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SYNOPTIC SURVEYS OF JUVENILE COHO POPULATIONS AND ASSOCIATED HABITAT CHARACTERISTICS IN SELECTED LAKES AND STREAMS WITHIN THE SKEENA RIVER WATERSHED, BRITISH COLUMBIA, BETWEEN 10 AUGUST AND 2 SEPTEMBER, 1996

by

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for

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INTRODUCTION

This report presents the results of the third year of habitat assessment and juvenile salmonid population sampling within the Skeena River watershed, as part of the Skeena River Green Plan Program. In 1994, synoptic juvenile coho salmon (*Oncorhynchus kisutch*) surveys were initiated as an alternative, cost effective, method to assess and monitor coho population levels within the Skeena River drainage. In combination with other information, this program will permit delineation of actual and potential areas of coho production in the Skeena watershed.

In the first two years of the program 93 sites on 46 streams were sampled for coho and other salmonids, principally chinook (*O. tshawytscha*) and steelhead trout (*O. mykiss*). Information was also collected on various components of habitat in lake and stream sites to assist in current appraisal of habitat utilization and potential. The 1996 study was conducted on 45 sites in 33 streams and in 8 lakes. A majority of sites sampled during the 1995 program were revisited in 1996.

This report documents the results of sampling conducted throughout the Skeena River watershed between 10 August and 2 September, 1996. Summary information is presented for physical and chemical characteristics of habitat as well as various estimates of population densities for juvenile coho and other species.

METHODS

A total of 8 lake and 45 stream sites were sampled during the field program, representing a majority of sites that were visited in the1995 study and the reinstatement of Clear Creek and Nangeese River from the 1994 program. Site locations were geo-referenced using a Micrologic Sportsman GPS. Site boundaries were marked with flagging tape. Sampling was conducted by two independent field crews, one of which was responsible for the western and central portions of the study area, while the other operated mainly in the northern and eastern areas.

Stream Habitat Assessment

Stream reaches of approximately 100 m were established at all stream sites with the exception of Gitnadoix River, where a shorter site was necessitated by high flows. An initial set of measurements was made to establish the accurate length of the reach and the distribution and lengths of habitat unit types (pool, riffle, run and dewatered). A sketch map was made of the entire reach, indicating the locations of habitat units, significant LWD, and other prominent habitat features. Pools were classified in terms of formation, whether by LWD (logs or root wads), beaver activity or other (neither of the previous two). The pool cross-sectional profile, at the mid-point, was categorized as rectangular, triangular, convex or concave. Residual depth was calculated from the maximum pool depth minus the depth at the riffle crest (downstream lip). Site gradients were measured in at least three sections between the downstream ends of pools, using a Suunto optical clinometer.

Measurements of temperature (^{0}C) and conductivity (μmhos) were made at the start and end of the reach, using a Cole Parmer Model 19815-00 conductivity meter. pH was recorded at these sites using a Cole-Parmer Model 59000-25 Waterproof pH Testr2. Time of sampling was recorded for these measurements.

Channel width was measured at 20 m intervals, using either a tape measure or a Sonin Combo Pro acoustical rangefinder. Additional measurements were taken to accommodate variations in channel width within habitat units. Three measures of channel width were recorded: wetted width; bankfull width (in the absence of well defined banks, this was a subjective measurement of channel extent at normal high flows, as indicated by established vegetation in the riparian zone or the extent of exposed sands and gravel); and 10 cm wetted width (the limit of water at least 10 cm deep) in pool habitat.

Sun arc was measured at 5 locations on the main thalweg using a Suunto optical clinometer. The angle of elevation of the horizon, if clearly visible, or of vegetation that was sufficiently dense to create shade was measured in five directions; east, south-east, south, south-west and west. Characteristics of riparian vegetation on each bank were recorded at each sun-arc site. The predominant type of vegetation within 5 m of the high water mark was recorded as one of the following categories: herbs and grasses (<1 m high); shrubs (1-3 m high); and trees (>3 m high). An assessment of density (sparse, moderate, dense) and percent deciduous was made for treed sections of bank.

The length of undercut banks that could hide predatory fish (≥100 mm) and the length of bank that provided overhanging vegetation (vegetation within 0.5 m of the stream) were measured. The areal extent of submerged and emergent vegetation that would provide cover for juvenile fish was estimated from measurements of mean length and width. Length and mean diameter of individual pieces of LWD were measured. Clumped LWD was measured as a unit, with an accompanying estimate of the number of pieces in the clump. The position of pieces of LWD in relation to the water surface was recorded using the following categories: submerged (≥50% of length); in contact (10%-50% of LWD in water); high water zone (<10% of length in water, remainder largely within the bank-full width); and bridging (crosses the stream out of the water but is likely to be submerged during normal high water).

Substrate composition was estimated as a percentage for the categories; silt, sand (<≈1 mm), gravel (<≈ 30 mm), cobble (<≈ 100 m) and boulder (>100 mm).

Lake Fish Collections

Quantitative sampling was performed by mark - recapture in Green Lake. Semi-quantitative collections were made in all other lakes. Sampling was generally conducted with Gee minnow traps baited with salmon roe, set along 200 m of shoreline for a set time ranging between 2.5 and 20 hours. Beach seining was used in Nilkitkwa

Lake. Captured coho were marked by removing a small portion of the caudal fin and released throughout the sampled area. Recapture sampling was carried out in Green Lake after three days.

Salmonid species were counted, anaesthetized in 2-phenoxy ethanol, and measured for fork length. A representative sub-sample of salmonids were weighed using an Ohaus CT600-S balance (± 0.1 g). Scales were taken from a sub-sample of coho and other salmonids. Other species were counted and fork lengths and weights were measured from a representative sub-sample. Where available, up to 30 fin clips from coho were preserved in 95% benzene free ethanol for genetic stock identification

Stream Fish Population Estimates

Concomitant removal and mark-recapture techniques were performed at a majority of sites by applying a unique mark to captured fish and returning these to the population. Fish were sequentially marked and released during multiple censuses of these sites, subsequently utilizing the mark types to identify population strata for mark-recapture and removal-depletion estimates.

A sampling site, approximately 30 m to 50 m in length, was selected within the reach to encompass a variety of hydraulic types, but with emphasis on pool habitat. This section of creek was blocked off with fine mesh barrier nets and repeated passes were made through the section using an appropriate sampling gear, usually electro-shocker or pole seine. Green River, Gitnadoix River and Clear Creek were too deep to permit the use of these gear types and were sampled using baited Gee minnow traps.

An initial pass was made through the site and the catch was removed to one or more 12 liter containers for sampling and marking. All fish collected in this pass were marked with an upper caudal fin clip. Following sampling for length and weights, performed concurrently with marking, all fish when fully recovered were returned to the population. In a majority of cases the sampling procedure was of sufficient duration to ensure the full recovery of all fish. However, a minimum period of 30 minutes

separated sampling passes when catches were low to minimize potential bias to catchability resulting from the sampling procedure.

Following a second pass through the site, all non-clipped fish were counted and marked with a lower caudal fin clip, so that these could be distinguished from all previously captured fish. Fish that were recaptured on this pass, i.e. upper caudal clips, were re-marked with a lower caudal fin clip. The catch from the third and final sampling pass was then enumerated for all unmarked fish and all mark types.

All captured fish were identified and counted and the fork length of all salmonids was measured. Representative sub-samples from the size range of each salmonid species were weighed and scale samples were taken. Sub-samples (up to 30 individuals) from other species were measured for fork length and weighed.

Semi-quantitative sampling was performed outside of the sampling site to increase sample sizes for size-frequency and age composition in streams where removal sampling failed to produce 30 coho. Electroshocking and pole seining were the most commonly used capture methods. Level of effort was recorded as duration of electroshocking and length of stream (m) seined. Coho and other salmonids were sampled as described above; data were maintained separately from those collected in quantitative sampling. Other species were identified and counted.

Calculations of Density Estimates for Stream Fish

Three methods of population estimation were appropriate to the data from sites where marks were released into the populations. Mark-recapture estimates were calculated using a modified Petersen formula (Chapman 1951) and sequential Bayes estimator (Gazey and Staley 1986). Removal-depletion estimates for three or more removals was calculated using the Zippin method (Zippin 1958). Removal patterns were tested for compliance with the assumption of constant probability of capture throughout successive removals. A specific example of each of the above methods of

estimation is provided in Appendix A, using coho data from Cullon Creek and Gosnell Creek (2 removals method).

RESULTS

Juvenile fish populations were sampled in 8 lakes and 33 streams (at 45 sites), in combination with assessment of selected habitat characteristics. All of the lakes that were sampled were previously visited in either the 1994 or 1995 programs. A majority of streams sampled during the 1996 field program were previously visited in 1995. Clear Creek and Nangeese River, both of which were sampled in 1994, were included in the current study. Previously sampled streams that were eliminated from the 1996 program were Cedar River and Sutherland River. Sites were also eliminated on Morrison River, Telkwa River and Sicintine River. Poor weather conditions prevented access to Ecstall River and tributary. Additional sites were sampled on Coldwater River, Copper River and Sockeye Creek. Locations, dates of sampling and general access methods for each sampling location are provided in Tables 1 and 2.

Habitat Sampling

Summaries of the dimensions and distribution of stream habitat units are provided in Tables 3 - 6. Basic water chemistry measurements are shown in table 7. Sun arc angles and measurements of bank-related cover are given in Tables 8 and 9, respectively. Other elements of cover, including LWD dimensions, are summarized in Tables 10 to 12.

Fish collections

All of the lakes sampled contained coho, with greatest abundances occurring in Toboggan Lake and McDonnel Lake (Table 13), respectively 156 and 124 individuals captured. Chinook were found only in Green Lake (24 individuals captured in two sampling visits) and rainbow trout comprised a minor portion of the catch in Footsore and Toboggan lakes. Catches of non-salmonid species are listed in Table 14. Measurements of fork length and weight are given for all species in Table 15. Regression parameters of weight on fork length are shown in Table 16.

Coho were captured in almosy all of the streams sampled (Table 17). Exceptions were Sicintine River, Johansen side channel, Telkwa River and Elliott Creek. Chinook were found in Kitwanga River, Cullon Creek, Moonlit Creek, Toboggan Creek, Boucher Creek Shea Creek and Sustut River. As usual, total catches of these and other species varied widely among sites.

Sampling effort and catches are shown for streams where quantitative sampling was unsuccessful, in Table 18. Catches resulting from semi-quantitative sampling beyond the boundaries of the original sampling site are given in Table 19.

Mean fork lengths and weights of coho and other species are presented in Table 20. Parameters of weight on fork length regressions are listed for species where at least 15 measurements of length and weight were made, in Table 21.

The total catches, marks released and marks recaptured for two sampling occasions on Green Lake are given in Table 22 with modified Petersen and Bayes population estimates. Both methods of estimation indicate a higher population density of coho than determined in 1995 (1424 versus 828 and 1845 versus 923, by the Petersen and Bayes estimators, respectively). Retrapping in Toboggan Lake to provide a population estimate was precluded by access difficulties.

Catch data for each of the three quantitative sampling passes in stream sites are presented in Table 23. The data used in the modified Petersen method of population estimation are listed in Table 24. The various estimates of abundance from the

modified Petersen method are given in Table 25 and means of these estimates are listed in Table 26. Fewer than normal population estimates were obtained by mark-recapture due to a reluctance on the part of one crew chief to initiate marking when fewer than 40 coho were captured on the first collection pass. Bayesian estimates are presented in Table (27). Removal-depletion estimates (Zippin) are presented in Table 28. Linear and areal estimates of abundance and biomass are provided in Tables 29 and 30 and Tables 31 and 32, respectively.

Bayesian and Petersen estimates agreed closely in almost all cases and good agreement generally occurred between these and removal-depletion estimates (Tables 29 to 32) with the latter tending to underestimate the population size, in comparison with the other methods. In common with previous years of the program, there were few cases where the probability of capture over three removals was significantly different among passes; Toboggan Creek tributary is an obvious exception, due to the capture of larger numbers of coho in the second versus the first pass (Table 23).

Zippin estimates of coho densities at the various river sites are compared in Fig. 1. Populations at a majority of sites attained 1 to 4 individuals.m^{-1}. Sites where greater than 5 individuals.m^{-1} occurred were Coldwater Creek (L) and (U), Copper River (U), Deep Creek, Kispiox River and Toboggan Creek tributary. Comparison of Zippin estimates of linear density for sites sampled in both 1995 and 1996 (Fig.2) indicates that at a majority of sites, 1996 densities of coho were lower than those in the previous year. The 95% confidence intervals for the above estimates are shown in Fig. 3. These indicate that populations can be considered to be different in eight out of the 12 streams, at this level of certainty. Population densities increased in 1996 in only four cases, Coldwater (U), Cullen (U) and (L) and Kitwanga (L).

Quantitative population estimates from streams that were sampled in each year of the program are compared in Fig. 4; also shown are 1994 and 1995 values for Alastair River, Elliot tributary, Gosnell Creek and Singlehurst Creek. Most of the 1996 estimates lie between those of the previous years. The overlap of 95% confidence intervals illustrated in Fig. 3 suggests that this is likely to be the case for Deep Creek and Hankin Creek also. Quantitative estimates were not obtained for Alastair River,

Elliot tributary, Gosnell Creek and Singlehurst Creek in 1996, due to low coho densities. Comparisons of catch per unit effort (total catch per unit length) for these streams in 1995 and 1996 are, respectively, 0.68 / 0.26, 3.26 / 0.15, 4.4 / 0.12 and 1.0 / 0.24 (Taylor 1996). Since the 1995 CPUE values are close to the calculated population estimates for 1995 the 1996 CPUE values have been provided in Fig. 3 for comparative purposes.

Coho densities in the upper Babine Lake tributaries, Boucher Creek and Lamprey Creek were lower than those measured in 1994 (no estimates were obtained in 1995). Sampling in Ninemile Creek failed to produced sufficient coho for quantitative analysis, for the second year. Upper and lower Boucher Creek contained, respectively, 2.3 and 6.5 individuals.m^{-1} in 1994 (Taylor 1995) and 0.91 and 1.78 individuals.m^{-1} in 1996 (Zippin estimates). Lamprey Creek also had a lower density of coho in 1996, 0.15 individuals.m^{-1} compared with 2.6 individuals.m^{-1} in 1994.

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Table 1. Sampling date, positional reference and access method for lake sites.

33Lake Name Crew based in	Date	GPS	Access
Green Lake	19-Aug-96	54 15 07.2 / 129 57 33.6	Road	Prince Rupert
Alastair Lake	20-Aug-96	54 04 07.8 / 129 11 06.5	Float plane	Prince Rupert
Lakelse Lake	26-Aug-96	54 23 16.4 / 128 32 11.8	Road	Terrace
Footsore Lake	01-Sep-96	55 33 16.1 / 128 27 56.0	Road	New Hazelton
Nangese Lake	01-Sep-96	55 44 16.5 / 128 25 43.4	Road	New Hazelton
Nilkitkwa Lake	18-Aug-96	55 24 37.9 / 126 41 02.8	Boat	Fort Babine
McDonnel Lake	18-Aug-96	54 47 15.2 / 127 34 09.4	Road	Smithers
Toboggan Lake	30-Aug-96	54 53 23.3 / 127 16 01.3	Road	Smithers
Green Lake	22-Aug-96	54 13 59.7 / 129 58 29.6	Road	Prince Rupert

Table 2. Sampling date, positional reference and access method for stream sites.

Stream Name	Site	Date	GPS	Access	Crew based in
Hankin Creek	1	13-Aug-96	54 47 05.2 / 127 10 02.2	Road	Smithers
Hankin Creek (L)	2	13-Aug-96	54 47 05.2 / 127 10 02.0	Road	Smithers
Copper River (L)	1	15-Aug-96	54 46 33.2 / 127 27 57.4	Road	Smithers
Kitwanga River (L)	1	16-Aug-96	55 19 10.6 / 128 05 47.7	Road	New Hazelton
Clifford Creek	1	17-Aug-96	55 39 36.0 / 128 13 27.4	Road	New Hazelton
Clifford Creek	2	17-Aug-96	55 39 36.0 / 128 13 27.4	Road	New Hazelton
Kitwanga River (U)	1	18-Aug-96	55 24 46.8/ 128 09 33.4	Road	New Hazelton
Moonlit Creek	1	18-Aug-96	55 19 28.5 / 128 05 18.1	Road	New Hazelton
Green River	1	19-Aug-96	54 13 59.7 / 129 58 29.6	Road	Prince Rupert
Alastair River	1	20-Aug-96	54 04 13.3 / 129 11 26.5	Float plane	Prince Rupert
Clearwater Creek	1	23-Aug-96	54 19 14.3 / 128 33 53.3	Road	Terrace
Clearwater Creek	2	23-Aug-96	54 19 14.3 / 128 33 53.3	Road	Terrace
Clear Creek (U)	1	24-Aug-96	54 54 21.1 / 128 47 14.8	Road	Terrace
Sockeye Creek (L)	1	26-Aug-96	54 26 04.1 / 128 31 51.7	Road	Terrace
Sockeye Creek (U)	2	29-Aug-96		Road	Terrace
Gitnadoix River	1	27-Aug-96	54 16 32.0 / 129 11 35.0	Helicopter	Terrace
Gitnadoix River	2	27-Aug-96	54 16 32.0 / 129 11 35.0	Helicopter	Terrace
Hadenschild Creek	1	28-Aug-96	56 55 49.9 / 128 52 49.3	Road	Terrace
Deep Creek	1	28-Aug-96	54 34 26.6 / 128 38 40.3	Road	Terrace
Singlehurst Creek	1	29-Aug-96	54 36 28.8 / 128 23 55.6	Road	Terrace
Coldwater Creek (U)	1	30-Aug-96	54 21 14.7 / 128 39 55.1	Road	Terrace
Coldwater Creek (L)	2	30-Aug-96	54 21 14.7 / 128 39 55.1	Road	Terrace
Cullon Creek (U)	1	1-Sep-96	55 34 07.7/ 127 54 08.8	Road	New Hazelton
Cullon Creek (L)	2	1-Sep-96	55 34 10.8 / 127 54 22.9	Road	New Hazelton
Kispiox River	1	2-Sep-96	55 33 25.6 / 127 37 01.1	Road	New Hazelton
Toboggan Creek Trib.	1	14-Aug-96	54 53 46.6 / 127 15 58.0	Road	Smithers
Toboggan Creek (L)	2	17-Aug-96	54 53 46.6 / 127 15 58.0	Road	Smithers
Copper River (U)	2	15-Aug-96		Road	Smithers
Tachek Creek	1	10-Aug-96	55 47 46.1 / 126 07 28.8	Road	Houston
Boucher Creek (L)	1	18-Aug-96	55 24 56.3 / 126 41 06.5	Boat	Babine Lodge
Boucher Creek (U)	2	18-Aug-96	55 24 82.4 / 126 41 06.5	Boat	Babine Lodge
Nine Mile Creek	1	19-Aug-96	55 12 46.8 / 126 34 57.4	Boat	Babine Lodge
Lamprey Creek	1	20-Aug-96	55 18 02.3 / 126 35 59.6	Boat	Babine Lodge

Table 2. cont'd

Stream Name	Site	Date	GPS	Access	Crew based in
Morrison River (U)	1	21-Aug-96	55 09 06.9 / 126 17 13.6	Float plane	Burns Lake
Gosnell Creek	1	23-Aug-96	54 11 50.4 / 127 38 57.2	Helicopter	Smithers
Shea Creek (side)	1	25-Aug-96	54 15 28.5 / 127 31 23.0	Helicopter	Smithers
Shea Creek (main)	2	25-Aug-96	54 15 28.5 / 127 31 23.4	Helicopter	Smithers
Sicintine River	1	26-Aug-96	55 59 26.0 / 127 25 36.0	Helicopter	Smithers
Sustut River	1	27-Aug-96	56 38 46.2 / 126 30 18.5	Helicopter	Smithers
Johansen side ch.	1	27-Aug-96		Helicopter	Smithers
Telkwa River Trib.	1	28-Aug-96	54 31 51.4 / 127 39 26.8	Helicopter	Smithers
Elliot Creek Trib.	1	29-Aug-96	54 34 10.7 / 127 35 52.5	Helicopter	Smithers
Elliot Creek Main.	2	29-Aug-96	54 34 17.5 / 127 35 42.5	Helicopter	Smithers
Footsore Lk. inlet	1	1-Sep-96	55 44 42.5 / 128 29 33.5	Road	New Hazelton
Nangeese River	1	2-Sep-96		Road	New Hazelton

Table 3. Summary of stream habitat units.

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Alastair River	1	1	Riffle	43
Alastair River	1	2	Run	40
Alastair River	1	3	Pool	4
Alastair River	1	4	Run	13
Boucher Creek (L)	1	1	Riffle	60
Boucher Creek (L)	1	2	Run	14
Boucher Creek (L)	1	3	Pool	26
Boucher Creek (U)	2	0	Run	5.3
Boucher Creek (U)	2	2	Riffle	14.7
Boucher Creek (U)	2	3	Run	10.9
Boucher Creek (U)	2	4	Riffle	4.1
Boucher Creek (U)	2	5	Pool	9
Boucher Creek (U)	2	6	Riffle	5.9
Boucher Creek (U)	2	7	Run	3.6
Boucher Creek (U)	2	8	Riffle	5.5
Boucher Creek (U)	2	9	Pool	6
Boucher Creek (U)	2	10	Run	9.4
Boucher Creek (U)	2	11	Riffle	14.6
Boucher Creek (U)	2	12	Run	16.1
Clear Creek (U)	1	1	Riffle	25
Clear Creek (U)	1	2	Pool	15
Clear Creek (U)	1	3	Run	15
Clear Creek (U)	1	4	Riffle	8
Clear Creek (U)	1	5	Pool	3
Clear Creek (U)	1	6	Run	34
Clearwater Creek	1	1	Riffle	31
Clearwater Creek	2	1	Riffle	81
Clearwater Creek	2	2	Run	19
Clearwater Creek	1	2	Run	21
Clearwater Creek	1	3	Pool	6
Clearwater Creek	1	4	Run	5
Clearwater Creek	1	5	Riffle	4
Clearwater Creek	1	6	Run	6
Clearwater Creek	1	7	Riffle	13

Table 3. cont'd

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Clearwater Creek	1	8	Pool	2
Clearwater Creek	1	9	Riffle	12
Clifford Creek	1	1	Riffle	43
Clifford Creek	2	1	Riffle	24
Clifford Creek	2	2	Run	10
Clifford Creek	1	2	Run	3
Clifford Creek	2	3	Riffle	66
Clifford Creek	1	3	Riffle	19
Clifford Creek	1	4	Run	8
Clifford Creek	1	5	Riffle	27
Coldwater Creek (L)	2	1	Riffle	40
Coldwater Creek (L)	2	2	Run	12
Coldwater Creek (L)	2	3	Riffle	8
Coldwater Creek (L)	2	4	Pool	12
Coldwater Creek (L)	2	5	Riffle	28
Coldwater Creek (U)	1	1	Run	8
Coldwater Creek (U)	1	2	Riffle	6
Coldwater Creek (U)	1	3	Run	15
Coldwater Creek (U)	1	4	Riffle	26
Coldwater Creek (U)	1	5	Pool	24
Coldwater Creek (U)	1	6	Riffle	21
Copper River (L)	1	1	Run	84
Copper River (L)	1	2	Riffle	26
Copper River (U)	2	1	Run	61.8
Copper River (U)	2	2	Riffle	15.2
Copper River (U)	2	3	Run	30
Copper River (U)	2	4	Pool	28
Copper River (U)	2	5	Pool	15.3
Cullon Creek (L)	2	1	Riffle	55
Cullon Creek (L)	2	2	Pool	25
Cullon Creek (L)	2	3	Run	20
Cullon Creek (U)	1	1	Run	16
Cullon Creek (U)	1	2	Riffle	59
Cullon Creek (U)	1	3	Pool	10
Cullon Creek (U)	1	4	Run	2

Table 3. cont'd

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Cullon Creek (U)	1	5	Pool	13
Deep Creek	1	1	Pool	24
Deep Creek	1	2	Riffle	41
Deep Creek	1	3	Pool	15
Deep Creek	1	4	Riffle	20
Elliot Creek Main.	2	1	Riffle	20
Elliot Creek Main.	2	2	Pool	13.6
Elliot Creek Main.	2	3	Riffle	38.4
Elliot Creek Main.	2	4	Pool	22.6
Elliot Creek Main.	2	5	Run	5.4
Elliot Creek Main.	2	6	Pool	24.2
Elliot Creek Trib.	1	1	Run	58.9
Elliot Creek Trib.	1	2	Pool	12
Elliot Creek Trib.	1	3	Run	6.9
Elliot Creek Trib.	1	4	Pool	7.9
Elliot Creek Trib.	1	5	Riffle	5.3
Footsore Lk. inlet	1	1	Pool	4.3
Footsore Lk. inlet	1	2	Run	44.6
Footsore Lk. inlet	1	3	Pool	11.4
Footsore Lk. inlet	1	4	Riffle	8.6
Footsore Lk. inlet	1	5	Pool	7.1
Footsore Lk. inlet	1	6	Riffle	14.3
Footsore Lk. inlet	1	7	Run	12.7
Gitnadoix River	1	1	Pool	18
Gitnadoix River	2	1	Run	54
Gitnadoix River	1	2	Riffle	55
Gitnadoix River	1	3	Run	7
Gitnadoix River	1	4	Riffle	20
Gosnell Creek	1	1	Run	101
Gosnell Creek	1	2	Run	7
Green River	1	1	Run	31
Green River	1	2	Riffle	6
Green River	1	3	Run	10
Green River	1	4	Riffle	33
Hadenschild Creek	1	1	Run	20

Table 3. cont'd

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Hadenschild Creek	1	2	Riffle	14
Hadenschild Creek	1	3	Run	16
Hadenschild Creek	1	4	Riffle	7
Hadenschild Creek	1	5	Run	43
Hankin Creek	1	1	Riffle	2.1
Hankin Creek	1	2	Run	16.4
Hankin Creek	1	3	Riffle	11.8
Hankin Creek	1	4	Pool	11.7
Hankin Creek	1	5	Riffle	10.6
Hankin Creek	1	6	Pool	1
Hankin Creek	1	7	Riffle	10.6
Hankin Creek	1	8	Run	2.6
Hankin Creek	1	9	Pool	4.5
Hankin Creek	1	10	Riffle	10.2
Hankin Creek	1	11	Run	7
Hankin Creek	1	12	Run	4.9
Hankin Creek	1	13	Pool	3.1
Hankin Creek	1	14	Run	4.2
Hankin Creek	1	15	Pool	8
Hankin Creek (L)	2	1	Riffle	25
Hankin Creek (L)	2	2	Run	10.2
Hankin Creek (L)	2	3	Riffle	18.3
Hankin Creek (L)	2	4	Run	15.1
Hankin Creek (L)	2	5	Riffle	17.9
Johansen side ch.	1	1	Pool	10.6
Johansen side ch.	1	2	Run	13
Johansen side ch.	1	3	Riffle	13.4
Johansen side ch.	1	4	Pool	11.9
Johansen side ch.	1	5	Pool	14.9
Johansen side ch.	1	6	Riffle	10.6
Johansen side ch.	1	7	Pool	7.4
Johansen side ch.	1	8	Pool	12
Johansen side ch.	1	9	Pool	5.6
Johansen side ch.	1	10	Pool	7.2
Kispiox River	1	1	Pool	20

Table 3. cont'd

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Kispiox River	1	2	Run	80
Kitwanga River (L)	1	1	Riffle	8
Kitwanga River (L)	1	2	Run	25
Kitwanga River (L)	1	3	Riffle	21
Kitwanga River (L)	1	4	Pool	13
Kitwanga River (L)	1	5	Run	33
Kitwanga River (U)	1	1	Run	29
Kitwanga River (U)	1	2	Riffle	20
Kitwanga River (U)	1	3	Run	36
Kitwanga River (U)	1	4	Riffle	15
Lamprey Creek	1	1	Pool	6
Lamprey Creek	1	2	Pool	14
Lamprey Creek	1	3	Run	6.5
Lamprey Creek	1	4	Pool	6.2
Lamprey Creek	1	5	Run	31
Lamprey Creek	1	6	Pool	29.6
Moonlit Creek	1	1	Riffle	41
Moonlit Creek	1	2	Run	22
Moonlit Creek	1	3	Riffle	35
Moonlit Creek	1	4	Run	18
Morrison River (U)	1	1	Pool	28.2
Morrison River (U)	1	2	Pool	11.8
Morrison River (U)	1	3	Pool	16.3
Morrison River (U)	1	4	Run	36.7
Nangeese River	1	1	Run	60.6
Nangeese River	1	2	Riffle	39.4
Nangeese River	1	3	Pool	12
Nine Mile Creek	1	1	Riffle	27.6
Nine Mile Creek	1	2	Pool	9.6
Nine Mile Creek	1	3	Run	7.6
Nine Mile Creek	1	4	Riffle	5.2
Nine Mile Creek	1	5	Run	9.9
Nine Mile Creek	1	6	Pool	4.5
Nine Mile Creek	1	7	Pool	9.9
Nine Mile Creek	1	8	Riffle	9

Table 3. cont'd

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Nine Mile Creek	1	9	Pool	5.5
Nine Mile Creek	1	10	Run	4
Shea Creek (main)	2	1	Run	19.2
Shea Creek (main)	2	2	Riffle	60.8
Shea Creek (side)	1	1	Run	17.5
Shea Creek (side)	1	2	Riffle	10.5
Shea Creek (side)	1	3	Pool	10.8
Shea Creek (side)	1	4	Pool	12
Shea Creek (side)	1	5	Riffle	16
Shea Creek (side)	1	6	Pool	24
Sicintine River	1	1	Riffle	7.8
Sicintine River	1	2	Run	3.8
Sicintine River	1	3	Riffle	2.8
Sicintine River	1	4	Run	13.1
Sicintine River	1	5	Riffle	21
Sicintine River	1	6	Run	49.1
Sicintine River	1	7	Pool	6.2
Singlehurst Creek	1	1	Riffle	32
Singlehurst Creek	1	2	Pool	6
Singlehurst Creek	1	3	Riffle	2
Singlehurst Creek	1	4	Pool	5
Singlehurst Creek	1	5	Riffle	35
Singlehurst Creek	1	6	Run	7
Singlehurst Creek	1	7	Riffle	13
Sockeye Creek (L)	1	1	Pool	40
Sockeye Creek (L)	1	2	Riffle	35
Sockeye Creek (L)	1	3	Pool	15
Sockeye Creek (L)	1	4	Riffle	10
Sockeye Creek (U)	2	1	Run	35
Sockeye Creek (U)	2	2	Riffle	9
Sockeye Creek (U)	2	3	Run	10
Sockeye Creek (U)	2	4	Pool	21
Sockeye Creek (U)	2	5	Run	25
Sustut River	1	1	Pool	15.3
Sustut River	1	2	Pool	22.7

Table 3. cont'd

Stream Name	Site	Habitat Unit #	Habitat type	Length (m)
Sustut River	1	3	Pool	22.6
Sustut River	1	4	Run	30.6
Sustut River	1	5	Pool	10.3
Tachek Creek	1	1	Riffle	6.4
Tachek Creek	1	2	Pool	2.4
Tachek Creek	1	3	Riffle	1
Tachek Creek	1	4	Pool	12.1
Tachek Creek	1	5	Run	6.8
Tachek Creek	1	6	Riffle	38.3
Tachek Creek	1	7	Pool	8.5
Tachek Creek	1	8	Pool	4.5
Tachek Creek	1	9	Run	5.6
Tachek Creek	1	10	Run	12.4
Telkwa River Trib.	1	1	Riffle	20.9
Telkwa River Trib.	1	2	Pool	16.5
Telkwa River Trib.	1	3	Pool	26.3
Telkwa River Trib.	1	4	Riffle	16.1
Telkwa River Trib.	1	5	Run	15
Toboggan Creek (L)	2	1	Riffle	41
Toboggan Creek (L)	2	2	Pool	4.5
Toboggan Creek (L)	2	3	Run	15
Toboggan Creek (L)	2	4	Riffle	17
Toboggan Creek (L)	2	5	Run	12
Toboggan Creek (L)	2	6	Riffle	10
Toboggan Creek (L)	2	7	Run	14.2
Toboggan Creek Trib.	1	1	Riffle	73.6
Toboggan Creek Trib.	1	2	Run	18.4
Toboggan Creek Trib.	1	3	Pool	10

Table 4. Summary of channel dimensions and mean stream gradient.

Stream Name	Site	Mean bank-full width (m)	Mean wetted width (m)	Variance of bank-full width	Variance of Wetted Width	Mean % Gradient
Alastair River	1	7.2	6.4	2.82	0.89	0.67
Boucher Creek (L)	1	10.2	8.8	3.60	2.32	1.00
Boucher Creek (U)	2	8.9	6.2	1.85	2.62	4.00
Clear Creek (U)	1	12.3	12.3	60.99	60.99	1.33
Clearwater Creek	1	12.7	11.8	18.48	14.02	2.00
Clearwater Creek	2	12.1	11.7	9.99	10.56	1.33
Clifford Creek	1	6.9	6.1	2.22	1.53	1.33
Clifford Creek	2	8.1	7.3	7.98	8.21	1.67
Coldwater Creek (L)	2	9.7	5.6	8.85	5.54	1.67
Coldwater Creek (U)	1	8.8	6.5	4.98	3.50	1.33
Copper River (L)	1	15.7	14.8	5.95	5.09	1.00
Copper River (U)	2	17.3	15.0	3.55	7.36	1.33
Cullon Creek (L)	2	9.8	8.4	5.73	4.99	0.67
Cullon Creek (U)	1	11.4	8.9	14.31	7.78	0.67
Deep Creek	1	16.1	10.1	14.43	8.48	1.00
Elliot Creek Main.	2	9.9	8.2	5.89	6.52	3.00
Elliot Creek Trib.	1	4.1	3.7	1.11	1.56	1.33
Footsore Lk. inlet	1	4.0	3.1	0.72	1.19	2.00
Gitnadoix River	1	18.9	15.5	58.74	47.51	0.67
Gitnadoix River	2	6.7	6.7	7.21	7.21	0.00
Gosnell Creek	1	5.9	5.9	4.29	4.29	0.00
Green River	1	14.8	13.7	18.17	20.53	1.00
Hadenschild Creek	1	12.3	11.6	7.68	6.80	0.33
Hankin Creek	1	9.1	4.6	10.99	5.38	1.67
Hankin Creek (L)	2	11.2	7.9	48.97	14.57	0.67
Johansen side ch.	1	8.5	5.0	7.67	4.60	0.67
Kispiox River	1	11.4	9.7	3.63	3.89	0.00
Kitwanga River (L)	1	16.5	14.3	30.29	41.51	0.67
Kitwanga River (U)	1	11.9	8.6	21.33	3.98	0.00
Lamprey Creek	1	8.5	6.4	5.47	5.77	0.00
Moonlit Creek	1	13.7	11.0	3.19	2.61	1.00
Morrison River (U)	1	16.4	15.2	6.23	5.21	0.00
Nangeese River	1	15.4	12.4	4.08	10.43	2.33

Table 4. cont'd

Stream Name	Site	Mean bank-full width (m)	Mean wetted width (m)	Variance of bank-full width	Variance of Wetted Width	Variance of Gradient	Mean %
Nine Mile Creek	1	11.1	4.5	6.12	1.43	2.33	
Shea Creek (main)	2	16.2	10.4	21.88	22.17	1.67	
Shea Creek (side)	1	6.9	5.3	3.25	2.94	2.67	
Sicintine River	1	2.5	2.2	0.65	0.86	1.00	
Singlehurst Creek	1	5.8	4.8	1.01	0.57	1.33	
Sockeye Creek (L)	1	15.4	14.5	9.41	8.83	0.33	
Sockeye Creek (U)	2	18.6	17.0	10.96	13.79	0.33	
Sustut River	1	4.7	4.7	3.17	3.17	0.00	
Tachek Creek	1	11.0	5.9	3.70	1.35	1.67	
Telkwa River Trib.	1	9.0	6.5	6.04	4.86	1.33	
Toboggan Creek (L)	2	10.5	8.6	4.71	2.32	1.00	
Toboggan Creek Trib.	1	6.2	4.1	4.91	1.35	1.67	

Table 5. Length and area of riffles and runs by stream and habitat type.

Stream Name	Site	Habitat type	Length (m)	Wetted Area (m^2)
Alastair River	1	Riffle	43	298.9
Alastair River	1	Run	40	234.0
Alastair River	1	Run	13	79.3
Boucher Creek (L)	1	Riffle	60	497.4
Boucher Creek (L)	1	Run	14	119.0
Boucher Creek (U)	2	Riffle	15	103.6
Boucher Creek (U)	2	Riffle	4	22.8
Boucher Creek (U)	2	Riffle	6	32.5
Boucher Creek (U)	2	Riffle	6	26.7
Boucher Creek (U)	2	Riffle	15	83.2
Boucher Creek (U)	2	Run	11	76.7
Boucher Creek (U)	2	Run	4	22.7
Boucher Creek (U)	2	Run	9	48.4
Boucher Creek (U)	2	Run	16	129.9
Clear Creek (U)	1	Riffle	25	206.3
Clear Creek (U)	1	Riffle	8	140.8
Clear Creek (U)	1	Run	15	78.0
Clear Creek (U)	1	Run	34	418.2
Clearwater Creek	1	Riffle	31	513.1
Clearwater Creek	1	Riffle	4	57.6
Clearwater Creek	1	Riffle	13	176.2
Clearwater Creek	1	Riffle	12	66.6
Clearwater Creek	1	Run	21	214.2
Clearwater Creek	1	Run	5	69.0
Clearwater Creek	1	Run	6	82.2
Clearwater Creek	2	Riffle	81	832.7
Clearwater Creek	2	Run	19	290.7
Clifford Creek	1	Riffle	43	282.4
Clifford Creek	1	Riffle	19	115.9
Clifford Creek	1	Riffle	27	161.1
Clifford Creek	1	Run	3	15.9
Clifford Creek	1	Run	8	44.8
Clifford Creek	2	Riffle	24	192.0
Clifford Creek	2	Run	10	68.2
Coldwater Creek (L)	2	Riffle	40	284.0
Coldwater Creek (L)	2	Riffle	8	28.8
Coldwater Creek (L)	2	Riffle	28	185.7
Coldwater Creek (L)	2	Run	12	36.0
Coldwater Creek (U)	1	Riffle	6	31.2
Coldwater Creek (U)	1	Riffle	26	249.6
Coldwater Creek (U)	1	Riffle	21	112.4
Coldwater Creek (U)	1	Run	8	61.6
Coldwater Creek (U)	1	Run	15	72.8
Copper River (L)	1	Riffle	26	432.9
Copper River (L)	1	Run	84	1195.2
Copper River (U)	2	Riffle	15	192.0
Copper River (U)	2	Run	62	997.0
Copper River (U)	2	Run	30	419.0
Cullon Creek (L)	2	Riffle	55	441.8
Cullon Creek (L)	2	Run	20	202.0
Cullon Creek (U)	1	Riffle	59	454.3

Table 5. cont'd

Stream Name	Site	Habitat type	Length (m)	Wetted Area (m^2)
Cullon Creek (U)	1	Run	16	180.8
Cullon Creek (U)	1	Run	2	14.4
Deep Creek	1	Riffle	41	414.1
Deep Creek	1	Riffle	20	181.0
Elliot Creek Main.	2	Riffle	20	218.0
Elliot Creek Main.	2	Riffle	38	286.1
Elliot Creek Main.	2	Run	5	43.2
Elliot Creek Trib.	1	Riffle	5	18.0
Elliot Creek Trib.	1	Run	59	265.1
Elliot Creek Trib.	1	Run	7	17.6
Footsore Lk. inlet	1	Riffle	9	25.4
Footsore Lk. inlet	1	Riffle	14	48.6
Footsore Lk. inlet	1	Run	45	114.5
Footsore Lk. inlet	1	Run	13	48.9
Gitnadoix River	1	Riffle	55	1087.6
Gitnadoix River	1	Riffle	20	349.0
Gitnadoix River	1	Run	7	123.2
Gitnadoix River	2	Run	54	360.0
Gosnell Creek	1	Run	101	614.2
Gosnell Creek	1	Run	7	24.5
Green River	1	Riffle	6	102.0
Green River	1	Riffle	33	297.0
Green River	1	Run	31	438.7
Green River	1	Run	10	153.3
Hadenschild Creek	1	Riffle	14	257.6
Hadenschild Creek	1	Riffle	7	76.3
Hadenschild Creek	1	Run	20	190.0
Hadenschild Creek	1	Run	16	167.2
Hadenschild Creek	1	Run	43	479.5
Hankin Creek	1	Riffle	2	10.8
Hankin Creek	1	Riffle	12	74.3
Hankin Creek	1	Riffle	11	76.8
Hankin Creek	1	Riffle	11	38.9
Hankin Creek	1	Riffle	10	40.4
Hankin Creek	1	Run	16	74.6
Hankin Creek	1	Run	3	9.0
Hankin Creek	1	Run	7	20.7
Hankin Creek	1	Run	5	10.8
Hankin Creek (L)	2	Riffle	25	100.0
Hankin Creek (L)	2	Riffle	18	114.4
Hankin Creek (L)	2	Riffle	18	206.7
Hankin Creek (L)	2	Run	10	49.5
Hankin Creek (L)	2	Run	15	192.5
Johansen side ch.	1	Riffle	13	69.9
Johansen side ch.	1	Riffle	11	47.2
Johansen side ch.	1	Run	13	108.6
Kispiox River	1	Run	80	734.4
Kitwanga River (L)	1	Riffle	8	113.6
Kitwanga River (L)	1	Riffle	21	268.8
Kitwanga River (L)	1	Run	25	340.0
Kitwanga River (L)	1	Run	33	340.7

Table 5. cont'd

Stream Name	Site	Habitat type	Length (m)	Wetted Area (m^2)
Kitwanga River (U)	1	Riffle	20	158.0
Kitwanga River (U)	1	Riffle	15	143.3
Kitwanga River (U)	1	Run	29	288.1
Kitwanga River (U)	1	Run	36	255.6
Lamprey Creek	1	Run	7	31.9
Lamprey Creek	1	Run	31	251.1
Moonlit Creek	1	Riffle	41	453.7
Moonlit Creek	1	Riffle	35	343.0
Moonlit Creek	1	Run	22	233.2
Moonlit Creek	1	Run	18	216.0
Morrison River (U)	1	Run	37	546.8
Nangeese River	1	Riffle	39	538.5
Nangeese River	1	Run	61	785.4
Nine Mile Creek	1	Riffle	28	100.1
Nine Mile Creek	1	Riffle	5	22.1
Nine Mile Creek	1	Riffle	9	49.8
Nine Mile Creek	1	Run	8	40.0
Nine Mile Creek	1	Run	10	35.1
Nine Mile Creek	1	Run	4	20.2
Shea Creek (main)	2	Riffle	61	642.0
Shea Creek (main)	2	Run	19	193.0
Shea Creek (side)	1	Riffle	11	55.6
Shea Creek (side)	1	Riffle	16	77.6
Shea Creek (side)	1	Run	18	112.3
Sicintine River	1	Riffle	8	14.4
Sicintine River	1	Riffle	3	4.6
Sicintine River	1	Riffle	21	67.2
Sicintine River	1	Run	4	7.0
Sicintine River	1	Run	13	34.7
Sicintine River	1	Run	49	105.6
Singlehurst Creek	1	Riffle	32	142.4
Singlehurst Creek	1	Riffle	2	9.8
Singlehurst Creek	1	Riffle	35	166.3
Singlehurst Creek	1	Riffle	13	58.5
Singlehurst Creek	1	Run	7	27.3
Sockeye Creek (L)	1	Riffle	35	631.8
Sockeye Creek (L)	1	Riffle	10	104.0
Sockeye Creek (U)	2	Riffle	9	172.4
Sockeye Creek (U)	2	Run	35	721.0
Sockeye Creek (U)	2	Run	10	158.0
Sockeye Creek (U)	2	Run	25	337.5
Sustut River	1	Run	31	134.1
Tachek Creek	1	Riffle	6	35.8
Tachek Creek	1	Riffle	1	5.8
Tachek Creek	1	Riffle	38	256.0
Tachek Creek	1	Run	7	43.2
Telkwa River Trib.	1	Riffle	21	116.5
Telkwa River Trib.	1	Riffle	16	104.7
Telkwa River Trib.	1	Run	15	123.8
Toboggan Creek (L)	2	Riffle	41	355.1
Toboggan Creek (L)	2	Riffle	17	148.3

Table 5. cont'd

Stream Name	Site	Habitat type	Length (m)	Wetted Area (m^2)
Toboggan Creek (L)	2	Riffle	10	87.0
Toboggan Creek (L)	2	Run	15	148.0
Toboggan Creek (L)	2	Run	12	84.6
Toboggan Creek Trib.	1	Riffle	74	321.4
Toboggan Creek Trib.	1	Run	18	68.1

Table 6. Summary of pool dimensions by cross-sectional type.

Stream Name	Site	Pool cross-section	Length (m)	Mean wetted width (m)	Mean 10cm width (m)	Residual depth (cm)	Wetted area (m^2)	10cm area (m^2)
Alastair River	1	CCV	4	6.7	6.3	0.53	26.8	25.2
Boucher Creek (L)	1	CCV	26	10.0		1.0	260.7	260.7
Boucher Creek (U)	2	CCV	6	4.8	3.0	0.8	28.8	18.0
Boucher Creek (U)	2	CCV	9	5.5	6.3	0.76	49.8	56.7
Clear Creek (U)	1	CCV	3	24.1	24.1	0.69	72.3	72.3
Clear Creek (U)	1	CCV	15	4.6	4.6	0.75	69.0	69.0
Clearwater Creek	1	CCV	2	7.1		0.52	14.2	14.2
Clearwater Creek	1	CCV	6	11.1	11.1	0.41	66.6	66.6
Coldwater Creek (L)	2	CCV	12	3.7	2.9	0.9	44.4	34.8
Coldwater Creek (U)	1	CCV	24	6.3	5.7	0.8	150.0	136.8
Cullon Creek (L)	2	CCV	25	7.2		0.8	180.0	180.0
Cullon Creek (U)	1	R	10	9.1	7.8	0.4	90.5	78.0
Cullon Creek (U)	1	CCV	13	10.7	10.5	0.5	138.5	135.9
Deep Creek	1	CCV	15	7.2	5.8	0.8	108.0	87.0
Deep Creek	1	CCV	24	12.5	10.6	0.7	298.8	254.4
Elliot Creek Main.	2	CCV	13.6	8.1	5.6	1.3	109.5	76.2
Elliot Creek Main.	2	CCV	22.6	7.3	6.2	1.7	165.0	140.1
Elliot Creek Main.	2	CCV	24.2	6.1		0.1	147.6	147.6
Elliot Creek Trib.	1	CCV	7.9	3.7	4.6	0.65	29.2	36.3
Elliot Creek Trib.	1	CCV	12	3.2	3.3	0.3	37.8	39.6
Footsore Lk. inlet	1	CCV	4.3	2.4	3.4	0.36	10.3	14.6
Footsore Lk. inlet	1	CCV	7.1	3.4	4.1	0.12	24.1	29.1

Table 6. cont'd

Stream Name	Site	Pool cross-section	Length (m)	Mean wetted width (m)	Mean 10cm width (m)	Residual depth (cm)	Wetted area (m^2)	10cm area (m^2)
Footsore Lk. inlet	1	CCV	11.4	3.7	2.9	0.29	42.2	33.1
Gitnadoix River	1	CCV	18	3.9	3.2	0.72	69.3	57.6
Hankin Creek	1	CCV	1	4.1	3.0	0.15	4.1	3.0
Hankin Creek	1	CCV	3.1	2.7		0.37	8.4	8.4
Hankin Creek	1	CCV	4.5	4.5		0.2	20.3	20.3
Hankin Creek	1	CCV	11.7	5.8	3.7	0.7	67.9	42.7
Johansen side ch.	1	CCV	5.6	2.0	2.0	0.2	11.2	11.2
Johansen side ch.	1	CCV	7.2	4.0	4.0	0.5	28.8	28.8
Johansen side ch.	1	CCV	7.4	4.4	5.5	1.5	32.6	40.7
Johansen side ch.	1	CCV	10.6	6.6	3.0	0.5	70.0	31.8
Johansen side ch.	1	CCV	11.9	3.2	2.7	0.2	37.9	32.1
Johansen side ch.	1	CCV	12	5.2	5.2	1.2	62.8	62.4
Johansen side ch.	1	CCV	14.9	5.4	5.0	1.7	80.5	74.5
Kisplox River	1	CCV	20	12.4	11.9	0.7	248.0	238.0
Kitwanga River (L)	1	CCV	13	24.7	14.4	0.2	320.5	187.2
Lamprey Creek	1	CCV	6	3.8	3.5	0.13	22.5	21.0
Lamprey Creek	1	CCV	6.2	5.1	5.1	0.25	31.4	31.6
Lamprey Creek	1	CCV	14	4.8	4.4	0.38	66.5	61.6
Lamprey Creek	1	CCV	29.6	9.3	8.9	1.15	275.3	264.4
Morrison River (U)	1	CCV	11.8	15.1	15.1	0.85	177.6	177.6
Morrison River (U)	1	CCV	16.3	15.4	14.3	0.65	251.0	233.1
Morrison River (U)	1	CCV	28.2	15.3	15.1	0.6	430.1	426.5

Table 6. cont'd

Stream Name	Site	Pool cross-section	Length (m)	Mean wetted width (m)	Mean 10cm width (m)	Residual depth (cm)	Wetted area (m^2)	10cm area (m^2)
Nangeese River	1	CCV	12	5.6	1.0	0.2	67.2	12.0
Nine Mile Creek	1	CCV	4.5	2.5	2.0	0.35	11.3	8.8
Nine Mile Creek	1	CCV	5.5	5.3	4.9	0.41	29.2	27.0
Nine Mile Creek	1	CCV	9.6	5.2		0.7	49.4	49.4
Nine Mile Creek	1	CCV	9.9	4.4	2.8	0.4	43.2	27.2
Shea Creek (side)	1	CCV	10.8	3.7	3.7	0.4	40.0	40.0
Shea Creek (side)	1	CCV	12	4.1	4.3	0.53	49.2	51.0
Shea Creek (side)	1	CCV	24	6.1	6.3	1.2	146.4	151.2
Singlehurst Creek	1	CCV	5	5.7	5.0	0.4	28.5	25.0
Singlehurst Creek	1	CCV	6	6.0	4.9	0.4	36.0	29.4
Sockeye Creek (L)	1	CCV	15	13.5	12.1	1.15	202.5	181.1
Sockeye Creek (L)	1	CCV	40	14.5	14.4	0.95	580.0	574.0
Sockeye Creek (U)	2	CCV	21	15.3	15.2	0.88	320.3	318.2
Sustut River	1	CCV	10.3	4.0	4.0	0.3	41.4	41.4
Sustut River	1	CCV	15.3	4.4	4.4	0.5	67.8	67.8
Sustut River	1	CCV	22.6	5.0	5.0	1.4	111.9	111.9
Sustut River	1	CCV	22.7	5.5	5.5	0.3	125.6	125.6
Tachek Creek	1	CCV	2.4	5.4	5.4	0.18	13.0	13.0
Tachek Creek	1	CCV	4.5	4.8	3.3	0.2	21.6	14.9
Tachek Creek	1	CCV	8.5	5.2	3.7	0.34	43.8	31.0
Tachek Creek	1	CCV	12.1	6.0	4.5	0.55	72.9	54.0
Telkwa River Trib.	1	CCV	16.5	8.2	6.2	0.9	134.5	102.3

Table 6. cont'd

Stream Name	Site	Pool cross-section	Length (m)	Mean wetted width (m)	Mean 10cm width (m)	Residual depth (cm)	Wetted area (m^2)	10cm area (m^2)
Telkwa River Trib.	1	CCV	26.3	5.6	5.0	0.8	146.4	131.5
Toboggan Creek (L)	2	CCV	4.5	8.3	6.3	0.4	37.3	28.4
Toboggan Creek Trib.	1	CCV	4.4	2.4	2.4	0.41	10.6	10.6
Toboggan Creek Trib.	1	CCV	10	4.3	4.3	0.31	42.5	42.5

Table 7. Average stream water temperature, conductivity and pH.

Stream Name	Site	Temperature (^{0}C)	Conductivity (μmhos)	pH
Alastair River	1	23.0	6.9	7.3
Boucher Creek (L)	1	10.5	136.5	8.1
Boucher Creek (U)	2	11.6	136.2	7.9
Clear Creek (U)	1	9.5	42.8	6.8
Clearwater Creek	1	9.4	127.7	8.6
Clearwater Creek	2	9.8	113.7	8.9
Clifford Creek	1	8.8	58.6	7.9
Clifford Creek	2	8.9	57.9	7.8
Coldwater Creek (L)	2	11.8	24.4	7.4
Coldwater Creek (U)	1	11.9	24.2	7.5
Copper River (L)	1	11.6	76.8	7.7
Copper River (U)	2	11.6	76.6	7.8
Cullon Creek (L)	2	12.8	58.8	7.8
Cullon Creek (U)	1	12.5	51.6	7.7
Deep Creek	1	13.7	32.9	
Elliot Creek Main.	2	14.9	69.9	7.8
Elliot Creek Trib.	1	9.0	77.3	8.1
Footsore Lk. inlet	1	15.9	37.8	7.9
Gitnadoix River	1	8.8	16.9	
Gitnadoix River	2	13.0	14.4	
Gosnell Creek	1	11.0	63.6	7.9
Green River	1	11.4	78.8	5.6
Hadenschild Creek	1	9.3	30.8	
Hankin Creek	1	10.0	81.0	7.6
Hankin Creek (L)	2	9.6	82.4	7.6
Johansen side ch.	1	10.6	92.3	7.7
Kispiox River	1	11.5	63.2	7.4
Kitwanga River (L)	1	15.8	98.1	8.4
Kitwanga River (U)	1	10.3	118.2	7.9
Lamprey Creek	1	8.8	135.7	8.3
Moonlit Creek	1	7.8	132.1	8.5
Morrison River (U)	1	13.2	37.4	7.7
Nangeese River	1	8.7	83.3	8.0
Nine Mile Creek	1	9.8	105.5	7.8

Table 7. cont'd

Stream Name	Site	Temperature (^{0}C)	Conductivity (µmhos)	pH
Shea Creek (main)	2	14.6	62.6	8.4
Shea Creek (side)	1	15.1	59.1	7.8
Sicintine River	1	9.9	81.8	8.0
Singlehurst Creek	1	10.5	90.3	
Sockeye Creek (L)	1	9.4	60.0	7.1
Sockeye Creek (U)	2	9.7	61.2	
Sustut River	1	11.6	82.3	8.3
Tachek Creek	1	11.2	133.9	7.5
Telkwa River Trib.	1	4.5	152.3	8.1
Toboggan Creek (L)	2	9.0	50.6	7.8
Toboggan Creek Trib.	1	7.7	125.7	7.6

Table 8. Average stream sun arc angle by direction.

Stream Name	Site	East	South East	South	South West	West
Alastair River	1	30	20	17	30	29
Boucher Creek (L)	1	37	40	55	48	36
Boucher Creek (U)	2	43	48	50	38	54
Clear Creek (U)	1	33	17	37	24	17
Clearwater Creek	1	49	43	28	27	20
Clearwater Creek	2	56	53	17	29	44
Clifford Creek	1	24	30	28	32	37
Clifford Creek	2	12	18	31	38	25
Coldwater Creek (L)	2	51	38	30	31	25
Coldwater Creek (U)	1	30	39	45	32	29
Copper River (L)	1	28	29	43	40	29
Copper River (U)	2	42	32	41	42	46
Cullon Creek (L)	2	19	15	14	16	18
Cullon Creek (U)	1	23	16	12	17	21
Deep Creek	1	19	37	36	25	33
Elliot Creek Main.	2	17	16	15	15	14
Elliot Creek Trib.	1	65	56	60	65	53
Footsore Lk. inlet	1	85	84	79	70	84
Gitnadoix River	1	29	30	30	34	31
Gitnadoix River	2	18	20	10	30	35
Gosnell Creek	1	21	12	17	14	14
Green River	1	18	25	17	31	35
Hadenschild Creek	1	15	15	23	16	13
Hankin Creek	1	49	55	52	30	45
Hankin Creek (L)	2	17	18	14	17	16
Johansen side ch.	1	16	8	4	4	4
Kispiox River	1	24	16	6	21	34
Kitwanga River (L)	1	24	18	29	43	27
Kitwanga River (U)	1	30	17	26	32	23
Lamprey Creek	1	48	45	55	52	74
Moonlit Creek	1	49	53	38	14	22
Morrison River (U)	1	60	42	24	30	31
Nangeese River	1	50	15	51	52	55
Nine Mile Creek	1	59	41	39	43	40

Table 8. cont'd

Stream Name	Site	East	South East	South	South West	West
Shea Creek (main)	2	30	34	27	38	54
Shea Creek (side)	1	74	60	41	40	41
Sicintine River	1	9	13	9	3	5
Singlehurst Creek	1	38	47	23	34	43
Sockeye Creek (L)	1	16	11	12	27	32
Sockeye Creek (U)	2	27	47	22	30	33
Sustut River	1	15	14	26	34	14
Tachek Creek	1	45	34	19	32	43
Telkwa River Trib.	1	54	42	59	52	55
Toboggan Creek (L)	2	36	25	26	25	31
Toboggan Creek Trib.	1	50	58	48	47	48

Table 9. Total length of undercut banks, total length of overhanging vegetation and total area of submerged vegetation by stream.

Stream Name	Site	Total undercut length (m)	Total overhang length (m)	Total area of submerged vegetation (m^2)
Alastair River	1	28.0	35	1
Alastair River	1	3.0	8	0
Alastair River	1	10.0	26	0.5
Alastair River	1	58.0	40	1
Boucher Creek (L)	1	14.0	28	0
Boucher Creek (L)	1	31.0	52	8
Boucher Creek (U)	2	100.2	90.6	0
Clear Creek (U)	1	30.0	30	3
Clear Creek (U)	1	30.0	30	5
Clear Creek (U)	1	6.0	6	15
Clearwater Creek	1	4.0	1	0
Clearwater Creek	1	10.0	10	1.5
Clearwater Creek	1	12.0	12	2
Clearwater Creek	1	42.0	42	12
Clearwater Creek	2	20.0	38	18
Clifford Creek	1	3.0	6	0
Clifford Creek	1	4.0	16	1.5
Clifford Creek	2	16.0	17	0
Coldwater Creek (L)	2	3.0	16	0
Coldwater Creek (U)	1	2.0	23	0
Coldwater Creek (U)	1	28.0	30	0.5
Copper River (L)	1	85.0	168	120
Copper River (U)	2	15.3	10	1
Copper River (U)	2	30.0	35	10
Copper River (U)	2	40.0	105	15
Copper River (U)	2	0.0	10	56
Cullon Creek (L)	2	2.0	10	0
Cullon Creek (L)	2	0.0	25	2
Cullon Creek (U)	1	2.0	1	0
Cullon Creek (U)	1	12.0	32	0.5
Cullon Creek (U)	1	4.0	10	3
Cullon Creek (U)	1	3.0	15	3.5

Table 9. cont'd

Stream Name	Site	Total undercut length (m)	Total overhang length (m)	Total area of submerged vegetation (m^2)
Deep Creek	1	31.0	39	0
Elliot Creek Main.	2	13.6	13.6	0
Elliot Creek Trib.	1	8.9	0	6.9
Elliot Creek Trib.	1	12.0	12	36
Elliot Creek Trib.	1	15.8	1	39.5
Elliot Creek Trib.	1	80.0	60	117.8
Footsore Lk. inlet	1	14.4	24.8	0
Footsore Lk. inlet	1	14.2	14.2	2
Footsore Lk. inlet	1	27.0	89.2	10
Gitnadoix River	1	10.0	11	0
Gitnadoix River	1	9.0	10	0.5
Gitnadoix River	2	0.0	50	0
Gosnell Creek	1	7.0	7	0
Gosnell Creek	1	0.0	114	114
Green River	1	20.0	20	4
Green River	1	50.0	62	6.5
Hadenschild Creek	1	16.0	32	3.5
Hadenschild Creek	1	1.0	40	25
Hadenschild Creek	1	7.0	86	40
Hankin Creek	1	23.5	42.5	0
Hankin Creek (L)	2	6.0	30	5
Johansen side ch.	1	98.7	98.7	0
Kispiox River	1	20.0	83	28
Kispiox River	1	4.0	30	90
Kitwanga River (L)	1	23.0	106	0
Kitwanga River (L)	1	10.0	23	22
Kitwanga River (U)	1	12.0	58	1
Kitwanga River (U)	1	0.0	72	4.5
Lamprey Creek	1	39.6	69.6	0
Lamprey Creek	1	1.0	2	1
Lamprey Creek	1	5.0	12.4	6
Lamprey Creek	1	30.0	50	50
Moonlit Creek	1	20.0	28	0

Table 9. cont'd

Stream Name	Site	Total undercut length (m)	Total overhang length (m)	Total area of submerged vegetation (m^2)
Morrison River (U)	1	73.4	68.7	0
Morrison River (U)	1	22.3	21.3	2
Morrison River (U)	1	23.6	13	80
Morrison River (U)	1	15.0	15	280
Nangeese River	1	62.0	92.6	0
Nine Mile Creek	1	73.7	52.4	0
Shea Creek (side)	1	10.0	7	0
Shea Creek (side)	1	18.0	10	1.5
Shea Creek (side)	1	34.0	20	2
Sicintine River	1	84.0	105.8	0
Singlehurst Creek	1	9.0	4	0
Sockeye Creek (L)	1	8.0	25	6
Sockeye Creek (L)	1	15.0	35	8.5
Sockeye Creek (U)	2	13.0	20	2
Sockeye Creek (U)	2	20.0	50	6
Sockeye Creek (U)	2	35.0	70	40
Sockeye Creek (U)	2	15.0	42	55
Sustut River	1	20.6	18.3	10.3
Sustut River	1	61.2	50.6	30.6
Sustut River	1	30.6	16	76.5
Sustut River	1	45.2	13	135.6
Sustut River	1	45.4	28.7	136.2
Tachek Creek	1	113.5	98.9	0
Telkwa River Trib.	1	72.5	47.5	0
Toboggan Creek (L)	2	43.7	35.2	0
Toboggan Creek Trib.	1	17.0	51.4	0

Table 10. Summary of average stream LWD dimensions and totals of individual pieces, by position.

Stream Name	Site	Total number of pieces	Mean length (m)	Mean diameter (m)	Position
Alastair River	1	1	1.5	0.30	Buried
Alastair River	1	3	3.5	0.13	Submerged
Boucher Creek (L)	1	5	5.2	0.22	Submerged
Boucher Creek (U)	2	1	5.0	0.40	Contact
Boucher Creek (U)	2	2	3.5	0.10	High water
Boucher Creek (U)	2	4	3.3	0.40	Submerged
Clear Creek (U)	1	5	4.6	0.22	Bridging
Clear Creek (U)	1	15	5.6	0.28	Contact
Clear Creek (U)	1	11	4.9	0.14	Submerged
Clearwater Creek	1	3	8.7	0.30	Bridging
Clearwater Creek	1	1	10.0	0.50	Buried
Clearwater Creek	1	13	9.4	0.33	Contact
Clearwater Creek	1	6	8.5	0.45	Submerged
Clearwater Creek	2	3	12.0	0.37	Contact
Clearwater Creek	2	6	6.2	0.22	Submerged
Clifford Creek	1	1	3.0	0.10	Submerged
Clifford Creek	2	4	6.5	0.11	Bridging
Clifford Creek	2	1	4.0	0.10	Buried
Clifford Creek	2	3	6.7	0.15	Contact
Coldwater Creek (L)	2	5	10.2	0.40	Bridging
Coldwater Creek (L)	2	6	5.5	0.43	Contact
Coldwater Creek (L)	2	5	11.8	0.56	High water
Coldwater Creek (L)	2	2	4.0	0.40	Submerged
Coldwater Creek (U)	1	3	11.0	0.20	Bridging
Coldwater Creek (U)	1	1	4.0	0.10	Buried
Coldwater Creek (U)	1	7	6.7	0.24	Contact
Coldwater Creek (U)	1	6	4.5	0.10	Submerged
Copper River (L)	1	5	10.0	0.18	Bridging
Copper River (L)	1	6	9.2	0.23	Contact
Copper River (L)	1	4	12.5	0.20	Submerged
Copper River (U)	2	1	4.0	0.20	Contact
Copper River (U)	2	3	3.0	0.13	Submerged
Cullon Creek (L)	2	1	20.0	0.60	Bridging

Table 10. cont'd

Stream Name	Site	Total number of pieces	Mean length (m)	Mean diameter (m)	Position
Cullon Creek (L)	2	1	20.0	0.80	Contact
Cullon Creek (L)	2	1	9.0	0.20	High water
Cullon Creek (U)	1	1	10.0	1.20	Contact
Cullon Creek (U)	1	2	2.5	0.45	Submerged
Deep Creek	1	2	22.5	0.25	Bridging
Deep Creek	1	3	6.3	0.57	Contact
Deep Creek	1	3	13.7	0.30	High water
Deep Creek	1	3	4.7	0.30	Submerged
Elliot Creek Trib.	1	3	5.0	0.37	Contact
Elliot Creek Trib.	1	1	4.0	0.10	High water
Elliot Creek Trib.	1	5	4.0	0.16	Submerged
Footsore Lk. inlet	1	4	4.3	0.38	Contact
Footsore Lk. inlet	1	7	4.0	0.33	High water
Footsore Lk. inlet	1	2	3.8	0.15	Submerged
Gitnadoix River	1	2	12.5	0.33	Bridging
Gitnadoix River	1	3	4.0	0.17	Contact
Gitnadoix River	2	4	4.8	0.34	Bridging
Gitnadoix River	2	3	23.7	0.55	Contact
Green River	1	5	10.8	0.21	Bridging
Green River	1	2	7.0	0.48	Buried
Green River	1	6	8.0	0.22	Contact
Hadenschild Creek	1	1	1.0	0.10	Submerged
Hankin Creek	1	4	3.2	0.23	Buried
Hankin Creek	1	3	4.1	0.30	Contact
Hankin Creek	1	4	2.1	0.26	High water
Hankin Creek	1	3	3.3	0.25	Submerged
Hankin Creek (L)	2	3	14.7	0.20	Bridging
Hankin Creek (L)	2	2	4.0	0.25	High water
Johansen side ch.	1	1	3.2	0.30	Contact
Johansen side ch.	1	2	5.9	0.40	High water
Johansen side ch.	1	3	2.6	0.20	Submerged
Kispiox River	1	1	4.0	0.15	Bridging
Kitwanga River (L)	1	3	16.0	0.28	Bridging
Kitwanga River (L)	1	1	5.0	0.20	Buried

Table 10. cont'd

Stream Name	Site	Total number of pieces	Mean length (m)	Mean diameter (m)	Position
Kitwanga River (L)	1	8	6.6	0.21	Contact
Kitwanga River (L)	1	2	6.0	0.10	Submerged
Kitwanga River (U)	1	2	5.5	0.18	Bridging
Kitwanga River (U)	1	1	2.0	0.10	Buried
Kitwanga River (U)	1	4	2.6	0.13	Contact
Kitwanga River (U)	1	1	1.5	0.10	Submerged
Lamprey Creek	1	1	2.4	0.20	High water
Lamprey Creek	1	1	10.0	0.45	Contact
Lamprey Creek	1	1	5.0	0.30	High water
Lamprey Creek	1	1	2.5	0.10	Submerged
Moonlit Creek	1	4	3.6	0.24	Bridging
Moonlit Creek	1	2	6.5	0.28	Contact
Morrison River (U)	1	1	17.9	0.25	Buried
Morrison River (U)	1	4	6.4	0.21	Contact
Morrison River (U)	1	8	3.0	0.21	High water
Morrison River (U)	1	5	2.5	0.36	Submerged
Nangeese River	1	2	14.5	0.90	Buried
Nangeese River	1	3	5.8	0.63	Contact
Nangeese River	1	1	1.5	0.80	High water
Nangeese River	1	7	8.1	0.36	Submerged
Nine Mile Creek	1	1	0.0	0.00	Contact
Nine Mile Creek	1	2	2.5	1.50	High water
Nine Mile Creek	1	5	6.1	0.22	Submerged
Shea Creek (side)	1	4	3.3	0.33	Contact
Shea Creek (side)	1	1	4.0	0.50	High water
Shea Creek (side)	1	2	2.8	0.20	Submerged
Singlehurst Creek	1	2	15.0	0.45	Buried
Singlehurst Creek	1	8	4.9	0.28	Contact
Singlehurst Creek	1	1	7.0	0.20	Submerged
Sockeye Creek (L)	1	2	6.5	0.20	Bridging
Sockeye Creek (L)	1	1	8.0	0.30	Contact
Sockeye Creek (L)	1	2	9.0	0.25	Submerged
Sockeye Creek (U)	2	3	7.7	0.20	Contact
Sockeye Creek (U)	2	13	7.0	0.26	Submerged

Table 10. cont'd

Stream Name	Site	Total number of pieces	Mean length (m)	Mean diameter (m)	Position
Tachek Creek	1	2	12.0	0.50	High water
Tachek Creek	1	2	3.0	0.35	Submerged
Telkwa River Trib.	1	3	15.7	0.20	Contact
Telkwa River Trib.	1	4	8.2	0.23	Submerged
Toboggan Creek Trib.	1	1	2.5	0.15	Contact
Toboggan Creek Trib.	1	2	2.3	0.19	High water

Table 11. Summary of average dimensions of clumped LWD by position and total areal coverage within each stream.

Stream Name	Site	Number of clumps	Estimated total number of pieces	Mean area of clump (m^2)	Mean height of clump (m)	Position	Total area of clumped LWD (m^2)
Boucher Creek (L)	1	6	940	3.9	1.3	High water	23.1
Boucher Creek (L)	1	3	570	2.0	0.7	Contact	6.0
Boucher Creek (L)	1	8	1340	6.2	0.4	Submerged	49.8
Boucher Creek (U)	2	5	710	9.0	0.5	Contact	45.0
Boucher Creek (U)	2	5	275	2.6	0.3	Submerged	13.0
Clearwater Creek	1	1	12	6.0	0.3	Contact	6.0
Clifford Creek	2	1	10	1.0	0.6	Contact	1.0
Coldwater Creek (L)	2	5	610	2.9	0.7	Contact	14.5
Coldwater Creek (U)	1	4	380	9.5	1.6	contact	38.0
Coldwater Creek (U)	1	3	170	7.8	0.8	high water	23.5
Copper River (L)	1	4	47	4.1	0.6	Contact	16.5
Copper River (L)	1	1	25	1.5	1.0	High water	1.5
Copper River (U)	2	5	1204	9.4	0.9	contact	47.2
Copper River (U)	2	2	515	11.5	1.2	High water	23.0
Copper River (U)	2	2	225	9.3	0.3	Submerged	18.5
Cullon Creek (L)	2	3	900	8.0	1.4	Contact	24.0
Cullon Creek (U)	1	2	55	1.7	1.0	Contact	3.3
Deep Creek	1	3	4230	9.7	1.6	contact	29.0
Elliot Creek Main.	2	1	10	6.0	0.5	Contact	6.0
Elliot Creek Trib.	1	1	10	0.8	0.5	Contact	0.8
Footsore Lk. inlet	1	2	120	0.9	0.3	Contact	1.7
Footsore Lk. inlet	1	1	1000	1.5	0.2	Submerged	1.5
Gitnadoix River	1	2	70	5.3	1.4	contact	10.5

Table 11. cont'd

Stream Name	Site	Number of clumps	Estimated total number of pieces	Mean area of clump (m^2)	Mean height of clump (m)	Position	Total area of clumped LWD (m^2)
Gitnadoix River	2	2	150	0.3	0.6	contact	0.5
Green River	1	1	18	30.0	0.4	Contact	30.0
Hadenschild Creek	1	3	60	1.7	0.5	contact	5.2
Hankin Creek	1	1	3	4.0	0.4	Buried	4.0
Hankin Creek	1	6	376	4.3	0.5	Contact	25.6
Hankin Creek	1	2	110	13.0	0.2	Submerged	26.0
Johansen side ch.	1	3	1015	9.1	0.8	Contact	27.3
Johansen side ch.	1	1	100000	48.0	2.0	Submerged	48.0
Kitwanga River (L)	1	2	300	5.5	0.3	Contact	11.0
Kitwanga River (U)	1	5	856	8.1	0.6	Contact	40.4
Lamprey Creek	1	2	140	8.8	1.0	Contact	17.5
Lamprey Creek	1	6	330	3.7	0.6	High water	22.5
Lamprey Creek	1	7	349	3.3	0.3	Submerged	23.1
Moonlit Creek	1	1	50	4.0	1.5	Contact	4.0
Morrison River (U)	1	4	30100	7.8	2.2	Contact	31.0
Morrison River (U)	1	7	2255	5.2	0.8	High water	36.7
Morrison River (U)	1	3	220	5.1	0.4	Submerged	15.2
Nangeese River	1	6	241	3.5	1.0	Contact	21.0
Nangeese River	1	1	1000	40.0	0.5	High water	40.0
Nangeese River	1	6	230	6.5	0.4	Submerged	39.0
Nine Mile Creek	1	6	1050	6.3	0.7	Contact	37.7
Nine Mile Creek	1	6	935	6.7	0.8	High water	40.5
Nine Mile Creek	1	2	110	7.4	0.6	Submerged	14.9

Table 11. cont'd

Stream Name	Site	Number of clumps	Estimated total number of pieces	Mean area of clump (m^2)	Mean height of clump (m)	Position	Total area of clumped LWD (m^2)
Shea Creek (main)	2	1	5000	100.0	2.0	Contact	100.0
Shea Creek (side)	1	1	101	6.0	1.0	Contact	6.0
Shea Creek (side)	1	2	151	3.5	0.3	Submerged	7.0
Singlehurst Creek	1	6	678	8.3	1.6	contact	49.5
Sockeye Creek (L)	1	4	129	4.5	1.2	Contact	18.0
Sockeye Creek (U)	2	3	48	4.0	0.4	contact	12.0
Sustut River	1	1	100000	13.2	1.0	Contact	13.2
Tachek Creek	1	6	1920	33.4	1.0	Contact	200.5
Telkwa River Trib.	1	3	130	9.8	0.7	Contact	29.5
Telkwa River Trib.	1	2	12	2.1	0.2	Submerged	4.1
Toboggan Creek (L)	2	1	100	1.5	0.5	contact	1.5
Toboggan Creek Trib.	1	2	315	2.4	0.9	Contact	4.7
Toboggan Creek Trib.	1	1	100	4.0	0.6	High water	4.0

Table 12. Summary of average stream substrate composition. (Silt/sand <= 1mm, Gravel <=30 mm, Cobble <=100 mm and Boulder >100 mm).

Stream Name	Site	% Silt/sand	% Gravel	% Cobble	% Boulder
Alastair River	1	44	48	9	0
Boucher Creek (L)	1	43	23	20	13
Boucher Creek (U)	2	21	24	28	28
Clear Creek (U)	1	33	56	11	0
Clearwater Creek	1	51	36	12	0
Clearwater Creek	2	38	48	15	0
Clifford Creek	1	14	54	32	0
Clifford Creek	2	13	17	43	27
Coldwater Creek (L)	2	17	46	30	7
Coldwater Creek (U)	1	13	42	32	14
Copper River (L)	1	3	55	43	0
Copper River (U)	2	26	26	38	10
Cullon Creek (L)	2	20	50	30	7
Cullon Creek (U)	1	16	41	40	3
Deep Creek	1	5	18	49	29
Elliot Creek Main.	2	12	65	18	5
Elliot Creek Trib.	1	64	26	10	0
Footsore Lk. inlet	1	0	6	26	68
Gitnadoix River	1	19	29	53	0
Gitnadoix River	2	18	30	30	23
Gosnell Creek	1	60	23	15	3
Green River	1	8	4	0	89
Hadenschild Creek	1	67	29	4	0
Hankin Creek	1	8	41	43	8
Hankin Creek (L)	2	15	82	3	0
Johansen side ch.	1	38	33	25	5
Kispiox River	1	95	5	0	0
Kitwanga River (L)	1	0	40	60	0
Kitwanga River (U)	1	29	71	0	0
Lamprey Creek	1	59	31	7	0
Moonlit Creek	1	10	35	38	18
Morrison River (U)	1	18	34	29	20
Nangeese River	1	5	20	40	2

Table 12. cont'd

Stream Name	Site	% Silt/sand	% Gravel	% Cobble	% Boulder
Nine Mile Creek	1	31	27	33	10
Shea Creek (main)	2	13	15	58	15
Shea Creek (side)	1	24	21	28	28
Sicintine River	1	43	54	2	0
Singlehurst Creek	1	19	44	24	13
Sockeye Creek (L)	1	23	45	32	1
Sockeye Creek (U)	2	37	38	31	0
Sustut River	1	100	0	0	0
Tachek Creek	1	25	25	29	22
Telkwa River Trib.	1	35	28	26	9
Toboggan Creek (L)	2	32	26	31	10
Toboggan Creek Trib.	1	5	40	30	25

Table 13. Summary of sampling effort and total catches of principal species of interest by lake site. Captures were made with baited Gee minnow traps, with the exception of Nilkitkwa Lake.

Lake Name	Date	# traps	set length (hr.)	Total coho	Total chinook	Total rainbow trout	Total Dolly Varden	Total cutthroat trout
Green Lake	19-Aug-96	34	2.5	84	18	0	1	0
Alastair Lake	20-Aug-96	35	4.0	22	0	0	0	0
Lakelse Lake	26-Aug-96	40	4.0	6	0	0	0	0
Footsore Lake	01-Sep-96	20	3.5	41	0	1	0	0
Nangese Lake	01-Sep-96	20	5.0	63	0	0	0	0
Nilkitkwa Lake[1]	18-Aug-96	0	2.7	111	0	0	0	0
McDonnel Lake	18-Aug-96	25	4.5	124	0	0	0	0
Toboggan Lake	30-Aug-96	28	20.0	156	0	2	12	1
Green Lake	22-Aug-96	34	3.5	66	6	0	11	1

[1] Sampling conducted using a beach seine over 160m.

Table 14. Summary of total catches of additional species by lake site. All collections were made with baited Gee minnow traps.

Lake Name	Other species totals
Green Lake	160 stickleback
Alastair Lake	274 stickleback 2 redsided shiner
Lakelse Lake	9 stickleback 38 squawfish 26 cottus
Footsore Lake	25 cottus 6 sucker
Nangese Lake	321 redsided shiners
Nilkitkwa Lake	15 trout sp. 1 redsided shiner 3 whitefish
McDonnel Lake	30 cottus
Green Lake	83 stickleback

Table 15. Mean length and weight of fish species by lake site.

Lake Name	Fish species	Mean Lt. (mm)	n Length	Mean Wt. (g)	n Weight
Alastair Lake	coho	77.2	22	6.6	22
Alastair Lake	redsided shiner	82.5	2	7.0	2
Alastair Lake	stickleback	51.5	28	1.8	28
Footsore Lake	coho	90.7	41	10.3	41
Footsore Lake	cottus	88.3	25	9.9	25
Footsore Lake	rainbow	128.0	1	25.1	1
Footsore Lake	sucker	106.2	6	14.6	6
Green Lake	chinook	104.9	24	13.4	24
Green Lake	coho	84.3	150	8.6	150
Green Lake	cutthroat trout	149.0	1	30.9	1
Green Lake	Dolly Varden	132.4	11	23.8	11
Green Lake	stickleback	52.3	60	1.6	60
Lakelse Lake	coho	66.0	6	3.4	6
Lakelse Lake	cottus	94.2	11	13.2	11
Lakelse Lake	squawfish	54.6	17	3.1	17
Lakelse Lake	stickleback	33.0	2	0.6	2
McDonnel Lake	coho	84.2	55	7.3	55
McDonnel Lake	cottus	86.8	32	8.4	32
Nangese Lake	coho	88.5	63	8.9	63
Nangese Lake	redsided shiner	69.5	20	4.7	20
Nilkitkwa Lake	coho	61.6	108	2.5	49
Nilkitkwa Lake	redsided shiner	44.0	1	-	-
Nilkitkwa Lake	trout fry	41.2	15	0.6	9
Nilkitkwa Lake	whitefish	51.3	3	-	-
Toboggan Lake	coho	79.3	155	6.6	151
Toboggan Lake	cutthroat trout	80.0	1	6.8	1
Toboggan Lake	Dolly Varden	123.9	12	20.2	11
Toboggan Lake	rainbow trout	73.5	2	4.9	2

Table 16. Weight on fork length regressions ($Log_{(10)}$ weight=$Log_{(10)}$ length +a), by lake site and species, for $n \geq 15$.

Lake Name	Species	a	b	r^2	n
Alastair Lake	coho	-4.35	2.69	0.98	22
Alastair Lake	stickleback	-3.82	2.37	0.60	28
Footsore Lake	coho	-4.20	2.65	0.82	41
Footsore Lake	Cottus	-5.34	3.24	0.94	25
Green Lake	coho	-4.90	2.97	0.97	150
Green Lake	chinook	-5.38	3.21	0.98	24
Green Lake	stickleback	-4.36	2.64	0.84	60
Lakelse Lake	squawfish	-5.59	3.39	0.97	17
McDonnel Lake	coho	-4.90	2.98	0.97	55
McDonnel Lake	Cottus	-3.40	2.21	0.89	32
Nangeese Lake	coho	-5.07	3.07	0.98	63
Nangeese Lake	redsided shiner	-5.37	3.26	0.98	20
Nilkitkwa Lake	coho	-5.30	3.18	0.76	49
Toboggan Lake	coho	-4.78	2.92	0.91	151

Table 17. Summary of total catches, by species, from stream sites.

Stream Name	Site	Fish species	Total catch
Alastair River	1	coho	26
Alastair River	1	rainbow	1
Boucher Creek (L)	1	chinook	4
Boucher Creek (L)	1	coho	58
Boucher Creek (L)	1	Cottus	1
Boucher Creek (L)	1	cutthroat	4
Boucher Creek (L)	1	lamprey	4
Boucher Creek (L)	1	Trout sp.	6
Boucher Creek (L)	1	whitefish	1
Boucher Creek (U)	2	chinook	6
Boucher Creek (U)	2	coho	27
Boucher Creek (U)	2	cutthroat	3
Boucher Creek (U)	2	rainbow	5
Boucher Creek (U)	2	Trout sp.	51
Boucher Creek (U)	2	whitefish	1
Clear Creek (U)	1	coho	42
Clear Creek (U)	1	Dolly Varden	67
Clear Creek (U)	1	rainbow	7
Clearwater Creek	1	coho	68
Clearwater Creek	2	coho	48
Clearwater Creek	1	Cottus	30
Clearwater Creek	1	cutthroat	38
Clearwater Creek	2	cutthroat	27
Clearwater Creek	1	Dolly Varden	1
Clearwater Creek	2	Dolly Varden	1
Clearwater Creek	1	rainbow	19
Clearwater Creek	2	rainbow	22
Clifford Creek	1	coho	8
Clifford Creek	2	coho	2
Clifford Creek	1	rainbow	2
Coldwater Creek (L)	2	coho	200
Coldwater Creek (L)	2	cutthroat	12
Coldwater Creek (L)	2	Dolly Varden	23
Coldwater Creek (L)	2	rainbow	39

Table 17. cont'd

Stream Name	Site	Fish species	Total catch
Coldwater Creek (U)	1	coho	233
Coldwater Creek (U)	1	cutthroat	6
Coldwater Creek (U)	1	Dolly Varden	15
Coldwater Creek (U)	1	rainbow	23
Copper River (L)	1	coho	176
Copper River (L)	1	Cottus	5
Copper River (L)	1	cutthroat	2
Copper River (L)	1	rainbow	1
Copper River (L)	1	Trout sp.	4
Copper River (U)	2	coho	224
Copper River (U)	2	Cottus	5
Copper River (U)	2	Trout sp.	16
Cullon Creek (L)	2	coho	98
Cullon Creek (L)	2	rainbow	93
Cullon Creek (L)	2	sucker	7
Cullon Creek (L)	2	whitefish	1
Cullon Creek (U)	1	chinook	1
Cullon Creek (U)	1	coho	158
Cullon Creek (U)	1	rainbow	115
Deep Creek	1	coho	91
Deep Creek	1	rainbow	9
Elliot Creek Main.	2	Dolly Varden	3
Elliot Creek Trib.	1	coho	14
Elliot Creek Trib.	1	Dolly Varden	2
Footsore Lk. inlet	1	coho	9
Footsore Lk. inlet	1	cottus	15
Footsore Lk. inlet	1	rainbow trout	1
Gitnadoix River	1	coho	62
Gitnadoix River	2	coho	56
Gitnadoix River	2	Cottus	9
Gitnadoix River	2	rainbow	13
Gosnell Creek	1	coho	13
Green River	1	coho	40
Green River	1	cutthroat	1
Green River	1	Dolly Varden	1

Table 17. cont'd

Stream Name	Site	Fish species	Total catch
Hadenschild Creek	1	coho	77
Hadenschild Creek	1	Cottus	1
Hadenschild Creek	1	rainbow	3
Hankin Creek	1	coho	2
Hankin Creek	1	cutthroat	7
Hankin Creek	1	Dolly Varden	1
Hankin Creek (L)	2	coho	30
Hankin Creek (L)	2	cutthroat	1
Kispiox River	1	coho	247
Kispiox River	1	rainbow	22
Kitwanga River (L)	1	chinook	1
Kitwanga River (L)	1	coho	21
Kitwanga River (L)	1	Cottus	6
Kitwanga River (L)	1	rainbow	4
Kitwanga River (U)	1	coho	8
Kitwanga River (U)	1	Cottus	30
Kitwanga River (U)	1	cutthroat	2
Kitwanga River (U)	1	rainbow	2
Lamprey Creek	1	coho	13
Lamprey Creek	1	Cottus	8
Lamprey Creek	1	Trout sp.	10
Moonlit Creek	1	Char	1
Moonlit Creek	1	chinook	3
Moonlit Creek	1	coho	5
Moonlit Creek	1	rainbow	3
Moonlit Creek	1	Trout sp	1
Morrison River (U)	1	coho	16
Morrison River (U)	1	Cottus	7
Morrison River (U)	1	rainbow	1
Morrison River (U)	1	redsided shiner	11
Morrison River (U)	1	squawfish	20
Nangeese River	1	coho	15
Nangeese River	1	Dolly Varden	5
Nangeese River	1	lamprey	2
Nine Mile Creek	1	coho	2

Table 17. cont'd

Stream Name	Site	Fish species	Total catch
Nine Mile Creek	1	Cottus	3
Nine Mile Creek	1	rainbow	1
Nine Mile Creek	1	Trout sp.	1
Shea Creek (main)	2	coho	38
Shea Creek (main)	2	Dolly Varden	2
Shea Creek (main)	2	rainbow	4
Shea Creek (side)	1	chinook	1
Shea Creek (side)	1	coho	95
Shea Creek (side)	1	lamprey	2
Shea Creek (side)	1	rainbow	13
Shea Creek (side)	1	Trout sp.	8
Singlehurst Creek	1	coho	24
Singlehurst Creek	1	cutthroat	3
Singlehurst Creek	1	Dolly Varden	7
Singlehurst Creek	1	rainbow	11
Sockeye Creek (L)	1	coho	66
Sockeye Creek (L)	1	Cottus	11
Sockeye Creek (L)	1	rainbow	7
Sockeye Creek (U)	2	coho	30
Sockeye Creek (U)	2	Cottus	4
Sockeye Creek (U)	2	rainbow	7
Sockeye Creek (U)	2	stickleback	6
Sustut River	1	chinook	103
Sustut River	1	coho	161
Sustut River	1	Dolly Varden	5
Sustut River	1	Trout sp.	4
Sustut River	1	whitefish	4
Tachek Creek	1	coho	84
Tachek Creek	1	Cottus	1
Tachek Creek	1	cutthroat	12
Tachek Creek	1	rainbow	7
Tachek Creek	1	Trout sp.	61
Tachek Creek	1	whitefish	1
Toboggan Creek (L)	2	chinook	1
Toboggan Creek (L)	2	coho	45

Table 17. cont'd

Stream Name	Site	Fish species	Total catch
Toboggan Creek (L)	2	cutthroat	1
Toboggan Creek (L)	2	Dolly Varden	2
Toboggan Creek (L)	2	lamprey	2
Toboggan Creek (L)	2	rainbow	5
Toboggan Creek (L)	2	Trout sp.	6
Toboggan Creek (L)	2	whitefish	2
Toboggan Creek Trib.	1	coho	216
Toboggan Creek Trib.	1	cutthroat	1
Toboggan Creek Trib.	1	Dolly Varden	39
Toboggan Creek Trib.	1	lamprey	1
Toboggan Creek Trib.	1	rainbow	12
Toboggan Creek Trib.	1	Trout sp.	10

Table 18. Summary of catches and sampling effort for sites where quantitative estimates were not obtained.

Stream Name	Site	Site length (m)	Sampling gear	Sampling effort	Fish species	Total catch
Alastair River	1	100	PS / EL	34 minutes	coho	26
Alastair River	1	100	PS / EL	34 minutes	rainbow	1
Clear Creek (U)	1	100	Gee Traps	3.5 hours	coho	42
Clear Creek (U)	1	100	Gee Traps	3.5 hours	Dolly Varden	67
Clear Creek (U)	1	100	Gee Traps	3.5 hours	rainbow	7
Clifford Creek	1	100	EL	35 minutes	coho	8
Clifford Creek	1	100	EL	35 minutes	rainbow	2
Clifford Creek	2	100	EL	35 minutes	coho	2
Elliot Creek Main.	2	100	EL / BS	14 minutes	Dolly Varden	3
Elliot Creek Trib.	1	91	EL	11 minutes	coho	14
Elliot Creek Trib.	1	91	EL	11 minutes	Dolly Varden	2
Footsore Lk. inlet	1	103	EL	25 min	coho	9
Footsore Lk. inlet	1	103	EL	25 min	cottus	15
Footsore Lk. inlet	1	103	EL	25 min	rainbow trout	1
Gitnadoix River	2	54	Gee Traps	4.5 hours	coho	56
Gitnadoix River	2	54	Gee Traps	4.5 hours	Cottus	9
Gitnadoix River	2	54	Gee Traps	4.5 hours	rainbow	13
Gosnell Creek	1	107	BS	107 m	coho	13
Green River	1	45	Gee Trap	4.5 hrs	coho	40
Green River	1	45	Gee Trap	4.5 hrs	cutthroat	1
Green River	1	45	Gee Trap	4.5 hrs	Dolly Varden	1
Hankin Creek	1	100	EL	59 minutes	coho	2
Hankin Creek	1	100	EL	59 minutes	cutthroat	7
Hankin Creek	1	100	EL	59 minutes	Dolly Varden	1
Kitwanga River (U)	1	100	EL	52 minutes	coho	8
Kitwanga River (U)	1	100	EL	52 minutes	Cottus	30
Kitwanga River (U)	1	100	EL	52 minutes	cutthroat	2
Kitwanga River (U)	1	100	EL	52 minutes	rainbow	2
Lamprey Creek	1	47	EL / BS	10 / 30 minutes	coho	13
Lamprey Creek	1	47	EL / BS	10 / 30 minutes	Cottus	8
Lamprey Creek	1	47	EL / BS	10 / 30 minutes	Trout sp.	10
Moonlit Creek	1	116	EL	55 minutes	Dolly Varden	1
Moonlit Creek	1	116	EL	55 minutes	chinook	3
Moonlit Creek	1	116	EL	55 minutes	coho	5
Moonlit Creek	1	116	EL	55 minutes	rainbow	3
Moonlit Creek	1	116	EL	55 minutes	Trout sp	1
Nangeese River	1	100	EL	15 mins	coho	15
Nangeese River	1	100	EL	15 mins	Dolly Varden	5
Nangeese River	1	100	EL	15 mins	lamprey	2
Nine Mile Creek	1	80	EL	23 minutes	coho	2
Nine Mile Creek	1	80	EL	23 minutes	Cottus	3
Nine Mile Creek	1	80	EL	23 minutes	rainbow	1
Nine Mile Creek	1	80	EL	23 minutes	Trout sp.	1
Shea Creek (main)	2	80	EL	12 minutes	coho	38
Shea Creek (main)	2	80	EL	12 minutes	Dolly Varden	2
Shea Creek (main)	2	80	EL	12 minutes	rainbow	4
Singlehurst Creek	1	100	BS	100 m	coho	24
Singlehurst Creek	1	100	BS	100 m	cutthroat	3
Singlehurst Creek	1	100	BS	100 m	Dolly Varden	7
Singlehurst Creek	1	100	BS	100 m	rainbow	11
Sockeye Creek (U)	2	30	EL	12 min	coho	30

Table 18. cont'd

Stream Name	Site	Site length (m)	Sampling gear	Sampling effort	Fish species	Total catch
Sockeye Creek (U)	2	30	EL	12 min	Cottus	4
Sockeye Creek (U)	2	30	EL	12 min	rainbow	7
Sockeye Creek (U)	2	30	EL	12 min	stickleback	6
Toboggan Creek (L)	2	99.5	BS	20 m	chinook	1
Toboggan Creek (L)	2	99.5	BS	20 m	coho	45
Toboggan Creek (L)	2	99.5	BS	20 m	cutthroat	1
Toboggan Creek (L)	2	99.5	BS	20 m	Dolly Varden	2
Toboggan Creek (L)	2	99.5	BS	20 m	lamprey	2
Toboggan Creek (L)	2	99.5	BS	20 m	rainbow	5
Toboggan Creek (L)	2	99.5	BS	20 m	Trout sp.	6
Toboggan Creek (L)	2	99.5	BS	20 m	whitefish	2

Table 19. Estimates of catch-per-unit-effort, by species, for semi-quantitative sampling beyond the boundaries of the original sampling site.

Stream Name	Site	Length sampled (m)	Sampling method	Fish species	Total catch	Catch m^{-1}
Footsore Lk. inlet	1	10	Electroshocker	coho	5	0.50
Footsore Lk. inlet	1	10	Electroshocker	cottus	2	0.20
Hankin Creek (L)	2	55	Electroshocker	coho	5	0.09
Johansen side ch.	1	20	Beach seine	coho	3	0.15
Johansen side ch.	1	20	Beach seine	trout fry	4	0.20
Kitwanga River (L)	1	50	Electroshocker	coho	13	0.26
Kitwanga River (L)	1	50	Electroshocker	cottus	7	0.14
Kitwanga River (L)	1	50	Electroshocker	rainbow trout	4	0.08
Nangeese River	1	40	Electroshocker	coho	13	0.33
Nangeese River	1	40	Electroshocker	Dolly Varden	2	0.05
Nangeese River	1	40	Electroshocker	rainbow trout	1	0.03
Sicintine River	1	45	Electroshocker	coho	24	0.53
Sicintine River	1	45	Electroshocker	Dolly Varden	9	0.20
Sockeye Creek (U)	2	70	Pole seine	coho	27	0.39
Sockeye Creek (U)	2	70	Pole seine	rainbow trout	7	0.10
Sockeye Creek (U)	2	70	Pole seine	stickleback	5	0.07

Table 20. Mean length and weight of fish species by stream site.

Stream Name	Site	Fish species	Mean Lt. (mm)	n Length	Mean Wt. (g)	n Weight
Alastair River	1	coho	46.0	26	1.2	26
Alastair River	1	rainbow	36.0	1	0.3	1
Boucher Creek (L)	1	chinook	64.0	4	3.1	4
Boucher Creek (L)	1	coho	63.6	58	2.8	58
Boucher Creek (L)	1	Cottus	64.0	1	3.4	1
Boucher Creek (L)	1	cutthroat	136.0	4	29.7	4
Boucher Creek (L)	1	lamprey	79.3	4	0.0	4
Boucher Creek (L)	1	Trout sp.	36.5	6	0.5	6
Boucher Creek (L)	1	whitefish	54.0	1	1.5	1
Boucher Creek (U)	2	chinook	64.3	6	3.2	6
Boucher Creek (U)	2	coho	60.8	27	2.5	27
Boucher Creek (U)	2	cutthroat	110.0	3	13.6	3
Boucher Creek (U)	2	rainbow	139.8	5	8.9	5
Boucher Creek (U)	2	Trout sp.	37.7	51	0.2	51
Boucher Creek (U)	2	whitefish	62.0	1	2.0	1
Clear Creek (U)	1	coho	71.3	42	5.4	42
Clear Creek (U)	1	Dolly Varden	99.4	67	12.5	67
Clear Creek (U)	1	rainbow	72.0	7	5.0	7
Clearwater Creek	1	coho	66.7	68	3.9	68
Clearwater Creek	1	Cottus	99.0	30	12.2	30
Clearwater Creek	1	cutthroat	87.3	38	9.7	38
Clearwater Creek	1	Dolly Varden	110.0	1	14.0	1
Clearwater Creek	1	rainbow	49.1	19	1.9	19
Clearwater Creek	2	coho	60.4	48	3.0	48
Clearwater Creek	2	cutthroat	95.7	27	12.8	27
Clearwater Creek	2	Dolly Varden	149.0	1	36.5	1
Clearwater Creek	2	rainbow	56.9	22	3.1	22
Clifford Creek	1	coho	62.6	8	5.4	8
Clifford Creek	1	rainbow	35.0	2	0.6	2
Clifford Creek	2	coho	51.0	2	1.6	2
Coldwater Creek (L)	2	coho	48.0	200	1.8	200
Coldwater Creek (L)	2	cutthroat	100.8	12	19.6	12
Coldwater Creek (L)	2	Dolly Varden	91.2	23	9.2	23
Coldwater Creek (L)	2	rainbow	60.5	39	4.6	39

Table 20. cont'd

Stream Name	Site	Fish species	Mean Lt. (mm)	n Length	Mean Wt. (g)	n Weight
Coldwater Creek (U)	1	coho	49.6	233	2.1	233
Coldwater Creek (U)	1	cutthroat	115.2	6	23.5	6
Coldwater Creek (U)	1	Dolly Varden	88.7	15	10.0	15
Coldwater Creek (U)	1	rainbow	65.9	23	4.6	23
Copper River (L)	1	coho	45.3	176	0.3	176
Copper River (L)	1	Cottus	62.6	5	1.4	5
Copper River (L)	1	cutthroat	33.0	2	0.4	2
Copper River (L)	1	rainbow	35.0	1	0.0	1
Copper River (L)	1	Trout sp.	35.3	4	0.4	4
Copper River (U)	2	coho	49.0	224	0.6	224
Copper River (U)	2	Cottus	82.8	5	7.8	5
Copper River (U)	2	Trout sp.	35.0	16	0.0	16
Cullon Creek (L)	2	coho	48.6	98	1.7	98
Cullon Creek (L)	2	rainbow	40.0	93	1.1	93
Cullon Creek (L)	2	Sucker	48.7	7	1.6	7
Cullon Creek (L)	2	whitefish	234.0	1	177.5	1
Cullon Creek (U)	1	chinook	50.0	1	1.7	1
Cullon Creek (U)	1	coho	49.8	158	1.9	158
Cullon Creek (U)	1	rainbow	45.9	115	3.3	115
Deep Creek	1	coho	55.5	91	2.1	91
Deep Creek	1	rainbow	47.2	9	1.9	9
Elliot Creek Main.	2	Dolly Varden	54.7	3	4.5	3
Elliot Creek Trib.	1	coho	56.9	14	3.1	14
Elliot Creek Trib.	1	Dolly Varden	91.5	2	9.3	2
Footsore Lk. inlet	1	coho	75.7	9	6.4	9
Footsore Lk. inlet	1	cottus	77.7	15	5.9	15
Footsore Lk. inlet	1	rainbow trout	118.0	1	20.8	1
Gitnadoix River	1	coho	47.5	62	1.3	62
Gitnadoix River	2	coho	62.8	56	3.2	56
Gitnadoix River	2	Cottus	93.1	9	9.3	9
Gitnadoix River	2	rainbow	102.0	13	12.2	13
Gosnell Creek	1	coho	86.8	13	7.4	13
Green River	1	coho	84.1	40	7.5	40
Green River	1	cutthroat	158.0	1	37.7	1

Table 20. cont'd

Stream Name	Site	Fish species	Mean Lt. (mm)	n Length	Mean Wt. (g)	n Weight
Green River	1	Dolly Varden	110.0	1	11.9	1
Hadenschild Creek	1	coho	44.5	77	1.0	77
Hadenschild Creek	1	Cottus	94.0	1	11.4	1
Hadenschild Creek	1	rainbow	33.7	3	0.4	3
Hankin Creek	1	coho	78.5	2	6.1	2
Hankin Creek	1	cutthroat	15.9	7	2.5	7
Hankin Creek	1	Dolly Varden	134.0	1	24.1	1
Hankin Creek (L)	2	coho	50.8	30	2.2	30
Hankin Creek (L)	2	cutthroat	87.0	1	7.0	1
Kispiox River	1	coho	49.2	247	1.8	247
Kispiox River	1	rainbow	40.0	22	0.8	22
Kitwanga River (L)	1	chinook	8.0	1	6.4	1
Kitwanga River (L)	1	coho	61.7	21	2.9	21
Kitwanga River (L)	1	Cottus	93.5	6	12.5	6
Kitwanga River (L)	1	rainbow	46.3	4	1.3	4
Kitwanga River (U)	1	coho	64.0	8	3.9	8
Kitwanga River (U)	1	Cottus	69.1	30	4.2	30
Kitwanga River (U)	1	cutthroat	155.5	2	40.0	2
Kitwanga River (U)	1	rainbow	29.5	2	0.4	2
Lamprey Creek	1	coho	46.2	13	0.7	13
Lamprey Creek	1	Cottus	56.0	8	1.5	8
Lamprey Creek	1	Trout sp.	39.8	10	0.3	10
Moonlit Creek	1	chinook	62.7	3	6.6	3
Moonlit Creek	1	coho	46.4	5	1.3	5
Moonlit Creek	1	Dolly Varden	82.0	1	4.7	1
Moonlit Creek	1	rainbow	43.0	3	1.1	3
Moonlit Creek	1	Trout sp	40.0	1	0.3	1
Morrison River (U)	1	coho	63.8	16	3.0	16
Morrison River (U)	1	Cottus	70.9	7	4.7	7
Morrison River (U)	1	rainbow	142.0	1	27.8	1
Morrison River (U)	1	redsided shiner	64.3	11	1.8	11
Morrison River (U)	1	squawfish	118.5	20	1.8	20
Nangeese River	1	coho	50.7	15	1.9	15
Nangeese River	1	Dolly Varden	60.8	5	3.3	5

Table 20. cont'd

Stream Name	Site	Fish species	Mean Lt. (mm)	n Length	Mean Wt. (g)	n Weight
Nangeese River	1	lamprey	156.0	2	6.4	2
Nine Mile Creek	1	coho	41.0	2	0.6	2
Nine Mile Creek	1	Cottus	51.0	3	1.8	3
Nine Mile Creek	1	rainbow	76.0	1	5.5	1
Nine Mile Creek	1	Trout sp.	38.0	1	0.5	1
Shea Creek (main)	2	coho	55.3	38	2.7	38
Shea Creek (main)	2	Dolly Varden	115.5	2	62.4	2
Shea Creek (main)	2	rainbow	69.0	4	4.2	4
Shea Creek (side)	1	chinook	67.0	1	4.8	1
Shea Creek (side)	1	coho	55.8	95	2.2	95
Shea Creek (side)	1	lamprey	106.5	2	0.0	2
Shea Creek (side)	1	rainbow	69.9	13	5.7	13
Shea Creek (side)	1	Trout sp.	45.1	8	0.4	8
Singlehurst Creek	1	coho	62.7	24	3.2	24
Singlehurst Creek	1	cutthroat	155.3	3	47.0	3
Singlehurst Creek	1	Dolly Varden	114.1	7	18.2	7
Singlehurst Creek	1	rainbow	71.2	11	7.6	11
Sockeye Creek (L)	1	coho	61.7	66	3.5	66
Sockeye Creek (L)	1	Cottus	72.5	11	4.7	11
Sockeye Creek (L)	1	rainbow	37.9	7	0.6	7
Sockeye Creek (U)	2	coho	52.7	30	2.2	30
Sockeye Creek (U)	2	Cottus	82.5	4	5.8	4
Sockeye Creek (U)	2	rainbow	36.4	7	0.5	7
Sockeye Creek (U)	2	stickleback	46.3	6	1.4	6
Sustut River	1	chinook	47.1	103	0.4	103
Sustut River	1	coho	50.8	161	0.7	161
Sustut River	1	Dolly Varden	68.2	5	4.9	5
Sustut River	1	Trout sp.	31.5	4	0.0	4
Sustut River	1	whitefish	90.8	4	7.0	4
Tachek Creek	1	coho	66.9	84	1.8	84
Tachek Creek	1	Cottus	71.0	1	4.8	1
Tachek Creek	1	cutthroat	84.8	12	5.7	12
Tachek Creek	1	rainbow	115.6	7	7.9	7
Tachek Creek	1	Trout sp.	37.6	61	0.2	61

Table 20. cont'd

Stream Name	Site	Fish species	Mean Lt. (mm)	n Length	Mean Wt. (g)	n Weight
Tachek Creek	1	whitefish	68.0	1	0.0	1
Toboggan Creek (L)	2	chinook	65.0	1	2.9	1
Toboggan Creek (L)	2	coho	58.1	45	2.2	45
Toboggan Creek (L)	2	cutthroat	0.0	1	57.2	1
Toboggan Creek (L)	2	Dolly Varden	41.5	2	0.3	2
Toboggan Creek (L)	2	lamprey	86.5	2	0.0	2
Toboggan Creek (L)	2	rainbow	134.2	5	32.4	5
Toboggan Creek (L)	2	Trout sp.	33.2	6	0.1	6
Toboggan Creek (L)	2	whitefish	87.0	2	11.1	2
Toboggan Creek Trib.	1	coho	55.4	216	0.7	216
Toboggan Creek Trib.	1	cutthroat	68.0	1	0.0	1
Toboggan Creek Trib.	1	Dolly Varden	47.3	39	0.6	39
Toboggan Creek Trib.	1	lamprey	160.0	1	0.0	1
Toboggan Creek Trib.	1	rainbow	73.6	12	5.5	12
Toboggan Creek Trib.	1	Trout sp.	33.8	10	0.2	10

Table 21. Weight on fork length regressions ($Log_{(10)}$ weight=b($Log_{(10)}$ length) +a), by stream site and species, for n ≥ 15.

Stream Name	Site	Species	a	b	r^2	n
Alastair River	1	coho	-6.37	3.85	0.69	26
Boucher Creek (L)	1	coho	-5.32	3.20	0.93	51
Boucher Creek (U)	2	coho	-5.42	3.25	0.94	26
Boucher Creek (U)	2	Trout sp.	-5.44	3.29	0.85	16
Clear Creek (U)	1	coho	-5.00	3.01	0.99	42
Clear Creek (U)	1	Dolly Varden	-4.96	2.99	0.83	67
Clearwater Creek	2	coho	-4.91	3.00	0.90	48
Clearwater Creek	1	coho	-4.61	2.84	0.92	68
Clearwater Creek	1	Cottus	-5.47	3.27	0.95	30
Clearwater Creek	2	cutthroat	-4.91	2.97	0.99	27
Clearwater Creek	1	cutthroat	-4.71	2.88	0.99	38
Clearwater Creek	1	rainbow	-4.96	3.01	0.99	16
Clearwater Creek	2	rainbow	-4.74	2.87	0.97	22
Coldwater Creek (L)	2	coho	-4.85	3.00	0.94	188
Coldwater Creek (L)	2	Dolly Varden	-4.15	2.59	0.95	23
Coldwater Creek (L)	2	rainbow	-4.84	2.95	0.98	39
Coldwater Creek (U)	1	coho	-5.06	3.11	0.92	233
Coldwater Creek (U)	1	Dolly Varden	-5.41	3.23	0.96	15
Coldwater Creek (U)	1	rainbow	-4.51	2.78	0.97	23
Copper River (L)	1	coho	-4.95	2.99	0.87	54
Copper River (U)	2	coho	-5.08	3.06	0.94	67
Cullon Creek (L)	2	coho	-5.02	3.09	0.91	98
Cullon Creek (L)	2	rainbow	-5.11	3.13	0.90	93
Cullon Creek (U)	1	coho	-5.09	3.13	0.93	158
Cullon Creek (U)	1	rainbow	-4.95	3.04	0.97	115
Deep Creek	1	coho	-5.01	3.02	0.94	91
Footsore Lk. inlet	1	ottus	-4.35	2.69	0.90	15
Gitnadoix River	2	coho	-4.90	2.98	0.97	56
Gitnadoix River	1	coho	-5.00	3.00	0.93	62
Green River	1	coho	-5.31	3.18	0.98	40
Hadenschild Creek	1	coho	-5.30	3.20	0.87	77
Hankin Creek (L)	2	coho	-6.45	3.83	0.98	30
Kispiox River	1	coho	-4.29	2.67	0.79	247
Kitwanga River (L)	1	coho	-3.83	2.39	0.92	21

Table 21. cont'd

Stream Name	Site	Species	a	b	r^2	n
Kitwanga River (U)	1	Cottus	-4.96	3.01	0.95	30
Morrison River (U)	1	coho	-5.19	3.13	0.97	16
Nangeese River	1	coho	-5.38	3.28	0.83	15
Shea Creek (main)	2	coho	-4.99	3.06	0.93	26
Shea Creek (side)	1	coho	-4.56	2.84	0.96	51
Singlehurst Creek	1	coho	-4.70	2.86	0.94	24
Sockeye Creek (L)	1	coho	-4.71	2.89	0.83	66
Sockeye Creek (U)	2	coho	-5.01	3.08	0.97	30
Sustut River	1	chinook	-4.88	2.94	0.80	28
Sustut River	1	coho	-4.62	2.80	0.82	58
Tachek Creek	1	coho	-4.07	2.57	0.76	34
Toboggan Creek (L)	2	coho	-5.04	3.03	0.91	45
Toboggan Creek Trib.	1	coho	-4.93	3.00	0.95	59
Toboggan Creek Trib.	1	Dolly Varden	-4.19	2.52	0.72	22

Table 22. Numbers of captures (C), marks (M) and recaptures (R) with modified Petersen and Bayes estimates of coho abundances from mark - recapture sampling in Green Lake, using baited Gee minnow traps.

	Green Lake
(M)	84
(C)	66
(R)	3
N	1424
SD	617
Lower CI	214
Upper CI	2634
Bayes mode	1845
95% HPD	913 - 4767

Table 23. Summary of captures, by stream site and species, including mark type released and recaptured.

Stream Name	Site	Species	1st pass		2nd pass				3rd pass			
			Caught	Marked UC[1]	Caught	Recap. UC	Marked UC/LC[2]	Marked LC[3]	Caught	Recap. UC	Recap. UC/LC	Recap. LC
Alastair River	1	coho	0	0	0	0	0	0	0	0	0	0
Alastair River	1	rainbow	0	0	0	0	0	0	0	0	0	0
Boucher Creek (L)	1	chinook	1	0	3	0	0	0	0	0	0	0
Boucher Creek (L)	1	coho	27	0	25	0	0	0	3	0	0	0
Boucher Creek (L)	1	cutthroat	1	0	3	0	0	0	0	0	0	0
Boucher Creek (L)	1	lamprey	10	0	2	0	0	0	1	0	0	0
Boucher Creek (L)	1	trout fry	2	0	2	0	0	0	2	0	0	0
Boucher Creek (U)	2	chinook	6	0	0	0	0	0	0	0	0	0
Boucher Creek (U)	2	coho	22	0	4	0	0	0	2	0	0	0
Boucher Creek (U)	2	cutthroat	3	0	0	0	0	0	0	0	0	0
Boucher Creek (U)	2	trout fry	29	0	21	0	0	0	19	0	0	0
Clear Creek (U)	1	coho	0	0	0	0	0	0	0	0	0	0
Clear Creek (U)	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Clear Creek (U)	1	rainbow	0	0	0	0	0	0	0	0	0	0
Clearwater Creek	1	coho	13	0	20	0	0	0	18	0	0	0
Clearwater Creek	1	cottus	9	0	18	0	0	0	8	0	0	0
Clearwater Creek	1	cutthroat	7	0	8	0	0	0	10	0	0	0
Clearwater Creek	1	rainbow	4	0	4	0	0	0	2	0	0	0
Clearwater Creek	2	coho	24	0	14	0	0	0	10	0	0	0
Clearwater Creek	2	cottus	2	0	9	0	0	0	3	0	0	0
Clearwater Creek	2	cutthroat	11	0	8	0	0	0	3	0	0	0
Clearwater Creek	2	rainbow	7	0	8	0	0	0	6	0	0	0
Clifford Creek	1	coho	0	0	0	0	0	0	0	0	0	0
Clifford Creek	1	rainbow	0	0	0	0	0	0	0	0	0	0
Clifford Creek	2	coho	0	0	0	0	0	0	0	0	0	0

Table 23. cont'd

Stream Name	Site	Species	1st pass Caught	1st pass Marked UC[1]	2nd pass Caught	2nd pass Recap. UC	2nd pass Marked UC/LC[2]	2nd pass Marked LC[3]	3rd pass Caught	3rd pass Recap. UC	3rd pass Recap. UC/LC	3rd pass Recap. LC
Coldwater Creek (L)	2	coho	65	65	64	12	12	52	71	11	7	16
Coldwater Creek (L)	2	cutthroat	3	3	3	1	1	2	6	1	0	1
Coldwater Creek (L)	2	Dolly Varden	8	8	7	1	1	6	8	3	0	0
Coldwater Creek (L)	2	rainbow	17	17	11	2	2	9	11	2	0	1
Coldwater Creek (U)	1	coho	102	102	72	22	22	50	59	8	9	11
Coldwater Creek (U)	1	cutthroat	0	0	4	0	0	4	2	0	0	0
Coldwater Creek (U)	1	Dolly Varden	9	9	4	1	1	4	2	0	0	0
Coldwater Creek (U)	1	rainbow	10	10	9	0	0	9	4	0	0	0
Copper River (L)	1	coho	57	57	48	0	0	0	49	0	0	0
Copper River (L)	1	cottus	2	0	0	0	0	0	0	0	0	0
Copper River (L)	1	cutthroat	2	2	0	0	0	0	0	0	0	0
Copper River (L)	1	rainbow	4	4	1	0	0	0	0	0	0	0
Copper River (U)	2	coho	104	0	77	0	0	0	45	0	0	0
Copper River (U)	2	cottus	1	0	1	0	0	0	3	0	0	0
Copper River (U)	2	trout fry	8	0	4	0	0	0	3	0	0	0
Cullon Creek (L)	2	coho	49	0	28	0	0	0	21	0	0	0
Cullon Creek (L)	2	rainbow	45	0	34	0	0	0	14	0	0	0
Cullon Creek (U)	1	chinook	1	0	0	0	0	0	0	0	0	0
Cullon Creek (U)	1	coho	74	74	52	9	9	43	32	3	1	9
Cullon Creek (U)	1	rainbow	58	58	28	1	1	27	29	3	0	5
Deep Creek	1	coho	36	0	29	0	0	0	26	0	0	0
Deep Creek	1	rainbow	4	0	5	0	0	0	5	0	0	0
Elliot Creek Trib.	1	coho	0	0	0	0	0	0	0	0	0	0
Elliot Creek Trib.	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Footsore Lk. inlet	1	coho	0	0	0	0	0	0	0	0	0	0

Table 23. cont'd

Stream Name	Site	Species	1st pass Caught	1st pass Marked UC[1]	2nd pass Caught	2nd pass Recap. UC	2nd pass Marked UC/LC[2]	2nd pass Marked LC[3]	3rd pass Caught	3rd pass Recap. UC	3rd pass Recap. UC/LC	3rd pass Recap. LC
Footsore Lk. inlet	1	cottus	0	0	0	0	0	0	0	0	0	0
Footsore Lk. inlet	1	rainbow	0	0	0	0	0	0	0	0	0	0
Gitnadoix River	1	coho	38	0	15	0	0	0	9	0	0	0
Gitnadoix River	2	coho	0	0	0	0	0	0	0	0	0	0
Gitnadoix River	2	cottus	0	0	0	0	0	0	0	0	0	0
Gitnadoix River	2	rainbow	0	0	0	0	0	0	0	0	0	0
Gosnell Creek	1	coho	0	0	0	0	0	0	0	0	0	0
Gosnell Creek	1	rainbow	0	0	0	0	0	0	0	0	0	0
Green River	1	coho	0	0	0	0	0	0	0	0	0	0
Green River	1	cutthroat	0	0	0	0	0	0	0	0	0	0
Green River	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Hadenschild Creek	1	coho	37	0	25	0	0	0	15	0	0	0
Hadenschild Creek	1	rainbow	2	0	0	0	0	0	1	0	0	0
Hankin Creek	1	coho	0	0	0	0	0	0	0	0	0	0
Hankin Creek	1	cutthroat	0	0	0	0	0	0	0	0	0	0
Hankin Creek	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Hankin Creek	1	trout fry	0	0	0	0	0	0	0	0	0	0
Hankin Creek (L)	2	coho	8	8	14	0	0	0	8	0	0	0
Hankin Creek (L)	2	cutthroat	1	1	0	0	0	0	0	0	0	0
Johansen side ch.	1	coho	0	0	0	0	0	0	0	0	0	0
Johansen side ch.	1	trout fry	0	0	0	0	0	0	0	0	0	0
Kispiox River	1	coho	95	95	93	17	17	76	59	9	2	7
Kispiox River	1	rainbow	8	8	5	0	0	5	9	0	0	0
Kitwanga River (L)	1	chinook	1	0	0	0	0	0	0	0	0	0
Kitwanga River (L)	1	coho	10	0	7	0	0	0	4	0	0	0

Table 23. cont'd

Stream Name	Site	Species	1st pass Caught	1st pass Marked UC[1]	2nd pass Caught	2nd pass Recap. UC	2nd pass Marked UC/LC[2]	2nd pass Marked LC[3]	3rd pass Caught	3rd pass Recap. UC	3rd pass Recap. UC/LC	3rd pass Recap. LC
Kitwanga River (L)	1	cottus	5	0	1	0	0	0	1	0	0	0
Kitwanga River (L)	1	rainbow	0	0	0	0	0	0	0	0	0	0
Kitwanga River (U)	1	coho	0	0	0	0	0	0	0	0	0	0
Kitwanga River (U)	1	cutthroat	0	0	0	0	0	0	0	0	0	0
Kitwanga River (U)	1	rainbow	0	0	0	0	0	0	0	0	0	0
Lamprey Creek	1	coho	6	0	1	0	0	0	0	0	0	0
Lamprey Creek	1	cottus	1	0	3	0	0	0	0	0	0	0
Lamprey Creek	1	Dolly Varden	0	0	1	0	0	0	0	0	0	0
Lamprey Creek	1	trout fry	4	0	4	0	0	0	2	0	0	0
Moonlit Creek	1	chinook	0	0	0	0	0	0	0	0	0	0
Moonlit Creek	1	coho	0	0	0	0	0	0	0	0	0	0
Moonlit Creek	1	rainbow	0	0	0	0	0	0	0	0	0	0
Moonlit Creek	1	trout fry	0	0	0	0	0	0	0	0	0	0
Morrison River (U)	1	coho	14	0	0	0	0	0	2	0	0	0
Morrison River (U)	1	cottus	3	0	9	0	0	0	7	0	0	0
Morrison River (U)	1	rainbow	1	0	0	0	0	0	0	0	0	0
Morrison River (U)	1	redsided shiner	34	0	8	0	0	0	4	0	0	0
Morrison River (U)	1	squawfish	68	0	11	0	0	0	12	0	0	0
Morrison River (U)	1	sucker	4	0	1	0	0	0	4	0	0	0
Nangeese River	1	coho	0	0	0	0	0	0	0	0	0	0
Nangeese River	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Nangeese River	1	lamprey	0	0	0	0	0	0	0	0	0	0
Nangeese River	1	rainbow	0	0	0	0	0	0	0	0	0	0
Nine Mile Creek	1	coho	0	0	0	0	0	0	0	0	0	0
Nine Mile Creek	1	cottus	0	0	0	0	0	0	0	0	0	0

Table 23. cont'd

Stream Name	Site	Species	1st pass Caught	1st pass Marked UC[1]	2nd pass Caught	2nd pass Recap. UC	2nd pass Marked UC/LC[2]	2nd pass Marked LC[3]	3rd pass Caught	3rd pass Recap. UC	3rd pass Recap. UC/LC	3rd pass Recap. LC
Nine Mile Creek	1	rainbow	0	0	0	0	0	0	0	0	0	0
Nine Mile Creek	1	trout fry	0	0	0	0	0	0	0	0	0	0
Shea Creek (main)	2	coho	0	0	0	0	0	0	0	0	0	0
Shea Creek (main)	2	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Shea Creek (main)	2	rainbow	0	0	0	0	0	0	0	0	0	0
Shea Creek (side)	1	chinook	0	0	0	0	0	0	1	0	0	0
Shea Creek (side)	1	coho	42	42	34	4	3	30	19	2	1	4
Shea Creek (side)	1	Dolly Varden	6	6	2	1	1	1	1	0	0	1
Shea Creek (side)	1	rainbow	5	5	6	2	2	4	2	0	0	0
Sicintine River	1	coho	0	0	0	0	0	0	0	0	0	0
Sicintine River	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Singlehurst Creek	1	coho	0	0	0	0	0	0	0	0	0	0
Singlehurst Creek	1	cutthroat	0	0	0	0	0	0	0	0	0	0
Singlehurst Creek	1	Dolly Varden	0	0	0	0	0	0	0	0	0	0
Singlehurst Creek	1	rainbow	0	0	0	0	0	0	0	0	0	0
Sockeye Creek (L)	1	coho	33	0	18	0	0	0	15	0	0	0
Sockeye Creek (L)	1	cottus	6	0	3	0	0	0	2	0	0	0
Sockeye Creek (L)	1	rainbow	2	0	4	0	0	0	1	0	0	0
Sockeye Creek (U)	2	coho	30	0	0	0	0	0	0	0	0	0
Sockeye Creek (U)	2	cottus	4	0	0	0	0	0	0	0	0	0
Sockeye Creek (U)	2	rainbow	7	0	0	0	0	0	0	0	0	0
Sockeye Creek (U)	2	stickleback	7	0	0	0	0	0	0	0	0	0
Sustut River	1	chinook	39	34	29	4	4	19	35	7	2	4
Sustut River	1	coho	41	40	56	6	6	47	61	5	1	6
Sustut River	1	Dolly Varden	1	1	1	0	0	1	2	0	0	0

Table 23. cont'd

Stream Name	Site	Species	1st pass		2nd pass				3rd pass			
			Caught	Marked UC[1]	Caught	Recap. UC	Marked UC/LC[2]	Marked LC[3]	Caught	Recap. UC	Recap. UC/LC	Recap. LC
Sustut River	1	trout fry	4	2	0	0	0	0	0	0	0	0
Sustut River	1	whitefish	0	0	1	0	0	1	3	0	0	1
Tachek Creek	1	coho	33	32	29	13	11	13	21	3	2	3
Tachek Creek	1	cottus	1	1	1	0	0	1	0	0	0	0
Tachek Creek	1	cutthroat	6	6	3	1	0	2	4	0	0	1
Tachek Creek	1	rainbow	2	2	0	0	0	0	5	0	0	0
Tachek Creek	1	trout fry	27	17	26	0	0	21	25	0	0	0
Toboggan Creek (L)	2	coho	0	0	0	0	0	0	0	0	0	0
Toboggan Creek Trib.	1	coho	65	64	91	9	9	78	61	7	1	16
Toboggan Creek Trib.	1	cutthroat	0	0	1	0	0	1	0	0	0	0
Toboggan Creek Trib.	1	Dolly Varden	15	15	10	1	1	9	14	1	1	1
Toboggan Creek Trib.	1	rainbow	4	3	5	0	0	5	2	0	0	1
Toboggan Creek Trib.	1	trout fry	3	2	4	0	0	4	3	0	0	0

[1] UC - Upper caudal fin clip.

[2] UC/LC - Upper caudal, lower caudal combination fin clip.

[3] LC - Lower caudal fin clip.

Table 24. Numbers of fish captured (C), marked (M) and recaptured (R) in sequential collections, by stream site and species.

Stream Name	Site	Species	M	C	R	M2	C2	R2
Coldwater Creek (L)	2	cutthroat	3	3	1	5	6	2
Coldwater Creek (L)	2	rainbow	17	11	2	26	11	3
Coldwater Creek (L)	2	coho	65	64	12	117	71	34
Coldwater Creek (L)	2	Dolly Varden	8	7	1	14	8	3
Coldwater Creek (U)	1	rainbow	10	9	0	19	4	0
Coldwater Creek (U)	1	Dolly Varden	9	4	1	13	2	0
Coldwater Creek (U)	1	coho	102	72	22	152	59	28
Copper River (L)	1	coho	57	48	0	57	49	0
Cullon Creek (U)	1	coho	74	52	9	117	32	13
Cullon Creek (U)	1	rainbow	58	28	1	85	29	8
Hankin Creek (L)	2	coho	8	14	0	8	8	0
Kispiox River	1	rainbow	8	5	0	13	9	0
Kispiox River	1	coho	95	93	17	171	59	18
Shea Creek (side)	1	Dolly Varden	6	2	1	7	1	1
Shea Creek (side)	1	rainbow	5	6	2	9	2	0
Shea Creek (side)	1	coho	42	34	4	72	19	7
Sustut River	1	Dolly Varden	1	1	0	2	2	0
Sustut River	1	chinook	34	29	4	53	35	13
Sustut River	1	coho	40	56	6	87	61	12
Tachek Creek	1	cutthroat	6	3	1	8	4	1
Tachek Creek	1	trout fry	17	26	0	38	25	0
Tachek Creek	1	coho	32	29	13	45	21	8
Toboggan Creek Trib.	1	coho	64	91	9	142	61	24
Toboggan Creek Trib.	1	rainbow	3	5	0	8	2	1
Toboggan Creek Trib.	1	Dolly Varden	15	10	1	24	14	3
Toboggan Creek Trib.	1	trout fry	2	4	0	6	3	0

Table 25. Modified Petersen estimates of fish abundances, with associated variances and 95% confidence intervals from the release and subsequent recaptures of marks applied during repeated collections from stream sites.

Stream Name	Site	Species	N1*	V(N*)	Lower CI	Upper CI	N2*	V(N2*)	Lower CI	Upper CI
Coldwater Creek (L)	2	coho	330	6222.9	175	485	243	841.1	186	300
Coldwater Creek (L)	2	cutthroat	8	10.7	2	14	14	28.0	4	24
Coldwater Creek (L)	2	Dolly Varden	36	324.0	1	71	34	126.6	12	56
Coldwater Creek (L)	2	rainbow	72	972.0	11	133	81	874.8	23	139
Coldwater Creek (U)	1	coho	327	3050.0	219	435	317	1725.8	235	398
Coldwater Creek (U)	1	Dolly Varden	25	125.0	3	47	42	588.0	0	90
Cullon Creek (U)	1	coho	398	11654.0	186	609	278	2969.5	171	385
Cullon Creek (U)	1	rainbow	856	227135.3	0	1790	287	5752.4	138	435
Kispiox River	1	coho	501	10695.1	299	704	543	10079.9	346	740
Shea Creek (side)	1	coho	301	12943.0	78	524	183	2220.4	90	275
Shea Creek (side)	1	Dolly Varden	11	12.3	4	17	8	0.0	8	8
Shea Creek (side)	1	rainbow	14	28.0	4	24	30	300.0	0	64
Sustut River	1	chinook	210	6125.0	57	363	139	785.5	84	194
Sustut River	1	coho	334	12221.6	117	551	420	9943.5	224	615
Tachek Creek	1	coho	71	177.8	45	97	112	747.1	59	166
Tachek Creek	1	cutthroat	14	32.7	3	25	23	101.3	3	42
Toboggan Creek Trib.	1	coho	598	28975.8	264	932	355	2886.8	249	460
Toboggan Creek Trib.	1	Dolly Varden	88	2112.0	0	178	94	1289.1	23	164
Toboggan Creek Trib.	1	rainbow	24	240.0	0	54	14	20.3	5	22

Table 26. Mean estimates of population size by species, from modified Petersen estimates, with standard deviations and upper and lower 95% confidence intervals.

Stream Name	Site	Species	N1*	N2*	Mean N	SD	LCI	UCI
Coldwater Creek (L)	2	coho	330	243	286.4	61.7	165	407
Coldwater Creek (L)	2	cutthroat	8	14	11.0	4.2	3	19
Coldwater Creek (L)	2	Dolly Varden	36	34	34.9	1.6	32	38
Coldwater Creek (L)	2	rainbow	72	81	76.5	6.4	64	89
Coldwater Creek (U)	1	coho	327	317	321.7	7.3	307	336
Coldwater Creek (U)	1	Dolly Varden	25	42	33.5	12.0	10	57
Cullon Creek (U)	1	coho	398	278	337.8	84.4	172	503
Cullon Creek (U)	1	rainbow	856	287	571.1	402.2	0	1359
Kispiox River	1	coho	501	543	522.2	29.6	464	580
Shea Creek (side)	1	coho	301	183	241.8	83.8	78	406
Shea Creek (side)	1	Dolly Varden	11	8	9.3	1.8	6	13
Shea Creek (side)	1	rainbow	14	30	22.0	11.3	0	44
Sustut River	1	chinook	210	139	174.4	50.3	76	273
Sustut River	1	coho	334	420	376.8	60.7	258	496
Tachek Creek	1	coho	71	112	91.6	29.5	34	149
Tachek Creek	1	cutthroat	14	23	18.3	6.0	6	30
Toboggan Creek Trib.	1	coho	598	355	476.3	172.1	139	814
Toboggan Creek Trib.	1	Dolly Varden	88	94	90.9	4.1	83	99
Toboggan Creek Trib.	1	rainbow	24	14	18.8	7.4	4	33

Table 27. Bayes estimates of population densities by stream site and species, including the modal value (maximum likelihood estimate) and highest probability density (HPD) at 95% confidence.

Stream Name	Site	Species	Mode	95% HPH
Alastair River	1	coho	44	28-82
Coldwater Creek (L)	2	coho	303	197-525
Coldwater Creek (L)	2	cutthroat	16	7-111
Coldwater Creek (L)	2	Dolly Varden	43	20-184
Coldwater Creek (L)	2	rainbow	99	49-312
Coldwater Creek (U)	1	coho	354	292-450
Coldwater Creek (U)	1	Dolly Varden	68	18-2133
Cullon Creek (U)	1	coho	353	252-534
Cullon Creek (U)	1	rainbow	448	252-984
Kispiox River	1	coho	574	439-790
Shea Creek (side)	1	coho	254	155-493
Shea Creek (side)	1	Dolly Varden	9	9-161
Shea Creek (side)	1	rainbow	30	12-501
Sustut River	1	coho	443	298-724
Tachek Creek	1	coho	107	81-158
Tachek Creek	1	cutthroat	26	10-318
Toboggan Creek Trib.	1	coho	442	335-616
Toboggan Creek Trib.	1	Dolly Varden	125	53-527

Table 28. Estimates of population size from removal-depletion, by stream site and species, using Zippin's maximum likelihood model for three removals. The goodness-of-fit statistic T_1 indicates the stability of p, the probability of capture.

Stream Name	Site	Species	N	V(N)	Lower CI	Upper CI	T_1
Boucher Creek (L)	1	coho	57	2.5	54	60	12.89
Boucher Creek (L)	1	cutthroat	6	44.6	0	19	3.60
Boucher Creek (L)	1	chinook	6	44.6	0	19	3.60
Boucher Creek (U)	2	coho	29	1.0	27	30	0.67
Boucher Creek (U)	2	trout sp.	160	-	-	-	-
Clearwater Creek	1	coho	70	51.3	56	84	10.78
Clearwater Creek	1	rainbow	11	2.7	8	14	0.95
Clearwater Creek	2	coho	65	169.2	39	90	0.10
Clearwater Creek	2	cutthroat	27	41.2	15	40	0.48
Clearwater Creek	2	rainbow	105	8137.5	0	282	0.24
Coldwater Creek (L)	2	Dolly Varden	38	-	-	-	-
Coldwater Creek (L)	2	rainbow	47	87.5	29	66	0.47
Coldwater Creek (L)	2	coho	275	5029.1	136	414	0.12
Coldwater Creek (U)	1	Dolly Varden	15	3.4	12	19	0.25
Coldwater Creek (U)	1	rainbow	32	59.2	17	47	0.67
Coldwater Creek (U)	1	coho	218	207.2	190	246	0.45
Copper River (L)	1	coho	186	73.5	169	202	19.86
Copper River (L)	1	rainbow	5	0.1	5	6	0.23
Copper River (U)	2	coho	323	1325.5	251	394	0.67
Copper River (U)	2	trout sp.	19	41.0	7	32	0.11
Cullon Creek (L)	2	rainbow	119	254.5	88	150	1.75
Cullon Creek (L)	2	coho	132	345.5	96	169	0.35
Cullon Creek (U)	1	rainbow	131	148.1	107	155	1.26
Cullon Creek (U)	1	coho	160	127.6	138	182	0.48
Deep Creek	1	coho	228	1478.5	152	303	-
Gitnadoix River	1	coho	69	22.8	60	78	0.44
Hadenschild Creek	1	coho	104	271.5	72	136	0.06
Hadenschild Creek	1	rainbow	4	8.2	0	9	1.42
Hankin Creek (L)	2	coho	38	18.5	29	46	6.55
Kispiox River	1	coho	312	2363.3	216	407	1.78
Kitwanga River (L)	1	coho	28	74.0	12	45	0.05
Lamprey Creek	1	coho	7	0.2	6	8	0.16

Table 28. cont'd

Stream Name	Site	Species	N	V(N)	Lower CI	Upper CI	T_1
Lamprey Creek	1	trout sp.	17	372.3	0	55	0.28
Morrison River (U)	1	coho	16	0.6	15	18	5.73
Shea Creek (side)	1	Dolly Varden	7	0.1	7	8	26.12
Shea Creek (side)	1	rainbow	15	40.0	3	28	0.13
Shea Creek (side)	1	coho	104	157.4	79	128	1.40
Sockeye Creek (L)	1	rainbow	16	-	-	-	-
Sockeye Creek (L)	1	coho	92	239.9	61	122	0.58
Sustut River	1	chinook	146	3201.5	35	257	0.44
Tachek Creek	1	coho	81	128.7	58	103	0.78
Tachek Creek	1	cutthroat	15	40.0	3	28	0.96
Tachek Creek	1	trout sp.	600	17626.0	0	860	1.13
Toboggan Creek Trib.	1	trout sp.	32	115.7	0	53	1.24
Toboggan Creek Trib.	1	coho	391	445.4	350	433	1252.98
Toboggan Creek Trib.	1	Dolly Varden	88	568.6	41	134	1.26
Toboggan Creek Trib.	1	rainbow	13	34.0	2	25	1.80

Table 29. Linear density estimates of fish species by method of estimation.

Stream Name	Site	Species	Petersen $N^*.m^{-1}$	Petersen $N2^*.m^{-1}$	Bayes Mode.m^{-1}	Zippin $N.m^{-1}$
Boucher Creek (L)	1	chinook	-	-	-	0.19
Boucher Creek (L)	1	coho	-	-	-	1.78
Boucher Creek (L)	1	cutthroat	-	-	-	0.19
Boucher Creek (U)	2	coho	-	-	-	0.91
Boucher Creek (U)	2	trout sp.	-	-	-	5.00
Clearwater Creek	1	coho	-	-	-	1.46
Clearwater Creek	1	rainbow	-	-	-	0.23
Clearwater Creek	2	coho	-	-	-	1.30
Clearwater Creek	2	cutthroat	-	-	-	0.54
Clearwater Creek	2	rainbow	-	-	-	2.10
Coldwater Creek (L)	2	coho	10.31	7.59	9.47	8.59
Coldwater Creek (L)	2	cutthroat	0.25	0.44	0.50	-
Coldwater Creek (L)	2	Dolly Varden	1.13	1.05	1.34	1.19
Coldwater Creek (L)	2	rainbow	-	-	-	1.47
Coldwater Creek (L)	2	rainbow	2.25	2.53	3.09	-
Coldwater Creek (U)	1	coho	9.62	9.31	10.41	6.41
Coldwater Creek (U)	1	Dolly Varden	0.74	1.24	2.00	0.44
Coldwater Creek (U)	1	rainbow	-	-	-	0.94
Copper River (L)	1	coho	-	-	-	4.13
Copper River (L)	1	rainbow	-	-	-	0.11
Copper River (U)	2	coho	-	-	-	11.54
Copper River (U)	2	trout sp.	-	-	-	0.68
Cullon Creek (L)	2	coho	-	-	-	2.81
Cullon Creek (L)	2	rainbow	-	-	-	2.53
Cullon Creek (U)	1	coho	9.46	6.62	8.40	3.81
Cullon Creek (U)	1	rainbow	20.37	6.83	10.67	3.12
Deep Creek	1	coho	-	-	-	5.70
Gitnadoix River	1	coho	-	-	-	1.53
Hadenschild Creek	1	coho	-	-	-	2.08
Hadenschild Creek	1	rainbow	-	-	-	0.08
Hankin Creek (L)	2	coho	-	-	-	1.27
Kispiox River	1	coho	10.03	10.86	11.48	6.24
Kitwanga River (L)	1	coho	-	-	-	0.56

Table 29. cont'd

Stream Name	Site	Species	Petersen $N^*.m^{-1}$	Petersen $N2^*.m^{-1}$	Bayes $Mode.m^{-1}$	Zippin $N.m^{-1}$
Lamprey Creek	1	coho	-	-	-	0.15
Lamprey Creek	1	trout sp.	-	-	-	0.36
Morrison River (U)	1	coho	-	-	-	0.35
Shea Creek (side)	1	coho	5.79	3.51	4.88	2.00
Shea Creek (side)	1	Dolly Varden	0.20	0.15	0.17	0.13
Shea Creek (side)	1	rainbow	0.27	0.58	0.58	0.29
Sockeye Creek (L)	1	coho	-	-	-	2.56
Sockeye Creek (L)	1	rainbow	-	-	-	0.44
Sustut River	1	chinook	2.07	1.37	-	1.44
Sustut River	1	coho	3.29	4.13	4.36	-
Tachek Creek	1	coho	1.86	2.96	2.82	2.13
Tachek Creek	1	cutthroat	0.37	0.59	0.68	0.39
Tachek Creek	1	trout sp.	-	-	-	15.79
Toboggan Creek Trib.	1	coho	14.24	8.44	10.52	9.31
Toboggan Creek Trib.	1	Dolly Varden	2.10	2.23	2.98	2.10
Toboggan Creek Trib.	1	rainbow	0.57	0.32	-	0.31
Toboggan Creek Trib.	1	trout sp.	-	-	-	0.76

Table 30. Areal density estimates of fish species by method of estimation.

Stream Name	Site	Species	Petersen N1*.10m^{-2}	Petersen N2*.10m^{-2}	Bayes Mode.10m^{-2}	Zippin N.10m^{-2}
Alastair River	1	coho	1.3	1.0	1.1	0.8
Boucher Creek (L)	1	chinook	-	-	-	0.20
Boucher Creek (L)	1	coho	-	-	-	1.90
Boucher Creek (L)	1	cutthroat	-	-	-	0.20
Boucher Creek (U)	2	coho	-	-	-	1.51
Boucher Creek (U)	2	trout sp.	-	-	-	8.34
Clearwater Creek	1	coho	-	-	-	1.20
Clearwater Creek	1	rainbow	-	-	-	0.19
Clearwater Creek	2	coho	-	-	-	1.11
Clearwater Creek	2	cutthroat	-	-	-	0.46
Clearwater Creek	2	rainbow	-	-	-	1.79
Coldwater Creek (L)	2	coho	18.96	13.94	17.41	15.80
Coldwater Creek (L)	2	cutthroat	0.46	0.80	0.92	-
Coldwater Creek (L)	2	Dolly Varden	2.07	1.94	2.47	2.18
Coldwater Creek (L)	2	rainbow	4.14	4.65	5.69	-
Coldwater Creek (L)	2	rainbow	-	-	-	2.70
Coldwater Creek (U)	1	coho	12.13	11.75	13.14	8.09
Coldwater Creek (U)	1	Dolly Varden	0.93	1.56	2.52	0.56
Coldwater Creek (U)	1	rainbow	-	-	-	1.19
Copper River (L)	1	coho	-	-	-	2.90
Copper River (L)	1	rainbow	-	-	-	0.08
Cullon Creek (L)	2	coho	-	-	-	3.35
Cullon Creek (L)	2	rainbow	-	-	-	3.02
Cullon Creek (U)	1	coho	11.00	7.70	9.77	4.43
Cullon Creek (U)	1	rainbow	23.68	7.94	12.40	3.63
Deep Creek	1	coho	-	-	-	6.08
Gitnadoix River	1	coho	-	-	-	1.06
Hadenschild Creek	1	coho	-	-	-	1.87
Hadenschild Creek	1	rainbow	-	-	-	0.07
Hankin Creek (L)	2	coho	-	-	-	1.59
Kispiox River	1	coho	10.32	11.18	11.81	6.42
Kitwanga River (L)	1	coho	-	-	-	0.39
Lamprey Creek	1	coho	-	-	-	0.21
Lamprey Creek	1	trout sp.	-	-	-	0.51

Table 30. cont'd

Stream Name	Site	Species	Petersen N1*.10m^{-2}	Petersen N2*.10m^{-2}	Bayes Mode.10m^{-2}	Zippin N.10m^{-2}
Morrison River (U)	1	coho	-	-	-	0.23
Shea Creek (side)	1	coho	11.87	7.20	10.01	4.10
Shea Creek (side)	1	Dolly Varden	0.41	0.32	0.35	0.28
Shea Creek (side)	1	rainbow	0.55	1.18	1.18	0.59
Sockeye Creek (L)	1	coho	-	-	-	1.57
Sockeye Creek (L)	1	rainbow	-	-	-	0.27
Sustut River	1	chinook	4.43	2.93	-	3.08
Sustut River	1	coho	7.05	8.86	9.35	-
Tachek Creek	1	coho	3.10	4.93	4.69	3.55
Tachek Creek	1	cutthroat	0.61	0.99	1.14	0.66
Tachek Creek	1	trout sp.	-	-	-	26.32
Toboggan Creek Trib.	1	coho	34.64	20.54	25.60	22.65
Toboggan Creek Trib.	1	Dolly Varden	5.10	5.43	7.24	5.10
Toboggan Creek Trib.	1	rainbow	1.39	0.78	-	0.75
Toboggan Creek Trib.	1	trout sp.	-	-	-	1.85

Table 31. Estimates of linear fish biomass by species and method of population estimation. Mean weights per species were calculated from regressions of weight on length where n≥ 15.

Stream Name	Site	Species	Mean Weight (g)	Petersen N1*g.m^{-1}	Petersen N2*g.m^{-1}	Bayes Modeg.m^{-1}	Zippin Ng.m^{-1}
Boucher Creek (L)	1	coho	2.83	-	-	-	5.03
Boucher Creek (U)	2	coho	2.39	-	-	-	2.16
Boucher Creek (U)	2	Trout sp.	0.56	-	-	-	2.79
Clearwater Creek	1	coho	3.72	-	-	-	5.42
Clearwater Creek	1	rainbow	1.35	-	-	-	0.31
Clearwater Creek	2	coho	2.71	-	-	-	3.52
Clearwater Creek	2	cutthroat	9.40	-	-	-	5.08
Clearwater Creek	2	rainbow	1.98	-	-	-	4.16
Coldwater Creek (L)	2	coho	1.56	16.11	11.85	14.79	13.42
Coldwater Creek (L)	2	Dolly Varden	8.44	9.50	8.90	11.34	10.02
Coldwater Creek (L)	2	rainbow	2.61	-	-	-	3.83
Coldwater Creek (L)	2	rainbow	2.61	5.87	6.60	8.07	-
Coldwater Creek (U)	1	coho	1.63	15.70	15.20	17.00	10.47
Coldwater Creek (U)	1	Dolly Varden	7.62	5.60	9.41	15.23	3.36
Coldwater Creek (U)	1	rainbow	3.52	-	-	-	3.31
Copper River (L)	1	coho	1.00	-	-	-	4.15
Copper River (U)	2	coho	1.24	-	-	-	14.26
Cullon Creek (L)	2	coho	1.55	-	-	-	4.37
Cullon Creek (L)	2	rainbow	0.80	-	-	-	2.03
Cullon Creek (U)	1	coho	1.67	15.79	11.05	14.02	6.36
Cullon Creek (U)	1	rainbow	1.26	25.76	8.63	13.49	3.94
Deep Creek	1	coho	1.81	-	-	-	10.32
Gitnadoix River	1	coho	1.07	-	-	-	1.64

Table 31. cont'd

Stream Name	Site	Species	Mean Weight (g)	Petersen $N1*g.m^{-1}$	Petersen $N2*g.m^{-1}$	Bayes $Modeg.m^{-1}$	Zippin $Ng.m^{-1}$
Hadenschild Creek	1	coho	0.94	-	-	-	1.96
Hankin Creek (L)	2	coho	1.21	-	-	-	1.54
Kispiox River	1	coho	1.69	16.93	18.34	19.39	10.54
Kitwanga River (L)	1	coho	2.81	-	-	-	1.57
Morrison River (U)	1	coho	2.88	-	-	-	1.01
Shea Creek (side)	1	coho	2.51	14.55	8.82	12.28	5.03
Sockeye Creek (L)	1	coho	2.91	-	-	-	7.44
Sustut River	1	chinook	1.09	2.26	1.50	-	1.57
Sustut River	1	coho	1.43	4.72	5.93	6.26	-
Tachek Creek	1	coho	4.18	7.78	12.37	11.77	8.91
Toboggan Creek Trib.	1	coho	2.00	28.44	16.87	21.02	18.60
Toboggan Creek Trib.	1	Dolly Varden	1.07	2.25	2.40	3.19	2.25

Table 32. Estimates of areal fish biomass by species and method of population estimation. Mean weights per species were calculated from regressions of weight on length where n≥ 15.

Stream Name	Site	Species	Petersen N1*g.10m^{-2}	Petersen N2*g.10m^{-2}	Bayes Mode g.10m^{-2}	Zippin Ng.10m^{-2}
Boucher Creek (L)	1	coho	-	-	-	5.37
Boucher Creek (U)	2	coho	-	-	-	3.61
Boucher Creek (U)	2	Trout sp.	-	-	-	4.65
Clearwater Creek	1	coho	-	-	-	4.47
Clearwater Creek	1	rainbow	-	-	-	0.25
Clearwater Creek	2	coho	-	-	-	3.01
Clearwater Creek	2	cutthroat	-		-	4.33
Clearwater Creek	2	rainbow	-	-	-	3.55
Coldwater Creek (L)	2	coho	29.61	21.78	27.19	24.68
Coldwater Creek (L)	2	Dolly Varden	17.46	16.36	20.85	18.43
Coldwater Creek (L)	2	rainbow	-	-	-	7.04
Coldwater Creek (L)	2	rainbow	10.78	12.13	14.83	-
Coldwater Creek (U)	1	coho	19.81	19.18	21.45	13.21
Coldwater Creek (U)	1	Dolly Varden	7.07	11.87	19.22	4.24
Coldwater Creek (U)	1	rainbow	-	-	-	4.18
Copper River (L)	1	coho	-	-	-	2.92
Cullon Creek (L)	2	coho	-	-	-	5.21
Cullon Creek (L)	2	rainbow	-	-	-	2.42
Cullon Creek (U)	1	coho	18.36	12.85	16.31	7.39
Cullon Creek (U)	1	rainbow	29.95	10.04	15.68	4.59
Deep Creek	1	coho	-	-	-	11.01
Gitnadoix River	1	coho	-	-	-	1.14

Table 32. cont'd

Stream Name	Site	Species	Petersen N1*g.10m^{-2}	Petersen N2*g.10m^{-2}	Bayes Mode g.10m^{-2}	Zippin Ng.10m^{-2}
Hadenschild Creek	1	coho	-	-	-	1.77
Hankin Creek (L)	2	coho	-	-	-	1.93
Kispiox River	1	coho	17.43	18.88	19.95	10.84
Kitwanga River (L)	1	coho	-	-	-	1.08
Morrison River (U)	1	coho	-	-	-	0.66
Shea Creek (side)	1	coho	29.84	18.09	25.18	10.31
Sockeye Creek (L)	1	coho	-	-	-	4.57
Sustut River	1	chinook	4.84	3.20		3.37
Sustut River	1	coho	10.10	12.70	13.40	-
Tachek Creek	1	coho	12.97	20.62	19.62	14.86
Toboggan Creek Trib.	1	coho	69.20	41.04	51.15	45.24
Toboggan Creek Trib.	1	Dolly Varden	5.47	5.83	7.77	5.47

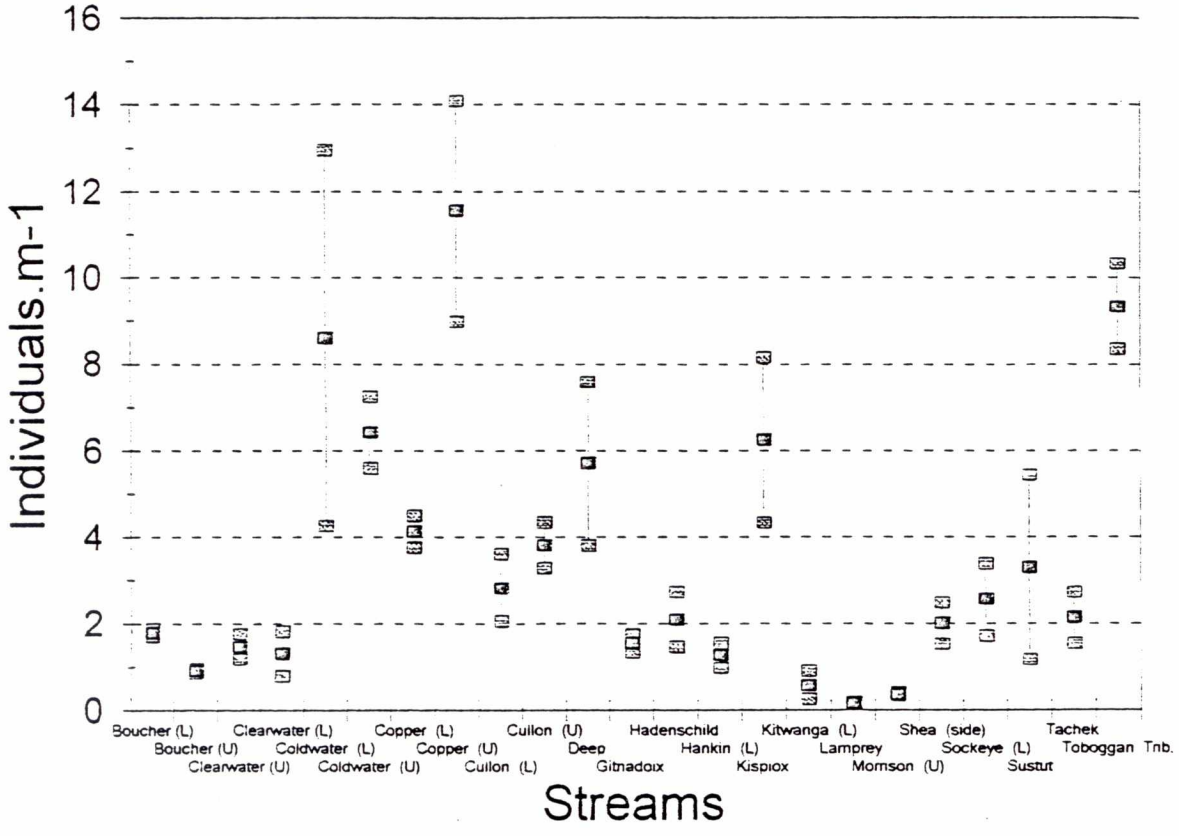

Fig. 1. Comparison of modified Zippin estimates of coho density ($m.^{-1}$), including 95% confidence intervals, among stream sites sampled in 1996

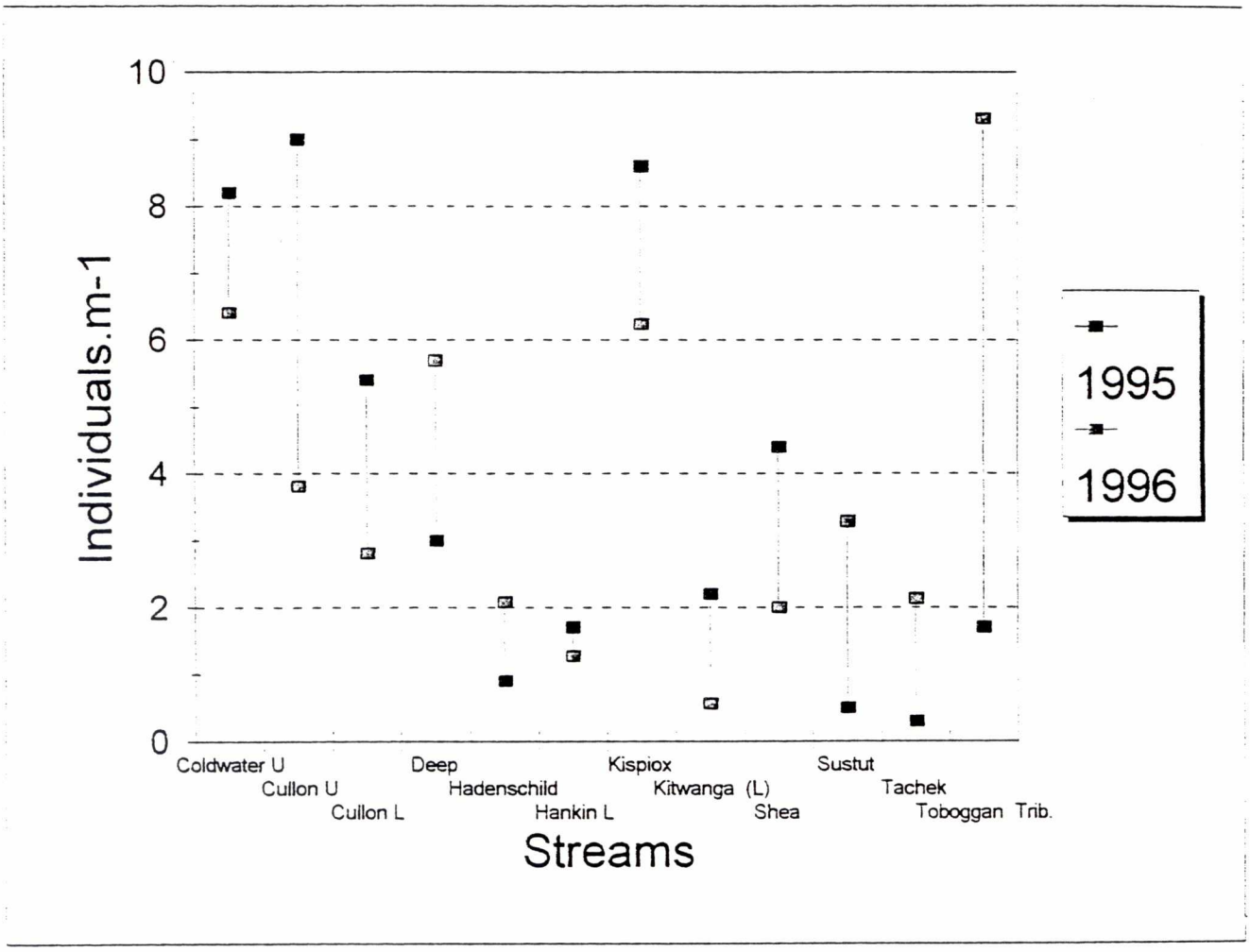

Fig. 2. Comparison of Zippin estimates of coho density ($m.^{-1}$) between stream sites sampled in 1995 and 1996.

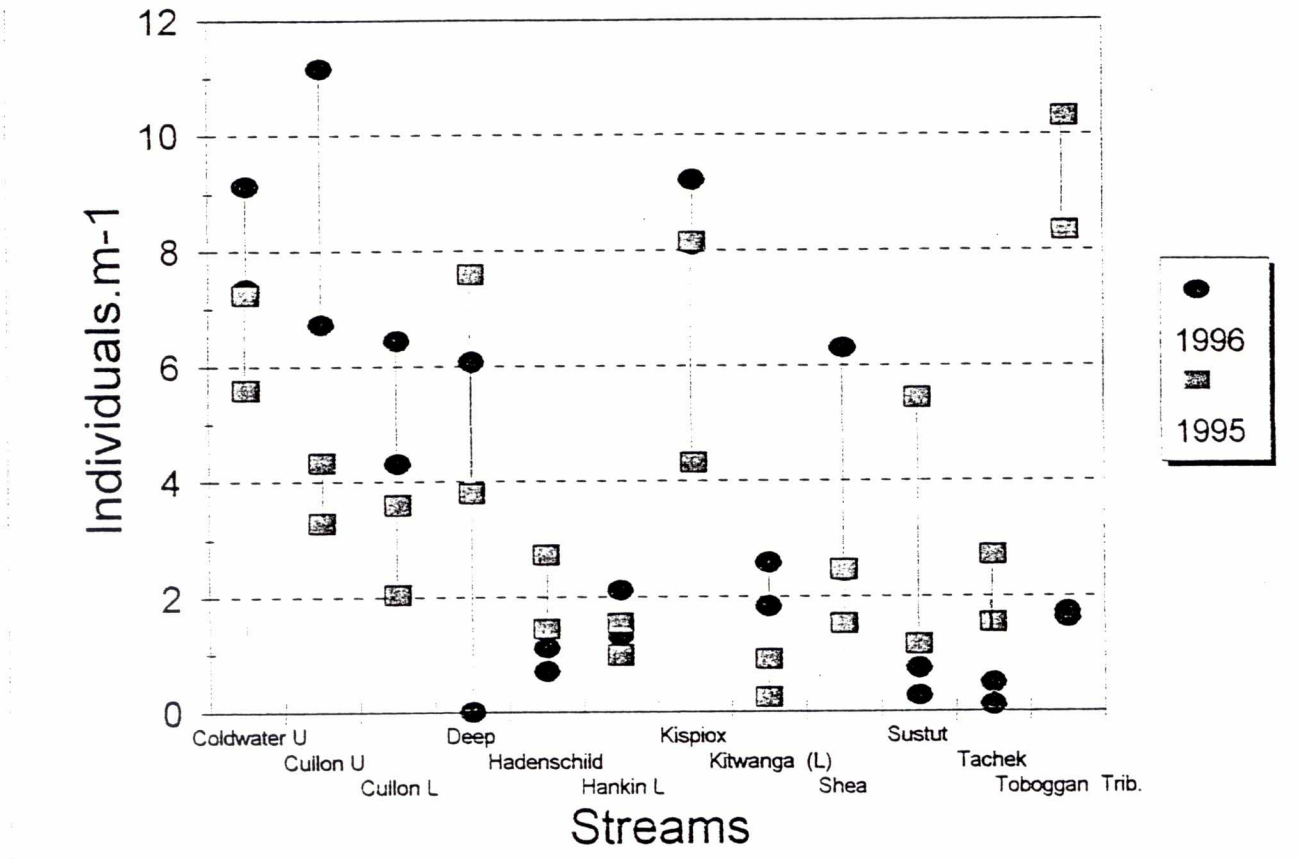

Fig. 3. Confidence intervals for Zippin estimates of coho density ($m.^{-1}$) in stream sites sampled in 1995 and 1996

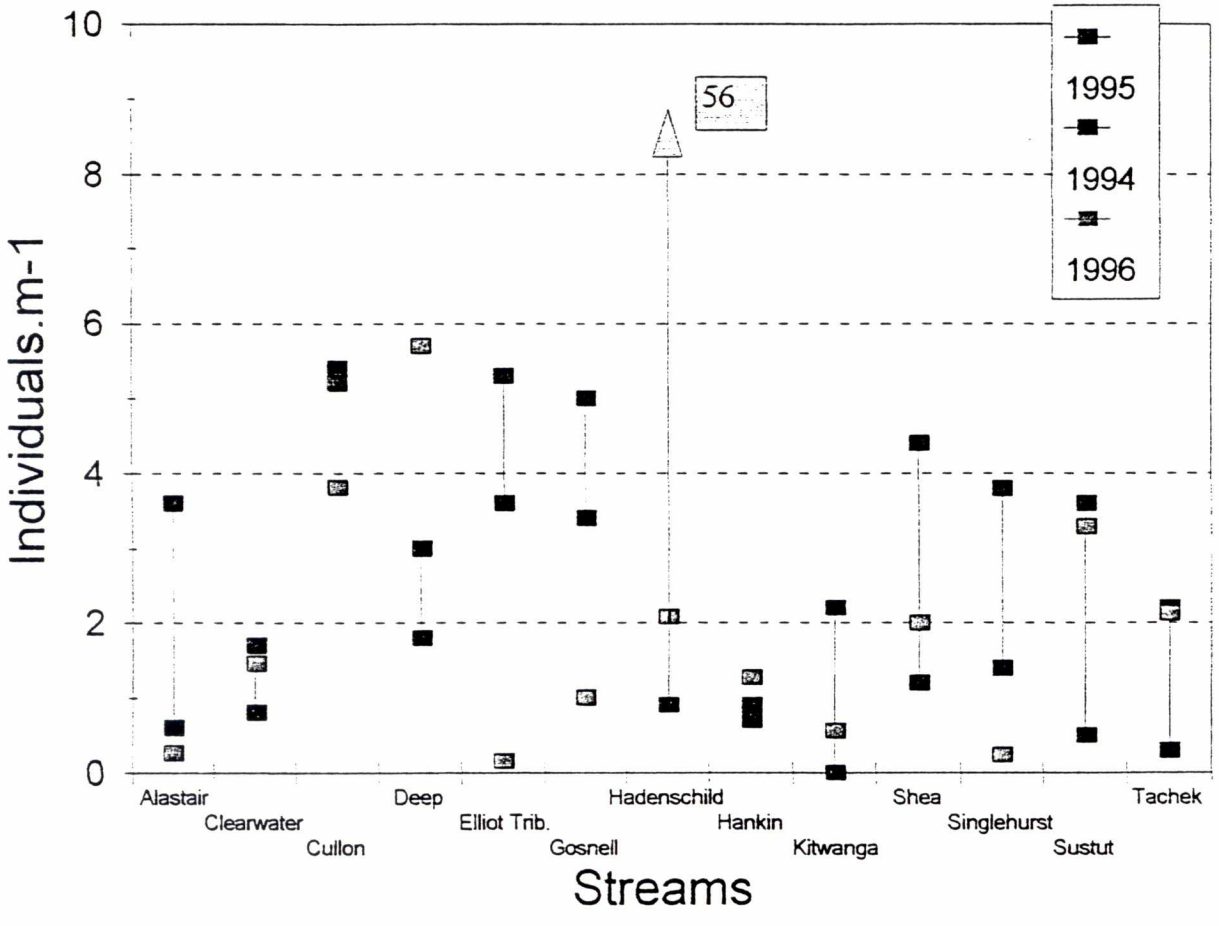

Fig. 4. Comparison of Zippin estimates of coho density ($m.^{-1}$) among stream sites sampled in 1994, 1995 and 1996

APPENDIX A

The following example calculations illustrate the various methods of population estimation using data for Cullon Creek (site 2) coho. Actual calculations were performed by computer, discrepancies between tabulated results and those calculated here result from rounding errors.

Modified Petersen Mark-Recapture.

The modified Petersen estimate (Chapman 1951) compensates for the tendency of the simple Petersen estimate to overestimate the true population, particularly at low sample sizes. The expression below is appropriate for either removal sampling or sampling with return of the catch to the population.

$$N^* = \frac{(M+1)(C+1)}{R+1} \qquad (1)$$

where M = # marked C = # in catch R = # of recaptured marks

Three sampling passes in Cullon Creek provided catches of coho of 74, 52 and 32, of which 74 and 43 fish were marked and released in the first and second passes, respectively (Table 23). Therefore, for successive estimates of N*, $C_1 = 52$, $M_1 = 74$, $R_1 = 9$ and $C_2 = 32$, $M_2 = 117$, $R_2 = 13$ (Table 24).

From (1)

$$N1^* = \frac{(75)(53)}{(10)} = \frac{(3975)}{(10)} = 398$$

Similarly, N2* = 278.

An approximation to the variance for N* is:

$$V(N^*) = \frac{(M+1)^2(C+1)(C-R)}{(R+1)^2(R+2)} = \frac{N^2(C-R)}{(C+1)(R+2)} \qquad (2)$$

therefore V(N1*) is

$$\frac{398^2(52-9)}{(53)(11)} = \frac{6811372}{583} = 11683.3$$

Approximate confidence limits for N1* are

$$\pm 1.96\sqrt{V(N1^*)} = \pm 211.9 \text{ or } (186, 610)$$

Linear and areal densities of coho are found from N1*/ L and N1*/A, respectively, where L is site length (m) and A is site area (m^2). The Cullon Creek site was 42m long with a mean width of 8.6m. Thus coho population sizes were 9.5 individuals.m^{-1} and 1.10 individuals.m^{-2} (or 11.0 individuals.$10m^{-2}$ Table 30).

Estimated mean biomass of coho in Cullon Creek was calculated from regression of weight on length

$$\log_{10} \text{weight} = b\,(\log_{10} \text{length}) + a$$

where b = 3.13 and a = -5.09 (Table 21). From Table 20 the mean length of coho was 49.8mm, resulting in a mean weight of 1.67g. The linear and areal biomasses of coho in Cullon Creek are then 15.9g.m^{-1} and 18.4g.$10m^{-2}$, respectively.

Sequential Bayes Estimator

The sequential Baysian approach (Gazey and Staley 1986) is an appropriate method for calculation of population estimates, particularly when low numbers of recaptures are anticipated. The method determines the posterior distribution of probabilities associated with population size from the joint probabilities of mark recovery rates. Calculated population parameters include Highest Probability Density (HPD) at 95% confidence and the mode, a maximum likelihood estimate of the sampling distribution.

Due to the iterative nature of the computational algorithm, it is not practical to illustrate the calculation for Cullon Creek. The required data from each sampling pass are the total captures (C_i), number of marks at large (M_i) and recaptures in the sample (R_i). These data are provided in the above example. The posterior distribution was

calculated with 801 evaluations between estimated population bounds of 50 - 500 individuals.

Removal - depletion.

The Zippin maximum-likelihood estimate is given by

$$\hat{N} = x_{s+1} / (1-\hat{q}^s) \qquad (3)$$

where $1-\hat{q}^s$ is determined graphically (Zippin 1956).

Similarly, the value of the probability of capture ($\hat{p}$) is derived from

$$\frac{\hat{q}}{\hat{p}} - \frac{s\hat{q}^s}{(1-\hat{q}^s)} = \frac{\sum_{i=1}^{s}(i-1)n_i}{x_{s+1}} = R \qquad (4)$$

and is also determined graphically.

From the Cullon Creek example, successive catches, excluding marks, were; n_1=74, n_2=43 and n_3=19. From (4)

$$R = \frac{n_2 + 2n_3}{n_1 + n_2 + n_3} = \frac{81}{136} = 0.60$$

From the appropriate graphs, for R=0.60 and s=3 gives $\hat{p} = 0.47$ and $(1-\hat{q}^3) = 0.85$

Then from (3)

$$\hat{N} = \frac{136}{0.85} = 160$$

The variance of the population estimate is

$$\hat{V}(\hat{N}) = \frac{\hat{N}(1-\hat{q}^s)\hat{q}^s}{(1-\hat{q}^s)^2 - (\hat{p}s)^2\hat{q}^{s-1}} \qquad (5)$$

$$\frac{160(0.85)(0.15)}{(0.85)^2 - (1.41)^2(0.15/0.53)} = \frac{20.4}{(0.723) - (1.988)(0.283)} = 127$$

and $\hat{\sigma}[\hat{N}] = 11.3$

An approximate confidence interval for $\hat{N}$ is ±1.96(11.3) or 138 and 182 (Table 28).

While it is necessary to assume that p_i, the probability of capture in the i th sample, is constant among passes when care is taken to sample with constant effort, we can determine the validity of this assumption for the above method using a goodness-of-fit statistic

$$T_1 = \sum_{i+1}^{s} (n_i - E_i)^2 / E_i \qquad (6)$$

where

$$(n_1, n_2, n_3) = (74, 43, 19)$$

and

$$(E_1, E_2, E_3) = (\hat{N}\hat{p}, \hat{N}\hat{p}\hat{q}, \hat{N}\hat{p}\hat{q}^2)$$

$$= (75, 40, 21)$$

Hence

$$T_1 = \sum (n_i - E_i)^2 / E_i = 0.43$$

which, at two degrees of freedom ($p>0.05$), indicates that p was unchanged throughout the sampling proceedure.