rainbow trout CPUE were found at Upper Bulkley tributary sites, temporal changes in rainbow trout CPUE at Upper Bulkley mainstem, Toboggan Creek mainstem and side channel sites were not significant.

Rainbow trout CPUE was compared between Upper Bulkley mainstem and tributary sites, and Toboggan Creek mainstem and side channel sites. Toboggan Lake and Upper Bulkley side channel sites were not included in the analysis since no rainbow trout were captured at these locations. Rainbow trout catch per unit effort did not differ significantly between Upper Bulkley mainstem, Upper Bulkley tributary, Toboggan Creek mainstem and Toboggan Creek side channel sites in December (ANOVA F = 0.460, p = 0.713), January (ANOVA F = 2.479, p = 0.089), February (ANOVA F = 2.237, p = 0.114) or March (ANOVA F = 0.832, p = 0.491). The fact that most of the rainbow trout captured during the study were captured at Upper Bulkley sites is therefore related to the fact that most of the sites are located in the Upper Bulkley watershed, rather than differences in rainbow trout CPUE between the two drainages.

In summary, most of the rainbow trout sampled in the overwintering study were captured in the Upper Bulkley watershed, where most of the sampling sites were located. Rainbow trout CPUE did not differ significantly between the Toboggan Creek mainstem and side channel sites, Upper Bulkley mainstem sites or Upper Bulkley tributary sites. Rainbow trout CPUE did not change significantly over the winter at Upper Bulkley mainstem, Toboggan Creek mainstem or side channel sites, but did decline significantly between February and March at Upper Bulkley tributary sites. No rainbow trout were captured in the Upper Bulkley side channel sites or the Toboggan Lake sites.

4.2.2.3 OTHER SPECIES

Species other than coho and rainbow trout captured during the overwintering study include chinook, cutthroat trout suckers, longnose dace, peamouth chub captured in the Upper Bulkley watershed, and Dolly Varden captured in the Toboggan Creek watershed. Chinook were captured at Buck Creek sites BUC 2, 5, 6, 7 and 8, Byman Creek sites BYM 2 and 3, all of the Richfield Creek sites (RIC 1, 2, 3, 4 and 5), and all Upper Bulkley mainstem sites (UBR 1, 2, 9, 12, 11 and 12) (Table 7). Chinook numbers were usually relatively low, with CPUE ranging between 0 and 2.83 (at UBR 2). One cutthroat trout was captured at Upper Bulkley side channel site SID 1 and one was captured at Byman Creek site BYM 1. Longnose dace were captured in three of the Buck Creek sites (BUC 2, 5 and 6), Byman Creek site BYM 1, and two of the Richfield Creek sites (RIC 1 and 5). Suckers were captured in the Buck Creek release pond (BUC 7 and 8), Richfield Creek (RIC 4 and 5) and Upper Bulkley side channels (SID 1 and 3). Peamouth chub were at all three Upper Bulkley side channel sites, but at no other sites in the Upper Bulkley watershed. Dolly Varden were captured in the Toboggan Creek mainstem site TOB 2, the side channel site (TOB 8), one of the Toboggan Lake sites (TOB 5) and the Toboggan Lake outlet (TOB 7). Dolly Varden CPUE was relatively low, ranging between 0 and 0.5 (Table 7). Catch per unit effort of species other than rainbow trout and coho was relatively low at both Toboggan Creek and Upper Bulkley sites.

ž

×

4.2.3 Fish Age, Size, and Condition

Fork length and weight data were collected for salmonids throughout the overwintering study. A total of 613 coho, 657 rainbow trout, 152 chinook, 10 Dolly Varden, five longnose dace, and three suckers were measured and weighed during the overwintering study. Length and weight data are summarized in the following sections.

4.2.3.1 COHO

Of the 662 coho captured throughout the overwintering study, fork length and weight data were collected for 613 (92.6%). Length, weight and condition factor data for sites sampled in the Upper Bulkley and Toboggan Creek are summarized in Appendix 5. The following sections present length and weight data for coho captured in Toboggan Creek and the Upper Bulkley watershed.

4.2.3.1.1 AGE AND LENGTH

Fork length data was recorded for coho captured at sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Mean fork length in Buck Creek appeared to be higher than at other sites sampled for the sampling period. Buck Creek is the only system were hatchery origin coho were captured, and these fish tended to be larger than wild origin coho (Appendix 5), resulting in a greater mean fork length for sites in the Buck Creek tributary. Fork length data for Buck Creek sites is therefore analysed separately from other Upper Bulkley tributary sites. Ranked fork length did not change significantly over the winter at Buck Creek (ANOVA F =0.445, p = 0.721), or Upper Bulkley mainstem sites (ANOVA F = 2.740, p = 0.065), at Toboggan Lake (ANOVA F = 0.148, p = 0.930), and Toboggan mainstem (ANOVA F = 1.646, p = 0.182). However, fork length differed significantly between months at Upper Bulkley tributary sites (ANOVA F = 4.442, p = 0.005) and at Toboggan Creek side channels (ANOVA F = 8.311, p = 0.000). Fork length decreased significantly between December and January at Upper Bulkley tributary sites excluding Buck Creek (Tukey HSD = 45.593, p = 0.004), and remained significantly lower than fork lengths in December throughout the February sampling period (Tukey HSD = 40.164, p = 0.022). However, a gradual increase in fork length from January to March resulted in no significant difference in ranked for length between December and March (Tukey HSD = 24.317, p = 0.801). Ranked fork length at Toboggan side channel sites were significantly lower in January than in February (Tukey HSD = 20.875, p = 0.017) and March (Tukey HSD = 37.875, p = 0.000). Ranked fork length was also significantly higher at Toboggan Creek side channel sites in March than in December (Tukey HSD = 25.386, p = 0.002). Coho fork length generally changed little during the winter at most sites although fork length declined in early winter at some sites, and increased between February and March at other sites.

Comparisons of ranked fork length between sites in the Upper Bulkley mainstem, Buck Creek sites, other Upper Bulkley tributaries, Toboggan Creek mainstem, side channel and lake indicates statistically significant differences for fish captured in December (ANOVA F = 12.142, p = 0.000), January (ANOVA F = 27.055, p = 0.000), February (ANOVA F = 16.111, p = 0.000) and March (ANOVA F = 23.299, p = 0.000). Ranked fork length data at Buck Creek was

4

÷

statistically similar to mean fork length at the Upper Bulkley mainstem sites and Toboggan Lake sites in December (Tukey HSD \leq 31.849, p \geq 0.529). Relatively large variance in fork length data at the Upper Bulkley mainstem sites may have resulted in the inability to detect a significant difference between coho fork length at Buck Creek, Toboggan Lake and the Upper Bulkley mainstem sites. Ranked fork length was significantly greater at Buck Creek than at other Upper Bulkley tributary sites (Tukey HSD = 78.474, p = 0.000) and Toboggan Creek mainstem sites (Tukey HSD = 97.974, p = 0.000). Fork length was statistically similar between Toboggan Creek mainstem, Toboggan Creek side channel, Upper Bulkley mainstem and Upper Bulkley tributary sites excluding Buck Creek (Tukey HSD ≤ 80.00 , p ≥ 0.104) in December. Ranked fork length was statistically similar between Toboggan Creek mainstem and Toboggan Lake sites in December (Tukey HSD = 46.625, p = 0.057), but ranked fork length was greater at Toboggan Lake sites than at Toboggan side channel sites (Tukey HSD = 60.125, p = 0.013) in December. Ranked fork length at Buck Creek was significantly greater than ranked fork length at other sites sampled in January (Tukey HSD \geq 70.006, p = 0.000) except Toboggan Lake, which had a large variance in fork length (Tukey HSD = 41.441, p = 0.833). Ranked fork length did not differ significantly between Upper Bulkley mainstem, Upper Bulkley tributary sites excluding Buck Creek, Toboggan Lake, Toboggan mainstem or Toboggan side channel sites sampled in January (Tukey HSD \leq 68.250, p \geq 0.196). As in January, ranked fork length data obtained in February at Buck Creek was significantly greater than at other sites sampled (Tukey HSD \geq 45.487, p \leq 0.041) except Toboggan Lake, which had a large variance in fork length (Tukey HSD = 13.208, p = 0.993). Ranked fork lengths did not differ significantly between Toboggan Lake, Toboggan mainstem, Toboggan side channel and Upper Bulkley mainstem sites (Tukey HSD \leq 51.625, p ≥0.198). However, ranked fork length at Upper Bulkley tributaries excluding Buck Creek were significantly lower than ranked fork length recorded at other sites sampled in February (Tukey $HSD \ge 30.207$, $p \le 0.028$) except at Toboggan Creek side channels, where ranked fork length was statistically similar to Upper Bulkley tributaries (Tukey HSD = 25.255, p = 0.124). Ranked fork length at Buck Creek remained higher than at all other sites (Tukey HSD \geq 27.962, p \leq 0.004) except the Toboggan side channel site, which had a large variance in fork length (Tukey HSD = 9.000, p = 0.973). Ranked fork length at Upper Bulkley tributary sites excluding Buck Creek were significantly lower than ranked fork length at other sites (Tukey HSD \ge 24.727, p \le 0.014) except at the Toboggan Creek mainstem (Tukey HSD = 3.030, p = 0.998). Ranked fork length at Toboggan Creek side mainstem sites were significantly lower than ranked fork length at Toboggan Creek side channel sites (Tukey HSD = 43.833, p = 0.010). Compared to most sites, ranked fork length was significantly higher at Buck Creek for all four sampling intervals and ranked fork length was significantly lower at Upper Bulkley tributaries excluding Buck Creek for January to March.

Coho ages were not determined empirically, but were estimated from fork length distributions obtained from samples collected at sites sampled in the Toboggan Creek and Upper Bulkley watersheds. Based on length frequency distributions of coho (Appendix 5), three different age groups (0+, 1+ and 2+) appear to be present in the sample obtained during the winter at Upper Bulkley tributary and Toboggan Creek sites. The majority of coho captured at Upper Bulkley tributary sites and Toboggan Creek sites are estimated to be 0+, with some 1+ coho and few 2+ coho. The few coho captured in Upper Bulkley mainstem sites appear to fall within the 0+ and 1+ age groups. Since ages were not determined empirically, but are estimated from fork length

.

data, and since there is considerable overlap in fork length between the estimated age classes, fork length data was not separated by age.

Coho age distribution based on fork length was used to estimate the proportion of 0+ coho in the total catch of coho obtained at sites sampled in the Upper Bulkley and Toboggan Creek systems in December to March. The Toboggan Lake outlet sites (TOB 7) were not included in this data since it was only sampled in March. The estimated mean proportion of 0+ coho at sites sampled in the Upper Bulkley mainstem, tributaries and side channels, and Toboggan Creek mainstem, side channel and lake sites are summarized in Table 8. Similarly, the catch per unit effort of 0+ coho and coho older than 0+ was determined at these sites for the duration of the study period (Table 9, Figure 5). These rough approximations of age distribution indicate that CPUE for 0+ coho in the Upper Bulkley sites (mainstem and tributary sites) declined by 32.3% between January and March, while the CPUE of coho estimated to be older than 0+ declined by only 8% in the same period. The estimated CPUE for 0+ coho in Toboggan Creek sites (mainstem, side channel and lake excluding the lake outlet) declined by 76% between January and March, and CPUE for coho older than 0+ did not decline between January and March, due to an increase in CPUE of coho older than 0+ in the Toboggan Creek side channel site. In fact, CPUE of 0+ coho declined by 92.8% between December and March in Toboggan Creek sites, and CPUE of coho older than 0+ declined by 78.9%. If only Toboggan Creek mainstem sites are considered, CPUE of 0+ coho declined by 73.2% between January and March, and CPUE of coho older than 0+ declined by 16% between January and March. More markedly, CPUE for Toboggan Creek mainstem sites declined by 90.9% for 0+ and 90% for coho older than 0+ between December and March. The decline of coho CPUE by age indicates a more significant decline in CPUE for coho in Toboggan Creek than in Upper Bulkley sites, particularly for age 0+ coho, which may be due to higher overall densities and resulting competition in Toboggan Creek sites.

In summary, coho captured during the overwinter study were found to be significantly larger at Buck Creek sites than at other sites. Similarly, coho fork length at Upper Bulkley tributary sites were significantly lower than those at most other sites in January, February and March. Low sample sizes and greater variance in fork length data collected at Upper Bulkley mainstem, and Toboggan Lake sites decreased the ability of statistical analysis to document significant differences between these sites and other sites during some months. In addition, 0+ fish were estimated to predominate catches in both Toboggan Creek and Upper Bulkley sites. Declines in the estimated CPUE for 0+ fish was greater than that for fish estimated to be older than 0+. Declines in CPUE for 0+ coho and coho older than 0+ were more severe at Toboggan Creek sites than at Upper Bulkley sites.

 $\sim 10^{-1}$

Table 8.Mean coho catch per unit effort and percent of catch estimated to be age 0+
(excluding hatchery origin coho) for the December 2000 to March 2001. Site TOB 7
at the Toboggan Lake outlet is not included in this data since it was only sampled in
March.

	December Januar		uary	February		March		
Sites	CPUE	% 0+	CPUE	% 0+	CPUE	% 0+	CPUE	% 0+
Upper Bulkley Tributaries	1.17	71.43	1.88	79.21	1.97	91.43	1.17	76.92
Upper Bulkley Mainstem	0.28	0.00	0.17	100.00	0.72	92.31	0.61	72.73
Upper Bulkley Sidechannel	0	0	0	0	0	0	0	0
Upper Bulkley Combined	0.81	70.42	1.24	79.81	1.44	91.53	0.90	76.19
Toboggan Creek Mainstem	18.00	76.56	5.17	90.32	3.5	80.95	1.67	75.00
Toboggan Creek Side Channel	7.33	100.00	1.33	100.00	6.67	90.00	1.33	25.00
Toboggan Lake	1.13	50.00	0.17	100.00	0.50	25.00	0	0
Toboggan Creek Combined	9.12	78.72	2.40	91.67	2.93	77.78	0.93	56.25

Table 9. Mean coho catch per unit effort estimated to be age 0+ and coho older than 0+ for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March.

	December		January		February		March	
Sites	0+	≥ 1+	0+	≥ 1+	0+	≥ 1+	0+	≥ 1+
Upper Bulkley Tributaries	0.84	0.33	1.49	0.39	1.80	0.17	0.90	0.27
Upper Bulkley Mainstem	0.00	0.28	0.17	0.00	0.67	0.05	0.44	0.17
Upper Bulkley Sidechannel	0	0	0	0	0	0	0	0
Upper Bulkley Combined	0.57	0.24	0.99	0.25	1.32	0.12	0.67	0.23
Toboggan Creek Mainstem	13.78	4.22	4.67	0.50	2.83	0.67	1.25	0.42
Toboggan Creek Side Channel	7.33	0.00	1.33	0.00	6.00	0.67	0.33	1.00
Toboggan Lake	0.57	0.57	0.17	0.00	0.13	0.37		
Toboggan Creek Combined	7.18	1.94	2.20	0.20	2.28	0.65	0.52	0.41

2

ž

 \sim

Upper Bulkley River Overwintering Study 2000-2001 Results – Fish Sampling

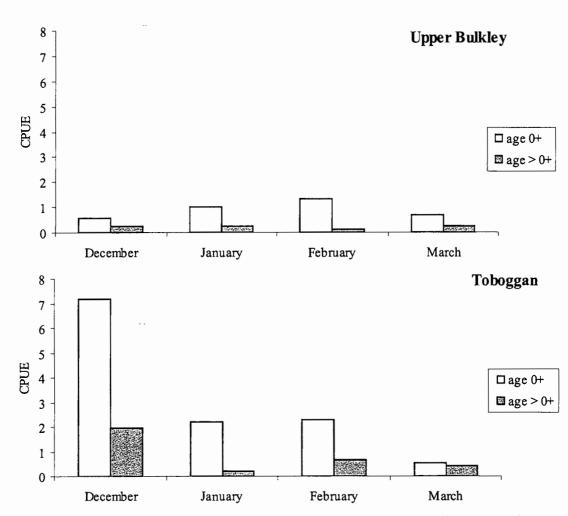


Figure 5. Estimated CPUE of 0+ coho and coho estimated to be older than 0+ at sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Ages are estimated from fork length distributions (see Tables 8 and 9).

4.2.3.1.2 CONDITION

Weight data is more variable than condition factor data, since condition factor is adjusted for variability in fish size. However, there appears to be a negative correlation between fork length and condition factor, since smaller fish appear to have greater condition, and since there is greater variability in the condition factor of smaller fish. This may be due to a combination of exaggerated effects of measuring errors on smaller fish and/or a lack of isometric growth in the population. Therefore, condition factor data for coho do not appear to be independent of coho size.

Condition factor appeared more variable early in the winter (December sample) than later in the winter (Appendix 5). This was especially the case at Toboggan Creek sites, where the variability in condition factor data appeared to be reduced later in the winter. Comparisons of condition factor data over time at Upper Bulkley sites indicate that condition factor varies significantly between months (ANOVA F = 35.837, p = 0.000), with condition factor varying little between December and January, followed by a significant decline in condition factor from February to March (Figure 6). Condition factors of Upper Bulkley coho are significantly lower in March than in December, January or February (Tukey HSD ≥ 0.251 , p = 0.000). Similarly, condition factor at Toboggan Creek sites are significantly higher early in the winter than later in the winter (ANOVA F = 25.413, p=0.000). Coho condition factor at Toboggan Creek sites is statistically similar between December and January samples, but mean condition factor is statistically lower in February than in December (Tukey HSD = 0.246, p = 0.000) or January (Tukey HSD = 0.280, p = 0.000). Coho condition factor at Toboggan Creek further declines in March, and is significantly lower than the February sample (Tukey HSD = 0.181, p = 0.027), and hence also significantly lower than the December or January samples (Tukey HSD ≥ 0.427 , p = 0.000) (Figure 6). The condition factor was found to decline significantly for coho during the winter at both Upper Bulkley and Toboggan Creek sites.

Mean condition factor varied between sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Within the Upper Bulkley system, condition factor appeared to be higher at tributary than mainstem sites (Appendix 5), with the highest mean condition factor noted at Byman Creek site BYM 2 and at the Richfield Creek sites. Condition factors were generally low at Buck Creek sites, which may be attributable to the presence of larger, hatchery origin coho (see previous section). Since condition factor is negatively correlated with size, the lower condition factor at Buck Creek may be a result of larger fork length of these fish. At Toboggan Creek sites, coho condition factor appeared to be higher at mainstem and side channel sites than at Toboggan Lake sites. In December, condition factor differed significantly between Upper Bulkley mainstem, Upper Bulkley tributary, Toboggan mainstem, Toboggan side channel and Toboggan Lake sites (ANOVA F = 4.626, p = 0.001). Condition factor at Buck Creek was significantly lower than condition factor at other Upper Bulkley tributary sites (Tukey HSD = 0.255, p = 0.027), at Toboggan mainstem sites (Tukey HSD = 0.306, p = 0.003), or at Toboggan side channel sites (Tukey HSD = 0.466, p = 0.000) sampled in December. Condition factors continued to differ significantly between sites in January (ANOVA F = 6.470, p = 0.000), with Toboggan side channel sites having significantly higher condition factor than Toboggan mainstem sites (Tukey HSD = 0.370, p = 0.011), Upper Bulkley tributaries excluding Buck Creek (Tukey HSD = 0.471, p = 0.000) and Buck Creek (Tukey HSD = 0.516, p = 0.000). Condition factor of coho did not differ significantly between Upper Bulkley mainstem, Upper

Department of Fisheries and Oceans & SKR Consultants Ltd.

•2

<u>_</u>

- 😫

÷

Upper Bulkley River Overwintering Study 2000-2001 Results – Fish Sampling

Bulkley tributary, Buck Creek, Toboggan mainstem, Toboggan side channel or Toboggan Lake sites in February, but condition factors did differ significantly in March (ANOVA F = 3.122, p = 0.012). Coho condition factor was significantly higher at Toboggan Creek mainstem sites than at Toboggan Lake sites (Tukey HSD = 0.161, p = 0.033), or at Toboggan side channel sites (Tukey HSD = 0.247, p = 0.019), while all other condition factor data were not significantly different. Condition factor was generally higher at Toboggan mainstem, Toboggan side channel and Upper Bulkley tributary sites (excluding Buck Creek).

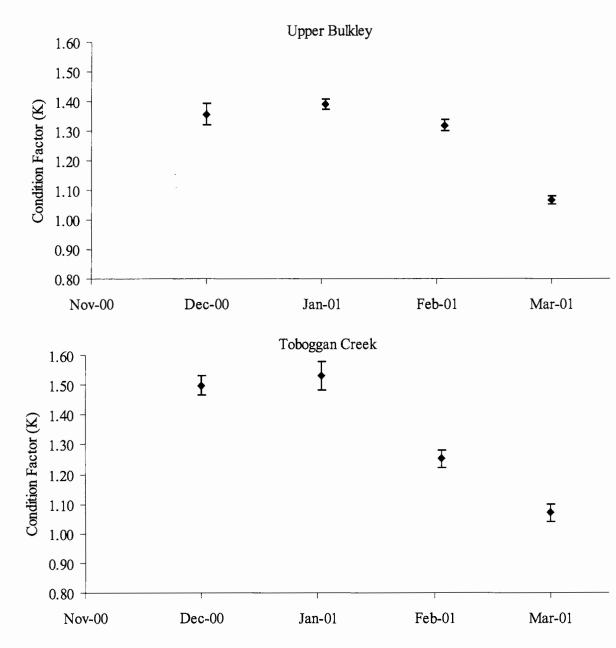


Figure 6. Mean Condition factor for coho captured at sites sampled in the Upper Bulkley Watershed (above) and at Toboggan Creek (below). Bars indicate standard errors.

쿺

In summary, condition factor was more variable, and was generally higher in early winter when compared to samples obtained at the end of winter. Condition factor varies with fork length, since larger fish tend to have lower condition than smaller fish (Appendix 5). Fish released into Buck Creek in August 2000 have significantly lower condition during much of the winter than their wild counterparts, which is not surprising since fork length and condition are negatively correlated. Of the sites sampled, condition factor was higher in Upper Bulkley tributary sites excluding Buck Creek, Toboggan Creek mainstem and Toboggan Creek side channel sites, but the temporal trends in condition factor over time are consistent between the watersheds, and between sites.

4.2.3.2 RAINBOW TROUT/STEELHEAD

Of the 662 rainbow trout captured throughout the overwintering study, fork length and weight data were collected for 657 (99.2%). Length, weight and condition factor data for sites sampled in the Upper Bulkley and Toboggan Creek are summarized in Appendix 5. The following sections present length and weight data for rainbow trout captured in Toboggan Creek and the Upper Bulkley watershed.

4.2.3.2.1 AGE AND LENGTH

Fork length data was recorded for rainbow trout captured at sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Mean fork lengths for each site at each sampling interval are summarized in Appendix 5. Fork length frequency histograms (Appendix 5) indicate that fork length is not normally distributed, and statistical analysis was conducted on ranked data to address the deviations from normality in the data. Ranked fork length increased gradually over the winter at Toboggan Creek sites, but the chang in fork length was not statistically significant (ANOVA F = 2.412, p = 0.083). However, ranked fork length did change significantly at Upper Bulkley sites (ANOVA F = 13.372, p = 0.000) due to a significant decrease in fork length between December and January (Tukey HSD = 13.311, p = 0.000). Fork length of rainbow trout increased significantly between January and February (Tukey HSD = 5.902, p = 0.017), but was still significantly lower than fork length in December (Tukey HSD = 7.408, p = 0.002). This is partly due to significant difference in ranked fork length in both Upper Bulkley mainstem sites (ANOVA F = 7.640, p = 0.000) and in Upper Bulkley tributaries (ANOVA F = 13.056, p =0.000). In Upper Bulkley mainstem sites, ranked fork length was significantly lower in January than in December (Tukey HSD = 16.886, p = 0.000), or February (Tukey HSD = 12.489, p = 0.025). In Upper Bulkley tributary sites, ranked fork length in December was significantly higher than in January (Tukey HSD = 57.992, p = 0.004), February (Tukey HSD = 118.759, p =0.000) or March (Tukey HSD = 73.051, p = 0.005). Ranked fork length was lowest in February, and was significantly lower than ranked fork length in January (Tukey HSD = 60.767, p = 0.004). While ranked fork length for rainbow trout did not change significantly over the winter at Toboggan Creek sites, it was significantly lower in January in Upper Bulkley mainstem sites, and in February at Upper Bulkley tributary sites.

Comparisons of ranked fork length between sites in the Upper Bulkley mainstem, Upper Bulkley tributaries, Toboggan Creek mainstem, and Toboggan Creek side channel indicates statistically significant differences for fish captured in December (ANOVA F = 8.356, p = 0.000), and

÷

فر ا

February (ANOVA F = 6.500, p = 0.000), but not for January (ANOVA F = 1.191, p = 0.314), or March (ANOVA F = 2.388 p = 0.057). Ranked fork length at the Toboggan Creek side channel sites was consistently lower than at other sites, but the large variability associated with the fork length data at this site resulted in no statistically significant difference between the Toboggan Creek side channel site and other sites sampled in December. Ranked fork length data at Upper Bulkley tributary sites were significantly lower than ranked fork length at Upper Bulkley mainstem sites (HSD = 61.684, p = 0.002), and Toboggan Creek mainstem sites (Tukev HSD = 39.111, p = 0.014) in December. Ranked fork length at Upper Bulkley mainstem sites were also significantly lower than ranked fork length at Toboggan Creek mainstem sites (Tukey HSD = 100.795, p = 0.000) in December. However, Toboggan Creek mainstem sites did not differ significantly in ranked fork length from Upper Bulkley mainstem sites (Tukey HSD = 24.917, p = 0.678) or Upper Bulkley tributary sites (Tukey HSD = 34.450, p = 0.166) in January, while ranked fork length was significantly higher at Upper Bulkley mainstem sites than in Upper Bulkley tributary sites (Tukey HSD = 59.366, p = 0.001) or at Toboggan Creek side channel sites (Tukey HSD = 88.250, p = 0.031). Ranked fork length differed significantly between Upper Bulkley mainstem, Upper Bulkley tributary, Toboggan Creek mainstem and Toboggan Creek side channel sites with Toboggan Creek mainstem sites having relatively high ranked fork length, and Upper Bulkley tributary sites having relatively low ranked fork length.

Rainbow trout ages were not determined empirically, but were estimated from fork length distributions obtained from samples collected at sites sampled in the Toboggan Creek and Upper Bulkley watersheds. Based on length frequency distributions of rainbow trout (Appendix 5), three different age groups (0+, 1+ and 2+) appear to be present in the sample obtained during the winter at Upper Bulkley mainstem, tributary and Toboggan Creek sites. A relatively clear gap in fork length at 56 mm was used as the division between age 0+ rainbow trout and rainbow trout older than age 0+. The distinction between age 1+ and 2+ rainbow trout was less clear due to considerable overlap in fork length. The majority of rainbow trout captured during the overwintering study are estimated to be older than 0+. The smallest rainbow trout captured during the sample. The predominance of rainbow trout estimated to be 1+ and 2+ in the sampled may be due to sampling error (traps are inefficient at catching smaller 0+ rainbow trout), or the inability of smaller fish to survive the winter (size selective mortality).

Rainbow trout age distribution based on fork length was used to estimate the proportion of 0+ rainbow trout in the total catch of rainbow trout obtained at sites sampled in the Upper Bulkley and Toboggan Creek systems in December to March. The Toboggan Lake outlet site (TOB 7) was not included in this data since it was only sampled in March. The estimated mean proportion of 0+ rainbow trout at sites sampled in the Upper Bulkley mainstem, tributaries and side channels, and Toboggan Creek mainstem, side channel and lake sites are summarized in Table 10. Similarly, the catch per unit effort of 0+ rainbow trout and rainbow trout older than 0+ was determined at these sites for the duration of the study period (Table 11, Figure 7). These rough approximations of age distribution indicate that CPUE for 0+ rainbow trout in the Upper Bulkley sites (mainstem and tributary sites) declined by 60.2% between January and March, and the CPUE of rainbow trout estimated to be older than 0+ declined by 61.3% in the same period. The estimated CPUE for 0+ rainbow trout in Toboggan Creek sites (mainstem, side channel and lake excluding the lake outlet) was low throughout the winter. CPUE for rainbow trout older

÷

- Zy

than 0+ in Toboggan Creek sites declined by 20.8% between January and March. As with coho, rainbow trout CPUE declined mostly between December and January at Toboggan Creek sites (43% for rainbow trout older than 0+). The decline of rainbow trout CPUE by age indicates a similar decline in CPUE for both age categories at Upper Bulkley sites (~60%), while declines in CPUE appear to be lower in Toboggan Creek than in Upper Bulkley sites particularly in January to March.

Table 10. Mean rainbow trout catch per unit effort and percent of catch estimated to be age 0+ for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March.

	Dece	mber	Jan	uary	Febr	February		arch
Sites	CPUE	% 0+	CPUE	% 0+	CPUE	% 0+	CPUE	% 0+
Upper Bulkley Tributaries	2.80	7.69	2.95	21.26	1.79	29.77	1.24	23.81
Upper Bulkley Mainstem	1.94	0	1.11	5.00	0.39	0	0.22	0
Upper Bulkley Sidechannel	0	0	0	0	0	0	0	0
Upper Bulkley Combined	2.26	7.27	2.16	19.82	1.24	30.47	0.86	22.73
Toboggan Creek Mainstem	2.67	18.75	1.17	0	1.33	0	0.83	0
Toboggan Creek Side Channel	0.33	0	0.33	. 0	0.37	50	0.33	0
Toboggan Lake	0	0	0	0	0	0	0	0
Toboggan Creek Combined	1.13	17.65	0.53	0	0.50	12.5	0.42	0

Table 11. Mean rainbow catch per unit effort estimated to be age 0+ and older than 0+ for the December 2000 to March 2001. Site TOB 7 at the Toboggan Lake outlet is not included in this data since it was only sampled in March.

	December		Jan	January		February		arch
Sites	0+	≥1+	0+	≥1+	0+	≥1+	0+	≥1+
Upper Bulkley Tributaries	0.22	2.58	0.63	2.33	0.53	1.26	0.29	0.94
Upper Bulkley Mainstem	0	1.94	0.06	1.06	0.39	0.22	0	0.22
Upper Bulkley Sidechannel	0	0	0	0	0	0	0	0
Upper Bulkley Combined	0.16	2.09	0.43	1.73	0.38	0.86	0.20	0.67
Toboggan Creek Mainstem	0.50	2.17	0	1.17	0	1.33	0	0.83
Toboggan Creek Side Channel	0	0.33	0	0.33	0.33	0.33	0	0.33
Toboggan Lake	0	0	0	0	0	0	0	0
Toboggan Creek Combined	0.2	0.93	0	0.53	0.06	0.44	0	0.42

In summary, rainbow trout captured during the overwintering study appeared to be larger at Toboggan Creek sites when compared to Upper Bulkley sites. This difference in size was statistically significant in December and February, and may be due to a greater proportion of rainbow trout older than 0+ at Toboggan Creek sites (CPUE of 0+ rainbow trout at Toboggan Creek was negligible). Similarly, rainbow trout fork length at Upper Bulkley tributary sites were significantly lower than those at Upper Bulkley mainstem sites in both December and February. Ranked fork length increased gradually over the winter at Toboggan Creek sites, although this increase was not statistically significant. Fluctuations in ranked fork length at Upper Bulkley sites were significant, and fork length was generally highest in December and lowest in January (Upper Bulkley mainstem sites) and February (Upper Bulkley tributary sites) with an increase in

Department of Fisheries and Oceans & SKR Consultants Ltd.

43

à.

-7-

÷.

Upper Bulkley River Overwintering Study 2000-2001 Results – Fish Sampling

fork length in the March sample. Low sample sizes and greater variance in fork length data collected at Toboggan Lake and side channel sites decreased the ability of statistical analysis to document significant differences between these sites and other sites during some months. In addition, rainbow trout older than 0+ were estimated to predominate catches in both Toboggan Creek and Upper Bulkley sites. Declines in the estimated CPUE for 0+ fish was similar to declines in CPUE for rainbow trout estimated to be older than 0+ in the Upper Bulkley sites. Declines in CPUE of rainbow trout were less severe in Toboggan Creek sites than in Upper Bulkley sites between January and March, although declines in CPUE of rainbow trout decreased more in December to January at Toboggan Creek sites.

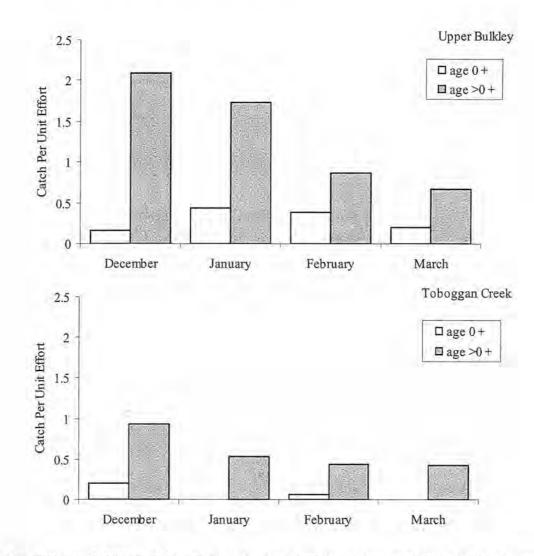


Figure 7. Estimated CPUE of 0+ rainbow trout and rainbow trout estimated to be older than 0+ at sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Ages are estimated from fork length distributions (see Tables 10 and 11).

4.2.3.2.2 CONDITION

Weight data is more variable than condition factor data, since condition factor is adjusted for variability in fish size. However, there appears to be a negative correlation between fork length and condition factor, since smaller fish appear to have greater condition, and since there is greater variability in the condition factor of smaller fish. This may be due to a combination of exaggerated effects of measuring errors on smaller fish and/or a lack of isometric growth in the population. Therefore, condition factor data for rainbow trout do not appear to be independent of rainbow trout size.

Condition factor appeared more variable early in the winter (December sample) than later in the winter (Appendix 5). This was especially the case at Toboggan Creek sites, where the variability in condition factor data appeared to be reduced later in the winter. Condition factor appears to decline at sites sampled during the winter (Figure 8). Comparisons of condition factor data over time at Upper Bulkley sites indicate that condition factor varies significantly between months (ANOVA F = 33.515, p = 0.000), due to a significant decline in condition factor between February and March (Figure 8) resulting in the March sample having a significantly lower condition factor than the December sample (Tukey HSD = 0.195, p = 0.000), the January sample (Tukey HSD = 0.266, p = 0.000) or the February sample (Tukey HSD = 0.231, p = 0.000). Similarly, condition factor at Toboggan Creek sites is significantly higher early in the winter than later in the winter (ANOVA F = 4.634, p=0.008). Rainbow trout condition factor in March is significantly lower at Toboggan Creek sites than condition factor of rainbow trout in December (Tukey HSD = 0.376, p = 0.006), and January (Tukey HSD = 0.378, p = 0.018). Condition factor for rainbow trout declined significantly during the winter at both Upper Bulkley and Toboggan Creek sites.

Condition factor data were compared between sites sampled in the Upper Bulkley and Toboggan Creek watersheds. Since there were significant differences in condition factor over time, mean condition factor at Upper Bulkley and Toboggan Creek sites were compared separately for each month. Mean condition factor of rainbow trout did not differ significantly between Upper Bulkley and Toboggan Creek sites in December (t = 0.912, p = 0.374), January (t = 0.087, p = 0.933), February (t = 1.462, p = 0.182) or March (t = 2.145, t = 0.073).

Overall, condition factor was more variable, and was generally higher in early winter when compared to samples obtained at the end of winter. Condition factor varies with fork length, since larger fish tend to have lower condition than smaller fish (Appendix 5). Condition factor was not statistically different between Upper Bulkley and Toboggan Creek sites. Condition factor declined during the winter at both Upper Bulkley and Toboggan Creek sites.

Department of Fisheries and Oceans & SKR Consultants Ltd.

Upper Bulkley River Overwintering Study 2000-2001 Results – Fish Sampling

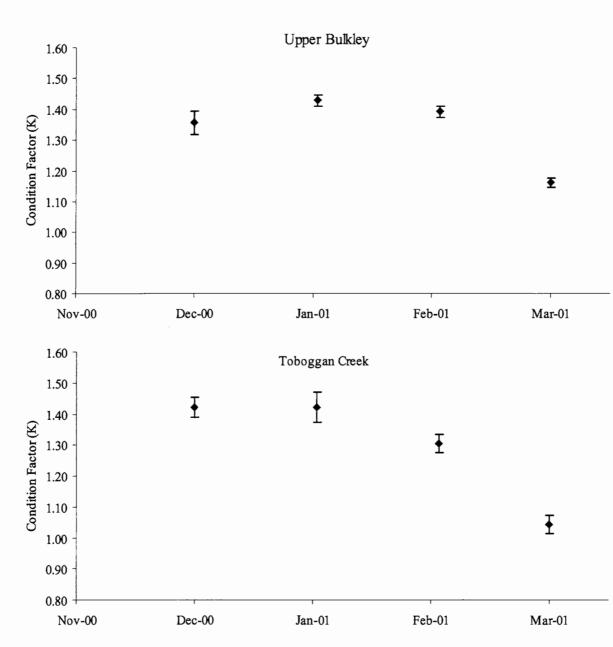


Figure 8. Mean condition factor for rainbow trout captured at sites sampled in the Upper Bulkley Watershed (above) and at Toboggan Creek (below). Bars indicate standard errors.

100

4.2.3.3 OTHER SPECIES

Other species captured during the overwintering study include three species of salmonids (Dolly Varden, chinook and cutthroat trout) and three species of non-salmonids (peamouth chub, longnose dace and suckers). Dolly Varden were only captured in Toboggan Creek, and the remaining species were only captured in Upper Bulkley system. Two cutthroat trout were captured in the Upper Bulkley system, one in a side channel site (SID 1) and one in Byman Creek (BYM 1). Fork length and weight data were recorded for five longnose dace (100% of catch), three suckers (100% of catch) and none of the peamouth chub captured. Due to the low sample size of cutthroat trout, longnose dace, and suckers, no data analysis was conducted for these species. Sample sizes for Dolly Varden (10) and chinook (152) were somewhat larger, allowing for some analysis of length and condition factor data.

4.2.3.3.1 AGE AND LENGTH

All of the ten Dolly Varden, and 91.6% of the 166 chinook that were captured during the overwintering study were measured. Fork length data are summarized in Appendix 5. Ranked fork length of chinook did not change significantly over the sampling period (ANOVA F = 1.211, p = 0.308), and neither did the ranked fork length of Dolly Varden (ANOVA F = 0.778, p = 0.495). Chinook were significantly longer in Upper Bulkley mainstem sites than in tributary sites in December (U=2202.5, p = 0.017), but fork lengths were similar between mainstem and tributary sites in January (U = 33.50, p = 0.480), February (U = 217.5, p = 0.152) and March (U = 205.6, p = 0.263). Sample size was too low to allow comparisons of Dolly Varden fork length between Toboggan Lake, Toboggan mainstem and sidechannel sites. Based on length frequency distribution, all of the 152 chinook that were measured are estimated to fall within the 0+ age group. Sample sizes of Dolly Varden were too low to speculate on age distribution, but two or three age classes are likely represented in the sampled (ages 0+, 1+ and 2+).

4.2.3.3.2 CONDITION

All of the ten Dolly Varden, and 152 (91.6%) of the chinook captured during the overwintering study were weighed, allowing for a calculation of condition. Condition factor was more variable in December than in March (Appendix 5). Chinook condition factor decreased significantly over the winter (ANOVA F = 17.557, p = 0.379) (Figure 9). While condition factor for December, January and February were not statistically different, condition factor in March was significantly lower than condition factor in December (Tukey HSD = 0.199, p = 0.000), January (Tukey HSD= 0.245, p = 0.000) or February (Tukey HSD = 0.179, p = 0.000). Although a similar trend is observed for Dolly Varden (Figure 10), condition factor did not change significantly over the sampling period for this species (ANOVA F = 0.204, p = 0.820). This may be due to low sample size and high variance in the sample for Dolly Varden. Sample size for Dolly Varden was too low to compare condition factors between Toboggan mainstem, sidechannel and lake sites, however sufficient chinook were captured to compare chinook condition factor between Upper Bulkley mainstem and tributary sites. Chinook condition factor did not differ significantly between Upper Bulkley mainstem and tributaries in December (t = 0.499, p = 0.618), January (t = 0.157, p = 0.878), February (t = 0.894, p = 0.379) or March (t = 0.148, p = 0.883). Declines in condition factor over the winter for both chinook and Dolly Varden (although not statistically significant for this species) are consistent with declines in condition factor for coho and rainbow trout over the winter.

Department of Fisheries and Oceans & SKR Consultants Ltd.

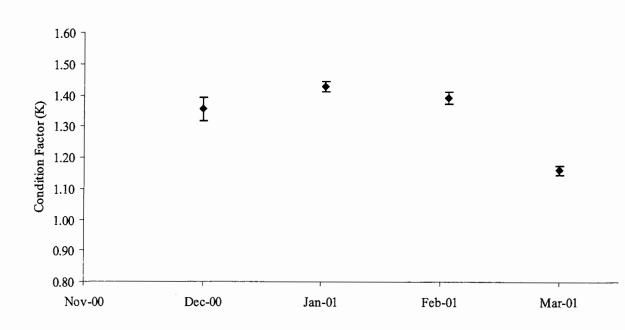


Figure 9. Mean condition factor for chinook captured at sites sampled in the Upper Bulkley Watershed. Bars indicate standard errors.

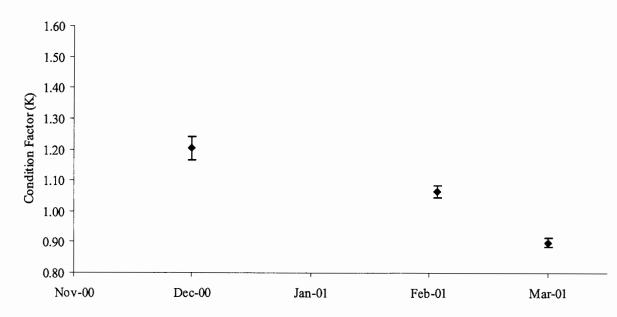


Figure 10. Mean Condition factor for Dolly Varden captured at sites sampled at Toboggan Creek (below). Bars indicate standard errors.

4.3 FISH AND FISH HABITAT

Catch per unit effort of species captured during the overwintering study depends in part on the distribution and overall escapement of the species to the sampled watersheds, as well as habitat characteristics sampled. Coho catch per unit effort was higher in Toboggan Creek and the Upper Bulkley watershed. Rainbow trout CPUE was not notably different between Upper Bulkley sites and Toboggan Creek sites. Habitat composition and location are factors, which may determine habitat suitability, and hence fish densities at sites sampled.

4.3.1 Upper Bulkley

While catch per unit effort differed between side channel, mainstem and tributary sites sampled in the Upper Bulkley watershed, some differences in catch per unit effort also existed among sites grouped in these broad categories. Catch per unit effort was generally low in Upper Bulkley side channel sites, when compared to Upper Bulkley tributary sites. Variability between Upper Bulkley tributary and mainstem sites were also found in the data collected.

Upper Bulkley side channel sites had the lowest capture rates and lowest species diversity sites sampled in the Upper Bulkley watershed. Substrate at these sites consisted primarily of fines, and water depths were among the lowest sampled (particularly at sites SID 2 and 3). In addition, these sites provided little cover, with undercut banks and instream cover being the main cover elements. The side channel sites sampled had some evidence of groundwater influence, as indicated by elevated water temperatures, lack of complete ice cover, and generally low dissolved oxygen. Dissolved oxygen concentrations in side channel sites sampled were among the lowest in the Upper Bulkley watershed. The majority of species captured at the Upper Bulkley side channel sites consisted of non-salmonids.

Catch per unit effort was moderate in Upper Bulkley mainstem sites, and consisted primarily of chinook, rainbow trout, and some coho. Among sites sampled in the Upper Bulkley mainstem, CPUE was generally highest at site UBR 2, and lowest at site UBR 12. Site UBR 2 is located at the mouth of Byman Creek, and is about 1 m deep, had moderate levels of instream cover (predominantly LWD and cobble), and consists primarily of pool habitat. Water levels and dissolved oxygen concentrations remained relatively consistent during the winter at this site, and the root wad at the site offers good cover, as does the cobble substrate, although embeddedness is 20%. Good cover, water quality and water levels are present at this site throughout the winter. In contrast, site UBR 12, is characterized by low instream cover (trace from LWD and moderate from cobble), with 50% pool habitat at the site. Embeddedness at this site is also 20%. Depth measurements were not recorded in the fall at this site, however, depth measurements at the limnological station are similar to those at site UBR 2. Some silt build up was noted at this site during fall sampling. The main differences between mainstem sites UBR 2 and UBR 12 is their proximity to a tributary with apparently high fish densities (Byman Creek for site UBR 2), the amount of cover, and the proportion of pool habitat. Chinook and rainbow trout form a major proportion of catches in mainstem sites sampled in the Upper Bulkley, and overall CPUE is high at a site with good cover, cobble substrate, a predominance of pool, and proximity to a tributary with apparently high fish densities.

 \mathbf{x}

Catch per unit effort in the Upper Bulkley watershed was highest at tributary sites, particularly for coho. Within the Upper Bulkley tributary sites, catch per unit effort was high in Richfield Creek (particularly RIC 2 and 3), Byman Creek (particularly BYM 2) and Buck Creek (BUC 5). Rainbow trout were dominant at the Buck Creek and Byman Creek site (78.4% and 56.8% respectively) while coho and rainbow trout co-dominated in Richfield Creek site RIC 3 (47.4%) coho and 41.7% rainbow) and coho dominated at site RIC 2 (68.0%). Coho CPUE was highest at sites RIC 2, RIC 3, and BYM 2. All of these sites are relatively deep (89 – 95 cm maximum depth with BYM 2 being the shallowest). Pool is the predominant habitat type at sites BYM 2, and RIC 2, while glide habitat (40%) predominates at site RIC 3, although pool habitat is also present (30%). Overall cover ranged from trace (RIC 3) to moderate (BYM 2 and RIC 2) with cobble being the primary cover element (abundant at all sites), and embeddedness was low (5% except in glide habitat at RIC 2 where embeddedness was 25%). Large woody debris cover was not present at sites BYM 2 and RIC 2, but was rated as trace at site RIC 3. Small woody debris cover was present at sites BYM 2 and RIC 2 but not at site RIC 3. Sites where coho CPUE was abundant therefore offer deep, primarily pool habitat, with cobble and organic cover. Rainbow trout CPUE was highest at site BUC 5, BYM 2, and RIC 3. Two of these sites (RIC 3 and BYM 2) also had high coho CPUE, indicating that these species can coexist. Site BUC 5 was one of the deepest sites sampled (max, depth = 119 cm) and consisted primarily of pool (40%) and glide (40%) habitat with cobble substrate. Cover was at trace levels and consisted primarily of cobble substrate with no forms of organic cover (LWD or SWD). Cobble embeddedness was 10% at site BUC 5. Boulder cover was also present at this site, and may be suitable for rainbow trout cover. Despite poor cover (no instream cover), high substrate embeddedness (50%), low percentage of pool (30%), rainbow trout CPUE was also relatively high at McQuarrie Creek (McQ 1). Coho and rainbow CPUE were relatively high at sites with water depths near 1 meter (among the deeper sites sampled), abundant cobble substrate, presence of organic cover (for coho) and low substrate embeddedness.

In summary, catch per unit effort is lowest in Upper Bulkley side channel sites, but appears to depend partly on habitat composition and location in Upper Bulkley mainstem and tributary sites. Within Upper Bulkley mainstem sites, CPUE was low for sites located downstream of the confluence with Buck Creek, in part because these sites offered poor cover, and had embedded substrate. CPUE was higher for mainstem sites near tributaries, which also had high CPUE. Despite stocking in Buck Creek, coho CPUE was not remarkably higher at sites sampled in this tributary, but appeared to be high in Richfield Creek, Byman Creek, and the one site sampled in McQuarrie Creek. The lack of significantly higher coho CPUE at Buck Creek as a result of coho released to the system in August may stem from the fact that the release site is located upstream of sample sites, and upstream of a beaver dam. Rainbow trout were relatively common in both mainstem and tributary sites in the Upper Bulkley, and both species appeared to be able to coexist. Generally, higher CPUE appeared to be associated with cobble substrate, the presence of organic cover (more so for coho), suitable dissolved oxygen and flow conditions, and availability of relatively deep pool habitat in the sites sampled in the Upper Bulkley watershed.

*-

4.3.2 Toboggan Creek

Of the sites sampled, coho were most commonly captured in Toboggan Creek mainstem and side channel sites, and appeared less abundant in Toboggan Lake sites. Rainbow trout CPUE at Toboggan Creek mainstem and side channel sites were comparable to those in Upper Bulkley mainstem and tributary sites. The lower capture rates of coho and rainbow trout in Toboggan Lake can be attributed to significant oxygen depletion at these sites during the winter. One of the Toboggan side channel sites (TOB 3) was not sampled during the winter due to low water depth, while the other side channel site (TOB 8) was utilized by salmonids throughout the winter. Coho CPUE was relatively high in Toboggan Creek mainstem sites, while rainbow trout CPUE was not as high as in some of the Upper Bulkley tributary sites, but rainbow trout CPUE was higher in Toboggan Creek mainstem sites than in Toboggan Creek sidechannel or lake sites. The two Toboggan Creek mainstem sites consisted primarily of pool habitat (50% at site TOB 1 and 75% at site TOB 2), with primarily cobble substrate and low embeddedness (5%). Cover was moderate with moderate levels of SWD at both sites, and moderate levels of LWD at site TOB 1. Boulders provided some cover at site TOB 2. Coho CPUE was somewhat higher at site TOB 1. which offered a greater amount of organic cover, than at TOB 2, which had larger substrate size, and less pool. Overall CPUE, and particularly coho CPUE was highest at the two Toboggan Creek mainstem sites and lowest at the Toboggan Lake sites.

51

ż.

5.0 DISCUSSION

Watershed characteristics, as well as habitat types sampled in the Upper Bulkley and Toboggan Creek watersheds are expected to influence species assemblages, fish densities, fish size and condition during the winter. Winter has been documented to be a critical time in the life history of salmonids (Bustard and Narver 1975), since this season can affect fish health and survival (Bustard and Narver 1975, Dolloff 1987). Several types of habitat, including side channel, off channel, ponds, beaver ponds, lakes and mainstems have been identified as important overwinter habitat for a variety of salmonids (Bustard and Narver 1975, Petersen 1982, Envirocon 1986, Swales *et al.* 1986, Swales and Levings 1989). Within these types of habitat, the importance of cobble substrate, deep pools and organic cover have been documented (Bustard and Narver 1975, Swales *et al.* 1986, Dolloff 1987). Habitat composition at the different sample sites is therefore expected to result in different species assemblages, densities and fish size. The two main indicators of habitat suitability in this study were species density indices (CPUE) and fish size (fork length and condition). Comparisons of habitats sampled, species assemblages, fish density and size, as well as the affects of habitat on fish are discussed in the following sections.

5.1 HABITAT ASSESSMENT

The results from both fall and winter habitat assessments were found to be valuable toward helping provide explanations for many of the trends in species diversity, catch per unit effort and fish size that were identified during this study. This section provides an overview of the results from the fall and winter habitat assessments and provides some definitions of the qualities and characteristics of different habitat types with some discussion regarding the most important qualities and changes to these habitats that occurred over the winter.

The majority of the sites sampled during the winter 2000/2001 were characterized by pool habitat with primarily cobble substrate. These sites were chosen because of their accessibility, and because they were thought to provide among the best overwintering habitat in the system. While Cunjak and Power (1987) indicate that riffles may be used for overwintering by trout, glide, edge and riffle habitat are less likely to be used for overwintering of coho and rainbow trout which have been found to prefer pool habitat in other studies (Bustard and Narver 1975, Cunjak and Power 1986, Heifetz et al. 1986, Swales et al. 1986, Dolloff 1987). Cobble was the dominant substrate at all sites where fall assessments were conducted except for Upper Bulkley side channel sites, where fines was the dominant substrate. Although percent embeddedness can affect the suitability of substrate for cover (Hillman et al. 1987), embeddedness was low to moderate but generally less at Toboggan Creek sites (5%) than at most Upper Bulkley sites (10%). Cobble has been found to be an important cover element at low water temperatures, as fish are often associated with interstitial spaces in the substrate (Bustard and Narver 1975, Heifetz et al. 1986, Swales et al. 1986). This would suggest that interstitial spaces in cobble substrate at the two Toboggan Creek sites may be more suitable for cover than those in Upper Bulkley sites, although the critical level at which embeddedness limits suitability of interstitial spaces for cover is not clear. Sites with cobble/pool habitat were found to maintain the most suitable conditions for winter rearing based on associated cover, habitat stability and water quality (i.e. constant oxygen supply).

÷.

Upper Bulkley River Overwintering Study 2000-2001 Discussion

Although the majority of sample sites sampled in winter 2000\2001 consisted primarily of cobble pools in mainstem and tributary areas, some side channel sites in both Toboggan and the Upper Bulkley, and two Toboggan Lake sites were also sampled. The Toboggan Lake and Upper Bulkley side channel sites that were sampled offered primarily fines for substrate, had little flow, and dissolved oxygen concentrations declined throughout the winter at these sites. Although side channel habitats (Bustard and Narver 1975, Peterson 1982, Envirocon 1986, Swales *et al.* 1986) and lakes (Swales and Levings 1989) have been reported to provide good overwintering habitat in other systems, the overwintering conditions at lake and side channel sites deteriorated over the winter and were of limited suitability for overwintering. The results from this study indicated the side channel and lake sites to have relatively poor quality in comparison to cobble pool habitats, but it is suspected that the sites sampled may not be completely representative of habitat available due to the relatively small sample size. It is suspected that lake and side channel habitat are more variable between sites and over the winter than tributary or mainstem sites.

In summary, both fall and winter habitat assessments were found to be useful toward obtaining a better understanding of the qualities of overwintering habitat in the Upper Bulkley River and Toboggan Creek. Probably due to greater velocity associated with cobble pools, these sites appear to provide the most stable habitat and water quality during the winter. Other studies have documented that substrate size, and the suitability of substrate to provide cover is in part determined by water velocity (Wetzel 1983, Chambers *et al.* 1987, Hunter 1991), which is consistent with findings during this overwintering study. The levels of dissolved oxygen and ice cover at the site samples were dependent on the current velocity and the influence of groundwater. Sites with greater current velocity have higher and more consistent dissolved oxygen, while sites with groundwater influence and/or low to no current generally have low dissolved oxygen, consistent with trends reported in other studies (Schreier *et al.* 1980, Wetzel 1983, Chambers *et al.* 1987). The best overwintering habitat that was identified in the Upper Bulkley River and Toboggan Creek, was characterized by cobble substrate, a relatively high proportion of deep pool habitat, the presence of organic cover (for coho) and moderate water flow.

5.2 FISH SAMPLING

Species diversity, densities, and fish size were recorded at all sites throughout the winter, since these measures were suspected to reflect the quality of overwintering habitat sampled. Habitat segregation during the winter has been reported for some salmonids (Bustard and Narver 1975, Cunjak 1986, Swales *et al.* 1986, Heifetz 1986, Hillman *et al.* 1987), and different species assemblages may occur at sites offering different types of habitat. In addition, overwintering habitat characteristics have been linked to different rates of survival (i.e. densities) and growth (i.e. fork length and condition factor) of salmonids in several systems (e.g. Swales *et al.* 1986, Cunjak 1996). This section of the discussion summarizes the variation of species distribution and diversity, density indices, age based on fork length data, fish condition, and the relationships of these factors between sites and watersheds.

Department of Fisheries and Oceans & SKR Consultants Ltd.

-3

ير.

ş

5.2.1 Species Distribution and Diversity

Species richness, diversity and evenness were expected to vary between and within watersheds, as species assemblages differ between the watersheds, and since some habitats are likely able to better support a variety of species. The number of species at a site is partly determined by the ability of some species to access the sites, while others may be absent from the area (Krebs 1999). In addition, greater habitat complexity has been shown to allow a greater variety of species to utilize sites (Hunter 1991). The relationship between species richness, diversity and evenness, and species distribution as well as catch per unit effort are discussed in this section.

Species richness, diversity and evenness were lowest at Upper Bulkley side channel sites, and Toboggan Lake sites. Species diversity at the sites sampled during the overwintering study is in part determined by the distribution of the species in the drainage, and the suitability of the site sampled for that species. No Dolly Varden were captured in the Upper Bulkley watershed, and no chinook were captured at Toboggan Creek. Chinook have rarely been captured in Toboggan Creek during other studies (O'Neil pers. comm., SKR 1995, 1996, 1997, 1998, 1999, 2000a), and likely stem from a low proportion of strays from other chinook populations. The lack of juvenile chinook in the Toboggan Creek samples is therefore consistent with the distribution of the species. Likewise, Dolly Varden have been documented in the Upper Bulkley watershed (FISS), but appear to be present at low densities. The presence of non-salmonids at sites sampled in the Upper Bulkley is consistent with the distribution of these species in the watershed, as is the lack of these species from Toboggan Creek (FISS, SISS, SKR 2000a). Despite differences in species assemblages, species richness, species diversity and evenness were not significantly different between Toboggan Creek and the Upper Bulkley. However, species richness, diversity, and evenness were significantly higher at Upper Bulkley tributary sites and lower at Upper Bulkley side channel sites. Species richness, diversity and evenness appeared to be somewhat lower at Upper Bulkley side channel sites and Toboggan Lake sites. Relatively high species richness, diversity and evenness at Upper Bulkley tributary and Toboggan Creek mainstem and side channel sites (TOB 8) indicate that these sites offer suitable overwintering habitat for a variety of species.

Sites with high overall CPUE (e.g. Upper Bulkley tributary and Toboggan Creek mainstem/ side channel sites) had higher species richness, species diversity and evenness than sites with low overall CPUE (e.g. Toboggan Lake, Upper Bulkley side channel). This is not surprising, since a higher CPUE infers a larger sample size, which often results in a greater number of species captured (Krebs 1999). Upper Bulkley tributary and Toboggan Creek mainstem sites had higher CPUE, species richness, species diversity and evenness, while Toboggan Lake sites and Upper Bulkley side channel sites had lower CPUE, species richness, diversity and evenness, indicating that these sites are less suitable for overwintering.

While species assemblages differ between Toboggan and Upper Bulkley sites, due to different species distributions in the two drainages, species richness, evenness and diversity is generally similar. Species richness, diversity and evenness were lowest in Upper Bulkley side channel sites and Toboggan Lake sites, sites that offered lower habitat complexity, and poorer habitat quality than other sites sampled. In particular, sampling in Upper Bulkley side channel site resulted in the capture of non-salmonids, indicating that these sites are unsuitable for salmonid

3

S.

overwintering. Generally, species richness, diversity and evenness were higher at sites with greater catch per unit effort. Toboggan Creek mainstem, Toboggan Creek side channel site (TOB 8) and Upper Bulkley tributary sites had the highest species richness, diversity and evenness, and also had high catch per unit effort, which indicates that these sites have more diverse habitat characteristics that are suitable for a greater variety of species during the winter.

5.2.2 Density Indices

Fish density is expected to vary between watershed, sites and over time. Differences in densities, as measured by CPUE, between watersheds are in part determined by species distribution, escapement of spawners, and survival of juveniles to the winter season. Sites with lower escapement, and sites with lower survival of juveniles in the summer and fall would result in lower juvenile densities than sites with higher escapement or juvenile survival. Likewise, density is expected to be higher throughout the winter at sites, which offer good, stable overwintering habitat able to support fish from fall to spring. Changes in CPUE over time may result from different levels of immigration and emigration to a site, or from mortality at the site, both of which may indicate the suitability of the habitat for overwintering. Differences in CPUE between watersheds and over time are discussed in the following sections.

Catch per unit effort for coho were higher at Toboggan Creek sites than at Upper Bulkley sites, while CPUE for rainbow trout did not differ significantly between the two drainages. This is likely due to the fact that Toboggan Creek sites are an enhanced coho stock, with hatchery releases of smolts, and subsequent returns of hatchery origin adults to the system. Escapement of coho to the Toboggan Creek system have been significantly higher than to the Upper Bulkley system, as determined at adult fence counts (Table 12), despite the fact that the Upper Bulkley is a bigger system than Toboggan Creek. Higher adult returns are expected to result in higher seeding of available spawning habitat, and consequently higher numbers of juveniles. This appears to be the case at Toboggan Creek. However, juvenile densities at Buck Creek, where fry have been released in August 1999 and August 2000 (Tamblyn 2000, SKR 2000a), do not appear to be higher than for other Upper Bulkley Tributaries. This could be due to several factors, including very low densities of wild coho at Buck Creek, and/or movement of released coho prior to the onset of winter, resulting in an inability to capture these fish. These fish may select sites other than those sampled, migrate out of the system, or died. An emigration study conducted in Buck Creek with a rotary screw trap (RST) in the fall of 2000 after the release of hatchery origin coho suggests that most coho did not migrate downstream prior to ice - up, although the RST trap could not be fished at all times (Tamblyn 2000). Fry released in Buck Creek in the fall were released upstream of a beaver dam located upstream of the release pond, and may not have been able to disperse to sample sites located downstream of the beaver dam prior to the onset of winter. Two sites sampled during the overwintering study (BUC 1 and BUC 2) had 100% hatchery coho, while the proportion of hatchery origin coho declined to 0% downstream of the release pond. Coho catch per unit effort was higher at Toboggan Creek than in the Upper Bulkley system, which is speculated to be a direct result of greater levels of escapement to Toboggan Creek when compared to the Upper Bulkley.

55

-3

÷,

25

-

Year	Upper Bulkley	Toboggan Creek	
1996	170	1124 (80.4% wild)	
1997	~ 85 (incomplete count of 22 coho at fence)	359 (79.7% wild)	
1998	317 (31% wild)	2415 (81.7% wild)	
1999	1073 (20.2% wild)	9224 (68.6% wild)	

Table 12.Summary of adult escapement estimates at weirs in the Upper Bulkley and Toboggan
Creek systems (Ewasiuk 1998, Glass 1999, 2000, O'Neil pers. comm.).

Significant declines at sites with high CPUE for rainbow trout or coho, while sites with low CPUE for coho or rainbow trout exhibited little change in CPUE for these species, indicate that sites where rainbow trout or coho are present in early winter either experience net emigration or mortality. Decreases in coho and rainbow trout CPUE were most pronounced at sites where CPUE for these species was relatively high in the beginning of the winter. Coho CPUE was very high in Toboggan Creek mainstem sites in December, and declined drastically particularly in January and February. Likewise, rainbow trout and coho CPUE were higher in Upper Bulkley tributary sites in the beginning of winter, and declined significantly during the winter. Rainbow trout CPUE in Upper Bulkley mainstem sites was lower than in tributary sites, and no significant change in rainbow CPUE was noted during the winter at Upper Bulkley mainstem sites. Similarly, coho CPUE was relatively low in Upper Bulkley tributary and mainstem sites, and did not change significantly during the winter. Higher CPUE indicates higher fish densities, which could result in increased intra- and inter-specific competition, increased stress, increased mortality, and render habitat less suitable (Ricker 1975, Bagenal 1978, Krebs 1985, Hauer and Lamberti 1996). Catches consisted predominantly of coho and rainbow trout, for which CPUE were generally highest in early winter, and declined between December and March.

Drastic decreases of CPUE at Toboggan Creek sites (primarily for coho) early in winter, and gradual but consistent decreases in CPUE at most sites in Upper Bulkley (for both coho and rainbow) in late winter suggest significant emigration and/or mortality in both systems. Winter has been identified as a potential bottleneck in some systems, since this period is associated with high stress, low metabolic activities, energy loss, decrease growth and survival (Bustard and Narver 1975, Dolloff 1987). Estimates of overwinter survival range from 6% to 73% (Bustard and Narver 1975, Envirocon 2984, Heifetz et al. 1986). Net emigration from sites is also a plausible explanation for declines in CPUE, since considerable movement of salmonids during the winter has been reported in other studies, including ones conducted on streams with ice cover (Cunjak 1996, Heggersen et al. in prep, Jakober et al. 1998, Simpkins et al. 2000, Wet'suwet'en pers. comm.). Many researchers however suggest that salmonids move little during the winter to minimize energy expenditure (Envirocon 1986, Heifetz et al. 1986, Swales et al. 1986, Dolloff 1987, Giannico and Healey 1998). Net emigration may be a potential explanation for some sites, but an overall decline in CPUE early in the winter at Toboggan Creek sites and later in the winter at Upper Bulkley sites indicates that movement of fish is not the primary factor influencing CPUE. Movement of fish should result in a decrease in CPUE at some sites, and an increase at other sites, as was observed for coho in some of the Upper Bulkley sites between December and February. The decreased activity of fish during the winter may result in decrease capture rates since fish are less likely to enter traps (Swales et al. 1986). This may account for some of the reduction in capture rates at some sites, but does not explain decreased CPUE from February to March in Upper Bulkley sites despite increases in water temperature, or the relatively consistent capture rates of coho at Upper Bulkley sites throughout the winter. Likewise, simple changes in capturability of fish due to changes in temperature does not explain varying levels of changes in CPUE that are not related to varying water temperatures. Decrease in rainbow trout and particularly coho CPUE at most sites, particularly in early winter in Toboggan Creek, are speculated to be due to mortality or net emigration rather than decreased capture efficiency.

Catch per unit effort for coho and rainbow trout differed between watersheds, between sites within the two watersheds sampled, and changed over time. Coho CPUE was generally higher at Toboggan Creek than in Upper Bulkley sites, which is likely due to differences in spawner escapements to the two drainages. Rainbow trout CPUE was generally similar between the two watersheds. Catch per unit effort generally declined over time, particularly for coho at Toboggan Creek, which may indicate significant emigration and/or mortality at these sites. Differences in CPUE between Toboggan and Upper Bulkley sites, particularly for coho, at the start of winter are speculated to be a result of spawner escapements, while declines in CPUE during the winter, particularly for coho in Toboggan Creek are likely a result of emigration or mortality, which may indicate overseeding of the habitat.

5.2.3 Fish Size, Age and Condition

Fish size, age structure and condition are expected to be affected by differences in recruitment, age class strength due to differing levels of escapement, size dependent mortality or migration patterns, and/or competition. Larger fish are frequently thought to have a competitive advantage over smaller fish, and may be able to displace smaller fish from better habitat (Giannico and Healey 1998). Conversely, higher fish densities are expected to result in greater competition, which may lower growth rate, and therefore fish size and condition. The following sections summarize the comparisons of fish size, age, and condition, which may reflect differences in recruitment, or habitat suitability for overwintering.

5.2.3.1 FISH SIZE

Fish size is expected to remain similar or increase over the winter and at sites offering better overwintering habitat. The competitive advantage inferred for larger fish, and consequent displacement of smaller fish to less suitable habitat (Giannico and Healey 1998) would result in size selective movement of fish, as smaller fish move to more marginal habitat. Fish size during the winter may increase due to growth, size selective mortality or size selective migration. Of these factors, growth is less likely to have a significant effect on fork length in interior systems, as growth rates are likely minimal (Dolloff 1997), and coho did not grow even under hatchery conditions in the Toboggan Creek hatchery (O'Neill 1999). Size selective mortality or migration can result in a shift in fish size during the winter. Generally, higher mortality rates are suspected to occur for smaller fish (Giannico and Healey 1998) or fish in lower condition (Cargnelli and Gross 1997), which are assumed to have fewer energy reserves to survive adverse conditions. Differences in fork length between sites and during the winter are relatively small, and consist primarily of decreases in fork length at sites with relatively high CPUE, which is contrary to the expected changes in fork length. Coho were significantly smaller at Upper Bulkley tributary sites when compared to other Upper Bulkley sites, and at Toboggan Creek mainstem sites when

Department of Fisheries and Oceans & SKR Consultants Ltd.

+3

Ĵ.

÷.

Ŷ

÷

Upper Bulkley River Overwintering Study 2000-2001 Discussion

compared to other Toboggan Creek sites in March. Declines in fork length are significant between December and January in Upper Bulkley mainstem sites (rainbow trout) and Upper Bulkley tributary sites (rainbow trout and coho), while fork length appears to increase in Toboggan Creek side channel sites in March. An unexpected decline in fork length at these sites is speculated to be due to size selective movement of larger fish out of these sites, smaller fish that may be displaced from other sites in the system into these sites, or due to chance events. The lack of a change in fork length at most sample sites is consistent with the expected temporal trends in fork length.

5.2.3.2 AGE

The proportion of younger, smaller fish at sample sites was expected to remain similar or decrease over the winter due to size selective mortality or migration. Differences in age distribution between sites may be a result of different spawner escapement, or affects of size selective movement or mortality on fish at the sampled site. Generally, age 0+ fish were expected to dominate the catch, since the affects of cumulative mortality and smolting of some fish after their first winter on older age classes should reduce their numbers compared to younger age classes. Mortality during the winter was also expected to be more severe for age 0+ fish, since larger, older fish are generally better able to out compete smaller fish (Giannico and Healey 1998). This is expected to result in a decrease in the proportion of 0+ of the total catch during the winter. A predominance of age 0+ coho (1999 brood year) at both Upper Bulkley and Toboggan Creek sites is not surprising since younger fish are expected to be more numerous. In addition, adult escapement, particularly at Toboggan Creek, was higher for the 1999 brood year than in 1998 brood year (Table 12). Age classes older than 0+ appear to dominate the rainbow trout catches during the study. This may be due to inaccurate interpretation of the length at age data, a decreased efficiency of minnow traps to catch smaller fish, or an inability of smaller 0+ fish to survive the winter. Alternatively, the combination of rainbow trout older than 0+ may actually form a larger group of fish than rainbow trout younger than 0+ at sites sampled. Changes in the proportion of 0+ in the catch for coho at both Upper Bulkley and Toboggan Creek sites indicate that a smaller proportion of age 0+ coho are captured at the end of winter (March) than in the beginning of winter (December or January). The decline is more obvious for Toboggan Creek, where coho CPUE was notably higher than in Upper Bulkley sites, between January and March, and even more so between December and March. Densities of rainbow trout age 0+ and rainbow trout older than age 0+ appear to decline by about the same amount at Upper Bulkley sites, but age 0+ rainbow trout were rarely captured at Toboggan Creek, and did not allow for this comparison. The proportion of age 0+ in the catch of coho at the end of winter is significantly lower than in the beginning of winter in Upper Bulkley and especially Toboggan Creek sites, while changes in age distribution for rainbow trout are less clear, which may be due to more complex age structures, sampling bias favoring larger, older rainbow tout, and lower sample size for this species.

5.2.3.3 CONDITION FACTOR

Condition factor is expected to change over the winter, and differ between sites, since the amount of energy loss during the winter is expected to vary between sites. Condition may be expected to decline in winter as fish utilize their stored energy reserves to survive this stressful season (Dolloff 1987). Condition factor may differ between sites as a result of varying

58

-3

<u>.</u>

environmental (e.g. temperature, habitat complexity) and biological (e.g. competition, food availability) factors. The differences in condition factor between sites and during the winter are discussed in this section.

Condition factor changed significantly over the winter for most species, and at most sites. Condition factor was more variable in early winter, but variance decreased as winter progressed (particularly for coho at Toboggan Creek sites). This may partly be due to the clear predominance of smaller fish (which have more variable and generally higher condition factor) at Toboggan Creek sites in December, and the drastic decline of 0+ fish from December to January. Declines in condition factor for coho, rainbow trout and chinook are statistically significant, and most obvious between the February and March samples.

Sites with high CPUE appear to have more smaller fish with higher condition factor than sites with low CPUE, which may be due to the affect of competition on migration patterns (size selective movements of fish), growth and/or condition. Combined with CPUE, fork length distribution affected condition factor at sites sampled during the overwintering study. Coho tended to be significantly smaller at sites with higher overall CPUE (Upper Bulkley tributary, Toboggan Creek mainstem and side channel), except coho in Buck Creek, which are of hatchery origin. Rainbow trout tended to be smaller in Upper Bulkley tributary sites (with relatively high overall CPUE), than at Upper Bulkley mainstem sites (relatively low CPUE), which were in turn smaller than rainbow trout captured at Toboggan Creek mainstem sites (high overall CPUE). Sites with high CPUE also had generally high coho condition factor (e.g. Upper Bulkley tributaries, Toboggan Creek mainstem/side channel sites), which is expected since fork length and condition factor appear to be inversely related. These differences in coho condition factor are more pronounced earlier in the winter (December and January), while there was no significant difference in condition between sites in February. However, coho condition factor was significantly greater at Toboggan Creek sites than Upper Bulkley sites in March, while rainbow trout condition factors were not significantly different between Toboggan Creek and Upper Bulkley sites, which also did not differ significantly in rainbow trout CPUE. Sites with high overall CPUE are expected to have higher densities of fish, which may result in increased inter and intra-specific competition, as reflected in differences in condition factor and fork length of fish.

Condition factor generally declined during the winter for rainbow trout, coho and chinook, and mean condition factor was consistently lower at sites with high CPUE. The significant decline in condition factor for a variety of species supports that winter is a stressful season for fish. Winter has been identified as a potential bottleneck for salmonid production (Bustard and Narver 1975, Swales *et al.* 1986, Dolloff 1987), and is usually associated with energy loss, declining fish health and increased mortality (Bustard and Narver 1975, Dolloff 1997). The decline in condition for salmonids found during the 2000/2001 overwintering study is consistent with other studies that have associated energy loss with winter, since stored reserves are utilized during the winter, resulting in a decline in fish condition.

Department of Fisheries and Oceans & SKR Consultants Ltd.

-3

تقرير.

- 1 - 1 -

-

5.3 FISH AND FISH HABITAT

Fish habitat is expected to play a role in species assemblages, fish densities, fish size and condition. While species diversity and density are in part determined by the distribution and escapement of the species to the watersheds sampled, differences in fish habitat within a watershed is also expected to play a role. The effects of different species distribution and escapement on species diversity, densities, size and condition have been discussed in the previous sections. The following sections focus on relationships between species assemblages and fish densities within sites sampled in the Upper Bulkley and Toboggan Creek watersheds.

5.3.1 Upper Bulkley

Species assemblages and densities were expected to vary among the different types of sites sampled, depending on the type of habitat offered by each site. Sites sampled in the Upper Bulkley watershed represented mainstem, tributary and side channel habitat, all of which are known to be important for overwintering for a variety of different species. Side channel, off channel and slough areas have been noted to be utilized for overwintering by coho (Bustard and Narver 1975, Bustard 1986, Swales *et al.* 1986, Sandercock 1991), while rainbow trout and chinook appear to overwinter more frequently in mainstem and tributary habitat (Swales *et al.* 1986, Heifetz *et al.* 1986, Healey 1991). Other studies have pointed to the importance of substrate cover (Cunjak 1988, Heifetz 1986, Reihle and Griffith 1993, Heggenes *et al.* in prep.) and organic cover for salmonids, particularly coho (Bustard and Narver 1975, Swales *et al.* 1986), during the winter. Minimum water quality criteria (e.g. dissolved oxygen and water depth) must be met in order to ensure the survival of salmonids at a site. Differences in species assemblages and catch per unit effort between and within Upper Bulkley side channel, mainstem and tributary sites are discussed in this section.

Side channels were expected to offer important salmonid overwintering habitat, especially for coho. Salmonids, especially coho, have been documented to utilize side channel habitat for overwintering in several systems (Bustard and Narver 1975, Bustard 1986, Envirocon 1986, Swales et al. 1986, Sandercock 1991). However, overall catch per unit efforts, species richness and diversity in the Upper Bulkley watershed was lowest at the three Upper Bulkley side channel sites. Substrate at these sites consisted primarily of fines, and water depth were among the lowest sampled (particularly at sites SID 2 and 3). These sites therefore do not offer any cover associated with substrate, which has been found to be important for salmonids in other studies (Cunjak 1988, Heifetz 1986, Reihel and Griffith 1993, Heggenes et al. in prep.). Swales et al. (1986) found a predominance of coho in off channel ponds in the Coldwater and Nicola systems. These ponds had similar substrate characteristics to the side channels sampled in the Upper Bulkley, but were significantly deeper (mean depth = 1 to 2 m) than Upper Bulkley side channel sites (maximum depth = 0.5 - 1 m). The combination of lack of substrate cover and relatively low water depth may have influenced the quality of overwintering habitat at side channel sites in the Upper Bulkley. While substrate cover was lacking at the side channel sites, undercut banks and instream vegetation provided some cover. Ice formation in the channel margins may render undercut banks unsuitable for cover in the winter. Thus, suitable cover for use during the winter by salmonids in Upper Bulkley side channel sites appears limited. In addition, dissolved oxygen concentrations at these sites were among the lowest in the Upper Bulkley watershed, while water

temperatures were generally higher, indicating some ground water influence (Appendix 2). The combination of substrate composition, lack of organic cover (other than instream vegetation), low dissolved oxygen and relatively low water depth likely reduced the suitability of side channels sampled in the Upper Bulkley system for overwintering.

Mainstern habitat in the Upper Bulkley was expected to be utilized primarily by chinook and rainbow trout, while coho were not expected to utilize these sites to a significant degree. Rainbow trout are frequently found associated with deeper pools in mainstem habitat (Swales et al. 1986, Heifetz et al. 1986), where they may be concentrated along the stream margins (Bustard and Narver 1975) and with larger substrate size (Bustard and Narver 1975, Swales et al. 1986, Dolloff 1987). Similarly, chinook tend to be associated with larger substrate size, moving from tributary to mainstem sites for overwintering (Healey 1991). They are generally less frequently found in ponds, although they may also utilize off channel ponds for overwintering in some systems (Swales et al. 1986). As expected, catch per unit effort, species richness and diversity was moderate in Upper Bulkley mainstem sites, and consisted primarily of chinook, rainbow trout, and some coho. The predominance of chinook and rainbow trout over coho in mainstem sites is consistent with findings in other overwintering studies conducted elsewhere in B.C. (Swales et al 1986). A predominance of chinook in the catches obtained at Upper Bulkley mainstem sites therefore suggests that Upper Bulkley chinook utilize mainstem habitat for overwintering. Among sites sampled in the Upper Bulkley mainstem, CPUE was generally highest at site UBR 2, and lowest at site UBR 12. This is consistent with speculations that mainstem sites near confluences with major tributaries are more attractive to fish since they offer access to a wider variety of habitat, satisfying a number of life history stages, and since water quality is presumed to be better at these sites than other mainstem sites (BCCF 1997, 1998). Good cover (LWD and substrate), water quality and water levels are present at site UBR 2 throughout the winter, and fluctuations in CPUE at UBR 2, as well as changes in fork length (see above) indicate that there may be movement of salmonids between this site and nearby Byman Creek. The main differences between mainstem sites UBR 2 and UBR 12 is their proximity to a tributary with apparently high fish densities (Byman Creek for site UBR 2), the amount of cover, and the proportion of pool habitat. Site UBR 12 is located in below the confluence with Buck Creek, an area of the Upper Bulkley mainstem noted for poor potential for fish production (BCCF 1998). As expected, chinook and rainbow trout form a major proportion of catches in mainstem sites sampled in the Upper Bulkley, and overall CPUE is high at a site with good cover, cobble substrate, a predominance of pool, and proximity to a tributary with apparently high fish densities.

Tributary habitat in the Upper Bulkley watershed was expected to be utilized primarily by coho and rainbow trout, while chinook were expected to be less common at these sites. Rainbow trout and particularly coho have been documented to overwinter in suitable tributary habitat in other studies (Bustard and Narver 1975), and small tributaries have been identified to offer important habitat for coho (Rosenfeld *et al.* 2000). As expected, catch per unit effort, species richness and diversity in the Upper Bulkley watershed was higher at tributary sites than in mainstem sites, particularly for coho. Coho have been documented to be more closely associated with organic cover types (e.g. LWD) than with substrate cover (e.g. cobbles) in some studies (Narver and Bustard 1975, Swales *et al.* 1986, Tschaplinski and Hartman 1993), although a preference of cobble cover has also been documented (Heifetz *et al.* 1986). Within the Upper Bulkley

ŵ

- <u>1</u>

50-

Upper Bulkley River Overwintering Study 2000-2001 Discussion

tributary sites, catch per unit effort was high in Richfield Creek, Byman Creek and Buck Creek. Rainbow trout were dominant at the Buck Creek and Byman Creek site while coho and rainbow trout co-dominated in Richfield Creek site RIC 3 and coho dominated at site RIC 2. Tributary sites where coho CPUE was abundant offer deep, primarily pool habitat, with cobble and organic cover. In addition, Richfield Creek and Byman Creek, both of the tributaries where coho CPUE was highest, are located near spawning concentrations for Upper Bulkley coho documented during aerial counts of spawners (Finnegan pers. comm.). Rainbow trout CPUE was highest at site BUC 5, BYM 2, and RIC 3. Two of these sites (RIC 3 and BYM 2) also had high coho CPUE, indicating that these species can coexist. Site BUC 5 was one of the deepest sites sampled, and consisted primarily of pool and glide habitat with cobble and boulder cover, but no organic cover. Coho and rainbow CPUE were relatively high at sites with water depths near 1 meter (among the deeper sites sampled), abundant cobble substrate, presence of organic cover (for coho) and low substrate embeddedness, as well as proximity to suspected locations of spawning areas.

Among the sites sampled in the Upper Bulkley watershed, rainbow trout and coho CPUE were highest in Upper Bulkley-tributary sites, while rainbow trout CPUE was also high at some Upper Bulkley mainstem sites, but salmonids were generally lacking at side channel sites. The lack of salmonids at the three side channel sites is somewhat surprising since the importance of side channels for overwintering has been pointed out in several studies (Bustard and Narver 1975, Bustard 1986, Swales *et al.* 1986, Sandercock 1991). However, the fact that the three side channels sampled during the overwintering study did not appear to provide suitable overwintering habitat should not be generalized across the whole watershed. The three side channels may not be representative of all side and off channel habitat in the Upper Bulkley. Overwhelming historic evidence points to the importance for these types of habitat, particularly by coho. As in other studies, coho are found to prefer tributary habitat with relatively deep pools, organic and substrate cover, and good water quality over mainstem habitat, while rainbow trout and chinook were captured in both mainstem and tributary habitat that provided substrate cover (e.g. cobble).

5.3.2 Toboggan Creek

Species assemblages and densities were expected to vary among the different types of sites sampled, depending on the type of habitat offered by each site. Side channel, off channel and slough areas have been noted to be utilized for overwintering by coho (Bustard and Narver 1975, Bustard 1986, Swales *et al.* 1986, Sandercock 1991), while rainbow trout appear to overwinter more frequently in mainstem and tributary habitat (Swales *et al.* 1986, Heifetz *et al.* 1986, Healey 1991). Lakes may be used for overwintering by coho (Swales and Levings 1989). Sites sampled in the Toboggan watershed represented mainstem, side channel, and lake habitat, all of which are known to be important for overwintering for a variety of salmonids. Other studies have pointed to the importance of substrate cover (Cunjak 1988, Heifetz 1986, Reihel and Griffith 1993, Heggenes *et al.* in prep.) and organic cover for salmonids, particularly coho (Bustard and Narver 1975, Swales *et al.* 1986), during the winter. Minimum water quality criteria (e.g. dissolved oxygen and water depth) must be met in order to ensure the survival of salmonids at a site. Differences in species assemblages and catch per unit effort between and within Toboggan Creek side channel, mainstem and tributary sites are discussed in this section.

ł

Æ

Ĵ.

Upper Bulkley River Overwintering Study 2000-2001 Discussion

Species diversity and catch per unit efforts were expected to be relatively high in Toboggan Lake sites when compared to Toboggan mainstem or side channel sites. Lake habitat has been identified as important for coho overwintering in several systems, and is frequently associated with good survival (Petersen 1982, Swales and Levings 1989, Quinn and Petersen 1996). Contrary to expectations, fish density, species richness and diversity were lower at Toboggan Lake than at Toboggan side channel or mainstem sites. The lower capture rates of fish, particularly coho and rainbow trout, in Toboggan Lake can be attributed to significant oxygen depletion at these sites during the winter to levels that are below minimum levels required by salmonids (Davis 1975, Canadian Council of Ministers of the Environment 1991). Toboggan Lake is a small (14.9 ha) shallow (1.9 m maximum depth) lake, with a predominance of littoral area vegetated by macrophytes (Remington and Donas 1999). As these macrophytes decompose during the winter, and as ice cover coupled with the lack of flow prevent re-oxygenation of the lake, oxygen levels decline and become unsuitable for salmonids, at least at the sites sampled between December 2000 and March 2001. Oxygen depletion into Toboggan Lake is at such levels as to cause lower oxygen concentrations in the outlet stream, which does have some flow. Low CPUE, species richness and diversity at Toboggan Lake, particularly at the conclusion of winter, can be attributed to low oxygen concentrations at Toboggan Lake sample sites, which appear to render this habitat unsuitable for overwintering.

Species diversity and densities were expected to be relatively high at Toboggan Creek side channel sites and mainstem sites, particularly coho, since the size of the Toboggan Creek mainstem is comparable to Upper Bulkley tributaries. Salmonids, especially coho, have been documented to utilize side channel habitat for overwintering in several systems (Bustard and Narver 1975, Bustard 1986, Envirocon 1986, Swales et al. 1986, Sandercock 1991). In addition, rainbow trout and particularly coho have been documented to overwinter in suitable tributary habitat in other studies (Bustard and Narver 1975), and small tributaries have been identified to offer important habitat for coho (Rosenfeld et al. 2000). While CPUE, particularly for coho, at Toboggan Creek side channel sites was expected to be high, one of the two side channel sites was unsuitable for sampling due to low water levels, and CPUE at the second side channel sites was comparable to CPUE in Toboggan mainstem sites. This indicates that not all side channel habitat is suitable for overwintering. Low winter flow and water levels can cause stranding and freezing of fish in some side channels, as has been documented in the Morice River (Envirocon 1984). Toboggan Creek mainstem habitat, which is comparable to Upper Bulkley tributary habitat in terms of stream size, appears to be more stable and suitable for overwintering of salmonids than some of the side channel habitat. Coho CPUE was relatively high in Toboggan Creek mainstem sites, and rainbow trout CPUE was higher in Toboggan Creek mainstem sites than in Toboggan Creek sidechannel or lake sites, which is expected as other studies have shown a preference for stream habitat for this species (Bustard and Narver 1975, Swales et al. 1986). Both mainstem sites offered primarily pool habitat, with cobble substrate and low embeddedness. Organic cover was also noted at site TOB 1, where coho CPUE was somewhat higher, than at TOB 2, which had larger substrate size, and less pool. This is consistent with the reported preferences of coho for organic cover in other studies (Bustard and Narver 1975, Heifetz et al. 1986, Swales et al. 1986). Fish densities, species richness and diversity was highest at the two Toboggan Creek mainstem sites, particularly the site offering organic cover in addition to substrate cover, and lowest at the Toboggan Lake sites. Toboggan Creek side channel, and

Department of Fisheries and Oceans & SKR Consultants Ltd.

. .

ş.

蟚

3

27

Upper Bulkley River Overwintering Study 2000-2001 Discussion

particularly Toboggan Creek mainstem habitat offered more suitable overwintering habitat or salmonids, as indicated by high CPUE, species richness and diversity at these sites.

Among the sites sampled in the Toboggan Creek watershed, CPUE, species richness and diversity were highest in Toboggan Creek mainstem and side channel sites, and lowest at Toboggan Lake. The low number of salmonids captured in Toboggan Lake, particularly at the end of the winter appears to be due to unsuitable water quality at the sample sites, as oxygen levels dropped below minimum requirements for salmonids. One of the two side channel sites was utilized by a number of fish during the winter, as indicated by relatively high CPUE, species richness and diversity, while the other side channel site could not be sampled due to low water levels. This indicates that some side channel habitat is unstable, and can result in stranding of fish during the winter. Similarly unstable overwintering habitat has been reported in other interior systems (e.g. Envirocon 1986), but the importance of stable, suitable side channel habitat has been identified in several studies (Bustard and Narver 1975, Bustard 1986, Swales et al. 1986, Sandercock 1991). High fish densities, species diversity and richness at the two mainstem sites, which offered cobble pool habitat with organic cover at site TOB 1 is similar to findings of overwinter distribution of coho and rainbow trout in other interior system (e.g. Swales et al. 1986), substantiating that cobble pools with organic cover and adequate water quality are important for overwinter survival of fish. Fish densities, particularly for coho, species diversity and evenness were highest at Toboggan mainstem sites, particularly the mainstem site offering both substrate and organic cover.

÷.,

-3

- F

6.0 A BRIEF REVIEW OF THE THREE YEARS OF OVERWINTERING DATA

Since November 1998, overwintering data has been collected in the Upper Bulkley and Toboggan Creek watersheds to identify potential factors that may influence overwinter habitat quality. Winter sampling was conducted at 28 sites (including 4 in Toboggan Creek) in 1998/1999, at 21 sites (including 4 in Toboggan Creek) in 1999/2000 and at 31 sites (6 in Toboggan) in 2000/2001. Over the three years of the study, fall and winter assessments were conducted at a total of 66 sites in the Upper Bulkley watershed, and 14 sites in Toboggan Creek, and resulted in the capture of 4,755 fish (1974 fish in 1998/1999, 1259 fish in 1999/2000, 1522 in 2000/2001). While the amount of data collected over the three years is large, funding sources are limited, and this has restricted comparisons of data collected. Data comparisons for the three years of the overwintering study are not exhaustive of the comparisons that could be made, and are limited to broad analysis. The cursory data analysis conducted on the three years of overwintering data focuses on obvious trends noted during the study.

6.1 GENERAL COMPARISONS

The overwintering study conducted in the Upper Bulkley and Toboggan Creek watersheds was initiated in November 1998, and was envisioned to include three years of data collection (Donas and Saimoto 1999, 2000). Sampling between November 2000 and March 2001 constituted the third and final winter field season of the overwintering studies in the Upper Bulkley and Toboggan Creek watersheds. During each of the three years, sites were sampled in the Upper Bulkley mainstem, Upper Bulkley tributaries and Toboggan Creek mainstem. However, side channel habitat (Upper Bulkley and Toboggan Creek) and lake habitat (Toboggan Lake) was not sampled in the first two years of the study. Measurements on habitat characteristics, particularly in the fall, were more detailed in the second (1999/2000) and third year (2000/2001) of the study, as detailed site assessment forms were developed after the initial field season of the study (Saimoto and Donas 1999, 2000).

6.1.1 Habitat Assessments

Characteristics in physical habitat parameters and winter conditions varied between the three years of the study. As data forms evolved, different data was collected in some cases, making comparisons of habitat and winter conditions in some instances difficult. However, some of the data that was collected is comparable. Subjective notes taken during the habitat assessments in the fall provided further indications on changes in overwintering habitat during the three years of the study. Cursory comparisons of habitat data and winter condition were conducted for the three years of the study in Toboggan Creek and the Upper Bulkley watershed.

Fall assessment data collected for sites sampled in the Upper Bulkley watersheds, documented some changes in physical conditions at sites, while the two sites sampled in Toboggan Creek appeared to have changed relatively little. In the Upper Bulkley sites, several notes on siltation and infilling were noted. For example, site RIC 3 was moved upstream slightly since site RIC 3 sampled in both 1998/1999 and 2000/2001 was infilling considerably. The pool habitat noted at this site during the first two years of the overwintering had infilled to such a degree that the site offered only fast flowing riffle habitat, with shallower depth than in previous years. Site RIC 4

Department of Fisheries and Oceans & SKR Consultants Ltd.

-

1

×.

3

÷

2

3

z-

÷.

located upstream of site RIC 3 also exhibited signs of infilling, and shifts in channel morphology between the years of the study (Appendix 1). Similarly, continual infilling was noted at sites BAR 1 (Barren Creek) and McQ 1 (McQuarrie Creek). Site BYM 1 was altered between the last two years of the study, as boulders in the center of the pool were removed for rip rap at the Highway 16 crossing (Appendix 1). The release pond sites sampled in Buck Creek were not present during the initial year of the study (1998/1999, SKR 2000b), and the addition of structure and substrate added complexity to the release ponds in 2000. In addition, sites selected in 1998/1999 and 1999/2000 represented a greater variety of substrate composition and organic cover types than sites selected in 2000/2001. The initial two years of the study had indicated an importance of substrate and organic cover types for overwinter, and sites deemed to provide good overwintering habitat based on these characteristics were focused on in the third year of the study. Notable changes in habitats at sites sampled during the last three years of the overwintering study in the Upper Bulkley, and the apparent lack of notable changes in Toboggan Creek indicate that sites sampled in the Upper Bulkley may be less stable.

Most of the data collected throughout the three years of the overwintering study were comparable between the three years of the study. For these comparisons, lake sites and Upper Bulkley side channel sites, which were notably different during the winter, were excluded. Air temperature was variable, and differed little between the three years of the study. Air temperature was lower in January 1998/99 than in January 2000/2001 in Toboggan Creek (ANOVA F = 5.523, p = 0.043; Tukey HSD = 3.00, p = 0.043), but not at Upper Bulkley sites. Air temperature was significantly higher in March 1998/99 than in March 2000/2001 at both Toboggan Creek (ANOVA F = 73.484, p = 0.000, Tukey HSD = 8.875, p = 0.000) and Upper Bulkley sites (ANOVA F = 42.073, p = 0.000, Tukey HSD = 4.805, p = 0.000). Air temperatures recorded during the study are not reflective of mean, maximum or minimum monthly air temperatures, as sampling was purposely biased towards warmer days that fall within the predetermined sampling period. Percent ice cover was recorded in the second (1999/2000) and third winter (2000/2001) of the study, and did not differ significantly for any months sampled in either the Upper Bulkley or Toboggan Creek watersheds. Similarly, water temperature did not differ significantly between these two years of the study. However, water temperature was significantly higher in March at Toboggan Creek sites (ANOVA F = 6.806, p =0.019, Tukey HSD = 0.700, p = 0.021) in the first year of the study (1998/1999). Water temperatures measured in January were significantly lower in the first year of the study (1998/1999) than in subsequent years at Toboggan Creek sites (ANOVA F = 4.425, p = 0.036, Tukey HSD = 0.475, p = 0.037). Water depths measurements were generally similar between the three years of the study, as was ice thickness. However, snow thickness was consistently higher in the first year of the study than in the third year of the study, in both the Toboggan Creek and Upper Bulkley watersheds (ANOVA F \geq 4.951, p \leq 0.035, Tukey HSD \geq 5.705, p \leq 0.035). Differences during the winter between the different years of the study appear relatively minor, and are most prevalent and consistent in snow depth, which was greater in 1998/1999 than in 2000/2001.

Habitat and winter conditions between the three years of the study were relatively similar, particularly at Toboggan Creek. In - filling noted in the Upper Bulkley system at several sites may have influenced overwinter habitat quality to some degree, particularly in terms of substrate composition, embeddedness and pool depth. A greater proportion of sites had cobble as the

÷

dominant substrate in 2000/2001 than in the previous two years of the study, as the data collected in 1998/1999 and 2000/2001 pointed to the importance of substrate as a source for cover. Snow depth in 1998/1999 was significantly higher than in 2000/2001. The third winter of the study was noted to be milder than the first two years of the study, with a later onset of ice off, and a delayed spring thaw.

6.1.2 Fish Sampling

Data on fish distribution, abundance, length and condition factor data were collected for all three years of the overwintering study. These data are variable within and between years, and changes in sampling methodologies resulted in some difficulties for comparisons of fish data between the three years of the study. Due to changes in methodologies in habitat descriptions between years, fish densities/unit area or fish densities/unit volume could not be determined for all sites in all vears. Therefore, comparisons of density were restricted to comparisons of CPUE (catch/trap), which could be determined for all sites in all years of the overwintering study. Sampling frequencies for length and weight data collection changed considerably after the first year of the overwintering study (Donas and Saimoto 1999, 2000), since primarily weight data was collected in the first year. In subsequent years, length and weight data were collected when possible, and comparisons of length and condition data were restricted to the overwintering studies conducted in 1999/2000 and 2000/2001. Age distribution was not estimated in 1999/2000 (Donas and Saimoto 2000), and age distribution was not compared between the years of the study. The following sections describe and analyse some of the trends and relationships of trends between different years related to species distribution and diversity, fish densities and fish and fish habitat for the three years of the study.

6.1.2.1 SPECIES DISTRIBUTION AND DIVERSITY

Generally, species distribution and diversity found between the three years of the study are similar. Coho, rainbow trout, chinook and longnose dace were captured in the Upper Bulkley watershed during all three years of the study. Burbot were also captured at a mainstem site in 1998/1999 (Donas and Saimoto 1999), and in Buck Creek in 1999/2000 (Donas and Saimoto 2000), but the species was not captured in the third year of the study. Burbot were present at low densities, and the lack of this species from samples obtained in the current year of the study appears purely due to chance. Suckers, peamouth chub and cutthroat trout were not captured in the previous two years of the study, but were captured in 2000/2001 in the Upper Bulkley watershed. Coho, rainbow trout and Dolly Varden were captured in all three years of the study at Toboggan Creek. In addition, a cutthroat trout was captured in Toboggan Creek in 1998/1999 (Donas and Saimoto 1999), and pink salmon and longnose dace were captured in Toboggan Creek in 1999/2000 (Donas and Saimoto 2000). The range in species richness in Upper Bulkley tributary sites was slightly larger in 2000/2001 (0-4 species) than in the initial two years of the study (0-3 species) (Donas and Saimoto 1999, 2000). Similarly, maximum levels observed for species diversity and evenness in Upper Bulkley tributary sites was greater in 2000/2001 than in the previous years of the study. Ranges in species diversity, evenness and richness at Upper Bulkley mainstem sites were similar between the three years of the study. While species richness in Toboggan Creek was similar between the three years of the study, the maximum richness and evenness at these sites were higher in 1998/1999 and 1999/2000 than in the third

Department of Fisheries and Oceans & SKR Consultants Ltd.

-

-

×.

-

È

÷.

÷

Z.

year of the study. Species richness, evenness and diversity were generally similar for Upper Bulkley mainstem sites, but differed for Toboggan Creek and Upper Bulkley tributary sites between the three years of the study.

6.1.2.2 DENSITY INDICES

Catch per unit effort was determined in all three years of the study, and can therefore be used for comparisons of density indices between the three years. Rainbow trout, coho and total CPUE did not differ significantly between the three years of the study at Toboggan Creek sites, Upper Bulkley mainstem sites or Upper Bulkley tributary sites (Figures 11, 12 & 13). The lack of a significant difference in December or March CPUE indicates that increased escapement of spawners does not result in a significant increase in juvenile CPUE during the three years of the study. However, it is important to consider that CPUE is a rough indicator of density, some of the sites sampled were not sampled in all three years of the study, and that habitat changes over the three years of the study may have reduced overwinter habitat quality.

Coho CPUE declined between December and March in Toboggan Creek sites for all three years of the study, while coho=CPUE at Upper Bulkley sites did not change significantly over the winter in each of the three years of the study. Coho CPUE at Toboggan Creek was notably higher in December (1999/2000 and 2000/2001 data only) than in March (Figure 12). In addition, coho CPUE in December is significantly higher at Toboggan Creek site than at Upper Bulkley mainstem or tributary sites in 1999/2000 and 2000/2001 (ANOVA F = 12.888, p = 0.000, HSD \geq 13.205, p \leq 0.000). However, coho CPUE in March is not significantly different between the Upper Bulkley sites (tributary and mainstem) and Toboggan Creek sites for any of the three years of the study (ANOVA F = 1.346, p = 0.247). Despite the fact that coho juvenile densities in December appear to be significantly higher at sites in Toboggan Creek than at Upper Bulkley mainstem or tributary sites, this difference does not persist at the end of winter since coho CPUE in March does not differ significantly between Toboggan and Upper Bulkley sites.

Rainbow trout CPUE appears to decline somewhat between December and March at Upper Bulkley and Toboggan Creek sites in each of the three years of the study. However, this decline is not statistically significant for any of the three years of the study. Rainbow trout CPUE was relatively low in December and March in Upper Bulkley sites for all three years of the study (Figure 13). While graphical comparisons of rainbow trout CPUE in Upper Bulkley sites to Toboggan Creek sites indicates that CPUE for rainbow trout was greater in the Upper Bulkley sites, this difference was not statistically significant in both December (ANOVA F = 1.428, p =0.210) and March (ANOVA F = 1.742, p = 0.118). Rainbow trout CPUE did not differ significantly between watersheds or over the winter, although a general trend of decline in CPUE over the winter, and lower CPUE at Toboggan Creek when compared to Upper Bulkley sites was noted. 33

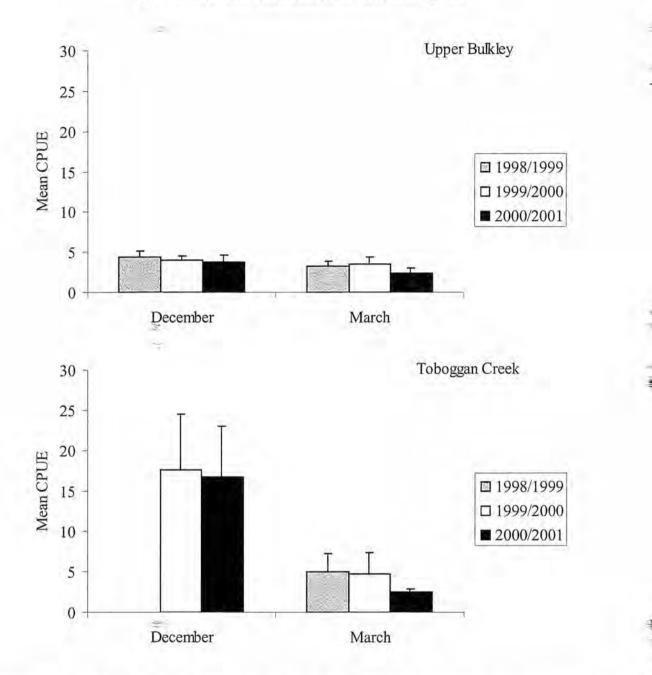


Figure 11. Total CPUE for the three years of the study. Toboggan Creek was not sampled in December 1998. Error bars indicate standard errors of catch per unit effort between the sites sampled

Department of Fisheries and Oceans & SKR Consultants Ltd.

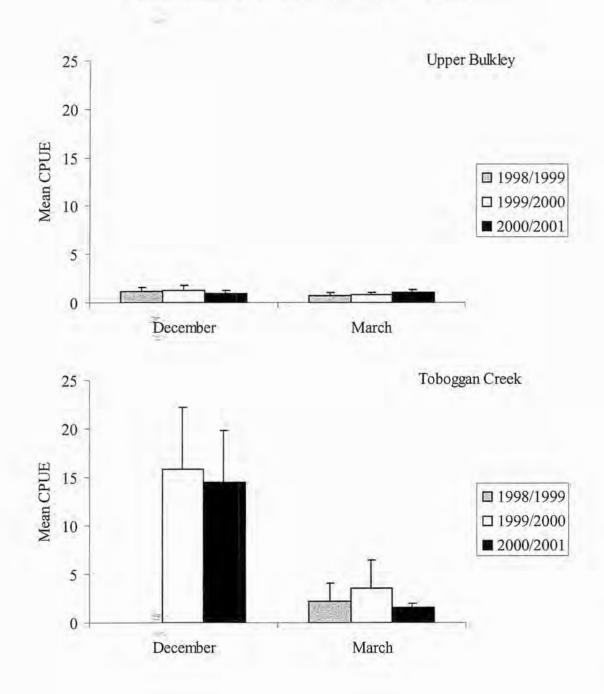


Figure 12. Coho CPUE for the three years of the study. Toboggan Creek was not sampled in December 1998. Error bars indicate standard errors of coho catch per unit effort between the sites sampled.

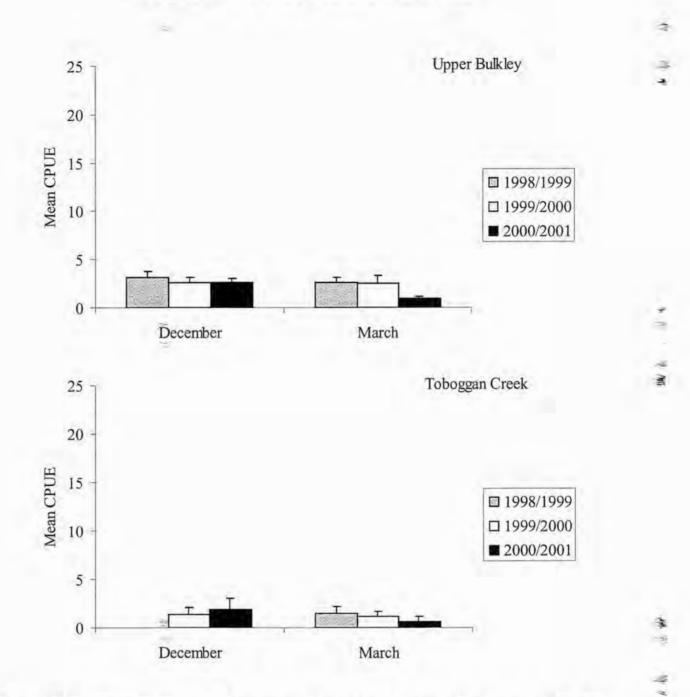


Figure 13. Rainbow CPUE for the three years of the study. Toboggan Creek was not sampled in December 1998. Error bars indicate standard errors of rainbow catch per unit effort between the sites sampled.

Department of Fisheries and Oceans & SKR Consultants Ltd.

Density indices between the three years of the study are relatively similar. No significant differences were found between the three years of the study when comparing monthly CPUE at Toboggan Creek, Upper Bulkley mainstem and Upper Bulkley tributary sites. Temporal trends noted for coho, rainbow trout and total catch are consistent between all three years of the study. While rainbow trout CPUE appears to change little in Upper Bulkley mainstem, tributary of Toboggan Creek sites, coho CPUE does change significantly over time, resulting in a significant decline in total CPUE over the winter. In particular for Toboggan Creek sites, coho and total CPUE are significantly higher in December than in March. Coho and total CPUE at Upper Bulkley mainstem and tributary sites changes comparatively little over the winter. While coho CPUE at Toboggan Creek is significantly higher than in Upper Bulkley sites at the start of winter, coho CPUE are not significantly different between Toboggan Creek and Upper Bulkley sites in March.

6.1.2.3 FISH SIZE AND CONDITION

Fork length and weight data were collected with less consistency in 1998/1999 and 1999/2000 than in 2000/2001. In the first year of the overwinter study, fork length was collected more sporadically than weight since it was felt the weight measurements were less stressful on the fish (Donas and Saimoto 1999). However, weight data is not as suitable in estimating age distribution as length data. In subsequent years of the study, a greater emphasis was placed on the collection of length data, particularly in light of the lack of scale samples. Weights were collected more sporadically in 1999/2000 than in 2000/2001 due to mechanical problems with the scale at cold temperatures. Age distribution was not estimated in 1999/2000, and was therefore not compared between the two years of the overwintering study. However, differences in age structure are expected to influence fork length and condition factor data. Comparisons of fork length, and especially condition factor data. The following sections present the analysis of some of the trends in size and condition factor that were observed in the three years of the overwintering study for coho and rainbow trout.

6.1.2.3.1 Соно

Coho fork length and condition factor data were compared for samples obtained in 1999/2000 and 2000/2001. During the first year of the overwintering study, weight was recorded for fish captured throughout the study, but fork length data was not collected until March 1999 (Donas and Saimoto 1999). The lack of fork length data for 1998/1999 resulted in the restriction of fish size and condition comparisons to 1999/2000 and 2000/2001 samples. The following sections compare coho length and condition between the second and third year of the overwintering study.

6.1.2.3.1.1 Fork Length

Fork length for 1999/2000 and 2000/2001 were compared between sites for each of the months sampled. Since fork length data are not normally distributed, ranked fork lengths were compared among Buck Creek, other Upper Bulkley tributaries, Upper Bulkley mainstem and Toboggan Creek sites between the second and third year of the overwintering study. Coho fork length data

obtained in December samples differ significantly between years (ANOVA F = 20.583, p =0.000), with Upper Bulkley tributary coho being significantly longer in December 1999 than in December 2000 (Tukey HSD = 96.096, p = 0.006), while Buck Creek coho were significantly longer in December 2000 than in December 1999 (Tukey HSD = 37.113, p = 0.000). Ranked fork length of coho captured in Toboggan Creek and Upper Bulkley mainstem were similar between the two years of the study. Ranked fork length in Upper Bulkley mainstem and tributary sites in January 2000 was significantly longer than ranked fork length in January 2001 (ANOVA F = 67.859, p = 0.000; Tukey HSD = 131.872 and 117.014 respectively, p = 0.000). However ranked fork length at Buck Creek or Toboggan Creek sites was not significantly different in January 2000 and January 2001. Ranked fork length at Upper Bulkley tributary sites continued to be higher in February 2000 than in February 2001 (ANOVA F = 34.671, p = 0.000; Tukey HSD = 132.995, p = 0.000), but ranked fork length at Buck Creek, Upper Bulkley mainstem and Toboggan Creek were not significantly different between February 2000 and February 2001. Similarly, ranked fork length for coho captured in Upper Bulkley tributary sites was significantly lower in March 2001 than in March 2000 (ANOVA F = 28.523, p = 0.000, Tukey HSD = 118.237, p = 0.000). Buck Creek coho were significantly longer in March 2001 than in March 2000 (Tukey HSD = 61.524, p = 0.000). While ranked fork length at most sites was similar or lower in 2000/2001 than in 1999/2000, ranked fork length at Buck Creek was similar or higher in 2000/2001 when compared to 1999/2000. This is likely attributable to the fact that coho fry releases occurred for the first time in August 1999, resulting in a predominance of 0+ coho in the catches during the winter at Buck Creek sites. Not all of the coho released in 1999 emigrated as smolts in the spring of 2000, but some remained to overwinter a second year in Buck Creek as 1+ coho in 2000/2001 (Saimoto and Donas 2000, Tamblyn 2000). Age 1+ coho were therefore present in Buck Creek in 2000/2001, but not in 1999/2000 and therefore likely resulted in the increase of ranked fork length in the third year of the study. Overall, wild coho populations were similar or smaller in ranked fork length in the 2000/2001 sampling period than in 1999/2000.

6.1.2.3.1.2 Condition

Coho condition factor also differed significantly between the second and third year of the overwintering study. Coho condition factor was significantly lower in December 2000 than in December 1999 at Toboggan Creek (ANOVA F = 30.855, p = 0.000). Tukey HSD = 0.253, p =0.005), Buck Creek (Tukey HSD = 1.210, p = 0.000) and Upper Bulkley tributary sites (Tukey HSD = 0.719, p = 0.000), but not in Upper Bulkley mainstem sites (Tukey HSD = 0.246, p = 0.000) 0.000). Condition factor did not differ significantly at Upper Bulkley mainstem, Upper Bulkley tributary, Buck Creek or Toboggan Creek sites between January 2000 and January 2001. However, condition factor was significantly lower in February 2001 than in February 2000 at Buck Creek (ANOVA F = 17.524, p = 0.000; Tukey HSD – 0.255, p = 0.006), Upper Bulkley mainstem (Tukey HSD = 0.385, p = 0.000), Upper Bulkley tributary (Tukey HSD = 0.351, p -(0.002) and Toboggan Creek sites (Tukey HSD = 0.400, p = 0.000). Condition factor continues to be significantly lower at Buck Creek (ANOVA F = 49.304, p = 0.000; Tukey HSD = 0.481, p = 0.000), Upper Bulkley mainstem (Tukey HSD = 0.400, p = 0.021) and Toboggan Creek sites (Tukey HSD = 0.586, p = 0.000) between March 2000 and March 2001, while condition factor for coho did not differ significantly at Upper Bulkley tributary sites between March 2000 and March 2001. Although condition factor in 1999/2000 and 2000/2001 is negatively correlated

Department of Fisheries and Oceans & SKR Consultants Ltd.

-

Ż

÷

÷

3

with fork length (Donas and Saimoto 2000), higher fork lengths in 1999/2000 did not translate to lower condition factor in 1999/2000 when compared to 2000/2001. Fork length and condition data indicate that at sites other than Buck Creek, coho were generally smaller and in lower condition in 2000/2001 than in 1999/2000.

6.1.2.3.2 RAINBOW TROUT / STEELHEAD

Rainbow trout fork length and condition factor data were compared for samples obtained in 1999/2000 and 2000/2001. During the first year of the overwintering study, weight was recorded for fish captured throughout the study, but fork length data was not collected until March 1999 (Donas and Saimoto 1999). The lack of fork length data for 1998/1999 resulted in the restriction of fish size and condition comparisons to 1999/2000 and 2000/2001 samples. The following sections compare rainbow trout length and condition between the second and third year of the overwintering study.

6.1.2.3.2.1 Fork Length 🛫

Rainbow trout fork length data was compared between 1999/2000 and 2000/2001. Fork length data collected in 1998/1999 was restricted to the spring sample (March and April) (Donas and Saimoto 1999), and was not generally comparable to fork length data collected for the other two years of the study. Since fork length data are not normally distributed, ranked fork lengths were compared among Upper Bulkley tributary, mainstem and Toboggan Creek sites between the second and third year of the overwintering study. Rainbow trout ranked fork length did not differ significantly between December 1999 and December 2000, between February 2000 and February 2001, or between March 2000 and March 2001, at Upper Bulkley mainstem, Upper Bulkley tributary or Toboggan Creek sites. Ranked fork length for rainbow trout continued to be similar in January 2000 and January 2001 at Toboggan Creek and Upper Bulkley mainstem sites, but ranked fork length was significantly lower at Upper Bulkley tributary sites in January 2001 (ANOVA F = 5.407, p = 0.000; Tukey HSD = 52.707, p = 0.000). Rainbow trout fork length were similar between 1999/2000 and 2000/2001 at Toboggan Creek and Upper Bulkley mainstem sites, while rainbow trout were significantly smaller in January 2000 than in January 2000 Eat Upper Bulkley tributary sites.

6.1.2.3.2.2 Condition

Condition factor data for rainbow trout were compared for 1999/2000 and 2000/2001. Rainbow trout condition factor at Upper Bulkley mainstem sites were similar for the four months of the overwintering study between the two years of the study. However, rainbow trout condition factor at Upper Bulkley tributary sites was significantly lower for December 2000 (ANOVA F = 13.066, p = 0.000; Tukey HSD = 0.689, p = 0.000), February 2001 (ANOVA F = 5.056, p = 0.000; Tukey HSD = 0.257, p = 0.000) and March 2001 (ANOVA F = 11.566, p = 0.000; Tukey HSD = 0.182, p = 0.000) than in respective months in the winter of 1999/2000. Rainbow trout condition factor for Toboggan Creek sites were similar between the two years of the study except in March 2001 (Tukey HSD = 0.472, p = 0.003). Rainbow trout condition factor did not differ

1

3

** 1

significantly at Upper Bulkley mainstem sites between the two years of the study, but rainbow trout condition was significantly higher in 1999/2000 than in 2000/2001 for Upper Bulkley tributary sites. Although condition factor in 1999/2000 and 2000/2001 is negatively correlated with fork length (Donas and Saimoto 2000), higher fork lengths in 1999/2000 did not translate to lower condition factor in 1999/2000 when compared to 2000/2001. Rainbow trout appear to be similar or smaller and in lower condition (particularly at Upper Bulkley tributary sites) in 2000/2001 than in 1999/2000.

ы, у

Department of Fisheries and Oceans & SKR Consultants Ltd.

* 2

اھ ج

6.2 GENERAL DISCUSSION

A variety of habitats were sampled in the three years of the overwintering study, and the variability in habitat sampled was expected to have some influence on species assemblages, fish densities, size and condition. Variability in fish data was expected during the three years of the study due to different levels of recruitment (adult escapement levels) and differences in the severity of the winter conditions (e.g. temperature, precipitation, duration). During each of the three years, sites were sampled in the Upper Bulkley mainstem, Upper Bulkley tributaries and Toboggan Creek mainstem. Side channel habitat (Upper Bulkley and Toboggan Creek) and lake habitat (Toboggan Lake), which were not sampled in the first two years of the study, were sampled in 2000/2001 since other studies reported that these habitats may provide important overwintering habitat in some systems (Bustard and Narver 1975, Envirocon 1986, Swales et al. 1986, Swales and Levings 1989). A greater proportion of the upper Bulkley sites were located in mainstem habitat in 1998/1999 (33% of Upper Bulkley sites) and 2000/2001 (24.0% of Upper Bulkley sites) than in 1999/2000 (5.9% of Upper Bulkley sites) (Saimoto and Donas 1999, 2000). Toboggan Creek sites were sampled as an index for a productive system with good adult returns. During the three years of the overwintering study, sites representing a variety of different potential overwintering habitat were sampled, particularly in the Upper Bulkley watershed, and this variability was expected to result in differences of species assemblages, fish densities and fish size. The following sections discuss some of the general trends noted during the three years of the overwintering study.

6.2.1 Habitat and Winter Assessments

Among the sites that were sampled in all three years of the overwintering study, particularly in the Upper Bulkley watershed, habitat characteristics and winter conditions were not expected to be constant over the three years. Varying flow levels, shifts in channel morphology and LWD, and sediment sources upstream were expected to cause some changes in habitats sampled, although these changes were expected to be minor since no major flood event occurred. Notable changes in habitats at some sites in the Upper Bulkley watershed sampled during the last three years of the overwintering study, and the apparent lack of notable changes in Toboggan Creek indicate that sites sampled in the Upper Bulkley are less stable. Habitat and winter conditions between the three years of the study were relatively similar at most sites, particularly at Toboggan Creek. Habitat data and notes taken during habitat assessments provided evidence of infilling, sedimentation and shifts in channel morphology at several Upper Bulkley sites (e.g. Richfield Creek site RIC 3, McQuarrie Creek site McQ1, Barren Creek site BAR 1). These signs of shifts in channel morphology, and movement of sediment, are consistent with the documentation of extensive aggrading and degrading in the Bulkley watershed (BCCF 1997, 1998). A greater proportion of sites had cobble as the dominant substrate in 2000/2001 than in the previous two years of the study, as the data collected in 1998/1999 and 2000/2001 pointed to the importance of substrate as a source for cover. Differences in winter condition between the years was also noted, as snow depth in 1998/1999 was significantly higher than in 2000/2001, consistent with the observation that the winter of the third winter of the study was milder than the first two years of the study, with a later onset of ice off, and a delayed spring thaw. However, annual differences in winter conditions are likely minor compared to physical changes in habitats due to shift in channel morphology, sedimentation, aggrading or degrading. Sites sampled in the Upper Bulkley generally have higher substrate embeddedness and appear to be -

-

÷

Ę

less stable than Toboggan-Creek sites, as indicated by considerable shifts in channel morphology observed in the watershed. It is speculated that the types and extent of development, as well as the underlying geology and geomorphology in the Upper Bulkley watershed have had a greater impact when compared to Toboggan Creek, and have significantly affected fish habitat.

6.2.2 Fish Sampling

6.2.2.1 SPECIES DISTRIBUTION AND DIVERSITY

Species distribution was generally similar between the three years of the study, and species richness, evenness and diversity were expected to be similar for the three years of the study at Upper Bulkley and Toboggan Creek sites. Species distribution, richness and evenness was expected to change as a result of notable alterations in habitat, rendering habitat less suitable for some species over time, changes in winter conditions over the three years, and/or changes in accessibility to the sites sampled. Species richness, evenness and diversity were generally similar for Upper Bulkley mainstem sites, but differed for Toboggan Creek and Upper Bulkley tributary sites between the years of the study. Since species assemblages were consistent between the three years of the study, accessibility to habitat sampled for species in the watersheds did not appear to have changed between the three years. Changes in species diversity, evenness and richness may in part be due to changes in overwintering habitat sampled (see section 6.1), the milder winter conditions in 2000/2001, and/or chance events. Comparisons of species richness, evenness and diversity are influenced by the fact that samples may not represent the complete assemblage of species in a community, and may thus provide a vague measure of the actual species richness, diversity and evenness at the site. Meaningful comparisons of species richness, evenness and diversity should involve a complete inventory of the species at each site (Krebs 1998), which is difficult to accomplish by overnight minnow trapping. The capture of one individual of a relatively uncommon species at a site can have significant impacts on measures of species richness, diversity and evenness, and this element of chance limits the comparability of species richness, diversity and evenness for studies were a complete list of species in a community is not available. The slight differences in species richness and diversity in Toboggan Creek mainstem and Upper Bulkley tributary sites are likely due to chance, since accessibility of habitat to the species present in the watershed does not appear to have changed in the three years of the study.

6.2.2.2 DENSITY INDICES

Fish densities are speculated to be partly determined by differences in escapement levels of spawners, variability in egg and juvenile survival rates, and differences in severity of winter conditions over the three years of the study. Fish density between the three years may differ since adult escapement, survival of juveniles prior to the onset of winter, and severity of winter conditions are not constant between the three years of the study. Catch per unit effort, calculated as a density index for all three years of the study, are used for comparisons of density indices between the three years of the overwintering study. Catch per unit effort are expected to be higher if escapement of the parent population is higher. Likewise, survival of eggs in the gravel, and juveniles to the first winter is expected to be higher when conditions are more conducive to incubation, emergence and growth and minimize stress on fish (e.g. moderate temperatures, good

Department of Fisheries and Oceans & SKR Consultants Ltd.

i 🗨

- 2

-

Ì

•

si ji

dissolved oxygen, good food availability) (Hunter 1991). Trends in CPUE over the winter are expected to be similar between the three years of the study since habitat and winter conditions are relatively similar. This section discusses the trends in fish density observed in the three years of the overwintering study.

6.2.2.2.1 Соно

Coho densities, as indicated by CPUE were expected to vary between the three years of the study, especially at Toboggan Creek, as a result of increased spawner escapements of the parent generation. The numbers of adult spawners returning to the Upper Bulkley have been significantly lower than those returning to Toboggan Creek (Table 12), and have remained relatively low (Holtby *et al.* 1999, Glass 2000) despite the decline of harvest rates in the commercial fishery. Toboggan Creek coho escapement has increased in recent years. In addition, the proportion of wild fish returning to Toboggan Creek (Table 12). While the different levels of spawner escapement were expected to influence juvenile densities during the winter, the trend of decline in juvenile coho densities, particularly in Toboggan Creek was expected to be similar for all three years of the study. Trends in coho CPUE between and within the three years of the overwintering are discussed in this section.

Coho CPUE did not differ significantly between the three years of the study at Toboggan Creek sites, Upper Bulkley mainstem sites or Upper Bulkley tributary sites, despite the increased escapement of coho spawners into the Toboggan Creek and Upper Bulkley systems (Table 12). The lack of a significant difference in December or March CPUE indicates that increased escapement of spawners does not result in a significant increase in juvenile CPUE during the three years of the study. While CPUE is a rough approximation of fish densities, the lack of increased CPUE with increased spawner escapement provides circumstantial evidence that freshwater habitat may be a factor in limiting fish production in both systems, since juvenile densities did not appear to increase despite an increase in spawners. For the Upper Bulkley system, the number of spawners remains well below historic levels, and may not have resulted in a direct increase in juveniles because the system is likely chronically under seeded, and spawning may be patchy, resulting in patchy distribution of juveniles. For Toboggan Creek, spawner escapement are substantially higher than in the Upper Bulkley, and the system may be fully seeded, thus resulting in a lack of increase in juvenile densities with further increases in spawner escapement. Increased spawner escapement between 1997 and 1998 appears to have resulted in increased juvenile coho densities at Toboggan Creek from 1998 to 1999. However, a further increase in escapement between 1998 and 1999 did not result in an increase in juvenile coho densities in Toboggan Creek in the 2000 synoptic survey (Taylor 2000). While smolt enumerations have been conducted on Toboggan Creek, the methodologies used in estimating wild smolt output in the system have been adjusted over the last five years of the study. This makes wild smolt estimates more difficult to compare. In addition, confidence intervals around the more recent estimates (1999 and 2000) are broad since estimates are based on a relatively small number of censused and recaptured fish (SKR 1999, 2000). Future studies on coho smolt output at Toboggan Creek, particularly in 2001 (SKR in progress) will likely provide more conclusive evidence to document if smolt production is increased by an increased number of spawners. Data collected in the Lachmach, Babine and Toboggan Creek systems indicate that 2

_ ⇒

4

ž,

the number of smolts produced per spawner decreases when escapements are high (Holtby *et al.* 1999), indicating that the number of spawners is not directly related to the number of smolts. This may be due to decreased survival as a result of competition in some cases. Competition should be reflected in decreased size of fish, and decreased condition, as well as lower survival rate.

Temporal trends noted for coho CPUE are consistent between all three years of the study. Coho CPUE changes significantly over time in all three years of the study, resulting in a significant decline in total CPUE over the winter. In particular for Toboggan Creek sites, coho CPUE are significantly higher in December than in March. The drastic decline of coho CPUE between December and March at Toboggan Creek with high coho escapement, particularly when compared to the Upper Bulkley with low escapement, indicates that winter has a greater affect on coho densities in Toboggan Creek than in the Upper Bulkley. Coho CPUE at Upper Bulkley mainstem and tributary sites changes comparatively little over the winter, indicating that loss of juveniles during the winter (either through migration or mortality) is low, and that overwintering habitat may not be limiting in the system at least at current escapement levels. While coho CPUE at Toboggan Creek is significantly higher than in Upper Bulkley sites at the start of winter, coho CPUE is similar between these sites by the end of winter. This may be a due to mortality or migration in Toboggan Creek. Increased juvenile mortality in Toboggan Creek than in Upper Bulkley sites may be due to lower habitat quality, or higher densities causing increased inter and intra-specific competition, and may indicate that Toboggan Creek is near its overwinter carrying capacity. If movement of fish is extensive during the winter, some sites would be expected to show an increase in CPUE, but none of the sites sampled at Toboggan Creek showed an increase in coho CPUE between December and March. However, it is important to consider that few sites were sampled in Toboggan Creek, and that the sites sampled do not represent all different types of habitat available to coho in the system. For example smaller tributaries, which may be used for overwintering (Bustard and Narver 1975) were not sampled. Similarly, the mainstem sites sampled during the study are located near the Toboggan Creek hatchery, and in close proximity to each other. Arguably, these sites do not represent the entire Toboggan Creek mainstem. Net movement out of these sites and into habitats not sampled during the study may have resulted in drastic decrease in coho CPUE between December and March observed during 1999/2000 and 2000/2001. Some researchers indicate that salmonids may move extensively during the winter (Cunjak 1996, Heggersen in prep.), and salmonids have been documented to move up to one kilometer-in the winter (Jakober et al. 1998, Simpkins et al. 2000). However, several other studies point to a lack of extensive movement in the winter (Envirocon 1986, Heifetz et al. 1986, Swales et al 1986, Dolloff 1987, Giannico and Healey 1998). Dolloff (1987) argues that extensive movement and active habitat selection in winter is unlikely since fish have no prior knowledge of habitat distribution, and since fish are vulnerable during and after movement. If fish are unable to actively select overwintering habitat, changes in CPUE over the winter in some areas (e.g. Toboggan Creek) and less so in other areas (e.g. Upper Bulkley) are likely due to different overwinter mortality rates.

Catch per unit effort for coho did not differ substantially between the three years of the study. Neither did temporal trends in changes of CPUE between the three years of the study. Despite the fact that adult coho escapement, particularly in Toboggan Creek, was higher in some years than in other (Table 12), these changes were not reflected in increased CPUE of coho, . 🖘

. منبع الم

3

particularly in 2000/2001. This may be due to patchy distribution of juveniles, decreased survival of eggs and/or fry, or chronic under seeding of the system. In fact, coho CPUE through out the winter at Upper Bulkley sites is low, and does not differ statistically from CPUE in March in Toboggan Creek. In systems where spawner escapement meets or exceeds the capacity of the system, the number of smolts produced per spawner is expected to decline. Increased spawner escapement may not result in an increased density of juveniles (i.e. CPUE) in under-utilized systems since juveniles may occupy habitat that was previously unoccupied. Thus, CPUE is not affected, but overall smolt output may be affected. The decline in CPUE during the winter, particularly for coho in Toboggan Creek indicates that overwinter mortality may be affecting smolt output to some degree.

6.2.2.2.2 RAINBOW TROUT/STEELHEAD

Rainbow trout densities, as indicated by CPUE were expected to vary between the three years of the study due to different environmental conditions and different escapement levels of the parent generation. Rainbow trout CPUE generally appears to be lower in Toboggan Creek sites when compared to Upper Bulkley sites (Figure 13), although this difference was not statistically significant in December or March. Rainbow trout CPUE did not change significantly in Upper Bulkley or Toboggan Creek sites in the first two years of the study, but rainbow trout CPUE declined significantly between December and March in 2000/2001 in the Upper Bulkley watershed. This may be due to movement of fish, or mortality, particularly at Upper Bulkley tributary sites, between February and March, when the most significant decline in CPUE was noted (see section 5.2.2). The generally higher CPUE of rainbow trout in Upper Bulkley sites than at Toboggan Creek, though not statistically significant, may be due to better habitat quality for rainbow trout in the Upper Bulkley, or intra-specific competition with the relatively large numbers of juvenile coho in Toboggan Creek. The following sections discuss comparisons of fish size and condition between the last two years of the overwintering study.

6.2.2.3 FISH SIZE AND CONDITION

Comparisons in fork length and condition factor data between 1999/2000 and 2000/2001 indicate that coho and rainbow trout are generally similar or smaller and skinnier in 2000/2001. The only exception to this trend are coho captured in Buck Creek, which were similar or longer and in better condition in 2000/2001 than in 1999/2000. Buck Creek shows different trends for coho length and condition than other sites since the system is enhanced, with fry releases, which were initiated in August 1999. During the 1999/2000 overwinter study, these fry were captured as 0+. Not all of the coho released in 1999 emigrated as smolts in the spring of 2000, but some remained to overwinter a second year in Buck Creek as 1+ coho in 2000/2001 (Saimoto and Donas 2000, Tamblyn 2000). Age 1+ coho were therefore present in Buck Creek in 2000/2001, but not in 1999/2000 and therefore likely resulted in the increase of ranked fork length in the third year of the study. The general trend for fish to be smaller and skinnier in 2000/2001 is particularly apparent in Upper Bulkley tributary sites where it is consistent for both rainbow trout and coho. In addition, while coho had similar fork lengths between the two years of the study at Toboggan Creek, condition factor of coho at Toboggan Creek was lower in 2000/2001 than in 1999/2000. Lower fork length may be due to differences in age composition between the two years of the study, which were not compared separately since no age data was collected, and age

-

Ĵ.

9

1

-

Ŧ

-

structure was not estimated in1999/2000 (Donas and Saimoto 2000). Lower fork lengths would be expected to result in more variable and higher condition factors, since condition factor appears higher and more variable for smaller fish during the overwintering study (Donas and Saimoto 2000). However, while rainbow trout and coho are significantly smaller in 2000/2001 than in 1999/2000 in Upper Bulkley tributary sites, and coho are similar in length at Toboggan Creek sites, they are not in better, but in worse condition, indicating that they are significantly skinnier. This suggests that juveniles captured in 2000/2001 are similar or less healthy and smaller when compared to juveniles captured in 1999/2000. This difference in condition and length may be due to deteriorating habitat quality, higher densities, and/or competition. Differences in overwinter habitat quality appeared to be relatively minor, and CPUE were similar between the three years of the study. However, adult escapement for spawners which produced juveniles at some sites at the start of winter may be a result of increased competition prior to the onset of winter in 2000/2001 when compared to 1999/2000.

6.2.3 Fish and Fish Habitat

್ಷ

Habitat segregation between salmonids has been found in several systems, and overwintering habitat characteristics have been linked to different rates of survival and growth of salmonids. Different species of salmonids have been reported to utilize slightly different habitats (e.g. Bustard and Narver 1975, Envirocon 1986, Swales *et al.* 1986) and these differences in habitat utilization were expected to be found in the three years of the overwintering study. Differences in overwintering habitat quality were expected to correlate with species assemblages, fish densities and condition in all three years of the study.

6.2.3.1 COHO

Findings in the three years of the overwintering study in tributary and mainstem sites of the Upper Bulkley watershed and in Toboggan Creek indicate that coho CPUE is lowest in Upper Bulkley mainstem sites, and highest at sites that offer primarily cobble pool habitat (greater than 50 cm deep) with some organic cover elements, and with adequate flow to ensure the maintenance of adequate water depth and dissolved oxygen levels. Coho have been reported to utilize tributary, off channel, side channel, lake and pond habitat which offer deep pools with organic cover. The presence of relatively high densities of coho in riverine ponds, side channels, back channels, slough, beaver pond areas, lakes and tributaries has been documented in interior systems (Bustard 1986, Envirocon 1986, Swales et al. 1986, Petersen 1982, Swales and Levings 1989). Therefore, higher coho CPUE at Upper Bulkley tributary sites when compared to Upper Bulkley mainstem sites during all three years of the overwintering study is not surprising. However, the fact that coho were not captured in any of the three Upper Bulkley side channel sites, or in one of the two Toboggan Creek side channel sites is contrary to what was expected at the outset of the study. The lack of coho at these side channel sites can be attributed to poor water quality (low water depth and poor dissolved oxygen levels) and lack of suitable cover, which rendered these sites unsuitable for overwintering. In addition, access to side channel habitat may be limited by culvert crossings. Similarly, the relatively low CPUE for coho in Toboggan Lake when compared to mainstem habitat was contrary to expectation, since lakes have been reported to be utilized for overwintering by coho (Swales and Levings 1989). Again,

Department of Fisheries and Oceans & SKR Consultants Ltd.

2

ಸುಕ

<u>_</u>

.

- **F**

: **- - -** -

÷

Ł

-

Z,

×.,

poor water quality appears to have rendered overwintering habitat at this site unsuitable for salmonids. While off channel and lake habitat may be important for overwintering habitat in some systems, these sites must have sufficient flow or water exchange to ensure adequate water quality. Although pool habitat with cobble substrate appears to be the most productive habitat for both coho and rainbow trout in the Upper Bulkley in the three years of the overwintering study, off channel habitats are still suspected to play an important role.

6.2.3.2 RAINBOW TROUT / STEELHEAD

During the three years of the overwintering study provide rainbow trout in the Upper Bulkley and Toboggan Creek systems were found to primarily use mainstem and tributary habitat consisting of primarily pool habitat dominated by cobble or larger substrate. Rainbow trout have been found to overwinter in mainstem, tributary and off channel habitat, primarily at sites, which offer abundant substrate, cover in the form of cobbles, boulders or rip rap. Rainbow trout are generally found overwintering in mainstem or tributary habitat, where they are associated with rubble, cobble, boulder or rip rap substrate (Bustard and Narver 1975, Swales *et al.* 1986, Heifetz 1986, Cunjak 1988). The suitability of substrate cover depends in part on particle size and embeddedness (Hillman *et al.* 1987). The suitability of substrate cover may be declining at some Upper Bulkley sites due to increased siltation (resulting in increased embeddedness), and channel instability (BCCF 1997), which may affect both rainbow trout and coho overwintering habitat since both species were more commonly found at sites with cobble substrate during the three years of the overwintering study.

ž

-

. 3

÷

Æ

7.0 RECOMMENDATIONS

Studies on overwinter survival in ice covered streams are labour intensive and logistically challenging. Seasonal and spatial variability, interactions of different factors, logistical difficulties of studying fish under the ice and in adverse environmental conditions, and the relatively poor knowledge of overwintering dynamics of juvenile salmonids are challenges influencing the effectiveness of overwintering studies. Overwinter habitat is but one aspect of the freshwater portion of juvenile coho life histories.

- 1. To examine if freshwater habitat is limiting Upper Bulkley salmonid production, it may be useful to estimate coho smolt production in the system. By comparing the number of spawners as determined at the Bulkley fence and through aerial counts upstream, to coho smolt production, it may be possible to obtain better evidence on the limitation of freshwater habitat to Upper Bulkley salmonid production. It may be possible to install a rotary screw trap downstream of the Buck Creek confluence. The release of hatchery reared coho in the spring into Buck Creek could be used as a marked group (provided they are marked differently from fry released in late summer/August).
- 2. Cursory examination of the watershed, and WRP reports indicate that a significant proportion of the side channel habitat in the Upper Bulkley is inaccessible due to poorly designed or installed crossings at roads and the CNR track. While the three side channel sites sampled in 2000/2001 did not appear to be important for salmonid overwintering, other side channels, off channels and riverine ponds in the system may provide suitable habitat, but be currently inaccessible. These habitats may also provide important summer rearing habitat. An inventory of road crossings in the Bulkley River valley flat area may indicate what proportion of these habitats are currently inaccessible due to anthropogenic barriers. In addition, investigations on water quality at side channels during the winter may provide further evidence if side channels offer potentially suitable overwintering habitat in the Upper Bulkley.
- 3. The overwintering study identified that pool habitat with cobble substrate is important in the upper Bulkley watershed, particularly since other habitat types known to be important in other systems (egg. side channel, back channel, riverine ponds, sloughs etc) are lacking or inaccessible in the watershed. Existing information on pool habitat in the upper Bulkley watershed (e.g. from watershed restoration reports, community based surveys) could be summarized and evaluated to quantify pool habitat in the watershed. Pool composition in the Upper Bulkley River watershed could be compared to more productive systems to determine where pool composition rehabilitation projects are warranted.
- 4. The Upper Bulkley coho stock has been depressed for a number of years, and the system appears to be underseeded. Good habitat present upstream of Bulkley falls is not utilized by coho due to limited access. Spawners could be moved upstream of the cascade to utilize this habitat, and to increase the probability that fry will find refuge in the Upper Bulkley. Similarly, fry releases from the hatchery, such as those being conducted in Buck Creek, may allow for more utilization of available rearing habitat in the Upper

-

1

.

7

-

-

÷

- 21

÷,

×

Bulkley. However, the impacts of such releases on other species of fish, and the carrying capacity of the system should be established prior to these releases.

- 5. Cursory observations at Toboggan Creek indicate that a significant number of fry are washed downstream during spring freshets, and the probability of survival of these fry is likely low. It is anticipated that a significant number of fry also are washed downstream during spring freshets in the Upper Bulkley. Moving these fry back into the system, into habitat that provides refuge from high water, may increase their probability of survival.
- 6. One of the main issues facing the Upper Bulkley watershed is the level and timing of water withdrawal. Adult coho may be deterred or prevented from accessing suitable spawning habitat in the Upper Bulkley system due to the low water levels and the presence of beaver dams in the fall. Likewise, water levels may result in stranding of some juveniles, or render habitat less suitable for rearing. Until issues of water withdrawal in the Upper Bulkley are addressed, enhancement activities in the system are not likely to return the system to its historic productivity.
- 7. Cobble substrate was found to be an important cover element for overwintering by both rainbow trout and coho. The embeddedness of cobble can render substrate cover less suitable, and embeddedness in the Upper Bulkley was noted to be higher than in Toboggan. The Upper Bulkley WRP project (BCCF 1997, 1998) was able to identify some sediment sources. Problems of sedimentation in the Upper Bulkley are also likely to influence spawning and summer rearing habitat quality. The extent of this problem should be investigated further, including an identification of significant sediment sources, the ability to control them, and their impact on substrate in the streams.

ter Series

φę.

8.0 LITERATURE CITED

- Bagenal, T. 1978. <u>Methods for assessment of fish production in fresh waters.</u> (3rd. ed). IBP Handbook No. 3. Blackwell Scientific Publications, Oxford, London.
- Baxter, J.S. 1997a. Upper Sustut, Lower Sustut and Bear River steelhead: summary of current data and status review, 1997. Report for B.C. Environment Fisheries Branch, Skeena Region, Smithers, B.C. Skeena Fisheries Report SK # 98.
- Baxter, J.S. 1997b. Kispiox River steelhead: summary of current data and status review, 1997. Report for B.C. Environment Fisheries Branch, Skeena Region, Smithers, B.C. Skeena Fisheries Report SK # 100.
- Berg, N. H. 1994. Ice in stream pools in California's Central Sierra Nevada: Spatial and temporal variability and reduction in trout habitat availability. North Am. J. Fish. Man. 14: 372-384
- Bloom, A.M. 1976. Evaluation of minnow traps for estimating populations of juvenile coho salmon and Dolly Varden. Prog. Fish. Cult. 38: 99-101, as in Swales *et al.* 1986.
- Bradford, M.J. and J.R. Irvine 2000. Land use, fishing, climate change, and the decline of the Thompson River, British Columbia, coho salmon. Can. J. Fish. Aquat. Sci. 57: 13-16.
- British Columbia Conservation Foundation. 1997. Mid-Bulkley overview fish and fish habitat assessment for watershed restoration. Unpublished report prepared for Nadina Community Futures Development Corporation, Houston, B.C..
- British Columbia Conservation Foundation. 1998. Mid-Bulkley detailed fish habitat/riparian/channel assessment for watershed restoration. Unpublished report prepared for Nadina Community Futures Development Corporation, Houston, B.C..
- B.C. Environment. 2000. Freshwater Fishing Regulations Synopsis. B.C. Environment, Victoria, B.C.
- Bustard, D. R. 1986. Some differences between coastal and interior steams and the implications to juvenile fish production. In Proceedings of Habitat Improvement Workshop, 8-10 May 1984, Whistler, B.C. Can. Tech. Rep. Fish. Aquat. Sci. 1483: 219 p.
- Bustard, D.R. 1992. Juvenile steelhead surveys in the Kitwanga, Morice, Sustut and Zymoetz rivers, 1991. Report prepared by David Bustard and Associates for B.C. Environment, Smithers, B.C..
- Bustard, D.R. 1993. Juvenile steelhead surveys in the Kitwanga, Morice, Sustut and Zymoetz rivers, 1992. Report prepared by David Bustard and Associates for B.C. Environment, Smithers, B.C..

- Bustard, D.R. and D.W. Narver. 1975. Aspects of the winter ecology of juvenile coho salmon (Oncorhynchus kisutch) and steelhead trout (Salmo gairdneri). J. Fish. Res. Board Can. 31: 667-680.
- Canadian Ministers of the Environment. 1991. Canadian Water Quality Guidelines. Environmental Quality Guidelines Division, Water Quality Branch. Ottawa, Ontario.
- Cargnelli, L.M. and M.R. Gross. Fish energetics: larger individuals emerge from winter in better condition. Trans. Am. Fish. Soc. 126: 153-156.
- Chambers, P.A., G.J. Scrimgeour, A. Pietroniro. 1997. Winter oxygen conditions in ice-covered rivers: the impact of pulp mill and municipal effluents. Can. J. Fish. Aquat. Sci. 54: 2796-2806.
- Conover, W.J. and R.L. Iman. 1981. Rank transformations as a bridge between parametric and nonparametric statistics. The American Statistician 35 (3): 124-133.
- Cunjak, R.A. 1988. Behaviour and microhabitat of young atlantic salmon (Salmo salar) during winter. Can. J. Fish. Aquat. Sci. 45: 2156-2160.
- Cunjak, R. A. 1996. Winter habitat of selected stream fishes and potential impacts form landuse activities. Can. J. Fish. Aquat. Sci. 53 (Suppl. 1): 267-282.
- Cunjak, R.A. and G. Power. 1986. Winter habitat utilization by stream resident brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*). Can. J. Fish. Aquat. Sci. 43: 1970 1981.
- Davis, J. C. 1975. Minimal dissolved Oxygen requirements of aquatic life with emphasis on Canadian species: a review. J. Fish. Res. Bd. Can. Vol. 32(12): 2295-2232.
- Dolloff, C.A. 1987. Seasonal population characteristics and habitat use by juvenile coho salmon in a small southeast Alaska stream. Trans. Am. Fish. Soc. 116: 829-828.
- Donas, B. 2000. Personal communications. Community advisor, Department of Fisheries and Oceans, Smithers, B.C.
- Donas, B. and R.K. Saimoto. 1999. Upper Bulkley River overwintering study 1998-2000 Interim Report. Unpublished report prepared for Fisheries Renewal B.C., Smithers, B.C.
- Donas, B. and R.K. Saimoto. 2000. Upper Bulkley River overwintering study 1999-2000 Interim Report. Unpublished report prepared for Fisheries Renewal B.C., Smithers, B.C.

- Envirocon Ltd. 1984. Environmental studies associated with the proposed Kemano completion hydroeletric development. Volume 4: Fish resources of the Morice River system baseline information. Section C: Juvenile salmonid overwinter survival in selected side channels of the Morice River during 1981-1982. Unpublished report prepared for Aluminum Cooperation of Canada Ltd. Vancouver, B.C..
- Ewasiuk, J. 1998. Bulkley River Fish Fence 1998. Unpublished report prepared by Nadina Community Futures, Smithers, B.C. for Fisheries Renewal B.C., Smithers, B.C.
- Giannico, G.R. and M.C. Healey. 1998. Effect of flow and food on winter movements of juvenile coho salmon. Trans. Am. Fish. Soc. 127:645-651.
- Gibson, L. 1997. Toboggan Creek watershed restoration project level 1 and 2 detailed assessment. Unpublished report prepared by NorTec Consulting for Watershed Restoration Program, Smithers, B.C..
- Glass, A. 1999. Bulkley River Fish Fence 1999. Unpublished report prepared by Nadina Community Futures, Smithers, B.C. for Fisheries Renewal B.C., Smithers, B.C.
- Glass, A. 2000. Bulkley River Fish Fence 2000. Unpublished report prepared by Nadina Community Futures, Smithers, B.C. for Fisheries Renewal B.C., Smithers, B.C.
- Healey, M.C. 1991. Life history of chinook salmon (*Oncorhynchus tsawytscha*). In: <u>Pacific</u> <u>Salmon Life Histories.</u> C. Groot and L. Margolis (eds.). UBC Press, Vancouver, B.C.
- Hillborn, R. and C.J. Walters. 1992. <u>Fisheries stock assessment: choice, dynamics and uncertainty</u>. Chapman and Hall, New York
- Hillman, T.W., J.S. Griffith, W.S. Platts. 1987. Summer and winter habitat selection by juvenile chinook salmon in a highly sedimented Idaho stream. J. North Am. Fish. Soc. 116: 185-195.
- Heggenes, J., O. M. Wergeland Krog, O. R. Lindås, J. G. Dokk. in prep. Homeostatic behavioural responses in a changing environment: brown trout (*Salmo trutta*) become nocturnal during winter.
- Heifetz, J, L.M. Murphy, K.V. Koski. 1986. Effects of logging on winter habitat of juvenile salmonids in Alaskan streams. N. Am. J. Fish. Man. 6:52-58.
- Hols, G. 1999. <u>Marks of a century: a history of Houston, B.C. 1900-2000.</u> Friesen Corporation, Altona, Manitoba.
- Holtby, L.B. and B. Finnegan. 1998. A biological assessment of the coho salmon of the Skeena River, British Columbia, and recommendations for fisheries in 1998. PSARC working paper S97-12.

- Holtby, L.B., B. Finnegan, D. Chen and D. Peacock. 1999. Biological assessment of Skeena River coho salmon. PSARC document 99/140. Department of Fisheries and Oceans.
- Houston Chapter of the Steelhead Society. 1990. Upper Bulkley River fish fence project 1989. Steelhead society, Houston Chapter.
- Jakober, M.J, T.E. McMahon, T.F. Thurow and C.G. Clancy. 1998. Role of stream ice on fall and winter movements and habitat use by bull trout and cutthroat trout in Montana headwater streams. Trans. Am. Fish. Soc. 127: 223-235.
- Johnston, N.T. and P.A. Slaney. 1996. Fish habitat assessment procedures. Watershed restoration technical circular No. 8. Watershed Restoration Program, Vancouver, B.C..
- Koning, C.W. and E.R. Keeley. 1997. Salmonid biostandards for estimating production benefits of fish habitat rehabilitation techniques. in <u>Fish Habitat Rehabilitation Procedures.</u> Slaney and Zoldakos eds., Watershed Restoration Program Technical Report No. 9, Victoria, B.C.
- Krebs, C.J. 1985. Ecology. 3rd ed. Harper and Row Publishers, New York. 800 pp.
- MacKay, S. 1999. Project data report: 1999 Buck Creek juvenile salmonid trapping program. Unpublished report prepared by Nadina Community Futures, Houston, B.C. for Stock Assessment Section, Fisheries and Oceans Canada.
- Morice, A.G. 1906, reprinted in 1978. <u>The history of the Northern Interior of British Columbia.</u> Interior Stationary, Smithers, B.C..
- National Research Council. 1992. <u>Restoration of Aquatic Habitat</u>. National Academy Press, Washington, D.C..
- O'Neill, M. 1999. Annual report for Toboggan Creek hatchery operations in 1998/99. Unpublished report prepared by Toboggan Creek Fish Hatchery, Smithers, B.C.
- O'Neill, M. 2000. Personal communications. Hatchery Manager, Toboggan Creek Fish Hatchery, Smithers, B.C.
- Petersen, N.P. 1982. Population characteristics of juvenile coho salmon (*Oncorhynchus kisutch*) overwintering in riverine ponds. Can. J. Fish. Aquat. Sci. 39:1303-1307.
- Prowse, T.D. 1994. Environmental significance of ice to streamflow in cold regions. Freshwater Biology 32: 241-259.
- Remmington, D and B. Donas. 1999. Water quality in the Toboggan Creek watershed 1996-1998: are land use activities affecting water quality and salmonid health? Unpublished report prepared for Department of Fisheries and Oceans and Nadina Community Futures, Smithers, B.C..

- Remmington, D. and B. Donas. 2000. Nutrients and algae in the Upper Bulkley River watershed 1997-2000. Unpublished report prepared for Community Futures Development Corporation of Nadina, Houston, B.C..
- Rosenfeld, R., M. Porter, E. Parkinson. 2000. Habitat factors affecting the abundance and distribution of juvenile cutthroat trout (*Oncorhynchus clarki*) and coho salmon (*Oncorhynchus kisutch*). Can. J. Fish. Aquat. Sci. 57: 766-774.
- Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Bull. Fish. Res. Bd. Can. 191.
- Riehle, M.D. and J.S. Griffith. 1993. Changes in habitat use and feeding chronology of juvenile rainbow trout (*Oncorhynchus mykiss*) in fall and the onset of winter in Silver Creek, Idaho. Can. J. Fish . Aquat. Sci. 50: 2119-2128.
- Sandercock, F.K. 1991. Life history of coho salmon (*Oncorhynchus kisutch*). in <u>Pacific Salmon</u> <u>Life Histories.</u> C. Groot and L. Margolis eds. UBC Press, Vancouver, B.C.
- Saimoto, R.K. 1995. Toboggan Creek coho smolt enumeration 1995. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.
- Saimoto, R.S. and M.O. Jessop. 1997. Assessment of overwintering habitat and distribution of coho salmon (*Oncorhynchus kisutch*) in the mid-Bulkley watershed (Houston to Bulkley Lake) January to March 1997. Unpublished report prepared for the Department of Fisheries and Oceans, Smithers, B.C.
- Schreier, H., W. Erlebach and L Albright. 1980. Water quality variations in two Yukon Rivers with emphasis on dissolved Oxygen concentrations. Wat. Res. 14: 1354-1351.
- Shepherd, B.C. 1977. Minnow traps as a tool for trapping and tagging juvenile chinook and coho salmon in the Skeena river system. *In* Proceedings of the 1977 Northeast Pacific Chinook and coho salmon workshop, April 1980, Vancouver, B.C. Can Tech. Rep. Fish. Aquat. Sci. No. 759: 8-27. as in Swales *et al.* 1986.
- Simpkings, D.G., W.A. Hubert and T.A. Wesche. 2000. Effects of fall-to-winter changes in habitat and frazil ice on the movements and habitat use of juvenile rainbow trout in a Wyoming tailwater. Trans. Am. Fish. Soc. 129: 101-118
- SKR Consultants Ltd. 1995. Toboggan Creek coho smolt enumeration 1995. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.
- SKR Consultants Ltd. 1996. Toboggan Creek coho smolt enumeration 1996. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.

Department of Fisheries and Oceans & SKR Consultants Ltd.

1

- SKR Consultants Ltd. 1997. Toboggan Creek coho smolt enumeration 1997. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.
- SKR Consultants Ltd. 1998. Toboggan Creek coho smolt enumeration 1998. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.
- SKR Consultants Ltd. 1999. Toboggan Creek coho smolt enumeration 1999. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.
- SKR Consultants Ltd. 2000a. Toboggan Creek coho smolt enumeration 2000. Unpublished report prepared for the Department of Fisheries and Oceans, Nanaimo, B.C.
- SKR Consultants Ltd. 2000b. Buck Creek RST report B.C. Unpublished report prepared for the Department of Fisheries and Oceans, Smithers, B.C..
- SKR Consultants Ltd. In prep. Mission Creek overwintering study and coho smolt enumeration project 2000 – 2001. Unpublished report prepared for the Department of Fisheries and Oceans, Smithers, B.C..
- Slaney, P.A. and D. Zoldakos (eds.). 1997. Fish habitat rehabilitation procedures. Watershed Restoration Technical Circular No. 9. Watershed Restoration Program, Vancouver, B.C.
- Swales, S. 1987. The use of small wire-mesh traps in sampling juvenile salmonids. Aquaculture and Fisheries Management 1987, 18: 187-195
- Swales, S., R.B. Lauzier, C.D. Levings. 1986. Winter habitat preferences of juvenile salmonids in two interior rivers in British Columbia. Can. J. Zool. 64: 1506-1514.
- Swales, S. and C.D. Levings. 1989. Role of off-channel ponds in the life cycle of coho salmon (Oncorhynchus kisutch) and other juvenile salmonids in the Coldwater River, British Columbia. Can. J. Fish. Aquat. Sci. 46: 232-242.
- Taylor, J.A. 2000. The 2000 synoptic survey of juvenile coho populations in selected lakes and streams within the Skeena River watershed, British Columbia. Unpublished report prepared by J.A. Taylor and Associates Ltd. for Department of Fisheries and Oceans, Nanaimo, B.C.
- Tamblyn, G. 2000. Buck Creek juvenile salmonid emigration program: autumn 2000. Unpublished report prepared by Nadina Community Futures for DFO, Smithers, B.C..
- Tredger, C.D. 1982. Upper Bulkley River Reconnaissance with reference to juvenile steelhead carrying capacity. B.C. Environment, Fish and Wildlife Branch, Skeena Region, Smithers, B.C..

- Tschaplinski, P.J and G.F. Hartman. 1983. Winter distribution of juvenile coho salmon (*Oncorhynchus kisutch*) before and after logging in Carnation Creek, British Columbia, and some implications for overwinter survival. Can. J. Fish. Aquat. Sci. 40: 452-461.
- Walters, C.J. 1995. Fish on the line: the future of Pacific Fisheries. Report to the David Suzuki Foundation, Fisheries Project, Phase I, Vancouver, B.C.
- Wet'suwet'en Fisheries and R.K. Saimoto. in prep.. Morice River Overwinter Study November 1999 to April 2000. Unpublished report for Fisheries Renewal B.C., Smithers, B.C.
- Whalen, K.G., D.L Parrish, M.E. Mather. 1999. Effect of ice formation on selection of habitats and winter distribution of post-young-of-the-year Atlantic salmon parr. Can. J. Fish. Aquat. Sci. 56: 87-96.

Zar, J.H. 1984. Biostatistical Analysis. (2nd ed.). Prentice Hall Inc. Englewood Cliffs, N.J.

 \mathbf{x}

-

-

-

-

-

-

Plate 32.	Relationship of Fulton's condition factor and fork length for chinook captured in
	Upper Bulkley tributary (above) and mainstem sites (below)
Plate 33.	Relationship of Fulton's condition factor and fork length for chinook captured in the
	four months of the overwintering study

٠,

Plate 13. Fork length, weight and condition factor data for coho captured at sites sampled during the upper Bulkley Overwintering study.

· · · · · · · · · · · · · · · · · · ·]	Fork Len	gth (mm)			Weig	ht (g)		Fulton	's Condi	tion Facto	or (K)
Site	Date	N	Min	Max	Mean	SE	Min	Max	Mean	SE	Min	Max	Mean	SE
BAR 1	2000/12/05	4	63.0	91.0	71.3	13.23	2.8	7.6	4.13	2.33	1.01	1.15	1.07	0.07
BUC1 (all hatchery) BUC1 (all hatchery)	2000/12/14 2001/01/11	6 12	<u> 66.0</u> 65.0	74.0 75.0	68.5	2.88	3.7	5.6	4.73	0.63	1.29	1.59	1.47	0.11
BUC1 (all hatchery)	2001/01/11	4	70.0	78.0	70.7	3.17 3.79	3.7	5.5 6.0	4.83	0.58	1.26 1.14	1.75	1.37	0.15
BUC1 (all hatchery)	2001/02/08	13	66.0	111.0	78.8	11.65	3.3	12.8	5.45	2.40	0.91	1.57	1.23	0.11
BUC2 (all hatchery)	2001/01/11	2	90.0	103.0	96.5	9.19	10.6	13.8	12.20	2.26	1.26	1.45	1.36	0.14
BUC2 (all hatchery)	2001/02/08	1	105.0	105.0	105.0	n.a.	15.2	15.2	15.20	n.a.	1.31	1.31	1.31	n.a.
BUC5 (all wild)	2001/01/11	11	66.0	89.0	80.8	6.43	4.3	9.6	7.28	1.66	1.03	1.54	1.36	0.14
BUC5 (1 hatchery, 5 wild)	2001/02/08	6	64.0	95.0	76.7	14.99	3.0	10.8	6.33	3.50	1.14	1.60	1.30	0.16
BUC5 (all wild) BUC6 (all hatchery)	2001/03/08 2001/01/11	2	69.0 81.0	70.0 81.0	69.5	0.71	3.7	3.9	3.80	0.14	1.13	1.14	1.13	0.01
BUC7 (5 hatchery, 7 wild)	2000/12/06	12	71.0	117.0	81.0 93.4	n.a. 17.09	5.6 3.2	5.6 17.2	5.60 9.13	n.a. 5.02	1.05 0.89	1.05	1.05	n.a. 0.05
BUC7 (all hatchery)	2001/01/09	2	96.0	101.0	98.5	3.54	11.1	13.6	12.35	1.77	1.25	1.32	1.01	0.05
BUC7 (1 hatchery, 2 wild)	2001/02/06	3	71.0	100.0	83.0	15.13	4.3	12.9	7.60	4.64	1.18	1.29	1.22	0.05
BUC7 (2 hatchery, 5 wild)	2001/03/06	7	72.0	112.0	87.6	14.25	4.4	15.2	7.63	4.02	0.92	1.18	1.06	0.08
BUC8 (all wild)	2000/12/06	1	94.0	94.0	94.0	n.a.	9.2	9.2	9.20	n.a.	1.11	1.11	1.11	n.a.
BUC8 (1 hatchery, 5 wild)	2001/01/04	6	71.0	99.0	79.3	10.91	4.7	12.4	6.73	2.94	1.20	1.40	1.30	0.08
BUC8 (all wild)	2001/02/06	1	76.0	76.0	76.0	n.a.	6.4	6.4	6.40	n.a.	1.46	1.46	1.46	n.a.
BUC8 (all wild) BYM 1	2001/03/06 2001/01/08	2	80.0 52.0	102.0 52.0	91.0 52.0	15.56 n.a.	6.1 2.2	10.8	8.45 2.20	3.32	1.02 1.56	1.19	1.10 1.56	0.12
BYM 2	2001/01/08	17	42.0	78.0	53.5	9.63	1.2	7.0	2.20	<u>n.a.</u> 1.79	0.97	3.00	1.50	n.a. 0.46
BYM 2	2001/01/11	10	38.0	78.0	56.5	11.71	0.9	6.6	2.82	1.63	1.20	1.98	1.39	0.40
BYM 2	2001/02/08	2	62.0	68.0	65.0	4.24	3.5	3.8	3.65	0.21	1.20	1.47	1.34	0.18
BYM 2	2001/03/08	4	40.0	64.0	49.5	10.21	1.0	2.9	1.55	0.90	1.06	1.56	1.22	0.23
BYM 3	2000/12/14	1	62.0	62.0	62.0	n.a.	4.0	4.0	4.00	n.a.	1.68	1.68	1.68	n.a.
BYM 3	2001/01/11	6	44.0	53.0	46.3	3.33	1.1	1.9	1.35	0.28	1.28	1.43	1.35	0.07
BYM 3 BYM 3	2001/02/08 2001/03/08	5	41.0	70.0	56.6 59.3	12.82 12.22	0.5	4.3	2.40	1.55 1.15	0.73	1.32 1.23	1.13	0.23
McQ 1	2001/03/08	2	40.0 65.0	70.0	68.0	4.24	2.2	3.3	2.33	0.78	0.97	0.92	0.86	0.14
RIC 1	2000/12/03	1	52.0	52.0	52.0	n.a.	2.2	2.0	2.00	n.a.	1.42	1.42	1.42	n.a.
RIC 1	2001/01/17	6	51.0	85.0	62.0	12.46	2.4	7.9	3.87	2.07	1.29	1.86	1.57	0.27
RIC 1	2001/02/14	2	44.0	46.0	45.0	1.41	1.3	1.3	1.30	0.00	1.34	1.53	1.43	0.13
RIC 2	2000/12/05	1	75.0	75.0	75.0	n.a.	4.7	4.7	4.70	n.a.	1.11	1.11	1.11	n.a.
RIC 2	2001/01/08	15	46.0	61.0	52.9	4.57	1.1	2.9	2.01	0.53	1.13	1.81	1.33	0.17
RIC 2 RIC 2	2001/02/05 2001/03/05	46 23	44.0 47.0	68.0 100.0	51.0 56.0	4.74 10.35	1.1	3.9 10.4	1.84 2.05	0.53	1.10 0.80	2.02	1.36 1.05	0.19
RIC 3	2001/03/03	23	47.0	112.0	64.4	16.58	1.1	19.2	4.39	4.19	0.80	1.85	1.36	0.11
RIC 3	2001/01/17	30	44.0	89.0	56.1	11.19	1.3	9.4	2.74	2.11	1.06	2.00	1.37	0.18
RIC 3	2001/02/14	19	49.0	73.0	54.5	5.55	1.5	5.1	2.26	0.84	0.97	2.32	1.38	0.31
RIC 3	2001/03/14	7	48.0	69.0	56.9	8.07	1.0	3.2	1.93	0.86	0.83	1.14	0.99	0.10
RIC 4	2000/12/18	5	46.0	77.0	58.0	11.87	1.5	6.1	3.02	1.81	1.34	1.54	1.44	0.10
RIC 4	2001/01/17	5	50.0	62.0	54.8	5.72	1.8	3.5	2.54	0.76	1.30 0.98	1.88	1.52	0.24
RIC 4 RIC 4	2001/02/14 2001/03/14	18 2	<u>49.0</u> 65.0	91.0 71.0	57.6 68.0	10.14	1.3 2.9	9.6 3.9	3.40	0.71	1.06	1.77	1.24	0.20
RIC 5	2000/12/18	4	49.0	60.0	52.8	4.92	1.9	3.5	2.48	0.73	1.00	1.88	1.66	0.02
RIC 5	2001/01/17	12	40.0	62.0	50.4	5.30	0.9	3.2	1.81	0.72	1.10	1.77	1.35	0.20
RIC 5	2001/02/14	6	47.0	57.0	51.5	4.09	1.3	2.5	1.92	0.42	1.10	1.73	1.40	0.26
RIC 5	2001/03/14	5	44.0	55.0	49.6	4.51	0.8	1.8	1.26	0.38	0.94	1.08	1.00	0.05
UBR 2	2001/01/11	3	46.0	58.0	50.7	6.43	1.5	2.6	2.17	0.59	1.33	2.17	1.68	0.44
UBR 2 UBR 2	2001/02/08	11 11	50.0	71.0	58.9 63.4	6.27 7.66	<u>1.3</u> 1.7	5.1 4.3	2.69	1.09 0.94	0.97	1.42 1.28	1.25	0.15
UBR 2 UBR 9	2001/03/08 2000/12/05	11	54.0 71.0	76.0	71.0	/.00 n.a.	4.9	4.3	4.90	0.94 n.a.	1.37	1.28	1.07	n.a.
UBR 11	2000/12/03	2	65.0	65.0	65.0	0.00	2.5	3.7	3.10	0.85	0.91	1.35	1.13	0.31
TOB 1	2000/12/20	31	33.0	89.0	54.9	11.48	0.4	10.6	2.58	1.91	0.61	1.85	1.39	0.28
TOB 1	2001/01/22	18	41.0	65.0	49.2	6.88	1.0	3.7	1.88	0.66	1.19	2.67	1.57	0.34
TOB 1	2001/02/19	10	38.0	68.0	53.0	8.76	0.7	4.0	2.09	1.05	0.89	1.56	1.30	0.20
TOB 1	2001/03/19	5	45.0	55.0	49.8	3.90	1.0	2.0	1.42	0.40	1.06	1.21	1.12	0.07
TOB 2 TOB 2	2000/12/20 2001/01/22	33 13	37.0	88.0	57.1 56.9	<u>12.90</u> 7.11	0.9	<u>9.3</u> 4.5	3.12	1.94 0.97	0.93	2.50 1.54	1.54	0.33
TOB 2 TOB 2	2001/01/22 2001/02/19	13	48.0	70.0	62.5	7.11	1.4	4.5	3.38	1.35	1.20	1.54	1.33	0.09
TOB 2	2001/02/19	7	50.0	73.0	61.7	8.75	1.3	5.0	2.97	1.33	1.07	1.50	1.21	0.15
TOB 5	2000/12/20	5	53.0	101.0	87.4	19.73	1.7	13.3	9.54	4.65	1.14	1.32	1.26	0.07
TOB 5	2001/02/19	4	60.0	76.0	68.8	7.54	1.9	4.7	3.65	1.34	0.88	1.20	1.08	0.14
TOB 6	2000/12/20	3	53.0	56.0	54.3	1.53	2.4	2.7	2.57	0.15	1.52	1.75	1.60	0.12
TOB 6	2001/01/22	1	58.0	58.0	58.0	n.a.	2.6	2.6	2.60	n.a.	1.33	1.33	1.33	n.a.
TOB 7	2001/03/09	13	51.0 45.0	118.0 65.0	69.4 52.5	19.68 5.07	1.3	15.1 3.8	4.11 2.35	3.96 0.59	0.78	1.30	1.63	0.13
TOB 8 TOB 8	2000/12/20 2001/01/22	22 4	45.0	<u> </u>	47.0	3.56	1.5	2.2	1.93	0.39	1.68	2.74	1.86	0.33
TOB 8	2001/01/22	20	45.0	98.0	59.6	13.95	0.9	10.9	3.02	2.73	0.84	1.62	1.22	0.22
TOB 8	2001/03/19	4	68.0	75.0	72.8	3.20	3.2	4.0	3.58	0.35	0.84	1.02	0.93	0.07
L				.l		•	•	5 mm	···		····			

Department of Fisheries and Oceans & SKR Consultants Ltd.

۰.

				Fork Len	zth (mm)		1111 1 1 1 1	Weig	ht (g)	//////////////////////////////////////	Fu	lton's Cond	ition Factor (K)
Site	Date	N	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
BAR 1	2000/12/05	9	76.0	120.0	95.4	14.14	5.0	17.3	10.1	4.27	0.9	1.3	1.11	0.15
BAR 1	2001/01/08	1	46.0	46.0	46.0	n.a.	1.8	1.8	1.8	n.a.	1.9	1.9	1.85	n.a.
BUC 1	2000/12/14	4	88.0	93.0	89.8	2.22	9.3	11.4	10.1	0.91	1.4	1.4	1.39	0.02
BUC 1	2001/01/11	7	48.0	108.0	84.4	18.27	1.7	16.5	9.1	4.40	1.3	1.5	1.39	0.10
BUC 1 BUC 1	2001/02/08 2001/03/08	2	81.0 91.0	82.0 111.0	81.5 101.0	0.71 14.14	7.6 7.9	7.7	7.7 9.9	0.07	1.4 0.9	1.4	1.41 0.96	0.02
BUC 2	2000/12/14	6	74.0	92.0	81.5	5.52	4.8	11.9	8.2	1.78	1.1	1.5	1.34	0.13
BUC 2	2000/12/14	13	71.0	95.0	84.4	9.01	5.2	12.5	8.2	2.70	1.1	1.5	1.3	0.02
BUC 2	2001/02/08	5	80.0	95.0	85.2	6.30	6.3	13.5	8.9	2.78	1.2	1.6	1.41	0.15
BUC 2	2001/03/08	5	77.0	111.0	90.2	12.68	5.8	15.0	8.9	3.53	1.0	1.3	1.18	0.12
BUC 5	2000/12/14	15	68.0	112.0	84.9	13.27	5.1	19.5	9.9	4.41	1.3	2.0	1.55	0.19
BUC 5	2001/01/11	43	51.0	124.0	84.6	17.38	1.1	26.2	9.5	5.53	0.8	1.9	1.44	0.21
BUC 5	2001/02/08	22	65.0	110.0	78.4	11.25	4.1	18.6	7.5	3.33	1.2	1.8	1.49	0.14
BUC 5	2001/03/08	11	71.0	91.0	80.5	5.85	5.2	8.6	6.5	1.14	1,1	1.5	1.23	0.13
BUC 6	2000/12/14	9	58.0	84.0	72.1	8.10	2.9	8.9	5.7	1.87	1.3	1.7	1.49	0.12
BUC 6 BUC 6	2001/01/11 2001/02/08	13 6	51.0 45.0	99.0 65.0	71.2	<u>14.32</u> 7.50	2.3 1.1	12.5 3.4	5.9 2.1	3.20 0.99	1.2	1.9 1.7	1.53 1.38	0.17 0.19
BUC 6	2001/02/08	8	51.0	82.0	72.3	12.28	1.1	7.6	5.0	2.39	0.8	1.7	1.38	0.19
BUC 7	2001/03/08	11	74.0	125.0	96.5	14.90	5.5	24.1	12.0	5.62	1.1	1.4	1.17	0.09
BUC 7	2001/02/06	2	79.0	105.0	92.0	18.38	7.1	15.5	11.3	5.94	1.3	1.4	1.39	0.07
BUC 7	2001/03/06	4	82.0	109.0	97.0	11.22	5.7	13.2	9.7	3.08	1.0	1.1	1.04	0.06
BUC 8	2000/12/06	9	80.0	112.0	95.6	10.79	6.2	15.5	9.6	3.10	0.9	1.2	1.07	0.09
BUC 8	2001/01/04	2	72.0	89.0	80.5	12.02	5.1	9.4	7.3	3.04	1.3	1.4	1.35	0.02
BUC 8	2001/02/06	8	62.0	86.0	77.9	8.06	3.7	9.0	6.9	1.92	1.3	1.6	1.43	0.12
BYM 1	2000/12/15	5	76.0	126.0	93.4	20.83	5.0	20.9	9.5	6.48	0.8	1.3	1.09	0.18
BYM 1	2001/01/08	14	44.0	118.0	79.9	19.92	1.1	20.0	7.9	5.53	1.1	1.7	1.35	0.15
BYM 2	2001/02/05	6	61.0	130.0	86.3	24.70	3.5	28.2 22.5	10.5 7.5	9.16 6.70	1.3	1.5 1.2	1.40 1.12	0.12 0.08
BYM 3 BYM 2	2001/03/05 2000/12/15	8 17	49.0 56.0	131.0 98.0	82.0 76.9	24.94 11.72	1.4	14.2	7.5	6.70 3.01	1.0	1.2	1.12	0.08
BYM 2 BYM 2	2000/12/13	11	41.0	83.0	66.4	12.53	0.9	7.1	4.5	1.87	1.2	1.7	1.47	0.23
BYM 2	2001/01/11	8	44.0	103.0	69.6	19.78	1.0	15.3	5.8	4.55	1.2	1.6	1.41	0.15
BYM 2	2001/02/08	10	45.0	106.0	72.7	16.65	1.3	12.5	5.1	3.18	1.0	1.4	1.20	0.13
BYM 3	2000/12/14	2	68.0	84.0	76.0	11.31	5.4	8.4	6.9	2.12	1.4	1.7	1.57	0.21
BYM 3	2001/01/11	7	39.0	78.0	53.4	16.49	0.9	6.8	2.7	2.48	1.3	1.6	1.46	0.14
BYM 3	2001/02/08	12	39.0	76.0	53.1	15.73	0.6	6.3	2.6	2.43	0.8	1.5	1.30	0.21
BYM 3	2001/03/08	5	38.0	76.0	55.0	18.06	0.8	5.2	2.5	2.12	1.1	1.5	1.24	0.13
McQ 1	2000/12/05	13	49.0	97.0	75.2	15.40	1.2	8.4	4.6	2.37	0.9	1.1	0.97	0.07
McQ 1	2001/01/08	15	39.0	88.0	58.9	17.62	1.2	8.8	3.6	2.54	1.2	2.6	1.60	0.48
McQ 1 McQ 1	2001/02/05 2001/03/05	3	44.0	71.0	53.3 53.0	<u>15.31</u> 17.44	1.0 1.0	4.1	2.2	1.66 1.59	1.1	1.5	1.32	0.28
RIC 1	2001/03/03	3	68.0	105.0	86.3	18.50	4.7	16.6	10.0	6.06	1.0	1.5	1.43	0.06
RIC 1	2001/01/17	6	40.0	91.0	67.8	17.61	0.8	12.4	5.3	4.05	1.2	1.6	1.41	0.17
RIC 1	2001/02/14	3	45.0	68.0	59.0	12.29	1.5	4.8	3.2	1.66	1.3	1.6	1.49	0.18
RIC 1	2001/03/14	4	45.0	76.0	65.3	13.82	1.2	6.2	3.8	2.05	1.1	1.4	1.25	0.14
RIC 2	2000/12/05	6	76.0	133.0	95.8	24.28	4.6	24.3	11.2	8.20	1.0	1.2	1.11	0.08
RIC 2	2001/01/08	7	44.0	105.0	72.1	26.45	1.3	16.5	6.8	6.11	1.2	1.5	1.41	0.16
RIC 2	2001/02/05	12	41.0	80.0	63.3	13.31	1.1	7.6	3.9	1.94	1.2	2.0	1.45	0.20
RIC 2	2001/03/05	5	66.0	92.0	74.8	10.26	3.0	8.6	4.9	2.17	1.0	1.2	1.12 1.41	0.07
RIC 3	2000/12/18	32	42.0	124.0	73.6	18.37	1.0	25.3 9.1	6.6 4.1	5.39 2.63	1.0	1.6 1.9	1.39	0.13
RIC 3 RIC 3	2001/01/17 2001/02/14	22	41.0	89.0 71.0	63.4 51.5	15.41 11.84	1.1 0.8	5.3	2.3	1.73	0.9	1.9	1.46	0.19
RIC 3	2001/02/14	8	41.0	78.0	55.3	12.07	0.8	3.4	1.9	1.05	0.6	1.3	1.06	0.26
RIC 3	2001/03/14	10	58.0	86.0	73.6	8.83	3.8	9.4	6.3	1.05	1.2	2.3	1.57	0.29
RIC 4	2000/12/13	21	42.0	100.0	68.7	15.86	1.1	13.2	5.0	3.16	0.9	1.6	1.35	0.13
RIC 4	2001/02/14	17	42.0	85.0	65.4	14.82	0.8	7.5	4.2	2.23	1.1	1.8	1.34	0.18
RIC 4	2001/03/14	2	41.0	55.0	48.0	9.90	1.1	1.9	1.5	0.57	1.1	1.6	1.37	0.32
RIC 5	2000/12/18	16	61.0	92.0	77.6	10.69	3.6	10.1	7.0	2.41	1.3	2.0	1.46	0.17
RIC 5	2001/01/17	14	39.0	118.0	67.4	21.49	0.9	23.0	5.8	5.62	1.1	2.6	1.54	0.34 0.10
RIC 5	2001/02/14	14	39.0	94.0	61.9	20.22	0.7	11.3	4.0	3.32	1.0	1.4	1.30 1.10	0.10
RIC 5 UBR 1	2001/03/14 2000/12/18	9	38.0 73.0	73.0	63.9 73.0	24.50 n.a.	0.6	12.9 6.5	3.9 6.5	4.07 n.a.	1.7	1.0	1.67	n.a.
UBR 1	2000/12/18	2	81.0	105.0	93.0	n.a. 16.97	8.3	12.8	10.6	3.18	1.1	1.6	1.33	0.32
UBR 2	2001/01/17	$\frac{2}{14}$	56.0	103.0	75.9	13.43	2.9	13.2	6.5	3.28	1.2	2.2	1.42	0.24
UBR 2	2001/01/11	2	71.0	110.0	90.5	27.58	4.8	15.3	10.1	7.42	1.1	1.3	1.25	0.14
UBR 2	2001/02/08	ad an extension production the second s	89.0	102.0	95.5	9.19	8.1	12.8	10.5	3.32	1.1	1.2	1.18	0.04
UBR 9	2000/12/05	4	91.0	111.0	101.3	10.21	8.7	16.6	12.3	4.00	1.1	1.2	1.15	0.05
UBR 9	2001/01/08		81.0	90.0	85.5	6.36	7.3	10.6	9.0	2.33	1.4	1.5	1.41	0.06
UBR 9	2001/02/05	2	94.0	106.0	100.0	8.49	9.6	16.2	12.9	4.67	1.2	1.4	1.26	0.14
UBR 9	2001/03/05	2	77.0	93.0	85.0	11.31	5.0	8.7	6.9	2.62	1.1	1.1	1.09	0.01
UBR 11	2000/12/18		100.0	121.0	115.3	10.18	15.0	26.0	21.6	4.75	1.2 1.2	1.5	1.40	0.06
UBR 11	2001/02/15		93.0	98.0 86.0	95.3 67.0	2.52	9.5	12.2 9.5	<u> </u>	2.75	0.6	2.0	1.23	0.33
TOB 1 TOB 1	2000/12/20 2001/01/22		70.0	86.0	77.0	9.90	5.6	6.9	6.3	0.92	1.2	1.6	1.40	0.33
TOB 1	2001/01/22 2001/02/19		73.0	80.0	76.5	4.95	5.4	7.1	6.3	1.20	1.4	1.4	1.39	0.00
TOB 1	2001/02/19		79.0	86.0	81.7	3.79	4.6	7.2	5.6	1.38	0.9	1.1	1.02	0.10
TOB 1	2000/12/20		67.0	76.0	72.3	4.11	4.3	6.0	5.5	0.81	1.4	1.6	1.45	0.08
TOB 2	2001/01/22		70.0	100.0	85.4	12.95	4.8	13.3	9.0	3.96	1.3	1.5	1.37	0.10
TOB 2	2001/02/19	4	74.0	89.0	81.8	7.85	5.4	10.5	7.5	2.39	1.2	1.5	1.34	0.11
TOB 7	2001/03/09		90.0	93.0	91.5	2.12	7.1	7.8	7.5	0.49	1.0	1.0	0.97	0.00
TOB 8	2000/12/20	_	68.0	68.0	68.0	n.a.	4.6	4.6	4.6	n.a.	1.5	1.5	1.46	n.a. n.a.
TOB 8	2001/01/22		61.0	61.0	61.0	n.a.	3.9	3.9 4.6	3.9	n.a. 2.76	0.9	1.7	1.12	0.28
TOB 8	2001/02/19		42.0	70.0	56.0	19.80		3.3	3.3		1.3	1.3	1.14	n.a.
TOB 8	2001/03/19		64.0	64.0	64.0	n.a.	3.3	5.5	3.5	n.a.	1.5	1	1.20	

Plate 14. Fork length, weight and condition factor data for rainbow trout/steelhead captured at sites sampled during the upper Bulkley Overwintering study.

Department of Fisheries and Oceans & SKR Consultants Ltd.

			F	Fork Leng	gth (mm)		Weight (g)				Fulton's Condition Factor (K)				
Site	Date	N	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	
TOB 2	2000/12/20	2	79.0	110.0	94.5	21.9	5.6	12.7	9.2	5.0	1.0	1.1	1.0	0.13	
TOB 2	2001/03/19	1	155.0	155.0	155.0	n.a.	26.7	26.7	26.7	n.a.	0.7	0.7	0.7	n.a.	
TOB 5	2000/12/20	2	62.0	112.0	87.0	35.4	3.4	17.7	10.6	10.1	1.3	1.4	1.3	0.12	
TOB 5	2001/02/19	1	109.0	109.0	109.0	n.a.	13.8	13.8	13.8	n.a.	1.1	1.1	1.1	n.a.	
TOB 7	2001/03/09	2	92.0	108.0	100.0	11.3	7.0	10.8	8.9	2.7	0.9	0.9	0.9	0.03	
TOB 8	2000/12/20	2	49.0	89.0	69.0	28.3	1.5	8.3	4.9	4.8	1.2	1.3	1.2	0.07	

Plate 15. Fork length, weight and condition factor data for Dolly Varden captured at sites sampled during the upper Bulkley Overwintering study.

Plate 16. Fork length, weight and condition factor data for chinook captured at sites sampled during the upper Bulkley Overwintering study.

		1	F	ork Leng	th (mm)			Weig	ght (g)		Fulton's Condition Factor (K)				
Site	Date	Ν	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	
BUC 2	2001/01/11	2	73.0	76.0	74.5	2.1	5.4	6.4	5.9	0.7	1.4	1.5	1.4	0.05	
BUC 5	2001/01/11	3	65.0	66.0	65.3	0.6	3.3	4.3	3.9	0.5	1.2	1.6	1.4	0.18	
BUC 5	2001/02/08	2	69.0	69.0	69.0	0.0	4.2	4.6	4.4	0.3	1.3	1.4	1.3	0.09	
BUC 6	2001/02/08	3	64.0	78.0	69.3	7.6	3.2	6.2	4.6	1.5	1.2	1.5	1.3	0.14	
BUC 6	2001/03/08	4	60.0	81.0	70.8	10.3	2.8	5.5	4.3	1.4	1.0	1.3	1.2	0.12	
BUC 7	2001/01/09	4	72.0	83.0	75.8	5.0	4.7	7.5	5.8	1.2	1.1	1.5	1.3	0.16	
BUC 7	2001/02/06	1	80.0	80.0	80.0	n.a.	7.2	7.2	7.2	n.a.	1.4	1.4	1.4	n.a.	
BUC 7	2001/03/06	1	76.0	76.0	76.0	n.a.	5.6	5.6	5.6	n.a.	1.3	1.3	1.3	n.a.	
BUC 8	2000/12/06	4	77.0	86.0	81.0	3.9	4.7	7.6	5.7	1.3	1.0	1.2	1.1	0.10	
BUC 8	2001/01/04	3	69.0	85.0	76.3	8.1	4.2	7.4	5.6	1.6	1.2	1.3	1.2	0.04	
BUC 8	2001/02/06	2	70.0	78.0	74.0	5.7	4.4	5.7	5.1	0.9	1.2	1.3	1.2	0.06	
BUC 8	2001/03/06	3	74.0	81.0	76.3	4.0	4.4	5.3	4.8	0.5	1.0	1.2	1.1	0.09	
BYM 2	2001/01/11	3	59.0	67.0	64.3	4.6	2.8	4.7	4.0	1.1	1.4	1.6	1.5	0.11	
BYM 3	2001/03/08	1	68.0	68.0	68.0	n.a.	3.2	3.2	3.2	n.a.	1.0	1.0	1.0	n.a.	
RIC 1	2001/02/14	1	63.0	63.0	63.0	n.a.	3.5	3.5	3.5	n.a.	1.4	1.4	1.4	n.a.	
RIC 2	2001/01/08	3	55.0	71.0	62.0	8.2	2.2	4.8	3.3	1.3	1.3	1.3	1.3	0.01	
RIC 2	2001/02/05	3	67.0	68.0	67.7	0.6	3.6	4.4	4.1	0.4	1.2	1.4	1.3	0.10	
RIC 2	2001/03/05	4	61.0	71.0	66.5	4.8	2.5	3.9	3.2	0.7	1.0	1.1	1.1	0.03	
RIC 3	2000/12/18	6	61.0	73.0	67.7	4.8	2.8	5.9	4.5	1.1	1.1	1.7	1.4	0.26	
RIC 3	2001/01/17	9	60.0	72.0	67.7	3.6	3.2	5.2	4.3	0.6	1.2	1.7	1.4	0.16	
RIC 3	2001/02/14	1	55.0	55.0	55.0	n.a.	2.5	2.5	2.5	n.a.	1.5	1.5	1.5	n.a.	
RIC 3	2001/03/14	1	64.0	64.0	64.0	n.a.	3.1	3.1	3.1	n.a.	1.2	1.2	1.2	n.a.	
RIC 4	2000/12/18	7	44.0	76.0	63.3	10.9	1.5	6.3	3.8	1.6	1.1	1.8	1.4	0.18	
RIC 4	2001/01/17	6	61.0	74.0	66.7	5.0	3.3	5.3	4.2	0.9	1.3	1.7	1.4	0.16	
RIC 4	2001/02/14	5	59.0	69.0	63.6	3.9	3.0	3.7	3.3	0.3	1.1	1.5	1.3	0.13	
RIC 5	2001/01/17	1	59.0	59.0	59.0	n.a.	2.7	2.7	2.7	n.a.	1.3	1.3	1.3	n.a.	
RIC 5	2001/03/14	1	70.0	70.0	70.0	n.a.	4.0	4.0	4.0	n.a.	1.2	1.2	1.2	n.a.	
UBR 1	2001/01/17	2	58.0	78.0	68.0	14.1	3.0	6.8	4.9	2.7	1.4	1.5	1.5	0.07	
UBR 1	2001/02/14	5	61.0	65.0	63.8	1.8	3.1	4.0	3.5	0.5	1.1	1.5	1.4	0.14	
UBR 2	2001/01/11	9	57.0	69.0	62.7	3.8	2.9	5.1	3.4	0.7	1.2	1.6	1.4	0.17	
UBR 2	2001/02/08	17	55.0	71.0	64.5	4.6	2.2	4.7	3.5	0.7	0.9	1.8	1.3	0.21	
UBR 2	2001/03/08	8	59.0	67.0	63.3	3.1	2.6	3.7	3.2	0.4	1.2	1.4	1.3	0.05	
UBR 9	2000/12/05	1	70.0	70.0	70.0	n.a.	3.8	3.8	3.8	n.a.	1.1	1.1	1.1	n.a.	
UBR 9	2001/01/08	4	62.0	72.0	67.8	4.2	3.9	6.2	4.7	1.0	1.3	1.7	1.5	0.19	
UBR 9	2001/02/05	4	69.0	86.0	75.0	7.8	4.3	8.6	5.6	2.0	1.2	1.4	1.3	0.09	
UBR 9	2001/03/05	4	66.0	73.0	70.0	2.9	3.2	4.0	3.5	0.3	1.0	1.1	1.0	0.06	
UBR 10	2001/01/08	1	91.0	91.0	91.0	n.a.	10.7	10.7	10.7	n.a.	1.4	1.4	1.4	n.a.	
UBR 10	2001/03/05	2	70.0	78.0	74.0	5.7	3.7	5.3	4.5	1.1	1.1	1.1	1.1	0.03	
UBR 11	2000/12/18	5	62.0	78.0	68.4	6.3	3.5	5.3	4.3	0.8	1.1	1.5	1.3	0.15	
UBR 11	2001/01/18	1	68.0	68.0	68.0	n.a.	4.1	4.1	4.1	n.a.	1.3	1.3	1.3	n.a.	
UBR 11	2001/02/15	1	62.0	62.0	62.0	n.a.	3.1	3.1	3.1	n.a.	1.3	1.3	1.3	n.a.	
UBR 12	2001/03/15	4	67.0	74.0	69.8	3.0	3.4	4.3	3.7	0.4	1.0	1.2	1.1	0.06	

100

1000

(inter

16

1.14

協

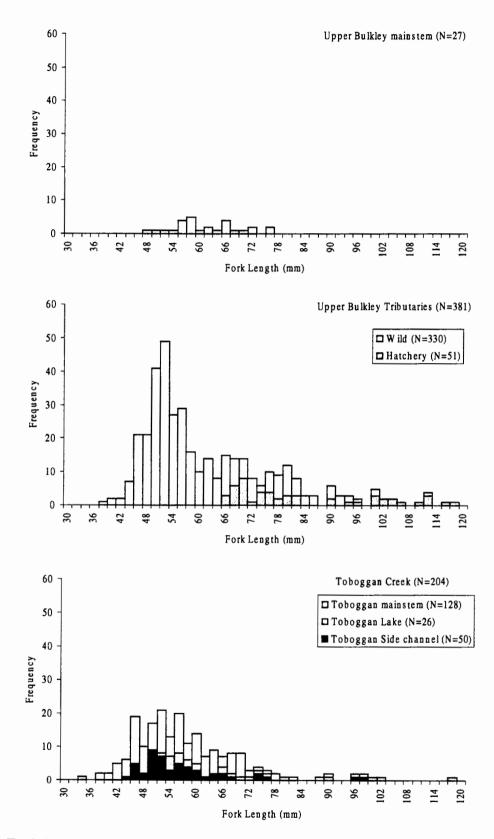


Plate 17. Fork length distribution for coho captured at Upper Bulkley mainstem, Upper Bulkley tributary and Toboggan Creek sites throughout the winter.

Line

£

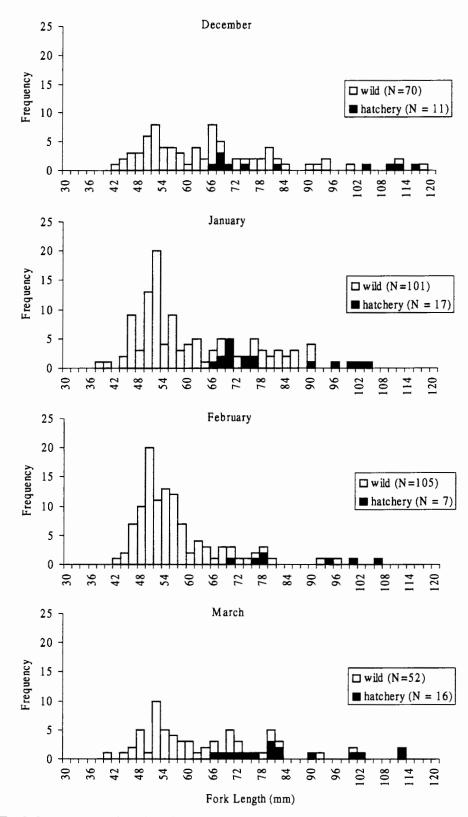


Plate 18. Fork length distribution for coho for December, January, February and March samples obtained in the Upper Bulkley watershed.

(1)

(iiii

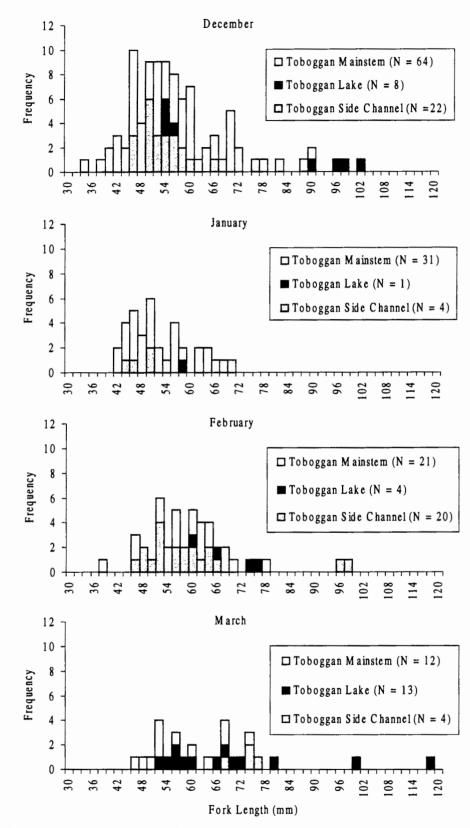


Plate 19. Fork length distribution for coho for December, January, February and March samples obtained in the Toboggan Creek watershed.

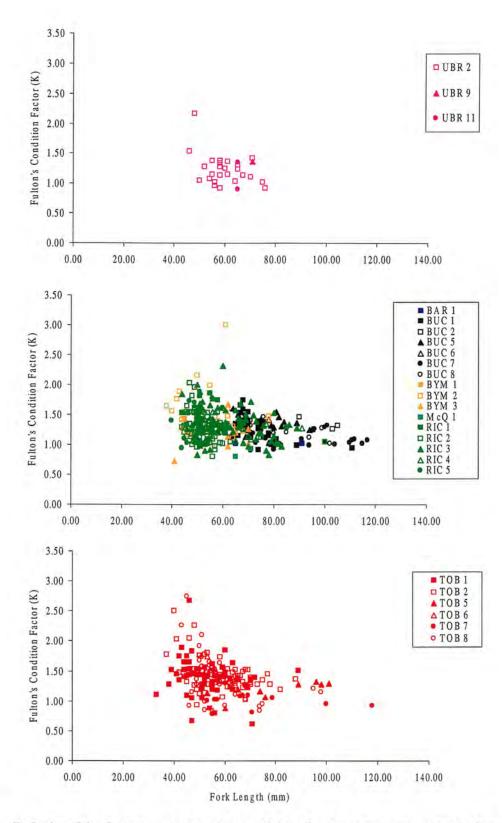


Plate 20. Relationship between Fulton's condition factor and fork length for coho for sites sampled in Upper Bulkley mainstem, tributaries and Toboggan Creek.

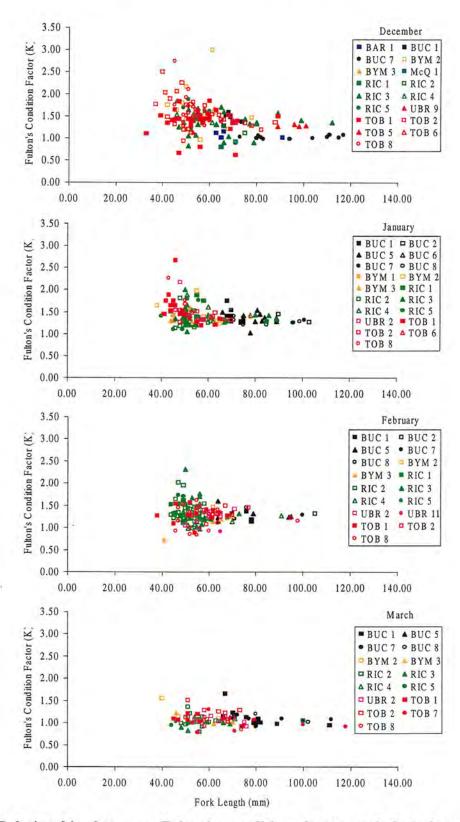


Plate 21. Relationship between Fulton's condition factor and fork length for coho captured in the four months of winter sampling (December, January, February and March).

Upper Bulkley River Overwintering Study 2000-2001

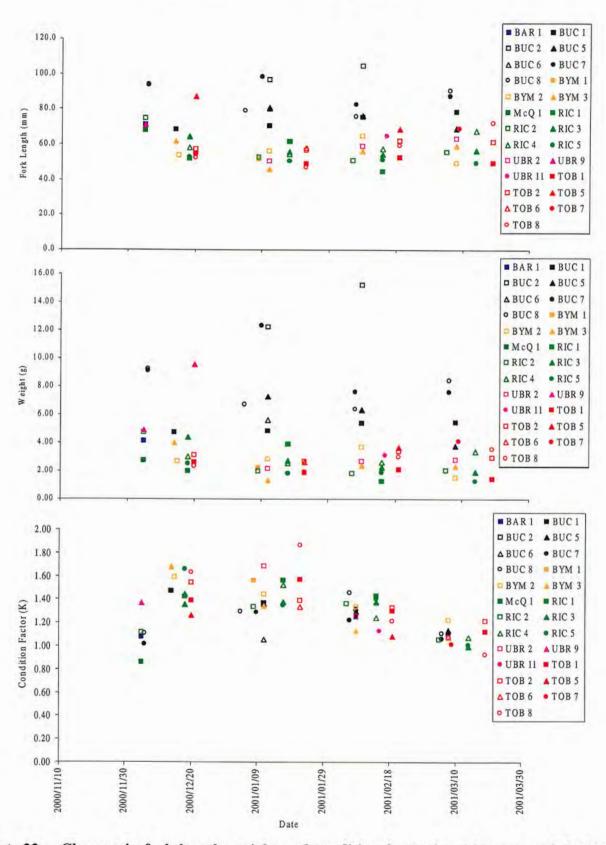


Plate 22. Changes in fork length, weight and condition factor for coho captured during the winter.

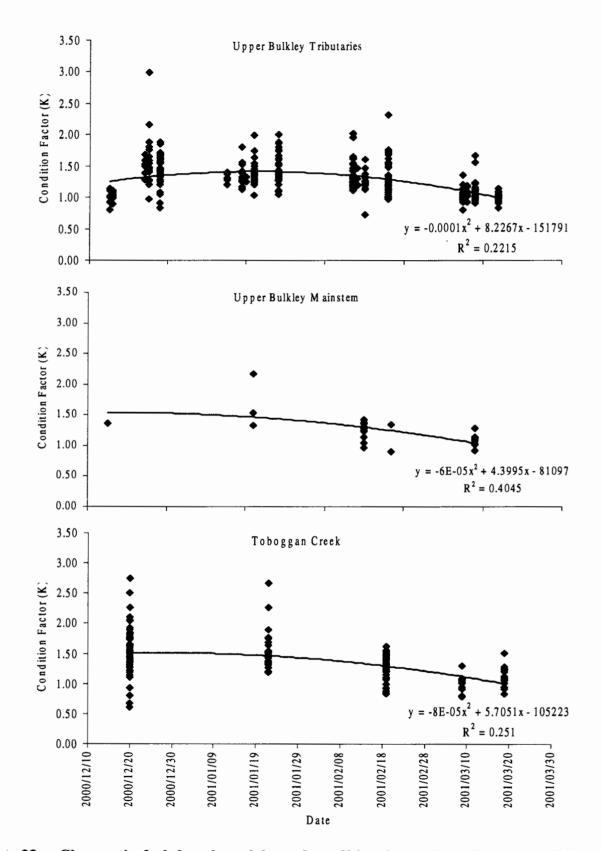


Plate 23. Changes in fork length, weight and condition factor for coho captured during the winter, showing trend lines.

Department of Fisheries and Oceans & SKR Consultants Ltd.

100

1.0

1000

North

1000

L.M

1

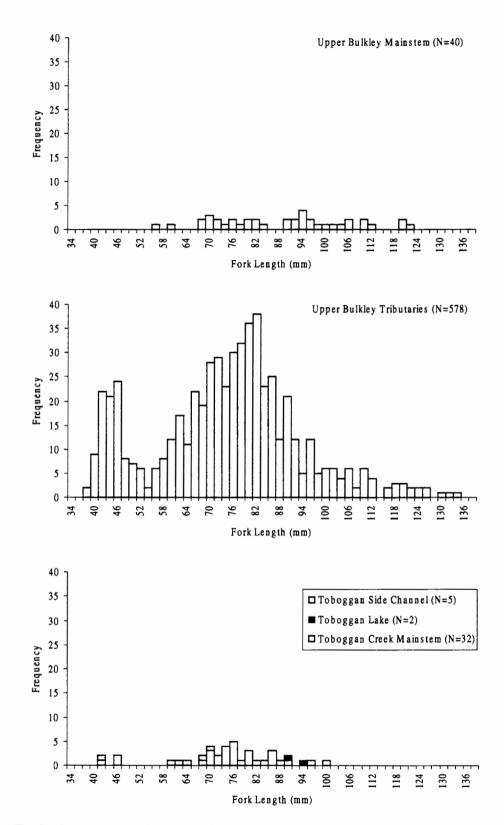


Plate 24. Fork length distribution for rainbow trout captured at Upper Bulkley mainstem, Upper Bulkley tributary and Toboggan Creek sites throughout the winter.

......

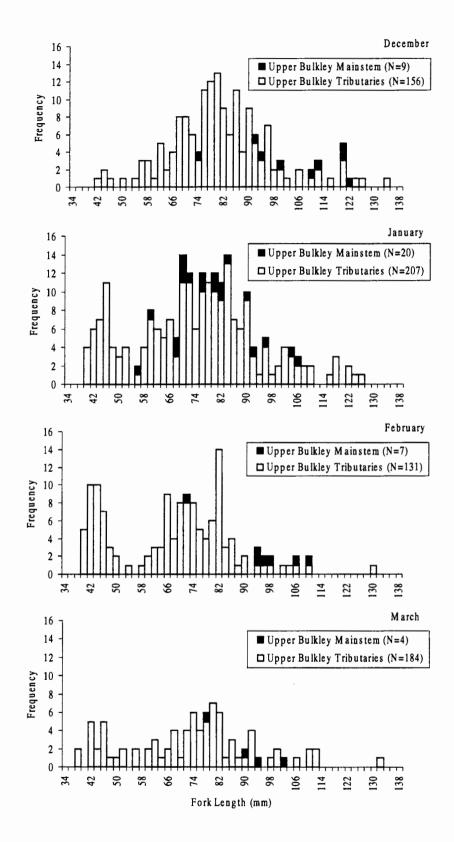
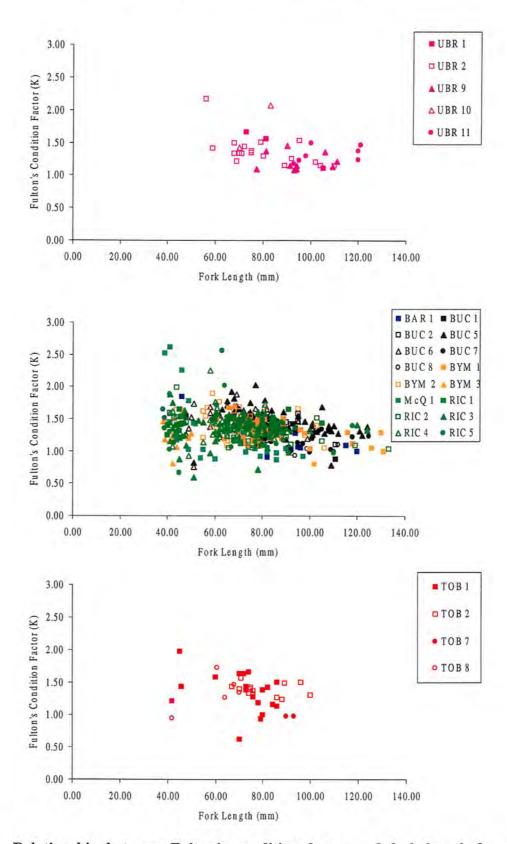
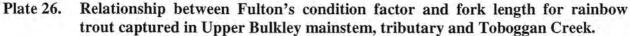


Plate 25. Fork length distribution for rainbow trout for December, January, February and March samples obtained in the Upper Bulkley watershed.

Upper Bulkley River Overwintering Study 2000-2001





Upper Bulkley River Overwintering Study 2000-2001

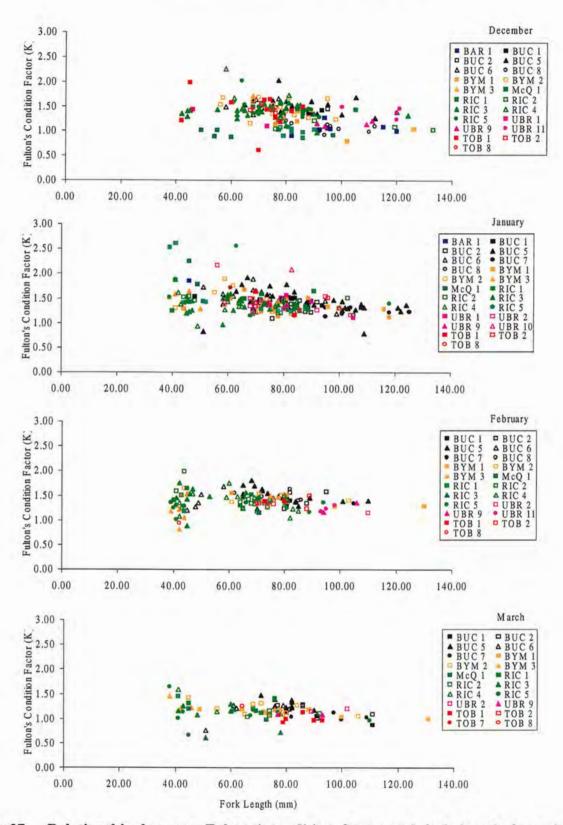


Plate 27. Relationship between Fultons' condition factor and fork length for rainbow trout captured during the four months of the overwintering study (December, January, February and March)

Upper Bulkley River Overwintering Study 2000-2001

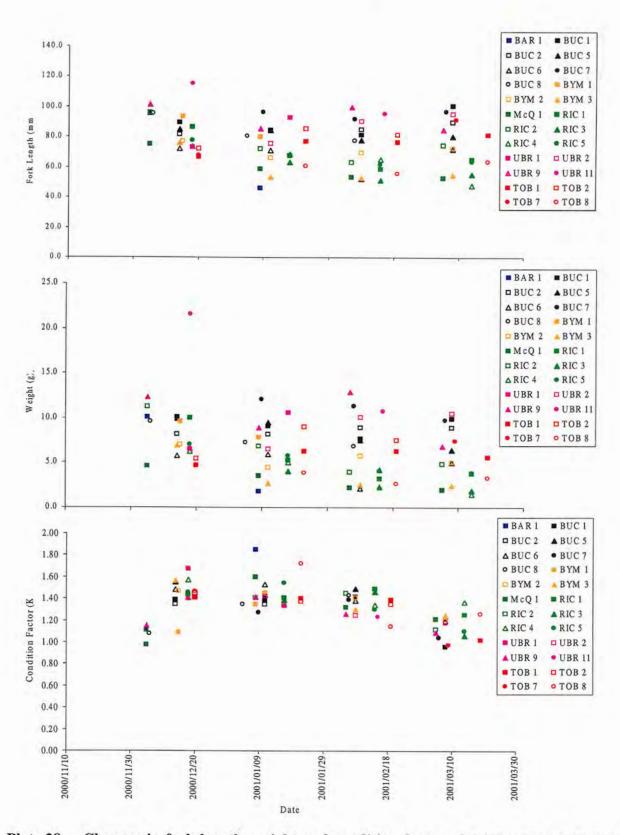


Plate 28. Changes in fork length, weight and condition factor of rainbow trout captured during the overwintering study.

Upper Bulkley River Overwintering Study 2000-2001

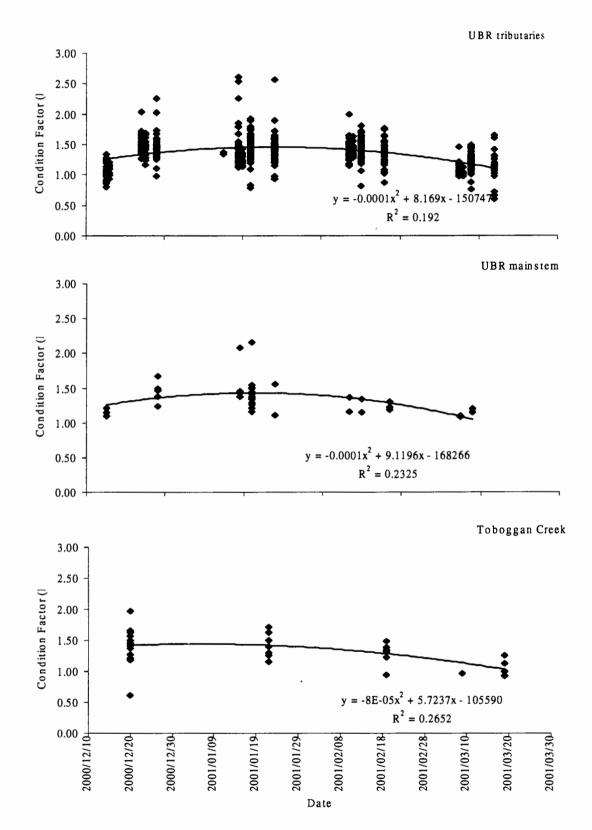


Plate 29. Changes in fork length, weight and condition factor of rainbow trout captured during the overwintering study, showing trend lines.

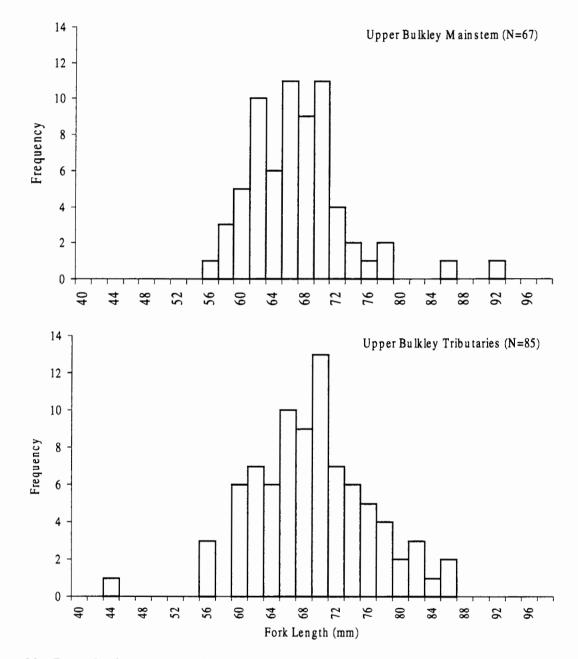


Plate 30. Length frequency histogram for chinook captured in the Upper Bulkley watershed.

1.83

1

1.83

· 5/10

.

100

100

1

i at

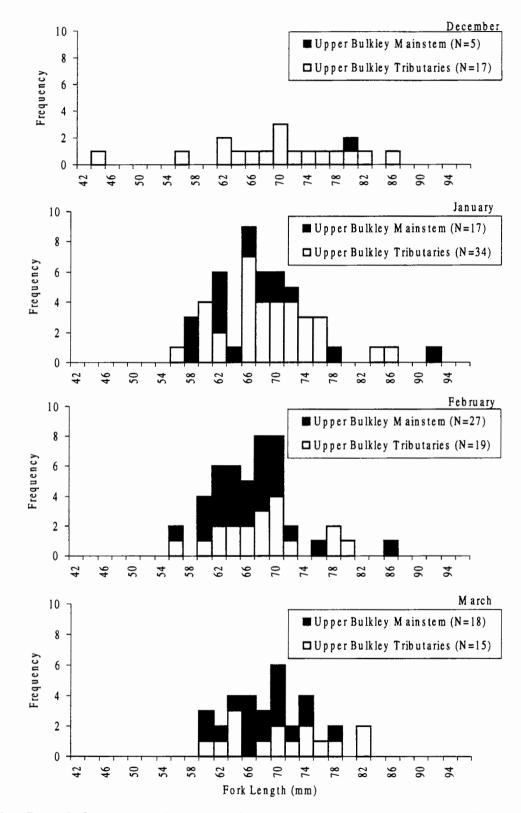


Plate 31. Length frequency histograms for chinook captured during the four months of the overwintering study in the Upper Bulkley watershed.

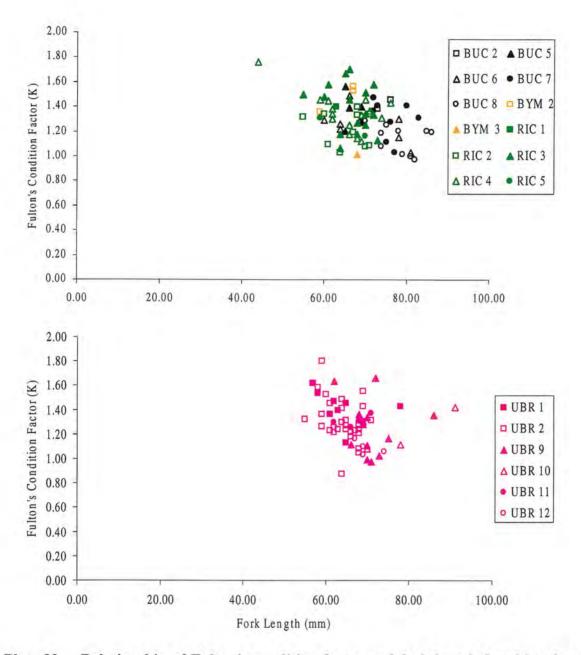


Plate 32. Relationship of Fulton's condition factor and fork length for chinook captured in Upper Bulkley tributary (above) and mainstem sites (below)

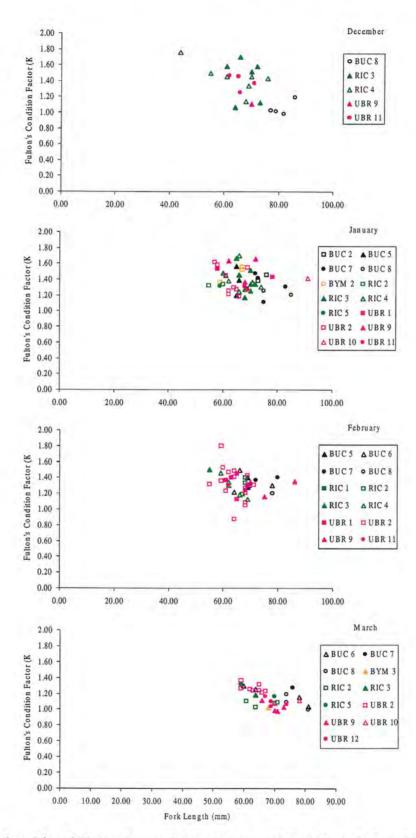


Plate 33. Relationship of Fulton's condition factor and fork length for chinook captured in the four months of the overwintering study.

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	RIC-	1	first three letters of stream name-site number			VIS	IT # 2
-					Date of survey	Time of surve	y Surveyors
					2001-01-17	10:05	TJ,TD,JD
Gazetted Stream	Name	Local Stream	m Name	Watershed Code	<u> </u>		
Richfield Creek				L			
Weather	Snowing						
Air Temperat	ture <u>-</u> 5 °	с		Strea	am Flow	, (High, Moderate	, Limited, None)
Ice Cover (%)) 100		Poter	tial for fish mi	gration L	(High, Moderate	, Limited, None)
LIM	INOLOGY	STATIC	DN		FISH S	UMMARY	
Depth from up	pper surface of ice	e (cm)	77		Total # of	Mininimum	Maximum
Ice thickness ((cm)		40	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice	(H,M,L, or N)	Γ	N	CO	6	51	85
(High, Moderate, I	Limited, None)		24	RB	6	40	91
Snow Depth (
	r Temperature		0.8 C				
	dity (H,M, L, or C Moderate, Low, or Clea		_ C				
Cond	uctivity		70 <i>uS</i>				
Disso	olved Oxygen (bot	tom)	13 ppm				
Disso	olved Oxygen (sur	face)	ppm				····
		F	ISH COLLEC	FION SUM	MARY		
Date of Setting	g	2001-01-1	7		Date of Co	llection	2001-01-18
Time of Settin	g	10:10			Time of Co	llection	10:55
Number of tra	ips set	3			Number of	traps collected	3
NOTE: Cluster conta	ains three traps within						
Capture Cluster	Mean	Instream Co Sub	Percent	umber Captured pe	er Cluster		
Method Numbe	er Denth Domi	nant Dominant	100 CO	6 RB / 6			
			Cor	nments			
pH = 7.5							

[]

.

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

RIC-1

first three letters of stream name-site number

VISIT # 2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	85	7.9	UM	
MT	1	1	СО	55	3.1	UM	
MT	1	2	RB	81	7.3	UM	
MT] 1	2	СО	58	3.4	UM	
MT	1	2	RB	91	12.4	UM	
MT	1	2	RB	69	3.9	UM	
MT	1	2	RB	66	4.3	UM	
MT] 1	2	RB	40	0.8	UM	
MT	1	2	CO	56	2.4	UM	
MT	1	2	CO	67	4	UM	
MT	1	2	RB	60	3.2	UM	
MT	1	2	СО	51	2.4	UM	

		SITE	VISIT	DESCRIPT	ION			
Site Name (e.g. TOB-1)	RIC-	1 first three le name-site n	etters of stream number			VIS	IT # 🔁	5
					Date of survey			
					2001-02-14	10:05	TJ <td-< td=""><td><₽</td></td-<>	<₽
Gazetted Stream Nam Richfield Creek	le	Local Stream Name		Watershed Code				
		L						
Weather Sno	wing							
Air Temperature	-2 °	с		Stream	n Flow N	(High, Moderate	, Limited, None)]
Ice Cover (%)	100	•	Poter	ntial for fish mig			, Limited, None)	
LIMNO	DLOGY	STATION			FISH S	UMMARY		
Depth from upper s	surface of ice	(cm) 74			Total # of	Mininimum	Maximum	
Ice thickness (cm)		56		Species	Fish	Length (mm)	Length (mm	i) 1
Clarity of Ice (H,M		Ν		CO	2	44	46] 1
(High, Moderate, Limited Snow Depth (cm)	i, None)	43		СН		63	63]
Water Ten	nperature	0.7	°c	RB	3	45	68	}
Turbidity (H,M, L, or C							
(High, Moder Conductiv	ate, Low, or Clear ity		uS					
Dissolved	Oxygen (bott		ppm					
Dissolved	Oxygen (surfa		ppm					
		FISH C	OLLEC	TION SUMM	ARY			
Date of Setting		2001-02-14			Date of Co	ollection	2001	-02-15
Time of Setting		10:05			Time of C	ollection	11	:20
Number of traps se	et .	3			Number o	f traps collected		3
NOTE: Cluster contains th	-	an ~5 meter diameter area Instream Cover	1 Species/ N	lumber Captured per	Cluster			
Capture Cluster Method Number	Mean Denth Domin	Sub Percent ant Dominant ice cover						
MT 1		100	CO /	2 CH / 1	RB / 3	3 /		
		a iye garaasaraa a		entra di serie i	- <u>515.000</u> 8.5	na se	t	al di sector
			Cor	mments	는 것 같은 것이 같이 같이 있다. 			
pH = 7.2								
		a a fair a fair an an an an Albain					,	
Feb. 15/01 Temp	+ -15							

(! !

(तो ;]

Site Name e.g. TOB-1)	RIC -1	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATIO	N
Roll Name	Frame Numb	er Photo Description	
OW4	13	Looking down into trap hole	
OW4	14	Site view looking dodwnstream.	

[

100

J.

(37) (38)

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СН	63	3.5	UM	
MT	1	1	RB	64	3.4	UM	
MT	1	1	СО	44	1.3	UM	
MT	1	2	СО	46	1.3	UM	
MT	1	3	RB	68	4.8	UM	
MT	1	3	RB	45	1.5	UM	

Site Name e.g. TOB-1) RIC	C = 1 first three letters of stree name-site number	visi'	Т # 4
		Date of surveyTime of survey2001-03-1410:10	Surveyors TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code	1
Richfield Creek			
Weather Sunny and	clear		
ir Temperature	° c	Stream Flow M (High, Moderste, L	imited, None)
ce Cover (%) 100	<u>)</u> P	Potential for fish migration M (High, Moderate, 1	imited, None)
LIMNOLO	SY STATION	FISH SUMMARY	
Depth from upper surface of	of ice (cm) 76	Total # of Mininimum	Maximum
Ice thickness (cm)	69		Length (mm)
Clarity of Ice (H,M,L, or N (High, Moderate, Limited, None) Snow Depth (cm)) N 36	RB 4 45	76
Water Temperature	• 1.2 ° C		
Turbidity (H,M, L, (High, Moderate, Low, o Conductivity	or C) C		
Dissolved Oxygen			
Dissolved Oxygen	···		
		ECTION SUMMARY	
Date of Setting	2001-03-14	Date of Collection	2001-03-1
Time of Setting	10:15	Time of Collection	9:50
Number of traps set	3	Number of traps collected	3
NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1	Instream Cover Spect Sub Percent Dominant Dominant ice cover 100 RB	ies/ Number Captured per Cluster	
		Comments	
oH = 7.3			·
Air pocket between ice l			
1 cm of ice above water			
from of ice above water			
alorn of ice above water			

		SITE VIST	T DESCRIPTI	ON	
Site Name (e.g. TOB-1)	RIC- 1	first three letters of stread name-site number	n	VISIT #	4

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	76	6.2	UM	
MT	1	2	RB	71	4	UM	
MT	1	2	RB	69	3.8	UM	
MT] 1	3	RB	45	1.2	UM	

	SITE VISI	T DESCRIPTION	
Site Name (e.g. TOB-1)	first three letters of stream name-site number	m VISIT #	1
Gazetted Stream Name	Local Stream Name	Date of survey Time of survey Si 2000-12-05 13:55 Si Watershed Code	BD
Richfield Creek	Local Sucall Mane	Watishta Code	
Weather High overcast			
Air Temperature 4	C	Stream Flow H (High, Moderate, Limited,	None)
Ice Cover (%) 70	Po	otential for fish migration H (High, Moderate, Limited,	None)
LIMNOLOGY	STATION	FISH SUMMARY	
Depth from upper surface of ic	e (cm) 92		.imum h (mm)
Ice thickness (cm)	14		33
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)	N		75
Snow Depth (cm)	0		
Water Temperature Turbidity (H,M, L, or (1.2 C		
(High, Moderate, Low, or Cle Conductivity	$\overline{60}$ uS		
Dissolved Oxygen (bo			
Dissolved Oxygen (su			
		CTION SUMMARY	
Date of Setting	2000-12-05	Date of Collection	2000-12-06
Time of Setting	13:55	Time of Collection	9:30
Number of traps set	3	Number of traps collected	3
NOTE: Cluster contains three traps within Capture Cluster Mean Method Number Denth Dom MT 1		es/ Number Captured per Cluster	
	(Comments	
Frazzle ice. Ice already has layers- some On December 6/00 thaw an		aps set in woody debris in middle of site. g over the ice.	
pH = 7.6			<u> </u>

010

Chie

(~~?

Site Name (e.g. TOB-1)

RIC-2

first three letters of stream name-site number VISIT #

1

.

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	76	4.6	UM	
MT] 1	1	СО	75	4.7	UM	
MT] [1	1	RB	79	5.9	UM	
MT	1	1	RB	133	24.3	UM	
MT	1	1	RB	119	18.3	UM	
MT] [1	1	RB	90	8.9	UM	
MT] [1	1	RB	78	5.1	UM	

Site Name (e.g. TOB-1)	RIC-2	first three letters of stream name-site number		VISI	T # 2
Gazetted Stream N	ame Loca	I Stream Name W	Date of survey 2001-01-08 /atershed Code	Time of survey	Surveyors TJ,TD,JD
Weather C	ear and sunny.				
Air Temperatu	re _4° c		Stream Flow	L (High, Moderate, 1	Limited, None)
ce Cover (%)	100	Potenti	al for fish migration	L (High, Moderate, 1	Limited, None)
LIMN	IOLOGY STA	ATION	FISH S	UMMARY	
Depth from upp	er surface of ice (cm)	73	Total # of Species Fish	Mininimum Length (mm)	Maximum Length (mm)
Ice thickness (cr	n)	53	CO 15	46	60
Clarity of Ice (H (High, Moderate, Lim		Ν	CH 3	55	71
Snow Depth (cm		18	RB 7	44	105
Water T	emperature	1 °c			L
	y (H,M, L, or C) derate, Low, or Clear) tivity	C 80 <i>uS</i>			
	ed Oxygen (bottom)	13 ppm			
	ed Oxygen (surface)	ppm		· · · · · · · · · · · · · · · · · · ·	
		FISH COLLECT	ION SUMMARY		
Date of Setting	2001	-01-08	Date of C	ollection	2001-01-0
Time of Setting		0:30	Time of C	ollection	10:10
Number of traps	set	3	Number o	of traps collected	3
NOTE: Cluster contains Capture Cluster Method Number MT 1	three traps within an ~5 m Instree Mean Denth Dominant D	am Cover Species/ Nun Sub Percent	nber Captured per Cluster	7) [/	
		Com	ments		
Approx. eight la	yers of ice.				
	e just behind limn e from original ho		ough water in original hole,	new trap hole is	less than 1
bH = 8.2		······································	· · · · · · · · · · · · · · · · · · ·		······································

.

375

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1) RIC-2

first three letters of stream name-site number

VISIT #

2

and a

100

Ú.

Section 2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fir Clip
MT	1	1	CH	55	2.2	UM	
MT	1	1	CH	71	4.8	UM	
MT] [1	1	RB	79	5.9	UM	
MT	1	1	CO	48	2	UM	
MT] 1] 1	СО	48	1.4	UM	
MT	1	1	СО	55	2.3	UM	
MT	1	1	СО	54	1.8	UM	
MT	1] [1	СО	46	1.1	UM	
MT	1] [1	RB	46	1.5	UM	
MT	1] 1	СО	48	1.3	UM	
MT	1] _ 1	RB	48	1.6	UM	
MT	1	1	RB	80	7.5	UM	
MT	1	2	RB	44	1.3	UM	
MT	1	2	CO	55	2.2	UM	
MT	1	2	RB	105	13.4	UM	
MT	1	3	RB	103	16.5	UM	
MT	1	3	CO	54	2.4	UM.	
MT	1	3	CO	52	2	UM	
MT	1	3	CO	51	1.7	UM	
MT	1	3	CO	60	2.7	UM	
MT	1	3	СН	60	2.9	UM	
MT	1	3	СО	52	2	UM	
MT	1	3	CO	51	1.7	UM	
MT	1	3	CO	61	2.9	UM	
MT	1	3	CO	59	2.7	UM	

	SITE	VISIT DESCRIP	TION	
Site Name (e.g. TOB-1)	RIC - 2 first three lett name-site nut	ters of stream mber	VI	SIT # 3
Gazetted Stream Name	Local Stream Name	Watershed Code	Date of surveyTime of survey2001-02-059:50	vey Surveyors TTJ <td<jd< th=""></td<jd<>
Richfield Creek				
	overcast.			
Air Temperature Ice Cover (%)	-10° c 100	Strea Potential for fish mi		ate, Limited, None)
LIMNO	LOGY STATION		FISH SUMMARY	
Depth from upper sur Ice thickness (cm)		Species	Total # of Mininimum Fish Length (mm)	Maximum Length (mm)
Clarity of Ice (H,M,L (High, Moderaw, Limiwd, N	ione)	CO CH	46 44 3 67	68 68
Snow Depth (cm)	<u>29</u>	C	12 41	75
Water Temps Turbidity (H, (High, Moderate, Conductivity	M, L, or C) Low, or Clear)			
		pm		
	FISH C	OLLECTION SUM	MARY	
Date of Setting	2001-02-05		Date of Collection	2001-02-06
Time of Setting	10:00		Time of Collection	9:45
Number of traps set	3		Number of traps collected	3
Capture Cluster	traps within an ~5 meter diameter area Instream Cover lean Sub Percent enth Dominant Dominant ice cover 100	Species/ Number Captured pe		
pH = 7.4 February 6/01, light	snowfall.	Comments		
		······		
	<u> </u>			<u>.</u>
			· · · · · · · · · · · · · · · · · · ·	

			SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	RIC-	2	first three letters of stream name-site number	VISIT # 3
			PHOTO DOCUMENTATI	ION
Roll Name	Frame Nu	mber	Photo Description	
OW3	12	L	ooking into trap hole.	
OW3	13	S	ite view loooking downstream.	

INDIVIDUAL FISH DATA

();

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1] со	68	3.9	UM	
MT	1	1	RB	67	4.3	UM	
MT	1	1	CO	47	1.6	UM	
MT	1] 1	СО	58	3	UM	
MT	1] [1	RB	80	7.6	UM	
MT	1	1	RB	65	3.4	UM	
MT	1	1	СО	47	2.1	UM	
MT	1	1	СО	49	1.4	UM	
MT	1	1	CO	49	1.9	UM	
MT	1	1	RB	73	5.2	UM	
MT	1	1	RB	65	4	UM	
MT	1]	CO	54	1.9	UM	
MT	1		СО	54	1.8	UM	
MT	1	1	СО	51	1.9	UM	
MT	1	1	СО	54	1.9	UM	
MT	1	1	СО	56	2.3	UM	
MT	1	1	CO	45	1.1	UM	
MT	1	1	СО	49	1.8	UM.	•
MT	1	1	СО	46	1.6	UM	
MT	1	1	RB	41	1.1	UM	
MT	1	1	RB	44	1.7	UM	
MT	1	1	CO	50	1.8	UM	
MT	1	2	CO	49	1.3	UM	
MT	1	2	RB	68	4.2	UM	
MT	1	2	CO	59	2.8	UM	
MT	1	2	CH	68	4.4	UM	
MT	1	2	СН	67	3.6	UM	
MT	1	2	CO	61	2.8	UM	
MT	1	2	CO	52	2	UM	
MT	1	2	СО	45	1.2	UM	
MT	1	2	СО	48	1.4	UM	

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1	A L	UC-	2 fi	rst three letters of strear ame-site number			VISIT #	3
MT	1	2	СО	53	1.9	UM		
MT	1	2	СО	48	1.4	UM		
MT	1	2	СО	48	1.7	UM		
MT	1	2	СО	48	1.3	UM		
MT	1	2	СО	47	1.4	UM		
MT	1	1	СО	47	1.3	UM		
MT	1	2	СО	46	1.5	UM		
MT	1	2	СО	50	1.9	UM		
MT	1	2	СО	53	2	UM		
MT	1	2	СО	53	2	UM		
MT	1	2	СО	48	1.4	UM		
MT	1	2	СО	49	2.3	UM		
MT	1	2	СО	50	1.7	UM		
MT	1	2	СО	49	1.5	UM		
MT	1	2	СО	54	2	UM		
MT	1	2	СО	56	2.1	UM		
MT	1	2	RB	43	1.2	UM		
MT	1	2	CO	50	1.7	UM		
MT	1	2	CO	44	1.1	UM		
MT	1	3	СН	68	4.2	UM		
MT	1	3	RB	74	5.1	UM		
MT	1	3	RB	75	5.9	UM		
MT	1	3	СО	54	2	UM		
MT	1	3	RB	64	3.6	UM		
MT	1	3	СО	45	1.2	UM		
MT	1	3	СО	54	2.3	UM		
MT	1	3	СО	57	2.2	UM		
MT	1	3	СО	51	1.7	UM		
MT	1	3	СО	54	2.1	UM		
MT	1	3	СО	49	1.5	UM		

(iei (7-9 (1)

64

24

22

- en

Site Name (e.g. TOB-1)	RIC-		three letters of stream e-site number	VISIT # 4
		·		Date of survey Time of survey Surveyors
Gazetted Stream Na	·	Local Stream N	Iama	2001-03-05 9:57 TJ,TD,JD Watershed Code
Richfield Creek	ame	Local Stream 1		waterstied Code
Weather Su	unny and clea	ar		
Lir Temperatu	re -7 °	С		Stream Flow L (High, Moderate, Limited, None)
ce Cover (%)	100		Pote	ntial for fish migration (High, Moderate, Limited, None)
LIMP	NOLOGY	STATION		FISH SUMMARY
Depth from upp	er surface of ice	e (cm) 52	2	Total # of Mininimum Maximum
Ice thickness (cr	m)	73	3	Species Fish Length (mm) Length (mm)
Clarity of Ice (H		N	I	$\begin{bmatrix} CO \\ 23 \\ 47 \\ 100 \\ \hline \end{bmatrix}$
(High, Moderate, Lim Snow Depth (cn		29	•	CH 4 61 71 DB 5 66 92
	Temperature		•	RB 5 66 92
Turbidit	ty (H,M, L, or C		2	
(High, Mo Conduc	oderate, Low, or Clea	ur)	uS	
Dissolv	ed Oxygen (bot	tom) 13	3 ppm	
Dissolv	ed Oxygen (sur	face)	ppm	
Constanting a second constant		FIS	H COLLEC	TION SUMMARY
アリーベル きょうけいしょうりょう				Date of Collection 2001-03
Date of Setting		2001-03-05		
Date of Setting Time of Setting		2001-03-05 9:57		Time of Collection 10:00
Date of Setting Time of Setting Number of traps	s set	9:57 3		
Date of Setting Time of Setting Number of traps	s SEL s three traps within	9:57 3 an ~5 meter diamete Instream Cover	Species/ N	Time of Collection 10:00
Date of Setting Time of Setting Number of traps IOTE: Cluster contains Capture Cluster Aethod Number	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	srcent cover	Time of Collection 10:00 Number of traps collected 3
Date of Setting Time of Setting Number of traps IOTE: Cluster contains Capture Cluster	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	species/ 1	Time of Collection10:00Number of traps collected3
Date of Setting Time of Setting Number of traps OTE: Cluster contains apture Cluster fethod Number	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	srcent cover	Time of Collection 10:00 Number of traps collected 3
Date of Setting Time of Setting Number of traps KOTE: Cluster contains Capture Cluster Aethod Number	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	srcent cover	Time of Collection 10:00 Number of traps collected 3
Date of Setting Time of Setting Number of traps NOTE: Cluster contains Capture Cluster Method Number	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	srcent cover	Time of Collection 10:00 Number of traps collected 3
Date of Setting Time of Setting Number of traps VOTE: Cluster contains Capture Cluster Method Number	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	server 100 CO /	Time of Collection 10:00 Number of traps collected 3
Date of Setting Time of Setting Number of traps NOTE: Cluster contains Capture Cluster Method Number MT 1	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	server 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /
Date of Setting Time of Setting Number of traps OTE: Cluster contains Capture Cluster Aethod Number MT 1	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	server 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /
Date of Setting Time of Setting Number of traps OTE: Cluster contains Capture Cluster Aethod Number MT 1	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	Species/ 1 conver 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /
Date of Setting Time of Setting Number of traps KOTE: Cluster contains Capture Cluster Aethod Number	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	Species/ 1 conver 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /
Date of Setting Time of Setting Number of traps OTE: Cluster contains Capture Cluster Aethod Number MT 1	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	Species/ 1 conver 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /
Date of Setting Time of Setting Number of traps OTE: Cluster contains Capture Cluster Aethod Number MT 1	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	Species/ 1 conver 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /
Date of Setting Time of Setting Number of traps OTE: Cluster contains apture Cluster Iethod Number MT 1	s set s three traps within Mean	9:57 3 an ~5 meter diamete Instream Cover Sub Pe nant Dominant ice	Species/ 1 conver 100 CO /	Time of Collection 10:00 Number of traps collected 3 Number Captured per Cluster 3 23 CH 4 RB 5 /

思いている

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

.

14

į.

.

RIC-2

first three letters of stream name-site number

VISIT #

4

PHOTO DOCUMENTATION

VISI1 *#*

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	50	1.2	UM	
MT	1	1	RB	66	3	UM	
MT	1	1	RB	92	8.6	UM	
MT	1	1	RB	68	3.8	UM	
MT	1	1	СО	51	1.5	UM	
MT	1	1	СН	61	2.5	UM	
MT	1	1	СО	55	1.7	UM	
MT	1	1	CO	51	1.4	UM	
MT	1	1	CO	54	1.7	UM	
MT	1	1	СО	57	1.7	UM	
MT	1	2	RB	74	4.7	UM	
MT	1	2	СО	57	1.8	UM	
MT	1	2	СН	71	3.9	UM	
MT	1	2	CO	63	2.6	UM	
MT	1	2	СН	64	2.7	UM	
MT	1	2	CO	51	1.3	UM	
MT	1	2	СО	59	2.1	UM	
MT	1	2	СН	70	3.7	UM	
MT	1	2	CO	51	1.8	UM	
MT	1	2	CO	57	2.1	UM	
MT	1	2	СО	54	1.6	UM	
MT	1	2	CO	54	1.7	UM	
MT	1	2	СО	48	1.1	UM	
MT	1	2	CO	53	1.5	UM	
MT	1	2	CO	51	1.6	UM	
MT	1	3	CO	100	10.4	UM	
MT	1	3	CO	52	1.7	UM	
MT	1	3	CO	56	1.4	UM	
MT	1	3	CO	60	2.2	UM	
MT	1	3	CO	56	1.9	UM	
MT	1	3	CO	47	1.1	UM	
MT	1	3	RB	74	4.3	UM]

Site Name (e.g. TOB-1)	RIC-3	first three letters of stream name-site number	VISIT #	1
			Date of survey Time of survey Survey	
	• •	10. Materia	2000-12-18 11:25 TJ,BI	D,TD
azetted Stream N ichfield Creek	Vame Lo	cal Stream Name Watershe	1 Code	
Veather C	Overcast with sno	ow flurries		
ir Temperatu	ure 1°C		Stream Flow L (High, Moderate, Limited, None)
ce Cover (%)	100	Potential for	fish migration M (High, Moderate, Limited, None)
LIM	NOLOGY ST	TATION	FISH SUMMARY	
Depth from upp	per surface of ice (cn	n) 28	Total # of Mininimum Maximum	n
Ice thickness (c	:m)	38 S	pecies Fish Length (mm) Length (m	m)
Clarity of Ice (H		N L	CO 4 49 60 ND 16 60 60	
(High, Moderate, Lir Snow Depth (cr	- /	14	RB 16 64 92	
Water	Temperature	0 ° C		
	ity (H,M, L, or C) loderate, Low, or Clear)	С		
Conduc		80 <i>uS</i>		
	ved Oxygen (bottom			
Dissolv	ved Oxygen (surface	Energy and the second s		
		FISH COLLECTION		
Date of Setting		000-12-18		0-12-
Time of Setting Number of trap		<u>11:25</u>	Number of traps collected	<u>1:45</u> 4
Dne cluster of f	four traps set at 1	Comments		
At all sites we a	-	imno and spread out depth to the bottom surface of the i	ce, water comes right up to the bottom of the	ice
At all sites we a	are taking water	imno and spread out depth to the bottom surface of the i		ice
At all sites we a surface, last yea	are taking water	imno and spread out depth to the bottom surface of the i		ice
At all sites we a surface, last yea	are taking water	imno and spread out depth to the bottom surface of the i		ice

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

5 1

 $\bigcap_{i \in I} f_i \in I$

(The

1 des

ţ.

ſ

1

<u>_</u>

ſ

يد ا

Ĺ

RIC-3

first three letters of stream name-site number

VISIT # 1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)		ype of Fin Clip adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	88	9.9] [UM	
MT	1	1	RB	86	8.6] [UM	
MT	1] _ 1	RB	70	4.6] [UM	
MT	1] 1	RB	70	5.1] [UM	
MT	1] [1	RB	70	5.1] [UM	
MT	1] _ 1	RB	74	5.9] [UM	
MT	1	1	RB	86	9] [UM	
MT	1	2	RB	65	4.2] [UM	
MT	1	2	СО	49	2		UM	
MT	1	3	RB	89	10.1		UM	
MT	1	3	RB	86	8.2		UM	
MT	1	3	RB	92	10		UM	
MT	1	3	RB	86	8.7		UM	
MT	1	3	RB	61	3.6		UM	
MT	1	3	СО	51	1.9		UM	
MT	1	3	CO	51	2.5		UM	
MT	1	3	СО	60	3.5		UM	
MT	1	3	RB	64	5.3		UM	
MT	1	3	RB	68	4.3		UM	
MT	1	3	RB	87	9.4		UM	

Date of survey Surveyors Date of survey Surveyors Cazetted Stream Name Watershed Code Richfield Creek Weather Snowing Air Temperature c Stream Flow L Orligh, Moderne, Limited, None) LiAMNOLOGY STATION Fish migration Let Over (%) 100 Potential for fish migration Click Moderne, Limited, None) Depth from upper surface of ice (cm) 52 Total # of Minimum Maximum Depth from upper surface of ice (cm) 52 Total # of Minimum Maximum Col 2 40 62 Col 12 40 <th colspan<="" th=""><th>Site Name (e.g. TOB-1)</th><th>[C - 3 first three name-site</th><th>e letters of stream e number</th><th>v</th><th>/ISIT # 2</th></th>	<th>Site Name (e.g. TOB-1)</th> <th>[C - 3 first three name-site</th> <th>e letters of stream e number</th> <th>v</th> <th>/ISIT # 2</th>	Site Name (e.g. TOB-1)	[C - 3 first three name-site	e letters of stream e number	v	/ISIT # 2
Richfield Creek Weather Snowing Air Temperature -5 C Stream Flow L (High, Modense, Limited, Nose) Ice Cover (%) 100 Potential for fish migration L (High, Modense, Limited, Nose) Ice Cover (%) 100 Potential for fish migration L (High, Modense, Limited, Nose) Depth from upper surface of ice (cm) 52 Total # of Minimum Maximum Ice thickness (cm) 32 Total # of Minimum Maximum Clarity of Ec (H, ML, or N) N Species Total # of Minimum Maximum CO 12 40 62 G	(e.y. 108-17					
Weather Snowing Air Temperature -5 ° C Stream Flow I. (High, Moderna, Limited, None) Ice Cover (%) 100 Potential for fish migration I. (High, Moderna, Limited, None) LimNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 52 Fish Length (mm) Maximum Ice thickness (cm) 32 CO 12 40 62 Clarity of Ice (H.M.L, or N) N CO 12 40 62 Chigh, Moderna, Low, or Cless) 34 RB 14 39 118 Water Temperature 0.1 ° C I. NC 1 90 90 Turbidity (H, M, L, or C) C I. NC 1 90 90 Conductivity 80 µS Dissolved Oxygen (bottom) 2 ppm Dissolved Oxygen (surface) ppm Date of Collection 2001-0 Number of traps set 4 Number of traps collected 4 NOTE: Claster coatals three traps within as -5 ander diameter area Species/ Number Captured per Cluster Method Number<		Local Stream Nam	e Watershed Code			
Air Temperature -5 C Stream Flow [(High, Moderate, Limited, None) Ice Cover (%) 100 Potential for fish migration [(High, Moderate, Limited, None) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 52 Total # of Mininimum Maximum Ice thickness (cm) 32 CO 12 40 62 Clarity of Ice (H,M,L, or N) N Species Fish Length (mm) Length (mm) Clarity of Ice (H,M,L, or N) N RB 14 39 118 Water Temperature 0.1 C RB 14 39 118 Water Temperature 0.1 C RB 14 39 118 Water Temperature 0.1 C Inc 1 90 90 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm 2001-01-17 Time of Collection 1111 Time of Setting 10:50 Time of Collection 1111 111 2001-02 111 Number of traps set 4 Number of traps coll	Richfield Creek					
Ice Cover (%) 100 Potential for fish migration I. (High, Moderate, Limited, None) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 52 Total # of Minimimum Maximum Ice thickness (cm) 32 Total # of Minimimu Maximum Clarity of Ice (H,M,L, or N) N Species Total # of Minimimum Maximum CO 12 40 62 CH 1 59 59 Snow Depth (cm) 34 RB 14 39 118 Water Temperature 0.1 C C Image: Conductivity 80 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Date of Collection 2001-0 Number of traps set 4 Number of traps collected 4 Mote: Image: Sub Species/ Number Captured per Cluster Species/ Number Captured per Cluster Mean Sub Percent Sub Species/ Number Captured per Cluster Method	Weather Snowing					
LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 52 Ice thickness (cm) 32 Clarity of Ice (H,M,L, or N) N (liph, Moderae, Limited, None) 34 Snow Depth (cm) 34 Water Temperature 0.1 Turbidity (H,M, L, or C) C (liph, Moderae, Low, or Cleer) C Conductivity 80 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-01-17 Time of Setting 10:50 Number of traps set 4 Number of traps collection 11:2 Method Number Mean Sub Prevent Method Number Mean Sub Prevent MT <td>Air Temperature 🚺 -</td> <td>-5 ° C</td> <td>Stre</td> <td>eam Flow L (High, Me</td> <td>cerate, Limited, None)</td>	Air Temperature 🚺 -	-5 ° C	Stre	eam Flow L (High, Me	cerate, Limited, None)	
Depth from upper surface of ice (cm) 52 Ice thickness (cm) 32 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 34 Snow Depth (cm) 34 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 80 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (surface) ppm ppm ppm Date of Setting 2001-01-17 Time of Setting 10:50 Number of traps set 4 NotTE: Claster coatals three traps withis as -5 meter diameter area Capture Cluster Maan Method Number Densinant Dominant to cover MT 1 10:00 CO 19 CH 71 CO 19 CH CO 19 CH CO 19 CH	Ice Cover (%)	00	Potential for fish m	nigration L (High, Mo	oderate, Limited, None)	
Ice thickness (cm) 32 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 34 Snow Depth (cm) 34 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) CO Conductivity 80 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm ptm 10:50 Number of traps set 4 NOTE: Cluster contails three traps within ao -5 oneter diameter area Capture Cluster Instream Cover Method Number Instream Cover MT 1 MT 1 MT 1 MT 2 MT 2 MT 2 MT 1 MT 2 MT 2 MT 2 MT 2 MT 2 MT 2 MT 1 1000 CO / 19	LIMNOLO	GY STATION		FISH SUMMA	RY	
Ice thickness (cm) 32 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 34 Snow Depth (cm) 34 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Cleer) C Conductivity 80 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 10:50 Number of traps set 4 Notte: Cluster contailse three traps within an -5 meter diameter area Capture Cluster Instream Cover Method Number Species/ Number Captured per Cluster Method Number Deminant Dominant MT 1 MT 1 MT 1 1000 CO / 11 CH / 5 CO / 11 CH / 4 RB / 4	Depth from upper surface	e of ice (cm) 52				
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) Snow Depth (cm) Water Temperature 0.1 ° C Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity 80 uS Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting Number of traps set Number of traps set Mean Sub Percent Mean Sub Percent Mean Sub Percent MT 1 MT 2 0 CH 1 59 59 CH 1 59 59 CH 1 59 CH 1 59 59 CH 1 59 59 CH 1 59 CH 1 59 CH 1 59 59 CH 1 59 59 CH 1 59 CH 1 59 CH 1 59 59 CH 1 59 59 CH 1 59 59 CH 1 59 59 CH 1 59 59 CH 1 59 59 CH 1 59 59 59 59 59 59 59 59 59 59	Ice thickness (cm)	32				
Snow Depth (cm) 34 Water Temperature 0.1 Turbidity (H,M, L, or C) C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 80 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-17 Time of Setting 10:50 Number of traps set 4 NOTE: Cluster contails three traps withils ao -5 meter diameter area Capture Cluster Instream Cover Method Number Species/ Number Captured per Cluster Method Number Mean Denth Dominant Pominant 100 CO / 11 CH / 5 RB / 14 MT 100 CO / 19 CH / 4 RB / 8	Clarity of Ice (H,M,L, or	N) N	CO		62	
Water Temperature 0.1 C RB 14 39 118 Water Temperature 0.1 C Image: Construction of the second o			СН] 1 59	59	
Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity C Dissolved Oxygen (bottom) 12 Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-17 Time of Setting 10:50 Number of traps set 4 Nother Cluster Instream Cover Capture Cluster Sub Percent Method Number MT 1 1000 CO CO 11 CO 11 CO 19 CH 19 CH 19 CH 19 CH 19 CH 19 CH 19	• • •	L	1.	14 39	118	
(High, Moderate, Low, or Clear) 80 uS Conductivity 80 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-17 Time of Setting 10:50 Time of Collection 11:2 Number of traps set 4 Number of traps collected 4 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Method Number Dominant Dominant CO / 11 CH / 5 RB / 14 / / / / MT 1 100 CO / 19 CH / 4 RB / 8 / / / /	-	L	C LNC	1 90	90	
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-17 Time of Setting 10:50 Number of traps set 4 NOTE: Cluster contailse three traps within an -5 meter diameter area Species/ Number Captured per Cluster Method Number Mean Sub Percent Species/ Number Captured per Cluster MT 1 100 MT 2 100 NT 2 100						
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-17 Date of Collection 2001-0 Time of Setting 10:50 Time of Collection 11:: Number of traps set 4 Note: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Sub Percent Method Number Depth Dominant Dominant ice cover MT 1 0 0 100 CO / 19 CH / 4 RB / 8 / 0 / 1	Conductivity	80	uS			
FISH COLLECTION SUMMARY Date of Setting 2001-01-17 Date of Collection 2001-0 Time of Setting 10:50 Time of Collection 11:2 Number of traps set 4 Number of traps collected 4 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Species/ Number Captured per Cluster Method Number Dominant Dominant Cover Species/ Number Captured per Cluster MT 1 100 CO / 11 CH / 5 RB / 14 ////// MT 2 100 100 CO / 19 CH / 4 RB / 8 //////	Dissolved Oxyge	en (bottom) 12	ppm			
Date of Setting 2001-01-17 Date of Collection 2001-01 Time of Setting 10:50 Time of Collection 11:2 Number of traps set 4 Number of traps collected 4 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent Method Number Dominant Dominant CO / 11 CH / 5 RB / 14 / / / / / / / / / / / / / / / / / / /	Dissolved Oxyge	en (surface)	ppm			
Time of Setting 10:50 Time of Collection 11:2 Number of traps set 4 Number of traps collected 4 NOTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster 4 Note: Cluster Mean Sub Percent Species/ Number Captured per Cluster 4 MT 1 100 CO / 11 CH / 5 RB / 14 // MT 2 100 CO / 19 CH / 4 RB / 8 // //		FISH	COLLECTION SUM	MARY		
Number of traps set 4 Number of traps collected 4 NOTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster 4 Note: Cluster Instream Cover Species/ Number Captured per Cluster 5 5 Mean Sub Percent 5 7 7 MT 1 100 100 1 1 7 MT 2 100 100 1 1 7	Date of Setting	2001-01-17		Date of Collection	2001-01-1	
NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Instream Cover Method Number Sub Denth Dominant MT 1 MT 2 MT 2 Image: Contrast of the stress of the str	Time of Setting	10:50		Time of Collection	11:20	
Capture Cluster Instream Cover Species/ Number Captured per Cluster Method Number Denth Dominant Dominant ice cover MT 1 1 100 CO / 11 CH / 5 RB / 14 // MT 2 100 100 CO / 19 CH / 4 RB / 8 // //	Number of traps set	4		Number of traps collec	ted 4	
Capture Cluster Mean Sub Percent Method Number Denth Dominant Dominant ice cover MT 1 1 100 CO / 11 CH / 5 RB / 14 / / MT 2 100 CO / 19 CH / 4 RB / 8 / /	NOTE: Cluster contains three trap			en Cluster		
MT 1 1 100 CO / 11 CH / 5 RB / 14 / / MT 2 1 100 CO / 19 CH / 4 RB / 8 / /	No. d. A. A. A.	Sub Percen	t i i i i i i i i i i i i i i i i i i i	ber Cluster		
				5 RB / 14	//_	
	MT 2		CO / 19 CH /	4 RB / 8		
	MT 1		CO / 12 CH /	1 RB / 14 LNC	/ 1 / _	
	•					
			Commente			
Commente	· · · · · · · · · · · · · · · · · · ·		COMMENICS	n an an Albert ann an Albert a Albert an Albert an A Albert an Albert an A		
Commente	pH = 8.1					

, 98.,

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

RIC-3

first three letters of stream name-site number

VISIT # 2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, soae)	Type of Recaptured Fin Clip
MT	1	1	СО	86	9	UM	
MT	1	1	RB	65	4	UM	
MT	1	1	RB	72	6	UM	
MT	1	1	СО	61	3.2	UM	
MT	1	1	CO	49	1.5	UM	
MT	1	1	CH	65	4.6	UM	
MT	1	1	RB	61	3.6	UM	
MT	1	1	СО	50	2	UM	
MT	1	1	CO	52	2	UM	
MT	1	1	СО	67	3.8	UM	
MT	1	1	RB	45	1.1	UM	
MT	1	1	RB	41	1.3	UM	
MT	1	1	RB	45	1.4	UM	
MT	1	1	RB	58	1.9	UM	
MT	1	2	RB	84	7.8	UM	
MT	1	2	СО	80	7.3	UM	
MT	1	2	RB	86	8	UM	
MT	1	2	СО	89	9.4	UM	
MT	1	2	СН	70	4.6	UM	
MT	1	2	RB	66	3.8	UM	
MT	1	2	RB	78	6.5	UM	
MT	1	2	CO	49	1.6	UM	
MT	1	2	СН	60	3.2	UM	
MT	1	2	СН	68	4	UM	
MT	1	2	RB	46	1.2	UM	
MT	1	3	RB	89	9.1	UM	
MT	1	3	СО	46	1.3	UM	
MT	1	3	RB	75	5.4	UM	
MT	1	3	СО	68	4.1	UM	
MT	1	3	CH	70	4.3	UM	
MT	2	1	СО	50	1.7	UM	
MT	2	1	СО	54	1.9	UM	
MT	2	1	СО	50	2.5	UM	
MT	2	1	RB	47	1.3	UM	
MT	2	1	СН	68	3.7	UM	

	3			SITE VISI	T DESC	RIPTION	
Site Nam (e.g. TOB-	e]	RIC-		first three letters of strea name-site number	m		VISIT # 2
MT	2	2	СО	51	1.6	UM	
MT	2	2	СО	49	1.5	UM	
MT	2	2	СН	70	5.2	UM	
MT	2	3	СО	50	1.8	UM	
MT	2	3	СО	60	3.1	UM	
MT	2	3	СО	51	1.9	UM	
MT	2	3	RB	45	1.4	UM	
MT	2	3	RB	85	8.3	UM	
MT	2	3	RB	64	3.8	UM	
MT	2	3	СН	66	4.2	UM	
MT	2	3	СО	52	1.7	UM	
MT	2	3	СО	52	1.9	UM	
MT	2	3	CO	51	1.4	UM	
MT	2	3	RB	47	1.5	UM	
MT	2	3	СО	51	2.2	UM	
MT	2	3	CO	51	1.7	UM	
MT	2	3	СО	55	2	UM	
MT	2	3	CO	58	2.6	UM	
MT	2	4	RB	62	3	UM	
MT	2	4	СО	53	2.3	UM	
MT	2	4	RB	60	3.4	UM	
MT	2	4	СО	44	1.3	UM	
MT	2	4	RB	73	5.4	UM	
MT	2	4	СН	72	5	UM	
MT	2	4	СО	50	1.5	UM	
MT	2	4	СО	55	2.3	UM	

1997 - Charles Annalds - Charles Branning Barres Barres

			SITE VISITA		an an An Andrews Andrews			
Site Name le.g. TOB-1)	RIC-	3	first three letters of stream name-site number				VIS	IT # 3
			-]	Date of survey		ne of surve	
				[2001-02-14		10:45	TJ,TD,JD
azetted Stream Na tichfield Creek	ame	Local Stre	eam Name	Watershed Code				
·····	nowing.							
51	iowing.							
ir Temperatu	re _4 °	С		Stream	1 Flow	M Œ	ligh, Moderate	, Limited, None)
e Cover (%)	100		Poten	tial for fish mig	ration	M a	ligh, Moderate	, Limited, None)
LIMP	NOLOGY	STAT	ION		FISH S	SUM	MARY	n teachtrain Station Chain
Depth from uppe	er surface of ice	e (cm)	52	94291 (2019) (2929909) 	Total # of	Mini	nimum	Maximum
Ice thickness (cm			38	Species	Fish		th (mm)	Length (mm)
Clarity of Ice (H				СО	6		47	57
(High, Moderate, Limit	ited, None)			RB	14		39	94
Snow Depth (cm	-		°					
	emperature		0.3 C					
(High, Mo	ty (H,M, L, or C derate, Low, or Clea							
Conduct	tivity		80 uS					
	ed Oxygen (bot		12 ppm					
Dissolve	ed Oxygen (sur		ppm			an a	Verenterette	
		2.03, 02 A.80	FISH COLLECT	ION SUMM				
Date of Setting		2001-02-	—	Date of Collection Time of Collection			2001-02-	
Time of Setting Number of traps	set	10:45			Number			<u>11:56</u>
			liameter area			-	A	
NOTE: Cluster contains	1	Instream C Sub	Cover Species/ Nu Percent	umber Captured per (Cluster			
Capture Cluster	Mean	540						
	Mean Denth Domin			6 RB / 14				
Capture Cluster Method Number				6 RB / 14]/			
Capture Cluster Method Number				6 RB / 14]/			
Capture Cluster Method Number				6 RB / 14]/			
Capture Cluster Method Number MT 1	Denth Domi	nant Domina		6 RB / 14]/			
Capture Cluster Method Number MT 1	Denth Domi	nant Domina		6 RB / 14]			
Capture Cluster Method Number MT 1	Denth Domi	nant Domina] 100 CO / (]			
Capture Cluster Method Number MT 1	Denth Domin Image: Image of the second sec	nant Domina] 100 CO / (]/			
Capture Cluster Method Number MT 1	Denth Domin Image: Image of the second sec	nant Domina] 100 CO / (]/			
Capture Cluster Method Number MT 1 DH = 7.2	Denth Domin Image: Denth Domin Image: Denth Image: Denth Image: Denth Image: Dent <td>nant Domina</td> <td>] 100 CO / (</td> <td></td> <td>]</td> <td></td> <td></td> <td></td>	nant Domina] 100 CO / (]			
Capture Cluster Aethod Number MT 1 0H = 7.2 Cemperature on	February 15	5 = -13.] 100 CO / (]			

		SITE VISIT DESCRIPTI	ON T
Site Name (e.g. TOB-1)	RIC-3	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATIO	DN
Roll Name	Frame Num	per Photo Description	
OW4	17	Site view looking downstream	
OW4	18	Limno hole showing sunken banks ie dropping wate	er level.

1.40

No.

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	52	1.7	UM	
MT	1	1	СО	61	2.7	UM	
MT	1	1	СО	49	1.9	UM	
MT	1	1	СО	50	1.6	UM	
MT	1	1	RB	46	1.5	UM	
MT	1	1	СО	56	1.7	UM	
MT	1	1	СО	55	1.7	UM	
MT	1	2	RB	45	1.3	UM	
MT	1	2	RB	70	5	UM	
MT	1	2	СО	52	2.2	UM	
MT	1	2	СО	53	2.5	UM	
MT	1	2	СО	55	2.5	UM	
MT	1	2	СО	52	1.8	UM	
MT	1	2	RB	53	2.2	UM	
MT	1	2	CO	50	2.9	UM	
MT	1	2	SUC	113	16	UM	
MT	1	3	СО	58	2.3	UM	
MT	1	3	СО	57	2	UM	
MT	1	3	СО	50	1.5	UM	
MT	1	3	СО	51	1.7	UM	
MT	2	1	СО	56	3	UM	
MT	2	1	RB	66	4.5	UM	
MT	2	2	СО	56	2.6	UM	
MT	2	2	СО	50	1.6	UM	
MT	2	3	CH	55	2.5	UM	
MT	2	3	RB	45	0.8	UM	
MT	2	3	RB	40	0.9	UM	
MT	2	4	RB	47	1.7	UM	
MT	2	4	RB	71	5.3	UM	
MT	2	4	RB	42	1.3	UM	
MT	2	4	RB	41	1	UM	

[안전] 19 전 19	OTHER A CHARACTER AND	
지수는 잘 들어난 걸음 것이 가지 않지 않는 것을 수 있는 것을 했다.	SITE VISIT DESCRIPTION	
ante en la filipe de la construction de la construction de la construction de la construction de la constructio	e fazzer un elze de la calendare de la construction de la calendaria de la calendaria de sector de la construct Al	

۶۶۶) ا

(*17) |____|

Site Name (e.g. TOB-1)	RIC-3) ł	first three letters of stream name-site number	n	VISIT # 3	
MT 2	4	СО	73	5.1	UM	

			ISIE DESCRIPTION
Site Name (e.g. TOB-1)	RIC-	3 first three letters of name-site number	
-			Date of surveyTime of surveySurveyors2001-03-1410:45TJ,TD,JD
Gazetted Stream N	lame	Local Stream Name	Watershed Code
Weather S	unny and Clea	11 11	
۔۔ Air Temperatu Ice Cover (%)	ire <u>-3</u> ° (c	Stream Flow M (High, Moderate, Limited, None) Potential for fish migration L (High, Moderate, Limited, None)
		STATION	FISH SUMMARY
Depth from upp	per surface of ice ((cm) 54	Total # of Mininimum Maximum
Ice thickness (c	m)	40	Species Fish Length (mm) Length (mm)
Clarity of Ice (High, Moderate, Lin Snow Depth (cr	mited, None)	N 31	CO 5 44 55 RB 9 38 110
Water	Temperature	0.6 °C	
	ity (H,M, L, or C) oderate, Low, or Clear)		
Conduc		uS	
Dissolv	ved Oxygen (botto	om) 12 ppm	n
Dissolv	ved Oxygen (surfa	ace) ppm	n
		FISH CO	LLECTION SUMMARY
Date of Setting		2001-03-14	Date of Collection 2001-03-15
Time of Setting	L L L L L L L L L L L L L L L L L L L	10:45	Time of Collection 10:20
Number of trap	s set	4	Number of traps collected 4
NOTE: Cluster contain	-	an ~5 meter diameter area Instream Cover [S	Species/ Number Captured per Cluster
1			
Capture Cluster Method Number	Mean	Sub Percent	
	Mean	Sub Percent ant Dominant ice cover	
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / //
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / / /
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover	CO / 5 RB / 9 / / / / / / / / / / / / / / / / /
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / / /
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / / /
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / / /
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / / /
Method Number	Mean Denth Domina	Sub Percent ant Dominant ice cover 85	CO/5 RB/9 / / / /

(j.

. .

-SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

Ċ

(The

1

1125

(iiiii

¥2

(iii)

RIC-3

first three letters of stream name-site number

VISIT #

4

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	78	3.4	UM	
MT	1	1	СО	69	3.2	UM	
MT	1	1	СО	48	1	UM	
MT	1	2	RB	60	2.5	UM	
MT	1	2	RB	43	1	UM	
MT	1	2	CO	51	1.1	UM	
MT	1	2	CO	54	1.8	UM	
MT	1	3	RB	61	2.7	UM	
MT	1	4	LNC				
MT	1	4	RB	51	0.8	UM	
МТ	1	4	СО	51	1.4	UM	
MT	1	4	СН	64	3.1	UM	
MT	2	1	NFC				
MT	2	2	RB	60	2.8	UM	
MT	2	3	RB	41	0.8	UM	
MT	2	3	CO	66	2.9	UM	
MT	2	3	CO	59	2.1	UM	
MT	2	3	RB	48	1.2	UM	

Species Fish Length (mm) Length (mm) Length (mm) Maximum Ice thickness (cm) 31 Species 5 46 7 Clarity of Ice (H,ML, or N) N N B 10 58 86 Show Depth (cm) 14 CB 7 44 76 Water Temperature 0.2 C CB 7 44 76 Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (bottom) 11 ppm Date of Collection 2000-12 Number of traps set 4 11:00 Time of Collection 11:31 Number of traps set 4 Number of traps collected 4 OTF: Cluster contains three traps within as -5 outer diameter area appure Cluster Suber Present Species/ Number Captured per Cluster method Number Instream Cover Sub Present Sub 100 C S RB 10 CH 7	e.g. TOB-1)	RIC-4	first three letters of stream name-site number		VISI	T # 1
azetted Stream Name Local Stream Name Watershed Code ichfield Creek						
ichfield Creek Weather Overcast with snow flurries ir Temperature 1 c Cover (%) 100 Potential for fish migration High, Modenae, Linnod, Nemo) Potential for fish migration High, Modenae, Linnod, Nemo) Depth from upper surface of ice (cm) Ice thickness (cm) Clarity of ice (H,ML, or N) (figh, Modenae, Lon, or Clarity of ice (H,ML, or C)) C (figh, Modenae, Lon, or Clarity of ice (H,ML, or C)) C (figh, Modenae, Lon, or Clarity of ice (H,ML, or C)) C (figh, Modenae, Lon, or Clarity of ice (H,ML, or C)) C (figh, Modenae, Lon, or Clarity 80 u.S Dissolved Oxygen (bottom) 11 ppm public of Setting 2000-12-18 Time of Collection 2000-12 Time of Setting 10:00 rime of Collection 11:33 Number of traps set 4 11:33 Number of traps set 4 11:33 Number of traps set 10:00 CO / S RB / 10 CH / 7 ////////////////////////////////////	Second Charles No.	T1	Otras Martin Marta		10.00	
Vestler Overcast with snow flurries ir Temperature 1 C stream Flow 1 Bigh, Moderas, Linkod, Nerroy e Cover (%) 100 Potential for fish migration H Bigh, Moderas, Linkod, Nerroy Depth from upper surface of ice (cm) 26 Fish Fish Length (rm) Maximum Ice thickness (cm) 31 CO 5 46 77 Clarity of Ice (H,M,L, or N) N N RB 10 58 86 Snow Depth (rom) 14 RB 10 58 86 CM Water Temperature 0.2 C RB 10 58 86 CM Water Temperature 0.2 C RB 10 58 86 CM Usigh, Moderas, or Chan 10 10 58 86 76 Dissolved Oxygen (bottom) 11 ppm ppm Diste of Collection 113 113 Number of traps set 11:00 100 Species/ Number Captured per Cluster 113 113 Deat of Setting 11:00			Stream Name Wate	rshed Code		
ir Temperature 1°C Stream Flow 1 (High.Moderne.Limited.Now) e Cover (%) 100 Potential for fish migration H (High.Moderne.Limited.Now) LIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (cm) 26 Total # of Minimum Maximum Length (mm) Length (mm) Co 5 46 77 (High.Moderne.Limited.Now) Snow Depth (cm) 14 Water Temperature 0.2 °C Turbidity (H.M. Lo of C) (High.Moderne.Low, or Clear) Conductivity 80 uS Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (bottom) 11 Dissolved Oxygen (bottom) 12 Disto (Cover (Classer) 12 Disto (Classe						
e Cover (%) 100 Potential for fish migration If tight, Modente, Lumicet, Nored) LIMNOLOGY STATION 26 Image: State of Lice (cm) 26 Depth find upper surface of ice (cm) 31 Image: State of Lice (cm) 31 Clarity of Ice (H,ML, or N) N N Species Total # of Minimum Maximum Maximum (Gigh, Modente, Limited, News) 31 Image: State of Lice (cm) 6 77 (Gigh, Modente, Limited, News) 14 Image: State of Lice (cm) 16 76 Water Temperature 0.2 C C Time of Collection 76 Using Moderne, Limited, News) 80 u/S Image: CH 7 44 76 Dissolved Oxygen (bottorn) 11 ppm ppm Dissolved Oxygen (surface) ppm 2000-12-18 Date of Collection 200-12 Time of Setting 11:00 Time of Collection 11:33 Number of traps set 4 The Order setting Muter set reast Bander area Species/ Number Captured per Cluster 4 11:33 Protect Ocluster Moder Deminate Bander area Species/ Number Captured per Cluster 4	eather Ove	ercast with snow	flurries			
LIMNOLOCY STATION FIGH SUMMARY Depth from upper surface of ice (cm) 26 Ice thickness (cm) 31 Clarity of Ice (H,ML, or N) N (figh, Modens, Low, or Claw) 14 Water Temperature 0.2 C Turbidity (H,M, L, or C) C (figh, Modens, Lew, or Claw) 80 Dissolved Oxygen (bottom) 11 ppm Pish Dissolved Oxygen (bottom) 11 pissolved Oxygen (bottom) 11 pissolved Oxygen (bottom) 11 pure Cluster 4 OTE: Cluster certain threat rates flameter area appure Cluster Sepcies/ Number Captured per Cluster Moment Deep Deminal Deep Reveent Species/ Number Captured per Cluster Moment Deep Deminal Deep Reveent Species/ Number Captured per Cluster MT 1 Eastream Cover Sub Per Deminal Deep Reveent Species/ Number Captured per Cluster Moment Deep Deminal Deep Reveent Species/ Number Captured per Cluster Moment Deep Deminal Deep Reveent Species/ Number Captured per Cluster Moment Deep Deminal Deep Reveent Species/ Number Captured per Cluster	-			Stream Flow	L (High, Moderate, 1	Limited, None)
Depth from upper surface of ice (cm) 26 Ice thickness (cm) 31 Clarity of ice (H,M,L, or N) N (figh, Moderse, Low, or Obset) 14 Water Temperature 0.2 Turbidity (H,M, L, or C) C (figh, Moderse, Low, or Clear) C Conductivity 80 Dissolved Oxygen (bottom) 11 ppm ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (bottom) 11 ppm 2000-12-18 Time of Setting 1000 Time of Setting 11:00 Number of traps set 4 OTE: Cluster contains three traps within set -5 enster diameter area apture Cluster Mean Dention of traps collected Material 1000 CO 5 RB 10 Conductive Species/ Number Captured per Cluster Material Instream Cover Material Species/ Number Captured per Cluster Mean Dentional Dentional Dentional Dentinant </td <td>e Cover (%)</td> <td>100</td> <td>Potential</td> <td>for fish migration</td> <td>H (High, Moderate,)</td> <td>Limited, None)</td>	e Cover (%)	100	Potential	for fish migration	H (High, Moderate,)	Limited, None)
Ice thickness (cm) 31 Species Fish Length (mm) Length (mm) Clarity of Ice (H,ML, or N) N N RB 10 58 86 Snow Depth (cm) 14 CB 7 44 76 Water Temperature 0.2 C CB 7 44 76 Water Temperature 0.2 C CB 7 44 76 Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (surface) ppm Date of Collection 2000-12 Date of Setting 2000-12-18 Date of Collection 2000-12 11:30 Number of traps set 4 Number of traps collected 4 OTE: Cluster contains three traps within se -5 meter diameter area Species/ Number Captured per Cluster Summer Cluster Mem Deminant Species/ Number Captured per Cluster Mem Deminant 1000 CO S RB 10 CH 7	LIMN	OLOGY STA	TION	FIS	H SUMMARY	
Ice thickness (cm) 31 Clarity of Ice (H,ML, or N) (figh, Moderse, Linical None) Show Depth (mm) 14 Water Temperature 0.2 C Turbidity (H,M, L, or C) (High, Moderse, Low, or Clear) Conductivity 80 using Dissolved Oxygen (bottom) 11 ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Time of Setting 11:00 Number of traps set 4 OTE: Cluster contains three traps within an -5 ander diameter area apture Cluster Moderne, Cluster Image Dominant Dom	Depth from upper	surface of ice (cm)	26			
Clarity of Ice (H, ML, tor N) (High, Moderes, Limited None) Snow Depth (cm) Id Water Temperature 0.2 ° C Turbidity (H, M, L, or C) (High, Moderes, Low, or Cleer) Conductivity B0 uS Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Dissolved Oxygen (surface) Ppm PissH COLLECTION SUMMARY Date of Setting 11:00 Number of traps set 4 Date of Collection 11:30 Number of traps collected 4 OTE: Cluster contains three traps within a -5 ander diameter area apture Cluster Mean Pmm Dominant Dominant Cover MT 1 Comments immo station appears to have filled in a little more so we couldn't set traps at the limno, Te: couldn't set near the buller cluster.	Ice thickness (cm))	31			
Snow Depth (cm) 14 Water Temperature 0.2 C Turbidity (H,M, L, or C) (High, Moderne, Low, or Clear) C Conductivity 80 Dissolved Oxygen (bottom) 11 ppm ppm Dissolved Oxygen (surface) ppm Pishe COLLECTION SUMMARY Date of Setting 2000-12-18 Time of Setting 11:00 Number of traps set 4 OTE: Cluster costalas three traps within au -5 dater diameter area apture Cluster Instream Cover Man Deminant Pominant Deminant Pominant Instream Cover Species/ Number Captured per Cluster Man Instream Cover Man 100 CO 5 RB / 10 CH / 7 MT 1 Demin Appears to have filled in a little more so we couldn't set traps at the limno, ie: couldn't set near the oulder cluster.		,	Ν			
Water Temperature 0.2 C Turbidity (H,M, L, or C) C C (High Moderne, Low, or Cleer) C C Conductivity 80 uS Dissolved Oxygen (bottom) 11 ppm Date of Setting 2000-12-18 Date of Collection 2000-12 Time of Setting 11:00 Time of Collection 11:31 Number of traps set 4 Number of traps collected 4 OTE: Cluster costalias three traps withis us -5 ander diameter area Species/ Number Captured per Cluster 11:33 Protect Sade Protect Species/ Number Captured per Cluster 100 CO MT 1 100 CO 5 RB / 10 CH / 7 ///// immo station appears to have filled in a little more so we couldn't set traps at the limmo, i.e.: couldn't set near the oulder cluster. 5 Comments 5			14			
Turbidity (H,M, L, or C) C (High, Moderne, Low, or Cleer) C Conductivity 80 uS Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Time of Setting 11:00 Time of Setting 11:00 Number of traps set 4 OTE: Cluster contains three traps within as -5 meter diameter area apture Cluster Safe Percent Sub Percent Species/ Number Captured per Cluster Instream Dominant Dominant Dominant ice cover Species/ Number Captured per Cluster MT 1 100 CO / 5 RB / 10 CH / 7 / / /	• • • •			<u>CH</u> 7	44	76
Conductivity 80 uS Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 2000-12 Time of Setting 11:00 Time of Collection 11:31 Number of traps set 4 Number of traps collected 4 OTE: Cluster costalise three traps within an -5 meter diameter area Species/ Number Captured per Cluster apture Instream Cover Species/ Number Captured per Cluster Mean Dominant cover Species/ Number Captured per Cluster Mm 1 Co 5 RB / 10 CH / 7 /// MT 1 Comments 2 2	Turbidity	(H,M, L, or C)	[]			
Dissolved Oxygen (bottom) 11 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 2000-12 Time of Setting 11:00 Time of Collection 11:30 Number of traps set 4 Number of traps collected 4 OTE: Cluster contains three traps within su -5 meter diameter area apture Cluster Bub Percent Superior Species/ Number Captured per Cluster lethod Number Dominant Dominant ice cover CO 5 RB 10 CH 7 / / /			80 <i>uS</i>			
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 2000-12 Time of Setting 11:00 Time of Collection 11:33 Number of traps set 4 Number of traps collected 4 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Denth Dominant Dominant ice cover MT 1 0 0 0 CO / 5 RB / 10 CH / 7 / / / /	Dissolved	i Oxygen (bottom)				
FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 2000-12 Time of Setting 11:00 Time of Collection 11:30 Number of traps set 4 Number of traps collected 4 OTE: Cluster costaliss three traps within an -5 meter diameter area Number of traps collected 4 apture Cluster Instream Cover Species/Number Captured per Cluster 4 MT 1 100 CO / 5 RB / 10 CH / 7 ////////////////////////////////////			· · ·			
Date of Setting 2000-12-18 Date of Collection 2000-12 Time of Setting 11:00 Time of Collection 11:30 Number of traps set 4 Number of traps collected 4 DTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/Number Captured per Cluster Mean Sub Percent Species/Number Captured per Cluster MT 1 000 CO / 5 RB / 10 CH / 7 / / / MT 1 000 CO / 5 RB / 10 CH / 7 / / / / / Comments		775555 AM R ACE2		N SUMMARY		
Number of traps set 4 Number of traps collected 4 OTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/Number Captured per Cluster 4 apture Cluster Mean Dominant Dominant ice cover Species/Number Captured per Cluster 100 CO / 5 RB / 10 CH / 7 ////////////////////////////////////	Date of Setting		-12-18	Date	of Collection	2000-12
OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent lethod Number Dominant Dominant ice cover MT 1 CO / 5 RB / 10 CH / 7 / / / / / / / / / / / / / / / / /		11	1:00	Time	of Collection	11:30
Apture Cluster Mean Sub Percent Tenth Dominant Dominant ice cover CO S RB / 10 CH / 7 / / / / / / / / / / / / / / / / /	Time of Setting		4	Num	ber of traps collected	4
Mean Sub Denth Dominant Dominant Dominant Image: Comments		et				
imno station appears to have filled in a little more so we couldn't set traps at the limno, ie: couldn't set near the oulder cluster.	Number of traps s	hree traps within an ~5 m		Cantured ner Cluster		
imno station appears to have filled in a little more so we couldn't set traps at the limno, ie: couldn't set near the oulder cluster.	Number of traps s OTE: Cluster contains the apture Cluster lethod Number	hree traps within an ~5 m Instre Mean	am Cover Sub Percent ominant ice cover		/ 7/	
et all four traps just downstream of cutbank. Water depth at set location is 81 cm. Ice thickness here is 14cm.	Number of traps s OTE: Cluster contains the second seco	hree traps within an ~5 m Instre Mean Denth Dominant Dr	am Cover Sub Percent ice cover 100 CO / 5	RB / 10 CH	/ 7/_	
	Number of traps s OTE: Cluster contains the apture Cluster Lethod Number MT 1	hree traps within an ~5 m Instre Mean Denth Dominant Dr	am Cover Sub Percent ice cover 100 CO / 5	RB / 10 CH	/ 7 /	/
	Number of traps s OTE: Cluster contains the apture Cluster MT 1	hree traps within an ~5 m Instre Mean Denth Dominant Dr	am Cover Sub Percent ice cover 100 CO / 5 Comme ed in a little more so we could	RB / 10 CH nts in't set traps at the 1		

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

100

1

1000

1163

.....

1

100

i and

094

1 de

1

1.00

- 56

RIC-

4

first three letters of stream name-site number

VISIT #

1

2

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Fork Length Fish Type of Fin Clip **Type of Recaptured Fin** Capture Cluster Trap Species Method Number Number (mm) Weight (g) Clip (e.g. adipose, upper caudal, uone) 1 RB 58 4.4 UM MT 1 MT 1 1 RB 86 9.4 UM MT 1 1 RB 81 9.2 UM UM RB 80 8.2 MT 1 1 1 1 CH 69 UM MT 4.4 UM MT 1 1 CH 68 3.6 UM 2 со 53 2.3 MT 1 CO 77 UM MT 1 2 6.1 2 CH 76 6.3 UM MT 1 1 2 CH 70 5 UM MT UM 1 2 со 61 3.1 MT MT 1 2 со 53 2.1 UM 1 2 CO 46 1.5 UM MT 2 CH 3.3 UM MT 1 61 UM MT 1 2 CH 44 1.5 3 3.8 UM MT 1 RB 61 4 RB 78 UM MT 1 6.1 1 4 RB 77 UM MT 5.7 MT 1 4 CH 55 2.5 UM 4 RB 71 UM MT 1 5.6 MT 1 4 RB 74 5.9 UM 1 4 RB 70 4.8 UM MT

Site Name (e.g. TOB-1)	RIC-	4	first three letters of stream name-site number	VISIT # 2
(e.g. 100-1/	L	L	7	Date of survey Time of survey Surveyors 2001-01-17 11:15 TJ,TD,JD
Gazetted Stream N	ame	Local Stre	am Name Wa	atershed Code
Richfield Creek		Ī		
Weather S1	nowing			
Air Temperatu	re <u>-5</u> °	С		Stream Flow L (High, Moderate, Limited, None)
ce Cover (%)	100		Potentia	al for fish migration L (High, Moderate, Limited, None)
LIM	NOLOGY	STATI	ON	FISH SUMMARY
Depth from upp	er surface of ice	e (cm)	79	Total # of Mininimum Maximum
Ice thickness (cr	n)		27	Species Fish Length (mm) Length (mm)
Clarity of Ice (H			N	$\begin{bmatrix} CO \\ 5 \\ \hline 50 \\ \hline 60 \\ \hline 71 \\ \hline 7$
(High, Moderate, Lin Snow Depth (cn			32	CH 6 61 74 RB 21 42 100
Water 1	emperature		0.1 °C	
	ty (H,M, L, or C Iderate, Low, or Clea		С	
Conduc		u)	80 <i>uS</i>	
Dissolv	ed Oxygen (bot	tom)	12 ppm	
Dissolv	ed Oxygen (sur	face)	ppm	
			FISH COLLECTI	ON SUMMARY
Date of Setting		2001-01-	.17	Date of Collection 2001-01-1
		11:20		Time of Collection 11:35
Time of Setting				Number of Angre collected
Number of traps		4		Number of traps collected 4
Number of traps NOTE: Cluster contain Capture Cluster				Number of traps collected 4
Number of traps NOTE: Cluster contain Capture Cluster	s three traps within Mean	an ~5 meter d Instream (Cover Species/ Num Percent nt ice cover	
Number of traps NOTE: Cluster contains Capture Cluster Method Number	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent nt ice cover	iber Captured per Cluster
Number of traps NOTE: Cluster contains Capture Cluster Method Number	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent nt ice cover	iber Captured per Cluster
Number of traps NOTE: Cluster contains Capture Cluster Method Number	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent nt ice cover	iber Captured per Cluster
Number of traps NOTE: Cluster contains Capture Cluster Method Number	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	aber Captured per Cluster
Number of traps NOTE: Cluster contains Capture Cluster Method Number	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster
Number of traps NOTE: Cluster contain Capture Cluster Method Number MT 1	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster
Number of traps NOTE: Cluster contain Capture Cluster Method Number MT 1	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster
Number of traps NOTE: Cluster contain Capture Cluster Method Number MT 1	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster
Number of traps NOTE: Cluster contain Capture Cluster Method Number MT 1	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster
Number of traps NOTE: Cluster contain Capture Cluster Method Number MT 1	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster
Number of traps NOTE: Cluster contain Capture Cluster Method Number MT 1	s three traps within Mean	an ~5 meter d Instream C Sub	Cover Species/ Num Percent ice cover 100 CO / 5	iber Captured per Cluster

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

ne |-1)

RIC-4

first three letters of stream name-site number

VISIT # 2

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, sone)	Type of Recaptured Fin Clip
MT	1	2	RB	84	8.1	UM	
MT	1	2	CO	51	2.5	UM	
MT	1	2	RB	85	8.9	UM	
MT	1	2	СН	74	5.3	UM	
MT	1	2	RB	80	6.7	UM	
MT	1	2	СН	66	3.6	UM	
MT	1	2	RB	58	2.9	UM	
MT	1	2	СН	66	4.9	UM	
MT	1	2	RB	77	6.1	UM	
MT	1	2	RB	69	4.1	UM	
MT	1	2	RB	64	3.7	UM	
MT	1	2	RB	59	2.6	UM	
MT	1	2	RB	42	1.2	UM	
MT	1	2	RB	85	8.9	UM	
MT	1	2	CO	62	3.1	UM	
MT	1	2	RB	60	3.1	UM	
MT	1	2	RB	49	1.1	UM	
MT	1	3	RB	69	4.7	UM	
MT	1	3	СН	71	4.9	UM	
MT	1	3	RB	78	5.8	UM	
MT	1	3	RB	84	7.4	UM	
MT	1	3	RB	100	13.2	UM	
MT	1	3	RB	46	1.4	UM	
MT	1	3	СН	61	3.3	UM	
MT	1	3	СН	62	3.3	UM	
MT	1	3	RB	64	3.5	UM	
MT	1	3	RB	43	1.1	UM	
MT	1	3	СО	51	1.8	UM	
MT	1	3	СО	60	3.5	UM	
MT	1	3	RB	65	3.7	UM	
MT	1	4	RB	81	6.9	UM	
MT	1	4	СО	50	1.8	UM	

64

120

<u>iiii</u>

(és)

100

6

6

(ille

(Å)

165

			na sera na sera a co
Site Name (e.g. TOB-1) RIC	first three letters of stream name-site number	VISIT	# 3
		Date of surveyTime of survey2001-02-1411:00	Surveyors TJ,TD,JD
Gazetted Stream Name	Local Stream Name W	/atershed Code	
Richfield Creek			
Weather High overca	ıst.		
Air Temperature]° c	Stream Flow M (High, Moderate, Lin	nited, None)
(ce Cover (%) 100	Potenti	al for fish migration M (High, Moderate, Lin	nited, None)
LIMNOLOG	Y STATION	FISH SUMMARY	
Depth from upper surface of	fice (cm) 69		Maximum
Ice thickness (cm)	15		ength (mm)
Clarity of Ice (H,M,L, or N)	N		91
(High, Moderate, Limited, None) Snow Depth (cm)	11	CH 5 59	69
Water Temperature	0.1 ° C	RB 17 42	85
Turbidity (H,M, L, c		SUC 1 96	96
(High, Moderate, Low, or Conductivity			
-			
Dissolved Oxygen (Dissolved Oxygen (
	FISH COLLECTI	ION SUMMARY	
Date of Setting	2001-02-14	Date of Collection	2001-02-1
Time of Setting	11:10	Time of Collection	12:11
Number of traps set	4	Number of traps collected	4
NOTE: Cluster contains three traps with			
Capture Cluster Mean	Sub Percent	nber Captured per Cluster	
Method Number Denth D	bominant Dominant ice cover	CH / 5 RB / 17 SUC / 1	
	Com	ments	
	Com	ments	
	Com	ments	
pH = 7.1 February 15/01 temperatu		ments	
pH = 7.1		ments	
pH = 7.1		ments	
pH = 7.1		ments	
pH = 7.1		ments	

5999 () 1999 ()

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	RIC-4	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Number	Photo Description	
OW4	16	Site view, limno and trap hole visible.	

- INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)		Type of Fin Clip 3. adipose, upper caudal, 2000)	Type of Recaptured Fin Clip
MT	1	1	СО	56	3.1]	UM	
MT	1	1	RB	47	1.6		UM	
MT	1	1	СО	56	2.7		UM	
MT	1	1	RB	81	7.5		UM	
MT	1	1	RB	59	3		UM	
MT	1	1	RB	80	6.7		UM	
MT	1	1	СН	62	3.1		UM	
MT	1	1	RB	63	3.7		UM	
MT	1	1	CO	55	1.9		UM	
MT	1	1	СО	59	2.5		UM	
MT	1	1	СО	68	4		UM	
MT	1	1	СО	58	2.4		UM	
MT	1	1	RB	42	1		UM	
MT	1	1	CO	51	1.6		UM	
MT	1	1	СО	50	1.9		UM	
MT	1	2	СО	49	1.6		UM	
MT	1	2	RB	42	0.8		UM	
MT	1	2	RB	69	4.4		UM	
MT	1	2	со	56	2.2	[UM	
MT	1	2	СО	50	1.4		UM	
MT	1	2	СО	51	1.3		UM	
MT	1	2	SUC	96	12.8	[UM	
MT	1	3	NFC			[
MT	1	4	СО	70	3.9	[UM	
MT	1	4	RB	60	3.8	[UM	
MT	1	4	RB	69	4.8	[UM	
MT	1	4	СН	62	3.2	[UM	
MT	1	4	СО	91	9.6	ſ	UM	
MT	1	4	CH	66	3.4	[UM	
MT	1	4	RB	83	7	[UM	
MT	1	4	CO	53	1.5	ſ	UM	
MT	1	4	СО	51	1.4	ſ	UM	

Π \bigcap

Site Name e.g. TOB-1)	F	UC-	+ 1	first three letters of stream name-site number			VISIT # 3
MT	1	4	CH	69	3.7	UM	
MT	1	4	CH	59	3	UM	
MT	1	4	CO	58	2.4	UM	
MT	1	4	RB	82	5.8	UM	
MT	1	4	RB	43	1	UM	
MT	1	4	СО	54	1.7	UM	
MT	1	4	RB	70	4.1	UM	
MT	1	4	RB	71	5	UM	
MT	1	4	RB	85	7.3	UM	
MT	1	4	RB	65	3.4	UM	

<u>(</u>

(G) | | | |

Site Name (e.g. TOB-1)	= 4 first three letters of name-site number	V ISI	Γ# 4
Jazetted Stream Name	Local Stream Name	Date of survey Time of survey 2001-03-14 11:00 Watershed Code	Surveyors TJ,TD,JD
Richfield Creek			
Weather sunny and cl	lear		
tir Temperature -3 ce Cover (%) 75]°c]	Stream Flow M (High, Moderate, Li Potential for fish migration L (High, Moderate, Li	
	Y STATION	FISH SUMMARY	
Depth from upper surface of	ice (cm) 64	Total # of Mininimum	Maximum
Ice thickness (cm)	22	Species Fish Length (mm) L	ength (mm)
Clarity of Ice (H,M,L, or N)		CO 2 65	71
(High, Moderate, Limited, None)		RB 2 41	55
Snow Depth (cm)	0		
Water Temperature	0.3 ° C		
Turbidity (H,M, L, o (High, Moderate, Low, or (
Conductivity	uS		
Dissolved Oxygen (t	bottom) 12 ppm		
Dissolved Oxygen (s	surface) ppm		
	···	LECTION SUMMARY	
	FISH COL	LECTION SUMMARY Date of Collection	2001-01
Dissolved Oxygen (s	FISH COL 2001-03-14		2001-01
Dissolved Oxygen (s Date of Setting	FISH COL	Date of Collection	2001-01 10:35 4
Dissolved Oxygen (s Date of Setting Time of Setting	FISH COL 2001-03-14 11:00 4	Date of Collection Time of Collection	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean	FISH COL 2001-03-14 11:00 4	Date of Collection Time of Collection	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set VOTE: Cluster contains three traps with Capture Cluster Mean Denth Do	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent Si Sub Percent Si	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set IOTE: Cluster contains three traps with Capture Cluster Mean	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent Sub Percent	Date of Collection Time of Collection Number of traps collected	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps with Capture Cluster Mean Denth Do	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent Si Sub Percent Si	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps with Capture Cluster Mean Denth Do	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent Si Sub Percent Si	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set VOTE: Cluster contains three traps with Capture Cluster Mean Denth Do	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent Si Sub Percent Si	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster	10:35
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps with Capture Cluster Method Number Mean Denth Do MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps with Capture Cluster Method Number Mean Denth Do MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent Si Sub Percent Si	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps with Capture Cluster Method Number Mean Denth Do MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number Method Number MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number Method Number MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number Method Number MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number Method Number MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps with Capture Cluster Aethod Number Mean Denth Do MT 1	FISH COL 2001-03-14 11:00 4 thin an -5 meter diameter area Instream Cover Si Sub Percent ominant ice cover 75 C	Date of Collection Time of Collection Number of traps collected pecies/ Number Captured per Cluster 20/2 RB/2 //	

; ; ;

Site Name (e.g. TOB-1)

RIC-4

first three letters of stream name-site number

VISIT # 4

0

(9) ---

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	55	1.9	UM	
MT	1	2	NFC				
MT	1	3	CO	65	2.9	UM	
MT	1	3	RB	41	1.1	UM	
MT	1	4	СО	71	3.9	UM	

Site Name e.g. TOB-1)	C - 5 first three letter name-site numb	s of stream VISIT #	1
Bazetted Stream Name	Local Stream Name	Date of survey Time of survey Survey 2000-12-18 10:50 BD,7 Watershed Code	
Richfield Creek			
Weather Overcast			
ir Temperature		Stream Flow L (High, Moderate, Limited, None) Potential for fish migration M (High, Moderate, Limited, None)	
LIMNOLO	GY STATION	FISH SUMMARY	
Depth from upper surface	of ice (cm) 74	Total # of Mininimum Maximum	n
Ice thickness (cm)	39	Species Fish Length (mm) Length (mm	m)
Clarity of Ice (H,M,L, or I	N) N	CO 27 46 112	
(High, Moderate, Limited, None) Snow Depth (cm)	14	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	
Water Temperatur		CH 6 61 73	
Turbidity (H,M, I	., or C) C		
(High, Moderate, Low, Conductivity	80 uS		
Dissolved Oxyger	n (bottom) 11 ppr	m	
Dissolved Oxyger	n (surface) ppr	m	
	FISH CO	DLLECTION SUMMARY	
Date of Setting	2000-12-18	Date of Collection 200	0-12
Time of Setting	10:50	in the second	10:55
Number of traps set	7	Number of traps collected	7
apture Cluster	Instream Cover	Species/ Number Captured per Cluster	
Mean Mean Denth	Sub Percent Dominant Dominant ice cover	RB / 8 CO / 9 CH / 1 / /	1,
MT 2		RB / 24 CO / 18 CH / 5 //	
MT 1			j / [
		Comments	
	aps set at limno station		
	ps set at beaver lodge (st	mall woody debris).	
		and the second	
H = 7.6			
H = 7.6			

SITE VISIT DESCRIPTION -

Site Name (e.g. TOB-1)

RIC-5

1

first three letters of stream name-site number

VISIT # 1

No.

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	2	RB	44	1.2	UM	
MT	1	2	СО	66	4.6	UM	
MT	1	2	СО	75	6.1	UM	
MT	1	2	СО	49	1.6	UM	
MT	1	2	СО	66	3.7	UM	
MT	1	2	RB	42	1	UM	
MT	1	2	RB	78	7.6	UM	
MT	1	2	RB	45	1.3	UM	
MT	1	2	CO	47	1.3	UM	
MT	1	2	RB	84	8.7	UM	
MT	1	3	СН	72	5.9	UM	
MT	1	3	СО	65	4.7	UM	
MT	1	3	СО	58	3.2	UM	
MT	1	3	СО	46	1.8	UM	
MT	1	3	СО	89	11.1	UM	
MT	1	3	RB	72	5.8	UM	
MT	1	3	RB	80	7.5	UM	
MT	1	3	RB	75	6.2	UM	
MT	2	4	СО	80	7	UM	
MT	2	4	СО	80	6.8	UM	
MT	2	4	СО	68	3.3	UM	
MT	2	4	CH	70	5.2	UM	
MT	2	4	СО	55	2.8	UM	
MT	2	4	RB	120	24.2	UM	
MT	2	4	RB	62	3.2	UM	
MT	2	4	RB	64	3.8	UM	
MT	2	4	RB	69	4.6	UM	-
MT	2	4	RB	80	5.7	UM	
MT	2	4	RB	90	9.9	UM	
MT	2	4	RB	55	2.4	UM	
MT	2	4	RB	71	5	UM	
MT	2	5	СН	64	2.8	UM	
MT	2	5	СН	73	4.4	UM	
MT	2	5	СО	51	1.4	UM	
MT	2	5	СО	54	2.3	UM	

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1	, [R	IC-	5	first three letters of stream name-site number	1			VISIT # 1
MT	2		5	СО	51	2.2		UM	
MT	2		5	RB	78	7.5		UM	
MT	2		5	CH	61	3.6		UM	
MT	2		5	RB	79	6.8		UM	
MT	2		5	RB	74	6.1		UM	
MT	2		5	RB	81	8.4		UM	
MT	2		5	RB	62	3.4		UM	
MT	2		5	RB	78	6.3		UM	
MT	2		6	CO	112	19.2		UM	
MT	2		6	CO	99	13.6		UM	
MT	2		6	Сн	66	4.9		UM	
MT	2		6	RB	70	5		UM	
MT	2		6	RB	85	9.4		UM	
MT	2		6	RB	80	7.6		UM	
MT	2		6	RB	65	3.9		UM	
MT	2		6	RB	124	25.3		UM	
MT	2		6	RB	66	3.8		UM	
MT	2		6	RB	84	9.1		UM	
MT	2		7	СО	79	4.5		UM	
MT	2		7	СО	66	2.6		UM	
MT	2		7	СО	63	3.3		UM	
MT	2		7	RB	91	7.4		UM	
MT	2		7	СО	51	1.1		UM	
MT	2		7	Со	52	2	[UM	
MT	2		7	Со	52	1.7		UM	
MT	2		7	СО	55	2.6		UM	
MT	2		7	Со	54	1.7		UM	
MT	2		7	СО	55	2.2		UM	
MT	2		7	RB	44	1.1	[UM	
MT	2		7	RB	62	3	[UM	

Land 196 7 (**(*** Ĺ -(inter-

1

2001-01-17 11:00 iazetted Stream Name Local Stream Name Watershed Code ichfield Creek	tj,td,jd tj,td,jd erate, Limited, None) erate, Limited, None) Y Maximum
azetted Stream Name Local Stream Name Watershed Code ichfield Creek	erate, Limited, None) erate, Limited, None) Y Maximum) Length (mm) 89 72
reather Heavy snowfall r Temperature -5 ° C Stream Flow L (High, Moderate, Limuted, I e Cover (%) 100 Potential for fish migration L (High, Moderate, Limuted, I LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 64 Total # of Mininimum Maxi Ice thickness (cm) 14 CO 30 44 84 Clarity of Ice (H,M,L, or N) N N CH 9 65 77 Snow Depth (cm) 33 RB 22 45 84	Maximum) Length (mm) 89 72
r Temperature _5 ° C Stream Flow L (High, Moderate, Limited, 1 c Cover (%) 100 Potential for fish migration L (High, Moderate, Limited, 1 LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 64 Species Fish Length (mm) Length Ice thickness (cm) 14 Co 30 44 88 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) Snow Depth (cm) 33	Maximum) Length (mm) 89 72
Potential for fish migration L (High, Moderate, Limited, I LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 64 Total # of Mininimum Maxie Ice thickness (cm) 14 Species Fish Length (mm) Length Clarity of Ice (H,M,L, or N) N CO 30 44 89 Snow Depth (cm) 33 RB 22 45 89	Maximum) Length (mm) 89 72
e Cover (%) 100 Potential for fish migration L (High, Moderate, Limited, I LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 64 Fish Length (mm) Maxie Ice thickness (cm) 14 Species Fish Length (mm) Length Clarity of Ice (H,M,L, or N) N CH 9 65 7 Snow Depth (cm) 33 RB 22 45 89	Maximum) Length (mm) 89 72
Depth from upper surface of ice (cm) 64 Ice thickness (cm) 14 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 33 Snow Depth (cm) 33	Maximum) Length (mm) 89 72
Ice thickness (cm)IdSpeciesFishLength (mm)LengthClarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)NCO304489Snow Depth (cm)33CH96577RB224589) Length (mm) 89 72
Ice thickness (cm) 14 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 33 Snow Depth (cm) 33	89 72
Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) CH 9 65 77 Snow Depth (cm) 33 RB 22 45 84	72
Snow Depth (cm) 33 RB 22 45 89	
	89
•	
Turbidity (H,M, L, or C) C	
(High, Moderate, Low, or Clear) Conductivity 70 uS	
Dissolved Oxygen (bottom)	
Dissolved Oxygen (surface) ppm	
FISH COLLECTION SUMMARY	
Date of Setting 2001-01-17 Date of Collection	2001-01
Time of Setting 11:05 Time of Collection	12:00
Number of traps set 7 Number of traps collected	

= 7.6			
. – 7.0			

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1) RIC-5

first three letters of stream name-site number

VISIT # 2

. .

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, uone)	Type of Recaptured Fin Clip
MT	1	1	СН	59	2.7	UM	
MT	1	1	СО	62	3.2	UM	
MT	1	1	LNC	90	8.4	UM	
MT	1	2	RB	73	5.5	UM	
MT	1	2	RB	65	4.1	UM	
MT	1	2	RB	88	9.1	UM	
MT	1	2	СО	51	2	UM	
MT	1	2	СО	51	1.9	UM	
MT	1	2	RB	68	3.6	UM	
MT	1	2	СО	40	0.9	UM	
MT	1	2	RB	45	1.3	UM	
MT	1	2	СО	51	1.7	UM	
MT	1	2	СО	50	1.8	UM	
MT	1	2	RB	39	0.9	UM	
MT	1	2	СО	50	1.9	UM	
MT	1	2	СО	49	1.3	UM	
MT	1	2	СО	51	1.6	UM	
MT	1	2	СО	45	1	UM	
MT	1	2	RB	46	1.4	UM	
MT	1	3	RB	61	3.9	UM	
MT	1	3	RB	72	5.5	UM	
MT	1	3	CO	56	3.1	UM	
MT	1	3	RB	63	6.4	UM	
MT	1	3	RB	80	7.2	UM	
MT	1	3	CO	49	1.3	UM	
MT	1	3	RB	41	1.3	UM	
MT	1	4	RB	118	23	UM	
MT	1	4	RB	84	8.2	UM	

1000

Link

t in the second se

1844

1000

	C = 5 first three letters of stream name-site number		VISIT # 3
(e.g. TOB-1)		Date of survey 2001-02-14	Time of survey Surveyors 11:15 TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code	
Richfield Creek			
Weather Snowing a	and extremely windy		
Air Temperature	4 ° C	Stream Flow M	(High, Moderate, Limited, None)
Ice Cover (%) 10	00 Poten	tial for fish migration	(High, Moderate, Limited, None)
LIMNOLO	GY STATION	FISH S	UMMARY
Depth from upper surface of	of ice (cm) 41	Total # of	Mininimum Maximum
Ice thickness (cm)	10	Species Fish	Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N	N) N	CO 19	49 73
(High, Moderate, Limited, None) Snow Depth (cm)	34	CH 1	55 55
• • •		RB 11	40 71
Water Temperatur		SUC 1	113 113
Turbidity (H,M, L (High, Moderate, Low, d			
Conductivity	uS		
Dissolved Oxygen	n (bottom) 11 ppm		
Dissolved Oxygen	n (surface) 3 ppm		
	FISH COLLECT	CION SUMMARY	
Date of Setting	2001-02-14	Date of Co	
Time of Setting	11:20	Time of Co	llection 12:30
Number of traps set	7	Number of	traps collected 7
NOTE: Cluster contains three traps			
Capture Cluster Mean	Sub Percent	umber Captured per Cluster	
Method Number Depth	Dominant Dominant ice cover	5 RB / 4 SUC / 1	
MT 2		4 RB / 7 CH / 1	
	Con		
이 같이 아니까 집에서 아니까 아니까 봐야? 것 같다.	Con	iments	
			-
pH = 8.1			
	ture = -13		
pH = 8.1 February 15/01 temperat			
pH = 8.1 February 15/01 temperat	ture = -13 g taken as meter is not working.		
pH = 8.1 February 15/01 temperat			
pH = 8.1 February 15/01 temperat			

S.

REG.

		SITE VISIT DES	CRIPTION
Site Name (e.g. TOB-1)	RIC-	5 first three letters of stream name-site number	VISIT # 3
	n Carl	PHOTO DOCUM	ENTATION
Roll Name	Frame Nun	nber Photo Description	
OW4	15	Site view looking downstrraam.	

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip Type of Recaptured Fin (e.g. adipose, upper caudal, none) Clip
MT	1	1	RB	44	1.1	UM
MT	1	2	RB	41	0.7	UM
MT	1	3	RB	75	5.7	UM
MT	1	3	RB	73	5.3	UM
MT	1	3	RB	89	8.2	UM
MT	1	3	RB	81	6.6	UM
MT	1	3	СО	47	1.8	UM
MT	1	3	СО	57	2.5	UM
MT	1	3	RB	66	3.9	UM
MT	1	3	СО	56	2.2	UM
MT	1	4	RB	39	0.8	UM
MT	1	4	RB	69	4.5	UM
MT	1	4	RB	40	0.8	UM
MT	1	4	RB	94	11.3	UM
MT	1	4	RB	74	5.4	UM
MT	1	4	СО	49	1.3	UM
MT	1	4	СО	51	1.7	UM
MT	1	4	RB	41	0.9	UM
MT	1	4	СО	49	2	UM
MT	1	4	RB	40	0.9	UM

		SCRIPTION	
Site Name (e.g. TOB-1)	5 first three letters of stream name-site number	Date of survey 2001-02-14 Time of survey 11:10	IT # 4
Gazetted Stream Name	Local Stream Name Waters	shed Code	
Richfield Creek			
Weather Sunny and clea	۱۲ 		
Air Temperature -3°	C	Stream Flow M (High, Moderate	e, Limited, None)
Ice Cover (%) 95	Potential f	or fish migration M (High, Moderate	e, Limited, None)
LIMNOLOGY	STATION	FISH SUMMARY	
Depth from upper surface of ice	e (cm) 50	Total # of Mininimum	Maximum
Ice thickness (cm)	4	Species Fish Length (mm)	Length (mm)
Clarity of Ice (H,M,L, or N)	Ν		69
(High, Moderate, Limited, None) Snow Depth (cm)	0	CH 1 64	64
		RB 8 41	78
Water Temperature Turbidity (H,M, L, or C		LNC 0 0	0
(High, Moderate, Low, or Clean	r)		
Conductivity	uS		
Dissolved Oxygen (bott	··		
Dissolved Oxygen (surf			
	FISH COLLECTIO	N SUMMARY	
Date of Setting	2001-03-14	Date of Collection	2001-03-1
Time of Setting	11:10	Time of Collection	10:45
Number of traps set	7	Number of traps collected	7
NOTE: Cluster contains three traps within Capture Cluster		Captured per Cluster	
Method Number Denth Domin	Sub Percent nant Dominant ice cover		
MT 2	95 CO / 2	RB / 3 / / / /	
	Commen	nts 🚌	
pH = 7.2			
Lnc not sampled			

67

(15) (15)

(°)

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

. Viille

in

100

(

i

(66)

i.

166

RIC-5

first three letters of stream name-site number

PHOTO DOCUMENTATION

VISIT #

4

و محمد بالمربع المربع المرابع. و محمد محمد بو من المربع المربع المربع المربع المربع المربع المربع المربع المربع

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	CO	44	0.8	UM	
MT	1	2	CO	51	1.3	UM	
MT	1	2	RB	110	12.9	UM	
MT	1	2	RB	41	0.7	UM	
MT	1	2	RB	68	3.7	UM	
MT	1	3	CO	46	1	UM	
MT	1	3	RB	67	3.2	UM	
MT	1	3	СН	70	4	UM	
MT	1	4	RB	38	0.9	UM	
MT	1	4	RB	77	5.2	UM	
MT	1	4	CO	52	1.4	UM	
MT	1	4	CO	55	1.8	UM	
MT	1	4	RB	43	0.9	UM	
MT	1	4	RB	45	0.6	UM	
MT	1	4	RB	86	7.1	UM	

	SID-1	first three letters of stream name-site number		VISIT	# 1
			Date of sur 2000-12-		Surveyors TJ,TD,JD
Gazetted Stream Name		ream Name	Watershed Code		
Upper Bulkley River Sid	de Channel				
Weather Overc	ast				
Air Temperature	2 ° c		Stream Flow	L (High, Moderate, Lim	ited, None)
ce Cover (%)	80	Poten	tial for fish migration	M (High, Moderate, Lim	ited, None)
LIMNO	LOGY STAT	ION	FISE	SUMMARY	
Depth from upper sur	rface of ice (cm)	100	Total # o		faximum
Ice thickness (cm)		8	Species Fish	Length (mm) Le	ngth (mm)
Clarity of Ice (H,M,L	., or N)	N	PCC 2		
(High, Moderate, Limited, N Snow Depth (cm)	lone)	0	SUC 2		
Water Temps		1.5 ^c			
Turbidity (H. (High, Moderate,		C			
Conductivity	'	180 <i>uS</i>			
Dissolved Or	xygen (bottom)	9 ppm			
Dissolved Ox	xygen (surface)	ppm			
		FISH COLLECT	TION SUMMARY		
Date of Setting	2000-1	2-20	Date of	Collection	2000-12
Time of Setting	11:4	5	Time o	f Collection	9:50
Number of traps set	6		Numbe	er of traps collected	6
NOTE: Cluster contains three	e traps within an ~5 meter Instream		umber Captured per Cluster		
	Mean Sub Depth Dominant Domi	6			
MT 1			2 PCC / 1 /		
MT 2		80 PCC /	1 /		

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	SID-1	first three letters of stream name-site number	VISIT # 1
		PHOTO DOCUMENTATI	ON

INDIVIDUAL FISH DATA

Site Name (e.g. TOB-1)	ID - 1 first three le name-site nu	tters of stream Imber	VISIT	# 2
		Date of s 2001-0		Surveyors TJ,TD,JD
Gazetted Stream Name Upper Bulkley River Side (Local Stream Name	Watershed Code		
Weather Snowing	5			
Air Temperature	-5 ° C	Stream Flow	(High, Moderate, Limit	ed, None)
ce Cover (%)	100	Potential for fish migration	(High, Moderate, Limit	ed, None)
LIMNOLO	OGY STATION	FIS	H SUMMARY	
Depth from upper surfac	xe of ice (cm) 101			
Ice thickness (cm)	34			
Clarity of Ice (H,M,L, or (High, Moderate, Limited, None)				
Snow Depth (cm)	27			
Water Temperat		С		
Turbidity (H,M, (High, Moderate, Lov	w, or Clear)			
Conductivity	160	uS		
Dissolved Oxyg	gen (bottom) 9	ppm		
Dissolved oxyg		••		
Dissolved Oxyg	gen (surface)	ppm		
	en (surface)			r to to to to
Dissolved Oxyg	en (surface)	PPPM COLLECTION SUMMARY	of Collection	2001-01-1
Dissolved Oxyg	en (surface)	PPT POLLECTION SUMMARY Date		2001-01-
Dissolved Oxyg Date of Setting	en (surface) FISH C 2001-01-09	ppm OLLECTION SUMMARY Date Tim	of Collection	
Dissolved Oxyg Date of Setting Time of Setting	ren (surface) FISH C 2001-01-09 12:30	ppm OLLECTION SUMMARY Date Tim	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting Number of traps set	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim Num	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting Number of traps set	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim Num	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting Number of traps set	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim Num	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting Number of traps set January 10th, overcast NO FISH CAUGHT A	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim Num	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting Number of traps set January 10th, overcast NO FISH CAUGHT A	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim Num	of Collection e of Collection	10:50
Dissolved Oxyg Date of Setting Time of Setting Number of traps set January 10th, overcast NO FISH CAUGHT A	gen (surface) FISH C 2001-01-09 12:30 6	ppm OLLECTION SUMMARY Date Tim Num	of Collection e of Collection	10:50

[a

2007 (2008) (20) 2007 (20) 2007 (20)		SITE VISIT DESCRIPT	ON
Site Name (e.g. TOB-1)	SID- 1	first three letters of stream name-site number	VISIT # 2
		PHOTO DOCUMENTATI	DN

INDIVIDUAL FISH DATA

-

η

		E VISIT DESCRIPTION
Site Name (e.g. TOB-1)	D - 1 first three name-site	e letters of stream VISIT # 3
		Date of surveyTime of surveySurveyors2001-02-0611:10TJ,TD,JD
Gazetted Stream Name	Local Stream Nam	
Upper Bulkley River Side C	hannel	
Weather High over	rcast, light snowfall.	
Air Temperature -	10 ° C	Stream Flow M (High, Moderate, Limited, None)
ce Cover (%)	00	Potential for fish migration L (High, Moderate, Limited, None)
LIMNOLO	GY STATION	FISH SUMMARY
Depth from upper surface	e of ice (cm) 99	Total # of Mininimum Maximum
Ice thickness (cm)	45	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or	N) N	NFC 0 0 0
(High, Moderate, Limited, None) Snow Depth (cm)	20	
Water Temperatu	ure 0.5	° c
Turbidity (H,M, I (High, Moderate, Low,		
Conductivity	140	uS
Dissolved Oxyge	n (bottom) 9	ppm
Dissolved Oxyge	n (surface)	ppm
	FISH	COLLECTION SUMMARY
Date of Setting	2001-02-06	Date of Collection 2001-02-07
Time of Setting	11:10	Time of Collection 10:05
Time of Setting		
Number of traps set	6	Number of traps collected 6
Number of traps set	s within an ~5 meter diameter area	a
Number of traps set	s within an -5 meter diameter area Instream Cover Sub Percent	a Species/ Number Captured per Cluster
Number of traps set	s within an ~5 meter diameter area Instream Cover	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	swithin an -5 meter diameter area Instream Cover Sub Percent Dominant Ice cove	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	swithin an -5 meter diameter area Instream Cover Sub Percent Dominant Ice cove	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	swithin an -5 meter diameter area Instream Cover Sub Percent Dominant Ice cove	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	swithin an -5 meter diameter area Instream Cover Sub Percent Dominant Ice cove	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number Method MT	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number Method MT	swithin an -5 meter diameter area Instream Cover Sub Percent Dominant Ice cove	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1 0H = 7.6	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove 100	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth MT 1	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove 100	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1 0H = 7.6	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove 100	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1 0H = 7.6	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove 100	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1 0H = 7.6	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove 100	a Species/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1 0H = 7.6	a within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cove 100	a Species/ Number Captured per Cluster

ſ

Site Name (e.g. TOB-1)	SID- 1	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATIO	N
Roll Name	Frame Numbe	r Photo Description	
OW3	20	Site view looking from highway.	

		SCRIPTION
Site Name (e.g. TOB-1) SID	= 1 first three letters of stream name-site number	VISIT # 4
		Date of surveyTime of surveySurveyors2001-03-0611:50TJ,TD,JD
Gazetted Stream Name		rshed Code
Upper Bulkley River Side Chann		
Weather High overcas	t	
Air Temperature -2	°C	Stream Flow L (High, Moderate, Limited, None)
ce Cover (%) 100	Potential	for fish migration M (High, Moderate, Limited, None)
LIMNOLOGY	STATION	FISH SUMMARY
Depth from upper surface of i	ce (cm) 97	Total # of Mininimum Maximum
Ice thickness (cm)	36	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N)	N	NFC 0 0 0
(High, Moderate, Limited, None) Snow Depth (cm)	28	
Water Temperature	1.7 ° C	
Turbidity (H,M, L, or	C) C	
(High, Moderate, Low, or Cl Conductivity	ear) uS	
Dissolved Oxygen (bo	ottom) 9 ppm	
Dissolved Oxygen (su		
	ppin	
	FISH COLLECTIO	N SUMMARY
	FISH COLLECTIO	Date of Collection 2001-03-07
	FISH COLLECTIO	
Date of Setting	FISH COLLECTIC	Date of Collection 2001-03-07
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Caphure Cluster	FISH COLLECTIC 2001-03-06 11:50 6 in an -5 meter diameter area Instream Cover Species/ Number	Date of Collection2001-03-07Time of Collection10:00
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	FISH COLLECTIC 2001-03-06 11:50 6 in au -5 meter diameter area Instream Cover Sub Percent Sub Percent Sub Percent Sub Percent	Date of Collection2001-03-07Time of Collection10:00Number of traps collected6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number MT 1	FISH COLLECTIC 2001-03-06 11:50 6 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 NFC/	Date of Collection2001-03-07Time of Collection10:00Number of traps collected6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	FISH COLLECTIC 2001-03-06 11:50 6 in au -5 meter diameter area Instream Cover Sub Percent Sub Percent Sub Percent Sub Percent	Date of Collection2001-03-07Time of Collection10:00Number of traps collected6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number MT 1 0 0 0 0 0 0 0 0 0 0 0 0 0	FISH COLLECTIC 2001-03-06 11:50 6 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 NFC/	Date of Collection2001-03-07Time of Collection10:00Number of traps collected6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number MT 1	FISH COLLECTIC 2001-03-06 11:50 6 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 NFC/	Date of Collection2001-03-07Time of Collection10:00Number of traps collected6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number MT 1 MT 2 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6 er Captured per Cluster ////////////////////////////////////
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number MT 1 0 0 0 0 0 0 0 0 0 0 0 0 0	FISH COLLECTIC 2001-03-06 11:50 6 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6 er Captured per Cluster ////////////////////////////////////
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Depth Don MT 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Depth Don MT 1 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Depth Don MT 1 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Depth Don MT 1 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Depth Don MT 1 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Depth Don MT 1 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Depth Don MT 1 MT 2	FISH COLLECTIC 2001-03-06 11:50 6 In au -5 meter diameter area Instream Cover Sub Percent ice cover 100 NFC/ NFC/	Date of Collection 2001-03-07 Time of Collection 10:00 Number of traps collected 6

SITE VISIT DESCRIPTION		
------------------------	--	--

Site Name (e.g. TOB-1)

686

100

(and

6

(

6

6

lain

SID|-|1

1. 1. 1. ee

first three letters of stream name-site number

VISIT

4

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Fork Length Fish **Type of Recaptured Fin** Capture Cluster Trap Species Type of Fin Clip Method Weight (g) Clip Number Number (mm) (e.g. adipose, upper caudal, none) NFC MT 1 1 NFC MT 1 2 MT 1 3 NFC MT 2 1 NFC 2 2 NFC MT 2 3 NFC MT

Site Name (e.g. TOB-1)	SID-2	first three letters of stream name-site number	VISIT #	1
				rveyors
				J,TD,JD
Gazetted Stream N Upper Bulkley Riv		tream Name Watershed	l Code	
Weather C	Dvercast			
Lir Temperati	ure 2°c		Stream Flow L (High, Moderate, Limited,)	None)
ce Cover (%)		Potential for f		
LIM	NOLOGY STAT	ΓΙΟΝ	FISH SUMMARY	
Depth from up	per surface of ice (cm)	0	an ana ang ang ang ang ang ang ang ang a	
Ice thickness (c	cm)	0		
Clarity of Ice (I		Ν		
(High, Moderate, Lin Snow Depth (Ci		0		
Water	Temperature	2.9 ° C		
	lity (H,M, L, or C) foderate, Low, or Clear)	С		
Condu	ctivity	170 <i>uS</i>		
	ved Oxygen (bottom)	6 ppm		
	ved Oxygen (surface)	FISH COLLECTION S	NIMMADV	
Date of Setting	2000-1	Contraction and the set of the se	The second s	2000-12-07
Time of Setting			Time of Collection	9:40
Number of trap	os set 3		Number of traps collected	3
		nen metter tie r icht son bie	a sa ata na mina mina pina amin'ny s	
		Comments		
oH = 7.6				
oH = 7.6 No fish caught				

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	SID-2	first three letters of stream name-site number	VISIT # 1
		PHOTO DOCUMENTATI	ON

INDIVIDUAL FISH DATA

-

()

Site Name SII	J-12	SILE VISIE DI	ESCRIPTION	VI	SIT # 2
(e.g. TOB-1)	1	name-site number	Date of su		
			2001-01		TJ,TD,JD
Gazetted Stream Name Upper Bulkley River Side Cha	Local Strea	am Name Wa	ershed Code		
Weather Snowing.					
Air Temperature -5]° c		Stream Flow	M (High, Moder	ate, Limited, None)
(ce Cover (%) 50		Potentia	l for fish migration	M (High, Moder	ate, Limited, None)
LIMNOLOO	FY STATI	ON	FISI	H SUMMARY	C
Depth from upper surface o	of ice (cm)	49	and the second secon	an an ann an tha ann an	αδημαγιστές, μεταγραφία μεταγγούς, μεταγ
Ice thickness (cm)		4			
Clarity of Ice (H,M,L, or N (High, Moderate, Limited, None) Snow Depth (cm)) (0			
Water Temperature	. !	1.5]°c			
Turbidity (H,M, L,	or C)	C			
(High, Moderate, Low, o Conductivity	r Clear)	180 uS			
Dissolved Oxygen	(bottom)	7 ppm			
Dissolved Oxygen	(surface)	ppm		·	
	J	ISH COLLECTIO	ON SUMMARY		
Date of Setting	2001-01-	09	Date	of Collection	2001-01-10
Time of Setting	12:00			of Collection	10:30
Number of traps set	3		num	per of traps collected	3
n an tha she and she says and a string possible she was seen as	1 Mart Add Strategy The Law Street	a shakar wang shari tu tu takar wakar matana ka ma	1971 was the amount of the second second	and did the local to at the second second	s and so and the second
		Comm	ents	e stations	

(M)

NO FISH CAUGHT AT THIS SITE.

Broke through 4 cm of ice to get to limno.

January 10/01, All ice has melted from this site.

pH = 7.3

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	SID-2	first three letters of stream name-site number	VISIT # 2
an a		PHOTO DOCUMENTATI	ON

((48 ()))

INDIVIDUAL FISH DATA

Site Name	SID-	2 first three letters of stream	VISIT # 3
(e.g. TOB-1)		name-site number	Date of survey Time of survey Surveyors
			2001-02-06 11:40 TJ,td,JD
Gazetted Stream N Upper Bulkley Riv		Local Stream Name	Watershed Code
	ligh overcast, 1	ight snowfall	
	ingir överedasi, i		
Air Temperatu	ure <u>-10</u> ° (C	Stream Flow M (High, Moderate, Limited, None)
ce Cover (%)	100	Pote	ential for fish migration M (High, Moderate, Limited, None)
LIM	NOLOGYS	STATION	FISH SUMMARY
Depth from upp	per surface of ice ((cm) 42	Total # of Mininimum Maximum
Ice thickness (c	em)	5	Species Fish Length (mm) Length (mm) PCC 0 0 0
Clarity of Ice (I		Ν	
(High, Moderate, Lin Snow Depth (Ci		0	
Water	Temperature	1.9 ° C	
	ity (H,M, L, or C) loderate, Low, or Clear)		
Condu		130 <i>uS</i>	
Dissol	ved Oxygen (botto	om) 7 ppm	
Dissolv	ved Oxygen (surfa		
		FISH COLLEC	CTION SUMMARY
Date of Setting		2001-02-06	Date of Collection 2001-02-0
Time of Setting	ł	<u>11:40</u> 3	Time of Collection9:40Number of traps collected3
manner of rtab	L	n ~5 meter diameter area	<u> </u>
NOTE: Cluster contain	ns three traps within a		Number Captured per Cluster
Capture Cluster	Mean	Sub Percent	
Capture Cluster	Mean		
Capture Cluster Method Number	Mean	Sub Percent	
Capture Cluster Method Number	Mean	Sub Percent	
Capture Cluster Method Number	Mean	Sub Percent	
Capture Cluster Method Number MT 1	Mean Depth Domina	Int Dominant ice cover	
Capture Cluster Method Number MT 1	Mean Depth Domina	sub Percent ice cover 100 PMC	omments
Capture Cluster Method Number MT 1	Mean Depth Domina	sub Percent ice cover 100 PMC	
Capture Cluster Method Number MT 1 pH = 8.1 February 16/01		sub Percent ice cover 100 PMC	
Capture Cluster Method Number MT 1 pH = 8.1 February 16/01 Temperature =	Mean Depth Domina 	Sub Percent ice cover 100 PMC	
Capture Cluster Method Number MT 1 pH = 8.1 February 16/01 Temperature =		Sub Percent ice cover 100 PMC	
Capture Cluster Method Number MT 1 0H = 8.1 February 16/01 Temperature =	Mean Depth Domina 	Sub Percent ice cover 100 PMC	
Capture Cluster Method Number MT 1 0H = 8.1 February 16/01 Femperature =	Mean Depth Domina 	Sub Percent ice cover 100 PMC	

				SITE VIST	r desc	RIPTION	
Site Nam (e.g. TOB		SID-	2	first three letters of stream name-site number	1		VISIT # 3
n la ser Si da C La secta a sec				РНОТО D	OCUME	NTATION	
Roll Na	ne Fr	ame Num	ber Ph	oto Description	· · · · ·		
OW	3	18	Site	view			
		anter anter anter anter			ATOPTOT	DATA	
				INDIVIDU	AL RISH		
Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	NFC				
MT	1	3	PCC				

		SITE VISIT DESC	CRIPTION			
Site Name (e.g. TOB-1)	SID-2	first three letters of stream name-site number		VISI	T # 4	
(e.g. 100-17	L L	-	Date of sur		Surveyors	
0	N	North Materia	2001-03-	06 11:30	TJ,TD,JD	
Gazetted Stream Upper Bulkley	n Name Lo River Side Channel	cal Stream Name Watershe	d Code			
Weather	High overcast					
Air Tempera	ature -2 ° c		Stream Flow	L (High, Moderate, I	Limited, None)	
Ice Cover (%	(a) 10	Potential for	fish migration	(High, Moderate, I	Limited, None)	
LI	MNOLOGY SI	ATION	FISH	SUMMARY		
Depth from	upper surface of ice (cn		Total # o		Maximum	
Ice thickness	s (cm)	0	pecies Fish		Length (mm)	
	e (H,M,L, or N)		NFC 0	0		
(High, Moderate Snow Depth		0				
	er Temperature	3.8 °C				
	bidity (H,M, L, or C)	C				
(High	ductivity	uS				
	solved Oxygen (bottom) solved Oxygen (surface					
		FISH COLLECTION	SIMMADV			
Data of Data		n i nan gana na maganan kata na kata kata na kata na mata kana na mata kata na mata na kata na mata na kata na Mata mata na mata na mata kata na kata na kata na kata na mata kata na mata na mata na kata na mata na kata na m	and the second of the second o	f Collection	2001-03-07	
Date of Settin Time of Setti		01-03-06 11:30	Date of Collection2001-03-07Time of Collection9:45			
Number of t		3		er of traps collected	3	
	ntains three traps within an ~	5 meter diameter area				
Capture Clust	ег Меал	tream Cover Species/ Number Ca Sub Percent	ptured per Cluster			
Method Numb		Dominant ice cover				
		Comment	5			
Section Reads	ા હાર્યક્રિક અંગ્રે કે ગાઉ કે બિંજ કે છે.		ing ana panahing ing taking ing taking pang pang pang pang pang pang pang pa	a kan bada kana sa	n over her som en state en som en	
pH = 7.5						

			SITE VISIT DESCRIPT	ION	
Site Name (e.g. TOB-1)	SID-	2	first three letters of stream name-site number	VISIT #	4
		anto a sure La serie de la serie	PHOTO DOCUMENTATIO	ØN	
		e de la composición d	INDIVIDUAL FISH DATA		

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	2	NFC				
MT	1	2	NFC				
MT	1	3	NFC				

	SITE VIS	IT DESCRIPTION		
Site Name (e.g. TOB-1)	= 3 first three letters of stransmersite number	am	VISIT	# 1
		Date of su 2000-1		Surveyors TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code	11:52	13,10,30
Upper Bulkley River Side Chan				
Weather Overcast				
Air Temperature 2]°c	Stream Flow	L (High, Moderate, Limit	ed, None)
Ice Cover (%) 0] •	otential for fish migration	M (High, Moderate, Limit	ed, None)
LIMNOLOG	Y STATION	FIS	HSUMMARY	
Depth from upper surface of	ice (cm) 58	. A service of the support of the service of the se	antar caracter des esterios, par la	an an ann an t-an t-an
Ice thickness (cm)	0			
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)	Ν			
Snow Depth (cm)	0			
Water Temperature	3 °C			
Turbidity (H,M, L, c (High, Moderate, Low, or (
Conductivity	180 uS			
Dissolved Oxygen (I	bottom) 8 ppm			
Dissolved Oxygen (s	surface) ppm			
	FISH COLL	ECTION SUMMARY		
Date of Setting	2000-12-06	Date	of Collection	2000-12-07
Time of Setting	11:32	Time	of Collection	9:46
	6	Num	ber of traps collected	6

alls.

H = 7.3			
fish caught	 	 	

			SITE VISIT DESCRIPT	ION	
Site Name (e.g. TOB-1)	SID-	3	first three letters of stream name-site number	VISIT # 1	
			PHOTO DOCUMENTAT	ION	

.

.....

			SITE V	ISIT DE	SCRIP	TION		
Site Name	SID	- 3	first three letters of				VIS	(T # 2
(e.g. TOB-1)		Lemi Str	name-site number		ershed Code	Date of sur 2001-01-		y Surveyors TJ,TD,JD
Gazetted Stream Upper Bulkley		Local Su	eam name	Wall				
Weather	Snowing							
Air Tempera	ature -5	l.c			Strea	m Flow	M (High, Moderate,	Limited, None)
Ice Cover (%]		Potential	for fish mi	gration	M (High, Moderate,	
EN	INOLOG	Y STAT	ION			-	SUMMARY	
Depth from u	upper surface of	ice (cm)	54			Total # o	f Mininimum	Maximum
Ice thickness	: (cm)		8		Species	Fish	Length (mm)	Length (mm)
Clarity of Ice	e (H,M,L, or N)		N		PCC	0		0
(High, Moderate, Snow Depth			0		WSU	0	0	0
			1.7 ° c					
	er Temperature bidity (H,M, L, c	r C)	C					
(High	, Moderate, Low, or (1
	ductivity		180 uS					
	olved Oxygen (b		8 ppm					F.
	olved Oxygen (s		ppm				anto e setta e s	al constant
			FISH COI	LECTIC	IN SUMI			
Date of Settin		2001-02					f Collection	2001-01-10
Time of Settin	-	12:1	5				of Collection er of traps collected	10:40
Number of tr	aps set	bin an -5 mater	diameter area				er of traps conected	6
Capture Cluste Method Numb MT 1	er Mean	Instream Sub Dminant Domin	Cover S Percent ant ice cover	MC / 1	WSU / 1	r Cluster	//_	
	 Constraints of the second s			Comm	ents			
January 10th	, overcast.							
pH = 7.2								
L								
[

Site Nam (e.g. TOB	ie	SID-[3	SITE VIST		RIPTION	VISIT # [2
				РНОТО D	······			
Capture	Cluster	Trap	Species	INDIVIDU	Fish	Type of Fin Clip	Type of Recaptured F	
Method MT	Number 2	Number	PCC	(mm)	Weight (g)	(e.g. adipose, upper caudal, none)	Clip	
MT	2	1	WSU	1				

N-1

. .

Date of survey Time of survey Surveyses 2001-02-06 11:20 TJ,TD,JD Gazetted Stream Name Local Stream Name Watershed Code Upper Bulkey River Side Channel	Site Name (e.g. TOB-1) SID	- 3 first three letters of stream name-site number	VISIT # 3
Gazetted Stream Name Local Stream Name Wetershed Code Upper Bulkley River Side Channel High overcast, light snowfall Air Temperature -10 ° C Stream Flow M (tigh, Modense, Linnied, Now) Ice Cover (%) 100 Potential for fish migration M (tigh, Modense, Linnied, Now) Ice Cover (%) 100 Potential for fish migration M (tigh, Modense, Linnied, Now) Ice Cover (%) 100 Potential for fish migration M (tigh, Modense, Linnied, Now) Ice Cover (%) 100 Potential for fish migration M (tigh, Modense, Linnied, Now) Ice Cover (%) 100 1 C Total # of Minimum Maximum Ice Cover (%) 100 N N Species Total # of Minimum Maximum Note: Clarity of Ice (H.M.L, or N) 0 0 0 0 0 0 Water Temperature 0.1 ° C C Gazet for Minimum Maximum English (mm) Doil 0 0 0 0 0 0 0 0 0 0			
Upper Bulkley River Side Channel Weather High overcast, light snowfall Air Temperature -10 ° C Stream Flow M (High, Moderne, Limited, Nore) Ice Cover (%) 100 Potential for fish migration M (High, Moderne, Limited, Nore) Ice Cover (%) 100 Potential for fish migration M (High, Moderne, Limited, Nore) Ice Cover (%) 49 Depth from upper surface of ice (cm) 49 Ice LiMNOLOGY STATION Fish Clarity of Ice (H.M.I., or N) N (High, Moderne, Limited, Nore) Species Snow Depth (cm) 0 Water Temperature 0.1 ° C Conductivity 140 µ µS Dissolved Oxygen (bottom) 8 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) Ppm Nother of traps set 6 Notter cluster Species/ Number of traps collected Notter cluster Species/ Number Captured per Cluster Method Number Species/ Number Captured per Cluster Method Noff Noff 100	Gazattad Stream Name	I agai Stream Name	
Air Temperature -10 ° C Stream Flow M (High, Moderate, Limited, New) Air Temperature -10 ° C Stream Flow M (High, Moderate, Limited, New) Ice Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, New) Depth from upper surface of ice (cm) 49 Species FISH SUMMARY Det of Setting 5 Total # of Minimum Maximum Species Total # of Minimum Maximum NFC 0 0 0 0 Water Temperature 0.1 ° C Total # of Minimum Maximum Dissolved Oxygen (bottom) 8 ppm ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm ppm Date of Collection 2001-02-06 Time of Collection 2001-02-06 Time of Setting 11:55 Time of Collection 9:50 Number of traps collected 6 NOTE: Clatter costalta three traps within a - fonce trans Species/ Number Captured per Claster Species/ Number Captured per Claster 6 Motion Nominimis Nominime receiver <td< th=""><th></th><th></th><th>watershed code</th></td<>			watershed code
Interview	Weather High overcas	st, light snowfall	
Depth from upper surface of ice (cm) 49 Lee thickness (cm) 5 Clarity of Ice (H.M., L, or N) N (figh, Mosens, Limed, None) 0 Snow Depth (cm) 0 Water Temperature 0.1 Conductivity 140 Dissolved Oxygen (bottom) 8 ppm ppm Date of Setting 2001-02-06 Time of Setting 11:55 Number of traps set 6 NOTE: Species/ Number Captured per Cluster Method, Number Sub Precedult Method 100 NFC 100 NFC 100 NFC 100 Net extreme traps with a = 5 dater dataset area Capture Cluster Sub Precedult Method Number Minimized Dominant Dominant NFC 100 NFC 100 NFC <			
Ice thickness (cm) 5 Clarity of Ice (H,M,L, or N) N (ligh, Moderse, Limitek, Noro) 0 Snow Depth (cm) 0 Water Temperature 0.1 Conductivity 140 Dissolved Oxygen (bottom) 8 ppm Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Date of Setting 2001-02-06 Time of Setting 11:55 Number of traps set 6 NOTE: Cluster contains three traps withis as -5 meter diameter area Capture Cluster Subminime Tecory Method Number 100 NFC 100 NFC 100	LIMNOLOGY	Y STATION	FISH SUMMARY
Claricy of Ice (H.M.L., or N) (High, Moderne, Limited, None) Snow Depth (cm) Water Temperature Turbidity (H.M. L, or C) (High, Moderne, Low, or Clear) Conductivity Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) Pitel Collection Solved Oxygen (surface) Pitel Collection Solved Oxygen (surface) Number of traps set Solved Freeding MT 1 1 100 NFC NFC Dissolved Oxygen (surface) Species/ Number Captured per Cluster Species/ Number Captured per Cluster Mean Sub Prevent MT 1 Dissolved Oxygen (surface) Solved Pathology (surface) Species/ Number Captured per Cluster Species/ Number (solver) NFC NFC Pitel 7.7 Comments			
Water Temperature 0.1 C Turbidity (H,M, L, or C) C C (High, Moderne, Low, or Clear) C C (High, Moderne, Low, or Clear) 140 uS Dissolved Oxygen (bottom) 8 ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-02-06 Date of Collection Time of Setting 11:55 Time of Collection Number of traps set 6 Number of traps collected NOTE: Cluster costalis three traps witbin as -5 meter dianter area Species/ Number Captured per Cluster Method Number Dominant Dom	Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)		NFC 0 0 0
Turbidity (H,M, L, or C) (High, Moderae, Low, or Clear) Conductivity Id0 uS Dissolved Oxygen (bottom) 8 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-06 Time of Setting 11:55 Time of Collection 2001-02-06 Number of traps set 6 Number of traps collected 6 NOTE: Cluster constant three traps within as -5 meter diameter area Species/ Number Captured per Cluster 6 Motional Dominant Second 100 NFC / / / / / / / / / / / / / / / / / / /	_		
Dissolved Oxygen (bottom) 8 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-06 Time of Setting 11:55 Number of traps set 6 NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Dominant Dominant ice cover MT 1 MT 1 MT 2 Instream Cover Species/ Number Captured per Cluster MT 1 Denin Dominant Dominant ice cover NFC MT 1 100 NFC ////////////////////////////////////	Turbidity (H,M, L, or	·C) C	
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-06 Time of Setting 11:55 Number of traps set 6 Notte: Cluster contains three traps within as -5 meter alameter area Capture Cluster Instream Cover Mean Sub Percent MT 1 1 100 NFC / ////////////////////////////////////	Conductivity	140 <i>uS</i>	
FISH COLLECTION SUMMARY Date of Setting 2001-02-06 Date of Collection 2001-02-06 Time of Setting 11:55 Time of Collection 9:50 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 6 Math Dominant Dominant Species/ Number Captured per Cluster 9 9 MT 1 100 NFC / 1 1 MT 2 100 NFC / 1 1 PH = 7.7 Comments		···	
Date of Setting 2001-02-06 Date of Collection 2001-02-06 Time of Setting 11:55 Time of Collection 9:50 Number of traps set 6 Number of traps collected 6 Norte: Cluster contains three traps withis as -5 meter diameter area Capture Cluster Instream Cover Species/ Number Captured per Cluster Method Number Deminant Dominant MT 1 100 NFC / / / / / / / / / / / / / / / / / / /	Dissolved Oxygen (su		
Time of Setting 11:55 Time of Collection 9:50 Number of traps set 6 Number of traps collected 6 NortE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Cluster Instream Cover Species/ Number Captured per Cluster Method Number Denth Dominant Denth Dominant IO0 INFC / / MT 1 100 INFC / / MT 2 100 INFC / / PH = 7.7			n an
Number of traps set 6 Number of traps collected 6 NortE: Cluster contains three traps within as -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Method Number Mean Sub Percent NFC / MT 1 100 NFC / / MT 2 100 NFC / / PH = 7.7 7.7 1 1 1	-		
NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Instream Cover Method Number Denth Dominant Image: Denth Dominant Im			7.50
Capture Cluster Instream Cover Species/ Number Captured per Cluster Method Number Dominant Dominant Dominant Ice cover MT 1 100 NFC / / / MT 2 100 NFC / / / PH = 7.7 100 NFC / / / /			
pH = 7.7	Method Number Denth Dor MT 1	minant Dominant ice cover	mber Captured per Cluster Image: Image of the second sec
		Com	ments
		e = -16.	
	-		

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	SID-3	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	9N
Roll Name	Frame Number	Photo Description	
OW3	19	Site view looking down from highway	

8 J

in the second se

22

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Receptured Fin Clip
MT	1	1	NFC				
MT	1	2	NFC				
MT		3	NFC				
MT	2	1	NFC				
MT	2	2	NFC				
MT	2	3	NFC				

ite Name e.g. TOB-1) SID -	- 3 first three letters of stream vISIT # 4
.g. 108-1)	Date of survey Time of survey Surveyors
	2001-03-06 11:40 TJ,TD,JD
azetted Stream Name pper Bulkley River Side Channe	Local Stream Name Watershed Code
/eather High overcast	
ir Temperature -2	C Stream Flow L (High, Moderate, Limited, None)
e Cover (%) 95	Potential for fish migration (High, Moderate, Limited, None)
LIMNOLOGY	Y STATION FISH SUMMARY
Depth from upper surface of ic	
Ice thickness (cm)	4 Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
(High, Moderste, Limited, None) Snow Depth (cm)	
Water Temperature	1.8 ° C
Turbidity (H,M, L, or ((High, Moderate, Low, or Cle	
Conductivity	uS
Dissolved Oxygen (bo	ottom) 9 ppm
Dissolved Oxygen (sur	urface) ppm
	FISH COLLECTION SUMMARY
Date of Setting	2001-03-06 Date of Collection 2001-0
Date of Setting Time of Setting	11:40 Time of Collection 9:50
Date of Setting Time of Setting Number of traps set	11:40Time of Collection9:506Number of traps collected6
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster	11:40Time of Collection9:506Number of traps collected6
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Lethod Number Denth Dom	11:40 Time of Collection 9:50 6 Number of traps collected 6 sin an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent ice cover
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Denth Dom	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent minant Dominant ice cover
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Denth Dom MT	11:40 Time of Collection 9:50 6 Number of traps collected 6 sits an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Species/ Number Captured per Cluster minant Dominant ice cover 95 NFC / /
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster fethod Number MT 1 Denth Dom	11:40 Time of Collection 9:50 6 Number of traps collected 6 sits an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Species/ Number Captured per Cluster minant Dominant ice cover 95 NFC / /
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within a pture Cluster Mean Method Number MT 1 MT 2	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within a pture apture Cluster Mean Denth Dom MT 1 MT 2	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster fethod Number MT 1 Denth Dom	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Denth Dom MT 1 MT 2 MT 2	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Denth Dom MT 1 MT 2 MT 2	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1
Date of Setting Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster [ethod Number Denth Dom MT 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1
Date of Setting Time of Setting Number of traps set DTE: Cluster contains three traps within apture Cluster MT 1 0 MT 2 0	11:40 Time of Collection 9:50 6 Number of traps collected 6 site an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Percent minant ice cover PCC / 2 95 PCC / 2 SUC / 1

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

1

. .

13

SID-3

 $\frac{1}{2}$

first three letters of stream name-site number

VISIT #

PHOTO DOCUMENTATION

4

11.195

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT] [1	2	NFC				
MT	1	3	NFC				
MT	2	1	PCC				
MT	2	1	SUC				
MT	2	2	PCC				
MT	2	3	NFC				

	SITE VI	ISIT DESCRIPTION
Site Name (e.g. TOB-1)	= 1 first three letters of name-site number	f stream VISIT # 1
Gazetted Stream Name	Local Stream Name	Date of survey Time of survey Survey 2000-12-18 12:05 BD,TJ,TD Watershed Code Initial State Stat
Upper Bulkley River		
Weather Overcast wi	th snow flurries.	Stream Flow M (High, Moderate, Limited, None)
Ice Cover (%) 100	-	Potential for fish migration H (High, Moderate, Limited, None)
LIMNOLOG	Y STATION	FISH SUMMARY
Depth from upper surface of	Fice (cm) 51	Total # of Mininimum Maximum
Ice thickness (cm)	27	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)		RB 1 73 73
Snow Depth (cm)		
Water Temperature Turbidity (H,M, L, o		
(High, Moderate, Low, or Conductivity	(lear)	
Dissolved Oxygen (
Dissolved Oxygen (
		LECTION SUMMARY
Date of Setting	2000-12-18	Date of Collection 2000-12-19
Time of Setting	12:05	Time of Collection 12:30
Number of traps set	3	Number of traps collected 3
NOTE: Cluster contains three traps wi Capture Cluster Mean Method Number Denth D MT 1	Instream Cover Sj Sub Percent ominant Dominant ice cover 1000 R	pecies/ Number Captured per Cluster
		Comments
3 traps set in 1 cluster off Limno re-established with		ece.

Con Con

				SITE VISI	F DESC	RIPTION	
Site Nam (e.g. TOB	~	BR-	1	first three letters of stream name-site number	1		VISIT # 1
				РНОТО D	OCUME	NTATION	
				INDIVIDU	AL FISH	DATA	
Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	2	RB	73	6.5	UM	

Second State

Sector 3

		SII	E VISIT	DESC	RIPT	ION				
Site Name (e.g. TOB-1)	UBR-		ree letters of stream ite number					VIS	SIT #	2
(e.g. 100-1/	<u> </u>	L			1	Date of su	rvey	Time of surve	y Sur	veyors
					[2001-01	-17	11:50	T,	J,TD,JD
Gazetted Stream N Upper Bulkley Riv		Local Stream Nat	me	Watershed	Code					
				1						
Weather SI	nowing									
۔۔۔ Air Temperatu	re -5 °	С		1	Stream	n Flow	M	(High, Moderat	e, Limited, M	None)
Ice Cover (%)	100		Pote	ntial for f	ish mig	ration	M	(High, Moderat	e, Limited, }	None)
LIMP	NOLOGY	STATION				FISI	H SUI	MMARY		
Depth from upp	an an tha an Tha an tha an t	a de casa da secono de Constante da Constante da Constante da Constante da Constante da Constante da Constante Transmissione da Constante da Cons	size e wal or ser 			Total # (of N	Mininimum	Maxi	mum
Ice thickness (cr		22		Spe	ecies	Fish		ength (mm)	Length	(mm)
Clarity of Ice (H		N	ב ר		СН	2		58	78	3
(High, Moderate, Lim Snow Depth (cn	nited, None)	11			RB	2		81	10	5
•	Temperature	0.1	_]°c							
	ty (H,M, L, or C									
	derate, Low, or Clea	r) 150	$\exists uS$							
	ed Oxygen (bot									
	ed Oxygen (sur		ppm ppm						. <u>.</u>	
			COLLEC	TION S	UMM	ARY				
Date of Setting		2001-01-17	ang talan kalendar Ang	in an an strait anns a' s	n die Higentral	- 11	of Colle	ction	ag er boneste [2001-01-18
Time of Setting		11:50				Time	of Colle	ction	ĺ	13:55
Number of traps	s set	3				Numb	per of tr	aps collected		3
NOTE: Cluster contain	s three traps within	an ~5 meter diameter a Instream Cover	rea Species/1	Number Cap	tured per (Cluster				
Capture Cluster Method Number	Mean Denth Domin	Sub Perce	ent over				·	, . <u> </u>		
MT 1			0 СН	2 RB	/ 2		/			/
			Co	mments						
pH = 7.7	a an an an Arran an A An an Arran a									
[

7.9

(77) --

(V)

and a second
13

Site Name (e.g. TOB-1)

.

UBR -

1

first three letters of stream name-site number

VISIT # 2

等した

- chaine Anne

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Fork Length Fish **Type of Recaptured Fin** Capture Cluster Trap Species Type of Fin Clip Method Number Number (mm) Weight (g) Clip (e.g. adipose, upper caudal, none) CH 78 6.8 UM MT 1 1 UM CH 58 3 MT 1 1 1 2 RB 105 12.8 UM MT 3 RB 81 8.3 UM MT 1

	three letters of stream >-site number Date of survey Time of survey Surveyors 2001-02-14 TJ,TD,JD TJ,TD,JD TJ,TD,JD TJ,TD,JD TJ,TD,JD Stream Flow M (High, Moderate, Limited, None) Potential for fish migration M (High, Moderate, Limited, None)
Gazetted Stream NameLocal Stream NUpper Bulkley RiverWeatherOvercast, part sunAir Temperature4 ° CIce Cover (%)100	2001-02-14 12:40 TJ,TD,JD lame Watershed Code Stream Flow M (High, Moderate, Limited, None)
Upper Bulkley River Weather Overcast, part sun Air Temperature _4 ° C Ice Cover (%) 100	Stream Flow M (High, Moderate, Limited, None)
Air Temperature _4 ° C Ice Cover (%) 100	
Ice Cover (%) 100	
	FISH SUMMARY
Depth from upper surface of ice (cm) 74	Total # of Mininimum Maximum Species Fish Length (mm) Length (mm)
Ice thickness (cm) 19 Clarity of Ice (H,M,L, or N) N	CH 5 61 65
(High, Moderate, Limited, None) Snow Depth (cm)	
Water Temperature	
Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity	
Dissolved Oxygen (bottom)	
Dissolved Oxygen (surface)	ppm ppm
ris	H COLLECTION SUMMARY
Date of Setting 2001-02-14	Date of Collection 2001-02-15
Time of Setting 12:20	Time of Collection 13:27
Number of traps set 3	Number of traps collected 3
Mathad Number .	serea Species/ Number Captured per Cluster cover
	Comments
pH = 7.3	

SITE VISIT DESCRIPTION	
后,我们还是你这些了是你的人,你你你你你你你你你你的你?""你你你你你你你你你你你你你你你你你你你你你你你你你	Sec. 1

Site Name (e.g. TOB-1)

first three letters of stream name-site number

VISIT # 3

ন্দ্র

200

1997

.

UBR - 1

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA ся. С.

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	NFC				
MT	1	3	CH	65	4	UM	
MT	1	3	CH	65	3.1	UM	
MT	1	3	CH	65	4	UM	
MT		3	CH	63	3.5	UM	
MT	1	3	CH	61	3.1	UM	

		SITE	VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	UBR-	1 first three name-site	letters of stream			VISIT #	4
					Date of survey Tin	ne of survey	Surveyors
					2001-03-14	11:45	TJ,TD,JD
Gazetted Stream Na Upper Bulkley Rive		Local Stream Name		Watershed Code			······
wenther St	inny						
Air Temperatu	re -3 °	с		Stre	am Flow M (H	igh, Moderate, Limited	d. None)
Ice Cover (%)	80	•	Pote	ntial for fish m		igh, Moderate, Limited	
IIM	OLOGY	STATION			FISH SUMN	ADV	
al e al constructor de	a da se	an an i sita a da badala da 1977 		to Singe		199 <u>- 199</u> - 199 - 199 - 199	JAMMA NA
Depth from uppe							
Ice thickness (cn		13					
Clarity of Ice (H (High, Moderate, Lim		N					
Snow Depth (cm	h)	0					
Water T	emperature	1.3	°с				
	y (H,M, L, or C derate, Low, or Clea						
Conduct			uS				
Dissolve	d Oxygen (bot	tom) 11	ppm				
Dissolve	ed Oxygen (surf	face)	ppm				
		FISH C	OLLEC	TION SUM	MARY		
Date of Setting		2001-03-14	, an i riy an ea	ang ang sang ang ang ang sang sang sang	Date of Collection		2001-03-15
Time of Setting		11:45			Time of Collection	a	11:20
Number of traps	set	3			Number of traps	collected	3
	-	an ~5 meter diameter area Instream Cover	L Species/ N	lumber Captured pe	er Cluster		
Capture Cluster Method Number	Меал	Sub Percent nant Dominant ice cover					
MT 1		80	NFC /				/
						·	
			an ing a first that the second				
			Con	nments			
pH = 7.1							
		**					

5-2 5-2

42 (42)

13

18

Site Nam (e.g. TOB	ne [JBR-	1	first three letters of stream name-site number			VISIT #	4
				РНОТО D	OCUME	NTATION		
				INDIVIDU	AL FISH	DATA		

.

NFC

NFC

NFC

1

2

3

MT

MT

MT

1

1

1

	المحتيا	5		L DESCRIP.	LIUN			sittestis 1154 🗖	
Site Name (e.g. TOB-1)	UBR-	2	first three letters of stream name-site number				V15	IT # 1	!
					Date of su 2000-12		Time of surve	y Surveyo	
Gazetted Stream Nar		Local St	ream Name	Watershed Code					
JPPER BULKLEY						_			
Weather Cle	ar and cold		· · · · · · · · · · · · · · · · · · ·						
ir Temperatur	e -16°	с		- Strea	m Flow	Μ] (High, Moderate	, Limited, None)	
ce Cover (%)	100		Pot	tential for fish mig	gration	M	(High, Moderate	, Limited, None)	
LIMN	OLOGY	STAT	NON	한 한 사람과 한 것이다. 2003년 1973년 - 1973년 1973년 1973년 1973년 1	FISI	H SU	MMARY		
Depth from upper	surface of ice	: (cm)	100		Total #		Mininimum	Maximum	
Ice thickness (cm))		39	Species	Fish	I	ength (mm)	Length (mm	ו) ר
Clarity of Ice (H,)	VI,L, or N)		N	RB	26			L	J 1
(High, Moderate, Limite Snow Depth (cm)			0	СО	4				
				СН	1				J
	mperature		0.1 C						
	(H,M, L, or C erate, Low, or Clea								
Conductiv	vity		140 <i>uS</i>						
Dissolved	i Oxygen (bot	tom)	10 ppm						
Dissolved	i Oxygen (sur	face)	ppm					· · · ·	
			FISH COLLE	CTION SUMM	AARY		er her her solder solder i der solder State i der solder solder i der solder Französischer State i der solder i der solder i der solder i der solder i Französischer State i der solder i		
Date of Setting		2000-1	2-14		Date	of Colle	ction	2000)-12-
Time of Setting		10:3	0			of Coll		10):30
Number of traps s		3			Numb	per of ti	raps collected		3
NOTE: Cluster contains t	-	an ~5 meter Instream Sub	Cover Species	/ Number Captured per	r Cluster				
Aethod Number		nant Domin	nant ice cover			/ 1			,
MT 1			100 RB _/	26 CO / 4	CH	/_1		/	
							•		
			nga sing as an	rege at the second second	y ny Sanji ya Nanj	پېښې د وېژو و	್ಷ ಇತ್ಯಾಣವರ್ ಸಂಗಾಣಕರು	and the second secon	- Servit
			C	omments					
December 24 air	temp was -	24, coul	ld not sample fish as	s truck was too far	away and	l too c	old to sample	e fish outsic	de.
H = 8 0									
H = 8.0									
· · ··		<u> </u>							
	<u></u>								
	<u></u>		·····						

	*		SITE VISIT DESCRIPT	ION	
Site Name (e.g. TOB-1)	UBR	- 2	first three letters of stream name-site number	VISIT #	1
			PHOTO DOCUMENTATI	ON	

Section 198

Site Name	UBR-2	first three letters of stream name-site number		VISI	T # 2
e.g. TOB-1)	Local S		Date of su 2001-01 atershed Code		Surveyors TJ,TD,JD
Jpper Bulkley River Weather High	overcast				
ir Temperature	-7 ° C		Stream Flow	(High, Moderate,	Limited, None)
ce Cover (%)	100		al for fish migration	M (High, Moderate,	Limited, None)
LIMNO	LOGY STAT	FION	FISI	ISUMMARY	
Depth from upper su	urface of ice (cm)	64	Total # d		Maximum
Ice thickness (cm)		42	Species Fish	Length (mm)	Length (mm)
Clarity of Ice (H,M,I (High, Moderate, Limited, Snow Depth (cm)		N 39	CH 9 RB 14	57	<u>58</u> <u>69</u>
Water Temp	perature	0.1 ° C	KD 14	56	104
	H,M, L, or C) ie, Low, or Clear) Y	C 70 uS			
)xygen (bottom))xygen (surface)	11 ppm ppm			
		FISH COLLECTI	ON SUMMARY		
Date of Setting	2001-0	1-11	Date of	of Collection	2001-01-
Time of Setting	10:3	80	Time	of Collection	10:30
Number of traps set			Numb	er of traps collected	3
fethod Number	Mean Denth Dominant Domi	a Cover Species/ Nurr	aber Captured per Cluster		
MT 1		100 CO / 3	CH / 9 RB	/ 14 /	
				•	
		Comr	nents		
h = 7.8		en an		nadoli (madadadada).	a shi ta ka shi sa s
	eam and downstr	eam of the site.			
liver is open upstro	cam and downsh				
tiver is open upstro anuary 12th, temp					

.....

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

UBR-2

first three letters of stream name-site number **VISIT # 2**

- Y 33

and a

and the second s

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip Type o (e.g. adipose, upper caudal, none)	f Recaptured Fin Clip
MT	1	1	RB	92	9.8	UM	
MT	1	1	RB	104	13	UM	
MT	1	1	RB	80	6.6	UM	
MT	1	1	CH	66	3.4	UM	
MT	1	1	СН	62	3	UM	
MT	1	2	СН	64	3.4	UM	
MT	1	2	RB	68	4.7	UM	
MT	1	2	RB	56	3.8	UM	
MT	1	2	со	46	1.5	UM	
MT	1	2	СН	61	3.3	UM	
MT	1	3	RB	79	7.4	UM	
MT	1	3	RB	68	4.2	UM	
MT	1	3	RB	75	5.8	UM .	
MT	1	3	RB	75	5.7	UM	
MT	1	3	RB	95	13.2	UM	
MT	1	3	RB	72	5.4	UM	
MT	1	3	СН	65	3.5	UM	
MT	1	3	СН	62	2.9	UM	
MT	1	3	СН	57	3	UM	
MT	1	3	RB	69	4	UM	
MT	1	3	RB	59	2.9	UM	
MT	1	3	СН	69	5.1	UM	
MT	1	3	RB	70	4.6	UM	
MT	1	3	СО	58	2.6	UM	
MT	1	3	СН	58	3.1	UM	
MT	1	3	СО	48	2.4	UM	

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	UBR-	12.	first three letters of stream name-site number			VIS	IT # 3
					Date of survey		
					2001-02-08	10:25	TJ,TD,JD
Gazetted Stream N Upper Bulkley Riv		Local Stream	Name	Watershed Code			
		.		I			
weather	ight snowfall	•			- <u></u> .	,,,,,,,,,,	
Air Temperatu	ure <u>-7</u> °	С		Stre	am Flow	(High, Moderate	, Limited, None)
Ice Cover (%)	100		Poter	tial for fish mi	igration	(High, Moderate	e, Limited. None)
LIM	NOLOGY	STATIC	N		FISH S	SUMMARY	
Depth from up	per surface of ice	(cm)	36	0	Total # of	Mininimum	Maximum
Ice thickness (c	m)		57	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (I			N	CO		50	71
(High, Moderate, Lin Snow Depth (cr			21	СН	16	55	71
•	Temperature		0.1 °C	RB	2	71	110
	ity (H,M, L, or C		<u>c</u>				
	oderate, Low, or Clea	r) _	140 uS				
	ved Oxygen (bott		10				
	ved Oxygen (surf		10 ppm ppm				
		·	SH COLLEC	TION SUM	MADV		
Data of Satting		n en sou en se anes	nagariya ng sa		a na ang sa	Self Ale Children Iollaation	2001.02.00
Date of Setting Time of Setting		2001-02-08	5		Date of C Time of C		10:20
Number of trap		10:30 3				of traps collected	3
NOTE: Cluster contain			Deter area				
Capture Cluster	Mean	Instream Cov Sub	Ver Species/ N	umber Captured pe	er Cluster		
Method Number	Denth Domin		ice cover	11 CH / 10	6 RB /	2	
		[]					
						가야 하는 것이다. 같은 것이 같은 것이 같은 것이 같은 것이 같이	
				nments			
			at limno = 57cm, ap hole 135cm tow				
Leo is see 1	h	4					
ice is very slus	ny at new loca	ation measu	ring only ~ 4cm				

Site Name (e.g. TOB-1)	UBR-2	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATIO	N
Roll Name	Frame Number	Photo Description	

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	56	1.7	UM	
MT	1	2	CH	59	2.8	UM	
MT	· 1	2	RB	71	4.8	UM	
MT	1	2	CH	59	3.7	UM	
MT	1	2	RB	110	15.3	UM	
MT	1	2	СН	69	4.7	UM	
MT	1	2	СН	68	3.9	UM	
MT	1	2	СО	55	1.9	UM	
MT	1	2	CO	71	5.1	UM	
MT	1	2	CH	68	3.4	UM	
MT	1	2	СО	60	2.7	UM	
MT	1	2	CH	55	2.2	UM	
MT	1	2	CH	69	4.3	UM	
MT	1	2	СО	65	3.4	UM	
MT	1	2	СН	68	3.8	UM	
MT	1	2	CH	64	3.7	UM	
MT	1	2	СН	62	3.5	UM	
MT	1	2	СО	65	3.6	UM	
MT	1	2	СН	61	2.8	UM	
MT	1	2	CO	55	2.3	UM	
MT	1	2	СН	64	3.9	UM	
MT	1	2	СО	58	2.7	UM	
MT	1	2	CH	60	3.3	UM	
MT	1	2	СН	68	3.3	UM	
MT	1	2	CH	64	2.3	UM	
MT	1	2	СН	71	4.7	UM	
MT	1	2	СН	68	4	UM	
MT	1	2	СО	52	1.8	UM	
MT	1	2	CO	50	1.3	UM	
MT	1	3	СО	61	3.1	UM	

Site Name (e.g. TOB-1) UBR -	2 first three letters of stream name-site number			VIS	L
Gazetted Stream Name	Local Stream Name		e of survey 001-03-08	Time of survey 10:15	Surveyors
Jpper Bulkley River					
Weather Sunny and clea	ır				
ir Temperature -2 °	С	Stream F	low M	(High, Moderate,	Limited, None)
ce Cover (%) 100	Pot	ential for fish migrat	ion M	(High, Moderate,	Limited, None)
LIMNOLOGY	STATION		FISH SU	MMARY	
Depth from upper surface of ice	(cm) 82	-		Mininimum	Maximum
Ice thickness (cm)	23	Species CH	Fish L	ength (mm)	Length (mm)
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)	Ν		8 11	54	76
Snow Depth (cm)	19		2	89	102
Water Temperature	0.3 ° c		4	07	102
Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear Conductivity					
Dissolved Oxygen (botte	om) 11 ppm				
Dissolved Oxygen (surfi					
	FISH COLLEC	TION SUMMA	RY		
Date of Setting	2001-03-08	an da segunde services a construction de la segunde de	Date of Colles	ction	2001-03-0
Time of Setting	10:10		Time of Colle	ction	10:15
Number of traps set	3		Number of tr	aps collected	3
apture Cluster Mean		Number Captured per Clur 8 CO / 11	ster RB / 2		
	C				
	C.	omments			
0H= 7.5					
ice is thick at trap hole but J neters from traphole. A mod		e not far from hole.			

1.56

÷ .	4.77	-74	de la	 2	•
				j.)	1

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1) first three letters of stream name-site number

VISIT # 4

and the

UBR-2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip Type of Recaptured Fin (e.g. adipose, upper caudal, none) Clip
MT	1	1	СН	65	3.4	UM
MT	1	1	CH	62	3	UM
MT] 1] [1	CH	65	3.6	UM
MT	1	1	RB	102	12.8	UM
MT] [1	1	СН	67	3.7	UM
MT] [1	1	CH	66	. 3.5	UM
MT	1	2	CO	76	4	UM
MT	1	2	СО	61	2.6	UM
MT	1	2	СО	75	4.3	UM
MT	1	2	СО	67	3.4	UM
MT	1	2	СО	58	2.5	UM
MT	1	2	СН	63	3.1	UM
MT	1	2	RB	89	8.1	UM
MT	1	2	СО	56	1.8	UM
MT	1	2	СН	59	2.8	UM
MT	1] 2	СН	59	2.6	UM
MT	1	2	СО	70	3.8	UM
MT] [1	2	СО	64	2.7	UM
MT] [1	2	СО	58	2.2	UM
MT	1] 3	СО	58	1.8	UM
MT	1	3	СО	54	1.7	UM

	SITE VISI	T DESCRIPTION
Site Name (e.g. TOB-1)	9 first three letters of stream name-site number	visit # 1
		Date of survey Time of survey Surveyors
		2000-12-05 14:20 BD,TJ,TD
Gazetted Stream Name Upper Bulkley River	Local Stream Name	Watershed Code
Weather High overcast		
ingh overcast		
Air Temperature	c	Stream Flow H (High, Moderate, Limited, None)
Ice Cover (%) 70	-	Dtential for fish migration H (High, Moderate, Limited, None)
LIMNOLOGY		FISH SUMMARY
Depth from upper surface of ice	e (cm) 122	Total # of Mininimum Maximum
Ice thickness (cm)	5	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N)	N	RB 4 91 111
(High, Moderate, Limited, None)		CO 1 71 71
Snow Depth (cm)		CH 1 70 70
Water Temperature	0.5 C	
Turbidity (H,M, L, or C (High, Moderate, Low, or Clea	u)	
Conductivity	120 <i>uS</i>	
Dissolved Oxygen (bot	PP	
Dissolved Oxygen (sur	face) ppm	
	FISH COLLE	CCTION SUMMARY
Date of Setting	2000-12-05	Date of Collection 2000-12-
Time of Setting	14:20	Time of Collection 10:00
Number of traps set	3	Number of traps collected 3
NOTE: Cluster contains three traps within		es/ Number Captured per Cluster
Capture Cluster Mean	Sub Percent nant Dominant ice cover	
MT 1	70 RB	/ 4 CO / 1 CH / 1 / / /
	C	Comments
Ice is too dangerous and wat	er is too deep to set more t	traps. Would like to have set 6 traps but ice is too thin to walk
on.		
Due to weird ice, water is flo	owing over ice in some spo	ots at trap area.
	in some spo	
pH = 7.6		

(iii 4)

87

- 998 - -- -

1990 1992

- 5

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

UBR-9

first three letters of stream name-site number

VISIT # 1

1990 262

Ser - Ser and

Service Services

314

114

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] [1	RB	94	9.1	UM	
MT	1] [1	RB	111	16.6	UM	
MT	1	3	RB	109	14.8	UM	
MT] [1	3	СО	71	4.9	UM	
MT	1	3	СН	70	3.8	UM	
MT	· 1	3	RB	91.	8.7		

			SITE VI	SIT DI	ESCRIP	TION				
Site Name (e.g. TOB-1)	UBR	- 9	first three letters of s name-site number	itream				VIS	I T # [2
						Date of surve		me of survey		veyors
						2001-01-0	8	10:50	TJ,	,TD,JD
Gazetted Stream Upper Bulkley		Local S	ream Name	Wat	ershed Code]
Weather	Sunny and	Clear					_			
W Cather	Sumily and	Cical								
Air Tempera	ture -4]°c			Stre	am Flow	M	High, Moderate,	Limited, No	one)
Ice Cover (%) 100			Potentia	for fish mi	igration	H a	High, Moderate,	Limited, No	one)
LIN	ANOLOG	Y STA	ION			FISH	SUM	MARY		
Depth from u	upper surface of	fice (cm)	96			Total # of		inimum	Maxim	
Ice thickness	(cm)		23		Species	Fish	Leng	gth (mm)	Length	(mm)
	(H,M,L, or N)		Ν		СН	4		62	72	
(High, Moderate, Snow Depth			28		RB	2	L_	81	90]
Wate	er Temperature		0.3 ° C							
Turb	oidity (H,M, L,		C							
	, Moderate, Low, or ductivity	Clear)	150 uS							
	olved Oxygen (bottom)	11 ppm							
	olved Oxygen (ppm ppm							
			FISH COL	LECTIO	ON SUMI	MARY				
Date of Settin	g	2001-0	1-08			Date of	Collectio	n	2	001-01-09
Time of Settin	ng	10:	50			Time of			Ļ	10:35
Number of tr		3		- X	<u>_</u> *=	Number	of traps	collected	L	3
NOTE: Cluster con Capture Cluster	1	thin an ~5 mete Instream		ecies/ Numb	er Captured pe	er Cluster				
Method Numb	Ivicali	Su Cominant Domi	nant ice cover							
MT 1			100 CH	4	RB / 2	! []/	[
								,		
		SZNA		Comm	ente					
	ور دیکھری در اور 1995ء میں اور			Collin	011125	사망가 좋은 30 1000kg 이야지 않는 것이 같은 30kg 등 30 				and set
pH = 7.3										
January 9th,	overcast and	cold.								
			-							

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

UBR-9

first three letters of stream name-site number VISIT # 2

. 19

> (ř. 1) 10

1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	СН	72	6.2	UM	
MT	1	2	СН	69	4.2	UM	
MT	1	2	СН	68	4.3	UM	
MT	1	2	RB	81	7.3	UM	
MT	- 1	2	CH	62	3.9	UM	
MT	1	2	RB	90	10.6	UM	
MT	1	3	NFC				

				DESCRIPT	LION	
Site Name (e.g. TOB-1)	BR-		three letters of stream e-site number		VI	SIT # 3
					Date of survey Time of surv 2001-02-05 10:20	ey Surveyors
Gazetted Stream Name		Local Stream N	lame	Watershed Code		
Upper Bulkley River						
Weather High	overcast					
Air Temperature	-10 ° (C		Stream	m Flow M (High, Modera	te, Limited, None)
Ice Cover (%)	100		Poter	itial for fish mig	gration M (High, Modera	te, Limited, None)
LIMNOI	logy	STATION			FISH SUMMARY	
Depth from upper sur	face of ice ((cm) 11	2	Graning	Total # of Mininimum	Maximum
Ice thickness (cm)		38	1	Species	Fish Length (mm)	Length (mm)
Clarity of Ice (H,M,L,		Ν		RB	2 94	106
(High, Moderate, Limited, No Snow Depth (cm)	one)	4		СН	4 69	86
Water Tempe Turbidity (H,) (High, Moderate,	M, L , o r C)		=~			
Conductivity	Low, of Cical)	10	0 uS			
Dissolved Ox	ygen (botto	om) 10	ppm			
Dissolved Ox	ygen (surfa	.ce)	ppm			
		FIS	H COLLEC	TION SUMM	IARY	
Date of Setting	a e l'Alexa	2001-02-05	and a second and the	a transforma de la companya de la co	Date of Collection	2001-02-06
Time of Setting	[10:20			Time of Collection	10:20
Number of traps set		3			Number of traps collected	3
NOTE: Cluster contains three t						
Neede and Neede and an	ean		rcent	umber Captured per	Cluster	
	enth Domina		00 CH	4 RB / 2		
					,	
			Cor	nments		
pH = 7.8	alandi in	n de servicios T			alag Kalana Alika.	
-	= -11 wi	th light snow	fall.			
l coluary of or remp						
	t colores	d alima				
Traps covered in rust	t coloured	l slime				
	t coloured	d slime				
	t coloured	d slime				

and a second sec

计工作 医牙结 法公司 经边境公司 医可能性胸膜炎 医阿尔氏试验检尿道检验	"도 방송 승규는 승규는 가지 않는 것이 가지 않는 것이 가지 않는 것 같아. 이 가지 않는 것이 가지 않는 것이 같이 있는 것이 없다. 것이 같이 있는 것이 없는 것이 없 않 않이 않		
	STUDY VICTORIAN	CODIDTION	
	SITE VISIT DE	SUKIFIRJN	그는 사람은 승규가 물건을 하는 것이 많이 많이 했다.
化二氯化物 医颈骨膜炎 医外侧侧 计软件编辑字母 化合合合金 法法律法律	والمساد والمعادية مستقد بالمناقب والمتحد والمتحد والمتحد والمتحد والمحادث		같이 같이 바람이 있다. 동안 이 가격은 이 일이라서 이 가격하는 것

Site Name (e.g. TOB-1)

UBR-9

first three letters of stream name-site number

VISIT # 3

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	RB	106	16.2	UM	
MT		2	RB	94	9.6	UM	
MT] 1	3	СН	70	4.6	UM	
MT] 1	3	СН	86	8.6	UM	
MT		3	СН	69	4.3	UM	
MT	1	3	CH	75	4.9	UM	

	and the second	ESCRIPTION	
Site Name (e.g. TOB-1)	first three letters of stream name-site number	VIS	5IT # 4
		Date of survey Time of surve	
		2001-03-05 10:25	TJ,TD,JD
Gazetted Stream Name Upper Bulkley River	Local Stream Name W	'atershed Code	
Weather Sunny and cle			
Sumily and cie	a		
Air Temperature -7	°C	Stream Flow M (High, Moderate	e, Limited, None)
Ice Cover (%) 100		al for fish migration M (High, Moderate	e, Limited, None)
LIMNOLOGY	STATION	FISH SUMMARY	
Depth from upper surface of ic	e (cm) 98	Total # of Mininimum	Maximum
Ice thickness (cm)	54	Species Fish Length (mm)	Length (mm)
Clarity of Ice (H,M,L, or N)	Ν	CH 4 66	73
(High, Moderate, Limited, None) Snow Depth (cm)	12	RB 2 77	93
Water Temperature	0.4 ° C		
Turbidity (H,M, L, or (
(High, Moderate, Low, or Cle Conductivity			
Dissolved Oxygen (bo	(hand)		
Dissolved Oxygen (sur			
	FISH COLLECTI	ION SUMMADV	
Date of Setting	2001-03-05	Date of Collection	2001-03-06
Time of Setting	10:25	Time of Collection	10:30
Number of traps set	3	Number of traps collected	3
NOTE: Cluster contains three traps within			
Capture Cluster Mean Method Number Depth Dom	Sub Percent	nber Captured per Cluster	
MT 1	inant Dominant ice cover		
	Com	ments	
pH = 7.0		ments	
	Com	ments	
pH = 7.0	Com	ments	
pH = 7.0	Com	ments	
pH = 7.0	Com	ments	
pH = 7.0	Com	ments	

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

UBR-9

first three letters of stream name-site number

VISIT # 4

6

1

a star territoria da seconda da s

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	NFC				
MT] [1	3	RB	77	5	UM	
MT	1	3	RB	93	8.7	UM	
MT	1	3	СН	66	3.2	UM	
MT	1	3	CH	70	3.4	UM	
MT	1	3	Сн	73	4	UM	
MT	1	3	СН	71	3.5	UM	

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	UBR-	10	first three letters of stream name-site number		Data of survey		
					Date of survey 2000-12-05	14:25	y Surveyors BD,TJ, TD
Gazetted Stream N	ame	Local Strea	am Name	Watershed Code			
Upper Bulkley Riv	er						
Weather H	igh overcast						
Air Temperatu	re 4°	С		Strea	m Flow	H (High, Moderate	, Limited, None)
Ice Cover (%)	70		Poter	tial for fish mi	gration	H (High, Moderate	, Limited, None)
LIMP	OLOGY	STATI	ON		FISH S	UMMARY	
Depth from upp	er surface of ice	: (cm)	102		Total # of	Mininimum	Maximum
Ice thickness (cr	n)	1	0	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H	,M,L, or N)			NFC	0	0	0
(High, Moderate, Lim	ited, None)	1					
Snow Depth (cn		l					
	emperature		0.1 C				
	y (H,M, L, or C derate, Low, or Clea		C				
Conduc	tivity		120 uS				
Dissolv	ed Oxygen (bot	tom)	12 ppm				
Dissolv	ed Oxygen (sur	face)	ppm				
			ISH COLLEC	TION SUM	MARY		
Date of Setting		2000-12-	05		Date of C	ollection	2000-12-06
Time of Setting		14:25			Time of C	Collection	10:10
Number of traps	set	3			Number o	of traps collected	3
			Co	nments		아는 문화 가장 같은	
			en an	un ana si	services of these		
Would have like Traps set near w			e to unsafe ice cond	itions, could on	ly set 3 traps.		
pH = 7.6	· <u>·</u> ·····						
No fish caught.							

Site Name (e.g. TOB-1)	UBR-	10	first three letters of stream name-site number	VISIT # 1
			PHOTO DOCUMENTATI	ON

17. 18. 18.

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	UBR-	10	first three letters of stream name-site number			VIS	IT # 2
					Date of survey	Time of surve	y Surveyors
					2001-01-08	11:00	TJ,TD,JD
Gazetted Stream N		Local Stre	am Name	Watershed Code			
Upper Bulkley Riv	er						
Weather Su	inny and cle	ar				8.2	
Air Temperatu	re <u>-4</u> °	с		Stre	am Flow 🚺	(High, Moderate	, Limited, None)
Ice Cover (%)	100		Pote	ntial for fish m	igration	H (High, Moderate	e, Limited, None)
LIMN	OLOGY	STAT]	ON		FISH S	UMMARY	
Depth from uppe	er surface of ice	e (cm)	84		Total # of	Mininimum	Maximum
Ice thickness (cn	n)		24	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H	,M,L, or N)		N	СН	1	91	91
(High, Moderate, Lim	ited, None)			RB	2	70	83
Snow Depth (cm	-		25				
Water T	emperature		0.3 C				
	y (H,M, L, or (derate, Low, or Clea		C				
Conduct			130 uS				
Dissolve	ed Oxygen (bot	tom)	11 ppm				
Dissolve	ed Oxygen (sur	face)	ppm				
			FISH COLLEC	TION SUM	MARY		
Date of Setting		2001-01-	-08		Date of Co	ollection	2001-01-09
Time of Setting		11:00	 ·]		Time of C	ollection	13:45
Number of traps	set	3			Number o	of traps collected	3
NOTE: Cluster contains	-						
Capture Cluster Method Number	Mean	Instream (Sub	Percent	Jumber Captured pe	er Cluster		
MT 1	Denth Domi	nant Domina	100 CH	1 RB / 2			
				r			
				•			
			Cor	mments			
pH = 7.6							
January 9th, ove	ercast						
							·

71

(43) (43)

Arite Arite

· 114

14

WB

SITE VISIT DESCRIPTION	

Site Name (e.g. TOB-1)

UBR - 10

1

first three letters of stream name-site number

VISIT # 2

4

(777)

10

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	CH	91	10.7	UM	
MT	1	3	RB	83	11.9	UM	
MT	1	3	RB	70	4.9	UM	

			SITE VISIT	DESCRIP	FION		
Site Name (e.g. TOB-1)	UBR-	10	first three letters of stream name-site number			VIS	IT # 3
	<u> </u>				Date of sur	vey Time of surve	y Surveyors
					2001-02	-05 10:30	TJ,TD,JD
Gazetted Stream M Upper Bulkley Riv		Local Stre	am Name	Watershed Code			· · · · · · · · · · · · · · · · · · ·
		I		· · · · · · · · · · · · · · · · · · ·			
weather I	ligh overcast						
Air Temperatu	ire -10 [°]	с		Strea	m Flow	M (High, Moderate	, Limited, None)
Ice Cover (%)	100		Pote	ntial for fish mig	gration	M (High, Moderate	, Limited, None)
LIM	NOLOGY	STAT	ON		FISE	ISUMMARY	
Depth from up	per surface of ice	(cm)	93	s his solutions (Sec	Total # o	of Mininimum	Maximum
Ice thickness (c	m)		11	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (I	H,M,L, or N)			LND	0	0	0
(High, Moderate, Lin Snow Depth (ct			15				
	Temperature		0.3 ° C				
	ity (H,M, L, or C	2)	C				
	oderate, Low, or Clea		100 uS				
	ved Oxygen (bot	(mot					
	ved Oxygen (sur		ppm ppm				,
			FISH COLLEC	TION SUMM	ARY		
Date of Setting	1949 - 1979 - 19 49 - 1	2001-02-	-05	na fa sua fa é se alemente el fa	Date o	f Collection	2001-02-06
Time of Setting		10:35			Time o	of Collection	10:35
Number of trap	os set	3			Numb	er of traps collected	3
NOTE: Cluster contain	as three traps within	an ~5 meter d Instream (umber Captured per	Cluster		
Capture Cluster Method Number	Mean Denth Domi	Sub nant Domina	Percent nt ice cover				
MT 1			100 LND	1			
			Ca	mments			
pH = 7.9						and the second secon	
February 6/01,	light snowfal	l high ov	ercast				
No measureme	nt taken on lo	ngnose d	ace.	·····		· · · ·	

Site Name e.g. TOB-1)	UBR-	10	first three letters of stream name-site number	VISIT # 3
	e de la companya de l		PHOTO DOCUMENTAT	ION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] [1	NFC				
MT	1	2	NFC				
MT	1	3	LND				

1

W.

195

199

「ころ」

States and

Site Name				DESCRIP		
Site Name (e.g. TOB-1)	UBR-	10	first three letters of stream name-site number		VISI	Г # [4]
			-		Date of survey Time of survey	Surveyors
					2001-03-05 10:45	TJ,TD,JD
Gazetted Stream N		Local Stre	am Name	Watershed Code		
Upper Bulkley Riv	ver	<u> </u>				
Weather S	unny					
Air Temperatu	ıre -7 °	С		Strea	m Flow M (High, Moderate, L	imited, None)
Ice Cover (%)	100		Poten	tial for fish mig	gration M (High, Moderate, L	imited, None)
LIM	NOLOGY	STAT	ON		FISH SUMMARY	
Depth from upp	per surface of ice	(cm)	62		Total # of Mininimum	Maximum
Ice thickness (ca	m)		12	Species	Fish Length (mm)	Length (mm)
Clarity of Ice (H	H.M.L. or N)		N	СН	2 70	78
(High, Moderate, Lin	mited, None)			LNC	1 55	55
Snow Depth (cr	m)		5			
Water 7	Temperature		0.1 C			
	ity (H,M, L, or C oderate, Low, or Clea		C			
Conduc	ctivity		uS			
Dissolv	ved Oxygen (bott	tom)	11 ppm			
Dissolv	ved Oxygen (surf	face)	ppm			
			FISH COLLECT	TION SUMM	IARY	
Date of Setting		2001-03-	05		Date of Collection	2001-03-06
		10:25			Time of Collection	10:40
Time of Setting						
Time of Setting Number of trap		3			Number of traps collected	3
	s set 18 three traps within	an ~5 meter d				3
Number of traps NOTE: Cluster contain Capture Cluster	s set as three traps within Mean	an ~5 meter d Instream (Sub	Cover Species/ Nu Percent	umber Captured per		3
Number of trap	s set as three traps within Mean	an ~5 meter d Instream (Cover Species/ Nu Percent	umber Captured per		3
Number of traps NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	an ~5 meter d Instream (Sub	Percent Species/ Nu			3
Number of traps NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	an ~5 meter d Instream (Sub	Cover Species/ Nu Percent			3
Number of traps NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	an ~5 meter d Instream (Sub	Cover Species/ Nu Percent			3
Number of traps NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	an ~5 meter d Instream (Sub	Cover Species/ Nu Percent			3
Number of traps NOTE: Cluster contain Capture Cluster Method Number	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of trap: NOTE: Cluster contain Capture Cluster Method Number MT 1	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Species/ Name Percent ice cover 100 CH		Cluster	3
Number of traps NOTE: Cluster contain Capture Cluster Method Number	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of traps	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of trap: NOTE: Cluster contain Capture Cluster Method Number MT 1	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of trap: NOTE: Cluster contain Capture Cluster Method Number MT 1	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of trap: NOTE: Cluster contain Capture Cluster Method Number MT 1	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of trap: NOTE: Cluster contain Capture Cluster Method Number MT 1	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	
Number of trap: NOTE: Cluster contain Capture Cluster Method Number MT 1	s set Mean Denth Domin	an -5 meter d Instream (Sub nant Dominan	Cover Species/ Na Percent ice cover 100 CH	2 [INC]/ 1	Cluster	

Te

DA UA

C

14

173

(U)

Site Name (e.g. TOB-1)

UBR - 10

first three letters of stream name-site number VISIT # 4

Sector Sector

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	LNC	55	2.1	UM	
MT	1	3	СН	78	5.3	UM	
MT	1	3	СН	70	3.7	UM	

		and the state of the second		ESCRIPT		
Site Name (e.g. TOB-1)	UBR-	11 first three name-site	e letters of stream e number		VIS	5IT # 1
					Date of survey Time of survey	
				L	2000-12-18 13:20	BD,TJ,TD
Gazetted Stream Na Upper Bulkley Rive		Local Stream_Nam	e Wa	tershed Code	· * * *]
		now flurries.				
	cicast with s	now numes.				
Air Temperatur	e 1°	с		Stream	Flow L (High, Moderate	, Limited, None)
Ice Cover (%)	100	•	Potentia	l for fish migr		e, Limited, None)
	OLOGY	STATION			FISH SUMMARY	
Depth from upper	r surface of ice	(cm) 65			Total # of Mininimum	Maximum
Ice thickness (cm)	42		Species	Fish Length (mm)	Length (mm)
Clarity of Ice (H,	M,L, or N)	N		RB	4 100	121
(High, Moderate, Limit	ted, None)			СН	4 62	71
Snow Depth (cm)		13	•			
	emperature	0.1	С			
	(H,M, L, or C) erate, Low, or Clear)					
Conducti	vity	170	uS			
	d Oxygen (botto		ppm			
Dissolved	d Oxygen (surfa	ace)	ppm			
· · ·		FISH	COLLECTI	ON SUMMA	ARY	
Date of Setting		2000-12-18			Date of Collection	2000-12-19
Time of Setting		13:20			Time of Collection	13:40
Number of traps		3			Number of traps collected	3
NOTE: Cluster contains	-	n ~5 meter diameter are Instream Cover		ber Captured per C	luster	
Capture Cluster Method Number	Mean	Sub Percent ant Dominant ice cove				
MT 1		100	RB / 4	CH / 4		
			Comm	nents		
Set three traps in		off of limno stat	ion about 1.5			
metrs away from	rip rap.					
The entire river 1	s icea over.					
Caudel erosion o	n the 21.5g I	Rainbow.(line #	ŧ1).			
	5					
[
The entire river i	s iced over.	Rainbow.(line #	ł1).			

.

i

Site Name (e.g. TOB-1)

UBR - 11

Merie,

first three letters of stream name-site number

VISIT #

1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] 1	RB	120	21.5	UM	
MT	1	1	RB	120	23.8	UM	
MT	1	2	CH	71	4.9	UM	
MT	1	2	CH	66	3.6	UM	
MT	1	2	RB	100	15	UM	
MT	• 1	3	CH	62	3.5	UM	
MT	1	3	CH	65	4	UM	
MT	1	3	RB	121	26	UM	

		SITE	VISIT	DESCRIP	FION		
Site Name (e.g. TOB-1)	JBR - 1	first three let	ers of stream mber			VISIT #	2
					Date of survey	Time of survey S	urveyors
					2001-01-18	2:30	TJ,TD,JD
Gazetted Stream Name Upper Bulkley River		ocal Stream Name		Watershed Code			<u> </u>
							_
Weather High	Overcast						
Air Temperature	-5 ° c			Strea	m Flow M	(High, Moderate, Limited	1. None)
Ice Cover (%)	100		Poten	tial for fish mi		(High, Moderate, Limited	
LIMNO	LOGY S	TATION			FISH SUN	IMARY	
Depth from upper su	rface of ice (c	m) 120			Total # of M	lininimum Ma	ximum
Ice thickness (cm)		51		Species	Fish Le	ngth (mm) Leng	th (mm)
Clarity of Ice (H,M,I	., or N)			СН	1	68	68
(High, Moderate, Limited, 1 Snow Depth (cm)		17					
-							
Water Temp		0.9	С				
Turbidity (H (High, Moderate	, Low, or Clear)	C	_				
Conductivity			S				
	xygen (botton		pm				
Dissolved O	xygen (surfac	·	pm			- Both Base P	Maria Balanta
	- 	e source a service en en	JLLEC	TION SUM	an a chuir an	n sanan sa	
Date of Setting	2	001-01-18			Date of Collect Time of Collec		2001-01-19
Time of Setting Number of traps set		14:30 3			Number of tra		3
NOTE: Cluster contains three	e traps within an						
Capture Cluster	Ir Mean	Istream Cover Sub Percent	Species/ N	umber Captured pe	r Cluster		
Method Number	Denth Dominan	Dominant ice cover	СН	1			
						•	
			Cor	nments			
Several layers of ic	e.	un and a state for	-		in the second second		
pH = 7.1							

ite Name e.g. TOB-1)	UBR - 11	first three letters of stream name-site number	VISIT # 2
		PHOTO DOCUMENTATI	ON

en;

Chir.

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	СН	68	4.1	UM	
MT	1] 3	NFC				

.

	SIT	E VISIT DE	SCRIPTION	N	
Site Name (e.g. TOB-1)		ee letters of stream te number		VIS	SIT # 3
			Date of	f survey Time of survey	y Surveyors
			2001	-02-15 15:00	TJ,TD,JD
Gazetted Stream Name	Local Stream Nan	ne Water	rshed Code		
Upper Bulkley River					
Weather Sunny a	and clear				
Air Temperature [_4_° c		Stream Flow	W M (High, Moderat	e, Limited, None)
Ice Cover (%)	100	Potential	for fish migration	M (High, Moderat	e, Limited, None)
LIMNOL	OGY STATION	Maria da Maria da Calendaria		SH SUMMARY	
Depth from upper surfa	ace of ice (cm) 105]		# of Mininimum	Maximum
Ice thickness (cm)	42]		ish Length (mm)	Length (mm)
Clarity of Ice (H,M,L,	or N) N]		2 65	65
(High. Moderate, Limited, Non Snow Depth (cm)	ne) 18	7	RB	3 93	95
•		 ¥	СН	1 65	65
Water Temper] C			
Turbidity (H,N (High, Moderate, L					
Conductivity		uS			
Dissolved Oxy	gen (bottom) 11	ppm			
Dissolved Oxy	gen (surface)	ppm			11-1
	FISH	COLLECTIO	N SUMMARY		
Date of Setting	2001-02-15		Da	te of Collection	2001-02-16
Time of Setting	15:00		Tir	me of Collection	11:06
Number of traps set	3		Nu	mber of traps collected	3
NOTE: Cluster contains three to	aps within an ~5 meter diameter ar		Contrading Charter		
Capture Cluster Method Number Der		nt	r Captured per Cluster		
MT 1	th Dominant Dominant ice cov		RB / 3 CH		
		Comme	nts		
pH = 7.8	l i esti fatto i si parad				· · · · · · · · · · · · · · · · · · ·
Feb.16/01 temp = -16	;				

198

*3 -

-

		SITE VISIT DESCRIPT	ION
Site Name e.g. TOB-1)	UBR - 11	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Number	Photo Description	
OW3	14	ite View looking downstream	

¢.

.

gine .

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fi Clip
MT] 1	1	RB	93	9.5	UM	
MT	1	2	СО	65	3.7	UM	
MT	. 1	3	RB	98	12.2	UM	
MT	1	3	RB	95	10.5	UM	
MT	1	3	СН	62	3.1	UM	
MT	1	3	СО	65	2.5	UM	

			SITE VISIT D	ESCRIP		
Site Name (e.g. TOB-1)	UBR	11	first three letters of stream name-site number		VI	SIT # 4
			-		Date of survey Time of survey	
0		1	N		2001-03-14 12:40	TJ,TD,JD
Gazetted Stream I Upper Bulkley Ri		Local Str	eam Name W	atershed Code		
L	Sunny and cle	ar				
	and one	, , , , , , , , , ,				
Air Temperat	ure 🕒	с		Stre	am Flow M (High, Modera	tte, Limited, None)
Ice Cover (%)	100		Potentia	al for fish mi	igration M (High, Modera	tte, Limited, None)
LIM	NOLOGY	STAT	ION		FISH SUMMARY	
Depth from up	per surface of ic	e (cm)	85		Total # of Mininimum	Maximum
Ice thickness (em)		44	Species	Fish Length (mm)	Length (mm)
Clarity of Ice (1	H,M,L, or N)		N	NFC	0 0	0
(High, Moderate, Li Snow Depth (c						
	Temperature lity (H,M, L, or (~)	1.7 c			
(High, M	Ioderate, Low, or Cle		C			
Condu	-					
	ved Oxygen (bo		ppm			
Dissol	ved Oxygen (sur		ppm		an an an tao an tao an tao an tao an tao an	مىلىرىتى مەربىي بەتلەرمىر قىلىدى بەر مە
			FISH COLLECTI	ON SUM	MARY	
Date of Setting		2001-03	====		Date of Collection	2001-03-15
Time of Setting		12:40)		Time of Collection	11:40
Number of trag		3			Number of traps collected	3
Capture Cluster	1	Instream	Cover Species/ Nurr	ber Captured pe	er Cluster	
Method Number	Mean Denth Dom	Sub inant Domina				
MT 1		L	100 NFC /			
			Comr	nents		
pH = 7.4	un for all and the					
P11 / 17						
						<u></u>

2.4

Site Name (e.g. TOB-1)	U	BR-	11	first three letters of stream name-site number	n		VISIT #	4
Anne de Service au de Ser Service de Service au de Service Service de Service au				PHOTO D	OCUMEN	NTATION		
			a waxaa ahaa ka sa	leader and the second of the second	generation and the	an in the contract the contract contract rates as	an in a shekiri shekiri shine shekarin shine	
				INDIVIDU	AL FISH	DATA		
	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	DATA Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured F Clip	in

MT

MT

2

3

1

1

NFC

NFC

Site Name (s.g. TOB-1) UBR - 12 Intertwee means of stream VISIT # 1 Date of survey Time of survey Time of survey Surveyoer 2000-12-18 13:40 BD.12.TD Grazetted Stream Name Local Stream Name Wetershed Code Upper Bulkley River	Site Name	TIDD	10					
2000-12-18 13:40 BD.T7.TD Upper Bulkey River		UBR-	12		ream	V1511	* 1	
Gazetted Stream Name Local Stream Name Watershed Code Upper Bulkley River								
Upper Bulkey River Weather Overcast with snow flurries. Air Temperature 1 * C Stream Flow M (High, Modenne, Limited, New) Ice Cover (%) 100 Potential for fish migration H (High, Modenne, Limited, New) LIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (em) 56 Ice thickness (cm) 30 Clarity of Ice (HALL or N) N (High, Modenne, Limited, New) Snow Depth (cm) Snow Depth (cm) 13 Water Temperature 0 * C Turbidity (HML, I.or C) C (High, Modenne, Low, or Claw) Conductivity Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (bottom) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) 3 Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Gazetted Stream N	ame	Local Stre	am Name		13,40	00,10,10	
Air Temperature 1° C Stream Flow M (tigh, Modenne, Linnued, Nore) lee Cover (%) 100 Potential for fish migration H (tigh, Modenne, Linnued, Nore) LIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (cm) 56 lee thickness (cm) 30 Clarity of lee (HJAL, or N) N (ligh, Modenne, Linnued, Nore) Snow Depth from upper surface of ice (cm) 13 Water Temperature 0° C Turbidity (HJM, L, or C) CC (ligh, Modenne, Linnued, Nore) Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 13:55 Number of traps set 3 Number of traps collected 3 Number of traps set 3 Number of traps collected 3 1 traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4			Ī					
Inter Cover (%) 100 Potential for fish migration If (High, Modernet, Limited, Nore) Depth from upper surface of ice (cm) 56 Inter Cover (%) 30 Depth from upper surface of ice (cm) 30 Inter Cover (%) 100 Chrity of ice (H.M.L, or N) N N N (High, Modernet, Limited, Nore) 13 Water Temperature 0 ° C Turbidity (H.M, L, or C) C (High, Modernet, Limited, Nore) O ° C Dissolved Oxygen (bottom) 10 ppm ppm Dissolved Oxygen (bottom) 10 ppm Date of Setting 2000-12-18 Date of Collection 2000-12-18 Ime of Collection 13:55 Number of traps set 3 Number of traps collected 3 3 Number of traps set 3 Number of traps collected 3 3 Tarps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Weather	vercast with	snow flur	тies.	uuuu			
LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 56 Ice thickness (cm) 30 Clarity of Ice (H.M.L. or N) N (figh, Moders, Limet, Kens) 13 Water Temperature 0 C Turbidity (H.M.L., or C) C (figh, Moders, Limet, Kens) 160 Snow Depth (cm) 10 Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 13:40 Time of Collection Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Air Temperatu	ire 1°	с		Stream Flow	M (High, Moderate, Lin	mited, None)	
LIMINOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 56 Ice thickness (cm) 30 Clarity of Ice (H.M.L. or N) N (ligh, Modera, Limited, Now) 13 Water Temperature 0 ° C Turbidity (H.M. L., or C) C (ligh, Modera, Low, or Clear) C Conductivity 160 u/S Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (bottom) 10 ppm Date of Setting 2000-12-18 Date of Collection Time of Setting 13:40 Time of Collection Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	lce Cover (%)	100]	Potential for fish migration	H (High, Moderate, Lin	mited, None)	
Ice thickness (cm) 30 Clarity of Ice (H,M,L, or N) N (figs, Moderse, Linned, None) 13 Water Temperature 0 C Turbidity (H,M, L, or C) C (figs, Moderse, Linned, None) 0 Snow Depth (cm) 13 Water Temperature 0 C (figs, Moderse, Linne, Low, or Clae) C (figs, Moderse, Linne, Low, or Clae) 0 Conductivity 160 uS Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-18 Time of Setting 13:40 Number of traps set 3 Number of traps collected 3 3 3 Number of traps collected 3 3 3 Straps set in one cluster 1 meter from limmo station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	LIM	NOLOGY	STATI	ON	FIS	H SUMMARY		
Clarity of Ice (H.M.L. or N) N (High, Moderse, Limited, None) 13 Water Temperature 0 C Turbidity (H.M. L, or C) C (High, Moderse, Limited, None) 0 C Turbidity (H.M. L, or C) C C (High, Moderse, Limited, None) 10 ppm Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm ppm Date of Setting 2000-12-18 Time of Collection 2000-12-15 Time of Setting 13:40 Time of Collection 13:55 Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Depth from upp	er surface of ice	: (cm)	56				
(High, Modernar, Limited, Nore) Snow Depth (cm) 13 Water Temperature 0 C Turbidity (TJ,M, L, or C) C (High, Modernar, Low, or Cleav) 0 Conductivity 160 uS Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm Pitter of Setting 2000-12-18 Date of Collection 2000-12-19 Time of Setting 13:40 Time of Collection 13:55 Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Ice thickness (c	m)		30				
Water Temperature 0 C Turbidity (H,M, L, or C) C C (ligh, Moderna, Low, or Clear) C C Conductivity 160 uS Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm PISH COLLECTION SUMMARY Date of Setting 2000-12-18 Time of Setting 13:40 Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	•			N				
Turbidity (H,M, L, or C) C (High, Modernar, Low, or Clear) 160 uS Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-18 Date of Collection Time of Setting 13:40 Time of Collection Number of traps set 3 Number of traps collected 3 Traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Snow Depth (cr	n)		13				
(tigh, Moderner, Low, or Clear) Conductivity 160 uS Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 2000-12-15 Time of Setting 13:40 Time of Collection 13:55 Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4		-						
Dissolved Oxygen (bottom) 10 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Time of Setting 13:40 Number of traps set 3 Number of traps set 3 Comments 3 traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4				<u> </u>				
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Time of Setting 13:40 Number of traps set 3 Number of traps collected 3 Setting collection 13:55 Number of traps set 3 Setting collected Setting colspan="2">Setting collected Setting colspan="2">Setting colspan="2"Setting colspan" <td cols<="" td=""><td>Conduc</td><td>ctivity</td><td></td><td>160 uS</td><td></td><td></td><td></td></td>	<td>Conduc</td> <td>ctivity</td> <td></td> <td>160 uS</td> <td></td> <td></td> <td></td>	Conduc	ctivity		160 uS			
FISH COLLECTION SUMMARY Date of Setting 2000-12-18 Date of Collection 2000-12-15 Time of Setting 13:40 Time of Collection 13:55 Number of traps set 3 Number of traps collected 3 Comments 3 traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4								
Date of Setting 2000-12-18 Date of Collection 2000-12-19 Time of Setting 13:40 Time of Collection 13:55 Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	Dissolv	ed Oxygen (sur			TOTION OT MARANDS!	後後の日本 - Andre Andrews Andre Andrews		
Time of Setting 13:40 Time of Collection 13:55 Number of traps set 3 Number of traps collected 3 Comments 3 traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4			and a subsequence	an etta anti anti anti anti anti anti anti a	n englissa ola ella Elexia. Contra contra	AND THE OWNER	2000 12 14	
Number of traps set 3 Number of traps collected 3 Straps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4				\equiv				
Comments 3 traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4	_	s set						
3 traps set in one cluster 1 meter from limno station. River has 100% ice coverage for hundreds of meters upstream and downstream. pH = 7.4								
No fish caught.	pH = 7.4							
	No fish caught.							

-

SITE VISIT DESCRIPTION	
------------------------	--

Site Name (e.g. TOB-1)

UBR - 12

first three letters of stream

name-site number

VISIT # 1

198

200

200

165

082

di R

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured F Clip
MT	1	1	RB	120	21.5	UM	
MT	1] [1	RB	120	23.8	UM	
MT] [1	2	Сн	71	4.9	UM	
MT	1	2	СН	66	3.6	UM	
MT	1	2	RB	100	15	UM	
MT		3	СН	62	. 3.5	UM	
MT] [1	3	СН	65	4	UM	
MT	1	3	RB	121	26	UM	

Site Name (e.g. TOB-1) UBR - 12 first three letters of stream name-site number VISIT # 2 Date of survey 2001-01-18 Time of survey 1:45 Surveyor TI,TDJ Gazetted Stream Name Local Stream Name Watershed Code Upper Bulkley River Weather High overcast Air Temperature -5 ° C Stream Flow M Ice Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, None) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 87 Total # of Mininimum Maximum Ice thickness (cm) 39 Clarity of Ice (H,M,L, or N) N NFC 0 0 0 Net: 20 Quick, Moderate, Limited, None) 20 0 0 0 0 Water Temperature 0.1 ° C C C C Uigh, Moderate, Limited, None) 0 0 0 0 Show Depth (cm) 20 Conductivity 160 uS U	
Gazetted Stream Name Local Stream Name Watershed Code Upper Bulkley River	
Gazetted Stream Name Local Stream Name Watershed Code Upper Bulkley River	
Upper Bulkley River Weather High overcast Air Temperature -5 C Stream Flow M (High, Moderate, Limuted, None) Ice Cover (%) 100 Potential for fish migration M (High, Moderate, Limuted, None) LIMNOLOGY STATION Potential for fish migration M (High, Moderate, Limuted, None) Depth from upper surface of ice (cm) 87 Ice thickness (cm) 39 Ice thickness (cm) 39 Species Fish Length (mm) Length (mm) Clarity of Ice (H,M,L, or N) N N NFC 0 0 0 Water Temperature 0.1 C C (High, Moderate, Low, or Clear) Conductivity 160 uS	
Air Temperature -5 C Stream Flow M (High, Moderate, Limited, None) Ice Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, None) LIMNOLOGY STATION Potential for fish migration M (High, Moderate, Limited, None) Depth from upper surface of ice (cm) 87 Image: Species Fish Species Ice thickness (cm) 39 Species Total # of Mininimum Maximum Clarity of Ice (H,M,L, or N) N N NFC 0 0 0 Snow Depth (cm) 20 Vater Temperature 0.1 C C (High, Moderate, Low, or Clear) CO Conductivity 160 uS Dim to 10 for use 11	
Ice Cover (%) 100 Potential for fish migration M (High, Moderate, Limited. None) LIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (cm) 87 For thickness (cm) Maximum Lee thickness (cm) 39 Fish Length (mm) Length (mm) Clarity of Ice (H,M,L, or N) N N NFC 0 0 0 Snow Depth (cm) 20 Vater Temperature 0.1 C C Turbidity (H,M, L, or C) C C (High, Moderate, Low, or Clear) Conductivity 160 uS US US	
LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 87 Ice thickness (cm) 39 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited None) 20 Snow Depth (cm) 20 Water Temperature 0.1 Currbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) 160 US Dimension of the moderate of	
Depth from upper surface of ice (cm) 87 Ice thickness (cm) 39 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 20 Snow Depth (cm) 20 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 160 uS	
Ice thickness (cm) 39 Species Fish Length (mm) Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 20 Snow Depth (cm) 20 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 160	
Ice thickness (cm) 39 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 20 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 160 uS	
Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) Snow Depth (cm) 20 Water Temperature 0.1 °C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity 160 uS	
Snow Depth (cm) 20 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High. Moderate, Low, or Clear) C Conductivity 160 uS	
Turbidity (H,M, L, or C) C (High. Moderate, Low, or Clear) C Conductivity 160	
(High, Moderate, Low, or Clear) Conductivity 160 uS	
Conductivity 160 uS	
Dissolved Oxygen (bottom)	
Dissolved Oxygen (surface) ppm	
FISH COLLECTION SUMMARY	
Date of Setting 2001-01-18 Date of Collection 2001-	01-19
Time of Setting 14:45 Time of Collection 10	20
Number of traps set 3 Number of traps collected	
Comments	
pH = 7.3	

-

-

Site Name (e.g. TOB-1)	UBR - 12	first three letters of stream name-site number	VISIT # 2
an a		PHOTO DOCUMENTATI	ON

1780

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT] [1	2	NFC				
MT	1	3	NFC				

		S	ITTE VISIT	DESCRIP	rion		
Site Name (e.g. TOB-1)	UBR-		rst three letters of stream ame-site number			VISIT	# 3
						Time of survey	Surveyors
					2001-02-15	15:20	TJ,TD,JD
Gazetted Stream M Upper Bulkley Ri		Local Stream	Name	Watershed Code			
Weather	Sunny and clea	ar					
Air Temperat	ure –4 °	с		Strea	m Flow M	(High, Moderate, Lim	ited, None)
Ice Cover (%)		-	Poter	tial for fish mig	gration M	(High, Moderate, Lim	ited, None)
LIM	NOLOGY	STATIO	N	ta ka sa pagina sa	FISH SUN	IMARY	
Depth from up	per surface of ice	: (cm)	47	-	Total # of M		Aaximum
Ice thickness (c	cm)		32	Species	Fish Le	ngth (mm) Le	ngth (mm)
Clarity of Ice (H.M.L. or N)		N	NFC	0	0	0
(High, Moderate, Li	imited, None)						
Snow Depth (c			<u>22</u>				
Water	Temperature		0.5 С				
	lity (H,M, L, or C Aoderate, Low, or Clea		C				
Condu			uS				
Dissol	ved Oxygen (bot	tom)	11 ppm				
Dissol	ved Oxygen (sur	face)	ppm				
		FI	SH COLLEC	FION SUMN	IARY		
Date of Setting		2001-02-15]		Date of Collect	tion	2001-02-16
Time of Setting	ļ	15:20			Time of Collec	tion	11:30
Number of trap	ps set	3]		Number of tra	ps collected	3
NOTE: Cluster contai		an -5 meter diam Instream Cov		umber Centured ner	Cluster		
Capture Cluster Method Number	Mean Death Domi	Sub	Percent	umber Captured per	Cluster		
MT 1	Denth Domi		100 NFC				
	-		•				
			Cor	nments			
pH = 7.8					· · · · · · · · · · · · · · · · · · ·		
February 16/01	1 temprature =	= -16.					
-	-						

<u>E</u>

Site Name (e.g. TOB-1)	UBR - 12	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Number	Photo Description	

illian (

1

6

and the second

INDIVIDUAL FISH DATA Capture Cluster Trap Species Fork Length Fish Type of Fin Clip Type of Recaptured Fin Clip Method Number Number (mm) Weight (g) (e.g. adipose, upper caudal, none) NFC 1 MT 1 2 MT 1 NFC 3 NFC MT 1

Site Name	UBR -	12	first three letters of stream name-site number			VISIT	# 4
e.g. TOB-1)			name-site number		Date of survey	Time of survey	Surveyors
				1	2001-03-14	12:20	TJ,TD,JD
azetted Stream Na		Local Str	eam Name Wa	atershed Code			
pper Bullkley Riv	ver						
Veather Cl	lear, sunny a	nd beauti	iful				
ir Temperatu	re 🚺 °	С		Stream	n Flow M	(High, Moderate, Limit	ed, None)
e Cover (%)	100		Potentia	al for fish mig	ration M	(High, Moderate, Limit	ed, None)
LIMN	OLOGY	STAT	ION	ta estada estad 1910 - Alfred Alfred 1910 - Alfred Alfred	FISH SU	MMARY	
Depth from uppe	er surface of ice	e (cm)	100		Total # of		aximum
Ice thickness (cn	n)		65	Species	Fish I		igth (mm)
Clarity of Ice (H	,M,L, or N)		N	СН	4	67	74
(High, Moderate, Limi Snow Depth (cm			0				
•	emperature		2.2 ° C				
	ty (H,M, L, or C	C)	C				
(High, Mo Conduct	derate, Low, or Clea tivity	u)	uS				
	ed Oxygen (bot	tom)	11 ppm				
	ed Oxygen (sur		ppm ppm			······································	
			FISH COLLECTI	ON SUMM	LARY		
Date of Setting		2001-03	J-14	a na seu pra	Date of Colle	ction	2001-03-
Time of Setting		12:20	0		Time of Colle	ection	12:10
Number of traps	; set	3			Number of th	raps collected	3
OTE: Cluster contains	s three traps within	an ~5 meter Instream		nber Captured per	Cluster		
Capture Cluster	Mean Denth Domi	Sub	Percent				
fethod Number			100 CH / 4				
MT 1							
	 	[_] `/ [」∟/∟	· · · · · ·	
	[<u> </u>] [I // L	」∟/′∟		
	[/	[_] [/ [┘ └//└	· · ·	
				/ [/ [स्थान्यवः द्वान्त्रयः
				nents			<u>इस</u> करते हो संस्थ
MT 1				nents] []/[
MT 1				nents] []/[
Method Number MT 1 pH = 7.0				nents] []/[
MT 1	bit more tur	bid on pi			an di Manakaran		
MT 1	bit more tur	bid on pi	Comr		an di Manakaran		

(iiii)

14

-27

1		A 117 - 74		12. 19 10 10 10 10	10 m	• • • • • • • • • • • • • • • • • • •	 A 1977 (1978) 	100 April 100 April 10	والتواحد ال	a a 42	 	11.7.1211	5 J. C. 1997 S.		化化化 医胆管的	 		- 10 E	まったいい	19 JAN 19 1		· · · · · ·	5 N		
		24	1.4	10.0				-	1000				~~-			-			5 T						
	1 5 5	0 - 24 - 54 - 54 - 54 - 54 - 54 - 54 - 54					1.151	SI 11 B					216.34					S	S		1.2.1.1.2			the state of the	
en pa		1.00		V2.	C 20 C				.				SU^ P				- C.			1.00	5 G A 1993		C 6	C 31.	
2.12	100	1.1.1.1.1.1.1		WARY						7 J.A.A						. . .		1.000			14 I L L L L L		1.5 a	1 No. 1945	
	- 54		- Sec S					· · · · · ·			5 - T - T	- 505		N 121				1997 B.			Sec. 827				

Site Name (e.g. TOB-1)

12 UBR-

first three letters of stream name-site number

VISIT #

4

-32

oïks

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] [1] 1	CH	69	3.6	UM	
MT	1	1	CH	69	3.4	UM	
MT	1	2	CH	67	3.5	UM	
MT	1	2	CH	74	4.3	UM	
MT	1	3	NFC				

			SITE VISIT	DESCRIP	TION		la de la constante de la const Nomenta de la constante de la c
Site Name (e.g. TOB-1)	TOB-		first three letters of stream name-site number			VIS	IT # 1
					Date of survey	Time of surve	
Gazetted Stream	Name	Local Stream	Nama	Watershed Code	2000-12-20	10:50	TJ,TD
Toboggan Creek		Local Sucan		watershed Code			
Weather	Sun and part cl	oud					
	F						
Air Tempera	ture -12°	с		Strea	m Flow	(High, Moderate	, Limited, None)
Ice Cover (%) 19		Poter	tial for fish mi	gration N	(High, Moderate	, Limited, None)
LIN	INOLOGY	STATIC	N		FISH S	UMMARY	
Depth from u	pper surface of ice	(cm)	48	Species	Total # of	Mininimum	Maximum Length (mm)
Ice thickness	(cm)		19	CO	Fish	Length (mm)	98
•	(H,M,L, or N)		N	RB	12	42	86
(High, Moderate, Snow Depth (14	<u>K</u> B	12	42	
Wate	er Temperature		1.3 ° C				
	idity (H ,M , L, or C)	C				
	Moderate, Low, or Clea luctivity	r)	90 <i>uS</i>				
	olved Oxygen (bott	xom)	12 ppm				
	olved Oxygen (surf	_	ppm	L			
		Fi	SH COLLEC	TION SUM	MARY		
Date of Settin	g	2000-12-20	-	a hi sa a shi tafa ta ƙwallon	Date of Co	ollection	2000-12-21
Time of Settin		10:50			Time of Co	ollection	9:50
Number of tra	aps set	3			Number of	f traps collected	3
1	tains three traps within	an -5 meter dian Instream Co		umber Captured pe	r Cluster		
Capture Cluste Method Numb	Ivical)	Sub	Percent ice cover	amoor captaion po			
MT 1				75 RB / 12	2 /		
		de tal de caracte	an a	ng watan watan in	and the second	a state succession.	an a
			Coi	nments			
pH = 7.7	1.2.1 1						
Only sampled	131 coho.						
L							

Site Name (e.g. TOB-1)

TOB - 1

first three letters of stream name-site number

VISIT #

1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudai, none)	Type of Recaptured Fin Clip
MT	1	1	СО	56	1.4	UM	
MT	1	1	со	52	1.9	UM	
MT	1	1	СО	45	1.5	UM	
MT	1	1	СО	59	3.2	UM	
MT	1	1	СО	57	2.6	UM	
MT	· 1	1	СО	53	2.1	UM	
MT	1	1	СО	39	0.9	UM	
MT	1	1	СО	55	2.7	UM	
MT	1	1	СО	56	2.5	UM	
MT	1	1	СО	51	1.9	UM	
MT	1	1	CO	46	1.4	UM	
MT	1	1	СО	42	1	UM	
MT	1	1	RB	86	9.5	UM	
MT	1	1	RB	76	5.6	UM	
MT	1	1	RB	42	0.9	UM	
MT	1	2	СО	72	5.2	UM	
MT	1	2	СО	69	4	UM	
MT	1	2	RB	82	7.8	UM	
MT	1	2	RB	73	5.6	UM	
MT	1	2	СО	89	10.6	UM	
MT	1	2	СО	63	4.1	UM	
MT	1	2	СО	45	1.5	UM	
MT	1	2	RB	78	5.6	UM	
MT	1	2	CO	52	1.8	UM	
MT	1	2	со	60	3.1	UM	
MT	1	2	CO	60	3.2	UM	
MT	1	2	СО	60	4	UM	
MT	1	2	CO	47	1.9	UM	
MT	1	2	CO	60	3.1	UM	
MT	1	2	СО	70	4.7	UM	
MT	1	2	СО	57	2.5	UM	
MT	1	2	СО	47	1.5	UM	
MT	1	2	СО	44	1.2	UM	
MT	1	2	СО	45	1.3	UM	
MT	1	2	RB	70	2.1	UM	

di

i.

1

Site Name (e.g. TOB-		OB-		st three letters of stream me-site number	n		VISIT # 1
MT	1	2	CO	47	0.7	UM	
MT	1	2	CO	33	0.4	UM	
MT	1	2	СО	71	2.2	UM	
MT	1	2	RB	60	3.4	UM	
MT	1	2	RB	46	1.4	UM	
MT	1	3	RB	74	6.7	UM	
MT	l	3	RB	72	6.1	UM	
MT	1	3	RB	45	1.8	UM	

(e.g. TOB-1)	TOB-	1 first three letters of stream name-site number	VISIT # 2
-			Date of surveyTime of surveySurveyors2001-01-2210:00TJ,TD,JD
Gazetted Stream N	lame	Local Stream Name	Watershed Code
Foboggan Creek			
Veather H	ligh overcast		
ir Temperatu	ire <u>-5</u> °	С	Stream Flow M (High, Moderate, Limited, None)
ce Cover (%)	100		tential for fish migration (High, Moderate, Limited, None)
LIM	NOLOGY	STATION	FISH SUMMARY
Depth from upp	er surface of ice	(cm) 41	Total # of Mininimum Maximum
Ice thickness (c	m)	2	Species Fish Length (mm) Length (mm)
Clarity of Ice (F	I,M,L, or N)	M	CO 18 41 65
(High, Moderate, Lin Snow Depth (cr		0	RB 2 70 84
-			
	Temperature ity (H,M, L, or C	1.1 c	
(High, Mo	oderate, Low, or Clean	r)	
Conduc	•	90 <i>uS</i>	
	ed Oxygen (bott	····	
Dissolv	/ed Oxygen (surf		
	도 이번 위험가 관계적 경제도 전 전 관계적 관계적 관계적 관계적 	Contraction and the contract of the	CTION SUMMARY
en sama na serie na des		2001-01-22	Date of Collection 2001-01
Date of Setting		10.00	Time of Collection 10:10
Date of Setting Time of Setting		10:00	Number of two as illested
Date of Setting Time of Setting Number of trap	s set	3	Number of traps collected 3
Date of Setting Time of Setting Number of trap	s set 15 three traps within .	3 an -5 meter diameter area Instream Cover Species	Number of traps collected 3 s/ Number Captured per Cluster 3
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Species Sub Percent Iant Dominant ice cover	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Sub Percent Species	
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Species Sub Percent Iant Dominant ice cover	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Species Sub Percent Iant Dominant ice cover	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Species Sub Percent Iant Dominant ice cover	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Species Sub Percent Species ant Dominant ice cover CO	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set as three traps within Mean	3 an -5 meter diameter area Instream Cover Species Sub Percent Species ant Dominant ice cover CO	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number	s set	3 an -5 meter diameter area Instream Cover Species Sub Percent Species ant Dominant ice cover CO 100 CO	s/ Number Captured per Cluster
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number MT 1 Thin ice cover of	s set	3 an -5 meter diameter area Instream Cover Species Sub Percent Species ant Dominant ice cover CO 100 CO	s/ Number Captured per Cluster 18 RB 2 / / 10 1 / /
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number MT 1 Thin ice cover of No snow at lim	s set	3 aa -5 meter diameter area Instream Cover Species Sub Percent 100 CO/	s/ Number Captured per Cluster 18 RB 2 / / 10 1 / /
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number MT 1 Thin ice cover of	s set	3 aa -5 meter diameter area Instream Cover Species Sub Percent 100 CO/	s/ Number Captured per Cluster 18 RB 2 / / 10 1 / /
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number MT 1 Thin ice cover of No snow at lim	s set	3 aa -5 meter diameter area Instream Cover Species Sub Percent 100 CO/	s/ Number Captured per Cluster 18 RB 2 / / 10 1 / /
Date of Setting Time of Setting Number of trap NOTE: Cluster contain Capture Cluster Method Number MT 1 Thin ice cover of No snow at lim	s set	3 aa -5 meter diameter area Instream Cover Species Sub Percent 100 CO/	s/ Number Captured per Cluster 18 RB 2 / / 10 1 / /

Site Name (e.g. TOB-1)

TOB-1

first three letters of stream name-site number

VISIT #

2

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	63	3	UM	
MT	1	1	СО	65	3.7	UM	
MT	1	1	RB	84	6.9	UM	
MT	1	1	RB	70	5.6	UM	
MT	1	1	CO	55	2.1	UM	
MT	1	1	CO	46	2.6	UM	
MT	1	1	CO	48	1.6	UM	
MT	1	1	СО	49	1.8	UM	
MT	1	1	СО	41	1	UM	
MT	1	1	CO	50	1.8	UM	
MT	1	2	CO	49	1.8	UM	
MT	1	2	CO	44	1.3	UM	
MT	1	2	СО	46	1.6	UM	
MT	1	2	CO	45	1.6	UM	
MT	1	2	CO	43	1.5	UM	
MT	1	3	СО	52	1.9	UM	
MT	1	3	CO	44	1.4	UM	
MT	1	3	CO	57	2.2	UM	
MT	1	3	СО	46	1.6	UM	
MT	1	3	СО	42	1.3	UM	

Ŕ

(iii

Site Name	TOB-	1 first three letter	rs of stream		VIS	IT # 3
(e.g. TOB-1)		name-site numb	ber	Date of survey 2001-02-19	Time of surve	1
Gazetted Stream N	Name	Local Stream Name	Watershed Code			
Toboggan Creek						
Weather H	High overcast.					
Air Temperati	ure -3°	с	Strea	m Flow M	(High, Moderate	Limited, None)
ce Cover (%)	100		Potential for fish mig	gration M	(High, Moderate	Limited, None)
LIM	NOLOGY	STATION		FISH S	UMMARY	
	oper surface of ice		Species	Total # of Fish	Mininimum Length (mm)	Maximum Length (mm)
Ice thickness (c		8	СО	10	38	68
Clarity of Ice (l (High, Moderate, Li		N	RB	2	73	80
Snow Depth (c	:m)	0				
	Temperature	1.1 °C	2			
(High, M	lity (H,M, L, or C Moderate, Low, or Clear activity		;			
Dissol	lved Oxygen (bott	tom) 11 pp	m			
Dissol	lved Oxygen (surf					· · · · · · · · · · · · · · · · · · ·
		FISH CC	DLLECTION SUMM	IARY		
Date of Setting		2001-02-19	and the State of a sense of the second s	Date of Co	llection	2001-02-2
Time of Setting	3	10:05		Time of Co	llection	9:45
Number of trap	ps set	3		Number of	traps collected	3
NOTE: Cluster contai	ins three traps within	an ~5 meter diameter area Instream Cover	Species/ Number Captured per	Cluster		
Capture Cluster Method Number	Mean	Sub Percent nant Dominant ice cover	Species Runder Captured per	Clusier		
			CO / 10 RB / 2			
MT 1						
			Comments			
			Comments			
			Comments			
			Comments			
pH = 7.8			Comments			
			Comments			
pH = 7.8			Comments			
pH = 7.8			Comments			

Site Name (e.g. TOB-1)	TOB - 1	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Dell Norse	Frame Number	Photo Description	
Roll Name			

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] _ 1	1	СО	38	0.7	UM	
MT	1	1	CO	54	1.4	UM	
MT] _ 1	2	СО	55	2.2	UM	
MT	1	2	CO	68	4	UM	
MT	1	2	RB	73	5.4	UM	
MT	1	2	CO	52	2.2	UM	
MT	1	2	СО	46	1.5	UM	
MT	1	2	СО	45	1	UM	
MT	1	3	СО	62	3.3	UM	
MT	1	3	RB	80	7.1	UM	
MT	1	3	CO	59	2.9	UM	
MT	1	3	СО	51	1.7	UM	

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	TOB-	1	first three letters of stream name-site number			VISIT	4
		h	1		Date of survey	Time of survey	Surveyors
					2001-03-19	9:23	TJ,TD,JD
Gazetted Stream N	lame	Local Strea	m Name	Watershed Code			
Toboggan Creek				L			
Weather	ligh overcast	and windy	<i>.</i>				
Air Temperatu	ure <u>-3</u> °	с		Strea	m Flow	(High, Moderate, Limit	ed, None)
Ice Cover (%)	20		Poter	tial for fish mi	gration []	(High, Moderate, Limit	ed, None)
LIM	NOLOGY	STATI	ON		FISH S	UMMARY	
Depth from upp	per surface of ice	e (cm)	44		Total # of		aximum
Ice thickness (c	:m)	[0	Species	Fish		gth (mm)
Clarity of Ice (I		[N	СО	5	45	55
(High, Moderate, Lin Snow Depth (cr		ſ	0	RB	3	79	86
-		L r					
	Temperature	ן ייע ר	<u>1.3</u> °C				
	ity (H,M, L, or C loderate, Low, or Clea		<u>M</u>				
Conduc	ctivity		uS				
Dissolv	ved Oxygen (bott	tom)	11 ppm				
Dissolv	ved Oxygen (surf	face)	ppm	L			
		F	ISH COLLEC	TION SUMM	ARY		
Date of Setting		2001-03-1	9		Date of Co	llection	2001-03-20
Time of Setting		9:23			Time of Co	ollection	9:50
Number of trap	is set	3			Number of	f traps collected	3
NOTE: Cluster contain	-						
Capture Cluster Method Number	Mean	Instream Co Sub	Percent	lumber Captured per	Cluster		
MT 1	Denth Domin	nant Dominant	20 CO	5 RB / 3		$\neg \neg \neg \neg$	
	1						
			Cor	nments			
	8 - Alexandre and Alexandre Alexandre alexandre avec Alexandre alexandre avec		Cor	e and a second	13 m 1341, 134		
pH = 7.8							

Site Name (e.g. TOB-1)

1

0218

1

TOB-1

first three letters of stream name-site number

VISIT #

4

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	79	4.6	UM	
MT	1	2	RB	86	7.2	UM	
MT	1	2	CO	51	1.6	UM	
MT	1	2	СО	45	1	UM	
MT	1	2	СО	51	1.4	UM	
MT] [1	3	RB	80	5.1	UM	
MT	1	3	СО	55	2	UM	
MT	1	3	СО	47	1.1	UM	

Site Name (e.g. TOB-1)	TOD					
	TOB-	2 first three le name-site n	tters of stream		VIS	SIT # 1
				Date of su 2000-12		ey Surveyors TJ,TD,JD
Gazetted Stream Na	ame	Local Stream Name	Watersh	ed Code		
Toboggan Creek						
Weather pa	artly cloudy					
Air Temperatu	re <u>-12</u> ° (2		Stream Flow	L (High, Moderate	e, Limited, None)
Ice Cover (%)	50		Potential fo	r fish migration	M (High, Moderate	e, Limited, None)
LIMP	NOLOGY	STATION		FIS	H SUMMARY	
Depth from upp	er surface of ice ((cm) 64		Total #		Maximum
Ice thickness (cr	n)	0		Species Fish	Length (mm)	Length (mm)
Clarity of Ice (H		N		CO 33	37	88
(High, Moderate, Lim Snow Depth (cm		10		RB 4	67	76
Water T	emperature	0.6	с	DV 2	79	110
Turbidit	ty (H,M, L, or C)	C				
(High, Mo Conduc	oderate, Low, or Clear) tivity		uS			
Dissolv	ed Oxygen (botto	\ 1	ppm			
	ed Oxygen (surfa		ppm			
		••••••••••••••••••••••••••••••••••••••		SUMMARY		
Date of Setting		2000-12-20		Date	of Collection	2000-12-2
Time of Setting		11:08			of Collection	10:25
Number of traps		3		Numb	per of traps collected	3
NOTE: Cluster contains Capture Cluster		n ~5 meter diameter area Instream Cover	Species/ Number C	aptured per Cluster		
Method Number	Mean Denth Dominat	Sub Percent nt Dominant ice cover				
MT 1		50	CO / 33 R	B / 4 DV	/_2/	
고 목동 성격(전경)						
			Commen	S		
pH = 7.4						

άđr.

Site Name (e.g. TOB-1)

TOB-2

first three letters of stream name-site number

VISIT #

1

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)		Type of Fin Clip (. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	52	1.6]	UM	
MT	1	1	СО	53	2.1]	UM	
MT	1	1	CO	49	1.1]	UM	
MT	1	1	CO	42	1.1		UM	
MT	1	1	СО	41	1.4]	UM	
MT	1	1	СО	37	0.9]	UM	
MT	1	1	СО	49	1.4		UM	
MT	1	1	СО	45	1.2]	UM	
MT	1	2	СО	88	9.3]	UM	
MT	1	2	СО	69	5]	UM	
MT	1	2	RB	67	4.3]	UM	
MT	1	2	СО	78	6.1]	UM	
MT		2	СО	66	4.1]	UM	
MT		2	СО	64	4]	UM	
MT	1	2	СО	50	2.2]	UM	
MT	1	2	СО	46	2]	UM	
MT	1	2	RB	71	5.6]	UM	
MT	1	2	СО	58	2.8]	UM	
MT	1	2	RB	75	6]	UM	
MT	1	2	СО	82	6.6]	UM	
MT	1	2	СО	70	4.8]	UM	
MT	1	2	СО	70	4.6]	UM	
MT	1	2	СО	52	2.5]	UM	
MT		2	СО	65	3.9]	UM	
MT] 1	2	DV	79	5.6]	UM	
MT		2	DV	110	12.7]	UM	
MT] [1	2	СО	68	4.8]	UM	
MT	1	2	СО	53	2.7]	UM	
MT	1	2	СО	51	1.6]	UM	
MT	1	2	RB	76	6]	UM	
MT	1	3	Со	75	5.7]	UM	
MT	1	3	СО	60	3.2]	UM	
MT	1	3	СО	56	2.5]	UM	
MT	1	3	Со	58	3.4]	UM	
MT	1	3	СО	43	15]	UM	

1

10

1

Site Name (e.g. TOB-1)	T	OB-	2 1	first three letters of stream name-site number			VISIT # 1
MT	1	3	СО	40	1.6	UM	
MT	1	3	СО	61	3.5	UM	
MT	1	3	СО	48	2.5	UM	
MT	1	3	СО	45	1.2	UM	

			SITE VISIT	DESCRIP	TION	
Site Name (e.g. TOB-1)	TOB-	2	first three letters of stream name-site number		VISIT	Γ# 2
	L				Date of survey Time of survey	Surveyors
					2001-01-22 10:15	TJ,TD,JD
Gazetted Stream 1 Toboggan Creek	Name	Local Stream	m Name	Watershed Code	4 0	
		<u> </u>				
Weather I	High overcast					
۔ Air Temperat	ure -5 °	Ċ		Strea	am Flow M (High, Moderate, Lin	mited. None)
ce Cover (%)			Poter	ntial for fish mi		mited, None)
LIM	NOLOGY	STATI	DN	tana ara-daharan Tana ara-daharan Tana ara-daharan ara-daharan	FISH SUMMARY	na og skrige skæget og skoleter Sener skæget og sk Skæget og skæget og s
Depth from up	oper surface of ice	e (cm)	62		Total // Of	Maximum
Ice thickness (c			0	Species	Fish Length (mm) L	length (mm)
Clarity of Ice (I		Γ	C	СО	13 48	70
(High, Moderate, Li Snow Depth (c	imited. None)	Г	0	RB	5 70	100
_	Temperature	Γ	0.3 C			
	dity (H,M, L, or C	с) [<u>0.3</u> C			
(High, M	Moderate, Low, or Clea		80 uS			
	lved Oxygen (bot	∟ ۲۰۰۰)				
	ived Oxygen (bot	· -	12 ppm ppm			
		L.	ISH COLLEC	TION SUM!	MARY	
Date of Setting	e a die a	2001-01-2	netigente da altra da seria.	an go an a ta reg	Date of Collection	2001-01-23
Time of Setting		10:15			Time of Collection	10:28
Number of trap		3			Number of traps collected	3
NOTE: Cluster contai		n an ~5 meter dia Instream Co		Number Captured pe	er Cluster	
Capture Cluster Method Number	Mean	Sub inant Dominant	Percent tice cover			
MT 1				13 RB / 5	5 []/L] []/L] []/[
			e e e e e e e e e e e e e e e e e e e			
				mments		
Entire site is ic	e free, no sno	w at limno	o but snow depth at	shore is 40cm.		
pH = 7.3						

. g

<u>اللہ</u>

69

on On

Site Name (e.g. TOB-1)

TOB-2

first three letters of stream name-site number

VISIT # 2

. . . .

1050 2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip Type of Recaptured Fin (e.g. adlpose, upper caudal, none) Clip
MT	1] _ 1	СО	70	4.5	UM
MT	1	1	RB	70	4.8	UM
MT	1	1	RB	75	5.9	UM
MT	1	1	RB	100	13	UM
MT	1	1	СО	62	3.3	UM
MT	· 1	1	RB	86	. 8	UM
MT	1	2	СО	67	4	UM
MT	1	2	СО	50	1.8	UM
MT	1	2	СО	63	3.7	UM
MT	1	2	СО	55	2.1	UM
MT	1	2	со	56	2.3	UM
MT	1	2	СО	48	1.7	UM
MT	1	3	СО	61	3.1	UM
MT	1	3	СО	55	2.5	UM
MT	1	3	RB	96	13.3	UM
MT	1	3	СО	52	2	UM
MT	1	3	со	53	2.2	UM
MT	1	3	СО	48	1.4	UM

Site Name (e.g. TOB-1)	TOB-	2	first three letters of stream name-site number			VIS	IT # 3
o.g. 102	انب <u>ا</u>	L	1		Date of surv	vey Time of surve	
					2001-02-	19 10:15	TJ,TD,JD
Jazetted Stream 1	Name	Local Strea	m Name	Watershed Code	<u> </u>	····	
oboggan Creek		<u> </u>		L			
Veather H	High overcast.						
ir Temperat	ure <u>-3</u> °	С		Strea	am Flow [M (High, Moderate	e, Limited, None)
e Cover (%)	100		Poter	ntial for fish mi	igration	M (High, Moderate	e, Limited, None)
LIM	NOLOGY	STATI	ON		FISH	SUMMARY	
Depth from up	per surface of ice	e (cm) [62		Total # of		Maximum
Ice thickness (cm)	ſ	6	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H,M,L, or N)	[M	CO			77
(High, Moderate, L	imited, None)	ſ	 	RB	4	74	89
Snow Depth (o	em)	l					
Water	Temperature	ſ	1.5 C				
	dity (H,M, L, or (Moderate, Low, or Clea						
Condu	uctivity		uS				
Disso	lved Oxygen (bot	tom)	12 ppm				
	lved Oxygen (sur	face)	ppm				
			ppm RISH COLLEC	TION SUM	MARY	and an	
Disso			RISH COLLEC	TION SUM		f Collection	2001-02-2
Dissol Date of Setting		2001-02-	RISH COLLEC	TION SUM	Date o	f Collection of Collection	2001-02-2 10:00
Disso	алан (1997) 1997 - Салан		RISH COLLEC	TION SUM	Date o Time c		
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta	g gs set uns three traps within	2001-02- 10:15 3 1 an -5 meter d	RISH COLLEC		Date o Time c Numb	of Collection	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster	g g uns set Mean	2001-02- 10:15 3 a an ~5 meter d Instream C Sub	Ameter area Cover Percent Species/ 2	TION SUM	Date o Time c Numb	of Collection	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g uns set Mean	2001-02- 10:15 3 aan ~5 meter d Instream C	Ameter area Cover Species/ 7 Percent ti ice cover	Number Captured p	Date o Time c Numb	of Collection	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster	g g uns set Mean	2001-02- 10:15 3 a an ~5 meter d Instream C Sub	Interest of the second	Number Captured p	Date o Time c Numb er Cluster	of Collection	10:00
Disso Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g uns set Mean	2001-02- 10:15 3 a an ~5 meter d Instream C Sub	Ameter area Cover Species/ 7 Percent ti ice cover	Number Captured p	Date o Time c Numb er Cluster	of Collection	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g uns set Mean	2001-02- 10:15 3 a an ~5 meter d Instream C Sub	Ameter area Cover Species/ 7 Percent ti ice cover	Number Captured p	Date o Time c Numb er Cluster	of Collection	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g uns set Mean	2001-02- 10:15 3 a an ~5 meter d Instream C Sub	Ameter area Cover Species/ 7 Percent ti ice cover	Number Captured p	Date o Time c Numb er Cluster	of Collection	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g uns set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster	of Collection er of traps collected	10:00 3
Disso Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a an ~5 meter d Instream C Sub	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe MT 1	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00 3
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe MT 1	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00 3
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00 3
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00 3
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00 3
Dissol Date of Setting Time of Setting Number of tra NOTE: Cluster conta Capture Cluster Method Numbe MT 1	g g ups set uns three traps within Mean T Depth Dom	2001-02- 10:15 3 a a ~5 meter d Instream C Sub inant Domina	Ameter area Cover Species/ Percent ice cover CO 19 20 20 20 20 20 20 20 20 20 20	Number Captured p	Date o Time c Numb er Cluster 4	of Collection er of traps collected	10:00 3

त्रन ब

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	TOB-2	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Number	Photo Description	
OW5	2	ite view looking dowmstream.	

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	70	4.4	UM	
MT	1		RB	89	10.5	UM	
MT	• 1] [1	СО	61	2.8	UM	
MT	1] _ 1	Со	59	2.2	UM	
MT	1	2	СО	77	6.6	UM	
MT	1	2	СО	55	2.4	UM	
MT	1	2	СО	64	3.4	UM	
MT	1	3	RB	74	5.4	UM	
MT	1	3	СО	67	4.5	UM	
MT	1	3	RB	88	8.4	UM	
MT	1	3	CO	63	3.3	UM	
MT	1	3	СО	62	3.1	UM	
MT	1	3	CO	56	2.6	UM	
MT	1	3	CO	53	1.9	UM	
MT	1	3	RB	76	5.8	UM	

Site Name (e.g. TOB-1)	Τ	OB-	2	first three letters of stream name-site number				VIS	IT # 4
						Date of sur 2001-03-	_	Time of survey 9:33	y Surveyors
0	. NT		T a cal St	North North	Watembod Code	2001-03-	-19	9.55	10,10,00
Gazetted Stream Toboggan Creel			Local St	eam Name	Watershed Code	<u> </u>			
Weather	r	vercast	and win	dy					
Air Tempera	iture	-3 °	с		Strea	m Flow	Н	(High, Moderate	Limited, None)
ice Cover (%		0	-	Pote	ntial for fish mig	gration	Н	(High, Moderate	Limited, None)
LIN	ANOI	JOGY	STAT	ION		FISF	ISL	IMMARY	
Depth from u	ipper sur	face of ice	: (cm)	65	Smasies	Total # o		Mininimum	Maximum Length (mm)
Ice thickness	(cm)			0	Species	Fish	٦	Length (mm)	73
Clarity of Ice (High, Moderate,						1	 	155	155
Snow Depth		,		0		L			
Wate	er Tempe	rature		0.9 °C					
(High		M, L, or C Low, or Clea		M uS					
Diss	olved Ox	ygen (bot	tom)	11 ppm					
Diss	olved Ox	ygen (sur	face)	ppm				<u></u>	an a
				FISH COLLEC	TION SUMM	ARY			
Date of Settin	ıg		2001-0	3-19		Date o	of Coll	ection	2001-03-2
Time of Setti	ng		9:3	3		Time	of Col	lection	9:58
Number of tr	aps set		3			Numb	er of	traps collected	3
NOTE: Cluster con Capture Cluste Method Numb MT 1	ег м	ean	aa ~5 meter Instream Sut nant Domin	Cover Species/	Number Captured per	r Cluster	/		
				Со	mments	and the second			
pH = 7.4	- <u>-</u>	an series. Al contractor		and an an Arthur an A					n in an stair ann a

TOB - 2

first three letters of stream

name-site number

VISIT #

4

1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT	1	2	DV	155	26.7	UM	
MT	1	3	СО	59	2.2	UM	
MT		3	Со	68	3.2	UM	
MT	1	3	Со	73	5	UM	
MT	1	3	Со	67	3.7	UM	
MT	1	3	СО	64	3.3	UM	
MT	1	3	СО	51	2	UM	
MT	1	3	Со	50	1.4	UM	

Site Name (e.g. TOB-1)	TOB-	3	first three letters of stream name-site number	VISIT # 1
0.g. 100 f/	L	L	7	Date of survey Time of survey Surveyors
azetted Stream N	Nome	Local Stre	am Name Watershed Co	2000-12-20 TJ,TD,JD
oboggan Creek	and the second se			
Weather C	Cloudy			
⊥ ir Temperatı	ure	°C	5	Stream Flow (High, Moderate, Limited, None)
e Cover (%)			Potential for fis	h migration (High, Moderate, Limited, None)
LIM	NOLOGY	STATI	ON	FISH SUMMARY
Depth from up	per surface of ic	e (cm)		
Ice thickness (o	cm)	I		
Clarity of Ice (H,M,L, or N)			
(High. Moderate, Li Snow Depth (c				
-	Temperature		·`c	
	lity (H,M, L, or	C)		
(High, M	foderate, Low, or Cle	e) ar)	uS	
	activity			
	ived Oxygen (bo lved Oxygen (su		ppm	
Dissol	ved Oxygen (su			TA ATA ATA TANY BUTTLE A CONTRACT OF THE PARTY
Date of Setting		iyaa (n. 1913) T	FISH COLLECTION SU	Date of Collection
1)ofe of Neffind			<u> </u>	
				Time of Collection
Time of Setting	g			Time of Collection Number of traps collected
	g			Time of Collection Number of traps collected
Time of Setting	g			
Time of Setting	g			
Time of Setting	g			
Time of Setting	g		 	
Time of Setting	g		 	
Time of Setting	g			
Time of Setting Number of traj	g ps set		Comments	Number of traps collected
Time of Setting Number of traj	g ps set	der the ice	Comments to set traps. We cut holes in set	Number of traps collected
Time of Setting Number of traj	g ps set	der the ice	la statute e tradicio de la companya de la company La companya de la comp	Number of traps collected
Time of Setting Number of traj	g ps set	der the ice	la statute e tradicio de la companya de la company La companya de la comp	Number of traps collected
Time of Setting Number of traj	g ps set ater depth un	der the ice	la statute e tradicio de la companya de la company La companya de la comp	Number of traps collected
Time of Setting Number of traj	g ps set ater depth un	der the ice	la statute e tradicio de la companya de la company La companya de la comp	Number of traps collected
Time of Setting Number of traj Not enough wa	g ps set ater depth un	der the ice	la statute e tradicio de la companya de la company La companya de la comp	Number of traps collected

			SITE VISIT DESCRIPT	10N
Site Name (e.g. TOB-1)	TOB-	3	first three letters of stream name-site number	VISIT # 1
			PHOTO DOCUMENTATI	ION

Site Name e.g. TOB-1)	TOB-	3	first three letters of stream name-site number			VISIT	# 2
e.y. 108-17		L		Ľ	Date of survey	Time of survey	Surveyors
				Ľ	2001-01-22		tj <td≤jd< td=""></td≤jd<>
Gazetted Stream 1		Local Str	eam Name	Watershed Code			.
Toboggan Creek	side Channel						
Weather							
Air Temperat	ure 🜅 °	С		Stream	Flow	(High, Moderate, Lin	ited, None)
ce Cover (%)			Pote	ntial for fish migr	ation	(High, Moderate, Lin	nited, None)
LIM	NOLOGY	STAT	ION		FISH SU	MMARY	1997 - 1997 1997 - 1997 - 1997 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1
the second s	oper surface of ice	t server dere	a a construction of the second s		1 ° 4 19.9° °	an na haran da sa ƙwarar sa	• • •
•							
Ice thickness (
Clarity of Ice ((High, Moderate, L							
Snow Depth (cm)						
Water	Temperature		Ċ c				
Turbio	dity (H,M, L, or (C)					
	Moderate, Low, or Cle uctivity	ar)	uS				
	lved Oxygen (bo	ttom)	ppm				
	lved Oxygen (su		ppm				
			FISH COLLEC	TION SUMM	ARY		
Date of Setting	n state in	10 (15 6%) 			Date of Col	lection	
Time of Setting					Time of Co	llection	
Number of tra					Number of	traps collected	
	r	L]				
n ar an				omments		사용 아이는 HM 가지 같이 다 공부를	
	and a second br>Second second br>Second second						
NOT ENOUC	GH WATER I	DEPTH	IO SET TRAPS.				
1							
[

			SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	TOB-	3	first three letters of stream name-site number	VISIT # 2
			PHOTO DOCUMENTATI	ON

Site Name	TOB-	5	first three letters of stream name-site number			VISI	Т # 1
e.g. TOB-1)	LJ	L			Date of survey	Time of survey	Surveyors
					2000-12-20	12:20	TJ,TD,JD
Bazetted Stream	Name	Local St	ream Name V	Vatershed Code			
oboggan Lake						··· ··· <u></u>	
Weather (Overcast						
ir Temperat	ture -12	с		Strea	m Flow	H (High, Moderate, 1	imited, None)
ce Cover (%)) 100		Potent	ial for fish mig	gration	H (High, Moderate, 1	limited, None)
LIM	INOLOGY	STAT	[ION		FISH S	SUMMARY	
Depth from u	pper surface of ic	e (cm)	86		Total # of	Mininimum	Maximum
Ice thickness ((cm)		37	Species	Fish		Length (mm)
	(H,M,L, or N)			<u> </u>	5	53	
(High, Moderate, I	Limited, None)			DV	2	62	112
Snow Depth (6				
	r Temperature		0.9 C				
	idity (H,M, L, or Moderate, Low, or Clo						
Cond	luctivity		70 <i>uS</i>				
Disso	olved Oxygen (bo	ottom)	10 ppm				
	1 10 (c \					
Disso	olved Oxygen (su	rtace)	ppm	L			
Dissc	olved Oxygen (su	riace)	FISH COLLECT	ION SUM	MARY		
Disso Date of Setting		2000-1	FISH COLLECT	ION SUM	VIARY Date of C	Collection	2000-12-
	g		FISH COLLECT	TION SUM	Date of C	Collection Collection	2000-12- 11:40
Date of Setting	g 1g	2000-1	FISH COLLECT	TON SUM	Date of C Time of C		
Date of Setting Time of Settin Number of tra NOTE: Cluster cont	g ag aps set lains three traps with	2000-1 12:: 4 in an -5 wet	FISH COLLECT	· . · · · · · · · · · · ·	Date of C Time of C Number	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster	g ng aps set tains three traps with T Mean	2000-1 12:: 4 in an ~5 meter Instrear St	PISH COLLECT	TION SUM	Date of C Time of C Number	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster	g ng aps set tains three traps with T Mean	2000-1 12: 4 in an -5 wet Instrear	PISH COLLECT	· . · · · · · · · · · · ·	Date of C Time of C Number er Cluster	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number	g ng aps set tains three traps with T Mean	2000-1 12:: 4 in an ~5 meter Instrear St	PISH COLLECT	umber Captured pe	Date of C Time of C Number er Cluster	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number	g ng aps set tains three traps with T Mean	2000-1 12:: 4 in an ~5 meter Instrear St	PISH COLLECT	umber Captured pe	Date of C Time of C Number er Cluster	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number	g ng aps set tains three traps with T Mean	2000-1 12:: 4 in an ~5 meter Instrear St	PISH COLLECT	umber Captured pe	Date of C Time of C Number er Cluster	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number	g ng aps set tains three traps with T Mean	2000-1 12:: 4 in an ~5 meter Instrear St	PISH COLLECT	umber Captured pe	Date of C Time of C Number er Cluster	Collection	11:40
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe 5 DV / 2	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Numbe MT 1	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe 5 DV / 2	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Numbe MT 1	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe 5 DV / 2	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number MT 1 Drifting snow	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe 5 DV / 2	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number MT 1 Drifting snow	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe 5 DV / 2	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4
Date of Setting Time of Settin Number of tra NOTE: Cluster cont Capture Cluster Method Number MT 1 Drifting snow	g aps set tains three traps with or Mean er Denth Dor	2000-1 12:: 4 in an ~5 weta Instrear Suminant Dom	FISH COLLECT	umber Captured pe 5 DV / 2	Date of C Time of C Number er Cluster	Collection of traps collected	11:40 4

1.2.2.4	•• • • •	an an thair a	1443 T. Hall	 1. Sec. 1. Sec.				NG 150								- 121 - F	*****	n ang 1941 y	 		- C. C. S. J.						
	144 1 1	1999 - S. 1	A 11 AV	 5 - Y _ Y Y Y			シンチー うり		-			~ ~			~ ~				 	1 A	1.1.1	A 1 1 1 1 1					
	19 C		1775 A.	 9 C G C - 1		くやえた	Sec. 2010	121.14		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								IPT	 			C. 1	Sec. 1.			1	
- N - E -	t de la sur su				1100		- 1 - C	11/11					5 C	2 B .						100		1.5			1		
- i i i i i i i i i i i i i i i i i i i			1.1						7				1.00		1. J. L.		·		 	e			1.00		11 A A A A A A A A A A A A A A A A A A	Carlo de las s	
	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	1 A A A A A A A A A A A A A A A A A A A		 			· · · · ·	- 1 N N							_				 	1 H.	10.251			- in the second s		- A. 1997	5 C
			C 64 - 25	 1 C C C C C C C C C C C C C C C C C C C	1.	A		20 A Y	23 C 1	N 6 - N	1 A 14 A 14	- NG .		5 - J. C. A		1.00	- C	1 N N N N N N N N	 			a characht	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -			• • • • • • • •	

TOB - 5

first three letters of stream name-site number

VISIT # 1

a state of

際という

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1] [1	СО	96	11.7	UM	
MT] [1] 1	СО	53	1.7	UM	
MT] [1	2	СО	98	12	UM	
MT	1	4	DV	112	17.7	UM	
MT	1	4	СО	89	9	UM	
MT	· 1	4	DV	62	. 3.4	UM	
MT	1	4	СО	101	13.3	UM	

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	TOB	5	first three letters of stream name-site number			VISIT #	2
			-		Date of survey	Time of survey S	urveyors
					2001-01-22	11:30	TJ,TD,JD
Gazetted Strea		Local Strea	am Name	Watershed Code			
Toboggan Lak	· · ·						
Weather	high overcast						
Air Temper	ature -5	с		Strea	m Flow L	(High, Moderate, Limited	i. None)
Ice Cover (%	%) 100		Pote	ntial for fish mi	gration L	(High, Moderate, Limited	i, None)
LI	MNOLOGY	STATI	ON States		FISH SU	MMARY	
Depth from	upper surface of ic	e (cm)	84				ximum
Ice thicknes	ss (cm)		42	Species	·		th (mm)
Clarity of Ic	ce (H,M,L, or N)		N	NFC	0	0	0
(High, Moderat Snow Dept	e, Limited, None) h (cm)		26				
Wa	iter Temperature		0.1 ° C				
	rbidity (H,M, L, or (c)	M				
(Hig	h, Moderate, Low, or Cle						
	nductivity						
	solved Oxygen (bo		84 ppm				
Dis	solved Oxygen (su		ppm				i ostatena
		· · · · · · · · · · · · · · · · · · ·	ISH COLLEC	TION SUM	an a		
Date of Sett	-	2001-01-			Date of Colle		2001-01-23
Time of Sett		11:30			Time of Colle		<u>11:05</u>
Number of t		4			Number of tr		4
Capture Clus	ontains three traps within	Instream C		Number Captured pe	er Cluster		
Method Nur	IVICALI	Sub unant Dominar					
MT 1			100 NFC				
				·			
			Co	mments			
pH = 7.1					······		
					· · · · · · · · · · · · · · · · · · ·	··········	
							····
						·····	

		s de rien i ser	SITE VISIT DESCRIPT	
Site Name (e.g. TOB-1)	TOB-	5	first three letters of stream name-site number	VISIT # 2
		<u>'P</u>		

INDIVIDUAL FISH DATA

•

Site Name	DB-5	first three letters of stream			VIS	SIT # 3	7
e.g. TOB-1)		name-site number				L	
				Date of survey 2001-02-19	Time of surve	ey Surveyors	
Gazetted Stream Name	Local Str	eam Name	Watershed Code	L			
Toboggan Lake							
Weather High ov	ercast.						
ir Temperature	-3 ° c		Strea	m Flow	(High, Moderate	e, Limited, None)	
ce Cover (%)	100	Poter	ntial for fish mig	gration	(High, Moderate	e, Limited, None)	
LIMNOL	OGY STAT	ION		FISH S	UMMARY		
Depth from upper surfa-	ce of ice (cm)	92	Emosion	Total # of	Mininimum	Maximum Length (mm)	
Ice thickness (cm)		48	Species	Fish	Length (mm)	76	
Clarity of Ice (H,M,L, o		Ν					
(High, Moderate, Limited, Non Snow Depth (cm)	e)	8	DV	1	109	109	
Water Tempera Turbidity (H,M		0.2 C					
(High, Moderate, Lo							
Conductivity							
Dissolved Oxy		<i>uS</i> 7 ppm					
	gen (surface)	7 ppm			و الا و الراب و الراب و الراب و الراب	en beste an Albert ble a	•
Dissolved Oxy	gen (surface)	ppm	TION SUMM	ЛАПУ			
Dissolved Oxy	gen (surface)	7 ppm ppm FISH COLLEC	TION SUMN	Date of Co		2001-	
Dissolved Oxy Dissolved Oxy	gen (surface)	7 ppm ppm FISH COLLEC	TION SUMN	Date of Co Time of Co	ollection	11:	00
Dissolved Oxy Dissolved Oxy Date of Setting Time of Setting Number of traps set	gen (surface) 2001-02 11:0 4	7 ppm ppm FISH COLLEC	TION SUMN	Date of Co Time of Co			00
Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set	gen (surface) 2001-02 11:0 4	7 ppm ppm FISH COLLEC		Date of Co Time of Co Number o	ollection	11:	00
Dissolved Oxy Dissolved Oxy Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Mea	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N	Number Captured pe	Date of Co Time of Co Number o	ollection	11:	00
Dissolved Oxy Dissolved Oxy Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub	7 ppm ppm FISH COLLEC 2-19 0 0 diameter area Cover Species/ M		Date of Co Time of Co Number o r Cluster	ollection	11:	00
Dissolved Oxy Dissolved Oxy Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Mea Method Number Den	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent hant ice cover	Number Captured pe	Date of Co Time of Co Number o r Cluster	ollection	11:	00
Dissolved Oxy Dissolved Oxy Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Mea Method Number Den	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent hant ice cover	Number Captured pe	Date of Co Time of Co Number o r Cluster	ollection	11:	00
Dissolved Oxy Dissolved Oxy Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Mea Method Number Den	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent hant ice cover	Number Captured pe	Date of Co Time of Co Number o r Cluster	ollection	11:	00
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tr Capture Cluster Mea Method Number Den MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domir	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o r Cluster	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tr Capture Cluster Mea Method Number Den MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domir	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three trans Capture Cluster Mea Method Number Mea MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domir	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o r Cluster	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tr Capture Cluster Mea Method Number Den MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domir	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three trans Capture Cluster Mea Method Number Mea MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domin	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three trans Capture Cluster Mea Method Number Mea MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domin	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three trans Capture Cluster Mea Method Number Mea MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domin	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three trans Capture Cluster Mea Method Number Mea MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domin	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		
Dissolved Oxy, Dissolved Oxy, Dissolved Oxy, Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three trans Capture Cluster Mea Method Number Mea MT 1	gen (surface) 2001-02 11:0 4 aps within an ~5 meter Instream n Sub th Dominant Domin	7 ppm ppm FISH COLLEC 2-19 0 diameter area Cover Species/ N Percent int ice cover 100 CO /	Number Captured pe	Date of Co Time of Co Number o	ollection f traps collected		

ite Name e.g. TOB-1)	TOB-5	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Numbe	r Photo Description	
OW5	4	Site view limno visible	

Method	Number	Number	Species	(mm)	Weight (g)	(e.g. adipose, upper caudal, none)	Clip
MT] [1] [1	DV	109	13.8	UM	
MT	1	2	NFC				
MT	1	3	NFC				
MT	1	4	СО	76	4.7	UM	
MT	1	4	Со	65	3.3	UM	
MT] [1	4	СО	74	4.7	UM	
MT	1	4	СО	60	1.9	UM	

Date of survey Time of survey Surveyon 201-03-19 10-40 TLTDJD Grazented Stream Name Local Stream Name Watersheld Code Totoggan Lake	Site Name (e.g. TOB-1)	TOB-	5	first three letters of stream name-site number				VIS	IT # 4
Jacented Stream, Name Local Stream, Name Watershed Code Foboggan Lake Iigh overcast uir Temperature 3 C Stream Flow N (tigh Modens, Luniked, Neer) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 30 Ice tückness (cm) 53 Chrity of Ice (H,M,L or N) N Migh Modens, Lunike, Noor) 0 Soow Depth (cm) 0 Water Temperature 0.7 Conductivity 45 Dissolved Oxygen (strotom) 3 ppm Dissolved Oxygen (strotom) 9 Dissolved of traps collected Number of traps set Number of traps collected	0.g. 100 //		<u> </u>	ł					
Totoggan Lake Wenter High overcast Air Temperature -3 C Stream Flow N Otiga. Modenai. Limited, Nore) ce Cover (%) 100 Potential for fish migration M Otiga. Modenai. Limited, Nore) Depth from upper surface of ice (cm) 30 Estimate Nore) FISH SUMMARY NFC 0 0 0 0 Main Modenai. Limited, Nore) 0 0 0 Gringh. Modenai. Limited, Nore) 0 0 0 Migh. Modenai. Limited, Nore) 0 0 0 Water Temperature 0.7 C 0 0 0 Water Temperature 0.7 C 0 0 0 0 0 Dissolved Oxygen (bottom) us5 0						2001-03	-19	10:40	TJ,TD,JD
Weather Fligh overcast Lir Temperature -3 C Stream Flow Iftigh, Modente, Linned, Nore) cc Over (%) 100 Potential for fish migration M Iftigh, Modente, Linned, Nore) LIMNOLOGY STATION FISH SUMMARY Depth from upper sufface of ice (cm) 30 Species Total # of Minimum Maximum Ice thickness (cm) 53 NFC 0 0 0 Chrity of loe (H,ML, or N) N NFC 0 0 0 Show Depth (cm) 0		Name	Local Strea	m Name	Watershed Code				
air Temperature									
mark Mark	Wenther	High overcast							
me cover (%) 100 Potential for fish migration M (f) (f) (h) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	ir Temperat	ure -3°	с		Strea	am Flow	N	(High, Moderate	Limited, None)
Depth from upper surface of ice (cm) 30 Le thickness (cm) 53 Charly of Lee (H,ML, or N) N (figh, Moderse, Low, or Older) 0 Snow Depth (cm) 0 Water Temperature 0,7 ° C Turbidity (H,M, L, or C) M (figh, Moderse, Low, or Clear) 0 Conductivity u/S Dissolved Oxygen (surface) ppm Pate of Setting 2001-03-19 Time of Setting 10:40 Number of traps set Number of traps collected	-			Pote	ntial for fish mi	igration	Μ	(High, Moderate,	Limited, None)
Depin Hold Spite Hold Spite All and Constraints of Ref (M) Lee thickness (cm) Charly of Lee (H,M,L, or N) Ofligh, Modera, Limita Kone) Snow Depth (cm) 0 Water Temperature 0,7 Conductivity Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 10:40 Number of traps set Number of traps set PH = 6.8	LIM	NOLOGY	STATI	ON		FISI	H SUN	MARY	
Ice thickness (cm) 53 NFC 0 0 0	Depth from up	oper surface of ice	e (cm)	30					
Clarity of Ice (H,M,L, or N) (Figh, Moderase, Limited, Nove) Snow Depth (cm) Water Temperature 0.7 ° C Turibidity (H,M, L, or O) (Figh, Moderase, Low, or Clear) (Conductivity Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 10:40 Number of traps set Number of traps collected M Comments pH = 6.8	Ice thickness (cm)	[53					·
Snow Depth (cm) 0 Water Temperature 0.7 C Turbidity (H,M, L, or C) (tigh, Moderna, Low, or Clear) uS Dissolved Oxygen (bottom) 3 ppm Dissolved Oxygen (surface) ppm Bate of Setting 2001-03-19 Time of Setting 10:40 Number of traps set Number of traps collection PH = 6.8 Ecomments			[N	NFC	U		0	
Water Temperature 0.7 C Turbidity (H,M, L, or C) M uS Dissolved Oxygen (bottom) 3 ppm Dissolved Oxygen (surface) ppm Date of Setting 10:40 Time of Collection Number of traps set Dissolved Oxygen (surface) Date of Collection Plate of Setting 10:40 Time of Collection Number of traps set Comments			[0					
Turbidity (H,M, L, or C) (High, Moderna, Low, or Clear) Conductivity uS Dissolved Oxygen (bottom) 3 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-19 Time of Setting 10:40 Number of traps set Number of traps collected PH = 6.8 Comments	-		[,					
(High, Modernae, Low, or Clear) uS Dissolved Oxygen (bottom) 3 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-19 Time of Setting 10:40 Number of traps set Number of traps collected PH = 6.8 Comments		-	c) [
Dissolved Oxygen (bottom) 3 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-19 Date of Collection Time of Setting 10:40 Time of Collection Number of traps set Number of traps collected Number of traps set Number of traps collected pH = 6.8	(High, I	Moderate, Low, or Clea	ar)						
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-19 Date of Collection Time of Setting 10:40 Time of Collection Number of traps set Number of traps collected bet = 6.8			ttom)						
FISH COLLECTION SUMMARY Date of Setting 2001-03-19 Date of Collection Time of Setting 10:40 Time of Collection Number of traps set Number of traps collected Image: Setting Setting Setting Setting Setting Seties PH = 6.8 Comments			L. L			_			
Date of Setting 2001-03-19 Time of Setting 10:40 Number of traps set Number of traps collected PH = 6.8	21000				TION SHM	MARY		an a	
Time of Setting 10:40 Number of traps set Number of traps collected PH = 6.8	Date of Setting	e el traj. •					of Collec	tion	
Number of traps collected Comments pH = 6.8									\
Comments pH = 6.8			10.40			Num	ber of tre	aps collected	
pH = 6.8		•							
pH = 6.8									
pH = 6.8									
pH = 6.8									
pH = 6.8					·				
pH = 6.8									
pH = 6.8								·	
pH = 6.8		an a		Co	mments			an an an an an an An Anna Anna Anna Anna	
	nH = 6.8	en a construction de la construction 		addilada a sharara	<u></u>	e di setti di sustetti. Transforma	n for service	. * x	
No traps set, not enough water depth.	pii 0.0								
No traps set, not enough water depth.									
	No trans set	not enough wa	ter denth						······
		iot onough wa	uopui.						
								<u></u>	
				· · · · · · · · · · · · · · · · · · ·					

			SITE VISIT DESCRIPTION		
Site Name (e.g. TOB-1)	TOB-	5	first three letters of stream name-site number	VISIT # [4
			PHOTO DOCUMENTATION		

Site Name e.g. TOB-1)	TOB-	6	first three letters of stream name-site number		VIS	SIT # 1
		L		Date of s		ey Surveyors
Bazetted Stream Na	ume	Local Str	eam Name	Watershed Code	··· <u></u> ··	
Coboggan Lake		<u> </u>	·····	L		
Weather OV	ercast					
ir Temperatu	re -12 °	С		Stream Flow	(High, Moderat	e, Limited, None)
e Cover (%)	100		Pote	ntial for fish migration	H (High, Moderat	e, Limited, None)
LIMN	IOLOGY	STAT	ION	FIS	SH SUMMARY	
Depth from uppe	er surface of ice	e (cm)	87	Total		Maximum
Ice thickness (cm	n)		36	Species Fis		Length (mm)
Clarity of Ice (H, (High, Moderate, Limi Snow Depth (cm	ited, None)		N 19	<u>CO</u> <u>3</u>	53	56
Turbidity	emperature y (H,M, L, or (derate, Low, or Cle		0.6 C			
Conduct		,	70 <i>uS</i>			
Dissolve	d Oxygen (bo	ttom)	10 ppm			
Dissolve	ed Oxygen (sur	face)	ppm			
ang sa			FISH COLLEC	TION SUMMARY		
Date of Setting		2000-12	2-20	Dat	e of Collection	2000-12-2
Time of Setting		12:0	0		ne of Collection	11:40
Number of traps	set	4		Nur	nber of traps collected	4
	three traps within	an ~5 meter Instream Sub	Cover Species/ 1	Number Captured per Cluster		
NOTE: Cluster contains	Mean					
	Mean Denth Dom	inant Domin	ant ice cover 00/	3 /		
Capture Cluster Method Number		inant Domin		3		
Capture Cluster Method Number		inant Domin		3		/
Capture Cluster Method Number		inant Domin		3		
Capture Cluster Method Number	Denth Dom		<u>100</u> CO	(/		/
Capture Cluster Method Number MT 1	Denth Dom		[00] [C0]/[(/]/[] []/[
Capture Cluster Method Number MT 1			[00] [C0]/[(/ /		
Capture Cluster Method Number MT 1	Denth Dom		[00] [C0]/[(/		
Capture Cluster Method Number MT 1	Denth Dom		[00] [C0]/[(/		
Capture Cluster Method Number MT 1	Denth Dom		[00] [C0]/[(/		

SITE VISIT DESCRIPTION

TOB - 6

first three letters of stream name-site number

VISIT # 1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	2	СО	54	2.4	UM	
MT	1	3	СО	56	2.7	UM	
MT	1	4	СО	53	2.6	UM	

	SITE VIS	IT DESCRIPTION
Site Name (e.g. TOB-1)	- 6 first three letters of stree name-site number	visit # 2
·		Date of survey Time of survey Surveyors
		2001-01-22 11:45 TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code
Toboggan Lake		
Weather High overca	st	
Air Temperature -5]°c	Stream Flow L (High, Moderate, Limited, None)
Ice Cover (%) 100		Potential for fish migration L (High, Moderate, Limited, None)
LIMNOLOG	Andrew and a second	FISH SUMMARY
Depth from upper surface of Ice thickness (cm)	ice (cm) 81	Total # of Mininimum Maximum Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) Snow Depth (cm)	<u> </u>	CO 1 158 58
Water Temperature	0.1 °C	
Turbidity (H,M, L, c (High, Moderate, Low, or		
Conductivity		
Dissolved Oxygen (Dissolved Oxygen (<u> </u>	
	FISH COLL	ECTION SUMMARY
Date of Setting	2001-01-22	Date of Collection
Time of Setting	11:45	Time of Collection 11:10
Number of traps set	4	Number of traps collected 4
NOTE: Cluster contains three traps will Capture Cluster Method Number Depth D MT 1		ties/ Number Captured per Cluster
		Comments
pH = 6.7		
L		

INDIVIDUAL FISH DATA	
PHOTO DOCUMENTATION	
ite Name a.g. TOB-1) TOB - 6 first three letters of stream and and stream VISIT # 2	

(1) (1) (1)

Gazetted Stream Name Local Stream Name Watershed Code Toboggan Lake	TD,JD
Date of survey Time of survey Survey 2001-02-19 11:20 TJ,T Gazetted Stream Name Watershed Code Integen Code Toboggan Lake	TD,JD
Gazetted Stream Name Local Stream Name Watershed Code Toboggan Lake	ne)
Toboggan Lake Weather High overcast Air Temperature -3 ° C Stream Flow (High, Moderate, Limited, Non Ice Cover (%) 100 Potential for fish migration (High, Moderate, Limited, Non LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 81 Species Total # of Mininimum Maximu Ice thickness (cm) 47 Species Fish Length (rm) Length (rm) Clarity of Ice (H,M,L, or N) N NFC 0 0 0 Snow Depth (cm) 6	ne) Southann an Statistica Statistica um
Weather High overcast Air Temperature -3 C Stream Flow (High, Moderate, Limited, None) Ice Cover (%) 100 Potential for fish migration (High, Moderate, Limited, None) LIMNOLOCCY STATION Fish Butminum Maximum Depth from upper surface of ice (cm) 81 Species Total # of Mininimum Maximum Ice thickness (cm) 47 0 0 0 0 Clarity of Ice (H,M,L, or N) N N Itempth (rm) Length (rm) Length (rm) Length (rm) Snow Depth (cm) 6 Vater Temperature 0.2 C Turbidity (H,M, L, or C) M Migh, Moderate, Low, or Clear) Use Use Use Use Use Use Dissolved Oxygen (bottom) 4 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY	ne) Southann an Statistica Statistica um
Air Temperature -3 C Stream Flow (High, Moderate, Limited, Non Ice Cover (%) 100 Potential for fish migration (High, Moderate, Limited, Non LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 81 Fish Length (rmm) Maximu Ice thickness (cm) 47 Species Fish Length (rmm) Length (rmm) Clarity of Ice (H,M,L, or N) N N NFC 0 0 0 Snow Depth (cm) 6 Water Temperature 0.2 C C Turbidity (H,M, L, or C) M High, Moderate, Low, or Clear) Conductivity uS US US US Dissolved Oxygen (bottom) 4 ppm ppm Pissh COLLECTION SUMMARY	ne) Southann an Statistica Statistica um
Ice Cover (%) 100 Potential for fish migration (High, Moderate, Limited, None) Depth from upper surface of ice (cm) 81 FISH SUMMARY Ice thickness (cm) 47 Species Total # of Mininimum Maximu Clarity of Ice (H,M,L, or N) N N NFC 0 0 0 Snow Depth (cm) 6 Mater Temperature 0.2 °C M Maximu Maximu Dissolved Oxygen (bottom) 4 ppm jossolved Oxygen (surface) ppm ppm Dissolved Oxygen (surface) ppm ppm ppm ppm ppm ppm Fish COLLECTION SUMMARY Fish Colling (M, M, C) Maximu Maximu Maximu Bissolved Oxygen (surface) ppm fish Length (mm)	ne) Solar se se Solar se se se um
Ice Cover (%) 100 Potential for fish migration (High, Moderate, Limited, None) Depth from upper surface of ice (cm) 81 FISH SUMMARY Ice thickness (cm) 47 Species Total # of Mininimum Maximu Clarity of Ice (H,M,L, or N) N N NFC 0 0 0 Snow Depth (cm) 6 Mater Temperature 0.2 C M M High, Moderate, Low, or Clear) M Dissolved Oxygen (bottom) 4 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Fish Coll Coll Coll Coll Coll	1
Depth from upper surface of ice (cm) 81 Ice thickness (cm) 47 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 6 Snow Depth (cm) 6 Water Temperature 0.2 ° C Turbidity (H,M, L, or C) M (High, Moderate, Low, or Clear) uS Dissolved Oxygen (bottom) 4 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY	
Jeepin Hold upper surface of the (strift) UI Instantion of the formation of the f	
Ice thickness (cm) 47 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 6 Snow Depth (cm) 6 Water Temperature 0.2 ° C Turbidity (H,M, L, or C) M (High, Moderate, Low, or Clear) M Conductivity uS Dissolved Oxygen (bottom) 4 ppm Dissolved Oxygen (surface) ppm	nm)
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) Snow Depth (cm) 6 Water Temperature 0.2 Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity Ussolved Oxygen (bottom) 4 ppm Dissolved Oxygen (surface) ppm	
Snow Depth (cm) 6 Water Temperature 0.2 ° C Turbidity (H,M, L, or C) M (High, Moderate, Low, or Clear) M Conductivity uS Dissolved Oxygen (bottom) 4 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY	
Water Temperature 0.2 ° C Turbidity (H,M, L, or C) M (High, Moderate, Low, or Clear) M Conductivity uS Dissolved Oxygen (bottom) 4 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY	
Turbidity (H,M, L, or C) M (High, Moderate, Low, or Clear) uS Conductivity uS Dissolved Oxygen (bottom) 4 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY The summary of the sum	
Conductivity uS Dissolved Oxygen (bottom) 4 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY	
Dissolved Oxygen (bottom) Dissolved Oxygen (surface) FISH COLLECTION SUMMARY	
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY	
Date of Setting 2001-02-19 Date of Collection 20	001-02-20
Time of Setting 11:20 Time of Collection	11:20
Number of traps set 4 Number of traps collected	
NOTE: Cluster contains three traps within an ~5 meter diameter area Capture Cluster Mean Sub Percent	
Method Number Denth Dominant Dominant ice cover	
Comments	
pH = 6.5	

750

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	TOB-6	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Numl	er Photo Description	
OW5	5	Site view limno visible.	

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	NFC				
MT] [1	2	NFC				
MT	. 1	3	NFC				
MT] [1	4	NFC				

			SITE VI	SIT DE	SCRIP	rion				
Site Name (e.g. TOB-1)	TOB-	6	first three letters of name-site number	stream				VIS	SIT #	4
(e.g. 100 f/	LJ	L				Date of sur 2001-03		Time of surve		veyors J,TD,JD
Gazetted Stream N	Name	Local Str	eam Name	Wate	ershed Code					
Toboggan Lake					. <u> </u>					
Weather H	ligh overcast	and win	ły							
Air Temperatı	ure -2 °	С			Strea	m Flow	N	(High, Moderat	e, Limited, ?	None)
lce Cover (%)	100			Potential	for fish mi	gration	Μ	(High, Moderat	e, Limited, 1	None)
LIM	NOLOGY	STAT	ION	· ··		FISI	H SU	MMARY		
Depth from upp	per surface of ic	e (cm)	35			Total #	-	Mininimum	Maxi	
Ice thickness (c	:m)		52		Species	Fish	נ ר	Length (mm)	Length	
Clarity of Ice (I (High, Moderate, Liz					NFC		l		L	<u> </u>
Snow Depth (c	m)		0							
Water	Temperature		0.7 °C							
	lity (H,M, L, or (loderate, Low, or Cle ctivity		M uS							
	ved Oxygen (bo	ttom)								
	ved Oxygen (su		ppm ppm							
			FISH COL	LECTIO)N SUMI	MARY	ng ki jer Manazara			
Date of Setting	n a an	2001-0	- 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.		· · ·	a staat di	of Coll	ection	[
Time of Setting						Time	of Coll	lection	[
Number of trap						Numl	ber of t	raps collected	[
								<i>.</i>		
	e de la composición d	- 11-19-19-19-19-19-19	- 14-12-4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	24.4 <u>-</u> 14.4	.en jaur			n e ten <u>s</u> ter		un altaem alta
				Comm	ents				· ·	
pH = 7.0										
Notraps set, no	ot enough wa	ter depth								
						······				
[
L							•			

		SITE VISIT DESCRIPTION		
Site Name (e.g. TOB-1)	TOB-	first three letters of stream name-site number	VISIT # 4	

(@)

1

Con .

0

6

PHOTO DOCUMENTATION

Site Name (e.g. TOB-1)	DB- 7	first three letters of stream name-site number			VIS	IT # 1
		I	Da	te of survey	Time of surve	y Surveyors
				2001-03-09	10:10	TJ,TD,JD
Jazetted Stream Name	Local Strea	m Name W	atershed Code			
oboggan Lake Outflow	<u>l</u>					
Weather High ov	ercast and windy					<u></u>
ir Temperature 📋	<u>-3</u> ° C		Stream I	Flow L	(High, Moderate	e, Limited, None)
ce Cover (%)	0	Potentia	al for fish migra	tion H	(High, Moderate	e, Limited, None)
LIMNOL	OGY STATI	ON		FISH SU	JMMARY	
Depth from upper surface	ce of ice (cm)	130		Fotal # of	Mininimum	Maximum
Ice thickness (cm)		0	Species		Length (mm)	Length (mm)
Clarity of Ice (H,M,L, o	or N)		CO	13	51	100
(High, Moderate, Limited, None	ie)		DV	2	92	108
Snow Depth (cm)	L		RB	2	90	93
Water Tempera		2 C				
Turbidity (H,M (High, Moderate, Lo		M				
Conductivity	[uS				
Dissolved Oxy	gen (bottom)	6 ppm				
	г					
Dissolved Oxy	gen (surface)	ppm				
Dissolved Oxy		ISH COLLECT	ION SUMMA	RY		
		ISH COLLECT	ION SUMMA	RY Date of Coll	lection	2001-03
Date of Setting	2001-03-1	ISH COLLECT	ION SUMMA	4 • 4 V 1 4 4 4 4 • 4 V 1 4		2001-03
		ISH COLLECT	ION SUMMA	Date of Col Time of Col		
Date of Setting Time of Setting Number of traps set	2001-03-1 10:10 4	ISH COLLECT		Date of Coll Time of Col Number of	llection	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster	2001-03-3 10:10 4 aps within an ~5 meter dia Instream Co	AISH COLLECTI	ION SUMMA	Date of Coll Time of Col Number of	llection	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	2001-03-3 10:10 4 aps within an ~5 meter dia Instream Co	ameter srea over Percent t ice cover	nber Captured per Clu	Date of Col Time of Col Number of	llection traps collected	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster	E 2001-03- 10:10 4 sps within an ~5 meter dia Instream C an Sub	AISH COLLECTI 19 ameter area over Species/ Num Percent	nber Captured per Clu	Date of Coll Time of Col Number of	llection traps collected	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	E 2001-03- 10:10 4 sps within an ~5 meter dia Instream C an Sub	ameter srea over Percent t ice cover	nber Captured per Clu	Date of Col Time of Col Number of	llection traps collected	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	E 2001-03- 10:10 4 sps within an ~5 meter dia Instream C an Sub	ameter srea over Percent t ice cover	nber Captured per Clu	Date of Col Time of Col Number of	llection traps collected	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	E 2001-03- 10:10 4 sps within an ~5 meter dia Instream C an Sub	ameter srea over Percent t ice cover	nber Captured per Clu	Date of Col Time of Col Number of	llection traps collected	10:45
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent t ice cover 0 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Ister	llection traps collected	10:45 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	E 2001-03- 10:10 4 sps within an ~5 meter dia Instream C an Sub	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Col Time of Col Number of	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number MT 1	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number MT 1	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number MT 1	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number MT 1	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number MT 1	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three tra Capture Cluster Method Number MT 1	2001-03- 10:10 4 aps within an -5 meter dia Instream Can sub th Dominant Dominant	AISH COLLECTI ameter area over Species/ Num Percent ice cover CO / 13 CO / 13	nber Captured per Ch DV / 2	Date of Coll Time of Col Number of Lister RB / 2	llection traps collected	10:4 4

이 같은 것 같은			SITE VISI T I	DESCRIPTIO	ON		na na na Na Salita
---	--	--	----------------------	------------	----	--	-----------------------

TOB-7

first three letters of stream name-site number

VISIT # 1

4

6

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] [1	RB	93	7.8	UM	
MT] 1	1	RB	90	7.1	UM	
MT	1] 1	СО	118	15.1	UM	
MT	1	1	СО	100	9.5	UM	
MT	1] [1	DV	108	10.8	UM	
MT	• 1] [1	DV	92.	7	UM	
MT] [1] [1	СО	69	3.6	UM	
MT	1] [1	СО	71	2.9	UM	
MT	1	1	СО	66	3.1	UM	
MT	1	2	СО	53	1.5	UM	
MT	1	2	СО	56	1.8	UM	
MT	1	3	CO	57	1.9	UM	
MT	1	3	CO	60	2.8	UM	
MT	1	3	CO	55	1.3	UM	
MT	1	4	CO	67	3.3	UM	
MT	1	4	СО	51	1.4	UM	
MT	1	4	СО	79	5.2	UM	

Site Name (e.g. TOB-1)	TOB - 8 first three name-site	e letters of stream e number	VIS	SIT # 1
			Date of surveyTime of survey2000-12-201:17	ey Surveyors TJ,TD,JD
Gazetted Stream Name Toboggan Creek	Local Stream Nam	Watershed Cod	e	
Weather Cloud	ly			
Air Temperature	-12 ° C	St	ream Flow M (High, Modera	te, Limited, None)
ce Cover (%)	60	Potential for fish	migration M (High, Modera	te, Limited, None)
LIMNO	LOGY STATION		FISH SUMMARY	
Depth from upper su	rface of ice (cm) 99		Total # of Mininimum	Maximum
Ice thickness (cm)	17	Species		Length (mm)
Clarity of Ice (H,M,I	L, or N)			65
(High, Moderate, Limited,)	None)		1 68	68
Snow Depth (cm)	8	DV	2 49	89
Water Temp	erature] c		
	I,M, L, or C) e, Low, or Clear) y 30]] uS		
Dissolved O	xygen (bottom)	ppm		
	xygen (surface)] ppm	<u></u>	
	FISH	COLLECTION SUN	MMARY	
Date of Setting	2000-12-20		Date of Collection	2000-12-21
Time of Setting	13:17		Time of Collection	11:00
Number of traps set	3		Number of traps collected	3
Capture Cluster Method Number MT 1	e traps within an -5 meter diameter aro Instream Cover Mean Sub Percen Denth Dominant Dominant ice cov 60	Species/ Number Captured	1 DV / 2 /	
		Comments		
	bridge on Eric Johnsons p			
Oxygen meter quit	, couldn't get a reading.			
pH = 8.2				

.

. Viite

لفن

3

, TOB-8

first three letters of stream name-site number

VISIT # 1

ne)

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip Type of Recaptured Fin (e.g. adipose, upper caudal, none) Clip
MT	1	1	Со	58	2.5	UM
MT	1	1	СО	60	3	UM
MT	1] _ 1	RB	68	4.6	UM
MT	1] 1	СО	54	2.5	UM
MT	1] [1	СО	45	2.5	UM
MT	· 1	1	СО	55	2.6	UM
MT	1	1	Со	54	2.6	UM
MT	1	1	СО	51	2.3	UM
MT	1] [1	Со	50	1.9	UM
MT	1	1	Со	51	2.1	UM
MT	1] 1	СО	50	2.4	UM
MT	1	1	СО	65	3.8	UM
MT	1] [1	СО	49	1.8	UM
MT	1	1	DV	89	8.3	UM
MT	1	1	Со	45	1.6	UM
MT	1] _ 1	DV	49	1.5	UM
MT	1	2	СО	53	2.2	UM
MT	1	2	СО	58	3.2	UM .
MT	1	2	СО	56	2.7	UM
MT	1	2	СО	50	2.4	UM
MT	1	3	СО	49	1.6	UM
MT	1	3	СО	51	2.8	UM
MT	1	3	СО	56	2.5	UM
MT	1	3	СО	49	1.5	UM
MT	1	3	СО	45	1.3	UM

Site Name e.g. TOB-1) TOB	- 8 first three letters of str name-site number	visi	T # 2
		Date of surveyTime of survey2001-01-2211:07	Surveyors TJ,TD,JD
Jazetted Stream Name	Local Stream Name	Watershed Code	
oboggan Creek			
Weather High overcast	t		
ir Temperature _5	°c	Stream Flow M (High, Moderate,	Limited, None)
ce Cover (%) 90		Potential for fish migration (High, Moderate,	Limited, None)
LIMNOLOGY	STATION	FISH SUMMARY	
Depth from upper surface of ic	ce (cm) 80	Total # of Mininimum	Maximum
Ice thickness (cm)	20	Species Fish Length (mm)	Length (mm)
Clarity of Ice (H,M,L, or N)			50
(High, Moderate, Limited, None) Snow Depth (cm)	0	RB 1 61	61
Water Temperature	0.2 °C		
Turbidity (H,M, L, or (High, Moderate, Low, or Cl Conductivity			
-			
Dissolved Oxygen (bo			
Dissolved Oxygen (su		ECTION SUMMARY	
Date of Setting	2001-01-22	Date of Collection	2001-01-2
Time of Setting	11:07	Time of Collection	11:25
Number of traps set	3	Number of traps collected	3
NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Denth Dor MT 1		cies/ Number Captured per Cluster	
		Comments	
Fue laver of in-			
Γwo layers of ice.			
bH = 7.7			
pH = 7.7			

. _ _

. .

TOB-8

first three letters of stream name-site number

VISIT # 2

No.

8 0510

PHOTO DOCUMENTATION

Capture Method	•		Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fir Clip
MT	1	1	RB	61	3.9	UM	
MT] 1	1	СО	45	1.6	UM	
MT	1	2	СО	43	1.8	UM	
MT	1	3	Со	50	2.1	UM	
MT	1	3	СО	50	2.2	UM	

Site Name (e.g. TOB-1)	TOB-	8 first three name-site	letters of stream number			VISI	Т # 3
	L	LJ		<u>D</u>	ate of survey	Time of survey	Surveyors
					2001-02-19	10:40	TJ,TD,JD
Gazetted Stream N	lame	Local Stream Name	• Wat	tershed Code	<u></u>		
Toboggan Creek							
Weather H	ligh overcast.						
Lir Temperatu	ire -3°	с		Stream	Flow M	(High, Moderate, I	Limited, None)
ce Cover (%)	100		Potentia	l for fish migr	ation M	(High, Moderate, I	.imited, None)
LIM	NOLOGY	STATION			FISH S	JMMARY	
Depth from upp	per surface of ice	(cm) 81			Total # of	Mininimum	Maximum
Ice thickness (c	m)	11		Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H	H.M.L. or N)	N		СО	20	46	98
(High, Moderate, Lin	mited, None)			RB	2	42	70
Snow Depth (cr	m)	0	_				
Water	Temperature	0.2	° C				
	ity (H,M, L, or C) oderate, Low, or Clear						
Conduc			uS				
Dissolv	ved Oxygen (botte	om) 11	ppm				
Dissolv	ved Oxygen (surfa	ace)	ppm				
		FISH	COLLECTIO	ON SUMM	ARY		
Date of Setting	an an an an an an an an	2001-02-19			Date of Col	llection	2001-02-
Time of Setting		10:40			Time of Co	llection	10:30
Number of trap	is set	3			Number of	traps collected	3
NOTE: Claster contain	=	an ~5 meter diameter area					
TOTAL CONTRACT CONTRACT	Mean	Instream Cover Sub Percent		per Captured per C	luster		
Capture Cluster		ant Dominant ice cove		RB / 2			
Capture Cluster Method Number	Denth Domin						• L
Capture Cluster	Denth Domin			J "J			
Capture Cluster Method Number	Denth Domin		,	ن ۳ ن			
Capture Cluster Method Number	Denth Domin						
Capture Cluster Method Number	Denth Domin					•	
Capture Cluster Method Number						1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	
Capture Cluster Method Number	Denth Domin		Comm	ients			
Capture Cluster Method Number MT 1				ients			이 그는 것은 것을 했다.
Capture Cluster Method Number MT 1 pH = 7.5				ients			이 가지 않는 것이 있는 것이 없다.
Capture Cluster Method Number				ients			이 가지 않는 것이 있는 것이 없다.
Capture Cluster Method Number MT 1 pH = 7.5 Two layers of i	ice with water	100	Comm				이 가지 않는 것이 있는 것이 없다.
Capture Cluster Method Number MT 1 pH = 7.5 Two layers of i	ice with water		Comm				이 가지 않는 것이 있는 것이 없다.
Capture Cluster Method Number MT 1 pH = 7.5 Two layers of i	ice with water	100	Comm				이 가지 않는 것이 있는 것이 없다.

TOB-8

w.

first three letters of stream

name-site number

VISIT # 3

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudai, none)	Type of Recaptured Fin Clip
MT] 1] [1	СО	49	1.8	UM	
MT] _ 1	2	Со	55	2.7	UM	
MT	1	2	Со	46	0.9	UM	
MT	1	2	СО	47	1.5	UM	
MT	1	2	СО	52	1.8	UM	
MT		3	СО	64	2.9	UM	
MT] [1	3	СО	62	2.9	UM	
MT	1	3	СО	65	3.7	UM	
MT	1	3	СО	64	3.7	UM	
MT		3	СО	60	2.8	UM	
MT	1	3	СО	58	2.6	UM	
MT	1	3	СО	58	2.6	UM	
MT	1	3	RB	70	4.6	UM	
MT	1	3	СО	52	1.4	UM	
MT	1	3	СО	55	1.4	UM	
MT		3	СО	98	10.9	UM	
MT		3	СО	95	10.4	UM	
MT	1	3	СО	52	1.2	UM	
MT	1	3	СО	60	2	UM	
MT	1	3	СО	52	1.9	UM	
MT	1	3	СО	47	1.2	UM	
MT	1	3	RB	42	0.7	UM	

ite Name e.g. TOB-1)	OB-8	first three letters of stream name-site number	1		VIS	(T # 4
9.9. 108°17 [<u>_</u>	_		Date of survey 2001-03-19	Time of survey	/ Surveyors
azetted Stream Name	Local Str	eam Name	Watershed Code			
oboggan Creek						
Veather High c	overcast and wind	iy.	********************************			
ir Temperature	-3 ° c		Strea	m Flow H	(High, Moderate,	Limited, None)
e Cover (%)	10	Ро	tential for fish mig	gration H	(High, Moderate	Limited, None)
LIMNOI	LOGY STAT	ION		FISH S	UMMARY	
Depth from upper sur	face of ice (cm)	71		Total # of	Mininimum	Maximum
Ice thickness (cm)		0	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H,M,L	., or N)		CO	4	68	75
(High, Moderate, Limited, N Snow Depth (cm)	ione)	0	RB	1	64	64
Water Temps	erature	1.3 °C				
Turbidity (H, (High, Moderate,	, Low, or Clear)	M				
Conductivity		uS				
	xygen (bottom)	10 ppm				
Dissolved O	xygen (surface)	ppm			an an the state of t	A the stationary
		FISH COLLE	CTION SUMN	ARY		Secondas Internetas
Date of Setting	2001-03	3-19		Date of Co		2001-0
Time of Setting	11:0	<u>0</u>		Time of C		10:2
Number of traps set	3			Number 0	f traps collected	3
NOTE: Cluster contains three	Instream	Cover Specie	s/ Number Captured pe	r Cluster		
Aethod Number	Viean Sub Denth Dominant Domin	nant ice cover				
MT 1		10 CO	/ 4 RB / 1			
				a a constant and the set	e constant de la cons	1
			Comments			
			Comments			
bH = 7.1		C	Comments			
			Comments			
bH = 7.1			Comments			
bH = 7.1			Comments			
bH = 7.1			Comments			

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

TOB-8

first three letters of stream name-site number

VISIT # 4

1

Ś

PHOTO DOCUMENTATION

Capture Method	Cluster Number	•		Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] 1	NFC				
MT] 1	2	СО	74	3.7	UM	
MT	1	2	СО	68	3.2	UM	
MT	1	2	Со	75	4	UM	
MT	1	3	RB	64	3.3	UM	
MT		3	Со	74	3.4	UM	

-

Appendix 3. Species Richness, Diversity and Evenness

Plate 7.	Table summarizing ranges of species richness, diversity and eveness at each of the sites sampled
Plate 8.	Comparisons of coho capture rates between Upper Bulkley mainstem, side channel and tributary sites, and Toboggan Creek mainstem, sidechannels and lake sites. Percentages refer to the average percentage of the total coho catch
Plate 9.	Comparisons of rainbow trout capture rates between Upper Bulkley mainstem, side channel and tributary sites, and Toboggan Creek mainstem, sidechannels and lake sites. Percentages refer to the average percentage of the total coho catch

Appendix 1a. Fall Assessment Data Summary Table and Graphs

Plate 1. Table summarizing of fall assessment data.

1

. . .

Parents.

f'exe

Sytem		down-stream (m)2	1. (m)	Mean wetted width (m)	approx surface area (m?)	Mean (cm)	Functional LWD	LWD small LWD-mail LWD-moderate	LWD-lage	Te Boulder .	Bouldersingle	Boulder-cluster	Coble% area	ID-su cam vegetation	Cutbarits length (m)	s.	Riparian vegetation 2 1 1	Per lood %	% Pool/Glideedge	% iiffle	Area of (E	dees ()	Riffle state Dominants	Sub-Dommant D90	Weambeidedness	Sub-Dominant	Glide D90	Tomuani (1997)	Sub-Domnant-
BAR	1 11/23		0 4	4	16	61 77 T	N		N	T	5	1 M	40 N	I N		N	N	90	5 5	0	14 0.8	0.8	0 C	F 14	4 10 C	F	14	10	ARLEAN DESIGN
BUC	1 11/26 200	75	0 14	9.7	135	85 106 T	T		3 T	T	25	4 A	N	I M	10	1 T	T	30	60 10	0	1 81	14	0 C	F 3	يرسمون المحسر بريرا لايم	F	31	0	(i) share and the
BUC	2 11/26 100	150	0 16	12	188	121 134 T	T		2 T	N	1 1	Α	70 N		 A constraint order (1) if constraints 	T	N	40	50 10		75 94		0 C	F 24		F	24	Õ	
BUC	5 11/26 100	100	0 15	12	Transfer and an annual sectors of	117 119 T	N		N	M	20	2 M	60 N	I N	 A state of the state of the spectrum of the spect	T	N	40	40 20	0	70 70	35	0 C	F 2	0 10 C	F	20	10	· · · · · · · · · · · · · · · · · · ·
BUC	6 11/26 40	150	0 14	8.6	120	92 108 M			1 M	N		Α	90 N	I N		M	Т	30	60 10	0	36 72	12	0 C	F 1	9 5 C	F	19	5	
BUC	7 11/26		0 6	4.7	28	81 84 A	M	10) T	N		A	90 N	ALL AND ADDRESS OF		N	N	90	0 10	0	25 0	2.8	0 C	F 2		•••			· · · · · · · · · · · · · · · · · · ·
BUC	8 11/26		0 7	4.3	30	70 87 T	T		I N	Ν		Α	85 N			N	N	90	0 10	0	27 0	3	0 C	F 2		e danka seri			
BYM	1 11/22 500	300	0 13	11	146	70 124 T	N		T	Т	15	0 A	90 N	urs damana	#1.1 (# #**/***	T	Т	80	10 5	5 1	17 15	7.3	7.3 C	F 3		F	38	1 ¢	F 38
BYM	2 11/22 20		0 11	4.8	53	58 89 M	I N	l	M	a stranger in	20	1 A	70 N	- تعديما أور محديه		T	N	50	30 10	10	26 16	5.3	5.3 C	F 24		F	24	717.1	F 24
BYM	3 11/23 100	100	0 12	6.8	82	60 90 T	T		1 T	N		Α	85 N		1464.000	T	T	75	15 5	5	52 12	4.1	4.1 C	F 19	and a summer land	F	19	0 C	F 19
MCQ	1 11/23 500	200	0 9	5.6	50	64 80 N	in the second		N	T	10	М	50 T			N	N	30	70 0	0	15 35	1	0 C	F 24		F		50	
RIC	1 01/06 6	20	0 12	6	72	98 140 A		2 0) 0 A	N		Α	95 N		3	1 A	M	50	45 5	0	36 32	for an open of	0 C	F 1:	in a surface	F	15	0	
RIC RIC	2 10/06		12	6	72	84 92 M			M	N		A	80 N	· · · · · · · · · · · · · · · · · · ·	• · · · · · · · · · · · · · · · ·	M	M	40	40 5	15	29 29	3.6	11 C	F 10	and an a sum transm.	F	·	25 C	F 16
THE REAL PROPERTY AND INC.	3 11/22 15 3 11/22 20	15	0 11 0 13	ð.ð 10	96	58 95 T		2		N		A	90 N	e 12 - 100 20 - 1	for the state of t			30	40 15	a an	29 39	14	14 C	F 19	m	F	19	5 C	F 20
RIC RIC	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	15		10	134 112	54 70 T				IN M	Ē	M	50 N					10	10 10	have and a	3 13	1	94 F	$\begin{bmatrix} \mathbf{C} & 1 \\ \mathbf{F} & 3 \end{bmatrix}$	4 15 C	F	a comment from	15 C	F 14
RIC	4 11/22 10 5 11/22 4	50		8.3		83 109 M 82 105 M	v		1	M	2	1 M			- 4	2 T	I N	60	20 20		57 22	la company i	0 C	F = 1	store and the second	F		20	1
SID	1 11/27	50	0 18	8.5 16		97 97 A	N		M	N N		A		I I I NT	-	M	M	40 100	40 20	to a substant of the second	59 59		0 C	F 20	5C	F	21		
SID	2 11/27 25	50	0 12	8.7		40 50 M				N		IN NI		1 N 1 N		A	M	80	0 0	L		0	0 M	M	100 95	• • • • • • • • •			1
SID	3 11/27 25		0 12	12		70 89 M	···		2 N	N		T		I IN N	-	M T	T	90	0 20	for a new segment car an	$\frac{33}{0}$	21	0 F 0 F	G	95	• •			• • • • • • • • • • • • • • • • • • •
UBR	1 11/23	· · · · · · · · · · · · · · · · · ·		14	100				2 IN			1		- 11		1	1	70		0 14	iu U	10	νΓ	J	- CE				
UBR	2 11/23		tere franktive	4	4	96 102 M	M	••••••••••••••••••••••••••••••••••••••	1 T	Ť	10	M	70 N	N	· · · · · · · · · · · · · · · · · · ·	T	N	80	10 0	0 3	.2 0.4	- 1	0 C	F 2.	5 20 C	F	25	20	an an ann an
UBR	3 11/23 150	150	1 11	3.5		116 123 T	T			Ň		Ă	90 N			N N	N	70	25 5	for consumed a se	2 0.4		0 C	\mathbf{F} 2. \mathbf{F} 12		F	25 12	20	1.7% - 0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1
UBR	9 10/06	0	0 20	12	234 1	113 147 M	Ň		M	N		N	N	N	1	M	T	70	25 5	010	e en fra en		0 C 0 F	man a sea a se a se a	1 100 F	r C		70	
UBR	10 10/06		0 7	15	103	02 117 M	N		M	N	1	N	N	N			T		A DESCRIPTION OF CONTRACT OF					$\frac{c}{c}$	1 1	C	and the second second	90	
UBR	11 11/27 300	100	0 19	4	76 1	102 117 M 108 136 M T	N		M N 1 T 3 M M	A	50	1 M	N N	N N	-	M T	T	100	25 5 0 0	0 7	⁷ 2 26 76 0	5.1 0	0 F 0 B	F 76	4 90 F 5 15 7 20 C 7 5				
	12 11/23 70	100	0 19 0 7	9.7	68	T 60 75 69 87	T	1		M	20	0 M	50 N	T	2	· · · · · · · · · · · · · · · · · · ·	T_T	50	40 10	0	4 27	6.8	00	F 70 F 27	200	F	27 2	20	
UBR TOB	12 11/23 70 1 10/03 15	100 50 75	2 14	5	70	60 75 M	M		3 M	N		0 M M 0 A	50 N 80 N 95 N	T N	1	M		75	40 10 0 10 0 10	15 4	3 0	6.8 7 10	0 C 11 C	F 7	7 5			¢	P 7
TOB	2 10/03 30	75	0 11	9.3	103	69 87 M	N		M	Μ	50	0 A	95 N	Ñ	· · · · · ·	M T	T	75 50	0 10	40		10	41 C	F 28	3 5			Ċ	F 28
TOB TOB				····	0	•																<u> </u>				e l'alla su e danne			
TOB	5 11/16 6 12/20		1	e i saintakan	0		1997 - August Aug	a	1		e	······				··· ··· · ···	-	1 - +						(,) and () by - Name (,) (-), of (Store i aporta acare		
TOB	8 12/20		-		0									1,4 - 1 1 - 1	and				•••••	· · · · · • • • · · · · · · · · · · · ·	e fra solar		n i na internationalitatione						
_						ana a sa ga sa		ne e serve a a	· · · · · · ·				· · · · ·	a nation of the second	ан <u>ш</u> а	· ·	.н.,	ting to the			na tara d		e e dunne d	. Andrew .	. 5		n canada co	u ti ut	

¹ N = none, T = trace (< 5%), M = moderate (5-20%), A = abundant (> 20%) ² F = fines, G = gravels, C = cobbles, B = Boulders

Γ

į.

420

i

É 🚟

İ.

1

6

6

į ...

1

BAR	1	CO, RB	0-2	0-0.268	0-0.31
BUC	1	CO,RB	1-2	0-0.292	0-0.34
BUC	2	CO, RB, CH, LNC	1-3	0-0.308	0-0.36
BUC	5	CO, RB, CH, LNC	2-3	0.102-0.317	0.120-0.3
BUC	6	CO, RB, CH, LNC	2	0.112-0.276	0.132-0.32
BUC	7	CO, RB, CH, LNC	1-4	0-0.474	0-0.5
BUC	8	CO, RB,CH, LNC	3-4	0.361-0.577	0.427-0.6
BYM	1	CO, RB, CT	1-2	0-0.178	0-0.2
BYM	2	CO, RB, CH	2-3	0.217-0.427	0.257-0.5
BYM	3	CO, RB, CH	2-3	0.263-0.407	0.311-0.4
MCQ	1	CO, RB	1-2	0-0.171	0-0.2
RIC	1	CO, RB, CH	1-3	0-0.439	0-0.5
RIC	2	CO, RB, CH	2-3	0.178-0.398	0.211-0.4
RIC	5	CO, RB, CH, SUC, LNC	3-4	0.388-0.457	0.459-0.5
RIC	4	CO, RB, CH, SUC	2-4	0.301-0.466	0.356-0.5
RIC	3	CO, RB, CH, LNC	2-4	0.217-0.412	0.257-0.4
SID	1	PCC, SUC	0-2	0-0.301	0-0.3
SID	2	CT, PCC	0-2	0-0.301	0-0.3
SID	3	SUC, PCC	0-2	0-3.01	0-0.3
UBR	1	RB, CH	0-2	0-3.01	0-0.3
UBR	2	CO, RB, CH	0-3	0-0.412	0-0.4
UBR	9	CO,RB, CH	2-3	0.276-0.377	0.327-0.4
UBR	10	RB, CH, LNC	1-2	0-0.276	0-0.3
UBR	11	CO, RB, CH	0-3	0-0.439	0-0.5
UBR	12	СН	0-1	0.000	0.0
ТОВ	1	CO, RB	2	0.141-0.287	0.167-0.3
ТОВ	2	CO, RB, DV	2-3	0.164-0.257	0.194-0.3
ТОВ	5	CO, DV	0-2	0-0.260	0-0.3
ТОВ	6	СО	0-1	0.000	0.0
TOB	7	CO, RB, DV	3	0.308	0.3
ТОВ	8	CO, RB, DV	2-3	0.132-0.217	0.157-0.2

Plate 7. Table summarizing ranges of species richness, diversity and eveness at each of the sites sampled.

Upper Bulkley River Overwintering Study 2000-2001

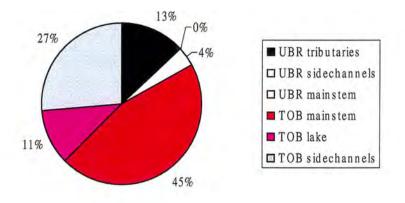


Plate 8. Comparisons of coho capture rates between Upper Bulkley mainstem, side channel and tributary sites, and Toboggan Creek mainstem, side channels and lake sites. Percentages refer to the average percentage of the total coho catch.

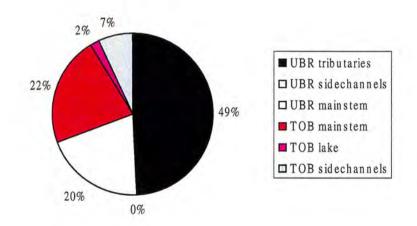


Plate 9. Comparisons of rainbow trout capture rates between Upper Bulkley mainstem, side channel and tributary sites, and Toboggan Creek mainstem, side channels and lake sites. Percentages refer to the average percentage of the total coho catch.

Appendix 4. Density Indices

Plate 10.	Density indices over time for all species	
	Density indices over time for coho.	
	Density indices over time for rainbow trout/steelhead	
Plate 12.	Density indices over time for fambow trouvsteemead.	

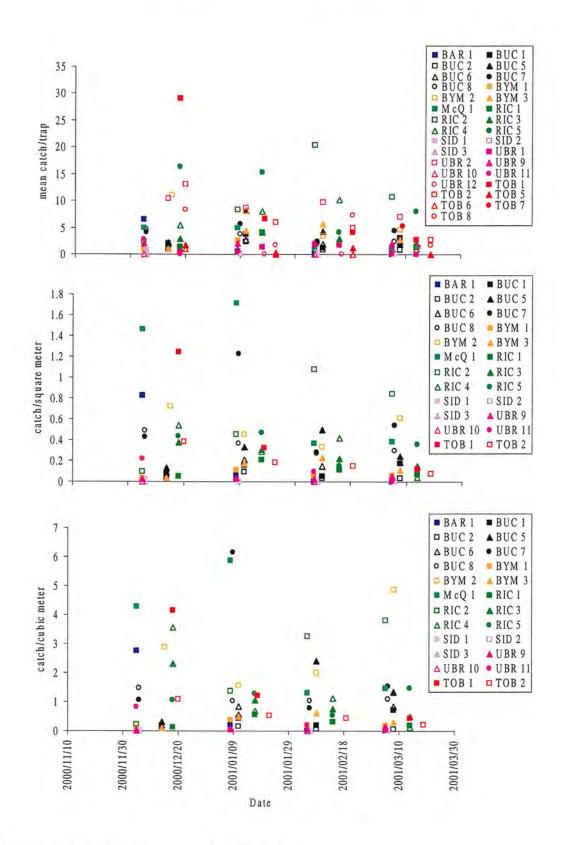


Plate 10. Density indices over time for all species.

Department of Fisheries and Oceans & SKR Consultants Ltd.

Upper Bulkley River Overwintering Study 2000-2001

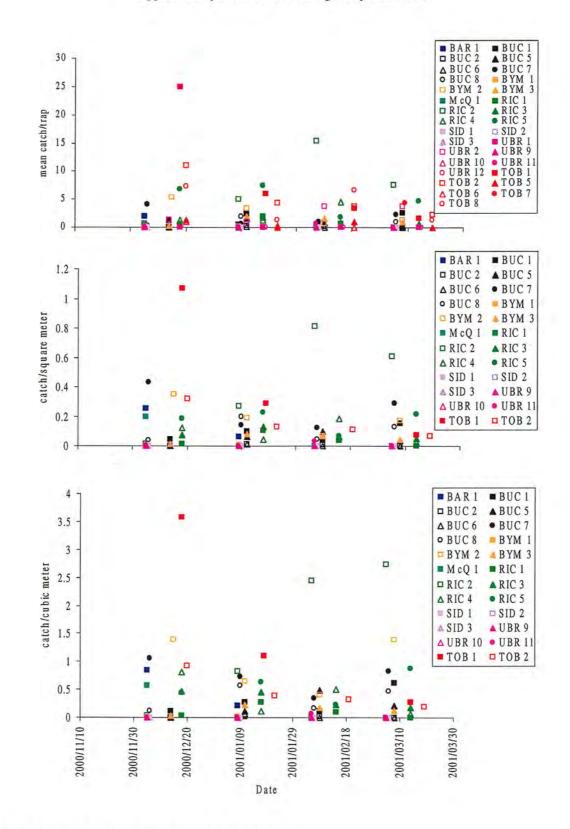


Plate 11. Density indices over time for coho.

Upper Bulkley River Overwintering Study 2000-2001

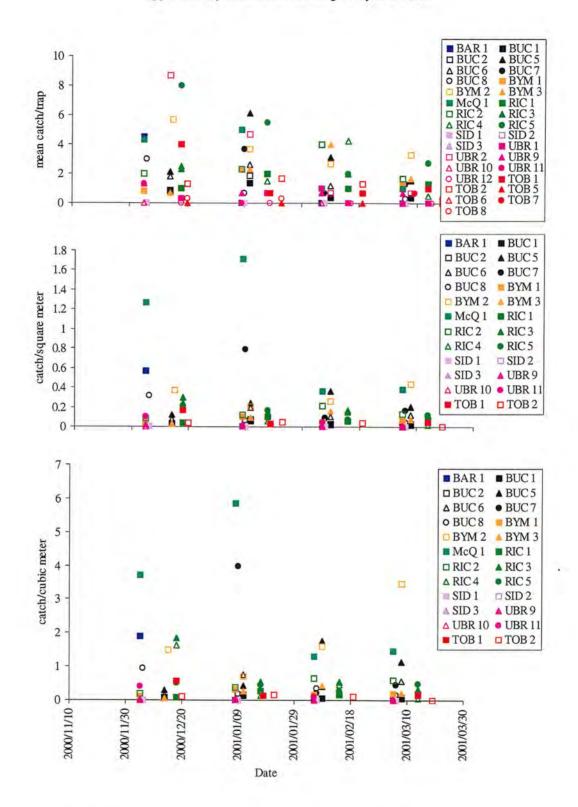


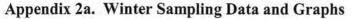
Plate 12. Density indices over time for rainbow trout/steelhead.

-

1

Appendix 5. Fork Length, Weight and Condition Factor Data

Plate 13.	Fork length, weight and condition factor data for coho captured at sites sampled during the upper Bulkley Overwintering study
Plate 14.	Fork length, weight and condition factor data for rainbow trout/steelhead captured at sites sampled during the upper Bulkley Overwintering study
Plate 15.	Fork length, weight and condition factor data for Dolly Varden captured at sites sampled during the upper Bulkley Overwintering study
Plate 16.	Fork length, weight and condition factor data for chinook captured at sites sampled during the upper Bulkley Overwintering study
Plate 17.	Fork length distribution for coho captured at Upper Bulkley mainstem, Upper Bulkley tributary and Toboggan Creek sites throughout the winter
Plate 18.	Fork length distribution for coho for December, January, February and March samples obtained in the Upper Bulkley watershed
Plate 19.	Fork length distribution for coho for December, January, February and March samples obtained in the Toboggan Creek watershed
Plate 20.	Relationship between Fulton's conditon factor and fork length for coho for sites sampled in Upper Bulkley msainstem, tributaries and Toboggan Creek
Plate 21.	Relationship between Fulton's condition factor and fork length for coho captured in the four months of winter sampling (December, January, February and March)278
Plate 22.	Changes in fork length, weight and condition factor for coho captured during the winter
Plate 23.	Changes in fork length, weight and condition factor for coho captured during the winter, showing trend lines
Plate 24.	Fork length distribution for rainbow trout captured at Upper Bulkley mainstem, Upper Bulkley tributary and Toboggan Creek sites throughout the winter
Plate 25.	Fork length distribution for rainbow trout for December, January, February and March samples obtained in the Upper Bulkley watershed
Plate 26.	Relationship between Fulton's condition factor and fork length for rainbow trout captured in Upper Bulkley mainstem, tributary and Toboggan Creek
Plate 27.	Relationship between Fultons' condition factor and fork length for rainbow trout captured during the four months of the overwintering study (December, January, February and March)
Plate 28.	Changes in fork length, weight and condition factor of rainbow trout captured during the overwintering study
Plate 29.	Changes in fork length, weight and condition factor of rainbow trout captured during the overwintering study, showing trend lines
Plate 30.	Length frequency histogram for chinook captured in the Upper Bulkley watershed.
Plate 31.	Length frequency histograms for chinook captured during the four months of the overwintering study in the Upper Bulkley watershed



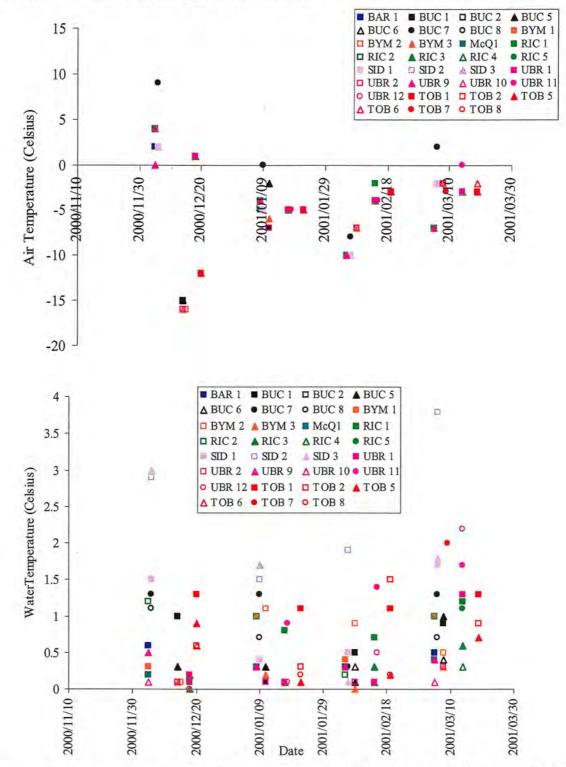


Plate 3. Air temperature and water temperature at the sites sampled during the Upper Bulkley and Toboggan Creek overwintering study.

Upper Bulkley River Overwintering Study 2000-2001

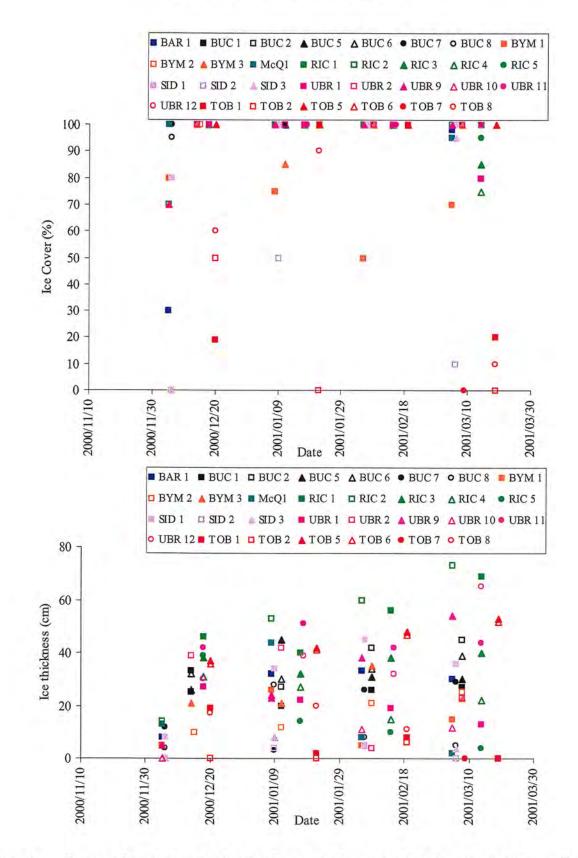


Plate 4. Percent ice cover and ice thickness at sites sampled during the Upper Bulkley and Toboggan Creek overwintering study.

Department of Fisheries and Oceans & SKR Consultants Ltd.

Upper Bulkley River Overwintering Study 2000-2001

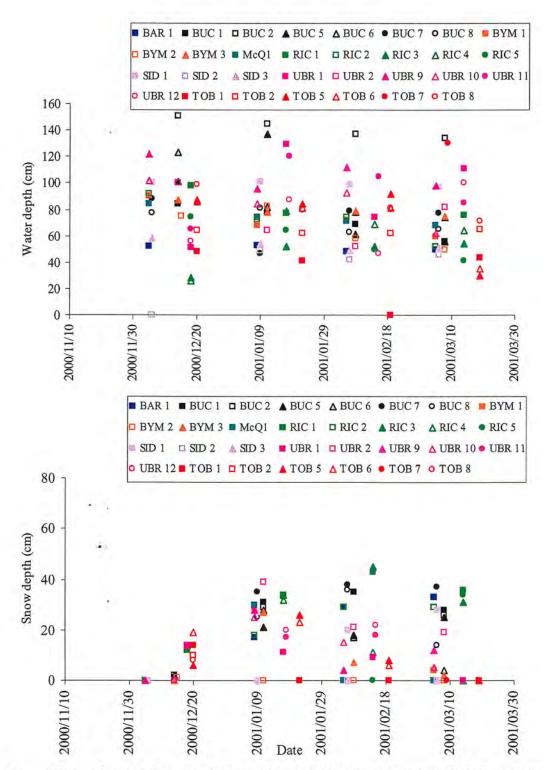


Plate 5. Water depth (above) and snow depth (below) at sites sampled during the Upper Bulkley and Toboggan Creek overwintering study. Upper Bulkley River Overwintering Study 2000-2001

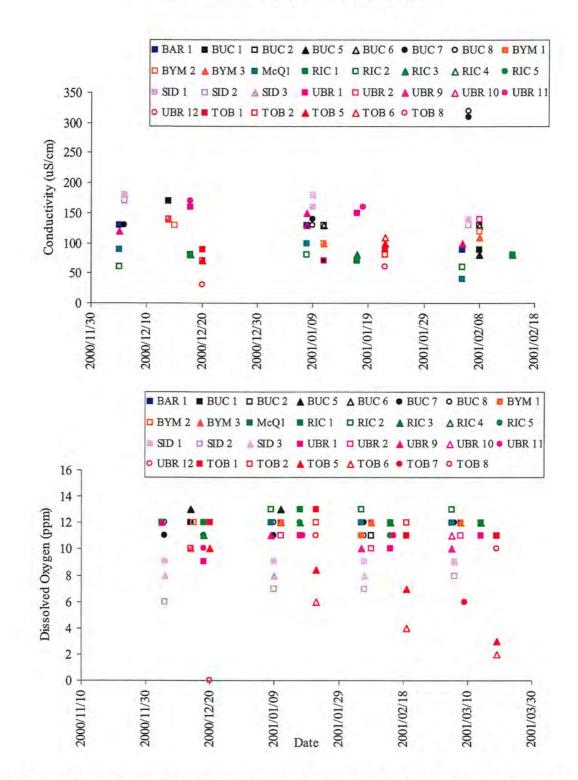
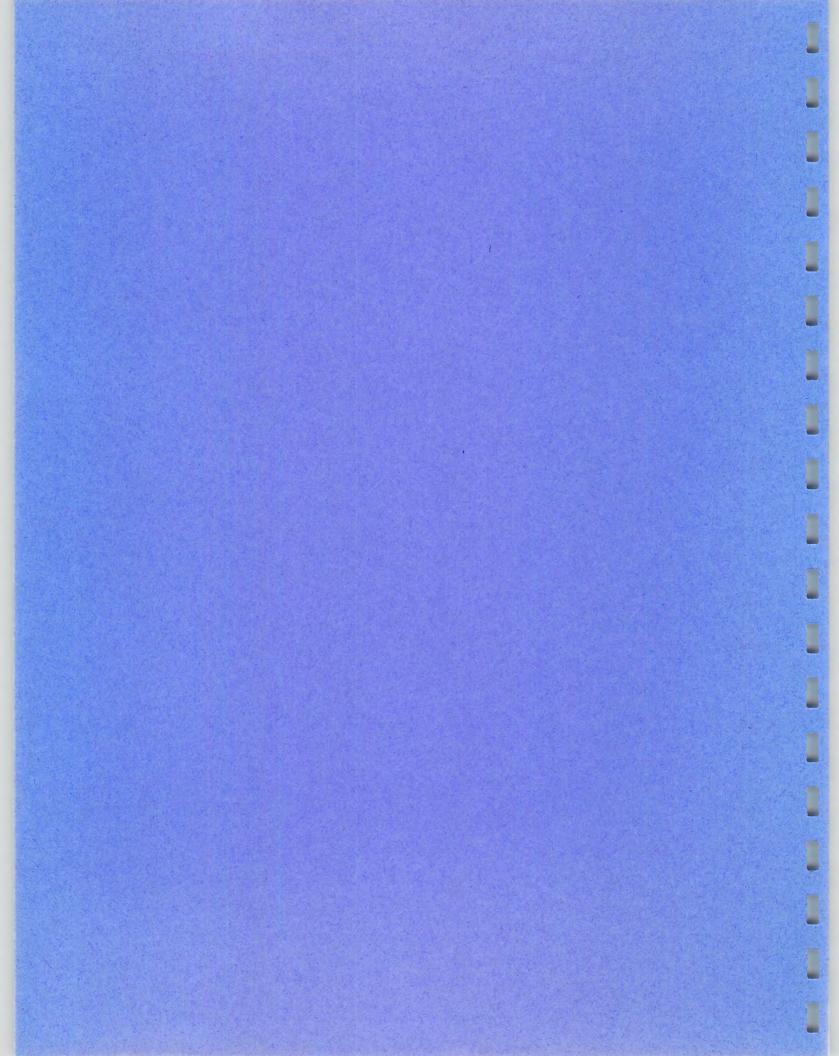


Plate 6. Conductivity (above) and dissolved oxygen (below) at sites sampled during the Upper Bulkley and Toboggan Creek overwintering study.

Appendix 2b.Winter Sampling Data Forms



Site Name (e.g. TOB-1) BAR	= 1 first three lette name-site nur		VIS	SIT # 1
e.g. 106-17			Date of surveyTime of survey2000-12-0515:25	ey Surveyors BD,TJ,TD
Gazetted Stream Name	Local Stream Name	Watershed Code		
Barren Creek				
Weather Partially high	h overcast			
ir Temperature 2-	° C	Strea	am Flow M (High, Moderat	e, Limited, None)
ce Cover (%) 30]	Potential for fish mi	igration L (High, Moderat	e, Limited, None)
LIMNOLOG	Y STATION		FISH SUMMARY	
Depth from upper surface of	ice (cm) 52	Smooling	Total # of Mininimum	Maximum Length (mm)
Ice thickness (cm)	8	Species	Fish Length (mm)	91
Clarity of Ice (H,M,L, or N)	Ν			
(High, Moderate, Limited, None) Snow Depth (cm)	0	RB	9 76	120
Water Temperature	0.6	с		
Turbidity (H,M, L, o		-		
(High, Moderate, Low, or (Conductivity	Jear)	ß		
CONDUCTIVITY	1 1 1 1 4			
-				
Dissolved Oxygen (t	pottom) 12 p	ppm		
-	pottom) 12 p purface) p	ppm		
Dissolved Oxygen (t Dissolved Oxygen (s	pottom) 12 p purface) p FISH C		(a) we we set the distribution of the distr	2000.12
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting	pottom) 12 p purface) p FISH C 2000-12-05	ppm	Date of Collection	2000-12-0
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting	pottom) 12 p purface) p RISH C 2000-12-05 15:25	ppm	Date of Collection Time of Collection	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set	bottom) 12 p purface) p FISH C 2000-12-05 15:25 2	ppm	Date of Collection	
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster	pottom) 12 p priface) p FISH C 2000-12-05 15:25 2 bin su -5 meter diameter area Instream Cover	ppm	Date of Collection Time of Collection Number of traps collected	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	bottom) 12 p purface) p RISH C 2000-12-05 15:25 2 bin su -5 meter diameter area Instream Cover Sub Percent Sub Percent purface	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean	bottom) 12 p priface) p RISH C 2000-12-05 15:25 2 bin an -5 meter diameter area Instream Cover Sub Percent	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	bottom) 12 p purface) p RISH C 2000-12-05 15:25 2 bin su -5 meter diameter area Instream Cover Sub Percent Sub Percent purface	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	bottom) 12 p purface) p RISH C 2000-12-05 15:25 2 bin su -5 meter diameter area Instream Cover Sub Percent Sub Percent purface	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	bottom) 12 p purface) p RISH C 2000-12-05 15:25 2 bin su -5 meter diameter area Instream Cover Sub Percent Sub Percent purface	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	11:55
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Denth Do	bottom) 12 p purface) p RISH C 2000-12-05 15:25 2 bin au -5 meter diameter area Instream Cover Sub Percent cominant Dominant ice cover 30	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	pottom) 12 p private private p	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Denth Denth Denth MT 1	pottom) 12 p private private p	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1	pottom) 12 p privation p RISH C 2000-12-05 15:25 2 bin an -5 meter diameter area Instream Cover Sub Percent Sub Percent 30	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1	pottom) 12 p privation p RISH C 2000-12-05 15:25 2 bin an -5 meter diameter area Instream Cover Sub Percent Sub Percent 30	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1	pottom) 12 p privation p RISH C 2000-12-05 15:25 2 bin an -5 meter diameter area Instream Cover Sub Percent Sub Percent 30	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1	pottom) 12 p privation p RISH C 2000-12-05 15:25 2 bin an -5 meter diameter area Instream Cover Sub Percent Sub Percent 30	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2
Dissolved Oxygen (t Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1	pottom) 12 p privation p RISH C 2000-12-05 15:25 2 bin an -5 meter diameter area Instream Cover Sub Percent Sub Percent 30	OLLECTION SUM	Date of Collection Time of Collection Number of traps collected er Cluster	<u>11:55</u> 2

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

BAR - 1

first three letters of stream

name-site number

VISIT # 1

-

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA t and a second second second

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	115	16.5	UM	
MT	1	1	СО	63	2.8	UM	
MT	1	1	RB	76	5.6	UM	
MT	1	1	RB	92	8	UM	
MT] [1	1	RB	94	10.6	UM	
MT	1	1	RB	96	9.3	UM	
MT	1	1	RB	95	9.1	UM	
MT	1	2	RB	89	9.4	UM	
MT	1	2	RB	82	5	UM	
MT	1	2	RB	120	17.3	UM	
MT	1	2	Со	91	7.6	UM	
MT	1	2	СО	65	2.8	UM	
MT	1	2	СО	66	3.3	UM	

	SITE VISIT	DESCRIPTION		
Site Name BAR	first three letters of stream name-site number		VISIT # 2	
(e.g. TOB-1)		Date of su	rvey Time of survey Surveyors	
		2001-01		$\mathbf{\Sigma}$
Gazetted Stream Name	Local Stream Name	Watershed Code		٦
Barren Creek				
Weather Sunny and cle	ar			
Air Temperature 5	С	Stream Flow	M (High, Moderate, Limited, None)	لسب
Ice Cover (%) 100		ential for fish migration	(High, Moderate, Limited, None)	
LIMNOLOGY	STATION	EIS	ISUMMARY	
Depth from upper surface of ic	e (cm) 53	Total #	of Mininimum Maximum	<u> </u>
Ice thickness (cm)	32	Species Fish	Length (mm) Length (mm)	
Clarity of Ice (H,M,L, or N)	N	RB 1	46 46	
(High, Moderate, Limited, None) Snow Depth (cm)	17			
Water Temperature				
Turbidity (H,M, L, or (
(High, Moderate, Low, or Cle Conductivity	ar) 130 <i>uS</i>			
Dissolved Oxygen (bo	ttom) 12 ppm			
Dissolved Oxygen (sur	· · ·			
	FISH COLLE	CTION SUMMARY		
Date of Setting	2001-01-08	Date	of Collection 2001-(01-09
Time of Setting	12:30		of Collection 13:	
Number of traps set	2	Num	per of traps collected 2	
NOTE: Cluster contains three traps within Capture Cluster	Instream Cover Species	Number Captured per Cluster		
Method Number Denth Dom	inant Dominant ice cover			
	c	omments		
~ 14 cm. Of air space betwe	en water and bottom of ice.			
pH = 7.7				
January 9th it was snowing.	· · · · · · · · · · · · · · · · · · ·			
,				
	-			

:

				SITE VISI	E DESC	RIPTION		
Site Name (e.g. TOB-	B.	AR-		first three letters of stream name-site number	I		VISIT # 2	
				РНОТО D	OCUME	NTATION		
				INDIVIDU	AL FISH	DATA		
Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip	
MT	1	1	NA	0	0			
MT	1	2	RB	46	1.8	UM		

/

-

		S	ITE VISIT	DESCRIP	TION	수영화 가수 가장 있다는 것이 있다. 가수 시작 및 가 적인 것이 가지 않는 것 	
Site Name (e.g. TOB-1)	BAR-		st three letters of stream me-site number			VISIT	# 3
					Date of survey	Time of survey	Surveyors
					2001-02-05	11:45	TJ,TD,JD
Gazetted Stream Barren Creek	Name	Local Stream	Name	Watershed Code			
	TT:-h	· · · · · · · · · · · · · · · · · · ·		••••••			
Weather	High overcast						
Air Tempera	ture - 10 °			Stre	am Flow L	(High, Moderate, Lim	ited, None)
ce Cover (%		e	Poter	ntial for fish mi		(High, Moderate, Lim	ited, None)
	INOLOGY	STATIO				MMARY	
Depth from u	pper surface of ice	(cm)	18		Total # of	Mininimum N	laximum
Ice thickness	• -		33	Species		Length (mm) Le	ngth (mm)
	(H,M,L, or N)		N	NFC	0	0	0
(High, Moderate,	Limited, None)		 				
Snow Depth			29				
	er Temperature).3 C				
(High,	idity (H,M, L, or C Moderate, Low, or Clea	r) [C				
	luctivity		90 uS				
	olved Oxygen (bot		11 ppm				
Diss	olved Oxygen (sur		ppm	 وله موجايده با و مرقابات		en Black (seksenses)	in sanganan
		r	SH COLLEC	TION SUM			
Date of Settin		2001-02-05]		Date of Col Time of Col		2001-02-00
Time of Settin	-	11:45 2				traps collected	2
	aps set	"L	eter area				
Capture Cluste	r Mean	Instream Cov Sub	er Species/ 1 Percent	Number Captured p	er Cluster		
Method Numb			100 NFC /				
	┘┃└───┘└──			/ /			L/* L
			Co	mments			
pH =7.6	n Andre Stadent generalen.	i sanî kedirîkêye -					
p11 - 7.0							
L							track

Site Name (e.g. TOB-1)	BAR -1	first three letters of stream name-site number	ON VISIT # 3
		PHOTO DOCUMENTATIO	ON
Roll Name	Frame Numb	er Photo Description	
OW3	21	Site view, trap hole visible.	

MT

MT

1

1

1

1

NFC NFC

Site Name (e.g. TOB-1) BA	R - 1 first three letters of stream name-site number	T VISI	ſ # 4
-		Date of surveyTime of survey2001-03-0511:30	Surveyors TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code	
Barren Creek			
Weather Sunny and	d clear		
ir Temperature	₽°c	Stream Flow M (High, Moderate, Li	mited, None)
ce Cover (%)	8 Po	otential for fish migration M (High, Moderate, Li	mited, None)
LIMNOLO	GY STATION	FISH SUMMARY	an an an an an an an an an an an an an a
Depth from upper surface	of ice (cm) 50	Total # of Mininimum	Maximum
Ice thickness (cm)	30		ength (mm)
Clarity of Ice (H,M,L, or	N) N	NFC 0 0	0
(High, Moderate, Limited, None) Snow Depth (cm)	33		
Water Temperatu	ure 0.5 ° C		
Turbidity (H,M,] (High, Moderate, Low Conductivity			
Dissolved Oxyge			
Dissolved Oxyge			
		ECTION SUMMARY	
Date of Setting	2001-03-05	Date of Collection	2001-03-0
Time of Setting	11:30	Time of Collection	12:10
Number of traps set	2	Number of traps collected	2
NOTE: Cluster contains three tran	s within an ~5 meter diameter area		
	Sub Percent	es/ Number Captured per Cluster	
Capture Cluster Mean			¬
Capture Cluster Mean Method Number Denth	Dominant Dominant ice cover		
Capture Cluster Mean Method Number Denth	Dominant Dominant ice cover 98 NFC		
Capture Cluster Mean Method Number Denth			
Capture Cluster Mean Method Number Denth			
Capture Cluster Mean Method Number Denth			
Capture Cluster Mean Method Number Denth] 98 NFC		
Capture Cluster Mean Method Number Denth MT 1] 98 NFC		
Capture Cluster Mean Method Number Denth MT 1] 98 NFC		
Capture Cluster Mean Method Number Denth MT 1] 98 NFC	Comments	
Capture Cluster Mean Method Number Denth MT 1] 98 NFC	Comments	
Capture Cluster Mean Method Number Denth MT 1] 98 NFC	Comments	
Capture Cluster Mean Method Number Denth MT 1] 98 NFC	Comments	
Capture Cluster Mean Method Number Denth MT 1] 98 NFC	Comments	

				SITE VISI	TDESC	RIPTION		
Site Name (e.g. TOB-	a B	AR-		first three letters of stream name-site number	n		VISIT # [4
				PHOTO D	OCUME	NTATION		
				INDIVIDU	AL FISH	DATA		
Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Clip	Fin
MT	1	1	NFC					
MT	1	2	NFC					

			()	8 (8/	(e.g. ampose, upper canoni, none	, , , , , , , , , , , , , , , , , , ,
1	1	NFC]
1	2	NFC				
		<u></u>	<u> </u>			<u> </u>

Air Temperatur ice Cover (%)	ear and cold	Local Stream	n Name	Watershed Code	Date of survey 2000-12-14	Time of surve	y Surveyors
Buck Creek Weather Ch Air Temperatur ce Cover (%)	ear and cold re -15 °		n Name	Watershed Code			
Weather Ch Air Temperatur ce Cover (%)	re <u>-15</u> °	c					
Air Temperatur ce Cover (%)	re <u>-15</u> °	c					
ce Cover (%)		с					
LIMN			Pote	Strea ential for fish mi		(High, Moderate, (High, Moderate,	
	OLOGY	STATIC)N		FISH S	UMMARY	
Depth from uppe	r surface of ice	(cm)	84		Total # of	Mininimum	Maximum
Ice thickness (cm	1)		33	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H, (High, Moderate, Limi Snow Depth (cm	ted, None)		N 1	CO RB	<u>6</u> <u>4</u>	66 88	93
Water T	emperature	 [1 ° c				
Turbidit	y (H,M, L, or C derate, Low, or Clean)	C 170 <i>uS</i>				
Dissolve	ed Oxygen (bott	om)	12 ppm				
Dissolve	ed Oxygen (surf		ISH COLLEC	TION SUM	MADV		
Date of Setting		2000-12-14	nesset at a part and a second s		Date of Co	Status Services at	2000-12-1
Time of Setting		12:47			Time of C		12:27
Number of traps	set	5			Number o	of traps collected	5
NOTE: Cluster contains Capture Cluster Method Number MT 1	Mean	an ~5 meter dia Instream Co Sub ant Dominant	ver Species/	Number Captured pe			
<u>ala di sebutat</u>			C	omments			
December 15 air pH=7.7 Fish sampled in							
						<u>.</u>	

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

BUC-1

first three letters of stream name-site number

VISIT # 1

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	68	5	A	
MT] [1	2	СО	67	4.6	A	
MT] 1	3	СО	74	5.6	A	
MT	1	3	RB	93	11.4	UM	
MT	1	3	RB	89	9.8	UM	
MT] 1	3	RB	88	9.3	UM	
MT	2	1	СО	66	3.7	A	
MT	2	1	СО	67	4.6	A	
MT	2	1	СО	69	4.9	A	
MT	2] 1	RB	89	9.8	UM	
MT	0	0	NA				

Site Name (e.g. TOB-1) BUC	First three letters of stream name-site number	VISI	Γ# 2
		Date of survey Time of survey	Surveyors
		2001-01-11 11:30	TJ,TD,JD
Fazetted Stream Name	Local Stream Name	Watershed Code	
Buck Creek			
Veather High overca	ıst		
ir Temperature -7]° c	Stream Flow M (High, Moderate, L	mited, None)
ce Cover (%) 100	Po	tential for fish migration M (High, Moderate, L	mited, None)
LIMNOLOG	Y STATION	FISH SUMMARY	
Depth from upper surface of	f ice (cm) 77	Total # of Mininimum	Maximum
Ice thickness (cm)	20		Length (mm)
Clarity of Ice (H,M,L, or N)		CO 12 65	75
(High, Moderate, Limited, None)		RB 7 48	108
Snow Depth (cm)	31		
Water Temperature			
Turbidity (H,M, L, (High, Moderate, Low, or	or C) Clear)		
Conductivity	70 <i>uS</i>		
Dissolved Oxygen	(bottom) 12 ppm		
Dissolved Oxygen	(surface) ppm		
	FISH COLLE	CTION SUMMARY	
Date of Setting	2001-01-11	Date of Collection	2001-01-1
Time of Setting	11:30	Time of Collection	11:40
Number of traps set	5	Number of traps collected	3
NOTE: Cluster contains three traps w			
Capture Cluster Mean	Instream Cover Species Sub Percent	s/ Number Captured per Cluster	
Method Number Denth I	Dominant Dominant ice cover		
	C	Comments	
Ice surface is very slushy			
January 12th, temperatur	e = -5		
·····			
pH = 7.7	ipose clipped.		
pH = 7.7 All Coho captured are ad	ipose clipped.		

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

BUC - 1

first three letters of stream name-site number

VISIT # 2

i, A

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	70	4.5	AD	
MT	1	1	СО	75	5.3	AD	
MT	1	1	RB	82	8.4	UM	
MT] [1	1	RB	108	16.5	UM	
MT	1] [1	СО	74	5.2	AD	
MT	1	1	RB	89	9.3	UM	
MT	1	1	СО	68	5.5	AD	
MT	1	2	СО	68	4.4	AD	
MT	1	2	RB	94	11.2	UM	
MT	1	2	RB	48	1.7	UM	
MT	1	2	RB	85	8.4	UM	
MT	1	3	СО	65	3.7	AD	
MT	1	3	СО	70	4.4	AD	
MT	1	3	CO	70	4.8	AD	
MT	1	3	СО	75	5.5	AD	
MT	1	3	СО	74	5.1	AD	1
MT	1	3	СО	69	4.2	AD	
MT	1	5	СО	70	5.3	AD	
MT	1	5	RB	85	8	UM	

ite Name e.g. TOB-1)	BUC-	1	first three letters of stron name-site number	eam				VISI	
) r	Date of sur	_	Time of survey	
					l	2001-02	-08	11:40	TJ,TD,JD
azetted Stream	Name	Local Strea	m Name	Water	shed Code				
luck Creek		<u> </u>							<u></u>
Veather	Light snowfall					<u> </u>	<u>.</u>		
ir Temperat	ture -7-°	С			Stream	n Flow	M	(High, Moderate,	Limited, None)
e Cover (%)	100		1	Potential f	for fish mig	ration	Μ	(High, Moderate,	Limited, None)
LIM	INOLOGY	STATI	ON			FISE	I SU	MMARY	
Depth from u	oper surface of ice	: (cm)	69		Species	Total # c Fish		Mininimum Length (mm)	Maximum Length (mm)
Ice thickness (l	26		CO	4		70	78
Clarity of Ice (High. Moderate, I	(H,M,L, or N) .imited, None)		<u>N</u>		RB	2		81	82
Snow Depth (cm)	[35		NA	0	Ī	0	0
Water	r Temperature		0.5 °C		L	L		ن <u>ب</u>	
	dity (H,M, L, or (С						
	Moderate, Low, or Clea uctivity	ar)	90 uS						
Disso	lved Oxygen (bot	tom)	12 ppm						
	lved Oxygen (sur	L	ppm						
			ISH COLL	ECTIO	N SUMM	ARY			
Date of Setting	g	2001-02-	08			Date o	of Coll	ection	2001-02
Time of Settin	g	11:40				Time	of Col	lection	11:30
Number of tra	ips set	5				Numb	er of t	raps collected	5
Capture Cluster Aethod Numbe MT 1 MT 2	er <u>Denth</u> Domi	Instream C Sub nant Dominar	Cover Spec Percent ice cover 100 CO 100 CO		RB / 1 RB / 1	Cluster			
				Comme	nts				
H = 6.9			· · · · · · · · · · · · · · · · · · ·						
			1			<u>.</u>			
All Coho cap	tured are adipo	ose clipped	1.						
All Coho cap	tured are adipo	ose clipped	1 .						

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	BUC - 1	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON
Roll Name	Frame Number	Photo Description	
OW4	3	Site view looking downstream ,both holes and limr	no visible.

{

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1] []	СО	76	6	AD	
MT] [1	2	RB	81	7.6	UM	
MT	1	3	CO	78	5.6	AD	
MT	2	1	RB	82	7.7	UM	
MT	2	2	СО	78	5.4	AD	
MT	2	2	СО	70	4.5	AD	

		SITE	VISITI	DESCRIP	TION		
Site Name (e.g. TOB-1)	BUC-	1 first three name-site	etters of stream number			VISIT	' # 4
					Date of survey	Time of survey	Surveyors
					2001-03-08	11:00	TJ,TD,JD
Gazetted Stream	Name	Local Stream Name	<u> </u>	Watershed Code			
Buck Creek		L					_]
Weather	Sunny and clea	ar -					
Air Tempera	ture -2.	С	_ *	Stree	m Flow M	(High, Moderate, Lir	nited. None)
Ice Cover (%		C	Potent	ial for fish mi		(High, Moderate, Lir	
	·		a transfer				t getter and
LIN	INOLOGY	SIATION			FISH SU	MMARY	
Depth from u	pper surface of ice	(cm) 56		Species	Total # of Fish		Maximum ength (mm)
Ice thickness	(cm)	27			13	Length (mm) L	
	(H,M,L, or N)	Ν		CO			
(High, Moderate, 1 Snow Depth (28		RB	2	91	111
-	r Temperature	0.9	°C				
	idity (H,M, L, or C		C				
(High,	Moderate, Low, or Clea						
	luctivity		uS				
	olved Oxygen (bot		ppm				
Disso	olved Oxygen (sur	د	ppm	en al est de Merce est			er ha stelaster.
		FISH	COLLECT	ION SUM	n na h-shekara na kara		
Date of Settin	g	2001-03-08			Date of Coll		2001-03-09
Time of Settin		11:00			Time of Col		11:05
Number of tra		5			Number of	traps collected	5
	1	an ~5 meter diameter area Instream Cover		umber Captured pe	er Cluster		
Capture Cluster Method Numb	INICOLI	Sub Percent nant Dominant ice cove					
MT 1					$\exists \square' \vdash$	/	_/
MT 2				5 RB / 1			
			Con	nments			
pH = 7.6		and the second second second second second second second second second second second second second second second					
All coho cant	ured ae adipos	e clipped.					
como capo		· ··· [[• ••·					
				<u></u>			
					<u> </u>		

Ĩ

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1) BUC-

1

first three letters of stream name-site number

VISIT # 4

1

(3))

i

PHOTO DOCUMENTATION

INDIVIDUAE FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip Type of Recaptured Fin (e.g. adipose, upper caudal, none) Clip
MT] 1] 1	Со	80	4.8	AD
MT] 1]1	СО	79	4.9	AD
MT	1	2	СО	82	5.5	AD
MT	1	2	СО	81	5.8	AD
MT] 1	3	СО	66	3.3	AD
MT	1	3	СО	76	4.9	AD
MT	1	3	СО	79	5.1	AD
MT] 1	3	СО	70	4.2	AD
MT] [1	3	RB	91	7.9	UM
MT	2		NFC			
MT	2	2	СО	74	3.7	AD
MT	2	2	СО	67	5	AD
MT	2	2	СО	89	6.9	AD
MT	2	2	СО	71	4	AD
MT	2	2	СО	111	12.8	AD
MT	2	2	RB	111	11.9	UM

ite Name e.g. TOB-1)	BUC-	2	first three letters of stream name-site number			VIS	I T # 1
					Date of survey 2000-12-14	Time of survey 1:30	/ Surveyors TJ,TD,JD
Bazetted Stream 1	Name	Local Stre	am Name	Watershed Code			
Buck Creek			-				
Weather (Clear and cold	•					
ir Temperat	ure [-1 5]°	С		Strea	m Flow M	(High, Moderate,	Limited, None)
e Cover (%)			Pote	ential for fish mig	gration M	(High, Moderate,	Limited, None)
LIM	NOLOGY	STATI	ON		FISH SU	MMARY	
Depth from up	per surface of ice	(cm)	151		Total # of	Mininimum	Maximum
Ice thickness (-		25	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice ((High, Moderate, L Snow Depth (c	imited, None)		N 2	RB	6	71	95
Turbic (High, N	Temperature lity (H,M, L, or C Aoderate, Low, or Clea activity		0.1 ° C C 170 uS				
Dissol	ved Oxygen (bot	tom)	12 ppm				
	ved Oxygen (sur		ppm				
		a a a a a a	FISH COLLEC	TION SUMM	/IARY		
Date of Setting	i	2000-12-	-14		Date of Col	lection	2000-12
Time of Setting	g	1:30		Time of Collection			
Number of tra	ps set	7			Number of	traps collected	7
NOTE: Cluster conta Capture Cluster Method Numbe	Ins three traps within Mean I Denth Domi	Instream (_{Sub}	Cover Species/ Percent	Number Captured per			
			C	omments			
December 15t pH=7.5	h air temp = -	15.					
	in truck.						
Fish sampled	4 1	site.					
Fish sampled Moved limno	to cluster # 2						

.

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

BUC -

2

first three letters of stream name-site number

VISIT # 1

.....

all a start and a start a start a start a start a start a start a start a start a start a start a start a start

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] _ 1] [1	RB	71	5.2	UM	
MT	1	3	RB	76	6.5	UM	
MT	2	2	RB	75	6.2	UM	
MT	2	3	RB	86	9.1	UM	
MT	2	3	RB	86	9.3	UM	
MT	2	3	RB	95	12.5	UM	

Site Name (e.g. TOB-1) BUC	- 2 first three letters of stree name-site number	ım		VIS	IT # 2
			Date of surv 2001-01-		y Surveyors TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code			
Buck Creek					
Weather High overcas	t	······			
Air Temperature -7	°C	Strea	m Flow	M (High, Moderate	e, Limited, None)
ce Cover (%) 100	P	otential for fish mi	gration	M (High, Moderate	e, Limited, None)
LIMNOLOGY	Y STATION	an the sector of	FISH	SUMMARY	
Depth from upper surface of i	ce (cm) 145	Smoolar	Total # of		Maximum
Ice thickness (cm)	27	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H,M,L, or N) (High. Moderate, Limited, None)	Ν	СН	2	73	76
Snow Depth (cm)	29	RB	13	74	92
Water Temperature	0.1 °C				
Turbidity (H,M, L, or (High, Moderate, Low, or Cl Conductivity					
Dissolved Oxygen (be	ottom) 12 ppm				
Dissolved Oxygen (su	urface) ppm				
an an an Araba an Araba. An Araba an Ar Araba an Araba	FISH COLL	ECTION SUM	MARY		
Date of Setting	2001-01-11		Date of	Collection	2001-01-
Time of Setting	12:05		Time o	f Collection	12:20
Number of traps set	7		Numbe	er of traps collected	7
NOTE: Cluster contains three traps with Capture Cluster Method Number Denth Dor MT 1 MT 2		es/ Number Captured pe	/	/_ 7/	
		Comments			
Ice surface is slushy.					
Ice surface is slushy. January 12/01, air temp. =	-6				
	-6				

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

2 BUC _

词《名

first three letters of stream name-site number

VISIT #

2

100 C

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none) Type of Recaptured Fin Clip
MT	1	1	RB	86	9.2	UM
MT	1	1	RB	74	5.6	UM
MT	1	3	RB	90	10.5	UM
MT	1	3	RB	90	8.9	UM
MT	1	3	RB	82	7	UM
MT	1	3	RB	89	9.3	UM
MT	2	1	RB	88	8.4	UM
MT	2	1	RB	84	8.9	UM
MT	2	1	CO	90	10.6	AD
MT	2	1	CO	103	13.8	AD
MT	2	1	RB	76	4.8	UM
MT	2	1	CH	76	6.4	UM
MT	2	2	СН	73	5.4	UM
MT	2	1	RB	83	7.9	UM
MT	2	3	RB	83	7.5	UM
MT	2	3	RB	80	7.4	UM
MT	2	4	RB	92	11.1	UM

	SITE VISIT DE	SCRIPTION	
Site Name BUC -	first three letters of stream	VISI	Г # 3
(e.g. TOB-1)		Date of surveyTime of survey2001-02-0812:10	Surveyors TJ <td<jd< td=""></td<jd<>
Gazetted Stream Name	Local Stream Name Water	shed Code	
Buck Creek			
Weather Light snowfall	and windy		
Air Temperature -7°	С	Stream Flow L (High, Moderate, I	limited, None)
Ice Cover (%) 100	Potential f	or fish migration M (High, Moderate, I	imited. None)
LIMNOLOGY	STATION	FISH SUMMARY	
Depth from upper surface of ice	(cm) 137	Total # of Mininimum	Maximum
Ice thickness (cm)	42	Species Fish Length (mm)	Length (mm)
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) Snow Depth (cm)	<u>N</u> 35	CO 1 105 RB 5 80	105 95
Water Temperature	0.1 ° C		
Turbidity (H,M, L, or C (High, Moderate, Low, or Clea Conductivity) C		
-			
Dissolved Oxygen (bot Dissolved Oxygen (sur			
	FISH COLLECTIO	N SUMMARY	
Date of Setting	2001-02-08	Date of Collection	2001-02-09
Time of Setting	12:10	Time of Collection	11:45
Number of traps set	7	Number of traps collected	7
NOTE: Cluster contains three traps within	an ~5 meter diameter area		
Capture Cluster Method Number Denth Domi MT 1 MT 2	Sub Percent	Captured per Cluster RB 2 / 2 / 2 / 1	
pH =7.1	Comme	ente	
p11 = /.1			
Coho captured were all adip	ose clipped.		

4

lte Name e.g. TOB-1)	BUC - 2	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATION	
Roll Name	Frame Number	Photo Description	

E Constant

Fork Length Capture Cluster Trap Species Fish **Type of Recaptured Fin** Type of Fin Clip Method Number Number (mm) Weight (g) Clip (e.g. adipose, upper caudal, none) MT 1 1 NFC 1 2 CO 105 15.2 AD MT 1 3 RB 80 UM MT 6.3 1 3 RB 82 8.6 UM MT 2 NFC MT 1 2 2 NFC MT 2 3 RB 88 9.1 UM MT 2 81 7.2 UM MT 4 RB 13.5 UM MT 2 4 RB 95

Site Name (e.g. TOB-1) BUC	- 2	first three letters of stream name-site number				VIS	SIT #	4
]	1		vate of surv 2001-03-0		Time of surv 11:30		veyors I,TD,JD
Bazetted Stream Name Buck Creek	Local Strea	m Name	Watershed Code					<u> </u>
Weather Sunny and c	lear		· · · · · · · · · · · · · · · · · · ·					
ir Temperature -2-]•		Stream	Flow	M	(High, Modera		
ir Temperature-2ce Cover (%)100] C]	Poter	ntial for fish migra	L r	M	(High, Modera		
LIMNOLOG	Y STATI	ON		FISH	SUN	MMARY		
Depth from upper surface of	ice (cm)	134	Species	Total # of Fish		Aininimum ength (mm)	Maxir Length	
Ice thickness (cm)		45	RB	5] [76	11	1
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)	ł	<u>N</u>		1		72	72	2
Snow Depth (cm)	[26	СО	0] [
Water Temperature	ſ	0.5 °C		L	JI	J	L	
Turbidity (H,M, L, o		C						
(High, Moderate, Low, or (Conductivity	Jear)	uS						
-								
Dissolved Oxygen ()	oottom)	12 nnm						
Dissolved Oxygen (h Dissolved Oxygen (s	-	12 ppm					- <u>-</u>	
Dissolved Oxygen (l Dissolved Oxygen (s	surface)	ppm	TION SUMM	ARY				
Dissolved Oxygen (s	surface)	ppm	TION SUMM	ವರ್ಷ ಸಿರ್ವಾಸ್ ಪ್ರದೇಶಗಳು	Collec	tion		2001-03
Dissolved Oxygen (s Date of Setting	surface) [[2001-03-(ppm	TION SUMMA	ARY Date of Time o				2001-03
Dissolved Oxygen (s Date of Setting Time of Setting	surface) [2001-03-(11:30	ppm	TION SUMM	Date of Time of	f Colle			2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set	surface) [2001-03-0 11:30 7	Ppm VISH COLLEC	TION SUMM	Date of Time of	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean	surface) [2001-03-0 11:30 7 thin an -5 meter dia Instream C	ameter area	TION SUMMA	Date of Time of Numbe	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number Denth D	surface) [2001-03-0 11:30 7 thin an -5 meter di	ameter area over Percent t ice cover	Number Captured per C	Date of Time of Numbe	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Mean Demth D MT 1	surface) [2001-03-(11:30 7 thin an -5 meter di Instream C Sub	ameter area over Percent t ice cover 100 RB	Number Captured per C 2 LNC / 1	Date of Time of Numbe	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number Denth D	surface) [2001-03-(11:30 7 thin an -5 meter di Instream C Sub	ameter area over Percent t ice cover	Number Captured per C	Date of Time of Numbe	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Mean Demth D MT 1	surface) [2001-03-(11:30 7 thin an -5 meter di Instream C Sub	ameter area over Percent t ice cover 100 RB	Number Captured per C 2 LNC / 1	Date of Time of Numbe	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Mean Demth D MT 1	surface) [2001-03-(11:30 7 thin an -5 meter di Instream C Sub	ameter area over Percent t ice cover 100 RB	Number Captured per C 2 LNC / 1	Date of Time of Numbe	f Colle	ction		2001-03
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 /	Date of Time of Numbe	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Mean Denth D MT 1	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 / 1 mments	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 / 1 mments	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 / 1 mments	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 / 1 mments	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 / 1 mments	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7
Dissolved Oxygen (s Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps wit Capture Cluster Method Number MT 1 MT 2	surface)	ameter area over Percent t ice cover RB/	Number Captured per C 2 LNC / 1 3 / 1 mments	Date of Time of Numbe luster	f Coller r of tra	ction aps collected		2001-03 11:50 7

SETE VISIT DESCRIPTION

Site Name (e.g. TOB-1) BUC

 $\overline{2}$

-

first three letters of stream name-site number

VISIT #

4

ā: Ş

S.

el foi

.....

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1] 1	NFC				
MT] [1	2	RB	111	15	UM	
MT] [1	1	RB	91	7.6	UM	
MT	1	2	LNC	72	7.6	UM	
MT] [1	3	NFC				
MT	2	1	RB	86	8	UM	
MT	2	2	RB	86	8.2	UM	
MT	2	3	NFC				
MT	2	4	RB	77	5.8	UM	

VISIT # 1
survey Time of survey Surveyors 12-14 2:00 TJ,TD,JD
<u></u>
(High, Moderate, Limited, None)
M (High, Moderate, Limited, None)
SH SUMMARY
of Mininimum Maximum
h Length (mm) Length (mm)
68 105
81 81
e of Collection 2000-12
ne of Collection 1:59
nber of traps collected 7

Site Name (e.g. TOB-1)

BUC-5

first three letters of stream

name-site number

VISIT # 1

1927

l

4

.....

3

28.9

C.

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1	2	RB	77	9.3	UM	
MT	1	2	RB	82	8.4	UM	
MT	1	2	RB	79	6.9	UM	
MT] [1	3	RB	78	6.6	UM	
MT	1	3	RB	112	17.9	UM	
MT	1	3	RB	68	5.4	UM	
MT	2	1	RB	91	10.2	UM	
MT	2		RB	100	13.4	UM	
MT	2	1	RB	75	6.8	UM	
MT	2	1	RB	75	6.4	UM	
MT	2] 1	RB	80	8.2	UM	
MT	2	1	RB	95	13.3	UM	
MT	2	1	RB	105	19.5	UM	
MT	2] 1	LNC	81	7.6	UM	
MT	2	2	RB	68	5.1	UM	
MT	2	3	RB	89	11.3	UM	

Site Name e.g. TOB-1)	BUC-	5	first three letters of stream name-site number				VIS	SIT # 2
					Date of sur	vey	Time of surve	y Surveyors
					2001-01	-11	13:45	TJ,TD,JD
azetted Stream	Name	Local Strea	m Name	Watershed Code				
uck Creek								
Veather	Sun and partly	cloudy						
ir Tempera	ture -2°	С	•	Strea	m Flow	M	(High, Moderate	e, Limited, None)
e Cover (%	r		Po	tential for fish mig	gration	M	(High, Moderate	e, Limited, None)
LIN	INOLOGY	STATI	DN		FISF	ISU	MMARY	
Depth from u	pper surface of ice	: (cm)	137		Total # c		Mininimum	Maximum
Ice thickness	(cm)	[45	Species	Fish	I T	ength (mm)	Length (mm)
Clarity of Ice	(H,M,L, or N)	ſ	N	CO	11		66	89
(High, Moderate, 1	Limited, None)	r	- <u>-</u>	СН	3		65	66
Snow Depth ((cm)	Ĺ	21	RB	43		51	124
Wate	er Temperature		0.3 °C					
	idity (H,M, L, or C		С					
	Moderate, Low, or Clea luctivity	ur)	100 <i>uS</i>					
	olved Oxygen (bot	ا ۲۰۰۰۰ [
		, r						
Disse	olved Oxygen (sur		ISH COLLE	CTION SUMN	AARY			
Date of Settin	g	2001-01-	11		Date o	of Colle	ection	2001-0
Time of Settin	ıg	13:45			Time	of Coll	ection	14:0
Number of tra	aps set	7			Numb	er of t	raps collected	7
	tains three traps within	an ~5 meter di Instream C	over Specie	s/ Number Captured per	r Cluster			
Capture Cluste	Mean	Sub	Percent tice cover 100 CO, 100 CO,	/ 4 CH / 3 / 6 RB / 22		/ 21		
Capture Cluster Method Numb MT 1 MT 2	Mean	nant Dominan	ice cover 100 CO, 100 CO,	/ 6 RB / 22				
Capture Cluster Aethod Numb MT 1 MT 2	er Denth Domi	nant Dominan	ice cover 100 CO 100 CO	/ 6 RB / 22				
Cluster fethod Numbrick MT 1 MT 2 anuary 12th anuary 12th	er Denth Domi	nant Dominan	ice cover 100 CO 100 CO	/ 6 RB / 22				

Site Name (e.g. TOB-1)

BUC - 5

first three letters of stream name-site number

VISIT #

2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] _ 1	1] <u>co</u>	81	8.2	UM	
MT	1	1	RB	102	14	UM	
MT	1	1	СО	75	6	UM	
MT] 1] 1	RB	122	22.7	UM	
MT	1] 1	СО	66	4.3	UM	
MT	1	1	RB	65	4.9	UM	
MT] 1	1	СО	83	7.4	UM	
MT	1	1	СН	65	4.3	UM	
MT	1] 1	RB	69	4.9	UM	
MT] 1	1	RB	76	6.8	UM	
MT] []	RB	70	5.7	UM	
MT	1	1	RB	101	13	UM	
MT	1] [1	RB	81	7.6	UM	
MT	1] [1	RB	84	9.7	UM	
MT	1		RB	69	4.3	UM	
MT	1	1	RB	84	9	UM	
MT	1	1	RB	78	6.9	UM	
MT	1] 1	RB	80	7.7	UM	
MT	1	2	RB	121	23.2	UM	
MT	1	2	СО	78	4.9	UM	
MT	1	2	RB	80	7.6	UM	
MT	1	2	RB	69	4.7	UM	
MT		2	Сн	65	3.3	UM	
MT		2	Сн	66	4	UM	
MT	1	2	RB	109	17	UM	
MT		2	RB	75	7.4	UM	
MT	1	3	RB	124	26.2	UM	
MT		3	RB	98	13.8	UM	
MT	1	3	RB	81	9.5	UM	
MT	2	1	RB	51	1.1	UM	
MT	2] [1	RB	80	6.8	UM	
MT	2		RB	81	8.3	UM	
MT	2	3	RB	108	17.5	UM	
MT	2	3	RB	79	7.4	UM	
MT	2	3	RB	72	6.1	UM	

100

Ì

į.

1

1

Site Name (e.g. TOB-1)	В	UC-5	fir: na:	at three letters of stream me-site number	1		VISIT # 2
MT	2	3	RB	109	10.2	UM	
MT	2	3	RB	70	4.2	UM	
MT	2	3	RB	76	5.7	UM	
MT	2	3	RB	71	5.3	UM	
MT	2	3	RB	67	5.8	UM	
MT	2	3	RB	68	4.5	UM	
MT	2	3	RB	71	5.1	UM	
MT	2	3	СО	80	6.6	UM	
MT	2	3	RB	88	9.5	UM	
MT	2	3	RB	89	10	UM	
MT	2	4	RB	106	15.1	UM	
MT	2	4	СО	89	9	UM	
MT	2	4	СО	84	8.1	UM	
MT	2	4	RB	83	8.6	UM	
MT	2	4	СО	82	8	UM	
MT	2	4	CO	89	9.6	UM	
MT	2	4	СО	82	8	UM	
MT	2	4	RB	101	14.8	UM	
MT	2	4	RB	103	14.2	UM	
MT	2	4	RB	91	10.3	UM	
MT	2	4	RB	74	6.4	UM	
MT	2	4	RB	63	4.1	UM	

Site Name (e.g. TOB-1)	BUC-	5 first three lette name-site nur			VISIT #	3
				Date of survey 2001-02-08	Time of survey Survey 12:45 TJ,T	
Gazetted Stream	Name	Local Stream Name	Watershed Code			
Bucjk Creek						
Weather]	Light snowfal	1				
Air Temperat	ure <u>-7</u> °	С	Str	eam Flow 🚺	(High, Moderate, Limited, None	e)
ce Cover (%)	100		Potential for fish n	nigration <u>N</u>	(High, Moderate, Limited, None	e)
LIM	NOLOGY	STATION		FISH S	UMMARY	
Depth from up	oper surface of ic	e (cm) 61		Total # of	Mininimum Maximu	
Ice thickness (cm)	31	Species	Fish	Length (mm) Length (m 64 95	m)
Clarity of Ice (N	СН		64 93 69 69	
(High, Moderate, L Snow Depth (e		18	RB		65 110	
Water	Temperature	0.1 °	c			
	lity (H,M, L, or (Moderate, Low, or Cle					
	ictivity	80 <i>u</i>	s			
Disso	lved Oxygen (bo	ttom) 12 p	pm			
Disso	lved Oxygen (sur	-	pm	and substantial and a substantial second	the set of the set of the set of the set	· ·
		FISH C	OLLECTION SUM	(c) and addressing distribution of		
Date of Setting		2001-02-08		Date of Co		01-02-09
Time of Setting		12:45		Time of Contract Number of Contr	f traps collected	<u>12:30</u> 7
Number of tra	-	7 a an ~5 meter diameter area				
NOTE: Cluster conta	-	Instream Cover	Species/ Number Captured	per Cluster		
Capture Cluster		Sub Percent				
	INICAL.	Sub Percent inant Dominant ice cover	RB / 7 CO /	1 CH / ′		/
Capture Cluster Method Numbe	INICAL.	Sub Percent	RB / 7 CO / RB / 15 CO /	1 CH / ^ 4 CH / ^]/
Capture Cluster Method Numbe	INICAL.	Sub Percent inant Dominant ice cover 100]/
Capture Cluster Method Numbe	INICAL.	Sub Percent inant Dominant ice cover 100]/[
Capture Cluster Method Numbe	INICAL.	Sub Percent inant Dominant ice cover 100				
Capture Cluster Method Numbe	INICAL.	Sub Percent inant Dominant ice cover 100]/
Capture Cluster Method Numbe MT 1 MT 2	INICAL.	Sub Percent inant Dominant ice cover 100	RB / 15 CO /			
Capture Cluster Method Numbe	INICAL.	Sub Percent inant Dominant ice cover 100	RB / 15 CO /			
Capture Cluster Method Numbe MT 1 MT 2		Sub Percent inant Dominant ice cover 100 100	RB / 15 CO /			
Capture Cluster Method Numbe MT 1 MT 2 pH = 7.2		Sub Percent inant Dominant ice cover 100 100	RB / 15 CO /			
Capture Cluster Method Numbe MT 1 MT 2 pH = 7.2		Sub Percent inant Dominant ice cover 100 100	RB / 15 CO /			

		SITE VISIT DESCRIPT	ion
Site Name (e.g. TOB-1)	BUC-5	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	ON

Roll Name Frame Number Photo Description

5

OW4

1

100

5

1

an's

acia

Site view loooking upstream ,both holes visible

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)		Type of Fin Clip 5. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	110	18.6]	UM	
MT	1	1	RB	85	7.9]	UM	
MT	1	1	СО	94	10.3]	AD	
MT	1	1	RB	81	7.8]	UM	
MT	1	2	RB	78	7]	UM	
MT	1	2	RB	84	8.2]	UM	
MT	1	2	Со	95	10.8]	UM	
MT	1	2	RB	70	4.2]	UM	
MT	1	3	RB	72	6]	UM	
MT	1	3	СН	69	4.6]	UM	
MT	2	1	СО	64	4.2]	UM	
MT	2	1	RB	74	6.3]	UM	
MT	2	1	RB	84	8.1		UM	
MT	2	1	RB	80	7.8]	UM	
MT	2	1	RB	76	6.4]	UM	
MT	2	1	СО	79	6.5]	UM	
MT	2	1	RB	81	7.4]	UM	
MT	2	1	со	64	3		UM	
MT	2	1	со	64	3.2]	UM	
MT	2	2	RB	69	5.6]	UM	
MT	2	2	RB	89	10.2]	UM	
MT	2	2	RB	68	5.7]	UM	
MT	2	3	RB	65	4.7]	UM	
MT	2	3	RB	72	6.1]	UM	
MT	2	3	RB	78	7]	UM	
MT	2	3	RB	78	7.1]	UM	
MT	2	3	RB	65	4.1]	UM	
MT	2	3	RB	65	4.2]	UM	
MT	2	3	СН	69	4.2]	UM	
MT	2	4	RB	101	14.3]	UM	

Site Name (e.g. TOB-1) BUC	C = 5 first three letters of str name-site number	visit # 4
		Date of survey Time of survey Surveyors
Gazetted Stream Name	Local Stream Name	2001-03-08 12:00 TJ,TD,JD Watershed Code
Buck Creek		
Weather Sunny and	clear	
Air Temperature -2	c	Stream Flow M (High, Moderate, Limited, None)
ce Cover (%) 100	0	Potential for fish migration M (High, Moderate, Limited, None)
LIMNOLOG	GY STATION	FISH SUMMARY
Depth from upper surface of	of ice (cm) 56	Total # of Mininimum Maximum
Ice thickness (cm)	30	Species Fish Length (mm) Length (mm) CO 2 69 70
Clarity of Ice (H,M,L, or N (High, Moderate, Limited, None)	D N	$\begin{array}{c c c c c c c c c c c c c c c c c c c $
Snow Depth (cm)	25	
Water Temperature	e <u>1</u> °C	
Turbidity (H,M, L, (High, Moderate, Low, o		
Conductivity		
Dissolved Oxygen		
Discolued Ovugen		
Dissolved Oxygen		
	FISH COLL	ECTION SUMMARY
Date of Setting	FISH COLI 2001-03-08	Date of Collection 2001-03-09
	FISH COLL	Date of Collection 2001-03-09
Date of Setting Time of Setting	FISH COL1 2001-03-08 12:00 7 within an -5 meter diameter area	Date of Collection2001-03-09Time of Collection12:00Number of traps collected7
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean	FISH COL1 2001-03-08 12:00 7 within an -5 meter diameter area	Date of Collection2001-03-09Time of Collection12:00
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1	FISH COLI 2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps to Capture Cluster Method Number	FISH COLI 2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent Sub Percent Spe Sub Percent Sec	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps v Capture Cluster Mean Method Number Denth MT 1 MT 2	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7 cies/ Number Captured per Cluster / / 2 RB / 7 / / 4 / / / 4 / /
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1 MT 2	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7 cies/ Number Captured per Cluster / / 2 RB / 7 / / 4 / /
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1 MT 2 Denth MT 2 pH = 7.6	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Spectrum Sub Percent Dominant ice cover 100 100 RB	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7 cies/ Number Captured per Cluster / / 2 RB / 7 / / 4 / / / 4 / /
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps v Capture Cluster Mean Method Number Denth MT 1 MT 2	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Spectrum Sub Percent Dominant ice cover 100 100 RB	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7 cies/ Number Captured per Cluster / / 2 RB / 7 / / 4 / / / 4 / /
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps of Capture Cluster Mean Method Number Denth MT 1 MT 2 Denth MT 2 pH = 7.6	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent 100 100 0 100 0 100 0 100 0 100 0 100 0 2 = 109cm	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7 cies/ Number Captured per Cluster / / 2 RB / 7 / / 4 / / / 4 / /
Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps v Capture Cluster Mean Method Number Denth MT 1 MT 2 pH = 7.6 Water depth at cluster #	2001-03-08 12:00 7 within an -5 meter diameter area Instream Cover Sub Percent 100 100 0 100 0 100 0 100 0 100 0 100 0 2 = 109cm	Date of Collection 2001-03-09 Time of Collection 12:00 Number of traps collected 7 cies/ Number Captured per Cluster / / 2 RB / 7 / / 4 / / / 4 / /

Site Name (e.g. TOB-1)

.....

1

1

1

100

1.06

BUC-5

first three letters of stream name-site number

VISIT #

4

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	80	5.8	UM	
MT	1	2	NFC				
MT	1	3	RB	76	5.5	UM	
MT	1	3	RB	91	8.1	UM	
MT	1	3	RB	78	5.2	UM	
MT	1	3	RB	82	7.4	UM	
MT	1	3	СО	69	3.7	UM	
MT	1	3	RB	90	8.6	UM	
MT	1	3	СО	70	3.9	UM	
MT	1	4	RB	80	6.3	UM	
MT	2	1	RB	82	6.8	UM	
MT	2	2	RB	71	5.3	UM	
MT	2	2	RB	76	6.1	UM	
MT	2	3	RB	80	6	UM	

lite Name e.g. TOB-1)	BUC-	6	first three letters of stream name-site number	VISIT # 1
e.g. (UB-1)		L		Date of survey Time of survey Surveyors
Jazetted Stream	Name	Local Strea	m Name Wa	2000-12-14 2:15 TJ,TD,JD
Buck Creek				
Weather	Clear and cold	1	<u>, , , , , , , , , , , , , , , , , , , </u>	
ر ir Temperat	ure <u>-15</u> °	° c		Stream Flow M (High, Moderate, Limited, None)
ce Cover (%)	100		Potentia	al for fish migration (High, Moderate, Limited, None)
LIM	NOLOGY	STATI	ON	FISH SUMMARY
Depth from u	oper surface of ic	e (cm)	123	Total # of Mininimum Maximum Species Fish Length (mm) Length (mm)
Ice thickness (cm)	[32	Species Fish Length (mm) RB 9 58 84
Clarity of Ice (High, Moderate, I	(H,M,L, or N) .imited, None)	[N	LNC 1 54 54
Snow Depth (2	
	Temperature		0.3 ° C	
(High,	dity (H,M, L, or Moderate, Low, or Cle		_ <u>C</u>	
	uctivity		140 uS	
	lved Oxygen (bo lved Oxygen (su	•	13 ppm ppm	
			ISH COLLECT	ION SUMMARY
Date of Settin		2000-12-		Date of Collection 2000-12-1
Time of Settin		14:15	==	Time of Collection 14:20
Number of tra	•	5		Number of traps collected 5
NOTE: Cluster cont Capture Cluste	ains three traps withi	Instream (Cover Species/ Nun	nber Captured per Cluster
Method Numb		Sub ninant Dominar	Percent ice cover 100 RB / 9	
	┛╏└╌╌┚└╴			
	The second state and states			n se surres annas services se antes de la construcción de la construcción de la construcción de la construcción
			an an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an tha an Tha an tha an t	ments
Fish sampled pH = 7.6	in truck as ter	mp was -1	9.	
pii - 7.0				

Site Name (e.g. TOB-1)

1000

(inter

1

100

1880

Carl

63

BUC-6

first three letters of stream name-site number

VISIT # 1

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	2	2	RB	65	4.2	UM	
MT	2	2	RB	79	6.6	UM	
MT	2	2	RB	69	5.4	UM	
MT	2	2	RB	78	6.6	UM	
MT	2	3	LNC	54	2.8	UM	
MT	2	3	RB	68	4.2	UM	
MT	2	3	RB	58	2.9	UM	
MT	2	3	RB	77	7.6	UM	
MT	2	3	RB	84	8.9	UM	
MT	2	3	RB	71	5.3	UM	

(e.g. TOB-1)	BUC	• 6	first three letters of stream name-site number		VIS	IT # 2
			1	Date o	f survey Time of surve	y Surveyors
Jazetted Stream N	Jamo	L 1 Ot			-01-11 14:00	TJ,TD,JD
Buck Creek	vame	Local Strea	im Name W	atershed Code		1
Veather S	un and partly	/ cloudy				
ir Temperatu	ire <u>-2</u> °	с		Stream Flo	• M (High, Moderate	Limited None)
e Cover (%)	100		Potentia	al for fish migration		
LIM	NOLOGY	STATE		- Colorador - Santa - Santa - Santa - Santa - Santa - Santa - Santa - Santa - Santa - Santa - Santa - Santa - Santa		radio de la composición Radio de la composición
and a straight and a star is a	en de la desta de la serie.	9999999999999999999999999999999999999 •	and a start a straight ann an straight ann an straight ann an straight ann an straight a straight a straight a	P1	SH SUMMARY	
Depth from upp		;(cm)	82	Tota Species Fi		Maximum Length (mm)
Ice thickness (cr		Ĺ	30		······	78
Clarity of Ice (H (High, Moderate, Lin		L	N	RB 1		99
Snow Depth (cn	n)	[28			77
Water 7	Femperature	[0.2 °C			
Turbidit	ty (H,M, L, or C	າ [С			
Conduc	derate, Low, or Clea	r) [130 uS			
Dissolv	ed Oxygen (bott	iom)	12 ppm			
	ed Oxygen (surf	· _	ppm ppm			
		-	ISH COLLECTI	ON STIMMAD		and the factor
Date of Setting		2001-01-1	an seneral se se substant de subgraf por la companya de la seconda de la seconda de la seconda de la seconda d Temp	e or a header a faire a faire a fair a fair fair a fair fair fair fai	e of Collection	
		14:00			e of Collection	2001-01-12
Û,		5	-		nber of traps collected	14:30 5
Time of Setting Number of traps	set					
Time of Setting Number of traps		<u> </u>	neter area			
Time of Setting Number of traps DTE: Cluster contains upture Cluster	three traps within a Mean	an ~5 meter dian Instream Co Sub		per Captured per Cluster		
Time of Setting Number of traps DTE: Cluster contains opture Cluster	three traps within a Mean	an ~5 meter dias Instream Co	Ver Species/ Numl			
Time of Setting Number of traps DTE: Cluster contains pture Cluster ethod Number	three traps within a Mean	an ~5 meter dian Instream Co Sub	ver Species/ Numb	er Captured per Cluster]//	
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number	three traps within a Mean	an ~5 meter dian Instream Co Sub	Ver Species/ Numl]//	
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number	three traps within a Mean	an ~5 meter dian Instream Co Sub	Ver Species/ Numl			
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number	three traps within a Mean	an ~5 meter dian Instream Co Sub	Ver Species/ Numl			
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number	three traps within a Mean	an ~5 meter dian Instream Co Sub	ver Percent ice cover 100 CO / 1	RB / 13]//	
Time of Setting Number of traps DTE: Cluster contains apture Cluster ethod Number MT 2	hean Denth Domin	an ~5 meter dian Instream Co Sub	Ver Species/ Numl	RB / 13		
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number	hean Denth Domin	an ~5 meter dian Instream Co Sub	ver Percent ice cover 100 CO / 1	RB / 13		
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number MT 2 r temp. on Jan	hean Denth Domin	an ~5 meter dian Instream Co Sub	ver Percent ice cover 100 CO / 1	RB / 13		
Time of Setting Number of traps DTE: Cluster contains apture Cluster ethod Number MT 2 r temp. on Jan I = 7.8	Mean Denth Domin	an ~5 meter dian Instream Co Sub	ver Percent ice cover 100 CO / 1	RB / 13		
Time of Setting Number of traps DTE: Cluster contains upture Cluster ethod Number MT 2 r temp. on Jan	Mean Denth Domin	an ~5 meter dian Instream Co Sub	ver Percent ice cover 100 CO / 1	RB / 13		
Time of Setting Number of traps DTE: Cluster contains apture Cluster ethod Number MT 2 r temp. on Jan I = 7.8	Mean Denth Domin	an ~5 meter dian Instream Co Sub	ver Percent ice cover 100 CO / 1	RB / 13		

Site Name (e.g. TOB-1)

-

1

1

1

ing

14

BUC

- 6

first three letters of stream name-site number

VISIT #

2

2

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fish Capture Cluster Trap Species Fork Length Type of Fin Clip Clip Weight (g) Method Number Number (**mm**) (e.g. adipose, upper caudal, none) 3.1 UM MT 2 1 RB 58 MT 2 1 RB 75 6.6 UM UM 2 RB 51 2.3 MT 1 MT 2 1 RB 95 12.5 UM 2 1 RB 58 2.7 UM MT 2 RB 6.2 UM MT 1 69 2 99 11.6 UM MT 2 RB 2 2 RB 75 6.3 UM MT 2 2 RB 3.1 UM 59 MT 2 2 CO 78 6.7 UM MT MT 2 2 RB 69 5.5 UM UM 2 77 6.2 2 RB MT 2 2 MT RB 62 3.7 UM 2 2 RB 79 7.3 UM MT

Site Name (e.g. TOB-1)	JC = 6 first three letter name-site number	
		Date of surveyTime of surveySurveyors2001-02-0813:10TJ,TD,JD
Gazetted Stream Name Buck Creek	Local Stream Name	Watershed Code
Weather Light sno	owfoll	
Light Sh	owian.	
Air Temperature	-7 ° c	Stream Flow H (High, Moderate, Limited, None)
ce Cover (%)	100	Potential for fish migration M (High, Moderate, Limited, None)
LIMNOLO	OGY STATION	FISH SUMMARY
Depth from upper surfac	ce of ice (cm) 78	Total # of Mininimum Maximum
Ice thickness (cm)	34	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or		CH 3 64 78
(High, Moderate, Limited, None	*	RB 6 45 65
Snow Depth (cm)		
Water Temperat Turbidity (H,M,		
(High, Moderate, Lo	w, or Clear)	
Conductivity	130 uS	
Dissolved Oxyg Dissolved Oxyg		
Dissorveu Oxyg		DLLECTION SUMMARY
Data of Satting	na presidente da la construita de la construita de la construita de la construita de la construita de la constr Transmismo de la construita de la construita de la construita de la construita de la construita de la construit	
Date of Setting Time of Setting	2001-02-08	Date of Collection2001-02-09Time of Collection12:45
Number of traps set	5	Number of traps collected 5
	ps within an ~5 meter diameter area	
Capture Cluster		Species/ Number Captured per Cluster
Anthon J. Manusham		CH / 3 RB / 6 / / / / / / / /
INICAL		
lethod Number Denti		
Iethod Number Denth MT 1		
Aethod Number Denth MT 1		
Iethod Number Denth MT 1		
Iethod Number Denth MT 1		
Acthod Number Dent		
Acthod Number Dent MT 1 1 MT 2 1		
Aethod Number Dent MT 1 MT 2		
fethod Number Dent MT 1 1 MT 2 1		
Acthod Number Dent		
fethod Number Dent MT 1 MT 2		

		SITE VISIT DESCRIPT	ION	
Site Name (e.g. TOB-1)	BUC-6	first three letters of stream name-site number	VISIT #	3
		PHOTO DOCUMENTATI	9N	
Roll Name	Frame Numbe	r Photo Description		
OW4	6	Site view ,both holes visible.		

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	Сн	64	3.2	UM	
MT	1	1	RB	49	1.6	UM	
MT	1	1	Сн	78	6.2	UM	
MT	1	1	RB	65	3.4	UM	
MT	1	1	RB	58	3.3	UM	
MT	1	1	Сн	66	4.3	UM	
MT	1	1	RB	48	1.4	UM	
MT	1	1	RB	50	1.9	UM	
MT] 1	2	RB	45	1.1	UM	
MT	2	1	NFC				
MT	2	2	NFC				
MT	2	3	NFC				

(e.g. TOB-1)	BUC - 6 first three I name-site		of survey Time of survey Surveyors
Gazetted Stream Name Buck Creek	Local Stream Name		01-03-08 12:30 TJ,TD,JD
Weather Sunny	v and clear		
Air Temperature (ce Cover (%)	° c 100	Stream Fl Potential for fish migrati	
Depth from upper sur Ice thickness (cm) Clarity of Ice (H,M,L (High, Moderate, Limited, N Snow Depth (cm) Water Temp Turbidity (H (High, Moderate Conductivity Dissolved O	39 39 None) 4 erature 0.4 ,M, L, or C) o, Low, or Clear) / xygen (bottom) 12 xygen (surface)		Minimum Maximum Fish Length (mm) Length (mm) 4 60 81 8 51 82 0
Date of Setting Time of Setting	2001-03-08 12:50	en en de de la de la de la de la de la de la de la de la de la de la de la de la de la de la de la de la de la]	Date of Collection2001-03-09Time of Collection12:30
Number of traps set	5 e traps within an ~5 meter diameter area		Number of traps collected 5
Method Number T MT 1 MT 2	Instream Cover Mean Sub Percent Depth Dominant Dominant ice cover 100 100 100	Species/ Number Captured per Clus CH/4 RB/4 RB/4	
pH = 7.4		Comments	

Site Name (e.g. TOB-1)

İ

(ille

986

65

first three letters of stream name-site number

 $\sum_{i=1}^{n}$

BUC-6

و و مرکز کار و

VISIT # 4

1.14

اللي فيكنيه تعاويه فال

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Fish **Type of Recaptured Fin** Species Fork Length **Type of Fin Clip** Capture Cluster Trap Weight (g) Clip (mm) Method Number Number (e.g. adipose, upper caudal, none) CH 60 2.8 UM MT 1 1 2 CH 78 5.5 UM MT 1 2 RB 82 7.6 UM 1 MT UM 2 6.9 RB 82 MT 1 6.3 UM 1 2 RB 79 MT 2 RB 80 6.1 UM 1 MT 3.3 UM MT 1 2 CH 64 UM 2 CH 81 5.5 1 MT 81 6.4 UM 2 RB MT 1 2 2 NFC MT 1 UM 2 3 RB 51 MT 2 3 RB 62 2.9 UM MT 2.9 UM 2 RB 3 61 MT

Site Name			
(e.g. TOB-1)	BUC-	7 first three letters of stream name-site number	VISIT # 1
			Date of surveyTime of surveySurveyors2000-12-061:59TJ,TD,JD
Gazetted Stream N		Local Stream Name	Watershed Code
uck Cr. Release F			
/eather Si	unny		
ir Temperatu	re 9°	с	Stream Flow L (High, Moderate, Limited, None)
ce Cover (%)	100	Poter	ntial for fish migration L (High, Moderate, Limited, None)
LIMP	NOLOGY	STATION	FISH SUMMARY
Depth from upp	er surface of ice	e (cm) 88	Total # of Mininimum Maximum
Ice thickness (cr	m)	12	Species Fish Length (mm) Length (mm)
Clarity of Ice (H	I,M,L, or N)	Ν	CO 12 71 115
(High, Moderate, Lim Snow Depth (cn			
-			0 0
	Cemperature	1.3 C	
(High, Mo	ty (H,M, L, or C oderate, Low, or Clear	r)	
Conduc	tivity	130 <i>uS</i>	
	ed Oxygen (bott	Lana 4 4	
	ed Oxygen (surf		
		FISH COLLEC	TION SUMMARY
Date of Setting		2000-12-06	Date of Collection 2000-12-
Time of Setting		2:00	Time of Collection 10:55
Number of traps	s set	3	Number of traps collected 3
	s three traps within a	an ~5 meter diameter area Instream Cover Species/ N	Jumber Captured per Cluster
Capture Cluster Method Number	Mean Denth Domin	Sub Percent nant Dominant ice cover	
MT 1	•	•	
		Ca	mments
		Cor	mments
		Cor	mments
		Cor	mments
Ph=7.9		n fan de en ferste en ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferst	mments
Ph=7.9	- adipose clip	Cor pped and 1+ adipose clipped a	mments
≥h=7.9	+ adipose clip	n fan de en ferste en ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferst	mments
•h=7.9	⊦ adipose clip	n fan de en ferste en ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferste ferst	mments

Site Name (e.g. TOB-1)

[į "

(TO 1

C

 $\left[\right]$ 1

<u>(</u>)

ſ

1

لوي

0

 $\overline{}$ ĺ

 $\mathbf{\Gamma}$

BUC

Martin States

- 7

1.00

first three letters of stream name-site number

VISIT # 1

·

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1	1	СО	110	13.7	A	
MT	1] 1	СО	111	14.7	A	
MT	1] [1	СО	115	15.4	A	
MT	1	1	СО	81	5.6	A	
MT		2	СО	71	3.2	UM	
MT] 1	2	СО	117	17.2	UM	
MT	1	2	СО	104	11.3	A/RM	
MT	1	2	СО	94	8.2	UM	
MT	1	2	СО	83	5.6	UM	
MT	1	2	СО	73	4	UM	
MT] 1	2	Со	80	5.1	UM	
MT	1	2	СО	82	5.6	UM	
MT	1	3	NA				
MT	1	3	NA				

			SITE	VISI T DI	ISCRIPT	FION				
Site Name (e.g. TOB-1)	BUC	- 7	first three lett name-site nut					VI	SIT i	# 2
		L				Date of sur 2001-01		Time of surv 14:35	/ey	Surveyors TJ,TD,JD
Gazetted Stream	n Name	Local St	ream Name	Wat	ershed Code			L		
Buck Creek Rel										
·		- .								
Weather	Snowing					<u> </u>				
Air Tempera	ature 0	°с			Stream	m Flow	M	(High, Moder	ste, Limit	ed, None)
[ce Cover (%	6) 100			Potentia	l for fish mig	gration	Μ	(High, Moder	ate, Limit	ed, None)
- ER	MNOLOGY	STAT	ION			FISE	I SU	MMARY	L .	
Depth from	upper surface of i	ce (cm)	47			Total # o	of 1	Mininimum	М	aximum
Ice thickness			3		Species	Fish	1	ength (mm)	Len	igth (mm)
					СО	2		96		101
•	e (H,M,L, or N) , Limited, None)		N		СН	4		72		83
Snow Depth			35		RB	11	7	74		125
Wat	ter Temperature		1.3	с		L		L	L	
	bidity (H,M, L, or	C)	<u> </u>	-						
(High	h, Moderate, Low, or Cl									
Con	ductivity		140 <i>u</i>	S						
Dise	solved Oxygen (b	ottom)	11 r	pm						
Diss	solved Oxygen (sı	rface)	F	opm						
	1997 - 18 9 - 189		FISH C	OLLECTI	ON SUMN	IARY				
Date of Settin	n and the contract that that	2001-0	Contraction and the second second	elen künigket elen kan kan elen elen kan elen elen elen elen elen elen elen el	an gir eine sei inne eine eine eine		of Colle	ction		2001-01-10
Time of Setti		14:3				Time	of Colle	ection		11:40
Number of th	-	3				Numt	per of ti	raps collected	I	3
	ntains three traps with		r diameter area	,						
Capture Clust	ter	Instream	n Cover	Species/ Numb	per Captured per	Cluster				
Method Num	1VICUII	Sui ninant Domi			, <u> </u>					
MT 1			100	CO / 2	CH / 4	RB	/ 11			
				Comn	ients			(-		
T.J fell throu										
January 10th	n, snowing.									
		<u></u>								
pH = 8										
pH = 8										
pH = 8										1
pH = 8										

Site Name (e.g. TOB-1)

1

1

(*#<u></u>

10

 \overline{C} C

 \overline{C} 6

T (1999) (1999)

 $\int \overline{}$ 1

 $\left(\right)$ (Car

6

66

[7 Cust

120 L.

(19)

1

5 (

5 1000

Ì

BUC-

7

first three letters of stream name-site number

VISIT # 2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1	1	СН	75	4.7	UM	
MT	1	1	СН	83	7.5	UM	
MT	1	1	RB	84	6.8	UM	
MT	1	1	RB	89	10.1	UM	
MT	1	2	RB	104	14.8	UM	
MT	1	2	RB	101	12.3	UM	
UM	1	2	RB	95	11.3	UM	
MT		3	RB	125	24.1	UM	
MT	1	3	RB	88	9.1	UM	
MT	1	3	СН	72	5.5	UM	
MT	1	3	RB	88	8.8	UM	
MT		3	RB	95	9.7	UM	
UM	1	3	СН	73	5.5	UM	
MT	1	3	СО	96	11.1	AD	
MT	1	3	RB	74	5.5	UM	
MT	1	3	СО	101	13.6	AD/RM	
MT	1	3	RB	118	20	UM	

Site Name (e.g. TOB-1)	UC - 7	first three letters of stream name-site number		VISIT	# 3
			Date of sur		Surveyors
Gazetted Stream Name	Local S	tream Name Wate	2001-02 rshed Code	-06 14:15	TJ,TD,JD
Buck Creek release pond					
Weather Sunny					
Air Temperature	<u>-8</u> °c		Stream Flow	(High, Moderate, Lim	uited, None)
ce Cover (%)	100	Potential	for fish migration	M (High, Moderate, Lim	ited, None)
LIMNOL	OGY STAT	FION	FISI	ISUMMARY	
Depth from upper surfa	ace of ice (cm)	79	Total # c	of Mininimum N	/ aximum
Ice thickness (cm)		26	Species Fish		ngth (mm)
Clarity of Ice (H.M.L.	or N)		CO 3	71	100
(High, Moderate, Limited, No			СН 2	72	80
Snow Depth (cm)		38	RB 2	79	105
Water Temper		0.3 C			
Turbidity (H,N (High, Moderate, I					
Conductivity		310 <i>uS</i>			
	(non (hottom)	12 ppm			
Dissolved Oxy		··			
Dissolved Oxy Dissolved Oxy		ppm			Den skilet stade se
Dissolved Oxy	/gen (surface)	FISH COLLECTIO	 A sign set of an advantage set as the set of a set of		
Dissolved Oxy Date of Setting	/gen (surface)	FISH COLLECTIO	Date of	of Collection	2001-02-07
Dissolved Oxy Date of Setting Time of Setting	/gen (surface) 2001-0 14:	FISH COLLECTIO	Date o Time	of Collection	11:05
Dissolved Oxy Date of Setting	/gen (surface) 2001-0 14: 3	FISH COLLECTIO	Date o Time		
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Me	raps within an -5 meter Instream	PISH COLLECTIO	Date o Time	of Collection	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number	raps within an ~5 meter	PISH COLLECTIO	Date o Time Numb r Captured per Cluster	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Me	raps within an -5 mete Instream en Su	PISH COLLECTIO	Date o Time Numb	of Collection	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number	raps within an -5 mete Instream en Su	PISH COLLECTIO	Date of Time of Numb r Captured per Cluster	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number	raps within an -5 mete Instream en Su	PISH COLLECTIO	Date of Time of Numb r Captured per Cluster	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number	raps within an -5 mete Instream en Su	PISH COLLECTIO	Date of Time of Numb r Captured per Cluster	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three ti Capture Cluster Me Method Number De MT 1	raps within an -5 meter Instream an Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three ti Capture Cluster Method Number MT 1	raps within an -5 meter Instream an Dominant Domi	PISH COLLECTIO	Date of Time (Numb r Captured per Cluster CH / 2 RB (of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Me Method Number De MT 1	/gen (surface) 2001-0 14: 3 raps within an -5 mete Instream an Su ph Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number De MT 1	/gen (surface) 2001-0 14: 3 raps within an -5 mete Instream an Su ph Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number De MT 1	/gen (surface) 2001-0 14: 3 raps within an -5 mete Instream an Su ph Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three ti Capture Cluster Me Method Number De MT 1	/gen (surface) 2001-0 14: 3 raps within an -5 mete Instream an Su ph Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number De MT 1	/gen (surface) 2001-0 14: 3 raps within an -5 mete Instream an Su ph Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05
Dissolved Oxy Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three to Capture Cluster Method Number De MT 1	/gen (surface) 2001-0 14: 3 raps within an -5 mete Instream an Su ph Dominant Domi	PISH COLLECTIO	Date of Time Numb r Captured per Cluster CH / 2 RB ,	of Collection er of traps collected	11:05

Site Name (e.g. TOB-1)

1

(

100

6

100

٢ į į

10

0

(

. Cii

BUC-

17

first three letters of stream name-site number

VISIT #

3

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fork Length Fish Type of Fin Clip Capture Cluster Trap Species Clip (mm) Weight (g) Method Number Number (e.g. adipose, upper caudal, none) NFC 1 1 MT 12.9 AD со 100 MT 1 2 UM 2 со 78 5.6 1 MT 2 CH 72 5.1 UM MT 1 7.1 UM 2 RB 79 MT 1 1 2 со 71 4.3 UM MT 105 15.5 UM RB 1 2 MT UM 7.2 3 CH 80 MT 1

ite Name e.g. TOB-1)	UC-7	first three letters of stream name-site number	1		VISI	Г # 4
,.g. 106-17	<u> </u>		ľ	Date of survey	Time of survey	Surveyors
1.0 mm	T a a	l Stream Name	L Watershed Code	2001-03-06	13:45	TJ,TD,JD
azetted Stream Name Jck Creek Release Pon		I Sucalli Ivallic	Watershed Code			
eather High c	vercast part	sun				
	• 					
ir Temperature	2° c		Stream	·	(High, Moderate, I	.imited, None)
e Cover (%)	100	Po	tential for fish migr	ation L	(High, Moderate, I	limited, None)
LIMNOI	.OGY ST	ATION		FISH SU	MMARY	
Depth from upper sur	face of ice (cm)	77			Mininimum	Maximum
Ice thickness (cm)		29	Species	Fish I	Length (mm)	Length (mm) 112
Clarity of Ice (H,M,L		N	SUC		72	78
(High, Moderate, Limited, N Snow Depth (cm)	unej	37	СН		76	76
Water Tempe	erature	1.3 ° C	RB	4	82	109
Turbidity (H, (High, Moderate,		С		Lł		L
Conductivity	2011, of closely	uS				
00						
	tygen (bottom)	12 ppm				
Dissolved Ox	tygen (bottom) tygen (surface)	12 ppm				
Dissolved Ox		ppm	CTION SUMM	ARY		
Dissolved Ox	tygen (surface)	ppm	CTION SUMM	ARY Date of Colle	ection	2001-03-07
Dissolved O Dissolved O	xygen (surface)	FISH COLLE	CTION SUMM	Date of Colle Time of Coll	ection	10:50
Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set	(xygen (surface)	FISH COLLE 01-03-06 13:45 3	CTION SUMM	Date of Colle Time of Coll		
Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set TOTE: Cluster contains three Capture Cluster	tygen (surface)	FISH COLLE ppm FISH COLLE 01-03-06 13:45 3 meter diameter area ream Cover Specie	CTION SUMM	Date of Colle Time of Coll Number of t	ection	10:50
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three apture Cluster Iethod Number	tygen (surface)	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Specie Sub Percent Specie	ss/ Number Captured per (Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three capture Cluster	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 13:45 3 meter diameter area ream Cover Sub Percent Specie		Date of Colle Time of Coll Number of t	ection	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set TOTE: Cluster contains three Capture Cluster Method Number	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Specie Sub Percent Specie	ss/ Number Captured per (Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three apture Cluster Iethod Number	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Specie Sub Percent Specie	ss/ Number Captured per (Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three Capture Cluster	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Specie Sub Percent Specie	ss/ Number Captured per (Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three Capture Cluster	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Number of traps set OTE: Cluster contains three apture Cluster Inthod Number D MT 1	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	ss/ Number Captured per (Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set TOTE: Cluster contains three Capture Cluster Aethod Number D	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three apture Cluster tethod Number MT 1	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three apture Cluster Acthod Number D	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set ROTE: Cluster contains three Capture Cluster N Method Number D MT 1	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Time of Setting Number of traps set OTE: Cluster contains three apture Cluster Acthod Number D	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3
Dissolved Or Dissolved Or Dissolved Or Date of Setting Number of traps set OTE: Cluster contains three apture Cluster Inthod Number D MT 1	traps within an -5 Instriction	FISH COLLE ppm FISH COLLE 01-03-06 3:45 3 meter diameter area ream Cover Sub Percent Dominant ice cover 100 CO	es/Number Captured per (/ 7 SKUC / 1	Date of Colle Time of Coll Number of t	ection raps collected	10:50 3

Site Name (e.g. TOB-1)

19

Via

6.0

100

100

লো 1

100

(

100

14

i

Ì

BUC-7

first three letters of stream name-site number

VISIT # 4

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	СО	100	10.5	AD	T/C
MT	1	1	RB	109	13.2	UM	
MT	1	1	RB	97	10.2	UM	
MT	1	1	CO	77	5	UM	
MT	1	1	СО	112	15.2	R/V	
MT	1	2	СО	91	8.2	UM	
MT	1	2	SUC	78	5.5	UM	
MT	1	3	RB	100	9.8	UM	
MT	1	3	СО	81	5.4	UM	
MT] [1	3	СО	72	4.4	UM	
MT	1	3	СН	76	5.6	UM	
MT	1	3	CO	80	4.7	UM	
MT	1	3	RB	82	5.7	UM	

		SIJ	E VISIE	DESCRIP	TION		
Site Name (e.g. TOB-1)	BUC-	10	aree letters of stream site number			VIS	SIT # 1
(e.g. 106-1)	L	£ · · · · · · · · · · · · · · · · ·			Date of survey 2000-12-06		y Surveyors TJ,TD,JD
Gazetted Stream	n Name	Local Stream Na	me	Watershed Code			
Buck CR. Relea	ise Pond			l			
Weather	Sunny						
Air Tempera	ture 9°	с		Strea	m Flow	L (High, Moderat	e, Limited, None)
ce Cover (%	95		Poter	ntial for fish mi	gration	L (High, Moderat	e, Limited, None)
LIN	INOLOGY	STATION			FISH S	SUMMARY	
Depth from u	upper surface of ice	e (cm) 77		Species	Total # of Fish	Mininimum Length (mm)	Maximum Length (mm)
Ice thickness	(cm)	4		CO	1	94	94
Clarity of Ice (High, Moderate,	e (H,M,L, or N) Limited. None)	N		СН	4	77	86
Snow Depth		0		RB	9	82	112
Wate	er Temperature	1.1	С С			<u> </u>	
Turb	oidity (H,M, L, or C	c) <u>C</u>					
	, Moderate, Low, or Clea ductivity	^{u)} 130					
	olved Oxygen (bot						
	olved Oxygen (bot olved Oxygen (sur		ppm				
		L		TION SUM	MARY	en en de la companya de la companya de la companya de la companya de la companya de la companya de la companya	
Date of Settin		2000-12-06			Date of C	assistention	2000-12-0
Time of Settin	U C	13:50				Collection	10:40
Number of tra		3				of traps collected	3
	tains three traps within		area				· · · · · · · · · · · · · · · · · · ·
Capture Cluste	1	Instream Cover Sub Perc	Species/ N	lumber Captured pe	er Cluster		
Method Numb		nant Dominant ice c		1 CH / 4		9	
			<i>.</i>				
			C01	mments			
pH=8.							
pr1-8.		oen area.					
-	set in a very or						
-	set in a very of						
-	set in a very or	<u></u>					
-	set in a very op						
-	set in a very op						
-	set in a very op						

Site Name (e.g. TOB-1)

۲Ľ -

2

1

(eq

1

1

1

BUC

first three letters of stream name-site number

- 8

VISIT

1

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fish Cluster Trap Species Fork Length **Type of Fin Clip** Capture Clip Weight (g) Method Number Number (mm) (e.g. adipose, upper caudal, none) UM 1 1 RB 112 15.5 MT 1 RB 94 7.7 UM MT ł RB 99 10.1 UM MT 1 1 MT 1 1 CH 79 5 UM CO 94 9.2 UM 1 1 MT 6.4 UM MT 1 1 RB 82 9.7 UM 1 RB 95 1 MT RB 92 7.8 UM 1 1 MT UM 2 CH 77 4.7 MT 1 UM 1 2 RB 80 6.2 MT 2 CH 82 5.4 UM 1 MT UM 1 2 RB 110 13.2 MT 9.7 1 3 RB 96 UM MT 3 СН 86 7.6 UΜ 1 MT

a.g. TOB-1) DCC O mame-site number Date of survey Time of survey Survey 2001-01-09 14:40 T1,TD Date of survey 2001-01-09 14:40 T1,TD Date of survey 2001-01-09 14:40 T1,TD Date of survey 14:40 T1,TD Cock Creck Release Pond Veather Snowing Cock Creck Release Pond O C Stream Flow M (High, Modenze, Limited, None) Potential for fish migration M (High, Modenze, Limited, None) Cock Creck (%) 100 Potential for fish migration M (High, Modenze, Limited, None) Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 28 Cock Creck (%) 29 Cock Creck (%) 29 Cock Creck (%) 20 Cock Creck (%) 29 Cock Creck (%) 20 Cock Cre						SITE	E VIS	I E D	ESC	RIP	FION				
2001-01-09 14:40 TJTD iazetted Stream Name Watershed Code Uck Creek Release Pond weather Snowing ir Temperature 0 ° C e Cover (%) 100 Potential for fish migration M (High, Moderale, Limited, None) e Cover (%) 100 Potential for fish migration M (High, Moderale, Limited, None) Depth from upper surface of ice (cm) 81 Species Total # of Minimum Maximum Ice thickness (cm) 28 CO 6 71 99 Clarity of Lice (H,M,L, or N) N Species Fish Length (mm) Length (mm) (High, Moderate, Limited, None) 25 RB 2 72 89 Water Temperature 0.7 ° C CH 3 69 75 RB 2 72 89 RB 2 72 89 FISH COLLECTION SUMMARY Date of Setting 100:01-09 Date of Collection 11 Dissolved Oxygen (surface) ppm Dissolved oxygen (surface) ppm Dissolved Oxygen (sur	Site Name (e.g. TOB-1)	E	BUC	- 8				am					V	ISIT	# 2
azerted Stream Name Watershed Code uak Creck Release Pond Veather Snowing ir Temperature 0 ° C Stream Flow M (High, Modenue, Limited, None) e Cover (%) 100 Potential for fish migration M (High, Modenue, Limited, None) LIMNOLOGY STATION Fish Ummediate Limited, None) Fish Length (mm) Length (mm) Depth from upper surface of ice (cm) 81 Species Fish Length (mm) Length (mm) Carity of Ice (H,M,L, or N) N RB 2 72 89 Chairty of Ice (H,M,L, or N) N RB 2 72 89 Water Temperature 0.7 ° C RB 2 72 89 Water Temperature 0.7 ° C Cff 3 69 75 RB 2 72 89 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Date of Collection 10 Time of Setting 14:40 Number of traps scollected Number of traps collected <															Surveyor
uck Creck Release Pond Veather Snowing ir Temperature 0 ° C Snowing Operation M ir Temperature 0 ° C e Cover (%) 100 Potential for fish migration M Peterstain for fish migration M (High, Modernae, Limited, None) Depth from upper surface of ice (cm) 81 Species Fish Length (nm) Ice thickness (cm) 28 Total # of Mininimum Maximum Clarity of Ice (H,M,L, or N) N Species Fish Length (nm) Length (nm) Snow Depth (cm) 25 RB 2 72 89 Water Temperature 0.7 ° C C (High, Modernae, Low, or Clew) CO 6 71 99 Conductivity 130 µS N	Constant Stere	n Nar		T ac	al C**** -	m No-		117	atomhad	Code	L 2001-01	-1/7		<u></u>	L1,1D,J
Veather Snowing ir Temperature 0 * C Stream Flow M (High, Moderate, Limited, None) e Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, None) Depth from upper surface of ice (cm) 81 Elimited, None) Fish SUMMARY Depth from upper surface of ice (cm) 81 Species Total # of Mininimum Maximum Ice thickness (cm) 28 Co 6 71 99 Clarity of Ice (H,M.L, or N) N Species Total # of Mininimum Maximum Mater Temperature 0.7 * C Turbidity (H,M, L, or C) C (High, Moderate, Limited, None) Snow Depth (cm) 25 RB 2 72 89 Water Temperature 0.7 * C RB 2 72 89 Water Temperature 0.7 C C Image: Color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color definition for the color defin		-	nd		ai Strea	un name	5		atersned	Code					
ir Temperature 0 ° C Stream Flow M (High, Moderate, Limited, None) e Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, None) ELIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 81 Ice thickness (cm) 28 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) Snow Depth (cm) 25 Water Temperature 0.7 ° C Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Traps set 3 OTE: Cluster contails three traps withils au -5 meter diameter area apture Cluster Mean Sub Percent															
e Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, None) LIMNOLOGY STATION Depth from upper surface of ice (cm) 81 Ice thickness (cm) 28 Charity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) Snow Depth (cm) 25 Water Temperature 0.7 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 14:40 Time of Collection 1 Number of traps set 3 DTE: Cluster contains three traps within au -5 aneer diameter area apture Cluster Mean Sub Percent	Weather	Snow	ing												
FISH SUMMARY Depth from upper surface of ice (cm) 81 Ice thickness (cm) 28 Total # of Mininimum Maximum Ice thickness (cm) 28 5 6 71 99 Clarity of Ice (H,ML, or N) N 10 69 75 Snow Depth (cm) 25 RB 2 72 89 Water Temperature 0.7 C 72 89 Water Temperature 0.7 C 72 89 Ocnductivity 130 45 45 45 Dissolved Oxygen (bottom) 12 ppm ppm 5 Date of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected 1 OTE: Cluster Sub Percent Species/ Number Captured per Cluster	Air Tempera	ature	0	°с						Strea	m Flow	M	(High, Mod	erate, Lim	iited, None)
Depth from upper surface of ice (cm) 81 Ice thickness (cm) 28 Clarity of Ice (H,M,L, or N) N (figh, Moderate, Limited None) N Snow Depth (cm) 25 Water Temperature 0.7 Turbidity (H,M, L, or C) C (figh, Moderate, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Species/ Number Captured per Cluster 1 OTE: Cluster Mean Species/ Number Captured per Cluster	lce Cover (%	b)	100				Р	otenti	al for fi	sh mig	gration	M	(High, Mod	erate, Lim	uited, None)
Ice thickness (cm) 28 Clarity of Ice (H,M,L, or N) N (High, Moderste, Limited, None) N Snow Depth (cm) 25 Water Temperature 0.7 C C (High, Moderste, Low, or Clear) C (High, Moderste, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm EVENT COLLECTION SUMMARY 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 11 Number of traps set 3 Species/ Number Captured per Cluster off: Cluster Mean Species/ Number Captured per Cluster	LR	MNO	LOG	Y ST	ATI	ON		:			FISI	I SU	IMMAR	Y	
Ice thickness (cm) 28 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 25 Water Temperature 0.7 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) CO Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-01-09 Time of Setting 14:40 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent	Depth from	upper su	rface of i	ice (cm)) [81					-			_	
Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 25 Snow Depth (cm) 25 Water Temperature 0.7 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected 1 OTE: Cluster Instream Cover Species/ Number Captured per Cluster Species/ Number Captured per Cluster	Ice thickness	; (cm)			[28					· · · · ·		r) Le	
Snow Depth (cm) 25 Water Temperature 0.7 °C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected 1 OTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster apture Cluster Mean Sub Percent					Γ	Ν									l
Water Temperature 0.7 °C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-01-09 Date of Collection Time of Setting 14:40 Time of Collection Number of traps set 3 Number of traps collected OTE: Cluster contains three traps within sa -5 meter diameter area apture Species/Number Captured per Cluster			None)		Г	25				CH	3		69		75
Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity I30 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-09 Time of Setting 14:40 Time of Collection 11 Number of traps set 3 Number of traps collected 1 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Species/Number Captured per Cluster					L r		°		F	B	2		72		89
(High, Moderate, Low, or Clear) 130 uS Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-09 Time of Setting 14:40 Number of traps set 3 OTE: Cluster contains three traps within su -5 meter diameter area apture Cluster Mean Species/ Number Captured per Cluster		-		0	L L		С		-						
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected 1 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Species/ Number Captured per Cluster					Ĺ										
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected OTE: Cluster contains three traps within su -5 meter diameter area apture Cluster Mean Sub Percent Species/ Number Captured per Cluster	Con	ductivity	/		l	130	uS								
FISH COLLECTION SUMMARY Date of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected 1 OTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster apture Cluster Sub Percent	Diss	olved O	xygen (b	ottom)		12	ppm								
Date of Setting 2001-01-09 Date of Collection 2001 Time of Setting 14:40 Time of Collection 1 Number of traps set 3 Number of traps collected 1 OTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster	Diss	iolved O	xygen (s	urface)]	ppm								
Time of Setting 14:40 Time of Collection Number of traps set 3 Number of traps collected OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Species/ Number Captured per Cluster					I	ISH O	COLL	ECTI	ION S	UMN	AARY				
Time of Setting 14:40 Time of Collection Number of traps set 3 Number of traps collected OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Instream Cover Sub Percent Species/ Number Captured per Cluster	Date of Settin	ng	an seen with	200)1-01-(09					Date of	of Coll	lection		2001-
Number of traps set 3 Number of traps collected OTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster apture Cluster Mean Sub Percent	Time of Setti	ng				=					Time	of Col	lection		11
apture Cluster Mean Sub Percent Species/ Number Captured per Cluster											Numb	er of	traps collecte	d	
apture Cluster Mean Sub Percent	NOTE: Cluster con	tains three	e traps with						1						
	Capture Cluste	· · · ·	_		Sub	Percent		ies/ Num	nder Capt	ured per	Cluster				
MT 1 Denth Dominant Dominant ice cover 100 CO / 6 CH / 3 RB / 2 /	Method Numb		<u>)enth</u> Do	minant	Dominani			/ 6	СН	/ 3	RB	/ 2			
		[i.		L		11								· · ·
								. بر در در میروند و روز اندر		and the state of the	مېرىمى د مېرىم د مەر			and and a	
								Com	nents						
Comments	pH = 7.7	e shiseed i	an san san s		5-4 - 6° (12- 43)	; e1;52(11-4) -44		ee er 10 - 10 473.	and the of the		ene men Brizin		n ngan ta ta gangan ti		
Comments	Pri (.)														
								<u> </u>							
											_				
									4						

Site Name (e.g. TOB-1)

100

100

155

e BUC-8

first three letters of stream name-site number

VISIT #

2

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fish **Type of Fin Clip** Trap Species Fork Length Capture Cluster Weight (g) Clip Number (mm) Method Number (e.g. adipose, upper caudal, none) 1 CO 99 12.4 AD MT 1 UM MT 1 CH 69 4.2 1 1 со 75 5.1 UM MT 1 UM 2 CO 71 5 1 MT UM 75 5.8 MT 1 2 CO UM 2 RB 72 5.1 1 MT UM со 71 4.7 MT I 2 89 UM 1 2 RB 9.4 MT 75 5.3 UM 1 3 CH MT 3 со 85 7.4 UM 1 MT 7.4 UM 3 СН 85 MT 1

	*			SITE	VISIT	DESC	RIP	TION				
Site Name (e.g. TOB-1)	B	UC-	8	first three lett name-site nur						VIS	IT #	ŧ 3
			L					Date of sur 2001-02		Time of surve		Surveyors TJ,TD,JD
Gazetted Stream	n Nama		Local St	ream Name		Watershed	Code			14.00		10,120,020
Buck Creek Rei							Couc				-	
Weather	Sunny		-			<u> </u>			<u> </u>			
Air Tempera	ature [<u>-8</u> °	С				Strea	m Flow	M] (High, Moderate	, Limite	ed, None)
ice Cover (%	6)	100			Pote	ntial for f	ish mi	gration	Μ	(High, Moderate	. Limite	ed, None)
LN	MNOL	OGY	STAI	TION				FISE	I SU	MMARY	SAN Areas Sana	
Depth from	upper surf	ace of ice	(cm)	63				Total # o		Mininimum		iximum
Ice thickness	s (cm)			8			ecies	Fish	I	Length (mm)	Lenį	gth (mm)
Clarity of Ice (High, Moderate,	Limited, No			N			CO CH	1 2		76 70		76 78
Snow Depth				36	_		RB	8		62		86
	er Temper Didity (H,N)	0.5 C	С							
(High	, Moderate, I ductivity			320 <i>u</i>	s							
Diss	olved Oxy	/gen (bott	om)	11 p	pm							
	olved Oxy				pm			<u>-</u>			. ,	
	8737			FISH C		TION	IIM	AARY				
Date of Settin			2001-0	an an an an tha an thair an an tha an tha an thair an thair an thair an thair an thair an thair an thair an thai	فی ہ اپنے اپنے اپنے ج ی			eren and eren said	of Colle	ution	i e la	2001-02-07
Time of Setti	-		14:3						of Colle			10:50
Number of tr	-		3							raps collected		3
NOTE: Cluster con		raps within :	L	r diameter area			•			-		
Capture Cluste Method Numb	I Me		Instream Sui	o Percent	Species/ 1	Number Cap	tured pe	r Cluster	_			
MT 1	<u>ׂ</u> ןׂ ב			100	<u> </u>	1 CH]/ 2	RB	/ 87		1	
			and the second second second second second second second second second second second second second second second	••••••≈••					1			
					Co	mments						
pH = 8.1												
Feb. 7/01 Te	mp = -10	5.										
Sucker not sa	ampled.			<u></u>								
					- 4 <u>.</u>				.			
								<u> </u>				

Site Name (e.g. TOB-1)

1

(in

BUC-8

first three letters of stream name-site number

VISIT # 3

الله الماري المحالية <u>من المحالة المحالية المحالية المحالية المحالة المحالة المحالة المحالة المحالة المحالة الم</u> المرابعة علي المحالية المحالية المحالية المحالية المحالية المحالية المحالية المحالية المحالية المحالية المحالية ا

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fork Length Fish Type of Fin Clip Trap Species Capture Cluster Clip Number Number (mm) Weight (g) Method (e.g. adipose, upper caudal, none) CH 78 5.7 UM 1 1 MT RB 81 6.8 UM MT 1 1 3.7 UM 1 1 RB 62 MT 1 RB 86 9 UM MT 1 2 UM CH 70 4.4 1 MT 1 3 CO 76 6.4 UM MT RB 81 7 UM 3 MT 1 9 UM 3 RB 82 MT 1 5.5 UM 1 3 RB 74 MT 3 RB 85 UM 1 8.6 MT 3 72 5.5 UM 1 RB MT SUC MT 1 3

Site Name (e.g. TOB-1) BUC	= 8 first three letters of stream	VISIT # 4
		Date of survey Time of survey Surveyors
		2001-03-06 13:39 TJ,TD,JD
Gazetted Stream Name Bukck Creek Release Pond	Local Stream Name	Watershed Code
Weather High overcast	t part sun	
Air Temperature 2	°C	Stream Flow M (High, Moderate, Limited, None)
ce Cover (%) 100	Potent	tial for fish migration L (High, Moderate, Limited, None)
LIMNOLOGY	(STATION	FISH SUMMARY
Depth from upper surface of ic	ce (cm) 65	Total # of Mininimum Maximum
Ice thickness (cm)	5	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or N)	Ν	CO 2 80 102
(High, Moderate, Limited, None) Snow Depth (cm)	14	CH 3 74 81
Water Temperature	0.7 ° C	RB 1 89 89
Turbidity (H,M, L, or		
(High, Moderate, Low, or Clo Conductivity		
Conductivity	uS	
Conductivity Dissolved Oxygen (bo	pttom) 12 ppm	
Conductivity	ottom) 12 ppm rface) ppm	NON SUMMADY
Conductivity Dissolved Oxygen (bo Dissolved Oxygen (su	uS pttom) 12 ppm rface) ppm FISH COLLECT	FION SUMMARY
Conductivity Dissolved Oxygen (bo Dissolved Oxygen (su Date of Setting	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06	Date of Collection 2001-03-
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39	enten en la referenzionen enten enten entre entre entre della entre internet entre entre entre enten enten entre Internet
Conductivity Dissolved Oxygen (bo Dissolved Oxygen (su Date of Setting	uS putom) <u>12</u> ppm ppm FISH COLLECT 2001-03-06 13:39 3 in an -5 meter diameter area	Date of Collection2001-03-Time of Collection10:41Number of traps collected3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in an -5 meter diameter area Instream Cover Sub Percent Species/ Nu	Date of Collection2001-03-Time of Collection10:41
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover	Date of Collection2001-03-Time of Collection10:41Number of traps collected3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Denth Dom	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Denth Dom	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Denth Dom	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Denth Dom	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in au -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withi Capture Cluster Method Number Mean Denth Dom MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Denth Dom	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bu Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withit Capture Cluster Mean Denth Dorr MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bu Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withit Capture Cluster Method Number MT 1 Mean Denth Dorr MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bu Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withit Capture Cluster Mean Denth Dorr MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bc Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withit Capture Cluster Method Number Mean Denth Dorr MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bu Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withit Capture Cluster Method Number MT 1 Mean Denth Dorr MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3
Conductivity Dissolved Oxygen (bu Dissolved Oxygen (su Date of Setting Time of Setting Number of traps set NOTE: Cluster contains three traps withit Capture Cluster Method Number MT 1 Mean Denth Dorr MT 1	uS pttom) 12 ppm rface) ppm FISH COLLECT 2001-03-06 13:39 3 in aa -5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover 100 CO / 2	Date of Collection 2001-03- Time of Collection 10:41 Number of traps collected 3

Site Name (e.g. TOB-1)

000

(in

100

in co Spin

Cas

Ű

Ú.

BUC-8

first three letters of stream name-site number

VISIT # 4

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1	1	СН	74	4.4	UM	
MT	1	1	СН	81	5.3	UM	
MT] 1	2	NFC				
MT] 1	3	СО	102	10.8	AD	
MT	1	3	СО	80	6.1	UM	
MT	1	3	СН	74	4.8	UM	

Gazetted Stream Name Local Stream Name Watershed Code Byman Creek	Site Name BYM (e.g. TOB-1)	I = 1 first three letters of stream name-site number	VISIT # 1 Date of survey Time of survey Surveyors
Byran Ceek Weather High overcast. Rain on pick-up day. Air Temperature 4 ° C Stream Flow M (High.Modena.Limital.None) Lee Cover (%) 80 Potential for fish migration H (High.Modena.Limital.None) Lee Cover (%) 80 Potential for fish migration H (High.Modena.Limital.None) Lee Cover (%) 80 Peth from uper surface of ice (cm) 90 Ice Kickness (cm) 5 Clarity of ice (H.M.L. or N) N (figh.Modena.Limital.None) 0.3 ° C Turbidity (H.M.L. or C) C (figh.Modena.Limital None) 90 u/S Dissolved Oxygen (butom) 12 ppm Dissolved Oxygen (butom) 12 ppm Dissolved Oxygen (butom) 12 ppm Dissolved Oxygen (put of a damater are and three traps collected 6 NOTE: Cuere cataliat three traps wriths as -5 meet damater are and three traps collected 6 Note: Cuere catalia three traps minutal cover Speciet/Number Capture Cluster Method Number Man Document Prime Speciet/Number Capture damater are andamater are and three traps not culteret three t			
Weather High overcast. Rain on pick-up day. Air Temperature 4 ' c Stream Flow M (High. Modena, Limited. None) Lee Cover (%) 80 Potential for fish migration H (High. Modena, Limited. None) LIMINOLOCY STATION Fish Depth from upper surface of ice (cm) 90 ice thickness (cm) 5 Clarity of Ice (H.M.L, or N) N High. Modena, Limited. None) 0 Snow Depth (cm) 0 Water Temperature 0.3 ' C Turbidity (H.M. L, or C) C (Bigb. Modena, Line, or Cheer) 0 Water Temperature 0.3 ' C Turbidity (H.M. L, or C) C (Bigb. Modena, Line, or Cheer) 0 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (butther enter the set of the coll has is Percered Method Man Basteam Cover Species/ Number Of traps collected 6 Norther Classer Man Basteam Cover Species/ Number Captured per Cluster Man Basteam Co	Gazetted Stream Name	Local Stream Name	Watershed Code
Rain on pick-up day. Air Temperature 4 C Stream Flow M (High, Moderes, Limited, News) ce Cover (%) 80 Potential for fish migration H (High, Moderes, Limited, News) LIMNOLOGY STATION Fish Use (High, Moderes, Limited, News) Maximum Depth from upper surface of ice (cm) 90 Second of the fish migration H Minimum Maximum Lethickness (cm) 5 RB 5 76 126 Charly of loc (H,M,L, or N) 0 N RB 5 76 126 Water Temperature 0.3 * C C Turbidity (H,M, L, or C) CC Gupta Koderes, Low or Clee) 126 Oute of Setting 2000-12-05 Date of Collection 2000-12 Time of Setting 14:50 Date of Collection 10:33 Number of traps set 6 Number Captured per Cluster 6 Contracts 5 Percent Species/ Number Captured per Cluster Species/ Number of traps collected 6 Number of traps collected 6 Ottic custer coust them traps themeter arem	Byman Creek		
If the perturbed is a set of the pool has iced over. Potential for fish migration If (figs. Moderne. Limited, Norre) Depth from upper surface of ice (cm) 90 Set of Collection Fish Depth from upper surface of ice (cm) 90 Set of Collection Langth (rmm) Maximum Ice thickness (cm) 5 Total # of Minimum Maximum Length (rmm) Length (rmm			
FIGH SUMMARY Depth from upper surface of ice (cm) 90 Solution of the pool has iced over. State State dataset area Control of Collection Game of the pool has iced over. With rest of the pool has iced over. Vertice of the pool has iced over. Vertice of the pool has iced over. Vertice of the pool has iced over. Vertice of the pool has iced over. Vertice of the pool has iced over. Vertice of the pool has iced over.	Air Temperature 4]° c	Stream Flow M (High, Moderate, Limited, None)
Depth from upper surface of ice (cm) 90 Ice thickness (cm) 5 Clarity of ice (H,M,L, or N) N (figh, Means, Limited, News) 0 Snow Depth (cm) 0 Water Temperature 0.3 Conductivity 90 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-05 Date of Collection Time of Setting 14:50 Time of Collection Normber of traps set 6 Number of traps collected Main Date of Setting Species/ Number Captured per Cluster Method Number Main Species/ Number Captured per Cluster Main Bister Receiver Species/ Number Captured per Cluster Main Site Species/ Number Captured per Cluster Species/ Number Captured per Cluster Main Bist Species/ Number Captured per Cluster Species/ Number Captured per Cluster Main Bist Species/ Number Captured per Cluster Species/ Number Captured per Cluster Main Comments: 2	ce Cover (%) 80	Poter	ntial for fish migration H (High, Moderate, Limited, None)
Depth from upper surface of ce (cill) 90 Ice thickness (cm) 5 Clarity of fice (H.M.L., or N) N (figh, Modera, Limitat, Nono) 0 Soow Depth (cm) 0 Water Temperature 0.3 Conductivity 90 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (surface) ppm Bissolved Oxygen (surface) ppm Vinte of Setting 12:00-12:05 Time of Setting 14:50 Number of traps set 6 Nort:: Cluster contains three traps within as -5 ander diameter area Capture Cluster Maa Main Deminant Deminant Pominant Method Number of traps collected Method Number Deminant Pominant So Present Method Number Deminant Pominant So Pominant So Pominant So Pominant <tr< td=""><td>LIMNOLOC</td><td>FY STATION</td><td>FISH SUMMARY</td></tr<>	LIMNOLOC	FY STATION	FISH SUMMARY
Ice thickness (cm) 5 Clarity of Ice (H,M,L, or N) N Righ, Modens, Linea, Nono) 0 Snow Depth (cm) 0 Water Temperature 0.3 Conductivity 90 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Plate of Setting 2000-12-05 Date of Collection Time of Setting 14:50 Time of Collection Number of traps set 6 Number of traps collected NoTE: Cluster contains three traps within as -5 meter diameter area Species/ Number Captured per Cluster Mean Set of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. MT 1 80 Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. H=7.0 The water temperature meter might be off.	Denth from under surface of	of ice (cm) 90	10tal # 01 Williaminan
Clarity of Ice (H,M,L, or N) N (Tigh, Motama, Linned, None) 0 Snow Depth (cm) 0 Water Temperature 0.3 Turbidity (H,M, L, or C) C (High, Modema, Linned, None) 0 Snow Depth (cm) 0 Water Temperature 0.3 Conductivity 90 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 14:50 Number of traps set 6 Nott:: Claster costalias three traps within as -5 meter diameter traps Method Number Instream Cover Method Number Mean Demin Dominant Versent Nott:: Mean Method Number Prenent Network RB Straps in boulder cluster area, 1 trap in slower flowing rip rap area. Straps in boulder cluster area, 1 trap in slower flowing rip rap area.	-		
(Hgb, Modense, Limited, Nona) Snow Depth (cm) 0 Water Temperature 0.3 C Turbidity (H,M, L, or C) (Hgb, Modense, Low, or Clear) Conductivity 90 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-05 Time of Setting 14:50 Number of traps set 6 Nother Cluster Instream Cover Species/ Number Captured per Cluster Species/ Number Captured per Cluster Method Number Mean Dentiam Dominam North: B0 RB 5 Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. Straps in boulder cluster area, 1 trap in slower flowing rip rap area. Straps in boulder cluster area, 1 trap in slower flowing rip rap area.			RB 5 76 126
Water Temperature 0.3 C Turbidity (H,M, L, or C) C C (High, Modens, Low, or Clean) 0 u/S Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-05 Date of Collection Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 Notr: Claster contails three traps within an -5 discret diameter area Species/ Number Captured per Cluster 6 More Cluster Man Descontered for the pool has iced over. Water response 8 MT 1 1 1 1 1 1 Straps in boulder cluster area, 1 trap in slower flowing rip rap area. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area.	(High, Moderate, Limited, None)		
Turbidity (H,M, L, or C) (High, Moderna, Low, or Clear) Conductivity 90 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Date of Setting 2000-12-05 Date of Collection 2000-12. Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Cluster Maan Dominant Dominant Second Species/ Number Captured per Cluster Method Number Dentional Dominant Dominant Second RB / 5 ////////////////////////////////////			
(figh, Moderae, Low, or Clear) 90 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-05 Date of Collection 2000-12. Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 NOTE: Cluster coulds three traps within an -5 meter diameter area Species/ Number Captured per Cluster 6 Moter Mean Sub Percent Species/ Number Captured per Cluster 1 Method Number Mean Instream Cover Species/ Number Captured per Cluster 4 Method Number Mean Sub Percent RB / 5 1 1 1 Percent Mean Sub Percent Species/ Number Captured per Cluster 4 4 MT 1 Percent 80 RB / 5 1 1 1 Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 5 1 1 <t< td=""><td>•</td><td></td><td></td></t<>	•		
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-05 Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps withis as -5 meter diameter area Species/ Number Captured per Cluster 6 Note: Instream Cover Species/ Number Captured per Cluster 6 Method Number Dention Dominant Dominant Species/ Number Captured per Cluster Mthod Number Mean Bottominant RB / 5 ////////////////////////////////////	(High, Moderate, Low, o	or Clear)	
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2000-12-05 Time of Setting 14:50 Number of traps set 6 Number of traps set 6 NorTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Cluster Mean Method Number Denth Deminant MT 1 Sub Percent MT 1 B0 RB Sub Percent MT 1 Sub Percent MT 1 B0 RB Sub Percent Staps in boulder cluster area, 1 trap in slower flowing rip rap area. Sub raps in boulder cluster area, 1 trap in slower flowing rip rap area. Sub raps in boulder cluster area, 1 trap in slower flowing rip rap area.	-		
FISH COLLECTION SUMMARY Date of Setting 2000-12-05 Date of Collection 2000-12. Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contails three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster Method Number Mean Dominant Pointing 80 RB / 5 ////////////////////////////////////			
Date of Setting 2000-12-05 Date of Collection 2000-12-05 Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 6 Capture Cluster Instream Cover Sub Percent Species/ Number Captured per Cluster 1 Method Number Deminant Dominant RB / 5 1 1 MT 1 80 RB / 5 1 1 1 Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. MH-7 0 The water temperature meter might be off. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area.	Dipportaen OxARen		TION SUMMARY
Time of Setting 14:50 Time of Collection 10:35 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within au -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Capture Cluster Mean Instream Cover Species/ Number Captured per Cluster 10:35 Method Number Instream Cover Species/ Number Captured per Cluster 10:35 MT 1 Instream Cover Species/ Number Captured per Cluster 10:35 MT 1 Instream Cover Species/ Number Captured per Cluster 10:35 MT 1 Instream Cover RB / 5 10:10:10:10:10:10:10:10:10:10:10:10:10:1			
Number of traps set 6 Number of traps collected 6 NOTE: Cluster contails three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster Method Number Dominant Dominant Dominant RB / 5 / / / / / / / / / / / / / / / / / / /			
NOTE: Cluster contains three traps within as -5 meter diameter area Capture Cluster Instream Cover Sub Percent Method Number Dominant Denth Dominant WT 1 Image: Sub Percent RB 5 MT 1 Image: Sub Percent RB 5 Image: Sub Sub RB 5 Image: Sub Sub RB 5 Plunge: area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. Straps in boulder cluster area, 1 trap in slower flowing rip rap area. PH=7.0 The water temperature meter might be off.	THE OF Setting		Number of traps collected 6
Capture Cluster Mean Sub Percent Method Number Dominant Dominant Tecover MT 1 1 80 RB 5 1 1 1 MT 1 80 RB 5 1 1 1 1 Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 S traps in boulder cluster area, 1 trap in slower flowing rip rap area. PH=7.0 The water temperature meter might be off.	Number of traps set	within an \sim 5 meter diameter area	Number Cantured ner Cluster
MT 1 80 RB 5			raminer captured per cruster
Comments Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. pH=7.9 The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean	Instream Cover Species/	
Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. pH=7.9. The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	Instream Cover Species/	
Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. pH=7.9. The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	Instream Cover Species/	
Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. pH=7.9 The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	Instream Cover Species/	
Plunge area is open but the rest of the pool has iced over. Water is plunging about 8 inches from stream to culvert bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. H=7.9 The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	Instream Cover Species/	
bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. pH=7.9. The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	Instream Cover Species/	
bottom. 5 traps in boulder cluster area, 1 trap in slower flowing rip rap area. pH=7.9. The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth MT 1	Instream Cover Sub Percent Dominant Dominant ice cover 80 RB/	5 / / / / / / / / / / / / / / / / / / /
$_{\rm pH-7.0}$ The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth MT 1	Instream Cover Sub Percent Dominant Dominant ice cover 80 RB/	5 / / / / / / / / / / / / / / / / / / /
mH-70 The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth MT 1	Instream Cover Sub Percent Dominant Dominant ice cover 80 RB/	5 / / / / / / / / / / / / / / / / / / /
$_{\rm H}$ = 7.9 The water temperature meter might be off.	NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth MT 1	Instream Cover Sub Percent Dominant Dominant ice cover 80 RB/	5 / / / / / / / / / / / / / / / / / / /
	NOTE: Cluster contains three traps Capture Cluster Mean Denth MT 1	Instream Cover Sub Percent Dominant Dominant ice cover 80 RB/ Co the rest of the pool has iced over er area, 1 trap in slower flowing r	5 / / / / / / / / / / / / / / / / / / /

SITE VISIT DESCRIPTION

Site Name (e.g. TOB-1)

[]

1

1

0.0

 $\overline{}$ İ.

1

BYM

1

-

first three letters of stream name-site number

VISIT #

 1

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fish Fork Length Type of Fin Clip Capture Trap Species Cluster Clip Weight (g) Number (mm) Method Number (e.g. adipose, upper caudal, none) 79 6.2 UM RB MT 1 1 UM RB 84 7.1 MT 1 1 UM 76 5 1 RB 1 MT 20.9 UM 4 RB 126 1 MT UM 8.5 102 MT 1 5 RB

Air Temperat (ce Cover (%)	Sunny and clea	Local Stream N	ame W	atershed Code	Date of survey 2001-01-08		y Surveyors TJ,TD,JD
Byman Creek Weather	Sunny and clea	ır	ame W	atershed Code			
Weather	ure <u>-5</u> °					· · · · · · · · · · · · · · · · · · ·	
Air Temperat (ce Cover (%)	ure <u>-5</u> °						
ice Cover (%)		С					
		•		Stream	n Flow	H (High, Moderate	, Limited, None)
	75		Potenti	al for fish mig	ration 🗌	M (High, Moderate	, Limited, None)
LIM	NOLOGY	STATION			FISH S	SUMMARY	
•	oper surface of ice			Species	Total # of Fish	Mininimum Length (mm)	Maximum Length (mm)
Ice thickness (cm)	26		СО	1	52	52
Clarity of Ice ((High, Moderate, L		N		RB	14	44	118
Snow Depth (29					
	Temperature lity (H,M, L, or C	$() \qquad \boxed{\frac{1}{C}}$	C				
(High, M	Aoderate, Low, or Clear activity	r) [10) uS				
Dissol	lved Oxygen (bott	tom) 12	ppm				
	lved Oxygen (surf		ppm				
			I COLLECT	ION SUMM	IARY		
Date of Setting	5	2001-01-08			Date of C	collection	2001-01
Time of Setting	g	11:50			Time of C	Collection	11:2
Number of tra	ps set	6			Number	of traps collected	6
NOTE: Cluster conta Capture Cluster	T -	Instream Cover		nber Captured per	Cluster		
Method Number		ant Dominant ice	cover	RB / 6			
MT 2			75 CO / 1 75 RB / 8				

Site Name (e.g. TOB-1)

1 = 2

6.00

in a

BYM-1

first three letters of stream name-site number

VISIT #

2

PHOTO DOCUMENTATION

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	72	4.6	UM	
MT	1	1	RB	96	11.8	UM	
MT	1	1	RB	71	4.7	UM	
MT	1	1	RB	81	7.9	UM	
MT	1	2	RB	44	1.1	UM	
MT	1	2	RB	78	6.4	UM	
MT	1	3	CO	52	2.2	UM	
MT	2	1	RB	89	10.6	UM	
MT	2	1	RB	78	5.4	UM	
MT	2	2	RB	72	5.3	UM	
MT	2	2	RB	61	3.4	UM	
MT	2	2	RB	66	4.8	UM	
MT	2	3	RB	118	18.4	UM	
MT	2	3	RB	116	20	UM	
MT	2	3	RB	77	5.6	UM	

Site Name (e.g. TOB-1)	BYM	[]- []	first three letters of stre- name-site number	am			VIS	SIT # 3
	L					e of survey 001-02-05	Time of surve	ey Surveyors TJ,TD,JD
Gazetted Stream	n Name	Local Str	ream Name	Watershe	d Code			
Iyman Creek								
/eather	High overca	ast.						
Air Tempera	ature -10]°c			Stream F	low I	(High, Moderat	e, Limited, None)
ce Cover (%	6) 50		P	otential for	fish migrat	ion 🚺	(High, Moderat	e, Limited, None)
L.	MNOLOG	IY STAT	ION			FISH S	UMMARY	
Depth from	upper surface of	fice (cm)	72			otal # of	Mininimum	Maximum
Ice thickness	s (cm)		5		pecies	Fish 6	Length (mm)	Length (mm)
-	e (H,M,L, or N))	H			0	0	0
(High, Moderate, Snow Depth	e, Limited, None) 1 (CM)		0		LNC			
	ter Temperature		0.4 ° C					
	bidity (H,M, L,		<u> </u>					
(High	h, Moderate, Low, or iductivity		40 <i>uS</i>					
	solved Oxygen	(bottom)						
	solved Oxygen		ppm ppm					
	Solved Oxygen		FISH COLL	FCTION	SUMMA	DV		رای از این این این و در این و مردم این آنگری از مراکز این ایکریک این ا
		2001.0			Senter	Date of C	dilection	2001-02-
Date of Settin		2001-0				Time of C		10:50
Number of t		6	<u> </u>			Number o	of traps collected	6
	ntains three traps w		diameter area					
Capture Clust	a tateati	Instream Sut		ies/ Number Ca	ptured per Clu	ister		
Method Num		Dominant Domi	nant ice cover	/ 5				
MT 2			50 RB		C/1			
				Comment	S			
pH = 8.4								
pH = 8.4								
pH = 8.4 Longnose ch	hub not samp	oled.						
pH = 8.4		oled.						
pH = 8.4 Longnose ch		bled.						
pH = 8.4 Longnose ch		oled.						

		SITE VISIT DESCRIPTI	on	
Site Name (e.g. TOB-1)	BYM- [1	first three letters of stream name-site number	VISIT #	3
1. - A. W. 1997 - M. M. 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - A. W. 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997		PHOTO DOCUMENTATIO	N .	
Roll Name	Frame Numb	per Photo Description		
OW3	16	Site view looking upstream, limno visible.		

INDIVIDUAL FISH DATA

í,

710

33) ())

3

(iii)

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] [1	RB	70	4.5	UM	
MT	1	1	RB	61	3.5	UM	
MT] _ 1	1	RB	78	6.9	UM	
MT	1	2	RB	98	12	UM	
MT	1	2	RB	130	28.2	UM	
MT] 1	3	NFC				
MT	2] [1	NFC				
MT	2	2	NFC				
MT	2	3	LNC				
MT	2	3	RB	81	8	UM	

Date of survey Time of survey Surveyors Gazetted Stream Name Local Stream Name Watershed Code Bayman Creek Sunny and clear Minimum Mifigh Modeme, Limited Name) Air Temperature _7 C Stream Flow Mifigh Modeme, Limited Name) Air Temperature _7 C Stream Flow Mifigh Modeme, Limited Name) Air Temperature _7 C Stream Flow Mifigh Modeme, Limited Name) Ce Cover (%) 70 Potential for fish migration Mifigh Modeme, Limited Name) Depth from upper suffice of ice (cm) 60 Image Name) Ength (mm) Ce thickness (cm) 15 N N Ength (mm) Length (mm) Sow Depth (cm) 4 Species Fish Length (mm) Length (mm) Water Temperature 1 C C Time of Collection 2001-03-05 Dissolved Oxygen (surface) pm pm Dissolved Oxygen (surface) pm Number of traps set 6 Species/ Number Captured per Cluster Species/ Number Captured per Cluster Number of traps set 6 Neveret	Date of survey Time of survey Surveyors 2001-03-05 11:00 T,TD,JD zetted Stream Name Vatershed Code man Creek Sunny and clear r Temperature -7 C Stream Flow M (High, Moderse, Limited, Now) cover (%) 70 Potential for fish migration M Depth from upper surface of ice (cm) 60 Species Fish Longth (mm) Let dickness (cm) 15 N RB 6 9 131 Giph Motens, Limited, News Species Fish Longth (mm) Longth (mm) Mater Temperature 1 C Total # of Mininimum Maximum Migh, Modens, Limited, News 3 49 131 131 Water Temperature 1 C Total # of Mininimum Maximum Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (sottom) 12 ppm Dissolved Oxygen (sottom) 12 ppm Dissolved Collection 11:10 Number of traps set 6 Time of Setting Now fore	ite Name e.g. TOB-1)	BYM-	first three letters of stransme-site number	eam VISIT # 4
Gazetted Stream Name Local Stream Name Watershed Code Byman Creek	zected Stream Name Local Stream Name Watershed Code man Creek	e.g. 100 1/	L	L	
Byman Creck Weather Sumny and clear Air Temperature -7 -7 C Stream Flow M (ftigh, Moderna, Limited, New) Ice Cover (%) 70 Potential for fish migration M (ftigh, Moderna, Limited, New) LIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (cm) 60 Ice thickness (cm) 15 Chirty of Ice (H.M.L. or N) N (ftigh, Moderna, Limited, New) A9 Sow Depth (cm) 4 Water Temperature 1 Turbidity (H,M, L, or C) C (ftigh, Moderna, Limited, New) aS Dissolved Oxygen (bottom) 12 pm ppm Dissolved Oxygen (surface) ppm Date of Setting 11:00 Number of traps set 6 NOTE: Classer costals thre traps within as - disser dimeter traps collection 11:10 Number of traps collected 6 NOTE: Classer costals thre traps within as - dimeter traps collected traps collected Min 1 70 <th>man Creek eather Sunny and clear r Temperature 7 C Stream Flow M (fligh, Modenee, Limited, Nore) Potential for fish migration M (fligh, Modenee, Limited, Nore) LIMNOLOGY STATION Lethickness (cm) IS Clarity of Ice (H,M,L, or N) (fligh, Modenee, Low, of Clee) Conductivity Mater Temperature 1 C Turbidity (H,M, L, or C) (fligh, Modenee, Low, of Clee) Conductivity Dissolved Oxygen (bottom) I2 ppm Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Stream Flow EFSH COLLECTION SUMMARY Det of Setting 2001-03-05 Time of Setting 11:00 Number of traps set 6</th> <th>fazetted Stream</th> <th>n Name</th> <th>Local Stream Name</th> <th></th>	man Creek eather Sunny and clear r Temperature 7 C Stream Flow M (fligh, Modenee, Limited, Nore) Potential for fish migration M (fligh, Modenee, Limited, Nore) LIMNOLOGY STATION Lethickness (cm) IS Clarity of Ice (H,M,L, or N) (fligh, Modenee, Low, of Clee) Conductivity Mater Temperature 1 C Turbidity (H,M, L, or C) (fligh, Modenee, Low, of Clee) Conductivity Dissolved Oxygen (bottom) I2 ppm Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Stream Flow EFSH COLLECTION SUMMARY Det of Setting 2001-03-05 Time of Setting 11:00 Number of traps set 6	fazetted Stream	n Name	Local Stream Name	
Air Temperature -7 C Stream Flow M (High Modenne, Limited, Now) Air Temperature 70 Potential for fish migration M (High Modenne, Limited, Now) Depth from upper surface of ice (cm) 60 FISH SUMMARY Det tokness (cm) 15 Total # of Minimum Maximum Charty of ice (HiALL, or N) N N B 49 131 Other Temperature 1 C Turbidity (H,M, L, or C) C G (High Modenne, Limited, Nowo) 35 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (bottom) 12 ppm Date of Collection 2001-03-06 Time of Setting 2001-03-05 Time of Collection 11:10 Norther Otraps set 6 Number of traps collected 6 NOTE: Claster contains three traps of this as - 5 entert duatter area Species Number Captured per Cluster 6 Mit 1 70 70 NFC 9 11:10 Number of traps set 6 NefC 11:10 11:10 Number of traps set 8 9 11:10 <	r Temperature 7 ° C Stream Flow M (High, Moderner, Limited, Nore) 2 Cover (%) 70 Potential for fish migration M (High, Moderner, Limited, Nore) 2 Depth from upper surface of ice (cm) 60 FISH SUMMARY Depth from upper surface of ice (cm) 60 Second Stream (Maximum Length (mm)) 1 Ce thickness (cm) 15 Second Stream (Maximum Length (mm)) 13 Second Stream (Maximum Length (mm)) 13 Second Stream (Maximum Length (mm)) 13 Second Stream (Maximum Length (mm)) 13 Second Stream (Maximum Length (mm)) 12 ppm 1 Dissolved Oxygen (bottom) 12 ppm 1 Dissolved Oxygen (surface) ppm 2 Dissolved Oxygen (surface) ppm 2 Dissolved Oxygen (surface) ppm 2 Dissolved Oxygen (surface) ppm 2 Dissolved Oxygen (surface) ppm 2 Dissolved Oxygen (Surface) Secies Number Captured per Cluster the Instream Cover Secies Number				
ce Cover (%) 70 Potential for fish migration M (High, Moderne, Limited, Nore) ELIMNOLOCY STATION Depth from upper surface of ice (cm) 60 ice thickness (cm) 15 Clarity of Ice (H,ML, or N) N (High, Moderne, Limited, Nore) 8 49 Snow Depth (cm) 4 9 Water Temperature 1 C Turbidity (H,M, L, or C) C 9 (High, Moderne, Low, or Clear) 0 9 Dissolved Oxygen (bottom) 12 9 ppm 9 10 2001-03-05 Time of Setting 100 100 11:10 Number of traps set 6 Number of traps collected 6 NOT: Clare cocluste three traps within as -5 meter and teaster area Species/ Number Captured per Cluster Method Number Instream Cover Species/ Number Captured per Cluster Method Number Men 70 NFC MT 70 NFC 1 1 Method Number 70 NFC 1 1 Method Number 70 <t< th=""><th>ex Cover (%) 70 Potential for fish migration (M) (High, Moderate, Limited, Nore) ELIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (cm) 60 Ice thickness (cm) 15 Clarity of ice (H.M.L, or N) (figh, Moderat, Lory of Clarity Snow Depth (cm) 4 Water Temperature 1 C Turbidity (H,M, L, or C) (figh, Moderat, Low, or Clare) Conductivity 4 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Fine of Setting 10:00 Number of traps set 6 Patter of collection 11:10 Number of traps set 6 Fish 2001-03-05 Fish 2001-03-05 Fish 2001-03-05 Fish Collection 11:10 Number of traps collected 6 Number of traps collected 1 Man 1 Total # of Minimum M Maximum Length (mm) Length (mm) ISB 10:00 Solution 1 Species 7 Species 7</th><th>Veather</th><th>Sunny and cle</th><th>ar</th><th></th></t<>	ex Cover (%) 70 Potential for fish migration (M) (High, Moderate, Limited, Nore) ELIMNOLOCY STATION FISH SUMMARY Depth from upper surface of ice (cm) 60 Ice thickness (cm) 15 Clarity of ice (H.M.L, or N) (figh, Moderat, Lory of Clarity Snow Depth (cm) 4 Water Temperature 1 C Turbidity (H,M, L, or C) (figh, Moderat, Low, or Clare) Conductivity 4 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Fine of Setting 10:00 Number of traps set 6 Patter of collection 11:10 Number of traps set 6 Fish 2001-03-05 Fish 2001-03-05 Fish 2001-03-05 Fish Collection 11:10 Number of traps collected 6 Number of traps collected 1 Man 1 Total # of Minimum M Maximum Length (mm) Length (mm) ISB 10:00 Solution 1 Species 7 Species 7	Veather	Sunny and cle	ar	
Limnolocy station Fish Summary Depth from upper surface of ice (cm) 60 Ice thickness (cm) 15 Clarity of Ice (H,ML, or N) N (High, Modena, Limad, Nere) 4 Snow Depth (cm) 4 Water Temperature 1 C C Turbidity (H,M, L, or C) C (High, Modena, Low, or Clear) uS Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (buttom) 12 ppm ppm Date of Setting 2001-03-05 Time of Setting 11:00 Number of traps set Species/ Number Captured per Cluster Method Number Instream Cover Method Number Peret Nethod	Purph from upper surface of ice (cm) 60 Ice thickness (cm) 15 Clarity of Ice (H,M,L, or N) N (figh, Moderata, Limited, None) 4 Snow Depth (cm) 4 Water Temperature 1 C C Jurbidity (H,M, L, or C) C (figh, Moderata, Lumited, None) 3 Snow Depth (cm) 4 Water Temperature 1 C C Jurbidity (H,M, L, or C) C (figh, Moderata, Low, or Clear) 2 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) fill the s-5 areter diameter area prize Cluster Instrum Cover prize Cluster Instrum Cover MT 1 70 INFC 1 1	ir Temper	ature -7	Ċ	Stream Flow M (High, Moderate, Limited, None)
Depth from upper surface of ice (cm) 60 Ice thickness (cm) 15 Clarity of Ice (H,M,L, or N) N (fligh, Moderae, Limited, Nono) 4 Snow Depth (cm) 4 Water Temperature 1 Conductivity uS Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Oute of Setting 11:00 Number of traps set 6 NOTE: Cluster cluster Instream Cover Method Number Percent Method Number Poning Nement 70 NFC 1	Depth from upper surface of ice (cm) 60 Ice thickness (cm) 15 Clarity dofters, Lainski, Nore) N Show Depth (cm) 4 Water Temperature 1 Turbidity (H,M, L, or C) C (High, Moderas, Low, or Clear) C Turbidity (H,M, L, or C) C (High, Moderas, Low, or Clear) uS Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dist of Setting 2001-03-05 Fine of Setting 11:00 Number of traps set 6 Tre: Cluster coatains thre traps with a a - 5 meter diameter arear Instream Cover Species/ Number Captured per Cluster MT 2 70 MT 2 70 NFC / ////////////////////////////////////	e Cover (%	6) 70	1	Potential for fish migration M (High, Moderate, Limited, None)
Ice thickness (cm) IS Ice thickness (cm) IS Clarity of Ice (H,ML, or N) N (figh, Modense, Limited, Nore) A Snow Depth (cm) Image: Conductivity Water Temperature Image: Conductivity Conductivity Image: Conductivity Dissolved Oxygen (bottom) Image: Conductivity Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-03-05 Time of Setting 11:00 Number of traps set 6 NOTE: Cluster Cluster Instream Cover Method Number Percent Method Number Percent MT Image: Contract traps within an +5 meter diameter area MT Image: Contract traps within an +5 meter diameter area MT Image: Contract traps within an +5 meter diameter area MT Image: Contract traps within an +5 meter diameter area MT Image: Contract traps within an +5 meter diameter area MT Image: Contract traps within an +5 meter diameter area MT Image: Contract traps within an +5 meter diameter area MT	Joe thickness (cm) 15 Ice thickness (cm) 15 Clarity of Lee (H,M,L, or N) N (High, Moderse, Linuket, Norse) 4 Water Temperature 1 C Turbidity (H,M, L, or C) (High, Moderse, Linuket, Norse) 4/// Water Temperature 1 C C Jurbidity (H,M, L, or C) C (High, Moderse, Linuket, Norse) 4/// Dissolved Oxygen (bottom) 12 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Time of Collection 11:00 Time of Collection Number of traps set 6 OTE: Cluster cotalias three traps within as -5 meter diameter area upture Cluster Mem MT 1 MT 1 MT 1 MT 1 MT 1 MT 2 70 NFC NFC <tr< td=""><td>EI</td><td>MNOLOGY</td><td>STATION</td><td>FISH SUMMARY</td></tr<>	EI	MNOLOGY	STATION	FISH SUMMARY
Ice thickness (cm) IS Ichickness (cm) IS IS Ichickness (cm) IS IS ICARITY of Ice (H,M,L, or N) IS ICARITY of Ice (H,M,L, or N) IS IS IS IS IS IS IS IS IS IS IS IS IS	Ice thickness (cm) Ice thickness (cm) Ise thickness	Depth from	upper surface of ic	e (cm) 60	Total " of the international
Clarity of Ice (H,M,L, or N) (High, Modera, Limited None) Snow Depth (cm) 4 Water Temperature 1 C Turbidity (H,M, L, or C) (High, Modera, Low or Clear) Conductivity u Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-03-05 Time of Setting 11:00 Number of traps set 6 NOTE: Cluster costains three traps within as -5 meter diameter area Capture Cluster Mean Sub Present MT 1 MT 2	Clarity of Ice (H,M,L, or N) N (High, Moderne, Limited None) Snow Depth (cm) 4 Water Temperature 1 C Turbidity (H,M,L, or C) C (High, Moderate, Low, or Cleer) Conductivity uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Date of Collection 2001-03-0 Time of Collection 11:10 Number of traps set 6 Number of traps set 6 Species/ Number Captured per Cluster tendo Number Mann Dominant Tecover MT 1 0 70 NFC / 0 NFC / 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ice thicknes	s (cm)	15	
Water Temperature 1 C Turbidity (H,M, L, or C) C C (tigh, Modense, Low, or Clear) uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-03-05 Date of Collection Time of Setting 11:00 Time of Collection Number of traps set 6 Number of traps collected NOTE: Cluster Instream Cover Sub Sub Sub Parcent Species/ Number Captured per Cluster Method Number Instream Cover Sub MT 1 70 NFC MT 2 70 NFC	Water Temperature 1 C Turbidity (H,M, L, or C) C C (High, Moderate, Low, or Clear) uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Patter of Setting 2001-03-05 Date of Collection Time of Setting 2001-03-05 Number of traps set 6 Number of traps set 6 PTE: Cluster contains three traps within au -5 meter diameter area npture Cluster Instream Cover Nem 1 0 70 NFE / 8 0 70 NFE / 8			N	
Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity uS Dissolved Oxygen (bottom) 12 ppm pm Dissolved Oxygen (surface) ppm Date of Setting 2001-03-05 Time of Setting 11:00 Number of traps set 6 NOTE: Cluster contains three traps within an -5 meter diameter areat Method Number Species/Number Captured per Cluster Method Number Mean MT 2 70 NFC	Turbidity (H,M, L, or C) (High, Moderase, Low, or Clear) Conductivity uS Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 11:00 Time of Collection Number of traps set 6 Office costains three traps within as -5 unster diameter area uppure Cluster Instream Cover MT 1 MT 2 70 NFC			4	
(High, Moderate, Low, or Clear) u.S Conductivity u.S Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 11:00 Time of Collection Number of traps set 6 NoTE: Cluster cotains three traps within as -5 meter diameter area Capture Cluster Instream Cover Method Number Species/ Number Captured per Cluster Method Number Tominant Cover MT 1 Dendin Dominant Cover Species/ Number Captured per Cluster MT 1 MT 2 Tominant Dominant Cover RB MT 2 Tominant Cover Species/ Number Captured per Cluster Method Number MFC MT 2 Tominant Cover Species/ Number Captured per Cluster	(High, Moderate, Low, or Clear) u.S Conductivity u.S Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 11:00 Time of Collection Number of traps set 6 Species/ Number Captured per Cluster when Normant Ecover MT 1 Denda Dominant MT 2 MT 70 NFC 1 Comments 4				
Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Sub Percent Method Number Mean Deminant Dominant Dominant T0 RB 8 ///// R ///// R ///// R ///// /// Comments	Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Date of Collection 2001-03-0 Time of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 TTE: Cluster contains three traps within au -5 meter diameter area Instream Cover Sub Percent Species/ Number Captured per Cluster thod Number Mean Dominant Dominant ice cover RB 8 / / / / / / / / / / / / / / / / / /	(Hig	h, Moderate, Low, or Cle	ar)	
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Date of Collection 2001-03-06 Time of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Sub Percent Method Number Dominant Dominant ice cover MT 1 70 RB / B / / / / / / / / / / / / / / / /	Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Date of Collection 2001-03-05 Fime of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 TF: Cluster contains three traps within an -5 meter diameter area upture Cluster User Instream Cover Species/ Number Captured per Cluster thod Number Dominant Dominant ice cover RB 8 / / / / / / / / / / / / / / / / / /				
Date of Setting 2001-03-05 Date of Collection 2001-03-06 Time of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 6 Number of Image: Sub Density Density Dominant Dominant Dominant is cover Species/ Number Captured per Cluster 1 MT 1 70 RB / 8 1 1 1 MT 2 70 NFC 1 1 1 1	FISH COLLECTION SUMMARY Date of Setting 2001-03-05 Date of Collection 2001-03-05 Time of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 TE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 6 Mpenh Dominant Dominant ice over Species/ Number Captured per Cluster MT 1 70 RB / 8 1 1 1 MT 2 70 NFC 1 1 1 Comments Comments Comments 2 2				
Date of Setting 2001-03-05 Date of Collection 2001-03-06 Time of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an -5 meter diameter area Instream Cover 6 Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster MT 1 70 RB / 8 ////////////////////////////////////	Date of Setting 2001-03-05 Date of Collection 2001-03-05 Fime of Setting 11:00 Time of Collection 11:10 Number of traps set 6 Number of traps collected 6 DTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Mpture Cluster Mean Sub Percent RB / B ////////////////////////////////////				ECTION SUMMARY
Number of traps set 6 Number of traps collected 6 NOTE: Cluster contains three traps within an ~5 meter diameter area Instream Cover Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster MT 1 70 RB / 8 / / MT 2 70 NFC / / /	Number of traps set 6 Number of traps collected 6 DTE: Cluster contains three traps within an -5 meter diameter area appure Cluster Instream Cover Species/ Number Captured per Cluster Man Sub Percent RB / 8 / 1 MT 1 70 NFC / 1 / 1 MT 2 70 NFC / 1 / 1		n al constation de la constation de la constation de la constation de la constation de la constation de la cons ng	Contraction of the second second second second second second second second second second second second second s	
Note: Contract of the percent NOTE: Cluster contains three traps within an ~5 meter diameter area Capture Cluster Mean Sub Dominant Dominant Dominant Dominant MT 1 T 70 NFC 1	The cluster contains three traps within an -5 meter diameter area appure Cluster Instream Cover Sub Percent ethod Number Dominant Dominant ice cover RB 8 / / / / / / / / / / / / / / / / / /	- · · ·			Time of Collection 11:10
Capture Cluster Mean Sub Percent Method Number Dominant Dominant ice cover MT 1 6 70 8 7 70 8	Apture Cluster Instream Cover tethod Number Dominant Dominant ice cover MT 1 0 70 RB 8 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 /		ing	11:00	
Method Number Denth Dominant Dominant ice cover MT 1 70 RB 1 1 1 MT 2 70 NFC 1 1 1 MT 2 70 NFC 1 1 1 Comments 5 6 6 6 6 6	ethod Number Denth Dominant ice cover MT 1 70 RB 8 MT 1 70 NFC Image: Second state Comments	Time of Sett Number of t	raps set	6	Number of traps collected 6
MT 2 70 NFC / 70 NFC / 70 / 70 / 70 / 70 / 70 / 70 / 70 / 7	MT 2 70 NFC 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Time of Sett Number of t NOTE: Cluster co	raps set ntains three traps withi	6 n an ~5 meter diameter area Instream Cover Spea	
Comments	Comments	Time of Sett Number of t OTE: Cluster co Capture Cluss Aethod Num	raps set ntains three traps within ter Mean ber Denth Don	6 In an ~5 meter diameter area Instream Cover Sub Percent inant Dominant ice cover	cies/ Number Captured per Cluster
Comments	Comments	Time of Sett Number of t NOTE: Cluster co Capture Clust Method Num MT	raps set ntains three traps within ter Mean ber Denth Dom	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
Comments	Comments	Time of Sett Number of t NOTE: Cluster co Capture Clust Method Num MT	raps set ntains three traps within ter Mean ber Denth Dom	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
Comments	Comments	Time of Sett Number of t NOTE: Cluster co Capture Clust Method Num MT	raps set ntains three traps within ter Mean ber Denth Dom	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
oH = 7.8	H = 7.8	Time of Sett Number of t NOTE: Cluster co Capture Clust Method Num MT 1 MT 2	raps set ntains three traps within ter Mean ber Denth Dom	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
		Time of Sett Number of t NOTE: Cluster co Capture Cluss Aethod Num MT 1 MT 2	raps set ntains three traps within ter Mean ber Denth Don	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
		Time of Sett Number of t NOTE: Cluster co Capture Cluss Aethod Num MT 1 MT 2	raps set ntains three traps within ter Mean ber Denth Don	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
		Time of Sett Number of t NOTE: Cluster co Capture Cluss Aethod Num MT 1 MT 2	raps set ntains three traps within ter Mean ber Denth Don	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
		Time of Sett Number of t NOTE: Cluster co Capture Cluss Aethod Num MT 1 MT 2	raps set ntains three traps within ter Mean ber Denth Don	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster
		Time of Sett Number of t NOTE: Cluster co Capture Cluss Aethod Num MT 1 MT 2	raps set ntains three traps within ter Mean ber Denth Don	6 In an ~5 meter diameter area Instream Cover Sub Percent Inant Dominant ice cover 70 RB	cies/ Number Captured per Cluster

Site Name (e.g. TOB-1)

100

(iii)

lin

(iiii

Cili

1 and

(ieie

Con.

1

6

G

(181) China

BYM-1

first three letters of stream name-site number

VISIT #

4

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1] 1	RB	78	5.6	UM	
MT	1	2	RB	72	4.3	UM	
MT	1	2	RB	49	1.4	UM	
MT	1	2	RB	100	10.3	UM	
MT	1	3	RB	88	8.1	UM	
MT	1] 3	RB	131	22.5	UM	
MT	1	3	RB	74	4.3	UM	
MT	1	3	RB	64	3.1	UM	
MT	2	1	NFC				
MT	2	2	NFC				
MT	2	3	NFC				

C Stream Flow [High, Moderate, Limited, None) Potential for fish migration M (High, Moderate, Limited, None) STATION FISH SUMMARY (cm) 75 Total # of 10 N Length (mm) 10 RB 17 56 N CO 16 42 78 0.1 C	yman Creek 'eather - 16 and clear ir Temperature -16 ° C e Cover (%) 100 Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 1 Snow Depth (cm) 1 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTIC Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean MT 1 100 Co / 16 16	2000-12-15 4:45 BD,TJ ershed Code Image: Code state of the state
Local Stream Name Watershed Code C C Stream Flow L (High, Moderate, Limited, None) Potential for fish migration M (High, Moderate, Limited, None) STATION FISH SUMMARY (cm) 75 Total # of Mininimum Maximum I0 N 10 N 10 N 10 RB 17 56 95 CO 16 42 78 CO 16 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	yman Creek 'eather - 16 and clear ir Temperature -16 ° C e Cover (%) 100 Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 1 Snow Depth (cm) 1 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTIC Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean MT 1 100 Co / 16 16	ershed Code Stream Flow L (High, Moderate, Limited, None) for fish migration M (High, Moderate, Limited, None) FISH SUMMARY Species Fish Length (mm) RB 17 56 95 CO 16 42 78 ON SUMMARY Date of Collection 2000- Time of Collection 2000- Number of traps collected 2
C Stream Flow [High, Moderate, Limited, None) Potential for fish migration M (High, Moderate, Limited, None) STATION FISH SUMMARY (cm) 75 Total # of 10 N Length (mm) 10 RB 17 56 N CO 16 42 78 0.1 C	yman Creek 'eather - 16 and clear ir Temperature -16 ° C e Cover (%) 100 Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 1 Snow Depth (cm) 1 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTIC Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean MT 1 100 CO 16	Stream Flow L (High, Moderate, Limited, None) I for fish migration M (High, Moderate, Limited, None) FISH SUMMARY Species Fish Length (mm) RB 17 56 95 CO 16 42 78 Date of Collection 2000- Time of Collection 2000- Time of traps collected
Potential for fish migration M (High, Moderate, Limited, None) STATION (cm) 75 Total # of Mininimum Maximum 10 Species Fish Length (mm) 10 RB 17 56 95 N CO 16 42 78 0.1 C O 0 0 0 0 0 130 uS 0 0 0 0 0 0 0 130 uS 0 Date of Collection 2000-12-1 9:45 1 0 2000-12-1 9:45 Time of Collection 2000-12-1 3 3 Number of traps collected 3 3	'eather -16 and clear ir Temperature -16 ° C ir Cover (%) 100 Potentia LIMNOLOGY STATION Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited None) 1 Snow Depth (cm) 1 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Denth Dominant Dominant Species/ Number MT 1 100 C0 / 16	for fish migration M (High, Moderate, Limited, None) FISH SUMMARY Species Total # of Mininimum Maximum Species Fish Length (mm) Length (mm) RB 17 56 95 CO 16 42 78 DN SUMMARY Date of Collection 2000- Time of Collection Image: Collection 2000- Number of traps collected 2
Potential for fish migration M (High, Moderate, Limited, None) STATION (cm) 75 Total # of Mininimum Maximum 10 Species Fish Length (mm) Length (mm) 10 RB 17 56 95 N CO 16 42 78 0.1 C O O O O O 130 uS O O O O O O 12 ppm Date of Collection 2000-12-1 O O O O 3 Number of traps collected 3 O O	ar Temperature -16 ° C e Cover (%) 100 Potentia LIMNOLOGY STATION Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 1 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent MT 1 0 100 C0 16	for fish migration M (High, Moderate, Limited, None) FISH SUMMARY Species Total # of Mininimum Maximum Species Fish Length (mm) Length (mm) RB 17 56 95 CO 16 42 78 DN SUMMARY Date of Collection 2000- Time of Collection Image: Collection 2000- Number of traps collected 2
Potential for fish migration M (High, Moderate, Limited, None) STATION (cm) 75 Total # of Mininimum Maximum 10 Species Fish Length (mm) 10 RB 17 56 95 N CO 16 42 78 0.1 C O 0 0 0 0 0 130 uS 0 0 0 0 0 0 0 130 uS 0 Date of Collection 2000-12-1 9:45 1 0 2000-12-1 9:45 Time of Collection 2000-12-1 3 3 Number of traps collected 3 3	e Cover (%) 100 Potentia LIMNOLOGY STATION Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) Snow Depth (cm) 1 Water Temperature 0.1 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm EISH COLLECTION Date of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent I Denth Dominant Toommant ice cover MT 1 0 0 10 10 10 10 10	for fish migration M (High, Moderate, Limited, None) FISH SUMMARY Species Total # of Mininimum Maximum Species Fish Length (mm) Length (mm) RB 17 56 95 CO 16 42 78 DN SUMMARY Date of Collection 2000- Time of Collection Image: Collection 2000- Number of traps collected 2
STATION FISH SUMMARY (cm) 75 Total # of Minimum Length (mm) Maximum Length (mm) 10 N RB 17 56 95 N 1 0.1 C 0 16 42 78 0.1 C 0 0 0 0 0 130 uS uS uS uS uS uS om) 12 ppm uS uS uS uS uS 2000-12-14 Date of Collection 2000-12-1 uS uS uS uS uS 3 Number of traps collected 3 uS uS uS	LIMNOLOGY STATION Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) 1 Snow Depth (cm) 1 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) 130 Conductivity 130 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 22000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Species/ Numl Import Dominant Dominant Species/ Numl MT 1 CO / 16 16	FISH SUMMARY Species Total # of Fish Mininimum Length (mm) Maximum Length (mm) RB 17 56 95 CO 16 42 78 Down Date of Collection 2000- Time of Collection 2000- Time of Collection Number of traps collected 2000- Collection 2000- Collection
(cm) 75 Total # of Mininimum Maximum Length (mm) 10 N RB 17 56 95 N 0.1 C 16 42 78 0.1 Sppm Date of Collection 2000-12-1 9:45 Time of Collection 2000-12-1 9:45 Number of traps collected 3 aa -5 meter diameter ares Instream Cover Species/ Number Captured per Cluster Sub Percent Species/ Number Captured per Cluster <td>Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 1 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Cligh, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Mean Sub Percent CO / 16</td> <td>Total # of Fish Mininimum Length (mm) Maximum Length (mm) RB 17 56 95 CO 16 42 78 ON SUMMARY Date of Collection 2000- Time of Collection 2000- Time of traps collected</td>	Depth from upper surface of ice (cm) 75 Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 1 Water Temperature 0.1 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) Cligh, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Mean Sub Percent CO / 16	Total # of Fish Mininimum Length (mm) Maximum Length (mm) RB 17 56 95 CO 16 42 78 ON SUMMARY Date of Collection 2000- Time of Collection 2000- Time of traps collected
10 N 10 N N RB 17 56 95 1 0.1 C 16 42 78 0.1 C 16 42 78 0.1 C 16 42 78 0.1 C 0.1 C 16 42 78 0.1 D ppm 2000-12-1 16 2000-12-1 9:45 Time of Collection 2000-12-1 9:45 Time of Collection 3 aa -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Species/ Number Captured per Cluster	Ice thickness (cm) 10 Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) N Snow Depth (cm) 1 Water Temperature 0.1 Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) C Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) C Dissolved Oxygen (bottom) 12 Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area Species/ Numi apture Cluster Mean Sub Percent MT 1 100 C0 / 16	Species Fish Length (mm) Length (mm) RB 17 56 95 CO 16 42 78 DN SUMMARY Date of Collection 2000- Time of Collection 1000- Number of traps collected 2
10 RB 17 56 95 N 0.1 C 6 42 78 0.1 C 0.1 C 78 78 0.1 C 0.1 6 42 78 0.1 C 0.1 6 42 78 0.1 C 0.1 6 6 42 78 0.1 0.1 C 0.1 6 42 78 0.1 0.1 C 0.1 6 42 78 0.1 0.1 C 0.1 16 42 78 0.1 0.1 0.1 0.1 0.1 16 10 10 1.0 0.1 0.1 0.1 0.1 10	Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) Snow Depth (cm) Water Temperature 0.1 C Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 DTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Denth Dominant Dominant CO 1 C 1 C 1 C 1 C 1 C 1 C 1 C C C C C	RB 17 56 95 CO 16 42 78 CO 16 42 78 Date of Collection 2000- Time of Collection 2000- Number of traps collected 2
N CO 16 42 78 1 0.1 C 6 6 78 0.1 C C 6 6 6 78 0.1 130 uS uS 6 6 78 6 78 0.1 12 ppm 2000-12-1 Date of Collection 2000-12-1 9:45 Time of Collection 2000-12-1 3 3 3 3 aar -5 meter diameter area Instream Cover Species/ Number Captured per Cluster 3 3 3 3	(High, Moderate, Limited, None) Snow Depth (cm) Water Temperature 0.1 C Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION Date of Setting 9:45 Number of traps set 3 DTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Denth Dominant Dominant C C C C C C C C C C C C C C C C C C C	CO 16 42 78 CO 16 42 78 DN SUMMARY Date of Collection 2000- Time of Collection 2000- Time of Collection 2000- Number of traps collected 2
1 0.1 ° C 130 uS om) 12 ppm ace) ppm FISH COLLECTION SUMMARY Date of Collection 2000-12-14 Date of Collection 9:45 Time of Collection 3 Number of traps collected an -5 meter diameter area Instream Cover Sub Percent	Snow Depth (cm) 1 Water Temperature 0.1 C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an ~5 meter diameter area apture Cluster Mean Sub Percent Mean Sub Percent Species/ Number MT 1 100 C0 / 16	Date of Collection 2000- Time of Collection 2000- Number of traps collected 2
0.1 ° C 130 uS om) 12 ppm ace) ppm FISH COLLECTION SUMMARY 2000-12-14 Date of Collection 9:45 Time of Collection 3 Number of traps collected an -5 meter diameter area Instream Cover Sub Percent	Water Temperature 0.1 C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an ~5 meter diameter area apture Cluster Mean Sub Percent Men Dominant Dominant Species/ Numl MT 1 0 100 C0 / 16	Date of Collection 2000- Time of Collection
) C 130 uS om) 12 ppm ace) ppm FISH COLLECTION SUMMARY 2000-12-14 Date of Collection 2000-12-1 9:45 Time of Collection 3 an -5 meter diameter area Instream Cover Sub Percent Species/ Number Captured per Cluster	Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity C Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an ~5 meter diameter area Species/ Numl apture Cluster Mean Sub Percent Mean Dominant Dominant Species/ Numl MT 1 0 100 C0 / 16	Date of Collection 2000- Time of Collection
130 uS om) 12 ppm ace) ppm FISH COLLECTION SUMMARY 2000-12-14 Date of Collection 9:45 Time of Collection 3 Number of traps collected an -5 meter diameter area Instream Cover Sub Percent	(High, Moderate, Low, or Clear) Conductivity 130 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent lethod Number Dominant Dominant ice cover MT 1 0 0 16	Date of Collection 2000- Time of Collection
om) 12 ppm ace) ppm FISH COLLECTION SUMMARY 2000-12-14 Date of Collection 2000-12-1 9:45 Time of Collection 3 an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Species/ Number Captured per Cluster	Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm FISH COLLECTION Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area apture Cluster Mean Sub Percent Denth Dominant Dominant CO 16	Date of Collection 2000- Time of Collection
ace) ppm FISH COLLECTION SUMMARY 2000-12-14 Date of Collection 9:45 Time of Collection 3 Number of traps collected an -5 meter diameter area 3 Instream Cover Species/ Number Captured per Cluster Sub Percent	Dissolved Oxygen (surface) ppm FISH COLLECTION Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an ~5 meter diameter area apture Cluster Mean Instream Cover Sub Percent Lethod Number Denth Dominant Dominant ice cover MT 1 CO / 16	Date of Collection 2000- Time of Collection
FISH COLLECTION SUMMARY 2000-12-14 Date of Collection 2000-12-1 9:45 Time of Collection	FISH COLLECTION Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an ~5 meter diameter area Instream Cover apture Cluster Mean Sub Percent lethod Number Dominant Dominant Cover MT 1 100 C0 / 16	Date of Collection 2000- Time of Collection
2000-12-14 Date of Collection 2000-12-1 9:45 Time of Collection	Date of Setting 2000-12-14 Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an ~5 meter diameter area apture Cluster Instream Cover geture Cluster Mean Dominant Dominant Dominant Dominant MT 1	Date of Collection 2000- Time of Collection
9:45 Time of Collection 3 Number of traps collected an -5 meter diameter area Instream Cover Sub Percent	Time of Setting 9:45 Number of traps set 3 OTE: Cluster contains three traps within an -5 meter diameter area Instream Cover apture Cluster Mean Sub Verhod Number Percent Denth Dominant Dominant MT 1 100 CO / 16	Time of Collection Number of traps collected
3 Number of traps collected 3 an ~5 meter diameter area Instream Cover Species/ Number Captured per Cluster Sub Percent Species/ Number Captured per Cluster	Number of traps set 3 DTE: Cluster contains three traps within an ~5 meter diameter area Instream Cover Species/ Number apture Cluster Mean Sub Percent lethod Number Dominant Dominant ice cover MT 1 1 100 CO / 16	Number of traps collected
an ~5 meter diameter area Instream Cover Sub Percent Species/ Number Captured per Cluster	OTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number apture Cluster Mean Sub Percent Species/ Number Iethod Number Dominant Dominant ice cover CO / 16 MT 1 1 100 CO / 16	
Instream Cover Species/ Number Captured per Cluster	apture Cluster Mean Sub Percent lethod Number Denth Dominant Dominant ice cover MT 1 CO / 16	er Captured per Cluster
Sub Percent	apture Cluster Mean Sub Percent lethod Number Demth Dominant Dominant ice cover MT 1 CO / 16	
ant Dominant ice cover	MT 1 CO / 16	
		RB / 17 / / /
		RB / 17 / / / / / / / / / / / / / / / / /
		ents
Comments	en gin in eine eine geste der die die Bin in die eine die eine geste die eine geste Berne verste der die eine Geste die seine die geste die geste die geste die geste die geste die geste die geste Berne verste die geste die	
Comments	December 15th temp. is -24. Fish sampled in truck.	
Comments	H = 8.3	
Comments		

Site Name (e.g. TOB-1)

(ile

(10

ia di katala di katala di katala di katala di katala di katala di katala di katala di katala di katala di katal La seconda di katala di katala di katala di katala di katala di katala di katala di katala di katala di katala di

(in

BYM-

2

first three letters of stream name-site number

VISIT # 1

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	75	5.7	UM	
MT	1	1	RB	78	7	UM	
MT	1	1	Со	68	3.8	UM	
MT	1	1	Со	43	1.5	UM	
MT	1	1	RB	72	5.6	UM	
MT	1	1	RB	98	11.7	UM	
MT	1] 1	СО	42	1.3	UM	
MT	1	1	СО	50	1.5	UM	
MT	1	1	СО	78	7	UM	
MT	1	1	СО	61	6.8	UM	
MT	1] [1	СО	46	1.6	UM	
MT	1	1	RB	88	8.7	UM	
MT	1	1	RB	56	2.7	UM	
MT	1	1	RB	95	14.2	UM	
MT	1		RB	83	7.6	UM	
MT	1] 1	RB	75	6.5	UM	
MT	1	2	RB	76	6.3	UM	
MT	1	2	RB	89	10	UM	
MT	1	2	RB	68	5.1	UM	
MT	1	2	СО	57	2.7	UM	
MT	1	2	СО	48	2	UM	
MT	1	2	СО	56	1.7	UM	
MT	1	2	СО	48	1.4	UM	
MT	1	2	СО	50	1.8	UM	
MT	1	2	Со	62	3.8	UM	
MT	1	2	RB	70	5.8	UM	
MT	1	2	RB	81	8.9	UM	
MT	1	2	Со	44	1.2	UM	
MT] [1	2	RB	57	3.1	UM	
MT	1	2	СО	49	1.5	UM	
MT] 1	2	СО	50	2.7	UM	
MT	1	2	СО	58	3	UM	
MT	1	2	RB	67	3.5	UM	
MT	1	2	RB	80	7.2	UM	

Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster costains three traps within an -5 meter diameter area Instream Cover 3 Capture Cluster Mean Sub Percent Method Number Instream Cover Sub Percent Method Number Dominant Dominant ice cover CO / 10 CH / 3 RB / 11 / / / / / / / / / / / / / / / / / / /	Site Name (e.g. TOB-1) BYM	- 2 first three letters of stream name-site number	VISIT # 2
Byman Creek Weather Overcast Air Temperature -7 °C Stream Flow M (High, Moderne, Limited, News) Ice Cover (%) 100 Potential for fish migration M (High, Moderne, Limited, News) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 83 78 Ice thickness (cm) 12 Total # of Minimum Maximum			
Weather overcast Air Temperature -7 C Stream Flow M (Figh, Modema, Limited, None) Lee Cover (%) 100 Potential for fish migration M (Figh, Modema, Limited, None) LiMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 83 78 Ice thickness (cm) 12 CO 10 38 78 Christy of Ice (H, M, L, or N) N CO 10 38 78 Ordigh, Modema, Limited, None) 0 CO 10 38 78 Output from upper surface of ice (cm) 0 Species Fish Length (nm) Length (nm) Co 10 38 78 CH 3 59 67 Storw Depth (rem) 0 us Species/ Number Caputed Part (nm) RB 11 41 83 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Number of raps collected 3 7001-01-12 Date of Setting 2001-01-11 Date of Collection 9:40 700 700 <td< th=""><th></th><th>Local Stream Name</th><th>Watershed Code</th></td<>		Local Stream Name	Watershed Code
Air Temperature [-7]*C Stream Flow M (High, Moderne, Limited, Norm) ce Cover (%) 100 Potential for fish migration M (High, Moderne, Limited, Norm) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of lice (cm) 83 lice thickness (cm) 12 Chrity of lice (H.M.L, or N) (Linity of lice (H.M.L, or N) (Linity of lice (H.M.L, or N) (Linity, Moderne, Limited, Norm) Show Depth (cm) 0 Water Temperature 1,1,1 ° C Turbidity (H.M. L, or C) (Lingh, Moderne, Limited, Norm) Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Number of traps set 3 Number of traps set 3 Number of traps set 3 Number of traps set 3 Comments Fell through the ice. No snow at limno. Normal time, internet,	· · · · · · · · · · · · · · · · · · ·		
Interview Interview Potential for fish migration M (High, Moderner, Limited, Neer) Depth from upper surface of ice (cm) 83 78 Species Fish Length (mm) Length (mm) Ice thickness (cm) 12 Species Fish Length (mm) Length (mm) Charly of Ice (HML, or N) N Image: Species Fish Length (mm) Length (mm) Show Depth (cm) 0 0 38 78 GH 3 59 67 Now Depth (cm) 0 0 Species Fish Length (mm) Length (mm) Water Temperature 1.1 C Turbidity (H, M, L, or C) C (High, Moderner, Science) GH 3 59 67 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm 2001-01-12 Time of Collection 2001-01-12 Time of Setting 2001-01-11 Date of Collection 9.40 3 3 NOTE: Charge collasis three traps within an - 4 meet diameter area Species/ Number Captured per Cluster 3 Method Number Imme of Collection	overcast		
ISEM STATION Depth from upper surface of ice (cm) 83 Ice thickness (cm) 12 Image: Colspan="2">Total # of Minimum Maximum Length (nm) Charty of ice (H,M,L, or N) N Species Total # of Minimum Maximum Snow Depth (cm) 0 10 38 78 Mater Temperature 1.1 C Turbidity (H,M,L, or C) C Charty Motema Low, or Class Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Claser contains three traps within as -5 addree dameter area Species/ Number Captured per Cluster Mem Method Number Mater Temperatur 1000 CO 10 CH 3 8 Species/ Number RB	Air Temperature -7)° C	Stream Flow M (High, Moderate, Limited, None)
Depth from upper surface of ice (cm) 83 lee thickness (cm) 12 Clarity of Ice (H,M,L, or N) N (fligh, Modens, Linnea, None) N Snow Depth (cm) 0 Water Temperature 1.1 C C (fligh, Modens, Linnea, None) C Snow Depth (cm) 0 Water Temperature 1.1 C C (fligh, Modens, Linne, None) C Conductivity 100 uS Dissolved Oxygen (Surface) ppm Dissolved Oxygen (Surface) ppm Dissolved Oxygen (Surface) ppm Date of Setting 2001-01-11 Time of Setting 9:50 NUmber of traps set 3 NOTE: Clurer centains these traps within an -4 set dateet arease Caphare Clurer Sub Present Method Number Method Number Method Number MT 1 MT 1 Sub Present Sub Present None wat limno.	lce Cover (%) 100	Poten	Itial for fish migration M (High, Moderate, Limited, None)
Ice thickness (cm) 12 Ice thickness (cm) 12 Clarity of Ice (H,M,L, or N) N (ligh, Modena, Limited, None) 0 Snow Depth (cm) 0 Water Temperature 1.1 Turbidity (H,M, L, or C) C (ligh, Modena, Limited, None) C Onductivity 100 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-01-11 Date of Setting 9:50 Number of traps set 3 NOTE: Cluster costalias three traps within as -5 other diameter area Capture Cluster Instream Cover Species/ Number Captured per Cluster Mean Interve North 10 100 Co 10 Contract Interve North 11 <	LIMNOLOGY	Y STATION	FISH SUMMARY
Ice thickness (cm) 12 Clarity of Ice (H,M,L, or N) N (figh, Modena, Lumie X, None) 0 Snow Depth (cm) 0 Water Temperature 1.1 C C Turbidity (H,M, L, or C) C (figh, Modena, Low, or Clear) 100 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Number of traps set 3 NOTE: Cluster contast three traps within as -5 stater dameter area Capture Cluster Species/ Number Captured per Cluster Metod Number Mass Metod Number 100 CO 10 Co 10 Species/ Number Captured per Cluster Metod Number Species/ Number Captured per Cluster Metod Number Co Metod Number 100 Co 10 Comments 2 Fell through the ice. No snow at linno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Depth from upper surface of i	ice (cm) 83	
Clarity of Ice (H.M.L. or N) (High, Moderna, Limited None) Snow Depth (cm) Water Temperature Turbidity (H.M. L. or C) (High, Moderna, Low, or Cleee) Conductivity Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) Species/ Number of Collection Species/ Number of traps collected Anumber of traps collected Species/ Number Captured per Cluster Method Number Comments Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Ice thickness (cm)	12	
Snow Depth (cm) 0 RB 11 41 83 Water Temperature 1,1 C <td></td> <td>Ν</td> <td></td>		Ν	
Turbidity (H,M, L, or C) (High, Modenia, Low, or Clear) C Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm PISH COLLECTION SUMMARY Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within as -5 meter diameter area Species/ Number Captured per Cluster Method Number Instream Cover Species/ Number Captured per Cluster Method Number Dominant Species/ Number Captured per Cluster Method Number 100 CO / 10 CH / 3 RB / 11 / / / / Fell through the ice. No snow at limmo. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site. State.		0	
(High, Moderate, Low, or Clear) 100 uS Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster costains three traps within an -5 meter diameter areat Species/ Number Captured per Cluster 3 Copture Cluster Mean Sub Percent Species/ Number Captured per Cluster 4 MT 1 100 CO / 10 CH / 3 RB / 11 ////////////////////////////////////	Water Temperature	1.1 ° C	
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 3 Capture Cluster Mean Dominant Species/ Number Captured per Cluster 4 Method Number Dominant Co/ 10 CH / 3 RB / 11 //// MT 1 100 CO / 10 CH / 3 RB / 11 //// //// Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.			
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster costains three traps withib an -5 meter diameter area Capture Cluster Mean Sub Percent Method Number Dominant Pominant ice cover MT 1 0 0 CO / 10 CH / 3 RB / 11 / / / /	Conductivity	100 uS	
FISH COLLECTION SUMMARY Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within au-5 meter diameter area Species/ Number Captured per Cluster 4 Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster 4 Method Number Instream Cover Species/ Number Captured per Cluster 4 4 4 Method Number Instream Dominant Dominant ice cover CO / 10 CH / 3 RB / 11 / / / / MT 1 100 CO / 10 CH / 3 RB / 11 / / / / Fell through the ice. No snow at limno. January 12th, air temp. = -16 January 12th, air temp. = -16 January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.		• • •	
Date of Setting 2001-01-11 Date of Collection 2001-01-12 Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 3 Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster 1 Method Number Instream Cover Species/ Number Captured per Cluster 1 MT 1 100 CO / 10 CH / 3 RB / 11 / _ / _ / _ / _ / _ / _ / Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site. Context of this site.	Dissoivea Oxygen (si		PION SUMMADY
Time of Setting 9:50 Time of Collection 9:40 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Mean Sub Percent Species/ Number Captured per Cluster Method Number Image: Cover CO / 10 CH / 3 RB / 11 / / / / / / / / MT 1 100 CO / 10 CH / 3 RB / 11 / / / / / / / / / / Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.			and and a state of the
Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent CO / 10 CH / 3 RB / 11 / / / / / / / / / / / / / / / / /			
Capture Cluster Instream Cover Mean Sub Denth Dominant Dominant Dominant Image: Denth Dominant Denth Dominant			Number of traps collected
Mean Sub Method Number Denth Dominant Dominant Dominant ice cover Image: State of the state	Time of Setting		
Comments Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with	3 bin an ~5 meter diameter area	· · · · · · · · · · · · · · · · · · ·
Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	3 blo an ~5 meter diameter area Instream Cover Species/ N Sub Percent minant Dominant ice cover	
Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	3 bin an ~5 meter diameter area Instream Cover Sub Percent minant Dominant ice cover	fumber Captured per Cluster
Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	3 bin an ~5 meter diameter area Instream Cover Sub Percent minant Dominant ice cover	fumber Captured per Cluster
Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	3 bin an ~5 meter diameter area Instream Cover Sub Percent minant Dominant ice cover	
Fell through the ice. No snow at limno. January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number	3 bin an ~5 meter diameter area Instream Cover Sub Percent minant Dominant ice cover	fumber Captured per Cluster
January 12th, air temp. = -16 Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Denth Doi MT 1	3 bia aa ~5 meter diameter area Instream Cover Sub Percent 100 CO/C	iumber Captured per Cluster 10 CH / 3 RB / 11 / / / / / / / / / / / / / / / / /
Creek is open for a bout10 meters upstream and downstream of this site.	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Denth Don MT 1	3 bia aa ~5 meter diameter area Instream Cover Sub Percent 100 CO/C	iumber Captured per Cluster 10 CH / 3 RB / 11 / / / / / / / / / / / / / / / / /
pH = 7.8	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Mean Method Number Denth Doo MT 1 1	3 his az ~5 meter diameter area Instream Cover Sub Percent 100 CO/ CO/ CO	<pre>iumber Captured per Cluster 10 CH / 3 RB / 11 / / / / / / / / / / / / / / / / /</pre>
	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number MT 1 Denth Doo MT 1 Fell through the ice. No snow at limno. January 12th, air temp. = -	3 hin an -5 meter diameter area Instream Cover Sub Percent 100 CO/ CO/ -16	tumber Captured per Cluster
	Time of Setting Number of traps set NOTE: Cluster contains three traps with Capture Cluster Method Number MT 1 Fell through the ice. No snow at limno. January 12th, air temp. = - Creek is open for a bout10	3 hin an -5 meter diameter area Instream Cover Sub Percent 100 CO/ CO/ -16	tumber Captured per Cluster

Site Name (e.g. TOB-1)

1

<u>C</u>[®]

-

L.

i.

3

1

first three letters of stream name-site number

BYM-2

VISIT #

2

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	59	3.9	UM	
MT	1	1	CH	67	4.6	UM	
MT	1	1	CH	67	4.7	UM	
MT	1	1	RB	62	4.2	UM	
MT	1	1	RB	41	0.9	UM	
MT	1	2	RB	71	4.4	UM	
MT	1	2	RB	83	6,8	UM	
MT	1	2	RB	74	6	UM	
MT	1	2	RB	81	7.1	UM	
MT	1	2	СО	78	6.6	UM	
MT	1	2	RB	76	5.4	UM	
MT	1	2	RB	55	2.7	UM	
MT	1	2	СО	58	2.7	UM	
MT	1	2	СО	62	3.2	UM	
MT	1	2	СО	45	1.4	UM	
MT] [1	2	RB	59	2.8	UM	
MT	1	2	СО	64	3.4	UM	
MT] []	2	СО	55	3.3	UM	
MT] _ 1	2	RB	69	4.9	UM	
MT] _ 1	3	СН	59	2.8	UM	
MT] 1	3	СО	38	0.9	UM	
MT	1	3	СО	55	2	UM	
MT	1	3	СО	45	1.3	UM	
MT	1	3	СО	65	3.4	UM	

Site Name (e.g. TOB-1) YM 2 first three letters of stream VISIT # 3 Date of survey Time of survey Surveyors 2001-02-08 10:00 TIJTD_JD Gazetted Stream Name Local Stream Name Watershed Code Byman Creek			SIT	E VISIT D	ESCRIPTI	ON		
Date of survey Time of survey Surveyors 2001-02-08 10:00 TJ,TD,JD Gazetted Stream Name Watershed Code Byman Creek		BYM-					VIS	IT # 3
Byman Creek Weather Light snowfall Air Temperature -7 C Stream Flow M (High, Modernue, Limited, None) Air Temperature -7 C Stream Flow M (High, Modernue, Limited, None) Ice Cover (%) 100 Potential for fish migration M (High, Modernue, Limited, None) Limited None 58 Ice thickness (cm) 21 Species Total # of Mininimum Maximum Clarity of Ice (H,M,L, or N) N N RB 8 44 103 Clarity of Ice (H,M,L, or C) C C G 68 68 Snow Depth (cm) 0 Vater Temperature 0.9 °C CO 2 62 68 Vater Temperature 0.9 °C C G 68 44 103 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps collected 3 NOTE: Cluster contains three traps withits as -5 c	(e.g. 105-17		L					
Weather Light snowfall Air Temperature -7 C Stream Flow M (High, Moderate, Limited, None) Lice Cover (%) 100 Potential for fish migration M (High, Moderate, Limited, None) LimMOLOGY STATION Potential for fish migration M (High, Moderate, Limited, None) LimMoloGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 58 Total # of Minimimum Maximum Ice thickness (cm) 21 N Species Total # of Minimimum Maximum Clarity of Ice (H,M,L, or N) N N RB 44 103 CO 2 62 68 Conductivity 120 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Date of Collection 2001-02-08 Date of Collection 2001-02-09 Time of Setting 2001-02-08 Date of Collection 9:45 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within as5 meter diameter area Species/Number	r	n Name	Local Stream Nar	ne Wa	tershed Code			
Air Temperature -7 C Stream Flow M (High, Moderne, Limited, None) Ice Cover (%) 100 Potential for fish migration M (High, Moderne, Limited, None) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 58 Total # of Minimum Maximum Ice thickness (cm) 21 N N Length (mm) Length (mm) Clarity of Ice (H,M,L, or N) N N RB 8 44 103 Clarity of Ice (H,M,L, or C) C C 68 68 68 Snow Depth (cm) 0 * C 62 68 Water Temperature 0.9 * C 62 68 Dissolved Oxygen (bottom) 12 ppm ppm 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 3 Number of traps set 3 Number of traps collected 3 Noth: Lease constate three traps withts as - meter diameter area Capture Cluster Species/ Number Captured per Cluster Species/ Number Captured per Clu	Byman Creek			[
Ice Cover (%) 100 Potential for fish migration M (High, Modernee, Limited, None) LIMNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 58 Fish Length (mm) Maximum Ice thickness (cm) 21 Species Fish Length (mm) Length (mm) Clarity of Ice (H,M,L, or N) N N Species 62 68 Snow Depth (cm) 0 CO 2 62 68 Water Temperature 0.9 °C CO 2 62 68 Dissolved Oxygen (bottom) 12 µpm ppm Ppm 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 3 Number of traps collected 3 NOTE: Cluster Instream Cover Species/ Number Captured per Cluster Species/ Number Captured per Cluster 3	Weather	Light snowfall	l					
FISH SUMMARY Depth from upper surface of ice (cm) 58 Ice thickness (cm) 21 Clarity of Ice (H,M,L, or N) N RB 8 44 103 Clarity of Ice (H,M,L, or N) N RB 8 44 103 Species Total # of Minimum Maximum RB 8 44 103 CO 2 62 68 Snow Depth (cm) 0 C RB 8 44 103 Water Temperature 0.9 C C Gene and the second collection Cole 2 62 68 Modema, Conductivity 120 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps set 3 Number of traps collected 3 Number of Lister Mean Dominant is creater Species/ Number Captured per Cluster	Air Tempera	ature <u>-7</u> °	С		Stream l	Flow	M (High, Moderate,	Limited, None)
Depth from upper surface of ice (cm) 58 Ice thickness (cm) 21 Clarity of Ice (H,ML, or N) N (ligh, Moderate, Limited, None) N Snow Depth (cm) 0 Water Temperature 0.9 CO 2 Conductivity 120 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (surface) ppm Date of Setting 10:20 Time of Setting 10:20 Number of traps set 3 NOTE: Cluster Instream Cover Method Number Sub Prevent Species/ Number Captured per Cluster	Ice Cover (%	b) 100		Potentia	l for fish migra	tion 📋	M (High, Moderate,	Limited, None)
Ice thickness (cm) 21 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 0 Water Temperature 0.9 O CO Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 120 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECCTION SUMMARY 2001-02-08 Time of Setting 10:20 Number of traps set 3 Notte: Cluster Instream Cover Species/ Number Captured per Cluster Species/ Number Captured per Cluster Meethod Number Deminant Pominant Species/ Number Captured per Cluster	LIN	MNOLOGY	STATION			FISH S	SUMMARY	
Ice thickness (cm) 21 Clarity of Ice (H,M,L, or N) N (High, Moderate, Limited, None) N Snow Depth (cm) 0 Water Temperature 0.9 Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 120 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 10:20 Number of traps set 3 Notte: Cluster Instream Cover Mean Submet recover Species/ Number Captured per Cluster Mean Submet recover	Depth from	upper surface of ice	e (cm) 58]	1			
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None) Snow Depth (cm) Water Temperature 0 Water Temperature 0.9 C Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) Conductivity 120 US Dissolved Oxygen (bottom) Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) Date of Setting 10:20 Time of Setting 10:20 Number of traps set 3 NoTE: Cluster contailes three traps within as -5 meter diameter area Capture Cluster Mean Denth Dominant Dominant ice cover Method Number	Ice thickness	s (cm)	21					
Snow Depth (cm) 0 Water Temperature 0.9 Turbidity (H, M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 120 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-08 Time of Setting 10:20 Number of traps set 3 NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Method Number Dominant Dominant Species/Number Captured per Cluster			Ν					
Water Temperature 0.9 ° C Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) C Conductivity 120 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Bate of Setting 2001-02-08 Date of Collection Time of Setting 10:20 Time of Collection Number of traps set 3 Number of traps collected NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Mean Sub Percent Method Number Dominant Dominant Dominant Species/ Number Captured per Cluster					CO	2	62	68
Turbidity (H,M, L, or C) (High, Moderate, Low, or Clear) C Conductivity 120 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Species/ Number Captured per Cluster Mean Sub Percent Species/ Number Captured per Cluster Species/ Number Captured per Cluster	-			•				
(High, Moderate, Low, or Clear) 12 uS Conductivity 12 ppm Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-08 Time of Setting 10:20 Time of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within as ~5 meter diameter area Species/ Number Captured per Cluster 3 Method Number Dominant Dominant Species/ Number Captured per Cluster				ן כ ר				
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-08 Time of Setting 10:20 Time of Setting 10:20 Number of traps set 3 NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Instream Cover Mean Sub Percent Denth Dominant								
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster Method Number Dominant Dominant ice cover	Con	ductivity	120	uS				
FISH COLLECTION SUMMARY Date of Setting 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Linstream Cover Species/ Number Captured per Cluster Method Number Dominant Species/ Number Captured per Cluster	Diss	solved Oxygen (bot	ttom) 12	ppm				
Date of Setting 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3	Diss	solved Oxygen (surf	face)	ppm	····			
Date of Setting 2001-02-08 Date of Collection 2001-02-09 Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3			FISH	COLLECTI	ON SUMMA	RY		
Time of Setting 10:20 Time of Collection 9:45 Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an ~5 meter diameter area Instream Cover Species/ Number Captured per Cluster Method Number Denth Dominant Dominant			2001-02-08	a da frei dan de sa da frei a la da da da frei da frei da frei da frei da frei da frei da frei da frei da frei Nota	ೆ ಬೆಕ್ಕೆ ಬಿಲ್ಲೇ ಕಾರ್ಯನಿ ಗೋಡಿಸಿದ್ದಾರೆ. ಬಿಲ್ಲಾ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾರ್ಯನಿ ಕಾ	Date of C	Collection	2001-02-09
Number of traps set 3 Number of traps collected 3 NOTE: Cluster contains three traps within an ~5 meter diameter area Instream Cover Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent Method Number Dominant Dominant						Time of C	Collection	9:45
Capture Cluster Instream Cover Species/ Number Captured per Cluster Mean Sub Percent Method Number Dominant Dominant ice cover						Number	of traps collected	3
Capture Cluster Mean Sub Percent Method Number Denth Dominant Dominant ice cover	NOTE: Cluster con	tains three traps within	an ~5 meter diameter a					
				-	ber Captured per Clu	uster		
					CO / 2			
						/•	[] · · · · · · · · · · · · · · · · ·
			- 1913年月1月11日1日日日日日日日日日日日日日日日日日日日日日日日日日日日日日日	an an an an an an an an an an an an an a				Desta de la composición de la composición de la composición de la composición de la composición de la composici
				Comn	nents			
Comments	pH = 7.4							
a (14, 4, 17, 1997), Beggi an Adag bega in Peres legistration of a transformational and the formation of a second								
s (1919)								
s (1919)	Rainbow on	line # 3 has ton	caudel erosion					
pH = 7.4	I CUITOOW OII	ine i o nao top						
s (1919)								
pH = 7.4								
pH = 7.4								
pH = 7.4	L			<u></u>				· · · · · · · · · · · · · · · · · · ·

			SITE VISIT DESCRIPT	ION	
Site Name (e.g. TOB-1)	BYM-	2	first three letters of stream name-site number	VISIT #	3
	n na finishing sa ta		PHOTO DOCUMENTATI	ON	
Roll Name	Frame Nu	mber	Photo Description		
0W3	24		ite view looking downstream, limno visible.	1 040	

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, some)	Type of Recaptured Fin Clip
MT	1	1	RB	61	3.1	UM	
MT	1	1	RB	44	1	UM	
MT] 1] 1	RB	103	15.3	UM	
MT	1	2	СО	62	3.5	UM	
MT	1	2	Со	68	3.8	UM	
MT] 1	2	RB	74	5.2	UM	
MT	1	2	RB	71	5.5	UM	
MT	1	3	RB	79	7.4	UM	
MT	1	3	RB	44	1.4	UM	
MT	1	3	RB	81	7.3	UM	

Site Name BYN	M - 2 first three letters of stream	VISIT # 4
e.g. TOB-1)	Indite-site indition	Date of survey Time of survey Surveyors
		2001-03-08 9:30 TJ,TD,JD
azetted Stream Name	Local Stream Name	Watershed Code
eather Sunny and	1 Clear	
ir Temperature -2	2 ° C	Stream Flow M (High, Moderate, Limited, None)
e Cover (%) 10	DO Pot	ential for fish migration M (High, Moderate, Limited, None)
LIMNOLO	GY STATION	FISH SUMMARY
Depth from upper surface	of ice (cm) 50	Total # of Mininimum Maximum
Ice thickness (cm)	25	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or I		CO 4 40 64
(High, Moderate, Limited, None) Snow Depth (cm)		RB 10 45 106
Water Temperatu	······································	
Turbidity (H,M, I		
(High, Moderate, Low, Conductivity		
Dissolved Oxyger		
Dissolved Oxyger		
		CTION SUMMARY
Date of Setting	2001-03-08	Date of Collection 2001-03-09
Time of Setting	9:30	Time of Collection 9:40
Number of traps set	3	Number of traps collected 3
1	s within an ~5 meter diameter area Instream Cover Species	/ Number Captured per Cluster
Capture Cluster Mean Method Number Depth	Sub Percent	
MT 1	100 CO	· 4 RB / 10 / / / / / / / / /
	c	omments
an in the second of the second s	c	omments
bH = 7.2	n en sur 2000 en el la substantia en el la substantia en la substantia en la substantia en la substantia en la	omments
oH = 7.2	C een sites 1 & 2 than last month	omments
bH = 7.2	n en sur 2000 en el la substantia en el la substantia en la substantia en la substantia en la substantia en la	omments
pH = 7.2	n en sur 2000 en el la substantia en el la substantia en la substantia en la substantia en la substantia en la	omments

Site Name (e.g. TOB-1)

BYM-

first three letters of stream name-site number

2

VISIT # 4

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fork Length Fish Type of Fin Clip Trap Species Capture Cluster Clip Number (**mm**) Weight (g) Number Method (e.g. adipose, upper caudal, none) NFC MT 1 1 UM MT 1 2 RB 45 1.3 MT 1 2 со 64 2.9 UM UM 2 RB 84 7.5 MT 1 UM 2 RB 79 5.3 MT 1 UM 1 2 со 47 1.2 MT UM 2 со 47 1.1 MT 1 UM со 1 1 2 40 MT 3 74 4.5 UM 1 RB MT 3 RB 106 12.5 UM 1 MT 3 UM RB 80 5.7 MT 1 1 3 RB 65 3 UM MT RB 68 4.1 UM 3 1 MT UM 2 MT 1 3 RB 55 4.7 UM 1 3 RB 71 MT

Γ

Site Name [e.g. TOB-1]	M-3	first three letters of stream name-site number	VISIT #	# 1
		1		Surveyors
Gazetted Stream Name	Local Strea	um Name Wa	2000-12-14 10:15	BD,TJ
Byman Creek	Local Suca			
Weather Clear and	l cold	· · · · · · · · · · · · · · · · · · ·		
Air Temperature -	16 °C		Stream Flow [L] (High, Moderate, Limit	ed, None)
ce Cover (%) 1	00	Potentia	l for fish migration M (High, Moderate, Limit	ed, None)
LIMNOLO	IGY STATI	ON	FISH SUMMARY	an an an an an an an an an an an an an a
Depth from upper surface	e of ice (cm)	87		aximum
Ice thickness (cm)	[21	Species Fish Length (mm) Len	gth (mm) 62
Clarity of Ice (H,M,L, or (High, Moderate, Limited, None)		N	RB 2 68	84
(High, Moderate, Limited, None) Snow Depth (cm)	,	0		J
Water Temperati	ure	0.1 °C		
Turbidity (H,M, (High, Moderate, Low		С		
Conductivity	, 0, 0,012)	140 <i>uS</i>		
Dissolved Oxyge	en (bottom)	10 ppm		
Dissolved Oxyg		ppm		
		FISH COLLECTI	ON SUMMARY	
Date of Setting	2000-12-	14	Date of Collection	2000-12-15
Time of Setting	10:15		Time of Collection	<u>10:15</u>
Number of traps set	3	lamatar a ma	Number of traps collected	3
NOTE: Cluster contains three trap Capture Cluster Mean	Instream C	Cover Species/ Num Percent	ber Captured per Cluster	
Method Number Depth	Dominant Dominat	$\begin{bmatrix} \text{nt} & \text{ice cover} \\ 100 \end{bmatrix} \begin{bmatrix} \text{CO} \\ 1 \end{bmatrix}$	RB/2	
		Comn	nents	
	a de les stalles stalls	ere sampled in the truck	с. — — — — — — — — — — — — — — — — — — —	
		1		
December 15th temp i		•		
December 15th temp i		-		
December 15th temp i		-		
December 15th temp i				

Site Name (e.g. TOB-1)	BYM - 3	first three letters of stream name-site number	VISIT # 1
		PHOTO DOCUMENTATI	ION

pture thod	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] [1] _ 1	СО	62	4	UM	
MT] _ 1] 1	RB	84	8.4	UM	
MT	1] 1	RB	68	5.4	UM	

Site Name e.g. TOB-1) BYM	first three letters of stream name-site number	VISIT # 2
		Date of surveyTime of surveySurveyors2001-01-1110:10TJ,TD,JD
Jazetted Stream Name	Local Stream Name Wa	atershed Code
Byman Creek		
eather Overcast.		
ir Temperature	_ ° c	Stream Flow (High, Moderate, Limited, None)
ce Cover (%) 85	Potentia	al for fish migration M (High, Moderate, Limited, None)
LIMNOLOG	Y STATION	FISH SUMMARY
Depth from upper surface of	f ice (cm) 78	Total # of Mininimum Maximum
Ice thickness (cm)	21	Species Fish Length (mm) Length (mm) CO 6 45 53
Clarity of Ice (H,M,L, or N) (High, Moderate, Limited, None)	Ν	RB 7 39 78
(High, Moderate, Limited, None) Snow Depth (cm)	27	
Water Temperature	0.2 ° C	
Turbidity (H,M, L, o (High, Moderate, Low, or		
Conductivity	100 <i>uS</i>	
Dissolved Oxygen ((bottom) 12 ppm	
Dissolved Oxygen (
	FISH COLLECTI	(2) A statistic sector sector is a sector sector method bet in the other inter- tion of the sector sector sector is a sector sector of the sector sector is a sector of the sector sector.
Date of Setting	2001-01-11	Date of Collection2001-01Time of Collection10:00
Time of Setting Number of traps set	<u> 10:10 </u> <u> </u>	Number of traps collected 3
NOTE: Cluster contains three traps wi	ithin an ~5 meter diameter area	
Capture Cluster Mean	Sub Percent	mber Captured per Cluster
Method Number Depth I MT 1	Dominant Dominant ice cover	
	· ·	
		ments
Ice surface is slushy. Sof	t enough to break through.	
	-15.	
January 12th, air temp =		
January 12th, air temp = - pH = 7.6		

Site Name (e.g. TOB-1)

1

124

COLUMN ST

-Sa

1

first three letters of stream name-site number

BYM-3

VISIT # 2

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] 1	1	RB	76	5.8	UM	
MT	1	1	RB	46	1.6	UM	
MT	1	1	CO	45	1.2	UM	
MT	1	1	СО	45	1.3	UM	
MT	1	1	СО	44	1.1	UM	
MT] 1	2	RB	41	1.1	UM	
MT	1	2	RB	78	6.8	UM	
MT	1	2	RB	50	1.6	UM	
MT	1	2	RB	44	1.2	UM	
MT] 1	2	СО	46	1.3	UM	
MT		3	СО	45	1.3	UM	
MT		3	СО	53	1.9	UM	
MT	1	3	RB	39	0.9	UM	

Site Name BYN (e.g. TOB-1)	M - 3 first three letters of stream name-site number	• VISIT # 3
		Date of surveyTime of surveySurveyors2001-02-0810:10TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code
Byman Creek		
Weather Light sno	wfall	
Air Temperature	7_° c	Stream Flow (High, Moderate, Limited, None)
lce Cover (%) 1(00 Po	tential for fish migration M (High, Moderate, Limited, None)
LIMNOLO	GY STATION	FISH SUMMARY
Depth from upper surface	e of ice (cm) 79	Total # of Mininimum Maximum
Ice thickness (cm)	35	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or	N) N	
(High, Moderate, Limited, None) Snow Depth (cm)	7	RB 12 39 76
Water Temperatu	•	
Turbidity (H,M, I		
(High, Moderate, Low, Conductivity		
Dissolved Oxyge		
Dissolved Oxyge		
	·	CTION SUMMARY
Date of Setting	2001-02-08	Date of Collection 2001-02-
Date of Denn-B	10:10	Time of Collection 9:55
Time of Setting		Number of trops collected
Time of Setting Number of traps set	3	Number of traps collected 3
	s within an ~5 meter diameter area	
Number of traps set	s within an -5 meter diameter area Instream Cover Specie Sub Percent	s/ Number Captured per Cluster
Number of traps set	s within an -5 meter diameter area Instream Cover Specie Sub Percent Dominant Dominant ice cover	
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	s within an -5 meter diameter area Instream Cover Specie Sub Percent Dominant Dominant ice cover	s/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	s within an -5 meter diameter area Instream Cover Specie Sub Percent Dominant Dominant ice cover	s/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number Denth	s within an -5 meter diameter area Instream Cover Specie Sub Percent Dominant Dominant ice cover	s/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number Denth MT	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 /
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	s/ Number Captured per Cluster
Number of traps set NOTE: Cluster contains three traps Capture Cluster Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 1 1
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 1 1
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 1 1
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 1 1
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 1 1
Number of traps set NOTE: Cluster contains three traps Capture Cluster Mean Method Number MT 1	s within an -5 meter diameter area Instream Cover Sub Percent Dominant Dominant ice cover 100 RB	S/ Number Captured per Cluster 12 CO 5 1 1

Site Name (e.g. TOB-1) BYM 3 first three letters of stream name-site number VISIT # 3 PHOTO DOCUMENTATION	Roll Name	Frame Number	Photo Description	
			PHOTO DOCUMENTATIO	ON
	Site Name (e.g. TOB-1)	BYM-3		VISIT # 3

·

OW3 25

- -----

. 10

1

Looking downstream with limno visible

na serie de la composition de la composition de la composition de la composition de la composition de la compo Nota de la composition de la composition de la composition de la composition de la composition de la compositio INDIVIDUAL FISH DATA

Type of Recaptured Fin Species Fork Length Fish Type of Fin Clip Cluster Trap Capture Weight (g) Clip (mm) Method Number Number (e.g. adipose, upper caudal, none) UM 2.7 MT 1 1 СО 62 UM 1 1 со 45 1.2 MT 72 5.2 UM 1 2 RB MT 2 RB 76 6.3 UΜ MT 1 1 2 RB 42 0.6 UM MT 2 RB 74 5.6 UM 1 MT 2 RB UM 1.1 MT 1 44 UΜ MT 1 2 RB 75 6.3 3.3 UM 2 со 65 1 MT 2 со 0.5 UM 41 MT 1 0.09 UM 1 2 RB 42 MT 3 RB 44 0.9 UM MT 1 0.9 UM 3 RB 41 MT 1 RB 1.2 UM MT 1 3 43 1 3 RB 39 0.7 UM MT 1.4 UΜ 3 RB 45 1 MT 70 UΜ MT 1 3 со 4.3

Date of survey Time of survey Surveyer 2001-03-08 9:45 TJ,TD. Byman Creek	2001-03-08 9:45 TJ,TD,JD Local Stream Name Watershed Code /and Clear -2 °C Stream Flow M (Fligh, Moderner, Limited, Nore) 100 Potential for fish migration M (Fligh, Moderner, Limited, Nore) 100 Potential for fish migration M (Fligh, Moderner, Limited, Nore) 100 Potential for fish migration M (Fligh, Moderner, Limited, Nore) 100 Potential for fish migration Minimizum Maximum face of ice (cm) 75	ite Name b.g. TOB-1) BYM	first three letters of stream name-site number	VISIT # 4
Gazetted Stream Name Local Stream Name Watershed Code Byman Creek	Local Stream Name Watershed Code ' and Clear -2 C -2 C 100 Potential for fish migration M (High, Modense, Limited, Nome) 100 Potential for fish migration M (High, Modense, Limited, Nome) 100 Potential for fish migration M (High, Modense, Limited, Nome) 100 Potential for fish migration (High, Modense, Limited, Nome) Potential for fish migration (A) 75 (A) (A) (A) (B) (A) (B) (A) (B) (A) (B) (A) (B) (A) (B) (B) (B) (B) (B) (B) (B) (B)			
Byman Creek Weather Sump and Clear Air Temperature -2 C Stream Flow M (High, Moderate, Linited, Norsh) Ice Cover (%) 100 Potential for fish migration M (High, Moderate, Linited, Norsh) LiMNOLOGY STATION Pish SUMMARY Depth from upper surface of ice (cm) 75 Stream Flow M (High, Moderate, Linited, Norsh) Ice thickness (cm) 23 CO 3 46 70 Clarity of Ice (H,M.L, or N) N Species Fish Length (mm) Length (mm) Mater Temperature 0.3 C Turbidity (H,M, L, or C) C RB 5 38 73 Dissolved Oxygen (surface) ppm ppm ppm Species/ Number of traps collection 2001 Time of Setting 2010-03-08 Date of Collection 2001 9 Number of traps set 3 Species/ Number Captured per Cluster 9 Method Number Species/ Number Captured per Cluster 9 Muthor Instream Cover Species/ Number Captured per Cluster 9 Mothon Muthor Species/ Number Captured per Cl	r and Clear -2 ° C Stream Flow M (High, Modernee, Limited, None) 100 Potential for fish migration M (High, Modernee, Limited, None) LOGY STATION Fish SUMMARY CO 3 46 70 CH 1 68 68 CH 1 68 68 CH 1 68 68 CH 1 68 68 CH 1 68 68 73 CH 1 68 68 73 CH 1 68 73 CH 1 68 73 CH 1 68 73 CH 1 75 75 75 75 75 75 75 75 75 75 75 75 75	azetted Stream Name	Local Stream Name Waters	
Air Temperature 2 C Stream Flow M (High, Modenne, Linnical, None) Air Temperature 100 Potential for fish migration M (High, Modenne, Linnical, None) Depth from upper surface of ice (cm) 75 FISH SUMMARY Det tokness (cm) 23 C Total # of Mininimum Maximum Charty of Ice (HML, or N) N N Eength (rmn) Length (rmn) Length (rmn) Snow Depth (cm) 2	-2 C Stream Flow M (figh, Moderate, Limited, Nore) 100 Detential for fish migratio M (figh, Moderate, Limited, Nore) 100 Contract fish migratio M (figh, Moderate, Limited, Nore) ISTEAM Flow Fish Stream Flow face of ice (cm) 75			
ce Cover (%) 100 Potential for fish migration M (High, Moderne, Liniked, Norw) Linknoloccy STATION Fish Fish Liniked, Norw) Depth from upper surface of ice (cm) 75 Total # of Mininimum Maximum Let thickness (cm) 23 Co 3 46 70 Clarity of Ice (H,ML, or N) N Species Fish Length (mm) Length (mm) Clarity of Ice (H,ML, or N) 0.3 C 73 46 70 Snow Depth (cm) 2 RB 5 38 73 Water Temperature 0.3 C C RB 5 38 73 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Date of Collection 2001 Time of Setting 2001-03-08 Date of Collection 9 Number of traps collected 9 NotE: Classer coatalase three traps within as -5 suster diamster area Species/ Number Captured per Cluster 9 Number of traps set 3 Co 3 CH 9 Number of traps set 100 CO 3 CH RB 5	100 Potential for fish migration M (High, Moderne, Limited, Nore) LOGY STATION face of ice (cm) 75 Image: Colspan="2">Species , or N) N Species Total # of Mininimum Maximum , or N) 0.3 C Image: Colspan="2">CO 3 46 70 , or N) 0.3 C Image: Colspan="2">CH 1 68 68 , or C) Co 3 46 70 , two or Clear) uS Image: Colspan="2">Species Total # of Mininimum Maximum wygen (bottom) 12 ppm gpm Species Total # of Olice total # of 2001-03-08 9:45 June of Collection 9:55 June of traps collected 3 a regar withis as -5 user diameter area Species/ Number Captured per Cluster 3 terms Species/ Number Captured per Cluster 3 terms 100 Co 3 CH 1 RB 5	eather Sunny and Cle	ear	
LIMNOLOGY STATION Figh Figh State of fice (cm) 75 Ice thickness (cm) 23 Co 3 46 70 Clarity of Ice (H,M,L, or N) N CO 3 46 70 Clarity of Ice (H,M,L, or N) N CO 3 46 70 Snow Depth (cm) 2 Co 3 46 68 Noterne, Lumide, None) 2 Co 3 46 70 Water Temperature 0.3 C C (H) 68 68 RB 5 38 73 73 73 74 Dissolved Oxygen (bottom) 12 ppm ppm 100 12 ppm 100 2001 92 Date of Setting 2001-03-08 Date of Collection 2001 92 92 92 92 Number of traps set 3 Number of traps collected 92 92 92 92 92 92 92 92 92 92 92 93 93 93 93 93 93 93	Image: Second second	ir Temperature -2	Ċ	Stream Flow M (High, Moderate, Limited, None)
Depth from upper surface of ice (cm) 75 Ice thickness (cm) 23 Clarity of Ice (H,M,L, or N) N (fligh, Moderna, Limited, None) 2 Snow Depth (cm) 2 Water Temperature 0.3 Conductivity 46 Turbidity (H,M, L, or C) C (High, Moderna, Low, or Clear) C Conductivity 45 Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-03-08 Norte: Cluster contains three traps within au -5 meter attanteer area Subset of Viniter Species/ Number of traps collection Norte: Cluster contains three traps within au -5 meter attanteer area Subset of Number of traps collected Species/ Number Captured per Cluster Method Number Dominant Norte: Contained Setting Species/ Number Captured per Cluster Method Number Dominant Species/ Number Captured per Cluster Maan Method Number Dominant Species/ Number Captured per Cluster Maan Method Number Dominant Species/ Number Captured per Cluster<	rface of ice (cm) 75 23 23 a, or N) N ione) 2 2 3 46 70 CH 1 68 68 RB 5 38 73 erature 0.3 0.3 C M, L, or C) C uS uS xygen (bottom) 12 ppm uS xygen (surface) ppm 2001-03-08 Date of Collection 9:45 Time of Collection 3 1 9:45 Number of traps collected 3 et reps withis as -5 meet diamster area Instream Cover Species/ Number Captured per Cluster dean Sub Percent Species/ Number Captured per Cluster mb 100 CO / 3 CH / 1 RB / 5	e Cover (%) 100	Potential fo	or fish migration M (High, Moderate, Limited, None)
Log in both eppty name of etc (11, 10) Log in the point of the	Image: Secies of the second sector of the second second second second second second	LIMNOLOGY	STATION	FISH SUMMARY
Le thickness (cm) Let thickness (cm) Clarity of Ice (H,M,L, or N) (High, Moderse, Limited, None) Snow Depth (cm) Water Temperature O.3 C Turbidity (H,M, L, or C) (High, Moderse, Liow, or Cless) Conductivity US Dissolved Oxygen (bottom) Dissolved Oxygen (surface) pm EISH COLLECTION SUMMARY Date of Setting 2001-03-08 Value of Setting 2001-03-08 Value of Collection Sub Percent MT 1 Co C Co Co Co Co Co Co Co	23	Depth from upper surface of ic	e (cm) 75	Total // Of Prainfilling
Clarity of Ice (H,M,L, or N) (fligh, Modense, Limited, None) Snow Depth (cm) Water Temperature Turbidity (H,M, L, or C) (digh, Modense, Low, or Clear) Conductivity Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm PISH COLLECCTION SUMMARY Date of Setting Time of Setting 12 Pate of Collection Time of Collection Species/ Number of traps collected Number of traps set Number of traps set Number of traps set Species/ Number Captured per Cluster Method Number MT MT CO Comments Comments Comments Comments Comments	A, or N) N CH 1 68 68 erature 0.3 C RB 5 38 73 www.or Clear) u.S u.S u.S u.S u.S xygen (bottom) 12 ppm pm 2001-03-08 Date of Collection 2001-03-08 9:45 Time of Collection 9:55 Number of traps collected 3 at raps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster dean Sub Percent CO / 3 CH / 1 RB / 5 / / /	Ice thickness (cm)	23	
Snow Depth (cm) 2 Water Temperature 0.3 Turbidity (H,M, L, or C) C (High, Modera, Low, or Clear) C Conductivity uS Dissolved Oxygen (bottom) 12 ppm ppm Dissolved Oxygen (surface) ppm Pate of Setting 2001-03-08 Time of Setting 9:45 Number of traps set 3 NoTE: Cluster Instream Cover Sub Percent Method Number Instream Cover Sub Percent Method Number Instream Cover Sub Species/Number Captured per Cluster Method Number Dentinant Dominant is eaver MT 1 Image: Courter Sub Sub Comments.	2 RB 38 73 erature 0.3 C RB 5 38 73 M, L, or C) C uS uS uS uS uS xygen (bottom) 12 ppm ppm uS uS uS uS xygen (surface) ppm ppm Date of Collection 2001-03-03 9:45 Time of Collection 2001-03-03 9:45 Time of Collection 9:55 Number of traps collected 3 et raps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster 3 dean Sub Percent Species/ Number Captured per Cluster 4 4 Dominant Dominant 100 CO / 3 CH / 1 RB / 5 / / /		Ν	
Turbidity (H,M, L, or C) C (High, Moderate, Low, or Clear) uS Conductivity uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-08 Time of Setting 9:45 Number of traps set 3 Number of traps collected 9 Number of traps set 3 Note: Cluster contains three traps within an -5 meter diameter area Capture Cluster Mean Method Number Dominant Dominant is ecover MT 1 Denh Dominant is ecover MT 100 CO 3 CH 1 Reson 100 Comments	M, L, or C) C , Low, or Clear) uS xygen (bottom) 12 ppm ppm FISH COLLECTION SUMMARY 2001-03-08 Date of Collection 9:45 Time of Collection 3 Number of traps collected 9:45 Number of traps collected 3 Number of traps collected	•	2	RB 5 38 73
(High, Moderate, Low, or Clear) Conductivity uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-08 Date of Collection 2001 Time of Setting 9:45 Time of Collection 9 Number of traps set 3 Number of traps collected Number of traps collected Species/Number Captured per Cluster Capture Cluster Mean Sub Percent Species/Number Captured per Cluster Method Number Dominant Dominant ise over Cluster Species/Number Captured per Cluster Species/Number Captured per Cluster Sub Percent Nethod Number 1 00 CO / 3 CH / 1 RB / 5 / /	Low, or Clear) xygen (bottom) 12 ppm xygen (surface) ppm FISH COLLECTION SUMMARY 2001-03-08 Date of Collection 2001-03- 9:45 Time of Collection 9:55 3 Number of traps collected 3 e traps within a -5 meter diameter area Instream Cover Species/ Number Captured per Cluster dean Sub Percent Species/ Number Captured per Cluster dean Sub Percent Cover Species/ Number Captured per Cluster dean Sub Percent Cover Species/ Number Captured per Cluster dean Sub Percent Cover Species/ Number Captured per Cluster dean Sub Percent Cover Cover Cluster Cov	Water Temperature	0.3 ° C	
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-08 Date of Collection 2001 Time of Setting 9:45 Time of Collection 99 Number of traps set 3 Number of traps collected 100 NOTE: Cluster contains three traps within an -5 meter diameter area Instream Cover Suber Percent Sub Percent 100 Percent 100 CO / 3 CH / 1 RB / 5 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1	xygen (bottom) 12 ppm pym FISH COLLECTION SUMMARY 2001-03-08 Date of Collection 2001-03- 9:45 Time of Collection 9:55 3 Number of traps collected 3 e traps within as -5 meter diameter area Instream Cover Species/ Number Captured per Cluster dean Sub Percent Species/ Number Captured per Cluster dean Sub Percent 100 CO / 3 CH / 1 RB / 5 / / /			
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-03-08 Date of Collection 2001 Time of Setting 9:45 Time of Collection 9 Number of traps set 3 Number of traps collected Number of traps collected Species/Number Captured per Cluster Capture Cluster Mean Sub Percent Mean Dominant Dominant Dominant ice cover CO / 3 CH / 1 RB / 5 / / /	xygen (surface) ppm FISH COLLECTION SUMMARY 2001-03-08 Date of Collection 2001-03- 9:45 Time of Collection 9:55 3 Number of traps collected 3 e traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Mean Sub Percent Species/ Number Captured per Cluster Mean Sub Percent Cover Cover Cluster Mean Dominant is ecover Cover Cover Cluster Mean Dominant is ecover Cover Cover Cluster Mean Sub Percent Cover Cluster Mean Cover Cover Cover Cluster Cluster Mean Cover Cover Cover Cluster Cluster Cluster Cluster Cluster Cover Cluster Cover Cluster Cover Cover Cover Cover Cover Cover Cover Cover Cluster Cover Cluster Cluster Cover Cluster Cover Cover Cover Cover Cover Cover Cover Cover Cover Cover Cover Cover Cover Cover Cluster Cover Cluster Cover Cover Cover Cover Cover Cover Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cover Cover Cover Cover Cover Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cover Cover Cover Cover Cluster Cover Cluster Cover Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cover Cluster Cluster Cover Cluster Cover Cluster Cluster Cover Cluster Cluster Cluster Cover Cluster Cluster Cover Cluster Cl	-		
FISH COLLECTION SUMMARY Date of Setting 2001-03-08 Date of Collection 2001 Time of Setting 9:45 Time of Collection 99 Number of traps set 3 Number of traps collected 99 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster Method Number Dominant Dominant Comments CO 3 CH 1 RB 5	FISH COLLECTION SUMMARY 2001-03-08 Date of Collection 2001-03-0 9:45 Time of Collection 9:55 3 Number of traps collected 3 e traps within aa -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Mean Sub Percent CO 3 CH 1 RB 5			
Date of Setting 2001-03-08 Date of Collection 2001 Time of Setting 9:45 Time of Collection 9 Number of traps set 3 Number of traps collected 9 NOTE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster 9 Capture Cluster Mean Sub Percent Species/ Number Captured per Cluster 9 Method Number Denth Dominant ice cover CO / 3 CH / 1 RB / 5 / / / / / / / / / / / / / / / / /	2001-03-08 Date of Collection 2001-03-0 9:45 Time of Collection 9:55 3 Number of traps collected 3 e traps within an -5 meter diameter area Instream Cover Vean Sub Percent Dominant Dominant ice cover 100 CO 3 CH 1 RB 5	Dissolved Oxygen (su		CEIMAA DV
Time of Setting 9:45 Time of Collection 9 Number of traps set 3 Number of traps collected 9 NOTE: Cluster contains three traps within an -5 meter diameter area Number of traps collected 9 Capture Cluster Instream Cover Species/ Number Captured per Cluster Method Number Dominant Dominant Ice cover 100 CO / 3 MT 1 100 CO / 3 CH / 1 RB / 5	9:45 Time of Collection 9:55 3 Number of traps collected 3 e traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Mean Sub Percent CO / 3 CH / 1 RB / 5 / / / / Dominant Dominant Item / 100 CO / 3 CH / 1 RB / 5 / / / /	Date of Setting		and an ended and a service sector and a second to a contract of the second second second second second second s
Number of traps set 3 Number of traps collected NOTE: Cluster contains three traps within an -5 meter diameter area Capture Cluster Instream Cover Mean Sub Percent Method Number Denth Dominant Dominant Dominant ice cover CO MT 1 Comments	3 Number of traps collected 3 e traps within as -5 meter diameter area Instream Cover Mean Sub Percent Dominant Dominant ice cover 100/3CH/1RB/5///		2001-05-08	
Capture Cluster Instream Cover Mean Sub Percent Method Number Dominant Dominant ice cover MT 1 0 0 100 CO / 3 CH / 1 RB / 5 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0	Instream Cover Mean Sub Percent Dominant Dominant ice cover 100 CO / 3 CH / 1 RB / 5 / / / / / / / / / / / / / / / / /		9:45	
Method Number Deminant Dominant Dominant ice cover 100 CO / 3 CH / 1 RB / 5 / / /	Denth Dominant loc cover 100 CO / 3 CH / 1 RB / 5 / / /	Time of Setting		Number of traps collected
Comments	[[[[[[[Time of Setting Number of traps set OTE: Cluster contains three traps withi	3 in an ~5 meter diameter area	
Comments	Comments	Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Lethod Number Denth Don	3 in an ~5 meter diameter area Instream Cover Sub Percent innant Dominant ice cover	Captured per Cluster
Comments	Comments	Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Lethod Number Denth Don	3 in an ~5 meter diameter area Instream Cover Sub Percent innant Dominant ice cover	Captured per Cluster
Comments	Comments	Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Lethod Number Denth Don	3 in an ~5 meter diameter area Instream Cover Sub Percent innant Dominant ice cover	Captured per Cluster
Comments	Comments	Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Lethod Number Denth Don	3 in an ~5 meter diameter area Instream Cover Sub Percent innant Dominant ice cover	Captured per Cluster
		Time of Setting Number of traps set OTE: Cluster contains three traps within apture Cluster Mean Lethod Number Denth Don	3 in an ~5 meter diameter area Instream Cover Sub Percent innant Dominant ice cover	Captured per Cluster
		Time of Setting Number of traps set OTE: Cluster contains three traps withit apture Cluster Mean Lethod Number Denth Don MT 1	3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster
		Time of Setting Number of traps set OTE: Cluster contains three traps with apture Cluster Mean lethod Number Don MT 1 [3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster CH / 1 RB / 5 / / /
		Time of Setting Number of traps set OTE: Cluster contains three traps with apture Cluster Mean lethod Number Don MT 1 [3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster CH / 1 RB / 5 / / /
		Time of Setting Number of traps set OTE: Cluster contains three traps with apture Cluster Mean lethod Number Don MT 1 [3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster CH / 1 RB / 5 / / /
		Time of Setting Number of traps set OTE: Cluster contains three traps with apture Cluster Mean lethod Number Don MT 1 [3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster CH / 1 RB / 5 / / /
		Time of Setting Number of traps set OTE: Cluster contains three traps with apture Cluster Mean lethod Number Don MT 1 [3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster CH / 1 RB / 5 / / /
		Time of Setting Number of traps set OTE: Cluster contains three traps with apture Cluster Mean lethod Number Don MT 1 [3 in an ~5 meter diameter area Instream Cover Sub Percent Dominant ice cover 100 CO / 3	Captured per Cluster CH / 1 RB / 5 / / /

Site Name (e.g. TOB-1)

18.3

1.16

1

1

ſ

BYM-3

2 N

first three letters of stream name-site number

VISIT # 4

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT	1	1	RB	73	4.4	UM	
MT] 1	1	RB	42	0.9	UM	
MT	1] 1	СО	62	2.3	UM	
MT	1	2	RB	38	0.8	UM	
М́Т	1	2	RB	76	5.2	UM	
MT] 1	2	СН	68	3.2	UM	
MT] 1	2	СО	70	3.5	UM	
MT	1	3	СО	46	1.2	UM	
MT	1	3	RB	46	1.2	UM	

ite Name e.g. TOB-1)	MCQ-		rst three letters of stream ame-site number			VISI	T # 1
					Date of survey	Time of survey	
					2000-12-05	15:10	BD,TJ,TD
azetted Stream		Local Stream	Name W	atershed Code			
		L					····
eather [High overcast						
ir Temperat	ure 4°	с		Strea	m Flow	(High, Moderate,	Limited, None)
e Cover (%)	100		Potenti	al for fish mi	gration H	(High, Moderate,	Limited, None)
LIM	NOLOGY	STATIO	N		FISH S	UMMARY	n an the state of
Depth from up	oper surface of ice	(cm)	84		Total # of	Mininimum	Maximum
Ice thickness (cm)		13	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (N	СО	2	65	71
(High, Moderate, L	imited, None)	L		RB	13	49	97
Snow Depth (o	cm)		0				
Water	Temperature).2 °С				
	dity (H,M, L, or C Moderate, Low, or Clea		C				
	uctivity		90 <i>uS</i>				
Disso	lved Oxygen (bot	om)	12 ppm				
	lved Oxygen (sur		ppm				
			SH COLLECT	ON SUM	MARY		n da san ƙwara Maria Ingala ƙasar ƙwara ƙasar ƙasar
Date of Setting		2000-12-05			Date of Co	llection	2000-12
Time of Setting	g	15:10			Time of Co	ollection	10:53
Number of tra	ps set	3			Number of	traps collected	3
OTE: Cluster conta	ins three traps within				- 01		
apture Cluster Iethod Number	Mean	Instream Cov Sub	Percent	ber Captured pe	r Cluster		
fethod Number	T Denth Domin	ant Dominant	100 CO / 2	RB / 13	5 _/_		
		,					
				i se antina de la composición de la composición de la composición de la composición de la composición de la co La composición de la composición de la composición de la composición de la composición de la composición de la c			
			Com	nents			
	g over the ice.	Traps set jus	st off of downstrrear	n side of culv	ert.	_	
-		in tran # ?	Coho are long and a	eru skinnu			
H = 8		m uap # 2.	Cono are long and	ory skilling.			
Water flowing oH = 8 Approx. 20 ca	ddistly larvae						
h = 8 Approx. 20 ca		tom to ice b	ottom is 84cm. 13	cm of water f	lowing over to	p of ice.	
H = 8 Approx. 20 ca		ttom to ice b	oottom is 84cm. 13	cm of water f	lowing over to	p of ice.	

Site Name (e.g. TOB-1)

1000

MCO-1

first three letters of stream name-site number

VISIT #

\$1.10

1

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA

Type of Fin Clip Type of Recaptured Fin Fork Length Fish Capture Cluster Trap Species Clip Method Number Number (**mm**) Weight (g) (e.g. adipose, upper caudal, none) RB 49 1.2 UM 1 1 MT UM RB 54 1.4 1 1 MT 82 5.8 UM 1 2 RB MT MT 1 2 RB 60 1.9 UM UM 79 4.5 2 1 RB MT UM MT 1 2 RB 82 5.4 81 5.8 UM 2 RB MT 1 UM 2 RB 55 1.7 MT 1 MT 1 2 RB 86 5.5 UM 2 77 UM MT 1 RB 4.7 UM 86 6.2 MT 1 2 RB MT 1 2 CO 65 2.2 UM 1 2 со 71 3.3 UM MT 2 RB 97 8.4 UM MT 1 MT 1 3 RB 90 7.5 UM

Date of survey Time of survey Survey of 12:10 Su	te Name MC .g. TOB-1)	CQ - 1 first three lett	
zered Stream Name Local Stream Name Watershed Code Quarrie Creek	.g. 100 1/		Date of survey Time of survey Surveyors
Quarie Creek ather Sunny and clear • Temperature -5 ° C Cover (%) 100 Potential for fish migration M (Figh, Moderae, Limited, Nose) LimNOLOGY STATION FISH SUMMARY Depth from upper surface of ice (cm) 74 Species Fish Length (rm) Maximum Isingh, Modera, Limited, Nose) 44 Species Fish Length (rm) Maximum Carity of ice (H,M.L, or N) N RB 15 39 88 Tubidity (H,M.L, or C) C Grift, Moderae, Law, or Clean Dissolved Oxygen (outfme) ppm Dissolved Oxygen (outfme) ppm ppm Pish 201-01-08 Time of Collection 201-01-08 Time of Setting 2001-01-08 Date of Collection 201-01-08 Number of traps collected 3 File cluster Instream Cover Species/ Number Captured per Cluster Maximum Species/ Number Captured per Cluster Man Sub Prevent Species/ Number Captured per Cluster Maximum 10 Man Sub Prevent Species/ Number Captured per Cluster Maxi			2001-01-08 12:10 TJ,TD,JD
sather Sumny and clear r Temperature _5 C Stream Flow M (Figh, Moderan, Limited, None) Cover (%) 100 Potential for fish migration M (Figh, Moderan, Limited, None) Depth from upper surface of ice (cm) 74 Fish Stream Flow M (Figh, Moderan, Limited, None) Depth from upper surface of ice (cm) 74 Species Fish Length (rm) Langth (rm) Ice thickness (cm) 44 Species Fish Length (rm) Langth (rm) Show Depth (cm) 30 Water Temperature 0.3 * C Turbidity (H, M, L, or C) C Conductivity 100 45 Discolved Oxygen (bottom) ppm ppm Discolved Oxygen (bottom) 12 ppm Date of Collection 2001-0 Number of traps set 12:0 Time of Setting Number Outper cluster Number of traps collected 3 Price cutter Instream Cover Species/ Number Captured per Cluster Number of traps collected 3 Price cutter Instream Cover Species/ Number Captured per Cluster Mat 100 <td< th=""><th>zetted Stream Name</th><th>Local Stream Name</th><th>Watershed Code</th></td<>	zetted Stream Name	Local Stream Name	Watershed Code
Temperature 5 C Stream Flow M (rtigh, Moderase, Limited, Nore) Cover (%) 100 Potential for fish migration M (rtigh, Moderase, Limited, Nore) Depth from upper surface of ice (cm) 74 Fish Length (rm) Maximum Ise thickness (cm) 44 Fish Length (rm) Length (rm) Length (rm) Ise thickness (cm) 44 RB 15 39 88 Clarity of Ice (H.M.L, or N) N RB 15 39 88 Species Fish Length (rm) Length (rm) Length (rm) Water Temperature 0.3 C Total # of Minimum Maximum Snow Depth (cm) 30 w5 Dissolved Oxygen (bottom) ppm ppm Dissolved Oxygen (bottom) 12 ppm Date of Collection 11:4 Mumber of traps set 3 Number of traps collected 3 Tr: Cluster contains three traps within a - 6 meet elumeter area Species/ Number Captured per Cluster 11:4 Moderame, Immum Neminant Norminant Noreminant 11:4	Quarrie Creek		
Potential for fish migration () (High, Modesale, Linide, Nore) Cover (%) 100 Potential for fish migration () (High, Modesale, Linide, Nore) Depth from upper surface of ice (cm) 74 Total # of Minimum Maximum Species Total # of Minimum Maximum Species/ Number Capured per Cluster The Coll ECTION SUMMARY Dissolved Oxygen (bottom) 12 Dissolved Oxygen (bottom) 12 Dissolved Oxygen (bottom) 2 The Coll ECTION SUMMARY The of Collection 11:4	ather Sunny a	nd clear	
FIGH SUMMARY Depth from upper surface of ice (cm) 74 Species (cm) 44 Species (cm) 44 Species (cm) Colspan="2">Maximum Length (cm) Length (cm) Length (cm) Length (cm) Length (cm) Length (cm) Length (cm) Colspan="2">Colspan="2" Colspan="2" Colspan="2" Colspan="2" Colspan="2" Species / Number Captured per Cluster Species / Number Captured per Cluster Species / Number Captured per Cluster Colspan="2" Colspan="2" Colspan="2" Colspan="2"	r Temperature	-5 ° C	Stream Flow M (High, Moderate, Limited, None)
Depth from upper surface of ice (cm) 74 lee thickness (cm) 644 Clarity of Ice (H,ML, or N) (High, Moderas, Low, or Clared) Snow Depth (cm) 30 Water Temperature 0.3 ° C Turbidity (H,M, L, or C) (High, Moderas, Low, or Clared) Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Dissolved Traps set 3 Species Number of traps collection 11:4 Species Number of traps collected 3 Species Number Captured per Cluster sum of air space between water surface and bottom of ice. muary 9th snowing. so of caldisfly larva in traps.	Cover (%)	100	Potential for fish migration M (High, Moderate, Limited, None)
Depin nonit tipped surface of the (clif) (M Lee thickness (cm) 44 Lee thickness (cm) 44 Clarity of Lee (H,ML, or N) N High, Modena, Low, or Clear) 30 Snow Depth (cm) 30 Water Temperature 0.3 Conductivity 100 Dissolved Oxygen (bottom) 2 ppm Dissolved Oxygen (bottom) Dissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Dissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Pissolved Oxygen (surface) ppm Ster of Setting 12:10 Time of Collection 11:4 Instream Cover 3 The of an space between water surface and bottom of ice. number of air space between water surface and bottom of ice. nuary 9th snowing. se of caddisfly larva in trap	LIMNOL	OGY STATION	FISH SUMMARY
Ice thickness (cm) 44 Clarity of Ice (H,M,L, or N) (High, Moderna, Limied, None) Snow Depth (cm) 30 Water Temperature 0.3 C Turbicity (H,M, L, or C) (High, Moderna, Low, or Clear) Conductivity 100 use of Setting 2001-01-08 Pissolved Oxygen (bottom) 12 ppm PissEl COLLECTION SUMMARY Postering Collection 11:4 Collection 11:4 Species/ Number of traps collected 3 Tri: Cluster Month Deminant Deminant ice cover Month Deminant Deminant ice sover Month Deminant Deminant ice sover Month Deminant Deminant ice sover Species/ Number Captured per Cluster thot, where the south south as 4 moder area Instrume Cover Sub Prevention RB / 15 15 201 of air space between water surface and bottom of ice. muary 9th snowing. to of air space between water surface and bottom of ice. muary 9th snowing. to of caddisfly larva in traps.	Depth from upper surfa	ce of ice (cm) 74	
Clarity of Ice (H,M,L, or N) (High, Moeraa, Limied, Nore) 30 Snow Depth (cm) 30 Water Temperature 0.3 C Turbidity (H,M, L, or C) (Gigh, Moderne, Low, or Clee) C Conductivity 100 45 Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Pissel of Setting 2001-01-08 Pine of Setting 12:10 Number of traps set 3 Number of traps set 3 Pisc Cueter contain three traps within an -5 meter diameter area ptime Cluster Instream Cover Parent Species/ Number Captured per Cluster tendo Number Mean Dominaun Dominaun Deminaun	Ice thickness (cm)	44	
Snow Depth (cm) 30 Water Temperature 0.3 C Turbidity (H,M, L, or C) (High, Moderae, Low, or Clear) Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-08 Date of Collection 2001-0 Time of Setting 12:10 Time of Collection 11:4 Number of traps set 3 Number of traps collected 3 Mumber of traps set 3 Number of traps collected 3 Mumber of traps set 100 RB / 15 / 100 RB / 15 / 100 / 11 / 100 RB / 15 / 100 / 11 / 100 /	•	· · · · · · · · · · · · · · · · · · ·	
Water Temperature 0.3 C Turbidity (H, M, L, or C) C C (itigh, Modenan, Low, or Clear) C C Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Prisht COLLECTION SUMMARY Date of Setting 2001-01-08 Date of Collection 2001-0 Number of traps set 3 Number of traps collected 3 Visues could as three traps within au -5 meter disauter area Number of traps collected 3 TE: Cluster could as three traps within au -5 meter disauter area Species/ Number Captured per Cluster 4 where many Prevent Species/ Number Captured per Cluster 6 6 MT 1 100 RB 15 1 1 Second air space between water surface and bottom of ice. a a a Mary of air space between water surface and bottom of ice. a a Jost of caddisfly larva in traps. a a a	(High, Moderate, Limited, None Snow Depth (cm)		
Turbidity (H,M, L, or C) C (figh, Moderate, Low, or Clear) 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm Date of Setting 2001-01-08 Date of Collection 2001-0 Filest Collection 11:4 Number of traps set 3 Number of traps collected 3 TE: Cluster contains three traps within au -5 meter diameter area Species/ Number Captured per Cluster 3 tendo Number Mean Sub Percent Species/ Number Captured per Cluster MT 1 100 RB 15	Water Tempers	ature 0.3 °	c
Conductivity 100 uS Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-08 Date of Collection 2001-0 Time of Setting 12:10 Time of Collection 11:4 Number of traps set 3 Number of traps collected 3 VE: Cluster contains three traps within an -5 meter diameter area Species/ Number Captured per Cluster Instream Cover Species/ Number Captured per Cluster Mean Dominant Decompt MT 1 Image: Decimal traps area RB 15 Image: Decimal traps area State Number of traps collected 3 Species/ Number Captured per Cluster Decimal traps area MT 1 Image: Decimal traps area RB 15 Image: Decimal traps area State Optimized and bottom of ice. Decimal traps area Decimal traps area Decimal traps area State Decimal traps area Decimal traps area Decimal traps area Decimal traps area State Decimal traps area Decimal traps area Decimal traps	Turbidity (H,M	I, L, or C)	
Dissolved Oxygen (bottom) 12 ppm Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-08 Date of Setting 12:10 Number of traps set 3 Visit constants three traps within au -5 meter diameter area npure Cluster Instream Cover Species/ Number Captured per Cluster Parth Dominant Dominant ice cover MT 1 Out of air space between water surface and bottom of ice. mury 9th snowing. ots of caddisfly larva in traps.	· +		ß
Dissolved Oxygen (surface) ppm FISH COLLECTION SUMMARY Date of Setting 2001-01-08 Date of Collection 2001-0 Time of Setting 12:10 Time of Collection 11:4 Number of traps set 3 Number of traps collected 3 TE: Cluster contains three traps within an -5 meter diameter area pture Cluster Mean Sub Percent Species/ Number Captured per Cluster ethod Number Depth Dominant Pominant ice cover MT 1 0 0 0 RB 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	-		nnq
Date of Setting 2001-01-08 Date of Collection 2001-0 Fine of Setting 12:10 Time of Collection 11:4 Number of traps set 3 Number of traps collected 3		· · · · · · · · · · · · · · · · · · ·	
Date of Setting 2001-01-08 Date of Collection 2001-0 Fine of Setting 12:10 Time of Collection 11:4 Number of traps set 3 Number of traps collected 3			OLLECTION SUMMARY
Fine of Setting 12:10 Time of Collection 11:4 Number of traps set 3 Number of traps collected 3 PTE: Cluster contains three traps within an -5 meter diameter area Instream Cover 3 opture Cluster Mean Sub Percent Detti Dominant Dominant ice cover MT 1 100 RB / 15 ////////////////////////////////////		FISH C	an an an an an an an an an an an an an a
Number of traps set 3 Number of traps collected 3 TE: Cluster coatains three traps within an -5 meter diameter area Instream Cover Species/ Number Captured per Cluster Species/ Number Captured per Cluster tethod Number Mean Sub Percent RB / 15 / / / / / / / / / / / / / / / / / / /	Date of Setting		Date of Collection 2001-0
TE: Cluster contains three traps within as -5 meter diameter area ipture Cluster Mean Sub Percent tethod Number Dominant Dominant ice cover MT 1 0 0 RB / 15 / 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		2001-01-08	
Comments 3cm of air space between water surface and bottom of ice. inuary 9th snowing. ots of caddisfly larva in traps.	Date of Setting Time of Setting Number of traps set	2001-01-08 12:10	Time of Collection
Comments 3cm of air space between water surface and bottom of ice. inuary 9th snowing. ots of caddisfly larva in traps.	Time of Setting Number of traps set DTE: Cluster contains three tra apture Cluster Mea Lethod Number Den	2001-01-08 12:10 3 aps within as ~5 meter diameter area Instream Cover an Sub Percent Sub Percent bth Dominant Dominant ice cover	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster
3cm of air space between water surface and bottom of ice. muary 9th snowing. ots of caddisfly larva in traps.	Time of Setting Number of traps set DTE: Cluster contains three tra apture Cluster Mea Lethod Number Den	2001-01-08 12:10 3 aps within as ~5 meter diameter area Instream Cover an Sub Percent Sub Percent bth Dominant Dominant ice cover	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster
nuary 9th snowing. ots of caddisfly larva in traps.	Time of Setting Number of traps set TE: Cluster contains three tra- pture Cluster Mea ethod Number Dep MT 1	2001-01-08 12:10 3 aps within as ~5 meter diameter area Instream Cover an Sub Percent Sub Percent bth Dominant Dominant ice cover	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster Image: Captured per Cluster RB / 15 / Image: Captured per Cluster
H = 7.4	Fime of Setting Number of traps set TE: Cluster contains three tra- pture Cluster Mea Number Der MT 1	2001-01-08 12:10 3 aps within as -5 meter diameter area Instream Cover an Sub Percent th Dominant Dominant ice cover 100	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster 1 RB / 15 / / / Comments 2
	Time of Setting Number of traps set DTE: Cluster contains three transformed the set apture Cluster Mean MT 1 1 3cm of air space be anuary 9th snowing.	2001-01-08 12:10 3 ups within an -5 meter diameter area Instream Cover an Sub Percent th Dominant Porninant ice cover 100 100	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster RB / 15 / Comments
	Time of Setting Number of traps set DTE: Cluster contains three transformed the set apture Cluster Mean mean mean mean mean mean mean mean mean	2001-01-08 12:10 3 ups within an -5 meter diameter area Instream Cover an Sub Percent th Dominant Porninant ice cover 100 100	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster 1 RB / 15 / / / Comments 2
	Time of Setting Number of traps set TTE: Cluster contains three transport of Number ethod Number MT 1 1 3cm of air space be muary 9th snowing.	2001-01-08 12:10 3 ups within an -5 meter diameter area Instream Cover an Sub Percent th Dominant Porninant ice cover 100 100	Time of Collection 11:4 Number of traps collected 3 Species/ Number Captured per Cluster 1 RB / 15 / / / Comments -

Site Name (e.g. TOB-1)

14

1

100

Ville

1600

(ille

1 Cim

MCQ-1

first three letters of stream name-site number

VISIT #

2

PHOTO DOCUMENTATION

INDIVIDUAL PISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)		Type of Fin Clip a adipose, upper caudal, sone)	Type of Recaptured Fin Clip
MT	1	1	RB	78	5.9] [UM	
MT] [1] 1	RB	75	5.8] [UM	
MT] 1	1	RB	44	1.2] [UM	
MT] 1] [1	RB	44	1.2		UM	
MT] [1] 1	RB	51	1.9] [UM	
MT	1	1	RB	44	1.2] [UM	
MT] _ 1	2	RB	52	2] [UM	
MT	1	2	RB	39	1.5		UM	
MT	1	2	RB	72	4.8		UM	
MT	1	2	RB	41	1.8] [UM	
MT	1	3	RB	83	7] [UM	
MT] [1	3	RB	49	2.1] [UM	
MT	1	3	RB	78	5.9] [UM	
MT] _ 1] 3	RB	88	8.8] [UM	
MT	1	3	RB	46	2.2] [UM	

	SITE VI	SIT DESCRIPTION
Site Name e.g. TOB-1)	CQ - 1 first three letters of name-site number	stream VISIT # 3
		Date of surveyTime of surveySurveyors2001-02-0511:35TJ,TD,JD
Gazetted Stream Name	Local Stream Name	Watershed Code
McQuarrie Creek		
Weather High o	vercast	
Air Temperature	-10 ° c	Stream Flow M (High, Moderate, Limited, None)
ce Cover (%)	100	Potential for fish migration L (High, Moderate, Limited, None)
	OGY STATION	FISH SUMMARY
	n ng ng ng ng ng ng ng ng ng ng ng ng ng	Total # of Mininimum Maximum
Depth from upper sur		Species Fish Length (mm)
Ice thickness (cm) Clarity of Ice (H,M,L,	, or N) H	RB 3 44 71
(High, Moderate, Limited, N	one)	
Snow Depth (cm)		
Water Tempe Turbidity (H,		
(High, Moderate,	Low, or Clear)	
Conductivity		
	tygen (bottom) 12 ppm tygen (surface) ppm	
Distorted Cr		LECTION SUMMARY
Date of Setting	2001-02-05	Date of Collection 2001-02-06
Time of Setting	11:35	Time of Collection 11:32
Number of traps set	3	Number of traps collected 3
NOTE: Cluster contains three	traps within an -5 meter diameter area Instream Cover S	pecies/ Number Captured per Cluster
S. C. S. S. T. L	fean Sub Percent	
MT 1		
		Comments
·		
pH = 8.0		

		SITE VISIT DESCRIPT	ION
Site Name (e.g. TOB-1)	MCQ - 1	first three letters of stream name-site number	VISIT # 3
		PHOTO DOCUMENTATI	on
Roll Name	Frame Number	Photo Description	
OW3	17	Site vieew looking upstream.	

INDIVIDUAL FISH DATA

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, sone)	Type of Recaptured Fin Clip
MT] _ 1] [1	RB	44	1	UM	
MT] 1	2	RB	71	4.1	UM	
MT] 1	2	RB	45	1.5	UM	
MT	1	3	NFC				

		DESCRIPTION
Site Name (e.g. TOB-1)	Q - 1 first three letters of stream name-site number	VISIT # 4
		Date of survey Time of survey Surveyors 2001-03-05 11:15 TJ,TD,JD
Gazetted Stream Name Mcquarrie Creek	Local Stream Name	Watershed Code
h	J _1	
Weather Sunny and	a clear	
Air Temperature -	-7 ° c	Stream Flow M (High, Moderate, Limited, None)
	Poten	tial for fish migration
LIMNOLO	GY STATION	FISH SUMMARY
Depth from upper surface	e of ice (cm) 68	Total # of Mininimum Maximum
Ice thickness (cm)	2	Species Fish Length (mm) Length (mm)
Clarity of Ice (H,M,L, or		RB 3 41 73
(High, Moderate, Limited, None)	[]	
Snow Depth (cm)		
Water Temperatu		
Turbidity (H,M,] (High, Moderate, Low	, or Clear)	
Conductivity		
Dissolved Oxyge	··	
Dissolved Oxyge	-	
	FISH COLLEC	FION SUMMARY
Date of Setting	2001-03-05	Date of Collection 2001-03-06
Time of Setting	11:15	Time of Collection11:20Number of traps collected3
Number of traps set	a mithin on a fi motor diamotor area	
NOTE: Cluster contains faree frap.		umber Captured per Cluster
Capture Cluster		
Capture Cluster Mean Method Number Denth	Dominant Dominant ice cover	
Mathead Mumbhan		3 / / / / / / / / /
Method Number Denth MT 1	Dominant Dominant ice cover	nments
Method Number Denth MT 1	Dominant Dominant ice cover 95 RB/ Cor	
Method Number Denth MT 1	Dominant Dominant ice cover	nments
Method Number Denth MT 1	Dominant Dominant ice cover	nments
Method Number Denth MT 1	Dominant Dominant ice cover	nments
Method Number Denth MT 1	Dominant Dominant ice cover	nments
Method Number Denth MT 1	Dominant Dominant ice cover	nments
Method Number Denth MT 1	Dominant Dominant ice cover	nments

・メールは、シルトンメールとして、シルト・レールのないかのないないない、シャクないのできたがない。 かたたい かいたい たいにない たいについ 二二二 進出 立法 ないない デーアー	
SITE VISIT DESCRIPTION	
	• C C

Site Name (e.g. TOB-1)

See.

1 Carl

1.00

Ĺ

MCQ

- 1

first three letters of stream name-site number

VISIT #

PHOTO DOCUMENTATION

4

INDIVIDUAL FISH DATA

Type of Recaptured Fin Fish Species Fork Length Type of Fin Clip Capture Cluster Trap Clip (mm) Weight (g) Method Number Number (e.g. adipose, upper caudal, none) UM 45 1.1 1 RB MT 1 2 NFC MT 1 UM 3 RB 73 3.8 MT 1 UM MT 1 3 RB 41 1

			SITE VISIT	DESCRIP	TION		
Site Name (e.g. TOB-1)	RIC-	1	first three letters of stream name-site number			VIS	IT # 1
(0.g. 102 i)					Date of survey	Time of surve	y Surveyors
					2000-12-18	10:05	BD,TD
Gazetted Stream N	ame	Local Stream	n Name	Watershed Code			
Richfield Creek							
Weather O	vercast with	snow flurr	es.				
Air Temperatu	re 🖡	с		Strea	m Flow L	(High, Moderate	Limited, None)
Ice Cover (%)	100		Pote	ntial for fish mi	gration L	(High, Moderate	, Limited, None)
LIM	NOLOGY	STATIC	DN	nder der soller der Berger Konstantigen Der Gescher Konstantigen	FISH SU	JMMARY	
Depth from upp	er surface of ice	e (cm)	98		Total # of	Mininimum	Maximum
Ice thickness (cr	n)	[46	Species	Fish	Length (mm)	Length (mm)
Clarity of Ice (H	(.M.L. or N)	Γ	N	СО	1	52	52
(High, Moderate, Lin	nited, None)			RB	3	68	105
Snow Depth (cn		L. _	<u>12</u>				
	Cemperature		<u>0.1</u> C				
	ty (H,M, L, or (oderate, Low, or Clea		С				
Conduc	tivity	Ĺ	80 <i>uS</i>				
Dissolv	ed Oxygen (bot	ttom)	12 ppm				
Dissolv	ed Oxygen (sur	face)	ppm	L			
		F	ISH COLLEC	TION SUM	MARY		
Date of Setting		2000-12-1	8		Date of Col		2000-12-19
Time of Setting		10:05			Time of Co		10:25
Number of traps	s set	3			Number of	traps collected	3
NOTE: Cluster contain	-	an ~5 meter dia Instream Co		Number Captured pe	er Cluster		
Capture Cluster Method Number	Меал	Sub inant Dominant	Percent				
MT 1				1 RB / 3			
	•		•				
			Co	mments			
Three traps set $pH = 7.7$	at limno.						
r							
			<u></u>				
L	<u> </u>						· · · · · ·

		SITE VISITI	DESCRIPTION			и ^н н. • и н.
Site Name	RIC - 1	first three letters of stream		VISIT #	1	

Site Name (e.g. TOB-1)

first three letters of stream

name-site number

and a

PHOTO DOCUMENTATION

INDIVIDUAL FISH DATA .

Capture Method	Cluster Number	Trap Number	Species	Fork Length (mm)	Fish Weight (g)	Type of Fin Clip (e.g. adipose, upper caudal, none)	Type of Recaptured Fin Clip
MT] [1	2	СО	52	2	UM	
MT	1] 3	RB	86	8.7	UM	
MT] [1	3	RB	105	16.6	UM	
MT] 1	3	RB	68	4.7		

Upper Bulkley River Overwintering Study 2000-2001

List of Appendices

Appendix 1. Fall Habitat Assessments	
Appendix 1a. Fall Assessment Data Summary Table and Graphs	
Appendix 1b. Fall Habitat Assessments Forms	
Appendix 2. Winter Sampling Data	
Appendix 2a. Winter Sampling Data and Graphs	
Appendix 2b. Winter Sampling Data Forms	
Appendix 3. Species Richness, Diversity and Evenness	
Appendix 4. Density Indices	
Appendix 5. Fork Length, Weight and Condition Factor Data	



AUG 2 8 2001

ADMINISTRATION

Department of Fisheries and Oceans & SKR Consultants Ltd.

Appendix 1. Fall Habitat Assessments

Appendix	1a. Fall Assessment Data Summary Table and Graphs	
	Table summarizing of fall assessment data	
Plate 2.	Histograms summarizing instream cover components at sites sampled during the overwintering study.	94

Appendix 1b. Fall Habitat Assessments Forms

-

-

Upper Bulkley River Overwintering Study 2000-2001

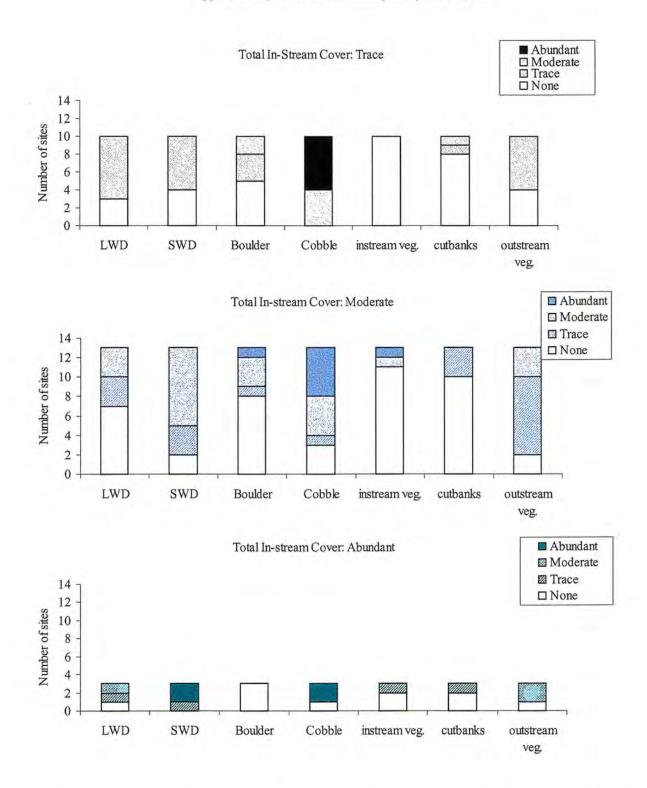


Plate 2. Histograms summarizing instream cover components at sites sampled during the overwintering study.

-

-

-

-

.....

Appendix 1b. Fall Habitat Assessments Forms

DETAILED SITE DESCRIPTION											
Site Name (e.g. TOB-1)	BAR-	1	first three lette name-site num				Date of su 2000-1		Time of su 12:00		Surveyors TJ,BD,TD
Gazetted Stream Na	ame	Local St	eam Name		Watersh	ned Code					
Barren Creek											······
TRIM Map Numbe			4	1:50000 Ma	p#			UTM	Zone	Northing	Easting
Site Location: Desc Upstream side of hig			<u>s</u>								
Opsitionin side of my	,	••••									_
	-							L	imnology	Station M	arked 🖌
Upstream Site Boun	dary mark er (e	.g. Red fla	gging)	Gravel Bar		distance	to nearest	pool upst	ream (mete	ers)	
Downstream Site Bo	oundary marke	r		Culvert		distance	to nearest	pool dow	nstream (n	neters)	
		te Length (motors)	4	Interv	al betweer	channel	widths (m	neters)		2
Gradient (%)	0 Si		meters) e: Minimum of							als to 9	
Cha	nnel Width (1	~ 							1		
	tted Width (1								┥┝────	╡┝──	-
	tted Depth (ci		╺━┥┝┉───	77					┥┝━━━	1	
	cful Depth (ci	₩ -		┥┝╾┈┈┥						1	┥┝━━━
						Estimated		ninant Su	bstrate		COBBLE
		depth is >		I I	Percent	Area (m2)	Sub	-Dominar	nt Substrate	•	FINES
Pool Habitat			< 0.1 m/sec, <10 cm deep				D90	D			14
				1	90	L	1 %E	Embedded	ness		10
Glide Habita	t surfa	nge flow is ce disturba s <10 cm d			Percent	Estimated Area (m2)) Sut] D90		nt Substrate	e [COBBLE FINES 14 10
Edge Habita	t 1 -	s of Pools a 10 cm deep		that	Percent	Estimated Area (m2			<u></u>		
							Do	minant Su	bstrate		
		_			. .	Estimated	Sul	-Dominal	nt Substrat	e 🖡	
Riffle Habits	it Surf	ace disturb	ance provides	cover	Percent	Area (m2	, D94	0		Ī	
	L						%I	Embedded	ness	Ē	
Assessment of Fis	h Habitat	In	tream Cover ((N,T,M,A)	г		Out of	Stream C	over (N,T,	M, A)	N
	(N,T,N	1,A) N=1	None, T=Trac	e, M=Moder	ate, A=A	bundant					
Functional LWD	N	N N	umber <20 cr	n	Nu	umber 20-5	0 cm		Number >	50 cm	
Functional SWD	N						_				
Boulder Cover	Т	s	ingle > 30 cm		5 Во	oulder-clust	ters	1			
Cobble Cover	M	Pe	ercent of site a	irea 4	0						
Undercut Banks	N	L	ength (m)		A	verage wid	th (m)				
Aquatic Vegetati	on N						_				
Overhanging Ve	g. N										
Fish Species Prese	nt:		r	<u> </u>						7	
-		Cohe Bri	bow/Steelhea	d	l			<u> </u>			
Fish Species Suspe	crea:	Cono Kair	oow/Steelnea	u							

DETAILED SITE DESCRIPTION											
Site Name (e.g. TOB-1)	BAR-	first three letters of stream name-site number	Date of survey 2000-11-23	Time of survey Surveyors 12:00 TJ,BD,TD							
PHOTO DOCUMENTATION											
Roll Name	Frame Numb	per Photo Description									
OW3	21	Site view, trap hole visible.									
NR	3	Looking downstream towards culvert with limno visible									
COMMENTS											
Disturbance Ind		Pool is infilling more and more each yea also eroding hillslopes upstream.	ar on both th upstream and downst	ream sides of the culvert. Thre are							
Comment 1		Gravel bar just upstream of pool appear sulvert.	s to be more built up this year. W	ater level is about halfway up the							
Comment 2		· · · · · ·									
Comment 3											

		Γ	ETAIL	ED SI	TE D	ES	CRIP	ΓΙΟΝ	I					
Site Name (e.g. BU TOB-1)	JC-	1	first three letter name-site num					Date of 2000	survey -11-26	Time	e of sur 10:29		Surveyors BD,TJ,TD	2
Gazetted Stream Name]	Local Stre	am Name		Wat	tershe	d Code		-					
Buck Creek														
TRIM Map Number			NTS	1:50000 1	Map #							Northing	z Easting	
Site Location: Describe re	ad and fo	ot access						-	UT	<u> </u>				
Same Limno station as last	year,ie, li	mno still i	n.											
										Limno	ology S	tation N	Aarked	$\mathbf{\overline{\mathbf{v}}}$
Upstream Site Boundary m	arken (e. o	Red flag	and a	Pink Fla	gging	7	distance	to near	est pool up	octream	meter	 (2		200
Downstream Site Boundary				Pink Fla					est pool de					75
Gradient (%) 0	Site	Length (n	neters)	14	Int	terval	i between	h chann	el widths	(meter	s)		2]
		Note	Minimum of	6 widths ta	ken at equ	ual inte	ervals (@ .:	5 interva	ls, 1.5 inter	vais, 2.5	interva	lsto	9.5 intervals)	
Channel V	Vidth (m)][┛Ĺ				┛
Wetted V	Vidth (m)	10	9	9	10		10	10	┥┝━╸	┛┝				┥
Max. Wetted De	epth (cm)	86		106		2	85	61	┥┝━━					-
Max. Bankful Do	epth (cm)													
									ominant	Substra	te	[COBBLE	:
		pth is > 5			Percen	_	Estimated Area (m2)	S	ub-Domii	nant Su	bstrate	Ī	FINES	ב
Pool Habitat			0.1 m/sec, <10 cm deep						90				31	
	<u> </u>	0 0			30			<u>%</u>	6 Embedd	edness			0	
				· · · · ·							-			
		0	0.1]		Estimated		ominant ub-Domi				COBBLE	4
Glide Habitat		disturban	0.1 m/sec, ce, exclue	no ding	Percen	nt /	Area (m2)	,	90	ian Su	USUALC	Ì	FINES 31	-
	edges <	10 cm de	p		60				6 Embedd	adnass			0	
									6 Ellibedu			1		
	Edges	f Pools ar	d Glides	that	D		Estimated							
Edge Habitat	-	cm deep	IC OTICES	UI61	Percer		Area (m2							
					10									
						1	Estimated	_	Dominant	Substra	ite			
	Surface		nce provides	cover	Percer		Area (m2)) S	ub-Domi	nant Su	ibstrate	ļ		
Riffle Habitat					╵──			1)90 					━┥
								1 %	% Embedo	ledness				
Assessment of Fish Habi	tat	Inst	ream Cover ((N,T,M,A		Т		Out	of Stream	Cover	(N,T,№	í, A)	Т	
	(N,T,M,A	N=N	one, T=Trace	e, M=Moo	derate, A	=Abı	undant						r	1
Functional LWD	T		mber <20 cn	n		Nun	nber 20-5	0 cm	3	Nurr	nber >5	0 cm	L	İ
Functional SWD	T	┥	1	F	25	P	14 1	1						
Boulder Cover	T	7	ngle > 30 cm cent of site a	=	25	вou	ilder-clust	ers	4					
Cobble Cover Undercut Banks	M	-	ngth (m)		10	A 1/4	erage widt	th (m)	1					
Aquatic Vegetation	N		ngui (iii)	L		710	stage with	ui (111)	للسشسيا					
Overhanging Veg.	T	า												
	<u></u>	J				┑┍						<u>ר</u> רך		
Fish Species Present:														
Fish Species Suspected:	C	ono, Rain	oow/Steelhea	ld										

		DETAILED SITE D	DESCRIPTION						
Site Name (e.g. TOB-1)	BUC-1	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2610:29BD,TJ,TD						
PHOTO DOCUMENTATION									
Roll Name	Frame Number	r Photo Description							
OW4	3	Site view looking downstream , both h	holes and limno visible.						
R3	R3 1 Looking downstream, limno station visible								
		COMME	NTS						
Disturbance Ind	icators Ro	ad, some farmland adjacent.							
Comment 1	De	eper water appears to be more in centre	e of creek where as last year deeper water was at cut bank.						
Comment 2	Cot	bble is slippery this year due to Periphy	rton growth.						
Comment 3									

		DETAI	LED SITE	E DES	CRIPTI	ON		
Site Name (e.g. B TOB-1)	UC-2	first three let name-site nu	ters of stream mber			te of survey 2000-11-26	Time of survey 11:01	Surveyors BD,TJ,MN
Gazetted Stream Name	Lo	al Stream Name		Watersh	ed Code			
Buck Creek				└──────			<u> </u>	
TRIM Map Number		NT	S 1:50000 Map	#			Zone Nort	hing Easting
Site Location: Describe	road and foot	access				UTM		
About 100 meters upstre	am of Buck Bri	dge # 1 between c	urved tree and	tree in th	e middle of th			
]	Limnology Statio	on Marked 🖌
Upstream Site Boundary	marker (e.g. R	ed flagging)	Pink Flaggin	ıg	distance to	nearest pool ups	tream (meters)	100
Downstream Site Bound	ary marker		Pink Flaggin	ıg	distance to	nearest pool dov	vnstream (meters) 150
Gradient (%) 0	Site Ler	ngth (meters) Note: Minimum o	16 f 6 widths taken a			annel widths (1 tervals, 1.5 interva	neters) Ils, 2.5 intervalsto	4 o 9.5 intervals)
Channe	l Width (m)							
Wetted	Width (m)	10 12	13	12				
Max. Wetted	Depth (cm)	102 127	120	134				
Max. Bankful	Depth (cm)							
	<u></u>		· · · · · · · · · · · · · · · · · · ·			Dominant Su	hatrote	COBBLE
	max, depth	is > 50 cm,			Estimated	Sub-Domina		FINES
Pool Habitat	average flo	w is < 0.1 m/sec,		rcent	Area (m2)	D90	In Subsuare	24
	excluding	edges <10 cm deep	° [40		% Embedde	inecs	0
					······································			
					Entimated	Dominant Su	ibstrate	COBBLE
	average fl	ow is >0.1 m/sec,	no Pe		Estimated Area (m2)	Sub-Domina	nt Substrate	FINES
Glide Habitat	surface dis edges <10	•		50		D90		24
	tuges its			50		% Embedde	iness	0
					Estimated			
Edge Habitat	-	ools and Glides	that Pe	ercent	Area (m2)			
Dugo Muonut	are <10 cm	deep	Г	10				
· · · · · · · · · · · · · · · · ·							1	
					Estimated	Dominant Su Sub-Domina		
Riffle Habitat	Surface di	sturbance provide	s cover Pe	rcent	Area (m2)	D90	III SUUSUAIE	
Kint Habitat		<u>.</u>	C			% Embedde	iness	
						70 Emoculo		
Assessment of Fish Ha	ibitat	Instream Cover	(N,T,M,A)	Т		Out of Stream C	over (N,T,M, A)	Т
	(N,T,M,A)	N=None, T=Tra	ce, M=Moderat	e, A=Ab	undant			
Functional LWD		Number <20 c	m	Nur	mber 20-50 cr	n	Number >50 cm	2
Functional SWD			r	-				
Boulder Cover	N	Single > 30 cm		Bou	ulder-clusters			
Cobble Cover		Percent of site	area 70	4		·		
Undercut Banks	N	Length (m)		Av	erage width (1	n)		
Aquatic Vegetation								
Overhanging Veg.	N							
Fish Species Present:								
Fish Species Suspected	: Coho	Rainbow/Steelhe	ad					

		Ι	DETAILED SITE DE	SCRIPTION				
Site Name (e.g. TOB-1)	BUC-	2	first three letters of stream name-site number	Date of survey 2000-11-26	Time of survey	Surveyors BD,TJ,MN		
	PHOTO DOCUMENTATION							
Roll Name	Frame Numb	er Phot	to Description					
OW4	4	Site vie	ew looking downstream, both hole	es visible.				
R3	2	Lookin	ng downstream, limno visible		·			
COMMENTS								
Disturbance Ind	Disturbance Indicators Beaver activity							
Comment 1	Comment 1 Last year water was deepest under the fallen trees, most of the deeper water is now just upstream of the fallen tree.							
Comment 2 There is a small creek entering at root wad of fallen tree.								
Comment 3	Comment 3							

	D	ETAILED SIT	E DESCRIP	ΓΙΟΝ	
Site Name (e.g. BU TOB-1)	JC-5	first three letters of stream name-site number		Date of surveyTime of surve2000-11-2613:07	y Surveyors TJ,BD,MN
Gazetted Stream Name Buck Creek	Local Stre	am Name	Watershed Code	······································	
TRIM Map Number		NTS 1:50000 Maj	p#		orthing Easting
Site Location: Describe r	oad and foot access				
About 100 meters from Bu	ick Creek Site # 6. L	imno rebar is submerged	so there is a pink fl	ag on middle tree marks the limno	station.
				Limnology Stat	tion Marked 🔽
Upstream Site Boundary n	narker (e.g. Red flag	ging) Pink Flaggi	ng distance	to nearest pool upstream (meters)	100
Downstream Site Boundar	y marker	Pink Flagg	ing distance	to nearest pool downstream (mete	ers) 100
Gradient (%) 0	Site Length (n Note:			1 channei widths (meters) 5 intervals, 1.5 intervals, 2.5 intervals .	3 to 9.5 intervals)
Channel					
Wetted V	Width (m) 10	11 11	13 13		
Max. Wetted D	epth (cm) 119	119 115	118 115	╞━━╾┥┝━╾╾┥┝╼╼╾┥╎	═══┥┝═══┥╽
Max. Bankful D	epth (cm)				
				Dominant Substrate	COBBLE
	max. depth is > 50 average flow is <		Estimated Percent Area (m2)	Sub-Dominant Substrate	FINES
Pool Habitat	excluding edges <		40	D90	20
				% Embeddedness	10
				Dominant Substrate	COBBLE
	average flow is >	-0.1 m/sec, no H	Estimated Percent Area (m2)	Sub Dominant Substants	FINES
Glide Habitat	surface disturbance edges <10 cm dee		40	D90	20
	cugos «To chi de	P		/ % Embeddedness	10
			Estimated	d	
Edge Habitat	Edges of Pools an	d Glides that	Percent Area (m2		
	are <10 cm deep		20]	
			,	Dominant Substrate	
			Estimated Percent Area (m2	Sub-Dominant Substrate	
Riffle Habitat	Surface disturba	nce provides cover		[/] D90	
	·····			% Embeddedness	
Assessment of Fish Hab		ream Cover (N,T,M,A)	Т	Out of Stream Cover (N,T,M,	A) T
Functional LWD		one, T=Trace, M=Moder		Number >50	cm
Functional SWD		mber <20 cm	Number 20-5		
Boulder Cover		ngle > 30 cm 2	0 Boulder-clus	ters 2	
Cobble Cover			0		
Undercut Banks	N Le	ngth (m)	Average wid	th (m)	
Aquatic Vegetation	N				
Overhanging Veg.	Ν				
Fish Species Present:					
Fish Species Suspected:	Coho, Rair	bow/Steelhead			

		DETAILED SITE D	ESCRIPTION					
Site Name (e.g. TOB-1)	BUC-5	first three letters of stream name-site number	Date of survey 2000-11-26	Time of survey 13:07	Surveyors TJ,BD,MN			
	PHOTO DOCUMENTATION							
Roll Name	Frame Number	Photo Description						
OW4	5	Site view loooking upstream ,both hol	es visible					
R3	6	looking downstream						
		COMMEN	NTS					
Disturbance In	dicators Bea	ver Activity						
Comment 1		is deeper than last year, boulders are al year due to broken beaver dams.	bout 0.5m to 1.0m in diameter. A	A little more silt on	edge areas than			
Comment 2								
Comment 3								

(? ; () ()

(() . . .

		DETAIL	ED SITE	DESCRII	PTION		
Site Name (e.g. B TOB-1)	UC - 6	first three lette name-site nun			Date of survey 2000-11-26	Time of survey	Surveyors TJ,BD,MN
Gazetted Stream Name	Lo	cal Stream Name_		Vatershed Code			
Buck Creek							· · · · · · · · · · · · · · · · ·
TRIM Map Number		NTS	1:50000 Map #	·		TM	thing Easting
Site Location: Describe							I[
500 meters downstream	of CNR crossin	g at fallen tree on r	ight bank side o	fcreek			
						Limnology Static	on Marked 🛛 🖌
Upstream Site Boundary	marker (e.g. Re	ed flagging)	Pink Flagging	distan	ce to nearest pool	upstream (meters)	4
Downstream Site Bound	ary marker		Pink Flagging	distan	ce to nearest pool	downstream (meters	s) 150
Gradient (%) 0	 	ngth (meters)	14	Interval betwe	en channel widtl	ns (meters)	2
						tervals, 2.5 intervalst	to 9.5 intervals)
Channel	Width (m)						
Wetted	Width (m)	8 8	10	8 9			
Max. Wetted	Depth (cm)	103 108	102	85 60			
Max. Bankful	Depth (cm)						
				·······	Dominar	t Substrate	COBBLE
	max. depth	is > 50 cm,		Estimate	ed Sub Don	ninant Substrate	FINES
Pool Habitat		w is < 0.1 m/sec, edges <10 cm deep	Perc	cent Area (m	D90		19
	excluding	edges <10 cm deep		30	% Embe	ddedness	5
	·····	· · · ·		Estimate	ed	it Substrate	COBBLE
	average flo surface dis	ow is >0.1 m/sec, turbance, exclu	no Perc	ent Area (m	2) Sub-Don	ninant Substrate	FINES
Glide Habitat	edges <10			60	D90		19
					% Embe	ddedness	5
				Estimat	ed		
Edge Habitat	Edges of Po are <10 cm	ools and Glides	that Per	cent Area (π	12)		
		doop	L	10			
			······			t Substrate	
			Perc	Estimate ent Area (m	Sub-Don	ninant Substrate	
Riffle Habitat	Surface di	sturbance provides	cover		D90		
					% Embe	ldedness	
Assessment of Fish Ha	hitat	Instraam Cover (м	Out of Stree	m Cover (N,T,M, A)) <u>M</u>
Assessment of Fish Ha		Instream Cover (J	Out of Suea		/
Functional LWD	(N,T,M,A)	N=None, T=Trace	·	1			
Functional SWD	M	Number <20 cn	n	Number 20-	50 cm	Number >50 cm	
Boulder Cover		Single > 30 cm		Boulder-clu		1	
Cobble Cover		Percent of site a				1	
Undercut Banks		Length (m)		Average wi	dth (m)	7	
Aquatic Vegetation	N		L	L	/	-	
Overhanging Veg.	T						
		r			r	r	
Fish Species Present:		Boish/Ctr. 11	<u>ــــــــــــــــــــــــــــــــــــ</u>				<u></u>
Fish Species Suspected:	Coho	, Rainbow/Steelhea	<u>a</u>	<u></u>			

:

:

			DETAILED SITE D	DESCRIPTION					
Roll Name Frame Number Photo Description OW4 6 Site view ,both holes visible. R3 5 Looking downstream, Limno flag visible hanging off fallen tree COMMENTS Disturbance Indicators Eroding bank upstream. Some Beaver activity, broken dam just upstream. Comment 1 Same tree as last year, water appears to be a little faster this year. Comment 2		BUC-6	first three letters of stream name-site number			Surveyors TJ,BD,MN			
OW4 6 Site view ,both holes visible. R3 5 Looking downstream, Limno flag visible hanging off fallen tree COMMENTS Disturbance Indicators Eroding bank upstream. Some Beaver activity, broken dam just upstream. Comment 1 Same tree as last year, water appears to be a little faster this year. Comment 2		PHOTO DOCUMENTATION							
R3 5 Looking downstream, Limno flag visible hanging off fallen tree COMMENTS Disturbance Indicators Eroding bank upstream. Some Beaver activity, broken dam just upstream. Comment 1 Same tree as last year, water appears to be a little faster this year. Comment 2	Roll Name	Frame Number	Photo Description						
Comment 1 Same tree as last year, water appears to be a little faster this year. Comment 2	OW4	6	Site view ,both holes visible.						
Disturbance Indicators Eroding bank upstream. Some Beaver activity, broken dam just upstream. Comment 1 Same tree as last year, water appears to be a little faster this year. Comment 2	R3	5	Looking downstream, Limno flag vis	sible hanging off fallen tree					
Comment 1 Same tree as last year, water appears to be a little faster this year. Comment 2	COMMENTS								
Comment 2	Disturbance Indicators Eroding bank upstream. Some Beaver activity, broken dam just upstream.								
	Comment 1 Same tree as last year, water appears to be a little faster this year.								
Comment 3	Comment 2								
	Comment 3				<u> </u>				

()

6

() () ()

	DETAII	LED SITE DES	SCRIPTI	ON	
Site Name (e.g. BU TOB-1)	JC - 7 first three lett name-site num			te of survey Time of survey 2000-11-26 11:28	Surveyors BD,TJ,MN
Gazetted Stream Name	Local Stream Name	Waters	hed Code		
Buck Creek					
TRIM Map Number		S 1:50000 Map #			thing Easting
Site Location: Describe re	ar about the middle of Buck Cree	ek release pond.			
Deline woody doollo of the		•			
	_			Limnology Stati	on Marked 🖌
Upstream Site Boundary n	uarker (e.g. Red flagging)	Pink Flagging	distance to r	nearest pool upstream (meters)	
Downstream Site Boundar	y marker	Pink Flagging	distance to 1	nearest pool downstream (meter	s)
Gradient (%) 0	Site Length (meters) Note: Minimum o			annel widths (meters) ervals, 1.5 intervals, 2.5 intervals	2 to 9.5 intervals)
Channel V					
	Width (m) 5 5				
Max. Wetted D	epth (cm) 84 84	75			
Max. Bankful D					
					COBBLE
	www.dowthics.50.cm		Estimated	Dominant Substrate	FINES
Pool Habitat	max. depth is > 50 cm, average flow is < 0.1 m/sec,	Percent	Area (m2)	Sub-Dominant Substrate	28
	excluding edges <10 cm deep	p 90		D90	0
				% Embeddedness	
				Dominant Substrate	
	average flow is >0.1 m/sec,	no Percent	Estimated Area (m2)	Sub-Dominant Substrate	
Glide Habitat	surface disturbance, excl	uding		D90	
	edges <10 cm deep			% Embeddedness	
	Tiday of Deals and Oliday	that n	Estimated		
Edge Habitat	Edges of Pools and Glides are <10 cm deep	that Percent	Area (m2)		
	· · ·				
			······································	Dominant Substrate	
		Percent	Estimated Area (m2)	Sub-Dominant Substrate	
Riffle Habitat	Surface disturbance provide	es cover		D90	
		J		% Embeddedness	
Assessment of Fish Hab	itat Instream Cover	r (N,T,M,A)	A	Out of Stream Cover (N,T,M, A	A) N
	(N,T,M,A) N=None, T=Tra	ce, M=Moderate, A=A	bundant		·
Functional LWD	M Number <20 c	cm N	umber 20-50 c	m 10 Number >50 c	m
Functional SWD	Т				
Boulder Cover	N Single > 30 cr		oulder-clusters		
Cobble Cover	A Percent of site			· .	
Undercut Banks	N Length (m)	A	verage width (m)	
Aquatic Vegetation	N				
Overhanging Veg.	Ν				
Fish Species Present:		[7			
Fish Species Suspected:	Coho, Rainbow/Steelh	ead			
		······································			

	DETAILED SITE DE	ESCRIPTION				
Site Name (e.g. BU(TOB-1)	C - 7 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2611:28BD,TJ,MN				
PHOTO DOCUMENTATION						
	COMMEN					
<u></u>	COMMEN	15				
Disturbance Indicators Release pond was constructed in September 1999, cobble and woody debris was added in September 2000						
Comment 1	Comparison between Buc 7 and Buc 8, Buc 7 mostly cobble.	7 has dense woody debris and Buc 8 has trace woody debris and				
Comment 2						
Comment 3						
	L					

CT

]	DETAILED SI	TE DES	CRIPT	TION		
Site Name (e.g. BU TOB-1)	JC-8	first three letters of stream name-site number		Ĭ	Date of survey 2000-11-26	Time of survey 11:43	Surveyors BD,TJ,MN
Gazetted Stream Name	Local Str	eam Name	Watersh	ed Code			
Buck Creek							
TRIM Map Number		NTS 1:50000	Map #		UTM	Zone North	ing Easting
Site Location: Describe r		\$					
Upstream end of Buck Cre	ek Kelease Pond						
					L	imnology Station	n Marked 🗹
Upstream Site Boundary n	arker (e.g. Red fla	gging) U?S we	ir	distance	to nearest pool upst	ream (meters)	
Downstream Site Boundar	y marker	Pink Fla	agging	distance	to nearest pool dow	nstream (meters)	
Gradient (%) 0	Site Length (meters) 7 e: Minimum of 6 widths te			channel widths (n intervals, 1.5 interval		2 9.5 intervals)
Channel V	Vidth (m) Vidth (m) 2	5 6	┥┝━━┥	\vdash		┥┝╼╾┥┝╸	═╡┝╾═┥╽
Max. Wetted D			┥┝╍╍╍┥			┥┢╾╍╼┥┝╍	
Max. Bankful D		╺┥╞╼╧╼┥╞╼╧╸					
							COBBLE
	max. depth is > :	50 cm		Estimated	Dominant Su Sub-Dominar		FINES
Pool Habitat	average flow is	< 0.1 m/sec,	Percent	Area (m2)	. D90	n Dubsduie	28
	excluding edges	<10 cm deep	90		% Embedded	ness	5
				Estimated	Dominant Su		
	average flow is surface disturbat		Percent	Area (m2)		nt Substrate	
Glide Habitat	edges <10 cm d	· -			D90		
					% Embedded	ness	
	Edger of Doolo	nd Glides that	1	Estimated			
Edge Habitat	Edges of Pools a are <10 cm deep		Percent	Area (m2)) 1		
	••••••		10]		
				Estimated	Dominant Su	bstrate	
	Surface disturb	ance provides cover	Percent	Area (m2)	Sub-Domina	nt Substrate	
Riffle Habitat					D90		
					% Embedded	iness	
Assessment of Fish Hab	itat Ins	stream Cover (N,T,M,A	A) T		Out of Stream C	over (N,T, M , A)	N
		None, T=Trace, M=Mo					
Functional LWD		umber <20 cm	Nu	mber 20-5() cm 1	Number >50 cm	
Functional SWD		ingla > 20 am	в-	ulder-cluste			
Boulder Cover Cobble Cover		ingle > 30 cm ercent of site area	85 Bo	auer-cluste			
Undercut Banks		ength (m)		verage widt	h (m)		
Aquatic Vegetation	N	Bui (114)	A		,/		
Overhanging Veg.	N						
Fish Species Present:			r				
Fish Species Suspected:	Coho, Rai	nbow/Steelhead					
	L=====, 100						

	DETAILED SITE DESC	CRIPTION					
Site Name (e.g. BUC TOB-1)	C - 8 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2611:43BD,TJ,MN					
PHOTO DOCUMENTATION							
	COMMENTS						
	COMMENTS						
Disturbance Indicators	Release pond site.						
	L <u></u>						
Comment 1	comparing Buck 7 to Buck 8.						
Comment 2							
Comment 3							

		•	DETAIL	ED SIT	re de	SCRIP	ΓION				
Site Name (e.g. TOB-1)	BYM-	1	first three letter name-site numb				Date of su 2000-11		Time of surve 12:51		veyors IJ, BD
Gazetted Stream Na	me	Local St	eam Name		Waters	hed Code					
Byman Creek		<u> </u>			┛			<u> </u>			
TRIM Map Number		-	NTS	1:50000 M	ap#]	Zone No	rthing	Easting
Site Location: Descr			s					UTM			
Downstream side of I	Highway 16 ci	ulvert.									
								L	imnology Stat	ion Mark	ked 🔽
Upstream Site Bound	arv marker (e.	.g. Red flag	zging)	Pink Flag	ging	distance	to nearest	nool unst	ream (meters)		50
Downstream Site Bou	-			Pink Flag					nstream (mete		30
Gradient (%)	0 Site	e Length (13		al between					3
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~ <b></b>	e: Minimum of 6	widths take	en at equal i	ntervals (@	5 intervals, 1	.5 interval	s, 2.5 intervals .	to 9.5 1	ntervals)
	nel Width (m ed Width (m	-		10	12	╏┝───┤	<u> </u>		┥┝━━━┥┝		<u> </u>
	ed Depth (cm			43	22				┥┝╍╍╍┥┝		
	ful Depth (cm	~							╡┣━━━╾┥┢		
		<u> </u>									
	·					Estimated	Dom	ninant Sul	ostrate	C	OBBLE
Pool Habitat		lepth is > f te flow is <	50 cm, < 0.1 m/sec,		Percent	Area (m2)			it Substrate		FINES
1 001 Habitat			<10 cm deep		80	<b></b>	D90				38
						L	<b>6</b> % E:	mbedded	ness		1
· · · · · · · · · · · · · · · · · · ·							Dom	ninant Sul	strate		OBBLE
	averag	ge flow is	>0.1 m/sec,	no	Percent	Estimated Area (m2)			it Substrate		FINES
Glide Habitat		e disturbar <10 cm de				· · · · · · · · · · · · · · · · · · ·	D90				38
	euges		ep		10	L	% Ei	mbedded	ness		1
Edge Habitat	Edges	of Pools a	nd Glides	that	Percent	Estimated Area (m2)					
Duge Mabilat	are <1	0 cm deep			5		]				
						Estimated	-	iinant Sul			OBBLE FINES
Riffle Habitat	Surfa	ce disturba	nce provides c	over	Percent	Area (m2)	. D90		t Substrate		38
Kine naonat					5			mbeddedi	ness		1
							,,,,				
Assessment of Fish	Habitat	Inst	tream Cover (1	N,T,M,A)	[ ]	·	Out of S	stream Co	over (N,T,M, A	N)	Т
	(N,T,M,	A) N=N	lone, T≕Trace,	, M=Mode	rate, A=A	bundant					
Functional LWD	N	N	umber <20 cm		N	umber 20-50	) cm	. I	Number >50 c	m [	
Functional SWD	Т										
Boulder Cover	Т	Si	ngle > 30 cm		IS Bo	oulder-cluste	ers	0			
Cobble Cover	A	4	rcent of site ar	ea 5	20						
Undercut Banks	N	Le	ngth (m)		A	verage widt	h (m)				
Aquatic Vegetation		4									
Overhanging Veg.	T										
Fish Species Present	· [										
Fish Species Suspect	ed:	Coho Raint	ow/Steelhead								

		]	DETAILED SITE DE	SCRIPTION			
Site Name (e.g. TOB-1)	BYM-	1	first three letters of stream name-site number	Date of survey 2000-11-22	Time of surve	y Surveyors	
	·····		PHOTO DOCUM	ENTATION			
Roll Name	Frame Num	per Pho	to Description				
OW3	16	Site vi	ew looking upstream, limno visib	le.			
NR	8	Lookin	ng upstream towards culvert, limn	o station visible			
			COMMEN	ГS			
Disturbance Inc		removed an	locks installed on right bank. Bo d used as rip rap to shore up the h	ock blocks.		oool has been	
Comment 1			el has been modified. This is a plued on banks.	inge pool limno station, same	e as last year.	Lock Blocks have	
Comment 2	Comment 2 There is rip rap on right bank and some on left bank as cover						
Comment 3							

		I	DETAIL	ED SI	TE D	ESC	CRIPT	[OI]	N					
Site Name (e.g. BY TOB-1)	М-	2	first three lette name-site rrum				]		of survey 0-11-22		Time of 13:		Surv BD<	eyors TJ <td< td=""></td<>
Gazetted Stream Name		Local Stre	am Name		Wate	ershee	d Code							
Byman Creek		<u> </u>		<u> </u>										
TRIM Map Number				1:50000 N	/lap #					тм	Zone	North	ing E	asting
Site Location: Describe re Perrow Station Rd approx.				grossing										
Ferrow Station Rd approx.	100 110	ues downsu		crossing.										
						_				Li	imnolog	y Station	n Marke	d 🔽 b
Upstream Site Boundary m	uarker-(e	.g. Red flag	ging)	Pink Fla	gging	2	distance	to near	rest pool	upstr	eam (me	eters)		20
Downstream Site Boundar	y marker	r		Pink Fla	gging	]	distance	to near	rest pool	down	nstream	(meters)	)	
Gradient (%) 0	Sit	e Length (n	-	11			bet <del>wee</del> n						[	2
		Note	Minimum of	6 widths tal	cen at equ	al inte	rvals (@ .	5 interva	als, 1.5 in:	tervals	s, 2.5 inte	rvalsto	9.5 int	ervals)
Channel V		╡ ╞━━━	┛┝━━━	<u>↓</u>	┥┝━	┛╏			ᆗ┝		┝───	┥┝╴	┉┥╽	
Wetted V	`~	╡┣━━	5	4	5	┥┝	6		┥┝╸			┥┝╸		
Max. Wetted De		~		89	67	╡┝	43		┥┝╸			┥┝		
Max. Bankful Do	epth (cn	ນ												<u>_</u>
								J	Dominar	nt Sub	strate		СО	BBLE
		depth is > 5			Percent		stimated .rea (m2)	5	Sub-Don	ninan	t Substra	ite	FI	NES
Pool Habitat		ge flow is < ding edges <	0.1 m/sec, (10 cm deep)						D90					24
					50			<b> </b>	% Embe	ddedr	iess			5
						E	stimated	J	Dominar	nt Sub	strate		CO	BBLE
		ge flow is > e disturban		no	Percent	A	rea (m2)	5	Sub-Don	ninan	t Substra	ite	FI	NES
Glide Habitat		<10 cm dee	,	ung	30	ור			D90					24
					L				% Embe	ddedr	ness			5
						E	stimated							
Edge Habitat	1 ~	of Pools an	d Glides	that	Percen	t A	(m2)	)						
	are <1	0 cm deep			10			]						
									Dominar	t Sul	ctrate		L co	BBLE
						Ε	stimated		Sub-Don			ite		NES
Riffle Habitat	Surfa	ice disturba	nce provides	cover	Percent	A	rea (m2)		D90		1 940341		<b>_</b>	24
Anne Hubhat					10	ן ב			% Embe	ddedr	ness			5
	<u> </u>					-							 	
Assessment of Fish Habi			ream Cover (			М		Out	of Stream	m Co	ver (N,I	(, <b>M</b> , A)	L	T
<b>x</b>	(N,T,M	-	one, T=Trace	·						<b>--</b> ,			_	
Functional LWD	N	Nu Nu	mber <20 cn	n L		Num	ber 20-50	) cm		ı	Number :	>50 cm	L	
Functional SWD	M	┥┈	-1- > 30		20	D 1	1au -1 - 4			٦				
Boulder Cover	A	=	gle > 30 cm		20 70	DOUI	der-cluste	51 S	1	1				
Cobble Cover Undercut Banks		=	cent of site a		<u></u>	A	n no	h (m)		٦				
Aquatic Vegetation	N		ngth (m)	L		Aver	age widt	u (III)	L					
Overhanging Veg.	N	4												
Fish Species Present:	<u> </u>										<u> </u>			
Fish Species Suspected:	L L	Coho, Raint	ow/Steelhea	d										
- ion openies puspected.	Ľ	cono, nam												

		DETAILED SITE DE	SCRIPTION									
Site Name (e.g. TOB-1)	BYM-	2 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2213:17BD <tj<td< td=""></tj<td<>									
	PHOTO DOCUMENTATION											
Roll Name	Frame Numb	er Photo Description										
OW3	24	Site view looking downstream, limno vi	sible.									
NR	7	Looking downstream with limno visible										
	······································	COMMEN	ΓS									
Disturbance Ind	dicators	CNR crossing approx 100 meters upstream.										
Comment 1	s	ite looks very similar to last year.										
Comment 2	Comment 2											
Comment 3												

		DETAILED SI	<b>FE DESC</b>	RIPTIO	N	
Site Name (e.g. BY TOB-1)	'M-3	first three letters of stream name-site number			of surveyTime of survey00-11-2310:30	Surveyors BD,TJ,TD
Gazetted Stream Name	Local	Stream Name	Watershed (	Code		
Byman Creek			┛└┈┯━╍			
TRIM Map Number		NTS 1:50000 M	lap #		Zone North	ing Easting
Site Location: Describe r						
Downstream of Byman # 2	and also dowst	eam of confluence with Pe	rrow Creek.			
					Limnology Station	n Marked 🖌
Upstream Site Boundary m		lagging) Pink Flag	rging 4		rest pool upstream (meters)	100
-		Pink Flag			rest pool downstream (meters)	
Downstream Site Boundar		F HIK F IAg				
Gradient (%) 0	Site Lengt				nel widths (meters)	2
	1	lote: Minimum of 6 widths tak	en at equal interv	als (@ .5 interv	als, 1.5 intervals, 2.5 intervals to	9.5 intervals)
Channel V	Width (m)		╏ <u>└──</u> ┤└	━┛┝━	<u>┙</u> ╘━┛╘═┛╘	
Wetted V	Width (m)	7 5 7		8 7	╺╾┥┝╾╍╼┥┝╼	
Max. Wetted D	epth (cm)	41 80 90		47 28	³ → → → → → → → → → → → → → → → → → → →	╺━━┥┝━━━┥╎
Max. Bankful D	epth (cm)					
					Dominant Substrate	COBBLE
	max. depth is	> 50 cm,		imated	Sub-Dominant Substrate	FINES
Pool Habitat		is $< 0.1 \text{ m/sec}$ ,	Percent Are	ea (m2)	D90	19
	excluding edg	ges <10 cm deep	75		% Embeddedness	0
	··	·····				
			Est	timated	Dominant Substrate	COBBLE
		is >0.1 m/sec, no			Sub-Dominant Substrate	FINES
Glide Habitat	surface distur edges <10 cm	· · · · · · · · · · · · · · · · · · ·			D90	19
					% Embeddedness	0
			Fe	timated		
Edge Habitat	Edges of Poo	s and Glides that	20	rea (m2)		
2464	are <10 cm d	eep	5			
					Dominant Substrate	COBBLE
			Est	timated	Sub-Dominant Substrate	FINES
	Surface dist	rbance provides cover	Percent Ar	rea (m2)	D90	19
Riffle Habitat			5		% Embeddedness	0
Assessment of Fish Hab	itat	Instream Cover (N,T,M,A)	Т	Ou	tt of Stream Cover (N,T,M, A)	Т
	(N,T,M,A)	I=None, T=Trace, M=Mod	erate, A=Abun	dant		
Functional LWD	T	Number <20 cm		er 20-50 cm	Number >50 cm	1
Functional SWD	T					
Boulder Cover	N	Single > 30 cm	Bould	er-clusters		
Cobble Cover	Α	Percent of site area	85			
Undercut Banks	N	Length (m)	Avera	ge width (m)		
Aquatic Vegetation	N	_				
Overhanging Veg.	Т					
Fish Spacios Prosants		] [	] [			
Fish Species Present:	Caba (	hinack and Bainham/Star				
Fish Species Suspected:	Cono, C	Chinook and Rainbow/Steel	lincau			

		DETAILED SITE DE	SCRIPTION								
Site Name (e.g. TOB-1)	BYM-	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2310:30BD,TJ,TD								
PHOTO DOCUMENTATION											
Roll Name	Frame Num	ber Photo Description									
OW4	1	Site view looking downstream.									
OW3	25	Looking downstream with limno visible									
		COMMENT									
Disturbance Inc	licators	CNR crossing about 250 meters upstream									
Comment 1		Pool is slightly larger than last year. Deepene	ed out at tail end of pool.								
Comment 2	ĺ										
Comment 3											
	1	L									

		E	<b>ETAILE</b>	ED SIT	E DE	SCRIP	TION				
Site Name (e.g. TOB-1)	CQ-	1	first three letters name-site numbe				Date of 2000-	survey 11-23	Time of s		Surveyors BD,TJ,TD
Gazetted Stream Name		Local Stre	am Name		Waters	hed Code				- <i>-</i>	]
McQuarrie Creek		<u> </u>		.60000 1/-	] Г				Zone	Northing	Easting
TRIM Map Number				:50000 Ma	P# L			итм			
Site Location: Describe Downstream of highway					<u>.</u>						
Downsacam of mgnway	10. 1113 13	u cuivoir p									
								I	.imnology	Station N	farked 🔽
Upstream Site Boundary :	markere(e.	g. Red flag		Pink Flagg		distance	e to neare:	st pool ups	tream (met	ers)	500
Downstream Site Bounda	ry marker			Pink Flagg	ing	distance	e to neare	st pool dow	/nstream (1	meters)	200
Gradient (%) 0	Site	Length (n	neters)	9	Inter	val betweer	n channe	l widths (n	neters)		2
	-	Note:	Minimum of 6	widths taken	at equal	intervals (@ .	.5 intervals	s, 1.5 interva	ls, 2.5 inter	valsto !	9.5 intervals)
Channel	Width (m						][			]	
Wetted	Width (m	) 3	5	6	7	7			┥┝━━━	┥┝───	┥┝━━┥
Max. Wetted I	· ·		77	69	53	42	<b>╎</b> ┣━━━		┥┝───	┥┝━━	┥┝━━┥
Max. Bankful I	Depth (cm				L		<u> </u>				
								ominant Su	bstrate	[	COBBLE
		lepth is $> 50$		F	Percent	Estimated Area (m2)	C.,	ib-Domina	nt Substrat	e [	FINES
Pool Habitat		e flow is < ing edges <	10 cm deep				, D	90		Ĺ	24
	le				30	[	<b>1</b> %	Embedded	iness	L	50
·····		· · · · · · · · · · · · · · · · · · ·								<u>г</u>	CODDUE
	averag	e flow is >	0 1 m/sec	nor		Estimated	1	ominant Su 1b-Domina		e [	COBBLE FINES
Glide Habitat	surface	e disturbanc	æ, excludi	11	Percent	Area (m2)	)	-		- I	24
	edges	<10 cm dee	p		70			Embedded	iness	ŀ	50
<b>DJ T</b>	Edges	of Pools an	d Glides	that	Percent	Estimated Area (m2					
Edge Habitat		0 cm deep				] [	<b>)</b>				
						J [					
						Estimated	1	ominant Su 1b-Domina			
Riffle Habitat	Surfa	ce disturbar	ice provides c	over	Percent	Area (m2)	) ⁵⁰		in Substrai	Γ Γ	
Kine Habitat							1	Embedded	iness	ľ	
			<del></del>			· · · · · · · · ·				L	
Assessment of Fish Hal	oitat	Inst	ream Cover (N	I,T,M,A)		V	Out o	f Stream C	over (N,T,	M, A)	N
	(N,T,M,	A) N=Ne	one, T=Trace,	M=Moden	ate, A=A	bundant					
Functional LWD	N	Nu	mber <20 cm		N	umber 20-5	0 cm		Number >	50 cm	
Functional SWD	N			·			-				
Boulder Cover		=	gle > 30 cm			oulder-clust	ters				
Cobble Cover		4	cent of site are	xa 5			., Г	1			
Undercut Banks	N T	Lei	ngth (m)	L	A	verage wid	un (m)				
Aquatic Vegetation Overhanging Veg.		4									
	L										
Fish Species Present:	Ļ										
Fish Species Suspected:		Coho, Chino	ook, Rainbow/	Steelhead							

Site Name (e.g. TOB-1)	MCQ-	DETAILED SITE DESC 1 first three letters of stream name-site number	Date of survey     Time of survey     Surveyors       2000-11-23     11:21     BD,TJ,TD							
PHOTO DOCUMENTATION										
Roll Name	Frame Numbe	er Photo Description								
OW3	17	Site vieew looking upstream.								
NR	4	Looking upstream at highway culvert with lin	nno visible.							
Disturbance Ind		COMMENTS DLock blocks installed around downstream side of ravel was clean last year. There is a cattle feed lo	f culvert. 2) Lots of algae and pariphyton on cobble. The ot just upstream.							
Disturbance Ind Comment 1	g	)Lock blocks installed around downstream side c ravel was clean last year. There is a cattle feed lo								
	E E	)Lock blocks installed around downstream side c ravel was clean last year. There is a cattle feed lo	xt just upstream.							
	gr C pr	Dock blocks installed around downstream side of ravel was clean last year. There is a cattle feed by the source of	xt just upstream.							

	J	DETAILED SI	TE DES	CRIPT	ION		
Site Name (e.g. F TOB-1)	RIC-1	first three letters of stream name-site number			ate of survey 2000-01-06	Time of survey 14:30	/ Surveyors BD, JE
Gazetted Stream Name		eam Name	Watershe	d Code			
Richfield Creek	Richfield	Creek	_ <u></u>				
TRIM Map Number		NTS 1:50000 N	vlap #				thing Easting
Site Location: Describe					UTM		
Just upstream with conflu	ence Upper Bulkley	River. (THIS WAS SI	TE # 2 LAST	YEAR).			
					J	Limnology Stati	on Marked 🛛 🔽
Upstream Site Boundary	marker (e.g. Red flau	gging) Orange I	Flagging	distance to	nearest pool ups		
Downstream Site Bounda			Flagging		nearest pool dov		rs) 20
Gradient (%) 0	Site Length (	· ·			hannel widths (1		3
	<b></b>	e: Minimum of 6 widths tal	ken at equal inte	ervals (@ .5 i	ntervals, 1.5 interva	als, 2.5 intervals	to 9.5 intervals)
	Width (m)		┥┝╼┯┥╎		9	╡┝━━┥┝	━┤┝━━┥
	Width (m) 4 Depth (cm) 62	╺╍┥┝╍╍╍┥┝╍╍╍	140	110	54	┥┝╾╾┥┝	╺━━┥┝╼╍╼┥
Max. Wetted I Max. Bankful I						┥┝╍╍╍┥╞	
				<u> </u>			
			т	Estimated	Dominant Su	ubstrate	COBBLE
Pool Habitat	max. depth is > f average flow is <			Area (m2)	Sub-Domina	nt Substrate	FINES
rooi Habitat	excluding edges		50	<b></b>	D90		15
				L	% Embedder	dness	0
·····							COBBLE
	average flow is	>0.1 m/sec, no	_	Estimated	Dominant Su Sub-Domina		FINES
Glide Habitat	surface disturbar		Percent A	Area (m2)	D90		15
	edges <10 cm de	ер	45		% Embedde	dness	0
	Edges of Pools a	nd Glides that		Estimated Area (m2)			
Edge Habitat	are <10 cm deep		Percent A				
			т	Estimated	Dominant Su	ubstrate	
	Surface disturbs	ance provides cover	-	Area (m2)	Sub-Domina	int Substrate	
Riffle Habitat					D90		
					% Embedde	dness	
Assessment of Fish Ha	bitat Ins	tream Cover (N,T,M,A)	) <u>A</u>		Out of Stream C	Cover (N,T,M, A	A) A
	(N,T,M,A) N=N	None, T=Trace, M=Mod	lerate, A=Abu	undant			
Functional LWD	T N	umber <20 cm	2 Num	nber 20-50 c	-m <b>0</b>	Number >50 cr	m 0
Functional SWD	A	-	<b>_</b>				
Boulder Cover		ingle > 30 cm		lder-clusters	\$		
Cobble Cover		ercent of site area	95		<b></b>		
Undercut Banks		ength (m)	3 Ave	rage width	(m) <u>1</u>		
Aquatic Vegetation	N						
Overhanging Veg.	M						
Fish Species Present:		<b></b>				] [	
			Ĺ			Ĺ	

.

		Γ	DETAILED SITE DE	SCRIPTION		
Site Name (e.g. TOB-1)	RIC-	1	first three letters of stream name-site number	Date of survey 2000-01-06	Time of survey 14:30	Surveyors BD, JE
			PHOTO DOCUM	ENTATION		
Roll Name	Frame Numb	er Phot	to Description			
OW4	13	Lookin	ng down into trap hole			
OW4	14	Site vie	ew looking dodwnstream.			
Rl	18					
			COMMEN	TS		
Disturbance Ind	licators F	Iay field.				
Comment 1	s	lite is deepe	er than last year on the outside co	mer, lots of small woody debri	s. Some algae grow	/th on cobble.
Comment 2				<u></u>		
Comment 3	Ĺ					

	Γ	DETAILED SI	TE DES	CRIPT	ΓΙΟΝ		
Site Name (e.g. R TOB-1)	IC-2	first three letters of stream name-site number		[	Date of survey 2000-10-06	Time of survey 15:00	Surveyors BD, JE
Gazetted Stream Name	Local Stre		Watersh	ed Code	<u> </u>		
Richfield Creek	Richfield	Creek				<u>.</u>	
TRIM Map Number		NTS 1:50000	Map #	<u> </u>	] UTM		uing Easting
Site Location: Describe r		······					
About 50 meters upstream	of CNK crossing					Limnology Statio	n Marked 🛛 🔽
Upstream Site Boundary m Downstream Site Boundary			Flagging Flagging		to nearest pool ups to nearest pool dow		)
Gradient (%)	Site Length (n				channel widths (		
	<b></b>	Minimum of 6 widths to	ken at equal in	ervais (@	intervals, 1.5 interv		
Channel V			╡┝━━┥	$\vdash$	┝┉┉┙┝┉┉	┥┝╼═┥┝╸	═╣┢══┥
Wetted V		92 89	┥┝╾╾╍┥			┥┝╾╍┥┝╌	╼┥┝╼╼┥
Max. Wetted D Max. Bankful D			╡┝───┥	<b>  </b>		╡┝╍╍╍┥╞═	
				<b>.</b>	Dominant S	ubstrate	COBBLE
	max. depth is $> 50$			Estimated Area (m2)	Sub-Domina	int Substrate	FINES
Pool Habitat	average flow is < excluding edges <				D90		16
			40		% Embedde	dness	5
				Estimated	Dominant S	ubstrate	COBBLE
	average flow is >	-	Percent	Area (m2)	Sub-Domina	int Substrate	FINES
Glide Habitat	surface disturbance edges <10 cm dee	, <b>Ç</b>	40		D90		16
	L		4 [		% Embedde	dness	25
				Estimated		-	
Edge Habitat	Edges of Pools an	d Glides that	Percent	Area (m2)			
	are <10 cm deep		5		]		
							CODDIT
				Estimated	Dominant S		COBBLE
	Surface disturbar	ice provides cover	Percent	Area (m2)		int Substrate	FINES
Riffle Habitat			15		D90	J	16 5
					% Embedde		
Assessment of Fish Habi		eam Cover (N,T,M,A	· •		Out of Stream (	Cover (N,T,M, A)	М
		one, T=Trace, M=Mo				Manhar	[]
Functional LWD		mber <20 cm	Nu	mber 20-50	) cm	Number >50 cm	L
Functional SWD	M	-la > 20 Г	]	.1.J			
Boulder Cover		gle > 30 cm	80 Bot	ulder-cluste	23		
Cobble Cover		cent of site area			h (m)		
Undercut Banks	T Lei	ngth (m)	AV	erage widtl			
Aquatic Vegetation							
Overhanging Veg.	M						
Fish Species Present:							
Fish Species Suspected:	Coho, Chine	ook, Rainbow/Steelhe	ad				

		DETAILED SITE D	ESCRIPTION
Site Name (e.g. TOB-1)	RIC-	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-10-0615:00BD, JE
		РНОТО DOCUM	ENTATION
Roll Name	Frame Num	ber Photo Description	
OW3	12	Looking into trap hole.	
OW3	13	Site view loooking downstream.	
<b>R</b> 1	19		
·		COMMEN	TS
Disturbance Ir	ndicators	-Evidence of cattle watering, land clearing Richfield #2.	for the hayfield, man made watering hole just upstream of
Comment 1			
Comment 2			
Comment 3	L		

DETAILED SITE DESCRIPTION								
Site Name (e.g. R TOB-1)	IC - 3	first three letter name-site numb			Ľ	Date of survey 2000-11-22	Time of surve	ey Surveyors TJ, BD
Gazetted Stream Name	Local S	tream Name	·····	Watershe	d Code			
Richfield Creek		<u> </u>				· · · · · · · · · · · · · · · · · · ·		
TRIM Map Number			1:50000 Map #	#	<u> </u>			orthing Easting
Site Location: Describe ro	oad and foot acco	255					· • • • • • • • • • • • • • • • • • • •	
This is last years site # 3								
							Limnology Sta	tion Marked 🛛 🗌
Upstream Site Boundary m	arker (e.g. Red fl	agging)			distance t	o nearest pool up:	stream (meters)	20
Downstream Site Boundary						o nearest pool do		
Gradient (%) 0	Site Length	(motors)	13	Interval	botween	channel widths (	meters)	
Gradient (%) 0	ę	•				intervals, 1.5 interv		
Channel W								
Wetted W		5 9	7					
Max. Wetted De	epth (cm)	60	70					
Max. Bankful De	epth (cm)							
	max. depth is >	50 cm		E	Estimated	Dominant S		FINES COBBLE
Pool Habitat	average flow is	< 0.1 m/sec,	Per	cent A	Area (m2)	D90	int Substrate	
	excluding edge	s <10 cm deep	Г	10		% Embedde	dness	15
						76 Ellibeuue		
·····	<u>,</u>					Dominant S	ubstrate	COBBLE
	average flow is				Estimated Area (m2)	Sub-Domina	unt Substrate	FINES
Glide Habitat	surface disturba edges <10 cm c		ing F	10		D90		14
	cuges <10 cm		L	10	Ļ	% Embedde	dness	15
Edge Habitat	Edges of Pools	and Glides	that Per		Estimated Area (m2)			
Luge Habitat	are <10 cm dee	р	┌	10				
						<b>D</b>		CODDLE
				Ŧ	Estimated	Dominant S		COBBLE FINES
Riffle Habitat	Surface distur	oance provides o	over Per	cent A	Area (m2)	D90	int Substrate	14
Kine nadiai		,	C	70		% Embedde	dness	14
						70 Emboddo		
Assessment of Fish Habi	tat Ir	stream Cover (1	N,T,M,A)	Т		Out of Stream (	Cover (N,T,M,	A)T
	(N,T,M,A) N=	None, T=Trace	, M=Moderate	e, A=Abu	indant			
Functional LWD	T 1	Number <20 cm		] Nurr	ber 20-50	cm	Number >50 o	2 2
Functional SWD	N			_				
Boulder Cover		Single > 30 cm		Boul	lder-cluster	rs		
Cobble Cover	M P	ercent of site ar	ea 50					
Undercut Banks		Length (m)		Ave	rage width	(m)		
	N							
Aquatic Vegetation								
Aquatic Vegetation Overhanging Veg.	T							
							]	

.

.

Site Name (e.g. TOB-1)	RIC-3	DETAILED SITE DE	ESCRIPTION Date of survey 2000-11-22	Time of survey	Surveyors TJ, BD				
PHOTO DOCUMENTATION									
Roll Name	Frame Number	Photo Description							
OW4	17	Site view looking downstream							
OW4	18	Limno hole showing sunken banks ie dropping water level.							
NR	12	Looking downstream, pink flag on limr	no station visible.						
		COMMEN	TS						

## **Disturbance Indicators**

Comment 1

Not much pool habitat reamining, mostly riffle now. Too fast to set traps. Shallower on average than last year

ilin.

.

uticas Quint

oraci

<u>í</u>

444

 $\overline{C}$ 

94/6

in the second

Comment 2

Comment 3

DETAILED SITE DESCRIPTION									
Site Name (e.g. R TOB-1)	IC-	3	first three letter name-site numb				Date of surve		ey Surveyors BD, TJ
Gazetted Stream Name Richfield Creek		Local Stre	am Name		Waters	hed Code		······	
TRIM Map Number			NTS	1:50000 N	1ap #				orthing Easting
Site Location: Describe r	oad and	foot access	. :== .				I		
50 meters upsteam of site #	¥ 4							Limnology Sta	ation Marked 🖌
Upstream Site Boundary m	uarker (e.j	g. Red flag	ging)	Pink Flag	zging	distance	to nearest poo	l upstream (meters)	) 15
Downstream Site Boundar	y marker			Pink Flag	gging	distance	to nearest poo	l downstream (met	ers)
Gradient (%) 0 Channel V	Vidth (m)		Minimum of 6		en at equal		n channel widt 5 intervals, 1.5 in	ths (meters) ntervals, 2.5 intervals	2 to 9.5 intervals)
Wetted V Max. Wetted D Max. Bankful D	epth (cm)	95	10 54	9 35	7 49				
Pool Habitat	average		0 cm, 0.1 m/sec, <10 cm deep		Percent 30	Estimated Area (m2)	) Sub-Do D90	nt Substrate minant Substrate eddedness	COBBLE FINES 19 5
Glide Habitat	surface	e flow is > disturbanc <10 cm dee		no ing	Percent	Estimated Area (m2)	) Sub-Do D90	nt Substrate minant Substrate eddedness	COBBLE FINES 19 5
Edge Habitat		of Pools an ) cm deep	d Glides	that	Percent	Estimated Area (m2			
Riffle Habitat	Surfac	e disturbar	nce provides c	over	Percent	Estimated Area (m2)	) Sub-Do D90	nt Substrate minant Substrate eddedness	COBBLE FINES 20 5
Assessment of Fish Habi	tat	Inst	ream Cover (N	I,T,M,A)		[]	Out of Stree	am Cover (N,T,M,	A) T
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	(N,T,M,4 T T N A N T	Nu Sin Per	one, T=Trace, mber <20 cm agle > 30 cm cent of site are ngth (m)		N B	bundant umber 20-56 oulder-clust verage widt	ers	Number >50 (	cm
Fish Species Present: Fish Species Suspected:	C	oho Rainb	ow/Steelhead						

Site Name (e.g. TOB-1)	RIC-3	first three letters of stream name-site number	Date of survey         Time of survey           2000-11-22         11:23	real frances of the second
		PHOTO DOCUME	NTATION	
Roll Name	Frame Number	Photo Description		
OW4	17	Site view looking downstream		
OW4	18	Limno hole showing sunken banks ie drop	ping water level.	
NR	12	Looking downstream, pink flag on limno s	station visible.	
		COMMENTS	5	

<u>Circ</u>

<u>Ó</u>blac

Jun .

ús:

## Comment 1 Comment 2 Comment 3

DETAILED SITE DESCRIPTION								
Site Name (e.g. TOB-1)	RIC	- 4	first three letters of stream name-site number			Date of survey Ti 2000-11-22	me of survey 11:00	Surveyors BD, TJ
Gazetted Stream Na	me	Local St	ream Name	Waters	hed Code			
Richfield Creek				!				
TRIM Map Number			NTS 1:50000 I	Map #		r	Zone Northi	ng Easting
Site Location: Descr	ibe road ar	d foot acce	85			UTM		
5 meters upstream of	Richfield #	3.						
						Lin	nnology Station	Marked 🔽
			gging) Pink Fla	aging		to nearest pool upstre	em (meters)	10
Upstream Site Bound			Pink Fla			to nearest pool downs		5
Downstream Site Bo	undary mari	er	Flink Fia					
Gradient (%)	0 5	ite Length				ı channel widths (me		3
		No	te: Minimum of 6 widths ta	ken at equal	intervals (@ .	5 intervals, 1.5 intervals,	2.5 intervalsto.	9.5 intervals)
Char	nnel Width	(m)	_ٳ	<u>_</u>			╞══┥╞═	═┥╞══┥
Wet	ted Width	(m) 4	9 11	8			┝╾╍┥┝╼	━┥┝━╍┥
Max. Wet	ted Depth (	em) 7	8 109 51	95	╡┝═╍╍┥		┝━━━┥┝╼╸	━┥┝━━┥
Max. Bank	ful Depth (	em)						
						Dominant Subs	trate	COBBLE
		. depth is >		Percent	Estimated Area (m2)	Sub-Dominant	Substrate	FINES
Pool Habitat	ave	rage flow is	< 0.1 m/sec, s <10 cm deep	Percent		, D90		13
	exc	lucing edge		60		% Embeddedne	SS	20
	<u> </u>							
					Estimated	Dominant Subs	strate	COBBLE
		Ų	s >0.1 m/sec, no	Percent	Area (m2)	Out Deminant	Substrate	FINES
Glide Habitat		face disturba es <10 cm c	, -	20	1	D90		13
	<u> </u>			4	J [	% Embeddedn	ess	20
					Estimate	1		
Edge Habitat	Edg	es of Pools	and Glides that	Percent	Area (m2			
Duge motion	are	<10 cm dee	p	20	] [	7		
	···-	<u></u>				Dominant Sub		
					Estimated			
	Su	rface distur	ance provides cover	Percent	Area (m2	) 500-120111192111 _ D90	Subsuale	
Riffle Habita						] % Embeddedn	P25	
Assessment of Fish	a Habitat	Ŀ	stream Cover (N,T,M,A	v 🗌	М	Out of Stream Cov	ver (N,T,M, A)	Т
	(N.T	,M,A) N=	None, T=Trace, M=Mo	derate. A=	Abundant			
Functional LWD	· · · ·		Number $< 20  \mathrm{cm}$		Jumber 20-5	i0 cm	lumber >50 cm	
Functional SWD		T		J `		الجمعينية		
Boulder Cover		M	Single > 30 cm	5 E	Boulder-clus	ters 1		
Cobble Cover			Percent of site area					
Undercut Banks		T I	Length (m)	4	Average wid	th (m) <b>2</b>		
Aquatic Vegetati	on H	N	L					
Overhanging Ve		Т						
						······] [····	——————————————————————————————————————	
Fish Species Prese								
Fish Species Suspe	cted:	Coho, Ra	inbow/Steelhead					

i | |''

3.2

11.1

. Kirs

		DETAILED SITE DI	ESCRIPTION						
Site Name (e.g. TOB-1)	RIC-4	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2211:00BD, TJ						
		РНОТО ДОСИМ	ENTATION						
Roll Name I	Frame Numbe	r Photo Description							
OW4	16	Site view, limno and trap hole visible.							
NR     11       Looking downstream with limno visible									
		COMMEN	TS						
Disturbance Indi	cators Cle	eared hay field on right bank, some erosic	n on outside corner of creek.						
Comment 1		is pool has changed since last year. The os infilled and only about half of the bould	deepest water used to be right at the boulder cluster, now that pool ers (depth wise) are showing.						
Comment 2	Lot	s of spawning size gravel							
Comment 3									

DETAILED SITE DESCRIPTION							
Site Name (e.g. R TOB-1)	IC-5	first three letters of stream name-site number			f survey Tir 0-11-22	ne of survey 10:45	Surveyors BD, TJ
Gazetted Stream Name Richfield Creek	Local St	ream Name	Watershed	Code		<u></u>	
TRIM Map Number	pad and foot acce	NTS 1:50000 M	ap #		z utm [	one Northi	ng Easting
At McCrackens fence line			lly connects to	site # 4.	Lim	nology Station	Marked 🖌
Upstream Site Boundary m Downstream Site Boundary		gging) Pink Flag Pink Flag			rest pool upstrea rest pool downst		4 50
Gradient (%) 0 Channel V Wetted V Max. Wetted Do Max. Bankful Do	Vidth (m) Vidth (m) Epth (cm)	e: Minimum of 6 widths take	4		ael widths (meto		4 . 9.5 intervals)
Pool Habitat	max. depth is > average flow is excluding edges	< 0.1 m/sec,		imated ea (m2)	Dominant Subst Sub-Dominant S D90 % Embeddednes	Substrate	COBBLE FINES 20 5
Glide Habitat	average flow is surface disturba edges <10 cm d	nce, excluding		ea (m2)	Dominant Subst Sub-Dominant S D90 % Embeddednes	Substrate	COBBLE FINES 21
Edge Habitat	Edges of Pools are <10 cm deep			timated rea (m2)			
Riffle Habitat	Surface disturb	ance provides cover		timated ea (m2)	Dominant Subst Sub-Dominant S D90 % Embeddednes	Substrate	
Assessment of Fish Habi		stream Cover (N,T,M,A)	М		of Stream Cove	er (N,T,M, A)	М
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	T M M N S A P	None, T=Trace, M=Mode Jumber <20 cm ingle > 30 cm ercent of site area length (m)	Boulde	dant er 20-50 cm er-clusters ge width (m)	Nu	mber >50 cm	
Fish Species Present: Fish Species Suspected:	Coho, Rai	nbow/Steelhead					

Site Name (e.g. TOB-1)	RIC-5	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2210:45BD, TJ							
PHOTO DOCUMENTATION										
Roll Name F	rame Number	Photo Description								
OW4	15	Site view looking downstrraam.								
NR	1	Looking at small woody debris with limno	visible.							
		COMMENTS	5							
Disturbance Indic	ators	ver activity- beaver lodge just upstream from								
	L									
Comment 1		pool ie. Partially formed last year- deeper a /sand. Lots of spawning size gravel.	and larger this year. Substrate under large woody debris =							
Comment 1 Comment 2			and larger this year. Substrate under large woody debris =							

-

DETAILED SITE DESCRIPTION											
Site Name (e.g. S TOB-1)	ID-	1	first three lette name-site num				Date of 2000-	survey 11-27	Time of surv 9:45		rveyors J,BD,TD
Gazetted Stream Name Upper Bulkley River Side	e Channel	Local Stre	am Name		Water	shed Code					
TRIM Map Number	ood and i	Foot access		1:50000 N	fap #				Zone N	orthing	Easting
Downstream of rest area o				and Topley	y between	CNR tracks	s and high		ide channel b .imnology St		
Upstream Site Boundary n Downstream Site Boundar		g. Red flag	ging)	Pink Flag	zging				ream (meters nstream (met		
Gradient (%) 0 Channel V Wetted V Max. Wetted D Max. Bankful D	Width (m) Width (m) epth (cm)	) 16 97		15 6 widths tak 16 97		val between intervals (@		-	neters) is, 2.5 intervals	to 9.5	5 intervals)
Pool Habitat	averag	epth is > 5( e flow is < ing edges <			Percent	Estimated Area (m2	1 ) Su D ⁹		nt Substrate		MUD MUD 100
Glide Habitat	surface	e flow is > disturbanc <10 cm dee	e, exclud	no ling	Percent	Estimated Area (m2	$\frac{1}{2}$ Su		nt Substrate		
Edge Habitat		of Pools an ) cm deep	d Glides	that	Percent	Estimated Area (m2					
Riffle Habitat	Surfac	e disturban	ce provides	cover	Percent	Estimated Area (m2	1 Su ) Su ] D9		nt Substrate		
Assessment of Fish Habi			eam Cover (		<b>b</b>	A	Out o	f Stream Co	over (N,T,M,	A)	A
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	(N,T,M,, N A N N M M	Nur Sin Pero	one, T=Trace mber <20 cm gle > 30 cm cent of site an agth (m)			Abundant (umber 20-5 oulder-clust	ters		Number >50	cm [	
Fish Species Present: Fish Species Suspected:		oho, Rainb	ow/Steelhea	d,Shiners,	Dace, Sq	awfish					

	DETAILED SITE D	ESCRIPTION								
SID-	first three letters of stream name-site number	Date of survey 2000-11-27	Time of survey     Surveyors       9:45     TJ,BD,TD							
PHOTO DOCUMENTATION										
Roll Name Frame Number Photo Description										
20	Site view looking from highway.									
8	Looking downstream, limno visible	<u></u>								
	COMMEN	ITS								
icators C	NR tracks, Highway 16, beaver activity.									
			water. Water is f lowing over							
	<u></u>									
	Frame Numb 20 8 icators C	PHOTO DOCUM         Frame Number       Photo Description         20       Site view looking from highway.         8       Looking downstream, limno visible         COMMEN         icators         CNR tracks, Highway 16, beaver activity.         Is an old side channel/beaver pond area.       Looking downstream	SID     I     name-site number     2000-11-27       PHOTO DOCUMENTATION       Frame Number Photo Description       20     Site view looking from highway.       8     Looking downstream, limno visible							

(G)

DETAILED SITE DESCRIPTION							
Site Name (e.g. S TOB-1)	ID-2	first three letters of stream name-site number	n	ן ן	Date of survey 2000-11-27	Time of survey 10:00	Surveyors TJ,BD,TD
Gazetted Stream Name Upper Bulkley River Side		ream Name	Waters	hed Code	<u> </u>		]
TRIM Map Number		NTS 1:50000	Map #			Zone North	ing Easting
Site Location: Describe r	oad and foot acce	SS			UTM		
Just downstream from Bill downstream of an old Upp	Wilson's driveway er Bulkley River c	<ul> <li>North side of highw hannel that heads north</li> </ul>	ay 16. Some n.	ground wat		e at time of survey Limnology Station	
Upstream Site Boundary m Downstream Site Boundar			lagging lagging		to nearest pool ups to nearest pool dov		25 50
Gradient (%) 0 Channel V Wetted V Max. Wetted D Max. Bankful D	Site Length No Width (m) Width (m) epth (cm)	(meters) 12 te: Minimum of 6 widths 7 7 12	2 Interv taken at equal i	al between	channel widths (1	neters)	
Pool Habitat	max. depth is > average flow is excluding edges	< 0.1 m/sec,	Percent 80	Estimated Area (m2)	Dominant Su Sub-Domina D90 % Embeddeo	nt Substrate	FINES GRAVEL 95
Glide Habitat	average flow is surface disturba edges <10 cm d	nce, excluding	Percent	Estimated Area (m2)	Dominant Su Sub-Domina D90 % Embeddeo	nt Substrate	
Edge Habitat	Edges of Pools are <10 cm deep		Percent	Estimated Area (m2)	]		
Riffle Habitat	Surface disturb	ance provides cover	Percent	Estimated Area (m2)	Dominant So Sub-Domina D90 % Embeddea	int Substrate	
Assessment of Fish Hab	itat In	stream Cover (N,T,M,	A) N	1	Out of Stream C	Cover (N,T,M, A)	М
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	T P T N S N P	None, T=Trace, M=M Jumber <20 cm Single > 30 cm ercent of site area ength (m)	Bo	bundant umber 20-50 pulder-cluste verage widtl	πs	Number >50 cm	1
Fish Species Present: Fish Species Suspected:	Coho, Rai	nbow/Stœlhead		L			

		DETAILED SITE	DESCRIPTION							
Site Name (e.g. TOB-1)	SID-	2 first three letters of stream name-site number	Date of survey 2000-11-27	Time of survey         Surveyors           10:00         TJ,BD,TD						
PHOTO DOCUMENTATION										
Roll Name H	Frame Numbe	r Photo Description								
OW3	18	Site view								
R3	9									
		COMM	ENTS							
Disturbance India	cators Ca	ttle grazing area runs parallel to this :	side channel. Highway 16.							
Comment 1		opears to be ground water influence. ogth of this site.	No ice at time of survey. There is a	fallen tree in the water that runs the						
Comment 2	Lot	s of grasses and willows in the water	at this site.							
Comment 3										

DETAILED SITE DESCRIPTION							
Site Name (e.g. S TOB-1)	ID- 3	first three letters of name-site number			Date of survey 2000-11-27	Time of survey 10:20	Surveyors BD,TJ,TD
Gazetted Stream Name Upper Bulkley River Side		eam Name	W	atershed Code			
TRIM Map Number	·····		50000 Map #		UTM	Zone North	ing Easting
Approx. 300 meters downs	the second second second second second second second second second second second second second second second s		ing at highwa	y 16.		Limnology Station	n Marked 🖌
Upstream Site Boundary m Downstream Site Boundar			Pink Flagging Pink Flagging		to nearest pool ups to nearest pool dow		
Gradient (%) 0 Channel V Wetted V Max. Wetted Do Max. Bankful Do	Vidth (m)         12           Vidth (m)         12           epth (cm)         89	e: Minimum of 6 v			a channel widths (1 5 intervals, 1.5 interva		4
Pool Habitat	max. depth is > average flow is excluding edges	< 0.1 m/sec,	Perc	Estimated ent Area (m2	C.L Damina	nt Substrate	FINES GRAVEL 95
Glide Habitat	average flow is surface disturbat edges <10 cm de	nce, excludir	no Perc	Estimated ent Area (m2		nt Substrate	
Edge Habitat	Edges of Pools a are <10 cm deep		that Perc	Estimated ent Area (m2			
Riffle Habitat	Surface disturb	ance provides cc	over Perc	Estimated ent Area (m2	Sub-Domina	nt Substrate	
Assessment of Fish Habi		tream Cover (N	_	М	Out of Stream C	Cover (N,T,M, A)	Т
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	T N N S T Pe	None, T=Trace, ) number <20 cm ingle > 30 cm ercent of site area ength (m)		A≕Abundant Number 20-5 Boulder-clust Average wid	ers	Number >50 cm	2
Fish Species Present: Fish Species Suspected:	Coho, Rai	nbow/Steelhead					

		DETAILED SITE D	DESCRIPTION							
Site Name (e.g. TOB-1)	SID-3	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2710:20BD,TJ,TD							
PHOTO DOCUMENTATION										
Roll Name Frame Number Photo Description										
R3	10	Limno visible								
OW3	19 Site view looking down from highway									
		COMMEN	NTS							
Disturbance In	dicators Hig	hway 16. Cattle grazing area parallel to	to side channel.							
Comment 1		re is a culvert under highway 16 at the no ice at time of survey.	downstream end of this site. There appears to be some flow. There							
Comment 2										
Comment 3		<del></del>								
	1									

(T)

(in the second s

-

		I	DETAILED	) SITE D	ESCRIP	TION		
Site Name (e.g. U TOB-1)	BR-	1	first three letters of s name-site number	itream		Date of survey 2000-11-23	Time of survey	Surveyors BD,TJ,TD
Gazetted Stream Name Upper Bulkley River		Local Stre	eam Name	Wat	ershed Code			
TRIM Map Number				000 Map #				thing Easting
Site Location: Describe								
100 meters downstream fr	om McK	illigan Road	i bridge at fallen	tree with root	wad in water.		Limnology Statio	on Marked 🖌
Upstream Site Boundary r	norker (e	a Red flag	(ging)		diatorea	to nonmatinool u	etroom (meters)	
Downstream Site Boundar						e to nearest pool up e to nearest pool do		s)
Gradient (%)	] Site	e <b>Length</b> (r Note	-			n channel widths .5 intervals, 1.5 inter		to 9.5 intervals)
Channel	Width (m	¬ <b>г</b>						
Wetted		ξ 💻	╡┝━╾╡╞				╡┢━━┥┢	
Max. Wetted D			╍┥┝╍╍╍┩┝╸			╣┟╼╼╍┥┝╼╼╸	┥┝╍╍┥┝	
Max. Bankful D			┥┝╍╍┥╞					
					Estimated	Dominant S	Substrate	
<b>D</b> 117 1/4 4		lepth is > 5 ge flow is <		Percen		Sub-Domir	ant Substrate	
Pool Habitat			<10 cm deep	r		ר ^{D90} ר		
						% Embedd	edness	
		• •						
					Estimated	Dominant S	Substrate	
		ge flow is≥ e disturban		no Percen	t Area (m2	) Sub-Domir	ant Substrate	
Glide Habitat		<10 cm de	-		┐ ┌───	7 ^{D90}		
						% Embedd	edness	
		·····			Estimate	4		
Edge Habitat	Edges	of Pools ar	nd Glides that	t Percer				
Edge Habitat	are <1	0 cm deep				, T		
					Estimated	Dominant !	Substrate	
	<b>6</b> 6			Percen	· · · · · · ·	Sub-Domir	ant Substrate	
Riffle Habitat	Suria		nce provides cove		F	D90		
					[	% Embedd	edness	
Assessment of Fish Hab	oitat	Inst	ream Cover (N,T	,M,A)		Out of Stream	Cover (N,T,M, A	)
	(N,T,M	A) N=N	one, T=Trace, M	=Moderate, A	=Abundant			
Functional LWD		Nu	mber <20 cm		Number 20-5	50 cm	Number >50 cn	n
Functional SWD								
Boulder Cover		Sir	ngle > 30 cm		Boulder-clus	ters		
Cobble Cover		Per	cent of site area					
Undercut Banks		Le	ngth (m)		Average wid	th (m)		
Aquatic Vegetation		]						
Overhanging Veg.		]						
Fish Species Present:	Γ							
Fish Species Suspected:	[				-			

		DETAILED SITE I	DESCRIPTIO	ON		
Site Name (e.g. TOB-1)	<b>UBR</b> -1	first three letters of stream name-site number		te of survey T 1000-11-23	ime of survey 12:17	Surveyors BD,TJ,TD
		PHOTO DOCU	MENTATIO	N		
Roll Name	Frame Number	Photo Description				
0	0	No pictures taken, camera battery de	ead.			
		СОММЕ	NTS			
Disturbance Ind	icators Lan	d cleared for hay field upstream of M	cKilligan road bridg	e		
	L	<u></u>				
Comment 1	- ba	ck eddy, - pool is larger and deeper th	an last year and it's	scouring out.		
Comment 2						
Comment 3						
		<u> </u>				

}.

DETAILED SITE DESCRIPTION								
Site Name (e.g. TOB-1)	UBR-	2	first three letters of a name-site number	stream		Date of survey 2000-11-23	Time of survey 10:54	Surveyors BD,TJ,Td
Gazetted Stream Na	and the second se	Local Str	eam Name	Wat	ershed Code			
Upper Bulkley Rive	r	<u>L</u>	•					
TRIM Map Number			NTS 1:50	0000 Map #				hing Easting
Site Location: Descr						UTM		
Big root wad about 7	5 meters upst	eam of con	fluence with Byn	nan Creek. Li	mno rebar und	er pink flag on root	wad.	
						1	Limnology Statio	n Marked 🖌
Upstream Site Bound	arv marker (e	.g. Red flag	rging) Pir	ık Flagging	distance	to nearest pool ups	tream (meters)	
Downstream Site Bo				nk Flaging	Ξ	to nearest pool dov		)
Gradient (%)	Sit	e Length (				channel widths (1		
			: Minimum of 6 wi	dths taken at equ	al intervals (@ .	5 intervals, 1.5 interva		5 9.5 intervais)
	ted Width (n		═┨╞══ <u></u> ┥┝	4	╺┥┝───┤		┥┝━╾┥╞	
	ed Depth (cn	-	╺╍┥┝╍╍╍┥┝╸	85			┥┝╍╍┥┝╸	
	ful Depth (cn	╡┢━━━	╧┥┝┷╩╍┥┝	<u> </u>			┥┝━━┥┝	
	r	1 0 1 1 1			Estimated	Dominant Su		COBBLE
Pool Habitat		depth is > 5 ge flow is <	< 0.1 m/sec,	Percen	t Area (m2)		nt Substrate	FINES 25
	exclu	ding edges	<10 cm deep	90		D90 % Embedded	Incos	20
	<u></u>					Dominant Su	ibstrate	COBBLE
			>0.1 m/sec,	no Percen	Estimated t Area (m2)		nt Substrate	FINES
Glide Habitat		e disturbar <10 cm de	· -	10	<b>-</b>	D90		25
	10,000		-p		[	. Kenbeddee	iness	20
					Estimated	1		
Edge Habitat	-	of Pools a	nd Glides the	at Percer	nt Area (m2	)		
	are <	0 cm deep				]		
						Dominant Su	ibstrate	
				P	Estimated	Sub-Domina		
<b>Riffle Habitat</b>	Surfa	ice disturba	nce provides cov	er Percen	t Area (m2	, D90		
	L			J [		% Embeddee	iness	
Assessment of Fish	Habitat	Ing	tream Cover (N,T		м	Out of Stream (	over (N,T,M, A)	Т
Assessment of Fish							····· (1 · · · · · · · · · · · · · · · ·	<b></b>
Functional LWD	(N,T,M		Ione, T=Trace, M	=Moderate, A			Number >50 cm	
Functional SWD		╡╹	umber <20 cm	L	Number 20-5		Tranifor > 50 cll.	
Boulder Cover	T		ngle > 30 cm	10	Boulder-clust	ers		
Cobble Cover	M		rcent of site area	70		·		
Undercut Banks	N	=	ength (m)		Average wid	th (m)		
Aquatic Vegetatio	n N			<u> </u>		<b></b>		
Overhanging Veg	. <b>N</b>							
Fish Species Presen	t: [				7		I	
Fish Species Suspec	L T	Coho. Chir	look Rainbow/Ste	elhead				
rian openes ouspec		cono, cim	NOR ICALIOUW/SIE	Calcau				

	urveyors								
Roll Name       Frame Number       Photo Description         NR       5       Looking upstream, middle pink flag is limno station         OW4       2       Site view showing both the original trap hole as well as the new one.         COMMENTS         Disturbance Indicators	BD,TJ,Td								
NR       5       Looking upstream, middle pink flag is limno station         OW4       2       Site view showing both the original trap hole as well as the new one.         COMMENTS         Disturbance Indicators    Small log jams. Some bank erosion just upstream.									
OW4     2     Site view showing both the original trap hole as well as the new one.       COMMENTS       Disturbance Indicators       Small log jams. Some bank erosion just upstream.									
COMMENTS Disturbance Indicators Small log jams. Some bank erosion just upstream.	VR 5 Looking upstream, middle pink flag is limno station								
Disturbance Indicators Small log jams. Some bank erosion just upstream.	OW4     2     Site view showing both the original trap hole as well as the new one.								
Disturbance Indicators Small log jams. Some bank erosion just upstream.									
LOOKS INC BOOL COVER, EVEN WHEN WHEN WHEN FOUND BOLS DOWN AS TOOL WAD BOES DOWN QUICE DEEP.									
Comment 2 NOTE: Byman Creek, the section just upstream of the confluence(100m) that used to be deep much shallower and has cobble substrate rather than silt/mud.	d is now								
Comment 3									

		]	DETAIL	ED SI	TE DE	SCRIP	ΓΙΟΝ				
Site Name (e.g. TOB-1)	JBR-	3	first three lette name-site num				Date of 2000	survey -11-23	Time of surve		yors FJ,TD
Gazetted Stream Name Upper Bulkley River	;	Local Str	eam Name		Water	shed Code					
TRIM Map Number Site Location: Describ	e road and	foot acces		1:50000 N	/lap #			UTM		orthing Ea	asting
100 meters downstream				llen tree w	ith root w	ad in the wat	ter.		Limnology Sta	tion Marke	d 🔽
Upstream Site Boundar Downstream Site Boun			gging)	Pink Flay Pink Flay				• •	stream (meters) wnstream (mete		150 150
	el Width (n 1 Width (n 1 Depth (cn	1) 2 1) 11	e: Minimum of	11 6 widths tab 4 114		val between intervals (@ .			meters) als, 2.5 intervals	to 9.5 into	3 ervals)
Pool Habitat	avera		50 cm, < 0.1 m/sec, <10 cm deep		Percent	Estimated Area (m2)	ו – ) s ר ב	oominant S ub-Domin 990 6 Embedde	ant Substrate	FI	BBLE NES 12 0
Glide Habitat	surfac	ge flow is e disturban <10 cm de	-	no ding	Percent	Estimated Area (m2		Dominant S Jub-Domin 090 6 Embedde	ant Substrate	FI	BBLE NES 12 0
Edge Habitat		of Pools a 0 cm deep		that	Percent	Estimated Area (m2					
Riffle Habitat	Surfa	ace disturba	ance provides	s cover	Percent	Estimated Area (m2	d 5 2) 5 7 1	Dominant S Gub-Domin D90 & Embedde	ant Substrate		
Assessment of Fish H	labitat	Ins	tream Cover	(N,T,M,A		T	Out	of Stream	Cover (N,T,M,	A)	N
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	(N,T,M T T A N N N		None, T=Trac fumber <20 ct ingle > 30 cm ercent of site ength (m)		90	Abundant Number 20-5 Boulder-clus Average wid	ters		Number >50	cm	1
Fish Species Present: Fish Species Suspecte	.d: [	Coho. Chi	nook, Rainbo	w/Steelhe	ad						
a lon openio ouspeen	1	, Cill									· · · ·

		DETAILED SITE D	ESCRIPTION
Site Name (e.g. TO <b>B-1</b> )	UBR-3	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2312:17BD,TJ,TD
		PHOTO DOCUM	IENTATION
Roll Name	Frame Number	Photo Description	
N	0	no photo, camera battery was dead	
OW4	19	Site view, limno visible.	
		COMMEN	NTS
Disturbance Ind	licators Land	l cleared for hay field upstream of McI	Killigan Road bridge.
Comment 1	this i	s a back eddy. Pool is larger and deep	per than last year as it is scouring out.
Comment 2			
Comment 3		<u></u>	

-

	DETAILED SITE DESCRIPTION
Site Name (e.g. TOB-1)	BR - 9     first three letters of stream name-site number     Date of survey     Time of survey     Surveyors       2000-10-06     13:15     BD,JE
Gazetted Stream Name Upper Bulkley River	Local Stream Name Watershed Code
TRIM Map Number	NTS 1:50000 Map # Zone Northing Easting UTM
Site Location: Describe ro	
Downstream from confluen	nce with Richfield Creek. Sample area is 1/3 of a large pool. Limnology Station Marked
Upstream Site Boundary ma Downstream Site Boundary	
Gradient (%) 0	Site Length (meters)     20     Interval between channel widths (meters)     3
Channel W Wetted W Max. Wetted De Max. Bankful De	Vidth (m)         13         12         13         11         11         11         11         11           epth (cm)         137         147         124         120         108         78         80
Pool Habitat	max. depth is > 50 cm, average flow is < 0.1 m/sec, excluding edges <10 cm deepEstimated PercentDominant Substrate Sub-Dominant SubstrateFINES COBBLE70709011% Embeddedness100
Glide Habitat	average flow is >0.1 m/sec, no surface disturbance, excluding edges <10 cm deep
Edge Habitat	Edges of Pools and Glides that are <10 cm deep 5 Estimated Percent Area (m2)
Riffle Habitat	Surface disturbance provides cover     Percent     Area (m2)     D90       % Embeddedness
Assessment of Fish Habit	tat Instream Cover (N,T,M,A) M Out of Stream Cover (N,T,M, A) M
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	(N,T,M,A)       N=None, T=Trace, M=Moderate, A=Abundant         N       Number <20 cm
Fish Species Present: Fish Species Suspected:	Coho, Rainbow/Steelhead, Sculpin

	DETAILED SITE D	
Site Name (e.g. UBI 10B-1)	R - 9 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-10-0613:15BD,JE
	PHOTO DOCUM	ENTATION
	COMMEN	TS
<u> </u>	COMMEN	15
Disturbance Indicators	Some bank erosion. This site is downstream	n of a hayfield
0	······	
Comment 1		
Comment 2		1
Comment 3		

erster.

		]	DETAILED SI	TE DES	SCRIPT	ION		
Site Name (e.g. TOB-1)	UBR-	10	first three letters of stream name-site number		נ [	Date of survey 2000-10-06	Time of surve	y Surveyors BD,JE
Gazetted Stream Nat Upper Bulkley Rive		Local Str	eam Name	Waters	ned Code			
TRIM Map Number			NTS 1:50000 1	Map #			Zone No	rthing Easting
Site Location: Descr	ibe road and	foot acces	\$			UTN		
Just downstream of U Upstream Site Bound	ary mark <b>er</b> (e.,		gging) Orange	Flagging		o nearest pool up		
Downstream Site Bou	mdary marker		Orange	Flagging	distance t	o nearest pool do	winstream (mete	ers)
Wett Max. Wett	0 Site nel Width (m ed Width (m ed Depth (cm ful Depth (cm	) 15	e: Minimum of 6 widths ta			channel widths ( intervals, 1.5 interv		3 to 9.5 intervals)
Pool Habitat	averag		50 cm, < 0.1 m/sec, <10 cm deep	Percent	Estimated Area (m2)	Dominant S Sub-Domin D90 % Embedde	ant Substrate	FINES COBBLE 4 90
Glide Habitat	surfac	e flow is e disturbar <10 cm de		Percent	Estimated Area (m2)	Dominant S Sub-Domin D90 % Embedda	ant Substrate	FINES COBBLE 4 90
Edge Habitat		of Pools a 0 cm deep	and Glides that	Percent	Estimated Area (m2)			
Riffle Habitat	Surfa	ce disturb	ance provides cover	Percent	Estimated Area (m2)	Dominant S Sub-Domir D90 % Embedd	ant Substrate	
Assessment of Fish			stream Cover (N,T,M,A		1	Out of Stream	Cover (N,T,M,	A) <u>M</u>
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetatio Overhanging Veg			None, T=Trace, M=Mo Number <20 cm ingle > 30 cm ercent of site area ength (m)	B	bundant umber 20-50 pulder-cluste verage widtl	rs	Number >50 o	em
Fish Species Presen Fish Species Suspec		Coho						
Tish obecies anabet		-0110						

:

	DETAILED SITE DE	SCRIPTION						
Site Name (e.g. UBI TOB-1)	R - 10 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-10-061:55BD,JE						
PHOTO DOCUMENTATION								
	COMMENT	IS J						
Disturbance Indicators	Some bank erosion							
	<u> </u>							
Comment 1		annel. Looks like root wad material in stream. This area is like a						
	large pool. Very meandering.							
Comment 2								
Comment 3								

	DETAILED SITE DESCRIPTION									
Site Name (e.g. TOB-1)	UBR-	11	first three letters of stream name-site number	1		ate of survey 2000-11-27	Time of survey 10:56	Surveyors BD,TJ,TD		
Gazetted Stream N	ame		am Name	Waters	ned Code	<del>.</del>				
Upper Bulkley Riv	er	Upper Bu	lkley River							
TRIM Map Numbe	T		NTS 1:50000	Map #		] UTM	Zone North	ing Easting		
Site Location: Desc								/		
Just Downstream of	North Road Fo	orest Service	e Road bridge crossin	g but upstream	m of highway	/ 16 bridge and C	NR crossing.			
			<u></u>				Limnology Station	n Marked 🗹		
Upstream Site Boun	dary mark <b>er</b> (e	.g. Red flag	ging) Pink Fl	agging	distance to	nearest pool ups	tream (meters)	300		
Downstream Site Bo	oundary marke	r	Pink Fl	agging	distance to	nearest pool dov	wnstream (meters)	100		
Gradient (%)	0 Sit	e Length (n	neters) [19 Minimum of 6 widths t			hannel widths (				
	nnel Width (n tted Width (n	n)								
	tted Depth (cn	~	105 136	84			┫┝━━━┥┝━			
Max. Banl	kful Depth (cn	n)								
Pool Habitat	avera	depth is > 5 ge flow is < ding edges <		Percent	Estimated Area (m2)	Dominant Su Sub-Domina D90 % Embedde	int Substrate	BOULDE FINES 76 15		
Glide Habita	t surfac	ge flow is > ce disturbanc <10 cm dec	ce, excluding	Percent	Estimated Area (m2)	Dominant S Sub-Domina D90 % Embedde	int Substrate			
Edge Habita		of Pools an 0 cm deep	d Glides that	Percent	Estimated Area (m2)					
Riffle Habita	t Surfa	ace disturba	nce provides cover	Percent	Estimated Area (m2)	Dominant S Sub-Domina D90 % Embedde	int Substrate			
Assessment of Fisl			ream Cover (N,T,M,A	·		Out of Stream (	Cover (N,T,M, A)	Т		
Eurodia 1 T STR	(N,T,M	<u> </u>	one, T=Trace, M=Mc			<b></b>	Number SEA	<b></b>		
Functional LWD	N N		mber <20 cm	Nu	umber 20-50 c		Number >50 cm			
Boulder Cover		-	ngle > 30 mm <b>Г</b>	50 Bo	oulder-clusters	s 1				
Cobbie Cover	M	=	ngle > 30 cm cent of site area		ander-stusters					
Undercut Banks	N		ngth (m)		verage width	(m)				
Aquatic Vegetati					Siugo middli					
Overhanging Ve		=								

Fish Species Present: Fish Species Suspected:

1 

12

ſ 

 $\overline{\phantom{a}}$ 

101

1

6.6

Coho Rainbow/Steelhead

DETAILED SITE DESCRIPTION										
UBR-1	1 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-2710:56BD,TJ,TD								
PHOTO DOCUMENTATION										
Frame Number	Photo Description									
16	Looking at small woody debris comp	lex								
14	Site View looking downstream									
	COMME	NTS								
ndicators Brid	dg Crossing, North Road Forest Servie	ce Road, Rip Rapped site.								
		ts of rip rap ie. One meter in diameter Ice already building up								
	Frame Number          16         14         adicators         Brid	UBR - 11       first three letters of stream name-site number         PHOTO DOCUN         Frame Number       Photo Description         16       Looking at small woody debris comp         14       Site View looking downstream         COMMED         adicators         Bridg Crossing, North Road Forest Service								

reser.

DETAILED SITE DESCRIPTION											
Site Name (e.g. U. TOB-1)	BR-	12	first three lette name-site num				Date of 2000	survey 11-23	Time of surve 14:14		veyors BD,MN
Gazetted Stream Name Upper Bulkley River		Local Str	eam Name		Water	shed Code					
TRIM Map Number				1:50000 N	/lap #		· · · · · · ·	UTM	Zone No	orthing H	lasting
Site Location: Describe 1 60 meters downstream of the middle of the river.				arge wood	y debris si	te with large	cobble o		of site is = we		
Upstream Site Boundary n Downstream Site Bounda		g. Red flag	ging)	Pink Flay Pink Flay				st pool upst	ream (meters)		70 100
Gradient (%) 0 Channel Wetted Max. Wetted I Max. Bankful I	Width (m Width (m Depth (cm		: Minimum of	7 6 widths tak 8	ليب	val between intervals (@			eters) s, 2.5 intervals	to 9.5 in	2 tervals)
Pool Habitat	averag		0 cm, 0.1 m/sec, <10 cm deep		Percent	Estimated Area (m2)	) Sι ) D!	ominant Sub ib-Dominan 90 Embeddedr	t Substrate		DBBLE INES 27 20
Glide Habitat	surface	e flow is > e disturban <10 cm de	•	no ding	Percent	Estimated Area (m2)	) Sι ] ^{D!}	ominant Sub b-Dominan 90 Embeddedr	t Substrate		DBBLE INES 27 20
Edge Habitat		of Pools ar ) cm deep		that	Percent	Estimated Area (m2					
Riffle Habitat	Surfac	e disturba	nce provides	cover	Percent	Estimated Area (m2)	ι ) Sι ] D!	ominant Sub ab-Dominan 90 Embeddedr	t Substrate		
Assessment of Fish Hab			ream Cover (		<b></b>	T	Out o	f Stream Co	over (N,T,M,	A)	Т
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetation Overhanging Veg.	(N,T,M, T T M M T N T	Nu Sin Per	one, T=Traca umber <20 cm ngle > 30 cm cent of site a ngth (m)		20 B	Abundant (umber 20-5 coulder-clust average widt	ers		Number >50 o		1
Fish Species Present: Fish Species Suspected:	L	oliy varde	n, Coho, Chi	nook, Rain	nbow/Stee	lhead				<u> </u>	

DETAILED SITE DESCRIPTION										
Site Name (e.g. TOB-1)	UBR-	12	first three letters of stream name-site number		ate of survey 2000-11-23	Time of survey 14:14	Surveyors TJ,BD,MN			
PHOTO DOCUMENTATION										
Roll Name Frame Number Photo Description										
R1	17	-								
OW3	15	Site vie	;w							
·····			СОММЕ	NTS						
Disturbance Ind			idge. CNR Bridge. Subdivi							
Comment 1	В	elow sewa	ge outfall, some silt build up,	one cottonwood in	the water.					
Comment 2					- n - inc					
Comment 3			177.							

	DETAILED SITE DESCRIPTION
Site Name (e.g. TOB-1)	TOBIfirst three letters of stream name-site numberDate of surveyTime of surveySurveyors2000-10-0311:05BD,TJ
Gazetted Stream Nar	e Local Stream Name Watershed Code
Toboggan Creek	
TRIM Map Number	NTS 1:50000 Map # Zone Northing Easting
Site Location: Descr	be road and foot access
Just downstream of th	Toboggan Creek Hatchery building
	Limnology Station Marked
-	
Downstream Site Bou	ndary marker Orange Flagging distance to nearest pool downstream (meters)
Gradient (%)	2 Site Length (meters) 14 Interval between channel widths (meters) 2
-	Note: Minimum of 6 widths taken at equal intervals (@.5 intervals, 1.5 intervals, 2.5 intervalsto 9.5 intervals)
Chan	rel Width (m)
Wett	ed Width (m) 5 3 4 6 7 5
Max. Wett	d Depth (cm) 69 75 74 61 38 42
Max. Bank	al Depth (cm)
	Dominant Substrate COBBLE
	max. depth is > 50 cm, Estimated Sub-Dominant Substrate FINES
Pool Habitat	average flow is < 0.1 m/sec,
	excluding edges <10 cm deep 75 % Embeddedness 5
	Estimated Dominant Substrate
	average flow is >0.1 m/sec, no Percent Area (m2) Sub-Dominant Substrate
Glide Habitat	surface disturbance, excluding D90
	% Embeddedness
	Estimated
Edge Habitat	Edges of Pools and Glides that Percent Area (m2)
Luge Mathiat	are <10 cm deep 10
	Dominant Substrate COBBLE
	Estimated Sub-Dominant Substrate PEBBLE
	Surface disturbance provides cover Percent Area (m2) D90 7
Riffle Habitat	15 D90 5
Assessment of Fish	Habitat Instream Cover (N,T,M,A) M Out of Stream Cover (N,T,M, A) M
	(N,T,M,A) N=None, T=Trace, M=Moderate, A=Abundant
Functional LWD	M         Number <20 cm         Number 20-50 cm         3
Functional SWD	
Boulder Cover	N Single > 30 cm Boulder-clusters
Cobble Cover	M Percent of site area 80
Undercut Banks	N Length (m) Average width (m)
Aquatic Vegetatio	
Overhanging Veg	T
Fish Species Presen	
-	
Fish Species Suspec	ea: Cono, Dony varden, kandow/steenead

Site Name (e.g.	TOB-	DETAILED SITE I		<b>ON</b> te of survey	Time of s	urvey S	Surveyors			
TOB-1)		1 name-site number	2	2000-10-03	11:0	5	BD,TJ			
PHOTO DOCUMENTATION										
Roll Name	Frame Numbe	er Photo Description								
R1	13	looking upstream								
<b>R</b> 1	14	looking downstream								
OW5	1	Site view looking downstream, limn	o visible.							
		СОММЕ	NTS							
Disturbance Ind	licators									
Comment 1	Se	me limno as last year								
Comment 2							<u></u>			
Comment 3				<u></u>						
		<u></u>								

		Ľ	DETAIL	ED SI	TE DI	ESCRIP	<b>IOIT</b>	N			
Site Name (e.g. TC TOB-1)	)B-	2	first three lette name-site num					of survey 0-10-03	Time of sur 11:35		BD,TJ
Gazetted Stream Name		Local Stre	am Name		Wate	rshed Code					
Toboggan Creek											
TRIM Map Number			NTS	1:50000 N	/iap #					Northing	Easting
Site Location: Describe ro	ad and	foot access						UTM			
Upstream of Hatchery at sn	nolt fenc	e site.									
								I	Limnology S	tation Ma	rked 🖌
Upstream Site Boundary m	arker (e	g Red flag	ging)	Orange F	lagging	distanc	e to pear	rest pool ups	tream (meter	s)	30
Downstream Site Boundary			BB)	Orange F		5			vnstream (me		75
					_	<u> </u>					
Gradient (%) 0	Site	e Length (1		11				nel widths (1			
			: Minimum of	6 widths tal	ten at equa	l intervals (@	).5 interv	als, 1.5 interva	ls, 2.5 interva	lsto 9.	
Channel W		-	┥┝╼╴			10		╡┝━━			╡┝━═╡
Wetted W	<u> </u>		8	87	76	67	30		-		┫┝╍╍┥
Max. Wetted De Max. Bankful De	-	~	┥┝╧╨		╡┝┷╧	╡┝╼┈╸					1
	.pen (en	<u>"</u>									
						Estimate		Dominant St	ibstrate		COBBLE
		depth is > 5 ge flow is <			Percent		2)		nt Substrate	F	FINES
Pool Habitat			<10 cm deep		50	ר ר		D90		-	28
				_			J	% Embedde	dness	L	5
								Dominant S	ibstrate	Г	
	avera	ge flow is	>0.1 m/sec,	no	Percent	Estimate Area (m	ed		int Substrate	F	
Glide Habitat	1	e disturban		.ding			-	D90		Ē	
	edges	<10 cm de	ep			┛└──		% Embedde	dness	Ē	
<b>T</b>	Edges	s of Pools a	nd Glides	that	Percen	Estimat t Area (m					
Edge Habitat	are <	10 cm deep			10						
							 				CORDUE
						Estimate		Dominant S		╞	COBBLE FINES
	Surf	ace disturba	nce provides	s cover	Percent	Area (m	,	D90	ant Substrate	-	28
Riffle Habitat					40			% Embedde	dness	F	5
		· . <del>.</del> .	»,								
Assessment of Fish Habi	itat	Ins	tream Cover	(N,T,M,A	)	М	Ou	t of Stream (	Cover (N,T,N	/I, A)	T
	(N,T,M	1,A) N=N	lone, T=Trad	e, M=Mo	derate, A:	-Abundant					
Functional LWD	N	<u>м</u>	umber <20 c	m [		Number 20	-50 cm		Number >5	i0 cm	
Functional SWD	M			_				<u></u>			
Boulder Cover	M	Si	ngle > 30 cn	י ד <u>ב</u>	50	Boulder-clu	isters	0			
Cobble Cover	A		rcent of site	area	95			·			
Undercut Banks	N		ength (m)	L		Average wi	idth (m)				
Aquatic Vegetation		=									
Overhanging Veg.	T										
Fish Species Present:											
Fish Species Suspected:		Dolly Vare	len, Coho, R	ainbow/St	eelhead						

		DETAILED SITE DE	SCRIPTION							
Site Name (e.g. TOB-1)	TOB-2	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-10-0311:35BD,TJ							
PHOTO DOCUMENTATION										
Roll Name	Frame Number	Photo Description								
R1	15	Site view looking upstreram								
OW5	2	Site view looking dowmstream.								
		COMMEN	ГS							
Disturbance In	dicators									
Comment 1	Son	e cobble about 30 cm in diameter has be	en added to the site from smolt fence installation.							
Comment 2										
Comment 3										

		Ľ	<b>ETAIL</b>	ED SIT	E DE	SCRIP	ΓΙΟΝ	ſ			
Site Name (e.g. T TOB-1)	OB-	5	first three letter name-site numb				Date of 2000	survey -11-16	Time of surv 1:30		veyors BD,TJ
Gazetted Stream Name		Local Stre	am Name		Waters	hed Code					
Toboggan Lake											
TRIM Map Number			NTS	1:50000 Ma	ap#				Zone No	orthing	Easting
Site Location: Describe	road and	foot access						UTM			
About 100 meters in fron	t of Jill St	oreys house						L	imnology Sta	tion Mark	ied 🔽
Upstream Site Boundary	marker (e.	g. Red flag	ging)		]	distance	to neare	est pool upst	ream (meters	)	
Downstream Site Bounda	ry marker					distance	to neare	est pool dow	nstream (met	ers)	
	-) Width (m			5 widths take				el widths (m	neters) s, 2.5 intervals	to 9.5 i	ntervals)
	Width (n		┥┝╍╍╍	{		┥┠━━━┥		╺┥┝╌┈┈	┥┝━━━┥		
Max. Wetted			╺┥┝───╴	╏┝━━━┥	<b></b>			┉┤┝╍╍╍╍			
Max. Bankful I	Depth (cn	<u> </u>									
Pool Habitat	avera	depth is > 5 ge flow is < ding edges <			Percent	Estimated Area (m2)	) s	oominant Sul ub-Dominan 990 6 Embedded	at Substrate		·
Glide Habitat	surfac	ge flow is > e disturbanc <10 cm dee	ce, exclud		Percent	Estimated Area (m2)	) s	Dominant Sub ub-Dominar 090 6 Embedded	nt Substrate		
Edge Habitat		of Pools an 0 cm deep	d Glides	that	Percent	Estimated Area (m2					
Riffle Habitat	Surfa	ice disturbar	ace provides	cover	Percent	Estimated Area (m2)	ו ) s ר ב	Dominant Su Gub-Dominar 090 % Embedded	nt Substrate		
Assessment of Fish Ha	bitat	Inst	ream Cover (	N,T,M,A)			Out	of Stream Co	over (N,T,M,	A)	
Functional LWD Functional SWD Boulder Cover	(N,T,M	Nu	one, T=Trace mber <20 cm ngle > 30 cm		м [	Abundant Tumber 20-5 oulder-clust	Ŧ		Number >50	cm [	]
Cobble Cover Undercut Banks		=	cent of site a ngth (m)	rea		verage wid	th (m)	[]			
Aquatic Vegetation			2 . /	L		-		ب			
Overhanging Veg.											
Fish Species Present:	Γ										
Fish Species Suspected	: Ī										
	- 1						_				

	DETAILED SITE DESCR	<b>UPTION</b>								
Site Name (e.g. TOB -	first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-11-161:30BD,TJ								
PHOTO DOCUMENTATION										
Roll Name Frame Number	· Photo Description									
OW5 4	Site view limno visible									
	COMMENTS									
Disturbance Indicators										
Comment 1										
Comment 2										
Comment 3										

		DETAIL	ED SITE D	ESCRIP	ΓΙΟΝ		
Site Name (e.g. TOB-1)	<b>DB-</b> 6	first three letter name-site numb			Date of survey 2000-12-20	Time of survey	Surveyors TJ,TD
Gazetted Stream Name	Loca	l Stream Name	Wat	ershed Code			<u> </u>
Toboggan Creek							
TRIM Map Number		NTS	1:50000 Map #			Zone North	ing Easting
Site Location: Describe r	oad and foot a	ccess			UTM		
About 50 meters to the rig	ht of site # 5.						
						Limnology Station	n Marked 🛛 🗸
			<u></u>	<b>.</b>			
Upstream Site Boundary r		i flagging)			e to nearest pool up e to nearest pool do		
Downstream Site Boundar	y marker						
Gradient (%)	Site Leng	gth (meters)	Int	erval betwee	n channel widths (	meters)	
	_	Note: Minimum of 6	widths taken at equ	al intervals (@	5 intervals, 1.5 interv	als, 2.5 intervalsto	9.5 intervals)
Channel	Width (m)					<u> </u>	
Wetted	Width (m)					┥┝╾┥┝╴	
Max. Wetted D	epth (cm)					┛┝╸	
Max. Bankful D	epth (cm)						
					Dominant S	ubstrate	
	max. depth	is $> 50$ cm,	_	Estimated	i Sub-Domin	ant Substrate	
Pool Habitat	average flow	w is < 0.1 m/sec,	Percer	t Area (m2	)		
	excluding e	dges <10 cm deep			6 Embedde	dness	
· _ · · · · · · · · · · · · · · · · · ·				Estimated	Dominant S	ubstrate	
		w is >0.1 m/sec,	no Percer		0 1 D '	ant Substrate	
Glide Habitat	surface distr edges <10 c				D90		
	cuges and c		[	[	ے % Embedde	edness	
				Estimate			
Edge Habitat	Edges of Po	ols and Glides	that Percer				
Euge Habitat	are <10 cm	deep			7		
			·····				-
				Estimated	Dominant S		
	Surface dis	turbance provides	cover Percer	nt Area (m2	.)	ant Substrate	
Riffle Habitat					D90		
	<u>p</u> .				% Embedde		
Assessment of Fish Hat	oitat	Instream Cover (	N,T,M,A)		Out of Stream	Cover (N,T,M, A)	
				- A hundant			
Functional LWD	(N,T,M,A)	N=None, T=Trace Number <20 cm		Number 20-	50 cm	Number >50 cm	
Functional SWD			· •	Trailibel 20-1			LJ
Boulder Cover		Single > 30 cm	<b></b>	Boulder-clus	ters		
Cobble Cover		Percent of site a	rea		····-		
Undercut Banks		Length (m)		Average wid	ith (m)		
Aquatic Vegetation		B ()	نـــــا				
Overhanging Veg.							
	LJ				<b></b>		
Fish Species Present:							
Fish Species Suspected:							

DETAILED SITE DESCRIPTION										
Site Name (e.g. TOB-1)	<b>TOB-</b> 6	first three letters of stream name-site number	Date of surveyTime of sur2000-12-2012:00	vey Surveyors						
PHOTO DOCUMENTATION										
Roll Name	Frame Number	Photo Description								
OW5	5	Site view limno visible.								
		СОММ	IENTS							
Disturbance Inc	licators									
	L			J						
Comment 1										
Comment 2										
Comment 3		· · · · · · · · · · · · · · · · · · ·	<u></u>							
		<del></del>								

DETAILED SITE DESCRIPTION								
Site Name (e.g. TOB-1)	TOB-	8	first three letters of str name-site number	eam		Date of survey 2000-12-20	Time of survey 1:17	Surveyors TJ,TD,JD
Gazetted Stream Na Toboggan Creek	me	Local Str	eam Name	Water	shed Code			
TRIM Map Number			NTS 1:500	00 Map # [		UTM		ing Easting
Site Location: Descr Couldn't get enough o				nder CNR brid	ge by Eric J		imnology Statio	n Marked 🗌
Upstream Site Bound Downstream Site Bou		;ging)		distance to nearest pool upstream (meters) distance to nearest pool downstream (meters)				
Wett Max. Wett	Sit nel Width (n ted Width (n ed Depth (cn ful Depth (cn	2				n channel widths (n .5 intervals, 1.5 interva		9.5 intervals)
Pool Habitat	avera		0 cm, < 0.1 m/sec, <10 cm deep	Percent	Estimated Area (m2	Sub Domina	nt Substrate	
Glide Habitat	surfac	ge flow is ce disturbar <10 cm de	ce, excluding	Percent	Estimated Area (m2	0 1 D ·	nt Substrate	
Edge Habitat		of Pools a 0 cm deep	nd Glides that	Percent	Estimated Area (m2			
Riffle Habitat	Surf	ace disturba	nce provides cover	Percent	Estimated Area (m2	Sub-Domina	nt Substrate	
Assessment of Fish	Habitat	Ins	tream Cover (N,T,I	M,A)		Out of Stream C	over (N,T,M, A)	
Functional LWD Functional SWD Boulder Cover Cobble Cover Undercut Banks Aquatic Vegetatio Overhanging Veg Fish Species Presen		N Si Pe	Ione, T=Trace, M= umber <20 cm ngle > 30 cm rcent of site area ength (m)		Abundant Jumber 20-5 Goulder-clus Average wid	ters	Number >50 cm	
Fish Species Suspec	7							

ite Name (e.g. TOB-1)	- 8 first three letters of stream name-site number	Date of surveyTime of surveySurveyors2000-12-201:17TJ,TD,JD				
PHOTO DOCUMENTATION						
COMMENTS						
N:	<b></b>					
Disturbance Indicators						
Comment 1						
Comment 2						
Comment 3						

## Appendix 2. Winter Sampling Data

## Appendix 2a. Winter Sampling Data and Graphs

-

-

-

	Air temperature and water temperature at the sites sampled during the Upper Bulkley and Toboggan Creek overwintering study
Plate 4.	Percent ice cover and ice thickness at sites sampled during the Upper Bulkley and Toboggan Creek overwintering study
Plate 5.	Water depth (above) and snow depth (below) at sites sampled during the Upper Bulkley and Toboggan Creek overwintering study
Plate 6.	Conductivity (above) and dissolved oxygen (below) at sites sampled during the Upper Bulkley and Toboggan Creek overwintering study

## Appendix 2b.Winter Sampling Data Forms