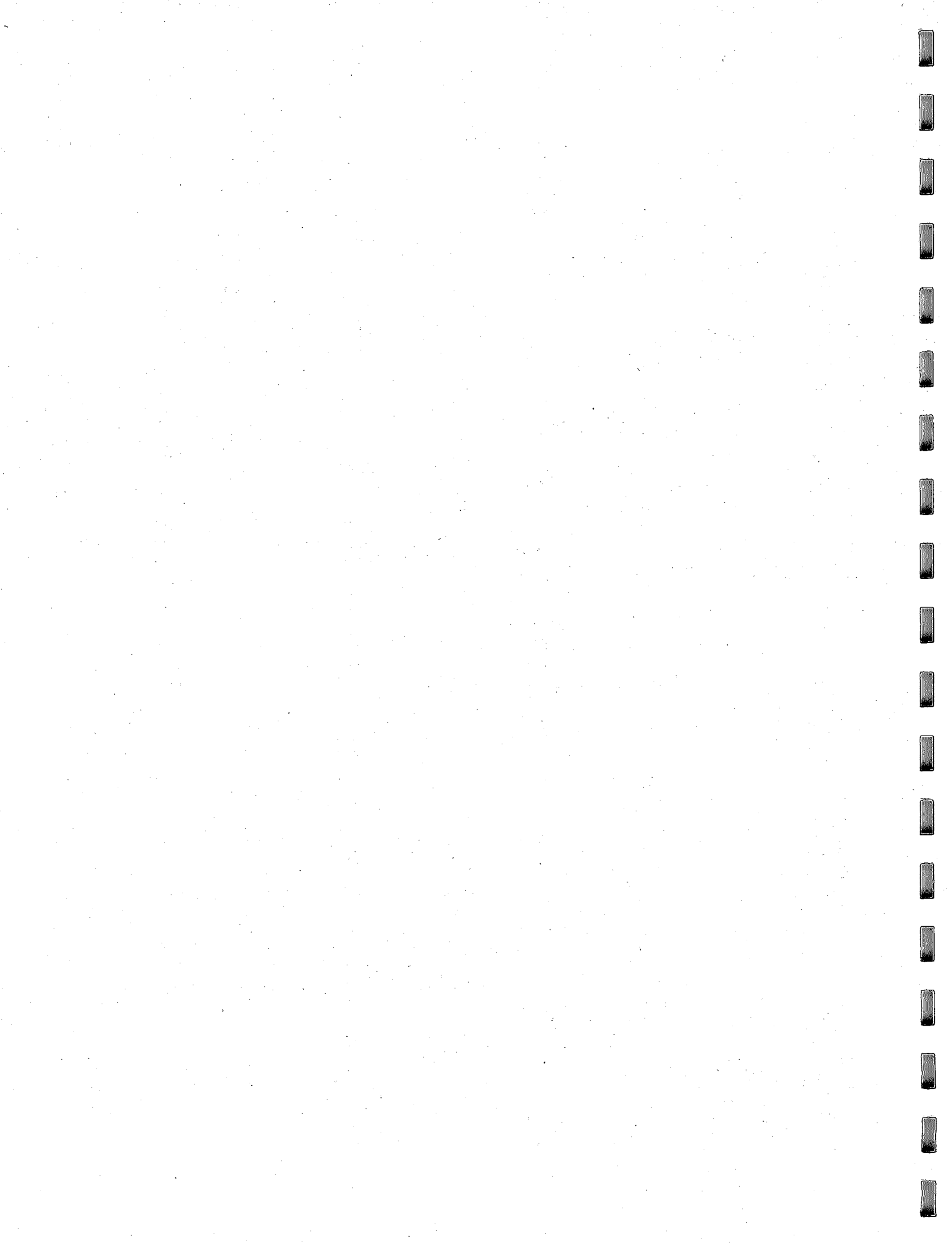

Reconnaissance Level Fish and Fish Habitat Inventory in the Bulkley T.S.A.

(Working Unit #7- Gramophone)



TRITON

Environmental Consultants Ltd.



2565.00/WP8347

Reconnaissance Level Fish and Fish Habitat Inventory in the Bulkley T.S.A.

(Working Unit #7 - Gramophone)

Prepared for:

Pacific Inland Resources (FRBC)

PO Box 3130
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April 1998

Prepared by:



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EXECUTIVE SUMMARY

Triton Environmental Consultants Ltd. was retained by Pacific Inland Resources (PIR) in partnership with the Ministry of Environment, Lands and Parks (MELP) in Smithers to conduct reconnaissance level fish and fish habitat inventories in the Bulkley Forest District. This report summarizes the historical fisheries data collected by SKR Consultants Ltd. and the field data collected by Triton survey crews in working unit 7. The historical information indicates the presence of the following species in this working area:

- pink (*Oncorhynchus gorbuscha*)
- coho (*O. kisutch*)
- chinook (*O. tshawytscha*)
- steelhead and rainbow trout (*O. mykiss*)

A total of 73 sites were sampled between July 25 and October 2 1996 and July 7 and September 20 1997. Two sites were classified as "Not A Creek" due to the lack of a defined channel. Fish were caught by electrofishing at 2 sites and by angling at 1 site and rainbow trout was the only species encountered by survey crews in this working unit. A total of 32 sites were classified as S5 or S6 and the basis for the non fish bearing status is summarized. The report also includes recommendations for resampling in reaches that fish are likely to use, but where no fish were caught.

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ACKNOWLEDGMENTS

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Triton would like to thank Mr. Alan Baxter of Pacific Inland Resources for his assistance throughout the planning and field phases of this project. The principal contract monitor was Mr. Paul Giroux, B.C. Ministry of Environment, Lands and Parks, Smithers office. The quality assurance was conducted by Mr. Ward Prystay and Mr. Ryan Sherman. Triton would also like to thank Mr. Dave Reynard and Mr. Steve Grey of Highland Helicopters. This project was funded by Forest Renewal B.C. The province has not accepted the contents of this product for the purposes of the Forest Practices Code, and reserves the right to dispute the validity of summarized results. The province does not necessarily agree with the classification assigned to any individual stream reach, for use in logging plans, silviculture prescriptions or any other application.

1.0 INTRODUCTION

1.1 Background

Pacific Inland Resources retained Triton Environmental Consultants Ltd. (Triton) to conduct a reconnaissance level fish and fish habitat inventory in 14 watersheds located in the Bulkley Forest District. Existing information on fish distribution within the watersheds under investigation was collected by SKR Consultants Ltd., in Smithers, B.C. Data from provincial and federal government sources such as the Stream Information Summary System (SISS) and the Fisheries Information Summary System (FISS) were researched for information. Stream classification is now required under the Forest Practices Code (FPC) of British Columbia Act (Bill 40 - 1994) and the associated Operational Planning Regulation enacted in June 1995. It is used to identify the required width of riparian management areas. This report summarizes historical and field data collected in unit 7 (see Figure 1). Little information existed for this unit prior to inventory. Some sampling had been carried out in the lower 2200 meters of Gramophone Creek, in Duckwing Lake, Duckbill Lake and the unnamed outlet of Duckbill Lake. Some fish sampling has also been carried out in lower Causqua Creek, near the confluence with the Bulkley River (Saimoto 1996). The historical information indicates the presence of the following species in working unit 7:

- pink
- coho
- chinook
- steelhead and rainbow trout

1.2 Objectives

Triton's objectives were to describe fish distributions and habitat characteristics, and to provide stream classifications according to the Forest Practices Code. Fish and fish habitat operational inventories consist of:

- reconnaissance-level surveys aimed at characterizing fish habitat and distribution.,
- identification of fish and fish habitat values that require special designation under the Forest Practices Code (e.g. sensitive areas); and
- new, reinterpreted, or augmented data to meet Forest Practices Code requirements for classification of areas (e.g. fish stream classification).

2.0 STUDY AREA

2.1 Location

The Bulkley Forest District is located in north-central British Columbia and contains several major tributaries to the Bulkley and Babine Rivers. The 1:20,000 TRIM sheets that cover this working unit are : 93 L 094, 93 L 095, 93 M004, 93 M 005, 93 M 014. . The Gramophone working unit covers roughly 235 km² and comprises 3% of the study area (Saimoto 1996). This following streams were sampled in this working unit :

- Causqua Creek (460-1883-000)
- Gramophone Creek (460-2238-000)
- Kwun Creek (460-1613-000)
- Meed Creek (460-2612-000)
- Wiggs Creek (460-2238-107)

Eighteen unnamed tributaries to the Bulkley River were also sampled in this inventory.

2.2 Access

The majority of the sample sites in this unit were accessed by road, however, the upper Causqua watershed was accessed by helicopter.

2.3 Resource Use

Logging and farming are the main resource based activities in working unit 7.

3.0 METHODS

3.1 Physical

Prior to the start of the field program 1:20,000 TRIM maps were used to estimate the location of reach breaks, as needed to identify potential sampling sites. The locations of these reach breaks were subsequently confirmed or modified during the field studies.

The survey was conducted by a 10 person field crew working in 5 teams in 1996, and an 8 person field crew working in 4 teams in 1997. Sites at the top of the watershed were sampled first to determine fish presence whenever possible. DFO/MELP Stream Inventory Survey forms were filled out for each site (Department of Fisheries and Oceans and Ministry of Environment, 1989). Channel widths were measured with meter sticks, hip chains and measuring tapes or were visually estimated where wading conditions were

dangerous. Water depth was measured with a meter stick. Stream classification, whether fish bearing or non fish bearing, requires the measurement of a minimum of six channel widths. Stream gradients were measured with a Suunto clinometer. In order to allow for future verification of sampling sites, all sampling sites were permanently marked with unique flagging tape (blue and white striped) and the GPS locations of all sites were noted.

Photos were taken at each site to document field data and conditions. Canon Sure Shot A1 Prima AS-1 cameras were used for this purpose. The camera is equipped with a 32 mm lens. Photos were usually taken of both the upstream and downstream view of the stream and any characteristic features such as beaver dams, falls and cascades were documented. Photos were often taken of fish captured at the site. The film used was 200 ISO. All of the fish, feature and site photos are included with the sub basin description in the results and discussion section. The photodocumentation summary is presented in Appendix 2.

The report maps were generated using 1:20,000 scale TRIM base maps provided by MELP. Using ARC Info, these files were projected into UTM and coverages were created from the field sampling and stream classification data.

3.2 Biological

Triton obtained fish sampling permits from the appropriate DFO and MELP offices. Fish presence/absence was determined by electrofishing and/or minnow trapping and occasionally angling. Electrofishing was conducted, where possible, at all sites where fish presence had not been determined upstream or habitat characteristics were sufficiently different from other sites. A minimum area of approximately 100 m² was sampled to ascertain fish presence. The effort, (shocking time and distance shocked) was recorded for each sample site. A variety of electroshocker models were used in this study including:

- Smithroot 12 B POW
- Smithroot Type VII
- Smithroot 15 A
- Coffelt Mark 10

The electroshockers were usually set at 60HZ at 6MS, however adjustments were made where appropriate. Salt was not used at any of the sample sites. The fork length of each fish collected was then measured and, whenever necessary, voucher specimens were collected and stored in a 10% formaldehyde solution in plastic bags. These specimens were delivered to the Smithers office of BC Environment. Where necessary, the Field Key to Freshwater Fishes of British Columbia (RIC Manual 1993) was used to identify fish to species.

The data collected from existing sources and during the field program were used to determine the riparian class as defined under the *Forest Practices Code*. **Table 1** shows the FPC definition of each riparian class. Draft procedures are also outlined in the guidebook to determine the riparian management areas (RMA) for lakes (L1 - L4), wetlands (W1 - W5) and fisheries sensitive zones.

4.0 STREAM FLOW AND WATER QUALITY

4.1 Stream Flow

There are no Water Survey of Canada (WSC) gauging stations located within the boundaries of Unit 7.

4.2 Water Quality

As agreed with the Ministry Representative, water samples were not collected for chemical analyses. The parameters that were measured for each site, however, were pH water temperature and conductivity. Conductivity was measured with a handheld Hanna TDS Tester #3 and a Hanna Conductivity TDS #3. The acceptable values of conductivity for electroshocking purposes must exceed 30 μ S. The pH was measured with a handheld Hanna pH meter 3#, an Oakton pH Tester #2 and a Hanna HI9024 Microcomputer pH meter, low pH Regents Accutron" Water Test System.. Water temperature was measured with a Weksler general purpose thermometer. Turbidity was determined subjectively and it was stipulated by the ministry representative during the quality assurance phase of the project that the depth of the deepest pool would be the default value in the database when the water was clear to the bottom.

Table 2 summarizes the pH, temperature and conductivity measurements collected in this inventory. Water temperatures during this period ranged between 2°C and 11.5°C, with an average value of 5.77. The pH values ranged from 7.17 to 8.14, with an average pH of 7.80. The conductivity ranged from 30 to 200 (umhos/cm) with an average value of 96.79. The turbidity values are not discussed here as the values were defaulted on request of the QA/QC monitor to the depth of the deepest pool when turbidity was recorded as clear to the bottom. This value is not considered indicative of the stream turbidity by Triton and will not be discussed further.

5.0 RESULTS AND DISCUSSION

The survey took place between July 25 and October 2 1996 and July 7 and September 20 1997. A total of 73 sites were sampled and 2 sites were classified as "Not a creek" due to the absence of a defined channel. Fish were caught at only 3 sites and a total of 32 sites

have been classified as non fish bearing. A number of sites were dry or at low flow at the time of survey, limiting fish sampling opportunities. A total of 11 sites classified as fish bearing, were dry at the time of sampling. An additional 19 were at low flow at the time of sampling and were classified as fish bearing. Seventeen reaches in the Causqua watershed were classified as non fish bearing, due to the presence of significant barriers downstream of the sampling areas. These barriers are listed in **Table 3**. The summary information for all sites in working unit 7 is listed in **Table 4**. This table is organized alphabetically, by sub-basin and includes fish data, stream classifications and sampling methods. The stream cards and site photos are arranged in alphabetical, sub basin order and appear with the appropriate sub basin descriptions. A summary of non fish bearing classifications established in this working unit is provided in **Table 5** and a summary of sites for which future sampling is recommended is provided in **Table 6**. **Table 7** lists the wildlife and wildlife signs observed in this working unit.. Individual fish data for this working unit has been summarized in Appendix 1. Fish catch data were compiled for all records that contained a discrete size measurement. These data were summarised and plotted in histograms by species, the results are presented in Figure 2a.

5.1 Unnamed Tributaries to the Bulkley River (460 -0000-000) (93 L 094, 93 L 095, 93 M 004, 93 M 014)

5.1.1 Sensitive Habitats and Barriers

Approximately 32.8 km of the Bulkley River flows through this working unit and is fed by 20 tributaries on the east side. A great deal of development and large number of road crossings, including highway 16, is associated with the Bulkley River in this working area. Eighteen unnamed tributaries to the Bulkley were sampled in this working unit.

5.1.2 Fish Summary Tables and Stream Classification

The historical information indicates the presence of spawning chinook, coho and steelhead in the Bulkley River in this unit. Coho, rainbow trout, pink, Dolly Varden, and steelhead have been recorded in some of the tributaries to the Bulkley in this working area. Ten sites were electrofished and no fish were caught. The mainstem of the Bulkley River was not sampled, however, it would be classified as an S1 in this unit based on the presence of fish and an average channel width well in excess of 20.0 meters. The majority of the unnamed tributaries sampled were classified as S3 based on an average channel width exceeding or equal to 1.5 meters and the presence of fish habitat in the surveyed areas. One tributary was classified as an S5 and 3 reaches on tributaries were classified as S6 based on a lack of suitable fish habitat in the sampling areas.



Location: BRUCE 98, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2685-003-390-000-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 2.5 MW Date: 26-Aug-96 Time: 12:00 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 .6166 .60904 Length surveyed (m): 50.0 GE Survey Crew: BM\DD\ \ \ \ \ \ \ \ Photos: B-6-25 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.6 MS
 N Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 8.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0
 % Debris Area: 0 GE
 % Stable: 0 GE

Specific Data

[Empty box for Specific Data]

Bed Material

Fines	Clay, silt, sand (<2mm):	20	20
Gravels	Small (2-16mm):	50	25
	Large (16-64mm):		25
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	30	5
	Blder cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 27 Compaction: Medium

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S4
- C2: LS = 45%, RS = 40%
- C3: No fisheries sensitive zones were noted at this site.
- C4: No electroshocking was carried out at this dry site.
- C5: Lat N 54 56' 49", Long W 127 10' 49"
- C6: No additional bank texture information.
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 14.0°C
- C8: Assuming this channel is accessible to fish, it could provide habitat during high flow.

Cover

Cover Total %: 100 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
0	0	0	0	100	0

Crown Closure %: 100 Aspect: SW

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Reach Symbol

(Fish)

(DV)

1 C 8.0 2530

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m): 0.1

% Unstable: 95

Fines Gravels Larges Bedrock

Confinement: OC

Valley : Channel Ratio 5-10

Stage: Dry Flood Signs Ht(m): 0.1

Bars (%): 100 pH: Braided: N

Water Temp. (°C): O2 (ppm):

Turb. (cm): Cond. (µmhos):



Photo #: B-6-25, 1996/08/26
Site #: B98, book in dry channel



Location: BRUCE 99, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 001-1700-000-000-000-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 0.8 MW Date: 26-Aug-96 Time: 12:30 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6162 .60905 Length surveyed (m): 100.0 GE Survey Crew: BM\DD \ \ \ \ \ \ \ \ Photos: B-7-1,1b Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.9 MS
 N Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 13.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0
 % Debris Area: >15 GE
 %Stable: 70 GE

Specific Data

[Empty box for Specific Data]

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S4
- C2: LS = 40%, RS = 25%
- C3: No fisheries sensitive zones were noted at this site.
- C4: No electroshocking was carried out at this site as the channel was dry.
- C5: Lat N 54 56' 51", Long W 127 11' 10"
- C6: No additional bank texture information.
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 14.0°C
- C8: The cover indicated at this site would be present when water was in the channel.
- C9: Sedimentation was noted downstream of this road crossing. Substantial flows move through this channel during freshet.

Cover

Cover Total %: 75 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	40	0	0	40	20

Crown Closure %: 100 Aspect: SW

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	50	30
	Large (16-64mm):		20
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	20	5
	Blder cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 28 Compaction: Medium

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.2
 % Unstable: 75

Fines Gravels Larges Bedrock

Confinement: OC
 Valley : Channel Ratio 10+
 Stage: Dry Flood Signs Ht(m): 0
 Bars (%): 100 pH: Braided: N
 Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)

(DV)

I C 13.0 | 3520

(Width, Valley: Channel, Slope) | (Bed Material)



Photo #: B-7-1, 1996/08/26
Site #: B99, Dry channel.



Photo #: B-7-1b, 1996/08/26
Site #: B99, Dry channel.



Location: BRUCE 100, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2685-000-000-000-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 2.1 MA Date: 26-Aug-96 Time: 13:45 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6155 .60897 Length surveyed (m): 200.0 GE Survey Crew: BM\DD \ \ \ \ \ \ Photos: B-7-2 Air Photos:

Channel Characteristics

Specific Data

Av. Chan. Width (m): 2.5 MS
 N Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 13.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0 GE
 % Debris Area: >15 GE
 % Stable: 30 GE

[Empty box for Specific Data]

Bed Material

Fines	Clay, silt, sand (<2mm):	20	20
Gravels	Small (2-16mm):	50	25
	Large (16-64mm):		25
	Sm. cobble (64-128mm):		15
Larges	Lge cobble (128-256mm):	30	10
	Bllder cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 26 Compaction: Medium

Cover

Cover Total %: 10 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
0	50	0	0	50	0

Crown Closure %: 100 Aspect: SW

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.4
 % Unstable: 75

Fines Gravels Larges Bedrock

Confinement: OC
 Valley : Channel Ratio 5-10
 Stage: Dry Flood Signs Ht(m): 0.5
 Bars (%): 100 pH: Braided: N
 Water Temp. (°C): O2 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)

(DV)

3 C 13.0 | 2530

(Width, Valley: Channel, Slope)

(Bed Material)

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S3
- C2: LS = 30%, RS = 30%
- C3: No fisheries sensitive zones were noted at this site.
- C4: No electroshocking was carried out as the channel was dry at the time of sampling.
- C5: Lat N 54 56' 26", Long W 127 11' 47"
- C6: No additional bank texture information.
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 14.0°C
- C8: LOD and overstream vegetation provide all of the cover at this site.



Photo #: B-7-2, 1996/08/26

Site #: B100, Dry channel with moss-covered LOD.



Location: BRUCE 101, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2685-005-270-000-000-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 1.1 MA Date: 26-Aug-96 Time: 14:15 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 6156 60897 Length surveyed (m): 100.0 GE Survey Crew: BM\DD\ \ \ \ \ \ \ \ Photos: B-7-3 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.5 MS
 N Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 18.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 N % Side Channel: 0 GE
 N % Debris Area: 5-15 GE
 %Stable: 20 GE

Specific Data

[Empty box for Specific Data]

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	70	20
Bedrock	Blder cobble (>256mm):		30
			0

Comments

- C1: S3
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished as the channel was dry at the time of sampling.
- C5: Lat N 54 56' 27", Long W 127 12' 12"
- C6: No additional bank texture information.
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 14.0°C
- C8: This site could provide fish habitat at higher flows.

Cover

N Cover Total %: 0 GE
 Pool LOD Bldr In Veg O Veg Ctbnk
 N 0 0 0 0 0 0
 Crown Closure %: 100 Aspect: SW

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.2
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: UC
 Valley : Channel Ratio 10+
 Stage: Dry Flood Signs H(m): 0.5
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

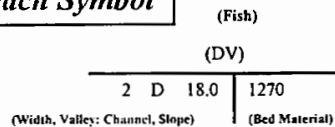




Photo #: B-7-3, 1996/08/26
Site #: B101, Large cobble in dry channel.

DFO/MoELP Stream Survey Form

Site Number: RYAN 132

Reach No.: 1

Trib to Bulkley R.



Location: RYAN 132, Unit 7, downstream of block 1-690, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-6800-000-000-000-000-000-000-000-000-0

Map #: 93 M 004

Reach Length (km): 2.0

MA

Date: 27-Sep-96

Time: 10:15

Agency: TEC

Access: V2

Fish Card: N

Field Historical

U.T.M.: 9 6097 61022

Length surveyed (m): 200.0

GE

Survey Crew: RH UL \ \ \ \ \ \ \ \ \ \

Photos: R-8-15,16,17

Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.2 MS
 Av. Wet. Width (m): 1.3 MS
 Av. Max Riffle Depth (cm): 6 MS
 Av. Max Pool Depth (cm): 14 MS
 Gradient (%): 6.0 CL
 Pool: 20; Riffle: 40; Run: 40; Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: >15 GE
 % Stable: 5 GE

Specific Data

3.0	2.3	2.0	1.9	2.0	2.2
1.5	1.7	1.3	0.7	0.5	1.9
6	7	6			
10	17				

Obstructions

C	Height (m)	Type	Location
	1	CV	1.6

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Comments

- C1: S3
- C2: LS = 30%, RS = 18%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished because too little water was present in the channel at the time of sampling.
- C5: Lat N 55 03' 17", Long W 127 16' 55"
- C6: No additional bank texture information.
- C7: DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 13.8°C
- C8: The culvert at this site is not a barrier to fish passage upstream, however it does require some repairs.

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Cfbnk
20	20	20	0	20	20

Crown Closure %: 75 Aspect: W

Bed Material

Fines	Clay, silt, sand (<2mm):	40	40
Gravels	Small (2-16mm):	30	15
	Large (16-64mm):		15
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	30	10
	Blder cobble (>256mm):		10
Bedrock		0	0

D90 (cm): 27 Compaction: Medium

Discharge

Wetted Width (m): 0.4 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.22 F
 Discharge (m3/s): 0.01 F

Banks

Height (m): 0.4
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: OC

Valley : Channel Ratio 5-10

Stage: L Flood Signs Ht(m): 0.4

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 7.5 O2 (ppm):

Turb. (cm): 17 Cond. (µmhos):

Reach Symbol

(Fish)

(RB)

2 C 6.0 4330

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: R-8-15, 1996/09/27
Site #: R132, Looking downstream.



Photo #: R-8-16, 1996/09/27
Site #: R132, Looking upstream.



Photo #: R-8-17, 1996/09/27
Site #: R132, Looking upstream toward culvert.

Location: RYAN 133, Unit 7, downstream of block 069-4, see C5. Stream (Gaz.): Unnamed Watershed Code: 002-7400-000-000-000-000-000-000-000-0

Map #: 93 M 004 Reach Length (km): 4.6 MA Date: 27-Sep-96 Time: 11:10 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 .6107 .61041 Length surveyed (m): 200.0 GE Survey Crew: RH UL \ \ \ \ \ \ \ \ Photos: R-8-18,19 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.0 MS
 Av. Wet. Width (m): 1.9 MS
 Av. Max Riffle Depth (cm): 9 MS
 Av. Max Pool Depth (cm): 24 MS
 Gradient (%): 11.0 CL
 Pool: 20 Riffle: 60 Run: 15 Other: 5
 % Side Channel: 0 GE
 % Debris Area: 5-15 GE
 % Stable: 30 GE

Specific Data

3.0	1.6	4.5	2.7	3.1	3.0
1.5	1.3	2.4	1.8	2.9	1.5
10	9	8			
30	20	22			

Obstructions

C	Height (m)	Type	Location

Cover

Cover Total % : 40 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
20	20	20	0	20	20

Crown Closure % : 45 Aspect : W

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	40	15
	Large (16-64mm):		25
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	30	10
	Blder cobble (>256mm):		10
Bedrock		20	20

D90 (cm): 40 Compaction: Medium

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

C1: S3
 C2: LS = 60%, RS = 60%
 C3: No fisheries sensitive zones were noted at this site.
 C4: The electroshocking effort, using a 12 B POW model was 700 seconds over 570 square meters.
 C5: Lat N 55 04' 16.7", Long W 127 15' 58.7"
 C6: Fines and bedrock make up the bank texture at this site.
 C7: DO was not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
 C8: Occasional cascades, which should not be barriers to fish passage were noted in the sampling area. Below the road crossing, the gradient results in a series of drops that could limit fish movement.

Discharge

Wetted Width (m): 0.8 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.31 F
 Discharge (m3/s): 0.02 F

Banks

Height (m): 0.4
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: L Flood Signs Ht(m): 0.4
 Bars (%): 0 pH: 7.7 Braided: N
 Water Temp. (°C): 7.5 02 (ppm):
 Turb. (cm): 30 Cond. (µmhos): 150

Reach Symbol

(Fish)
 (RB)
 3 B 11.0 | 1432
 (Width, Valley: Channel, Slope) (Bed Material)



Photo #: R-8-18, 1996/09/27
Site #: R133, Looking upstream.



Photo #: R-8-19, 1996/09/27
Site #: R133, Looking downstream.



Location: RYAN 134, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-7600-000-000-000-000-000-000-000-000

Map #: 93 M 004 Reach Length (km): 1.0 MA Date: 27-Sep-96 Time: 11:40 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6105 .61050 Length surveyed (m): 220.0 GE Survey Crew: RH \JL \ \ \ \ \ \ \ \ Photos: R-8-20,21 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.8 MS
 Av. Wet. Width (m): 0.4 MS
 Av. Max Riffle Depth (cm): 3 MS
 Av. Max Pool Depth (cm): 6 MS
 Gradient (%): 8.0 CL
 Pool: 15 Riffle: 40 Run: 45 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5-15 GE
 % Stable: 35 GE

Specific Data

0.7	0.4	0.5	1.1	1.2	0.6
0.4	0.4	0.3	0.4	0.2	0.5
4	4	2			
8	5				

Obstructions

C	Height (m)	Type	Location
	1	C	1.0

Bed Material

Fines	Clay, silt, sand (<2mm):	35	35
Gravels	Small (2-16mm):	35	25
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	30	10
	Bllder cobble (>256mm):		10
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Comments

- C1: S6
- C2: The side slopes were not evaluated at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished as the water level was too low at the time of sampling.
- C5: Lat N 55 04' 45", Long W 127 16' 07"
- C6: No additional bank texture information.
- C7: DO, pH and conductivity were not measured at this site. The flow was too low to measure discharge. The mean air temperature on this day was 13.8°C
- C8: The channel moves underground periodically at this site. No step pool habitat was observed at this site, despite the many .5m drops noted.

Cover

Cover Total %: 75 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
5	25	5	0	30	35

Crown Closure %: 85 Aspect: W

Discharge

Wetted Width (m):
 Mean Depth (m):
 Mean Velocity (m/s):
 Discharge (m3/s):

Reach Symbol

(Fish)

NF

1 D 8.0 | 3430

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m): 0.2
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: UC
 Valley : Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 0.2
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 7.0 O2 (ppm):
 Turb. (cm): 8 Cond. (µmhos):



Photo #: R-8-20, 1996/09/27
Site #: R134, Looking downstream.



Photo #: R-8-21, 1996/09/27
Site #: R134, Looking upstream, LOD in channel.



Location: RYAN 137, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-0000-000-000-000-000-000-000-000-0

Map #: 93 L 094 Reach Length (km): 1.5 MA Date: 27-Sep-96 Time: 15:30 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 6134 60888 Length surveyed (m): 200.0 GE Survey Crew: RH\U\ \ \ \ \ \ \ \ \ \ \ Photos: None Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.4 MS
 Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 6.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5-15 GE
 %Stable: 10 GE

Specific Data

1.8	3.3	2.9	1.8	3.0	1.4
-----	-----	-----	-----	-----	-----

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	50	25
	Large (16-64mm):		25
	Sm. cobble (64-128mm):		20
Larges	Lge cobble (128-256mm):	40	10
	Blder cobble (>256mm):		10
Bedrock		5	5

D90 (cm): 30 Compaction: High

Cover

Cover Total %: 25 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	10	25	15	50	0

Crown Closure %: 30 Aspect: S

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Reach Symbol

(Fish)
 (RB)
 2 B 6.0 | 1441
 (Width, Valley: Channel, Slope) | (Bed Material)

Banks

Height (m): 0.3
 % Unstable: 5
 Fines Gravels Larges Bedrock

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: Dry Flood Signs Ht(m): 0.3
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

C1: S3
 C2: LS = 40%, RS = 45%
 C3: No fisheries sensitive zones were noted at this site.
 C4: This dry site was not electrofished.
 C5: Lat N 54 56' 11.4", Long W 127 13' 49.3"
 C6: No additional bank texture information.
 C7: Water quality was not evaluated at this site. The mean air temperature on this day was 13.8°C
 C8: Boulders and overstream vegetation provide most of the cover for fish.



Location: ARNE 47, Unit 7, at 7.5km on the 2000 rd, near the Causqua River, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-6700-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 2.5 MA Date: 27-Sep-96 Time: 10:18 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 6098 61024 Length surveyed (m): 400.0 GE Survey Crew: AKL\BL \ \ \ \ \ \ Photos: A-5-9,10 Air Photos:

Channel Characteristics

Specific Data

Av. Chan. Width (m): 4.9 MS
 Av. Wet. Width (m): 1.8 MS
 Av. Max Riffle Depth (cm): 11 MS
 Av. Max Pool Depth (cm): 17 MS
 Gradient (%): 5.0 CL
 Pool: 20 Riffle: 30 Run: 50 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 %Stable: 85 GE

4.0	5.0	5.5	4.0	6.0	5.0
0.4	2.5	2.5	2.0	1.6	1.5
6	7	10	20		
18	17	17	15	20	13

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	30	10
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	40	10
	Blder cobble (>256mm):		10
Bedrock		0	0

D90 (cm): 26 Compaction: Low

Cover

Cover Total %: 60 GE

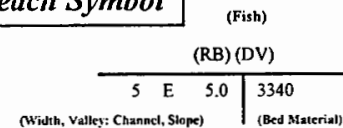
Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
5	30	5	0	50	10

Crown Closure %: 80 Aspect: NW

Discharge

Wetted Width (m): 1.9 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.33 F
 Discharge (m3/s): 0.05 F

Reach Symbol



Banks

Height (m): 0.7
 % Unstable: 10
 Fines Gravels Larges Bedrock
 Confinement: N/A
 Valley: Channel Ratio N/A
 Stage: L Flood Signs Ht(m): 0.6
 Bars (%): 20 pH: Braided: N
 Water Temp. (°C): 7.0 O2 (ppm):
 Turb. (cm): 20 Cond. (µmhos):

Obstructions

C	Height (m)	Type	Location
	1	CV	2.5

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S3
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 539 seconds over 720 square meters.
- C5: Lat N 55 03' 21", Long W 127 14' 58"
- C6: No additional bank texture information.
- C7: DO, pH and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
- C8: Excellent rearing and poor to fair spawning habitat were observed at this site. Some good LOD and boulder cover, as well as a number of step pools, were noted in the sampling area.



Photo #: A-5-9, 27-Sep-96
Site #: A47, Looking downstream.



Photo #: A-5-10, 27-Sep-96
Site #: A47, Looking upstream.



Location: ARNE 48, Unit 7, 2000 rd (2010km mark), see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-7500-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 1.0 MA Date: 27-Sep-96 Time: 11:28 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6106 .61046 Length surveyed (m): 400.0 GE Survey Crew: AKL\BLA \ \ \ \ \ \ Photos: A-5-11,12 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.0 MS
 Av. Wet. Width (m): 1.0 MS
 Av. Max Riffle Depth (cm): 6 MS
 Av. Max Pool Depth (cm): 23 MS
 Gradient (%): 17.0 CL
 Pool: 20 Riffle: 20 Run: 20 Other: 40
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: 95 GE

Specific Data

1.5	2.0	2.2	2.0	2.5	2.1
0.9	1.2	1.2	1.0	0.9	0.9
6	8	3	5	9	7
33	22	33	12	16	22

Obstructions

C	Height (m)	Type	Location
	1	CV	3.4

Bed Material

Fines	Clay, silt, sand (<2mm):	20	20
Gravels	Small (2-16mm):	30	10
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	50	20
	Blder cobble (>256mm):		10
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 80 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	40	5	0	40	5

Crown Closure %: 90 Aspect: W

D90 (cm): 27 Compaction: Low

Discharge

Wetted Width (m): 0.9 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.28 F
 Discharge (m3/s): 0.01 F

Banks

Height (m): 0.3
 % Unstable: 10

Fines Gravels Larges Bedrock

Confinement: N/A
 Valley : Channel Ratio N/A
 Stage: L Flood Signs Ht(m): 0.3
 Bars (%): 10 pH: 7.9 Braided: N
 Water Temp. (°C): 8.5 O2 (ppm):
 Turb. (cm): 33 Cond. (µmhos): 130

Reach Symbol

(Fish)

(RB) (DV)

2 E 17.0 | 2350

(Width, Valley: Channel, Slope)

(Bed Material)

Comments

- C1: S3
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 414 seconds over 300 square meters.
- C5: Lat N 55 04' 33", Long W 127 16' 03.6"
- C6: No additional bank texture information. A lot of erosion was seen near the bedrock at this site.
- C7: DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 13.8°C
- C8: Excellent rearing but poor spawning habitat were observed in the sampling area. A lot of step pools and LOD and boulder cover were noted at this site. The riparian vegetation at this site consists mainly of alder and aspen. The flow is subterranean in some sections.
- C9: This stream is used by livestock.



Photo #: A-5-11, 27-Sep-96
Site #: A48, Looking downstream.



Photo #: A-5-12, 27-Sep-96
Site #: A48, Looking upstream toward culvert, old logging debris.

Location: ARNE 49, Unit 7, 2100rd at 1 km, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-6600-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 4.9 MW Date: 27-Sep-96 Time: 12:25 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6102 .61058 Length surveyed (m): 300.0 GE Survey Crew: AKL\BLA \ \ \ \ \ \ Photos: A-5-13,14 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.6 MS
 Av. Wet. Width (m): 2.2 MS
 Av. Max Riffle Depth (cm): 8 MS
 Av. Max Pool Depth (cm): 27 MS
 Gradient (%): 9.0 CL
 Pool: 30 Riffle: 30 Run: 40 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: 80 GE

Specific Data

5.5	2.4	3.9	3.5	3.6	2.5
3.4	2.1	2.7	1.3	1.6	2.0
8	8	8	5	8	9
26	29	28	33	23	23

Obstructions

C	Height (m)	Type	Location
	1	CV	2.8

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	50	30
	Large (16-64mm):		20
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	20	5
	Blder cobble (>256mm):		5
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S3
- C2: LS = 12%, RS = 10%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 432 seconds over 660 square meters.
- C5: Lat N 55 05' 12.1", Long W 127 16' 24.5"
- C6: No additional bank texture information.
- C7: DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 13.8°C
- C8: The culvert at this road crossing is a barrier to fish passage upstream. Rearing and spawning habitat were observed at this site. Step pool habitat was noted in the sampling area.
- C9: A new channel is being created at this site. The riparian cover was removed by logging.

Cover

Cover Total %: 90 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	25	10	0	50	15

Crown Closure %: 90 Aspect: W

Discharge

Wetted Width (m): 2.0 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.34 F
 Discharge (m3/s): 0.05 F

Banks

Height (m): 0.6
 % Unstable: 15
 Fines Gravels Larges Bedrock
 Confinement: UC
 Valley: Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 0.8
 Bars (%): 20 pH: 8.0 Braided: N
 Water Temp. (°C): 7.5 O2 (ppm):
 Turb. (cm): 29 Cond. (µmhos): 110

Reach Symbol

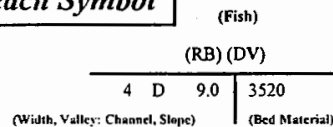




Photo #: A-5-13, 27-Sep-96
Site #: A49, Looking upstream.



Photo #: A-5-14, 27-Sep-96
Site #: A49, Looking downstream, gravel bar and alders.



Location: ARNE 51, Unit 7, km 1 on the 2000 rd, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-4700-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 0.8 MA Date: 27-Sep-96 Time: 14:47 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 .6082 .60976 Length surveyed (m): 100.0 GE Survey Crew: AKL\BL \ \ \ \ \ \ Photos: A-5-18,19 Air Photos:

Channel Characteristics

Specific Data

Av. Chan. Width (m): 1.8 MS
 Av. Wet. Width (m): 0.0 GE
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 19.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5 GE
 % Stable: GE

1.5	1.1	1.5	2.3	2.8	1.7
-----	-----	-----	-----	-----	-----

Obstructions

C	Height (m)	Type	Location
	1	CV	0.8

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	30	0
	Large (16-64mm):		30
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	70	40
	Blder cobble (>256mm):		10
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Cover

Cover Total %: 25 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	0	30	30	40	0

Crown Closure %: 80 Aspect: W

Banks

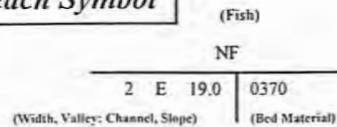
Height (m): 0.6
 % Unstable: 0
 Fines Gravels Larges Bedrock

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Confinement: N/A
 Valley: Channel Ratio N/A
 Stage: Dry Flood Signs Ht(m): 0.2
 N Bars (%): 0 pH: 7.7 Braided: N
 N Water Temp. (°C): 11.5 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 200

Reach Symbol



Comments

- C1: S6
- C2: LS = 20%, RS = 17%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This dry site was not electrofished.
- C5: Lat N 55 00' 48.5", Long W 127 18' 28.4"
- C6: No additional bank texture information.
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 13.8°C
- C8: This site provides no fish habitat. It was dry at the time of sampling and appeared to have been dry for some time.



Photo #: A-5-18, 27-Sep-96
Site #: A51, Looking downstream.



Photo #: A-5-19, 27-Sep-96
Site #: A51, Looking upstream.

Location: ARNE 54, Unit 7, outlet of pond, block 374-04, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-1760-000-370-000-000-000-000-000-0

Map #: 93 M 004 Reach Length (km): 4.7 MA Date: 28-Sep-96 Time: 10:26 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6150 .61039 Length surveyed (m): 300.0 GE Survey Crew: AKL\BLA \ \ \ \ \ \ Photos: A-6-1,2 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.7 MS
 Av. Wet. Width (m): 1.2 MS
 Av. Max Riffle Depth (cm): 3 MS
 Av. Max Pool Depth (cm): 14 MS
 Gradient (%): 6.0 CL
 Pool: 10 Riffle: 60 Run: 20 Other: 10
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 %Stable: 100 GE

Specific Data

1.5	4.0	1.1	1.1	1.5	1.0
0.7	2.7	1.3	0.6	1.0	1.0
4	2	3	3	3	3
16	16	19	10	8	14

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	20	5
	Large (16-64mm):		15
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	30	15
Bedrock	Blder cobble (>256mm):		5
		20	20

D90 (cm): 28 Compaction: Medium

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 60 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	30	2	0	50	18

Crown Closure %: 50 Aspect: SW

Comments

- C1: S3
- C2: LS = 10%, RS = 7%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 410 seconds over 360 square meters.
- C5: Lat N 55 04' 06.7", Long W 127 11' 56.6"
- C6: No additional bank texture information.
- C7: DO and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: Some good rearing, but poor spawning habitat was observed at this site.

Discharge

Wetted Width (m): 0.8 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.24 F
 Discharge (m3/s): 0.01 F

Banks

Height (m): 0.4
 % Unstable: 0
 Fines Gravels Larges Bedrock

Confinement: N/A
 Valley: Channel Ratio N/A
 Stage: L Flood Signs Ht(m): 0.2
 Bars (%): 20 pH: Braided: N
 Water Temp. (°C): 5.0 O2 (ppm):
 Turb. (cm): 19 Cond. (µmhos):

Reach Symbol

(Fish)

(RB) (DV)

2	E	6.0	3232
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(Width, Valley; Channel, Slope) (Bed Material)



Photo #: A-6-1, 28-Sep-96
Site #: A54, Looking upstream, moss-covered banks.



Photo #: A-6-2, 28-Sep-96
Site #: A54, Looking downstream, LOD across channel.



Location: ARNE 55, Unit 7, 300m north of pond, block 374-04, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-1760-000-000-000-000-000-000-000-0

Map #: 93 M 004 Reach Length (km): 0.7 MA Date: 28-Sep-96 Time: 11:39 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6149 .61045 Length surveyed (m): 300.0 GE Survey Crew: AKL\BL\ \ \ \ \ \ \ Photos: A-6-3,4 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.2 MS
 Av. Wet. Width (m): 1.0 MS
 Av. Max Riffle Depth (cm): 4 MS
 Av. Max Pool Depth (cm): 15 MS
 Gradient (%): 1.0 CL
 Pool: 10 Riffle: 10 Run: 80 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: 100 GE

Specific Data

1.1	2.0	1.0	1.0	1.2	1.2
0.9	1.5	0.6	0.8	1.0	1.2
2	2	7	3		
13	9	16	10	12	30

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	80	80
Gravels	Small (2-16mm):	5	1
	Large (16-64mm):		4
Larges	Sm. cobble (64-128mm):		3
	Lge cobble (128-256mm):	15	10
Bedrock	Blder cobble (>256mm):		2
		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 80 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	5	0	0	50	45

Crown Closure %: 20 Aspect: W

D90 (cm): 29 Compaction: Low

Comments

- C1: S6
- C2: LS = 1%, RS = 1%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 260 seconds over 250 square meters.
- C5: Lat N 55 04' 26.2", Long 127 12' 01.4"
- C6: No additional bank texture information.
- C7: DO and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: Some good to fair rearing, but poor spawning habitat occurs at this site. The flow is sub terranean in sections. The surrounding vegetation includes small shrubs and fir trees.

Discharge

Wetted Width (m): 0.7 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.23 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.4
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: N/A
 Valley: Channel Ratio N/A
 Stage: L Flood Signs Ht(m): 0
 Bars (%): 10 pH: 8.0 Braided: N
 Water Temp. (°C): 5.0 O2 (ppm):
 Turb. (cm): 30 Cond. (µmhos):

Reach Symbol

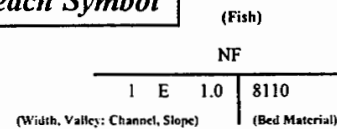




Photo #: A-6-3, 28-Sep-96
Site #: A55, Looking downstream.



Photo #: A-6-4, 28-Sep-96
Site #: A55, Looking upstream.



Location: ARNE 56, Unit 7, near Block 552-02. Altitude 1180m, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-6600-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 3.3 MW Date: 28-Sep-96 Time: 13:01 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6140 61062 Length surveyed (m): 300.0 GE Survey Crew: AKL\BRLA \ \ \ \ \ \ Photos: A-6-5,6 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.4 MS
 Av. Wet. Width (m): 1.0 MS
 Av. Max Riffle Depth (cm): 4 MS
 Av. Max Pool Depth (cm): 18 MS
 Gradient (%): 4.0 CL
 Pool: 20 Riffle: 50 Run: 30 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: 100 GE

Specific Data

2.4	1.2	1.3	1.3	1.0	1.4
1.4	0.6	0.7	1.0	1.0	1.3
5	4	3	3	4	3
24	13	12	34	13	15

Obstructions

C	Height (m)	Type	Location
	0	CV	7.2

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	60	30
	Large (16-64mm):		30
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	30	10
Bedrock	Blider cobble (>256mm):		0
		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 70 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	40	0	0	50	10

Crown Closure %: 85 Aspect: W

D90 (cm): 13 Compaction: Low

Discharge

Wetted Width (m): 0.6 MS
 Mean Depth (m): 4.0 MS
 Mean Velocity (m/s): 0.25 F
 Discharge (m3/s): 0.40 f

Banks

Height (m): 0.3
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: N/A
 Valley : Channel Ratio N/A

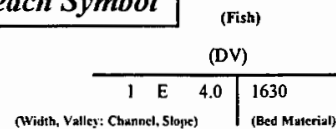
Stage: L Flood Signs Ht(m): 0.1

Bars (%): 10 pH: Braided: N

Water Temp. (°C): 5.5 O2 (ppm):

Turb. (cm): 34 Cond. (µmhos):

Reach Symbol



Comments

- C1: S4
- C2: LS=2%, RS=2%
- C3: No fisheries sensitive zones.
- C4: The electroshocking effort, using a Smithroot 15 A model was 280 seconds over 300 meters.
- C5: Lat N 55 05'21.9", Long W 127 12' 49.7"
- C6: Slopes and banks covered with moss, huckleberry and alder.
- C7: D.O. was not measured at this site. The mean air temperature on this day was 10.5°C
- C8: Some good spawning and rearing habitat was observed below culvert at this site. Some old hip chain and flagging was also noted.



Photo #: A-6-5, 28-Sep-96
Site #: A56, Looking upstream.



Photo #: A-6-6, 28-Sep-96
Site #: A56, Looking downstream through alders.



Location: W100, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 002-6700-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 2.2 MA Date: 23-Jul-97 Time: 11:06 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9.6166 .61024 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-11-15,16 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 4.7 MS
 Av. Wet. Width (m): 2.8 MS
 Av. Max Riffle Depth (cm): 11 MS
 Av. Max Pool Depth (cm): 35 MS
 Gradient (%): 5.0 CL
 Pool: 25 Riffle: 45 Run: 30 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5-15 GE
 % Stable: 60 GE

Specific Data

4.4	3.7	8.0	3.8	3.4	4.7
3.2	3.3	2.5	2.5	2.4	3.1
16	6	7	13	13	10
34	36	35	40	29	

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	30	15
	Large (16-64mm):		15
Larges	Sm. cobble (64-128mm):		25
	Lge cobble (128-256mm):	60	20
	Blder cobble (>256mm):		15
Bedrock		0	0

D90 (cm): 51 Compaction: Medium

Cover

Cover Total %: 40 GE

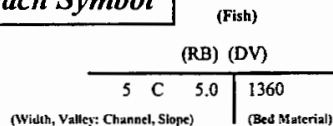
Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
15	25	30	0	10	20

Crown Closure %: 40 Aspect: NW

Discharge

Wetted Width (m): 2.5 MS
 Mean Depth (m): 0.2 MS
 Mean Velocity (m/s): 0.40 F
 Discharge (m³/s): 0.15 F

Reach Symbol



Banks

Height (m): 0.2
 % Unstable: 40

Fines Gravels Larges Bedrock

Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: M Flood Signs Ht(m): 0.8
 Bars (%): 15 pH: Braided: Y
 Water Temp. (°C): 9.0 O₂ (ppm):
 Turb. (cm): Cond. (µmhos):

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S3.
- C2: LS=10%, RS=10%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 400V, was 41 seconds over 140 meters.
- C5: No additional bank texture information.
- C6: DO, pH and conductivity were not measured at this site, the water was clear to bottom. The mean air temperature on this day was 11.1 C.
- C7: There is excellent rearing and spawning habitat in the sampling area. LOD and pools in provide cover.



Photo #: W-11-15, 23-Jul-97
Site #: W100, Looking upstream at the channel



Photo #: W-11-16, 23-Jul-97
Site #: W100, Looking downstream at the channel



Location: W113, Unit 7; 2.6km uproad of 210 road

Stream (Gaz.): Unnamed

Watershed Code: 005-3600-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 0.6 MA Date: 25-Jul-97 Time: 10:45 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9 6120 61086 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-12-19,20 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.1 MS
 Av. Wet. Width (m): 0.9 MS
 Av. Max Riffle Depth (cm): 4 MS
 Av. Max Pool Depth (cm): 19 MS
 Gradient (%): 5.0 CL
 Pool: 25 Riffle: 20 Run: 55 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5-15 GE
 % Stable: 40 GE

Specific Data

0.9	1.2	0.9	1.0	1.1	1.3
0.7	0.9	0.6	0.9	1.0	1.1
6	3	3	2	5	7
24	21	15	21	18	17

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S4.
- C2: LS=3%, RS=5%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 800V, was 111 seconds over 100 meters. No fish were caught. Low and subterranean flow made shocking somewhat difficult at this site.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 13.8 C.
- C7: Site disturbance by logging was noted. There is an overturned tree 30m from the mouth that has diverted the creek underground, creating a potential barrier. Sedimentation was observed.

Cover Cover Total %: 15 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
20	20	20	0	20	20

 Crown Closure %: 10 Aspect: SE

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	40	20
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	30	10
Bedrock	Blder cobble (>256mm):		10
		0	0

D90 (cm): 26 Compaction: Medium

Discharge

Wetted Width (m): 0.7 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.16 F
 Discharge (m3/s): 0.01 F

Banks

Height (m): 0.1
 % Unstable: 20
 Fines Gravels Larges Bedrock
 Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: M Flood Signs Ht(m): 0.1
 Bars (%): 10 pH: 8.0 Braided: Y
 Water Temp. (°C): 6.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 50

Reach Symbol

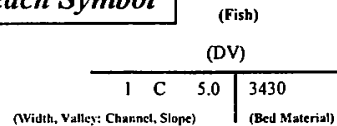




Photo #: W-12-19, 25-Jul-97

Site #: W113, Looking across stream at the channel



Photo #: W-12-20, 25-Jul-97

Site #: W113, Looking across stream at the channel

Location: W244, Unit 7; east of Bulkley R. in block 069-1

Stream (Gaz.): Unnamed

Watershed Code: 002-6800-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 2.3 MA Date: 07-Sep-97 Time: 15:00 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6117 .61012 Length surveyed (m): 50.0 GE Survey Crew: DD UP \ \ \ \ \ \ Photos: W-O-1,2 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.3 MS
 Av. Wet. Width (m): 1.2 MS
 Av. Max Riffle Depth (cm): 1 MS
 Av. Max Pool Depth (cm): 14 MS
 Gradient (%): 36.0 CL
 Pool: 20 Riffle: 10 Run: 50 Other: 20
 % Side Channel: 0 GE
 % Debris Area: >15 GE
 %Stable: 25 GE

Specific Data

2.8	3.5	3.8	3.2	3.0	3.4
1.4	1.4	1.5	1.8	0.4	0.6
1	1	1	1	1	1
18	12	15	16	14	12

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S5.
- C2: LS=34%, RS=51%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort was not recorded at this site.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The air temperature at this site was 12.0 C.
- C7: There is some habitat in this stream but the high gradient makes this reach inaccessible to fish. There is a one meter drop from the culvert and a gradient of 42% was measured directly below the culvert. The water also flows underground below the culvert.

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	20	40	0	20	10

Crown Closure %: 60 Aspect: W

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		35
	Lge cobble (128-256mm):	70	20
	Blder cobble (>256mm):		15
Bedrock		0	0

D90 (cm): 46 Compaction: Medium

Discharge

Wetted Width (m): 0.7 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.13 F
 Discharge (m3/s): 0.07 F

Banks

Height (m): 0.2
 % Unstable: 75
 Fines Gravels Larges Bedrock

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: L Flood Signs Ht(m): 0.9
 Bars (%): 90 pH: 7.6 Braided: N
 Water Temp. (°C): 9.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 100

Reach Symbol

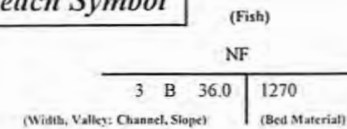




Photo #: W-O-1, 07-Sep-97
Site #: W244, Looking upstream at the channel



Photo #: W-O-2, 07-Sep-97
Site #: W244, Looking downstream at the channel

5.2 Causqua Creek (460-1883-000) (93 M 004, 93 M 005)

5.2.1 Sensitive Habitats and Barriers

The Causqua Creek mainstem is 19.8 km in length and is fed by 44 tributaries. Reach 1 of Causqua Creek has low gradient and is somewhat confined, while reach 2 has moderate gradient and is quite confined. This confinement peaks at the reach 2 and 3 break, where a 30 meter falls was observed. Reach 4 is considerably less confined than reach 3, but is fed by a number of steep gradient tributaries and is separated from reach 3 by a 10 meter falls. The confinement increases again in reach 5, which also has moderate gradient. Finally, reach 6 of Causqua Creek has low gradient and is fed by a number of steeper gradient tributaries. No sensitive habitat was identified in this system, however, the steep side slopes in reaches 2 and 3 warrant special attention in development plans for this watershed. Causqua Creek was sampled at 19 locations, including reaches 1, 3, 4 and 6 of the mainstem.

5.2.2 Fish Summary Tables and Stream Classification

Pink salmon have been recorded at the mouth of Causqua Creek and rainbow trout were caught by angling at one site, in reach 1. No fish were caught at any other sample site in this watershed. The mainstem was classified as an S2 in reach one based on the 15.6 meter average channel width and the presence of rainbow trout in the sampling area. Sampling was carried out above both the 30 meter and the 10 meter falls on Causqua Creek and no fish were caught, despite the presence of some excellent spawning and rearing habitat at the sample sites. As a result, all reaches above the 30 meter falls have been classified as non fish bearing. The mainstem was classified as an S5 in reach 3 based on an average channel width of 14.02 meters and the absence of fish in the sampling area. Reach 6 was classified as an S6, based on an average channel width of 2.90 meters and the lack of evidence of a resident population of fish above the barriers. Typically the tributaries to these reaches are S6 sized streams, with several smaller streams identified as "NC". Many of the tributaries in the upper Causqua watershed have falls and cascades ranging from 2 to 10 meters in height.

Location: ARNE 50, Unit 7, at the 2000 rd bridge, see C5. Stream (Gaz.): Causqua Creek Watershed Code: 460-1883-000-000-000-000-000-000-000-0

Map #: 93 M 004 Reach Length (km): 1.0 MA Date: 27-Sep-96 Time: 13:45 Agency: TEC Access: V2 Fish Card: N Field Historical

U.T.M.: 9 6087 61005 Length surveyed (m): 300.0 GE Survey Crew: AKL\BL \ \ \ \ \ \ \ \ \ \ Photos: A-5-15,16,17 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 15.6 T
 Av. Wet. Width (m): 7.1 T
 Av. Max Riffle Depth (cm): 32 MS
 Av. Max Pool Depth (cm): 84 MS
 Gradient (%): 4.0 CL
 Pool: 5 Riffle: 80 Run: 15 Other: 0
 % Side Channel: GE
 % Debris Area: 10 GE
 % Stable: 40 GE

Specific Data

17.2	10.4	14.1	15.2	20.0	16.8
8.8	4.7	5.7	7.7	6.7	8.9
42	40	38	40	18	17
57	55	140			

Obstructions

C	Height (m)	Type	Location
	1	F	0.8

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	RB	1	175	J	R			AG

Comments

- C1: S2
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: The rainbow trout was caught by angling in a plunge pool, downstream of the rock falls listed in the obstructions section.
- C5: Lat N 55 02' 22.1", Long W 127 17' 56.5"
- C6: Gravels and larges make up the bank texture at this site. The banks are highly unstable in the sampling area.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
- C8: Excellent rearing habitat was observed at this site.
- C9: A bedrock canyon was noted upstream of the road crossing.

Cover

Cover Total %: 50 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
5	20	70	0	5	0

Crown Closure %: 5 Aspect: S

Bed Material

Fines	Clay, silt, sand (<2mm):	15	15
Gravels	Small (2-16mm):	20	5
	Large (16-64mm):		15
Larges	Sm. cobble (64-128mm):		15
	Lge cobble (128-256mm):	65	30
Bedrock	Bldr cobble (>256mm):		20
		0	0

D90 (cm): 45 Compaction: Medium

Discharge

Wetted Width (m): 5.2 T
 Mean Depth (m): 0.3 MS
 Mean Velocity (m/s): 1.77 F
 Discharge (m3/s): 2.07 F

Banks

Height (m): 2.0
 % Unstable: 100
 Fines Gravels Larges Bedrock

Confinement: UC
 Valley : Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 1.5
 Bars (%): 80 pH: Braided: N
 Water Temp. (°C): 8.5 O2 (ppm):
 Turb. (cm): 140 Cond. (µmhos):

Reach Symbol

(Fish)

RB

16 D 4.0 | 2260

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: A-5-15, 27-Sep-96
Site #: A50, Looking downstream.



Photo #: A-5-16, 27-Sep-96
Site #: A50, Looking upstream, blowdowns over creek.



Photo #: A-5-17, 27-Sep-96

Site #: A50, Looking upstream, waterfall and cascades.



Location: RYAN 140, Unit 7, 2.1km downstream of a 10m falls, see C5.

Stream (Gaz.): Causqua Creek

Watershed Code: 460-1883-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 10.4 MW Date: 28-Sep-96 Time: 11:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6179.60998 Length surveyed (m): 400.0 GE Survey Crew: RH V L \ \ \ \ \ \ \ \ \ \ Photos: R-9-9,10 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 14.0 MS
 Av. Wet. Width (m): 6.1 MS
 Av. Max Riffle Depth (cm): 20 MS
 Av. Max Pool Depth (cm): 35 MS
 Gradient (%): 3.0 CL
 Pool: 15 Riffle: 70 Run: 15 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 %Stable: 95 GE

Specific Data

22.6	15.1	12.8	9.0	10.6
4.9	4.1	8.8	8.5	4.2
17	20	23		
30	32	42		

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	35	10
	Large (16-64mm):		25
Larges	Sm. cobble (64-128mm):		25
	Lge cobble (128-256mm):	65	20
Bedrock	Blder cobble (>256mm):		20
		0	0

D90 (cm): 80 Compaction: High

Cover

Cover Total %: 15 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
10	20	40	0	15	15

Crown Closure %: 5 Aspect: W

Discharge

Wetted Width (m): 3.7 MS
 Mean Depth (m): 0.2 MS
 Mean Velocity (m/s): 0.29 F
 Discharge (m3/s): 0.16 F

Reach Symbol

(Fish) NF
 14 B 3.0 0460
 (Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m): 0.5
 % Unstable: 10
 Fines Gravels Larges Bedrock

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: L Flood Signs Ht(m): 1.3
 Bars (%): 0 pH: 8.0 Braided: N
 Water Temp. (°C): 5.0 O2 (ppm):
 Turb. (cm): 42 Cond. (µmhos): 50

Obstructions

C	Height (m)	Type	Location
C8	30	F	0.0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

C1: S5
 C2: LS = 110%, RS = 55%
 C3: No fisheries sensitive zones were noted at this site.
 C4: The electroshocking effort, using a 12 B POW model was 1400 seconds over 2440 square meters.
 C5: Lat N 55 02' 3.4", Long W 127 09' 21.7"
 C6: The banks of this stream contain fines, larges, graveLS and bedrock.
 C7: DO was measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
 C8: A 30m fallS on this system is a definite barrier to fish passage upstream. A resident population is possible, but unlikely in this creek, upstream of the fallS. Future sampling is recommended in the entire upper Causqua drainage.



Photo #: R-9-10, 1996/09/28

Site #: R140, Looking upstream, wide channel, large bars.

DFO/MoELP Stream Survey Form

Site Number: RYAN 145

Reach No.: 4

Causqua Cr.



TRITON
Environmental Consultants Ltd.

Location: RYAN 145, Unit 7, 1km upstream of a ten meter falls, see C5.

Stream (Gaz.): Causqua Creek

Watershed Code: 460-1883-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.7 MA Date: 28-Sep-96 Time: 14:15 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6201 61018 Length surveyed (m): 900.0 GE Survey Crew: RH UL \ \ \ \ \ \ \ \ \ \ Photos: R-9-18,19 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 4.0 MS
 Av. Wet. Width (m): 2.5 MS
 Av. Max Riffle Depth (cm): 27 MS
 Av. Max Pool Depth (cm): 46 MS
 Gradient (%): 3.5 CL
 Pool: 10 Riffle: 60 Run: 30 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 80 GE

Specific Data

6.0	3.0	2.2	4.0	3.5	5.1
2.0	2.2	2.1	2.4	2.0	4.3
24	28	30			
34	80	40	31		

Obstructions

C	Height (m)	Type	Location
C8	10	F	12.3

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	50	20
	Large (16-64mm):		30
Larges	Sm. cobble (64-128mm):		15
	Lge cobble (128-256mm):	40	15
	Blder cobble (>256mm):		10
Bedrock		5	5

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 35 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	5	30	0	30	25

Crown Closure %: 10 Aspect: W

Banks

Height (m): 0.8
 % Unstable: 5

Fines Gravels Larges Bedrock

Confinement: OC

Valley: Channel Ratio 5-10

Stage: L Flood Signs Ht(m): 1.4

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 02 (ppm):

Turb. (cm): 80 Cond. (µmhos):

Discharge

Wetted Width (m): 1.4 MS
 Mean Depth (m): 0.2 MS
 Mean Velocity (m/s): 0.29 F
 Discharge (m3/s): 0.06 F

Reach Symbol

(Fish)

NF

4 C 4.0 1540

(Width, Valley: Channel, Slope)

(Bed Material)

Comments

- C1: S5
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 1300 seconds over 2250 square meters.
- C5: Lat N 55 03' 5.3", Long W 127 07' 13.4"
- C6: Fines and larges make up the bank texture at this site.
- C7: DO, pH, temperature and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: The 10m falls located 1km downstream of the sampling area, would prevent fish access upstream.



Photo #: R-9-18, 1996/09/28
Site #: R145, Looking upstream.



Photo #: R-9-19, 1996/09/28
Site #: R145, Looking downstream.



Location: Y268, Unit 7

Stream (Gaz.): Causqua Creek

Watershed Code: 460-1883-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 3.4 MW Date: 15-Sep-97 Time: 13:00 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 622490.610477 Length surveyed (m): 200.0 GE Survey Crew: JP \FC \ \ \ \ \ \ \ Photos: Y-32-24,25 Air Photos:

Channel Characteristics

CI Av. Chan. Width (m): 2.9 MS
 CI Av. Wet. Width (m): 2.7 MS
 Av. Max Riffle Depth (cm): 12 MS
 Av. Max Pool Depth (cm): 47 MS
 Gradient (%): 3.0 CL
 Pool: 5 Riffle: 10 Run: 85 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0 GE
 % Stable: 0 GE

Specific Data

3.2	3.2	2.1	2.0	1.8	1.7
3.2	3.2	2.1	2.0	1.8	1.6
10	12	14	8	14	
46	56	40			

Obstructions

C	Height (m)	Type	Location
	30	F	3.1
	10	F	13.0

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	60	30
	Large (16-64mm):		30
Larges	Sm. cobble (64-128mm):		15
	Lge cobble (128-256mm):	30	10
Bedrock	Blder cobble (>256mm):		5
		10	10

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6. Additional channel and wetted widths of 4.7 and 4.3m and 3.5 and 4.3 m were taken at this site.
- C2: LS = 40%, RS = 5%
- C3: No fisheries sensitive zones present.
- C4: The electroshocking effort at this site, using a Smithroot 12 B POW model set at I-5-500V, was 130 seconds over 200 meters.
- C5: Fines and gravels make up the bank texture at this site.
- C6: DO was not measured at this site, the water was clear to the bottom. The air temperature at this site was 6.C.
- C7: This reach has some good cutbank, boulder and pool cover but is located above a 30 m and 10 m falls.

Cover

Cover Total %: 25 GE
 Pool LOD Bldr In Veg O Veg Ctnk
 10 0 20 0 30 40
 Crown Closure %: 0 Aspect: W

Banks

Height (m): 0.2
 % Unstable: 5
 Fines Gravels Larges Bedrock

Discharge

Wetted Width (m): 2.0 MS
 Mean Depth (m): 0.2 MS
 Mean Velocity (m/s): 0.52 F
 Discharge (m3/s): 0.16 F

Confinement: OC

Valley : Channel Ratio 5-10
 Stage: M Flood Signs H(m): 0
 Bars (%): 5 pH: 7.8 Braided: N
 Water Temp. (°C): 4.5 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 50

Reach Symbol

(Fish) NF
 3 C 3.0 0631
 (Width, Valley: Channel, Slope) (Bed Material)



Photo #: Y-32-24, 15/09/97

Site #: Y268, Looking upstream at the channel, note boulder cover



Photo #: Y-32-25, 15/09/97

Site #: Y268, Looking downstream at the channel



Location: RYAN 139, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-8300-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 2.9 MA Date: 28-Sep-96 Time: 10:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6200 60994 Length surveyed (m): 250.0 GE Survey Crew: RH UL \ \ \ \ \ \ Photos: R-9-7,8 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.8 MS
 Av. Wet. Width (m): 1.0 MS
 Av. Max Riffle Depth (cm): 13 MS
 Av. Max Pool Depth (cm): 22 MS
 Gradient (%): 10.0 CL
 Pool: 30 Riffle: 50 Run: 20 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0 GE
 % Stable: 0 GE

Specific Data

1.5	1.6	1.2	2.1	1.9	2.2
0.7	0.7	1.4	1.6	0.7	1.0
16	14	8			
20	20	27			

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6
- C2: LS = 10%, RS = 1%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, was not available for this site.
- C5: Lat N 55 02' 14", Long W 127 07' 17.7"
- C6: No additional bank texture information.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: Some good fish habitat was observed at this site. Future sampling is recommended at higher water temperatures.

Cover

Cover Total %: 70 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
30	0	0	0	50	20

Crown Closure %: 30 Aspect: W

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	15	5
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		30
	Lge cobble (128-256mm):	80	50
Bedrock	Blder cobble (>256mm):		0
		0	0

D90 (cm): 15 Compaction: Medium

Discharge

Wetted Width (m): 1.1 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.23 F
 Discharge (m3/s): 0.02 F

Banks

Height (m): 0.5
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: UC

Valley: Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.1

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 3.0 O2 (ppm):

Turb. (cm): 27 Cond. (µmhos):

Reach Symbol

(Fish)

NF

2 D 10.0 | 1180

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: R-9-7, 1996/09/28
Site #: R139, Looking downstream.



Photo #: R-9-8, 1996/09/28
Site #: R139, Looking upstream, channel through willows.



Location: RYAN 141, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-4100-000-000-000-000-000-000-000-0

Map #: 93 M 005

Reach Length (km): 0.8 MA

Date: 28-Sep-96 Time: 11:50

Agency: TEC

Access: H

Fish Card: N

Field Historical

U.T.M.: 9.6180 .60998

Length surveyed (m): 200.0 GE

Survey Crew: RH VJ \ \ \ \ \ \ \ \

Photos: R-9-11,12

Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.7 MS
 Av. Wet. Width (m): 1.9 MS
 Av. Max Riffle Depth (cm): 7 MS
 Av. Max Pool Depth (cm): 26 MS
 Gradient (%): 24.0 CL
 Pool: 15 Riffle: 80 Run: 5 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 30 GE

Specific Data

4.2	3.7	3.3	2.9	5.1	2.9
1.8	2.4	1.8	2.0	1.6	1.9
8	5	9			
29	33	16			

Obstructions

C	Height (m)	Type	Location
C9	2	F	0.1

Bed Material

	Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):		25	10
	Large (16-64mm):			15
Larges	Sm. cobble (64-128mm):			20
	Lge cobble (128-256mm):		60	20
	Bldr cobble (>256mm):			20
Bedrock			10	10

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S5
- C2: LS = 63%, RS = 70%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The confluence of this stream and Causqua Creek was electrofished at the previous site, R140.
- C5: Lat N 55 02' 4.6", Long W 127 09' 11.8"
- C6: Fines, gravels and bedrock were noted in the banks at this site.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: The falls on this stream may impede fish access upstream. The gradient decreases farther up this reach.
- C9: The air temperature at this site was 5.5 degrees celcius.

Cover

Cover Total %: 45 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
15	15	20	0	25	25

Crown Closure %: 15 Aspect: NW

Banks

Height (m): 0.7

% Unstable: 5

Fines Gravels Larges Bedrock

Confinement: CO

Valley: Channel Ratio 0-2

Stage: L Flood Signs Ht(m): 0.7

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 4.0 O2 (ppm):

Turb. (cm): 33 Cond. (µmhos):

Discharge

Wetted Width (m): 0.4 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.30 F
 Discharge (m3/s): 0.01 F

Reach Symbol

(Fish)

NF

4 A 24.0 | 1261

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: R-9-11, 1996/09/28

Site #: R141, Looking upstream at confluence, cascade over LOD.



Location: RYAN 142, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-8400-000-000-000-000-000-000-000-0

Map #: Reach Length (km): Date: Time: Agency: Access: Fish Card: Field Historical
 U.T.M.: Length surveyed (m): Survey Crew: RH JLA \ \ \ \ \ \ \ \ \ \ Photos: Air Photos:

Channel Characteristics

Av. Chan. Width (m):
 Av. Wet. Width (m):
 Av. Max Riffle Depth (cm):
 Av. Max Pool Depth (cm):
 Gradient (%):
 Pool: Riffle: Run: Other:
 % Side Channel:
 % Debris Area:
 %Stable:

Specific Data

2.8	2.4	1.6	3.8	2.2	2.5
1.0	1.5	1.4	1.6	1.5	1.5
9	11	8			
23	18	16			

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	40	15
	Large (16-64mm):		25
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	55	20
Bedrock	Blder cobble (>256mm):		15
		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				EL

Cover

Cover Total %:

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
5	5	15	0	55	20

Crown Closure %: Aspect:

D90 (cm): Compaction: Medium

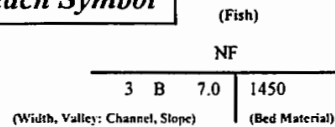
Discharge

Wetted Width (m):
 Mean Depth (m):
 Mean Velocity (m/s):
 Discharge (m3/s):

Banks

Height (m):
 % Unstable:
 Fines Gravels Larges Bedrock
 Confinement:
 Valley: Channel Ratio
 Stage: Flood Signs Ht(m):
 Bars (%): pH: Braided:
 Water Temp. (°C): O2 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol



Comments

- C1: S6
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: The mainstem of Causqua Creek was electroshocked.
- C5: Lat N 55 02' 59.6", Long W 127 07' 56"
- C6: Fines and gravels make up the bank texture at this site.
- C7: DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 10.5°C
- C8: A 10m falls on the mainstem of Causqua Creek likely prevents fish access to this site.



Photo #: R-9-14, 1996/09/28
Site #: R142, Looking upstream.



Location: RYAN 143, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-8500-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 2.0 MA Date: 28-Sep-96 Time: 13:10 Agency: TEC Access: H Fish Card: N Field Historical U.T.M.: 9.61931.61016 Length surveyed (m): 200.0 GE Survey Crew: RH V L Photos: R-9-15,16 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.9 MS
Av. Wet. Width (m): 0.9 MS
Av. Max Riffle Depth (cm): 6 MS
Av. Max Pool Depth (cm): 10 MS
Gradient (%): 8.0 CL
Pool: 10 Riffle: 20 Run: 70 Other: 0
% Side Channel: 0-10 GE
% Debris Area: 0-5 GE
%Stable: 80 GE

Specific Data

Table with 7 columns of numerical data: 0.4, 0.7, 1.2, 1.7, 0.6, 0.8, 0.4, 0.7, 0.9, 1.7, 0.6, 0.8, 5, 6, 8, 9, 11

Obstructions

Table with columns: C, Height (m), Type, Location

Bed Material

Table with columns: Material (Fines, Gravels, Larges, Bedrock) and values for Clay, silt, sand (<2mm), Small (2-16mm), Large (16-64mm), Sm. cobble (64-128mm), Lge cobble (128-256mm), Blder cobble (>256mm)

Fish Summary

Table with columns: C, Species, Number, Size Range (mm), Life Phase, Use 1, Use 2, Use 3, Method

Cover

Cover Total %: 90 GE

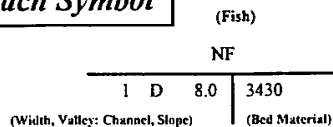
Table with columns: Pool, LOD, Bldr, In Veg, O Veg, Ctnk

Crown Closure %: 45 Aspect: S

Discharge

Wetted Width (m): 0.4 MS
Mean Depth (m): 0.1 MS
Mean Velocity (m/s): 0.18 F
Discharge (m3/s): 0.01 F

Reach Symbol



Banks

Height (m): 0.1
% Unstable: 0

Fines [checked] Gravels [] Larges [] Bedrock []

Confinement: UC
Valley: Channel Ratio 10+
Stage: L Flood Signs Ht(m): 0.1
Bars (%): 0 pH: Braided: N
Water Temp. (°C): 5.5 02 (ppm):
Turb. (cm): 11 Cond. (µmhos):

Comments

- C1: S6
C2: LS = 8%, RS = 25%
C3: No fisheries sensitive zones were noted at this site.
C4: This site was not electrofished as too little water was available to shock at the time of sampling.
C5: Lat N 55 02' 57.1", Long W 127 07' 54.7"
C6: No additional bank texture information.
C7: DO, conductivity, pH were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
C8: A 10m falls on the Causqua Creek mainstem prevents fish access to this site.



Photo #: R-9-16, 1996/09/28

Site #: R143, Looking upstream, willows over channel.



Location: RYAN 144, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-8600-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.5 MA Date: 28-Sep-96 Time: 13:45 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6199 .61018 Length surveyed (m): 200.0 GE Survey Crew: RH V L \ \ \ \ \ \ \ \ \ \ Photos: R-9-17 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.7 MS
 Av. Wet. Width (m): 0.6 MS
 Av. Max Riffle Depth (cm): 5 MS
 Av. Max Pool Depth (cm): 7 MS
 Gradient (%): 7.0 CL
 Pool: 10 Riffle: 10 Run: 80 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 90 GE

Specific Data

0.2	0.6	0.7	1.2	0.8	0.4
0.2	0.5	0.5	1.2	0.8	0.4
4	7	5			
8	7	7			

Obstructions

C	Height (m)	Type	Location
	2	C	0.0

Bed Material

Fines	Clay, silt, sand (<2mm):	40	40
Gravels	Small (2-16mm):	40	20
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	20	5
	Bllder cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 24 Compaction: Medium

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Cover

Cover Total %: 80 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
0	5	0	0	75	20

Crown Closure %: 15 Aspect: SW

Discharge

Wetted Width (m): 0.4 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.16 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.1
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: UC
 Valley : Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 0.1
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 6.0 O2 (ppm):
 Turb. (cm): 8 Cond. (µmhos):

Reach Symbol

(Fish)

NF

1 D 7.0 4220

(Width, Valley: Channel, Slope)

(Bed Material)

Comments

- C1 S6
- C2 LS = 6%, RS = 9%
- C3 No fisheries sensitive zones were noted at this site.
- C4 This site was not electrofished as too little water was present in the channel at the time of sampling.
- C5 Lat N 55 03' 6", Long W 127 07' 25.2"
- C6 No additional bank texture information.
- C7 DO, pH conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8 The 2m cascade and the disappearance of the channel prevent fish access upstream.



Photo #: R-9-17, 1996/09/28

Site #: R144, Looking upstream, willows over channel.



Location: RYAN 146, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-8700-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 0.4 MA Date: 28-Sep-96 Time: 14:45 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6201.61018 Length surveyed (m): 250.0 GE Survey Crew: RHJL \ \ \ \ \ \ \ \ Photos: None Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.8 MS
 Av. Wet. Width (m): 1.2 MS
 Av. Max Riffle Depth (cm): 10 MS
 Av. Max Pool Depth (cm): 18 MS
 Gradient (%): 7.0 CL
 Pool: 15 Riffle: 60 Run: 25 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 50 GE

Specific Data

2.3	1.8	1.4	1.5	2.0	2.0
1.4	1.2	1.2	1.0	1.6	1.0
14	8	7			
17	18				

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Comments

- C1: S6
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished as too little water was present in the channel at the time of sampling. The mainstem of Causqua was shocked instead.
- C5: Lat N 55 03' 5.3", Long W 127 07 13.4"
- C6: Fines and larges make up the bank texture at this site.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: Boulder and overstream vegetation cover are predominant at this site.

Cover

Cover Total %: 35 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	5	30	0	35	20

Crown Closure %: 30 Aspect: SW

Bed Material

Fines	Clay, silt, sand (<2mm):	15	15
Gravels	Small (2-16mm):	45	15
	Large (16-64mm):		30
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	40	10
Bedrock	Blder cobble (>256mm):		10
		0	0

D90 (cm): 25 Compaction: Medium

Discharge

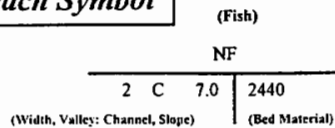
Wetted Width (m): 0.9 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.23 F
 Discharge (m3/s): 0.02 F

Banks

Height (m): 0.4
 % Unstable: 5
 Fines Gravels Larges Bedrock

Confinement: OC
 Valley : Channel Ratio 5-10
 Stage: L Flood Signs Ht(m): 0.4
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 5.5 O2 (ppm):
 Turb. (cm): 18 Cond. (µmhos):

Reach Symbol





Location: RYAN 147, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-8900-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.0 MA Date: 28-Sep-96 Time: 15:20 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6207 .61011 Length surveyed (m): 100.0 GE Survey Crew: RH\J\ \ \ \ \ \ \ \ \ \ \ Photos: R-9-20,21 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.6 MS
 Av. Wet. Width (m): 1.0 MS
 Av. Max Riffle Depth (cm): 4. MS
 Av. Max Pool Depth (cm): 20 MS
 Gradient (%): 15.0 CL
 Pool: 10 Riffle: 80 Run: 10 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 %Stable: 90 GE

Specific Data

1.9	2.1	1.4	1.6	1.4	1.3
0.9	0.5	1.3	1.5	0.9	1.1
5	2	6			
13	28	20			

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	15	15
Gravels	Small (2-16mm):	60	20
	Large (16-64mm):		40
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	25	10
Bedrock	Blder cobble (>256mm):		5
		0	0

D90 (cm): 18 Compaction: Medium

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Cover

Cover Total %: 25 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	10	10	0	35	35

Crown Closure %: 15 Aspect: NW

Comments

- C1: S6
- C2: LS = 016%, RS = 8%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished as too little water was present in the channel at the time of sampling.
- C5: Lat N 55 02'45.9", Long W 127 23' 33.4"
- C6: Fines and gravelLS make up the bank texture at this site.
- C7: DO, pH and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: OverStream vegetation and cutbanks are the predominant forms of cover at this site.

Discharge

Wetted Width (m): 0.6 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.09 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.4
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: CO
 Valley : Channel Ratio 0-2
 Stage: L Flood Signs H(m): 0.4
 Bars (%): 5 pH: Braided: N
 Water Temp. (°C): 3.0 O2 (ppm):
 Turb. (cm): 28 Cond. (µmhos):

Reach Symbol

(Fish) NF

2	A	15.0	2620
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(Width, Valley: Channel, Slope) (Bed Material)



Photo #: R-9-20, 1996/09/28
Site #: R147, Looking downstream.



Photo #: R-9-21, 1996/09/28
Site #: R147, Looking upstream, LOD in channel.



Location: RYAN 148, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-1883-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.9 MA Date: 28-Sep-96 Time: 16:20 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6168 .61024 Length surveyed (m): 350.0 GE Survey Crew: RHUL \ \ \ \ \ \ \ \ Photos: R-9-22,23 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.1 MS
 Av. Wet. Width (m): 0.6 MS
 Av. Max Riffle Depth (cm): 7 MS
 Av. Max Pool Depth (cm): 16 MS
 Gradient (%): 8.0 CL
 Pool: 15 Riffle: 60 Run: 25 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5 GE
 %Stable: 65 GE

Specific Data

1.1	0.7	1.0	1.2	1.6	0.9
0.5	0.4	0.5	0.7	1.1	0.5
8	7	5			
13	19	15			

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6
- C2: LS = 35%, RS = 33%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 250 seconds over 120 square meters.
- C5: Lat N 55 03' 27.9", Long W 127 10' 19"
- C6: Fines and bedrock make up the bank texture at this site.
- C7: DO, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 10.5°C
- C8: Overstream vegetation and cutbanks are the predominant forms of cover at this site.

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	40	15
	Large (16-64mm):		25
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	30	10
Bedrock	Blder cobble (>256mm):		10
		20	20

D90 (cm): 25 Compaction: Medium

Cover

Cover Total %: 40 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
5	10	5	0	50	30

 Crown Closure %: 35 Aspect: SW

Banks

Height (m): 0.4
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: FC
 Valley: Channel Ratio 2-5
 Stage: L Flood Signs Ht(m): 0.4
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 3.0 O2 (ppm):
 Turb. (cm): 19 Cond. (µmhos):

Discharge

Wetted Width (m): 0.5 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.15 F
 Discharge (m3/s): 0.01 F

Reach Symbol

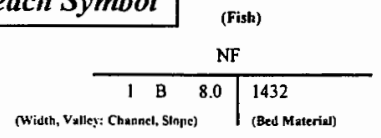




Photo #: R-9-22, 1996/09/28
Site #: R148, Looking upstream, moss-covered bedrock.



Photo #: R-9-23, 1996/09/28
Site #: R148, Looking downstream.



Location: RYAN 149, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-7900-000-000-000-000-000-000-000-0

Map #: Reach Length (km): Date: Time: Agency: Access: Fish Card: Field Historical
 U.T.M.: Length surveyed (m): Survey Crew: RH\J\ \ \ \ \ \ \ \ \ \ \ Photos: Air Photos:

Channel Characteristics

Av. Chan. Width (m):
 Av. Wet. Width (m):
 Av. Max Riffle Depth (cm):
 Av. Max Pool Depth (cm):
 Gradient (%):
 Pool: Riffle: Run: Other:
 % Side Channel:
 % Debris Area:
 %Stable:

Specific Data

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	35	10
	Large (16-64mm):		25
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	50	20
Bedrock	Bllder cobble (>256mm):		10
		5	5

D90 (cm): Compaction: Medium

Cover

Cover Total %:

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
5	10	15	0	50	20

Crown Closure %: Aspect:

Discharge

Wetted Width (m):
 Mean Depth (m):
 Mean Velocity (m/s):
 Discharge (m³/s):

Reach Symbol

(Fish)
NF

1	C	10.0	1351
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(Width, Valley: Channel, Slope) (Bed Material)

Banks

Height (m):
 % Unstable:
 Fines Gravels Larges Bedrock

Confinement:
 Valley: Channel Ratio
 Stage: Flood Signs Ht(m):
 Bars (%): pH: Braided:
 Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Comments

C1: S6
 C2: The side slopes were not evaluated at this site.
 C3: No fisheries sensitive zones were noted at this site.
 C4: This site was not electrofished.
 C5: Lat N 55 00' 44.6", Long W 127 10' 13.1"
 C6: Fines and larges make up the bank texture at this site.
 C7: Water quality was not evaluated at this site. The mean air temperature on this day was 10.5°C
 C8: Overstream vegetation and cutbanks are the predominant forms of cover at this site.
 C9: This discharge was estimated at .005 cubic meters per second.

Location: Y267, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 000-9400-000-000-000-000-000-000-000-

Map #: 93 M 005 Reach Length (km): 1.7 MW Date: 15-Sep-97 Time: 12:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.622429.6101389 Length surveyed (m): 100.0 GE Survey Crew: JP\VC\ \ \ \ \ \ \ \ \ \ \ Photos: Y-32-14,15,16 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.8 MS
 Av. Wet. Width (m): 0.8 MS
 Av. Max Riffle Depth (cm): 7 MS
 Av. Max Pool Depth (cm): 28 MS
 Gradient (%): 9.0 CL
 Pool: 10 Riffle: 20 Run: 60 Other: 10
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 0 GE

Specific Data

1.0	0.4	0.8	0.8	1.3	0.4
1.0	0.4	0.8	0.8	1.3	0.4
9	7	4	10	5	
20	22	48	21	31	

Obstructions

C	Height (m)	Type	Location
	1	C	0.0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6
- C2: LS = 38%, RS = 34%
- C3: No fisheries sensitive zones present.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 1-5-500V, was 111 seconds over 100 meters.
- C5: Fines, gravels and larges make up the bank texture at this site.
- C6: DO was not measured, the water was clear to the bottom. The air temperature at this site was 6.C.
- C7: This reach has a lot of good cover, including deep pools and deeply undercut banks. Potential spawning habitat was also noted. However, this tributary is located above a 30 m falls and a 10 m falls on the mainstem.

Cover

Cover Total %: 40 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
20	0	10	0	30	40

 Crown Closure %: 0 Aspect: N

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	50	25
	Large (16-64mm):		25
	Sm. cobble (64-128mm):		15
Larges	Lge cobble (128-256mm):	40	15
	Bldr cobble (>256mm):		10
Bedrock		0	0

D90 (cm): 32 Compaction: High

Discharge

Wetted Width (m): 0.7 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.56 F
 Discharge (m3/s): 0.03 F

Banks

Height (m): 0.1
 % Unstable: 20
 Fines Gravels Larges Bedrock
 Confinement: FC
 Valley: Channel Ratio 2-5
 Stage: M Flood Signs H(m): 0
 Bars (%): 0 pH: 7.8 Braided: Y
 Water Temp. (°C): 5.5 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 60

Reach Symbol

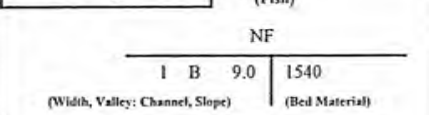




Photo #: Y-32-14, 15/09/97

Site #: Y267, Looking upstream, note steep gravel right bank



Photo #: Y-32-15, 15/09/97

Site #: Y267, Looking downstream, note heavy willow cover



Photo #: Y-32-16, 15/09/97
Site #: Y267, Looking upstream at the channel



Location: W99, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 110-0500-000-000-000-000-000-000-000-000

Map #: 93 M 004 Reach Length (km): 1.8 MA Date: 23-Jul-97 Time: 10:10 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9 .6137 .61017 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ \ \ Photos: W-11-13,14 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.8 MS
 Av. Wet. Width (m): 2.7 MS
 Av. Max Riffle Depth (cm): 9 MS
 Av. Max Pool Depth (cm): 34 MS
 Gradient (%): 2.0 CL
 Pool: 35 Riffle: 30 Run: 35 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 5-15 GE
 % Stable: 70 GE

Specific Data

1.9	2.8	3.4	4.2	2.7	1.9
1.8	3.0	2.9	4.0	3.0	1.6
8	9	8	6	12	9
27	31	35	30	34	46

Obstructions

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	40	20
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	30	10
	Blder cobble (>256mm):		10
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
30	40	10	0	5	15

 Crown Closure %: 5 Aspect: SW

D90 (cm): 31 Compaction: Medium

Comments

- C1: S6
- C2: LS=20%, RS=18%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 400V, was 311 seconds over 100 meters.
- C5: No additional bank texture information.
- C6: DO, pH and conductivity were not measured at this site, the water was clear to bottom. The mean air temperature on this day was 11.1 C.
- C7: This stream runs through a large cutblock which was logged to the banks. Evidence of slash burning was noted. Instream LOD derived from logging activities has created step-pool habitat. Overstream vegetation cover is limited. Spawning substrate was noted. The cutblock has been replanted.

Discharge

Wetted Width (m): 2.0 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.85 F
 Discharge (m3/s): 0.13 F

Banks

Height (m): 0.1
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: CO
 Valley: Channel Ratio 2-5
 Stage: M Flood Signs Ht(m): 0.4
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 6.0 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)
 NF

3	B	2.0	3430
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 (Width, Valley: Channel, Slope) (Bed Material)



Photo #: W-11-13, 23-Jul-97

Site #: W99, Looking upstream at the channel, note the abundant instream LOD



Photo #: W-11-14, 23-Jul-97

Site #: W99, Looking downstream at the channel



Location: W101, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 002-5200-000-000-000-000-000-000-000-000

Map #: 93 M 004 Reach Length (km): 0.8 MA Date: 23-Jul-97 Time: 12:44 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9.6102 .60995 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-11-17,18,19 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.2 MS
 Av. Wet. Width (m): 1.1 MS
 Av. Max Riffle Depth (cm): 3 MS
 Av. Max Pool Depth (cm): 24 MS
 Gradient (%): 2.0 CL
 Pool: 15 Riffle: 50 Run: 35 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: GE

Specific Data

4.4	1.9	2.6	1.5	1.5	1.2
2.0	1.2	1.0	0.6	0.9	1.2
2	3	2	3	6	4
25	12	35	12	40	22

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1 S3.
- C2 LS= 8%, RS= 7%
- C3 No fisheries sensitive zones noted.
- C4 The electroshocking effort, using a Smithroot 12 B POW model set at 400V, was 247 seconds over 200 meters. No fish were caught. The shocking was difficult because of the low water level.
- C5 No additional bank texture information.
- C6 DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 11.1 C.
- C7 This stream could provide rearing habitat at higher flows. Cover consists mainly of pools, boulders and cutbanks. Minnow trapping the lake upstream is recommended. A 1.3m falls was observed.

Cover Cover Total % : 15 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
10	20	0	0	40	30

 Crown Closure % : 40 Aspect : W

Bed Material

Fines	Clay, silt, sand (<2mm):	20	20
Gravels	Small (2-16mm):	30	10
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		30
	Lge cobble (128-256mm):	50	15
	Blder cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 15 Compaction: Medium

Discharge

Wetted Width (m) : 0.8 MS
 Mean Depth (m) : 0.1 MS
 Mean Velocity (m/s) : 0.20 F
 Discharge (m3/s) : 0.01 F

Banks

Height (m): 0.2
 % Unstable: 40
 Fines Gravels Larges Bedrock
 Confinement: CO
 Valley : Channel Ratio 2-5
 Stage: L Flood Signs Ht(m): 1.2
 Bars (%): 20 pH: Braided: N
 Water Temp. (°C): 10.0 O2 (ppm):
 Turb. (cm): 27 Cond. (µmhos):

Reach Symbol

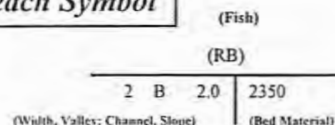




Photo #: W-11-17, 23-Jul-97
Site #: W101, Looking at small falls through devil's club



Photo #: W-11-18, 23-Jul-97
Site #: W101, Looking downstream at the channel



Photo #: W-11-19, 23-Jul-97
Site #: W101, Looking upstream at the channel



Location: W282, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 000-9200-000-000-000-000-000-000-000-000-

Map #: 93 M 005 Reach Length (km): 1.6 MA Date: 15-Sep-97 Time: 12:25 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6222 .61016 Length surveyed (m): 100.0 GE Survey Crew: DD\JP \ \ \ \ \ \ \ \ \ \ Photos: W-R-16,17,18 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.1 MS
 Av. Wet. Width (m): 1.3 MS
 Av. Max Riffle Depth (cm): 3 MS
 Av. Max Pool Depth (cm): 31 MS
 Gradient (%): 7.0 CL
 Pool: 20 Riffle: 20 Run: 60 Other: 0
 % Side Channel: GE
 % Debris Area: 0 GE
 % Stable: 0 GE

Specific Data

0.9	1.2	1.1	1.5	1.2	1.0
1.1	1.3	1.1	1.5	1.3	1.4
2	2	3	4	3	4
40	25	23	34	19	43

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6. This site is located above a 30 meter falls and a 10 meter falls on the mainstem of Causqua Creek.
- C2: LS = 10%, RS = 25%
- C3: No fisheries sensitive zones present.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at J -4-800V, was 346 seconds over 100 meters.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to the bottom. The air temperature at this site was 2.C.
- C7: Some rearing habitat was observed at this site, however the series of barriers downstream on the Causqua mainstem likely prevent fish migration upstream to this area.

Cover

Cover Total %: 25 GE

Pool	LOD	Bldr	In Veg	O Veg	Cfbnk
30	0	50	0	0	20

Crown Closure %: 0 Aspect: S

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	30	10
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	70	30
	Blder cobble (>256mm):		20
Bedrock		0	0

D90 (cm): 33 Compaction: Medium

Discharge

Wetted Width (m): 1.5 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.55 F
 Discharge (m3/s): 0.06 F

Banks

Height (m): 0.1
 % Unstable: 10
 Fines Gravels Larges Bedrock
 Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: H Flood Signs Ht(m): 0.3
 Bars (%): 0 pH: 7.2 Braided: N
 Water Temp. (°C): 2.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 30

Reach Symbol

(Fish)

NF

1 B 7.0 | 0370

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: W-R-16, 15-Sep-97

Site #: W282, Looking upstream at a 30m falls/barrier on Causqua Creek mainstem



Photo #: W-R-17, 15-Sep-97

Site #: W282, Looking upstream at the channel



Photo #: W-R-18, 15-Sep-97

Site #: W282, Looking downstream at the channel, note the willow cover



Location: W283, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 000-9100-000-000-000-000-000-000-000-000-

Map #: 93 M 005

Reach Length (km): 1.5 MA

Date: 15-Sep-97

Time: 13:00

Agency: TEC

Access: H

Fish Card: N

Field Historical

U.T.M.: 9.6199 .61016

Length surveyed (m): 150.0 GE

Survey Crew: DDVP \ \ \ \ \

Photos: W-R-19-20

Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.0 MS

Av. Wet. Width (m): 1.0 MS

Av. Max Riffle Depth (cm): 2 MS

Av. Max Pool Depth (cm): 28 MS

Gradient (%): 8.0 CL

Pool: 20 Riffle: 10 Run: 30 Other: 40

% Side Channel: GE

% Debris Area: 0 GE

% Stable: 0 GE

Specific Data

1.0	0.7	1.0	1.2	1.2	0.9
1.6	0.8	0.8	0.9	1.1	0.8
3	3	2	2	1	2
43	10	15	21	59	23

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6. This site is located above a 30 meter falls and a 10 meter falls on the Causqua Creek mainstem.
- C2: LS = 35%, RS = 45%
- C3: No fisheries sensitive zones present.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at J-4-600V, was 277 seconds over 150 meters.
- C5: Larges and fines make up the bank texture at this site.
- C6: DO was not measured at this site, the water was clear to the bottom. The air temperature at this site was 2.C.
- C7: Some deep pool and boulder rearing cover was observed at this site.

Cover

Cover Total %: 15 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
40	0	50	0	0	10

Crown Closure %: 0 Aspect: N

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	10	5
	Large (16-64mm):		5
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	70	30
	Blder cobble (>256mm):		20
Bedrock		20	20

D90 (cm): 0 Compaction: High

Discharge

Wetted Width (m): 0.61 MS

Mean Depth (m): 0.1 MS

Mean Velocity (m/s): 0.57 F

Discharge (m3/s): 0.03 F

Banks

Height (m): 0.1

% Unstable: 10

Fines Gravels Larges Bedrock

Confinement: CO

Valley: Channel Ratio 0-2

Stage: M Flood Signs Ht(m): 0.3

Bars (%): 0 pH: 7.7 Braided: N

Water Temp. (°C): 2.0 O2 (ppm):

Turb. (cm): Cond. (µmhos): 50

Reach Symbol

(Fish)

NF

I A 8.0 0172

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: W-R-19, 15-Sep-97
Site #: W283, Looking upstream at the channel



Photo #: W-R-20, 15-Sep-97
Site #: W283, Looking downstream at the channel

5.3 Gramophone Creek (460-2238-000) (93 L 094, 93 L 095, 93 M 005)

5.3.1 Sensitive Habitats and Barriers

The mainstem of Gramophone Creek is 14.6 km in length and is fed by 14 tributaries. Gramophone Creek has low gradient and is unconfined in reach 1. Reach 2 has moderate gradient and is quite confined and reach 3 has moderately steep gradient. Wetlands identified as fisheries sensitive zones, occur in the headwaters of the mainstem and four of the tributaries. No barriers to fish migration were noted in this system. Gramophone Creek was sampled at 14 locations, including reaches 1 and 2 of the mainstem.

5.3.2 Fish Summary Tables and Stream Classification

The historical records indicate the presence of rainbow trout and steelhead at the mouth. Spawning steelhead have been recorded well into reach one of Gramophone Creek. Six sites were electrofished in this watershed and rainbow trout were caught at 2 sites, one in an unnamed tributary to reach 2, and the other in reach 1 of the mainstem. Gramophone Creek was classified as an S2 in reach one, based on an average channel width of 6.1 meters and the presence of rainbow trout in the sampling area. It was classified as an S4 in reach 3 based on an average channel width of 1.4 meters and the observation of suitable fish habitat. One large tributary to reach 2 of the main creek, sampled at J272, was classified as an S2, based on an average channel width of 5.50 meters and the presence of rainbow trout in the sampling area. No fish were caught above reach 2, suggesting the presence of a barrier in that reach. The remaining tributaries range in size from S3 to S6 with some reaches identified as "NC" based on the absence of defined channels in the locations specified on the TRIM sheets.

Gramophone Cr.



Location: RYAN 103, Unit 7, upstream of block C15, see C5.

Stream (Gaz.): Gramophone Creek

Watershed Code: 460-2238-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 4.7 MA Date: 24-Sep-96 Time: 10:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6191 60979 Length surveyed (m): 250.0 GE Survey Crew: RH UL \ \ \ \ \ \ \ \ \ \ Photos: R-6-12,13 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.4 MS
 Av. Wet. Width (m): 1.1 MS
 Av. Max Riffle Depth (cm): 9 MS
 Av. Max Pool Depth (cm): 26 MS
 Gradient (%): 6.0 CL
 Pool: 15 Riffle: 70 Run: 15 Other: 0
 % Side Channel: GE
 % Debris Area: 0.5 GE
 % Stable: 0 GE

Specific Data

1.3	1.2	1.4	1.1	1.7	1.7
1.1	1.0	1.0	1.1	1.1	1.2
12	8	7			
17	24	37			

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	80	25
	Large (16-64mm):		55
	Sm. cobble (64-128mm):		5
Larges	Lge cobble (128-256mm):	15	5
	Blder cobble (>256mm):		5
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1 S4
- C2 LS = 10%, RS = 6%
- C3 No fisheries sensitive zones were noted at this site.
- C4 The electroshocking effort, using a 12 B POW model was 700 seconds over 400 meters.
- C5 Lat N 55 00' 59.1", Long W 127 08' 14.8"
- C6 No additional bank texture information.
- C7 DO, pH and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C.
- C8 Some good spawning and rearing habitat was observed at this site.

Cover

Cover Total %: 35 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
5	5	5	0	20	65

Crown Closure %: 30 Aspect: W

Discharge

Wetted Width (m): 0.6 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.10 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.3
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: UC

Valley : Channel Ratio 10+

Stage: L Flood Signs Ht(m): 0.3

Bars (%): 10 pH: 7.8 Braided: N

Water Temp. (°C): 10.0 02 (ppm):

Turb. (cm): 37 Cond. (µmhos): 90

Reach Symbol

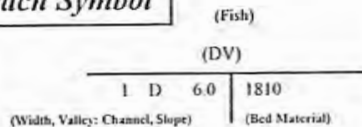




Photo #: R-6-12, 1996/09/24

Site #: R103, Looking upstream, cutbank cover habitat.

Location: RYAN 138, Unit 7, .5km East of Bulkley River, see C5.

Stream (Gaz.): Gramophone Creek

Watershed Code: 460-2238-000-000-000-000-000-000-000-0

Map #: 93 L 094 Reach Length (km): 5.5 MA Date: 27-Sep-96 Time: 16:30 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6126 .60940 Length surveyed (m): 100.0 GE Survey Crew: RHJL \ \ \ \ \ \ \ \ \ \ Photos: R-9-3,4,5 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 6.1 MS
 Av. Wet. Width (m): 3.3 MS
 Av. Max Riffle Depth (cm): 17 MS
 Av. Max Pool Depth (cm): 28 MS
 Gradient (%): 2.0 CL
 Pool: 10 Riffle: 80 Run: 10 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0.5 GE
 %Stable: 90 GE

Specific Data

6.1	5.7	4.8	7.2	6.9
2.8	2.7	3.6	3.2	4.0
17	18	17		
28	24	32		

Obstructions

C	Height (m)	Type	Location

Cover

Cover Total %: 35 GE

Pool	LOD	Bldr	In Veg	O Veg	Cfbnk
5	5	40	0	45	5

 Crown Closure %: 40 Aspect: W

Bed Material

	Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):		20	5
	Large (16-64mm):			15
	Sm. cobble (64-128mm):			15
Larges	Lge cobble (128-256mm):		75	30
	Bldr cobble (>256mm):			30
Bedrock			0	0

D90 (cm): 35 Compaction: Medium

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	RB	7	80-120	J	R			EL

Comments

- C1: S2
- C2: LS = 10%, RS = 20%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a Smithroot 15 A model was 40 seconds over 165 square meters.
- C5: Lat N 54 58' 48.6", Long w 127 14' 25.9"
- C6: No additional bank texture information.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
- C8: Boulder and overstream vegetation cover are prevalent at this site.

Discharge

Wetted Width (m): 2.1 MS
 Mean Depth (m): 0.2 MS
 Mean Velocity (m/s): 0.15 F
 Discharge (m3/s): 0.05 F

Banks

Height (m): 1.0
 % Unstable: 5
 Fines Gravels Larges Bedrock
 Confinement: FC
 Valley: Channel Ratio 2-5
 Stage: M Flood Signs Ht(m): 2
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 8.0 O2 (ppm):
 Turb. (cm): 32 Cond. (µmhos):

Reach Symbol

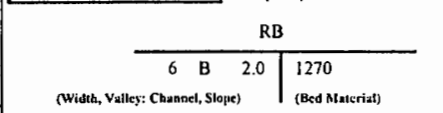




Photo #: R-9-3, 1996/09/27
Site #: R138, Rainbow trout caught by electrofishing.



Photo #: R-9-4, 1996/09/27
Site #: R138, Looking downstream, boulder cover.



Photo #: R-9-5, 1996/09/27

Site #: R138, Looking upstream toward bridge.

DFO/MoELP Stream Survey Form

Site Number: RYAN 104

Reach No.: 1

Trib. to Gramophone Cr.



Location: RYAN 104, Unit 7, East of block C15, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-7500-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.3 MA Date: 24-Sep-06 Time: 11:25 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6191 60976 Length surveyed (m): 300.0 GE Survey Crew: RH UL \ \ \ \ \ \ \ \ \ \ Photos: R-6-14,15 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.9 MS
 Av. Wet. Width (m): 0.5 MS
 Av. Max Riffle Depth (cm): 2 MS
 Av. Max Pool Depth (cm): 6 MS
 Gradient (%): 8.0 CL
 Pool: 10 Riffle: 60 Run: 30 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5-15 GE
 % Stable: 50 GE

Specific Data

1.3	1.0	0.8	0.6	0.7	1.3
0.4	0.7	0.3	0.4	0.7	0.3
4	1				
6	6	7			

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
	Sm. cobble (64-128mm):		20
Larges	Lge cobble (128-256mm):	50	20
	Bldr cobble (>256mm):		10
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Cover

Cover Total %: 60 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	20	20	0	40	10

Crown Closure %: 80 Aspect: NW

D90 (cm): 27 Compaction: Medium

Discharge

Wetted Width (m): 0.3 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.13 F
 Discharge (m³/s): 0.00 F

Banks

Height (m): 0.1
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: UC
 Valley: Channel Ratio 10+
 Stage: L Flood Signs H(m): 0.1
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 2.0 O2 (ppm):
 Turb. (cm): 7 Cond. (µmhos):

Reach Symbol

(Fish)

NF

1 D 8.0 3250

(Width, Valley: Channel, Slope)

(Bed Material)

Comments

- C1: S6
- C2: LS = 11%, RS = 7%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished due to the low flow present in the channel at the time of sampling. This site should be electrofished at higher flows.
- C5: Lat N 55 00' 41", Long w 127 08' 11"
- C6: No additional bank texture information.
- C7: DO, pH and conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
- C8: The channel moves underground in several areas, creating a number of barriers to fish passage upstream.



Photo #: R-6-15, 1996/09/24
Site #: R104, Looking upstream.

Location: RYAN 105, Unit 7, East of block C15, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-7300-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.7 MA Date: 24-Sep-96 Time: 12:00 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6192 60964 Length surveyed (m): 200.0 GE Survey Crew: RH\JL \ \ \ \ \ \ \ \ \ \ Photos: R-6-16,17 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.9 MS
 N Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 15.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: >15 GE
 % Stable: 80 GE

Specific Data

0.9 0.7 0.5 1.5 1.3 0.7

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	60	60
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	20	5
	Bldr cobble (>256mm):		5
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Cover

Cover Total %: 30 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
30	20	20	0	30	0

Crown Closure %: 80 Aspect: W

Banks

Height (m): 0.2

% Unstable: 0

Fines Gravels Larges Bedrock

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Confinement: OC

Valley: Channel Ratio 5-10

Stage: Dry Flood Signs Ht(m): 0.2

N Bars (%): 0 pH: Braided: N

N Water Temp. (°C): O2 (ppm):

Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)

NF

1 C 15.0 6220

(Width, Valley: Channel, Slope)

(Bed Material)

Comments

- C1: S6
- C2: LS = 14%, RS = 12%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This dry site was not electrofished.
- C5: Lat N 55 00' 20", Long W 127 08' 10"
- C6: No additional bank texture information.
- C7: Water quality could not be evaluated at this dry site. The mean air temperature on this day was 5.5°C
- C8: This channel frequently moves underground, presenting numerous barriers to fish passage upstream.



Photo #: R-6-17, 1996/09/24
Site #: R105, Looking downstream.



Location: RYAN 106, Unit 7, East of block 036-9, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 000-7600-000-000-000-000-000-000-000-0

 Map #: 93 M 005 Reach Length (km): 2.8 MA Date: 24-Sep-96 Time: 14:15 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6164 60964 Length surveyed (m): 250.0 GE Survey Crew: RHJL \ \ \ \ \ \ \ \ \ \ Photos: R-6-18,19 Air Photos:
Channel Characteristics
 Av. Chan. Width (m): 2.1 MS
 Av. Wet. Width (m): 1.4 MS
 Av. Max Riffle Depth (cm): 8 MS
 Av. Max Pool Depth (cm): 23 MS
 Gradient (%): 13.0 CL
 Pool: 20 Riffle: 50 Run: 30 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: 5 GE
Specific Data

2.2	3.1	1.9	1.3	2.3	1.8
1.4	2.5	1.0	0.9	0.9	1.7
10	6	8			
28	17	25			

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	70	35
	Large (16-64mm):		35
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	20	5
	Blder cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 24 Compaction: Medium

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S3
 C2: LS = 37%, RS = 47%
 C3: No fisheries sensitive zones were noted at this site.
 C4: The electroshocking effort, using a 12 B POW model was 810 seconds over 300 meters.
 C5: Lat N 55 00' 12.3", Long W 127 10' 50.6"
 C6: No additional bank texture information.
 C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
 C8: Some nice step pool habitat was observed at this site.

Cover

Cover Total %: 30 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
30	10	10	0	20	30

 Crown Closure %: 45 Aspect: SW
Discharge
 Wetted Width (m): 0.5 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.22 F
 Discharge (m3/s): 0.01 F
Banks

Height (m): 0.2

% Unstable: 0

Fines Gravels Larges Bedrock

Confinement: FC

Valley: Channel Ratio 2-5

Stage: L Flood Signs Ht(m): 0.2

Bars (%): 5 pH: 7.2 Braided: N

Water Temp. (°C): 3.0 02 (ppm):

Turb. (cm): 28 Cond. (µmhos):

Reach Symbol

(Fish)

(DV)

2 B 13.0 | 1720

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: R-6-18, 1996/09/24
Site #: R106, Looking upstream.



Photo #: R-6-19, 1996/09/24
Site #: R106, Looking downstream, LOD and pool.

DFO/MoELP Stream Survey Form

Site Number: RYAN 107

Reach No.: 1

Trib. to Gramophone Cr.



Location: RYAN 107, Unit 7, East of block 036-9, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2238-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.5 MA Date: 24-Sep-96 Time: 14:35 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6164 .60964 Length surveyed (m): 200.0 GE Survey Crew: RH UL \ \ \ \ \ \ \ \ Photos: None Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.8 MS
 Av. Wet. Width (m): 1.1 MS
 Av. Max Riffle Depth (cm): 8 MS
 Av. Max Pool Depth (cm): 30 MS
 Gradient (%): 12.0 CL
 Pool: 20 Riffle: 55 Run: 25 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0.5 GE
 % Stable: 10 GE

Specific Data

3.1	3.0	2.7	2.6	2.9	2.2
0.6	1.1	0.4	1.5	1.0	1.7
5	8	10			
36	34	20			

Obstructions

C	Height (m)	Type	Location

Bed Material

	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	65	25
	Large (16-64mm):		40
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	30	10
Bedrock	Blder cobble (>256mm):		10
		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				El.

Comments

- C1: S3
- C2: LS = 38%, RS = 50%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a 12 B POW model was 810 seconds over 300 meters.
- C5: Lat N 55 00' 12.3", Long W 127 10' 50.6"
- C6: No additional bank texture information.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
- C8: Step pool habitat is abundant at this site.

Cover

Cover Total % : 30 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
30	10	10	0	20	30

 Crown Closure % : 50 Aspect : S
 D90 (cm): 25 Compaction: Medium

Discharge

Wetted Width (m): 0.4 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.09 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.3
 % Unstable: 0
 Fines Gravels Larges Bedrock

Reach Symbol

(Fish)
 (DV)
 3 B 12.0 | 1630
 (Width, Valley: Channel, Slope) | (Bed Material)

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: L Flood Signs H(m): 0.3
 Bars (%): 10 pH: Braided: N
 Water Temp. (°C): 3.5 02 (ppm):
 Turb. (cm): 36 Cond. (µmhos):



Location: ARNE 34, Unit 7, downstream of block 375-8, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2238-003-940-065-600-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 2.5 MA Date: 24-Sep-96 Time: 13:48 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6173 .60939 Length surveyed (m): 200.0 GE Survey Crew: AKL HKV \ \ \ \ \ Photos: A-4-6,7 Air Photos:

Channel Characteristics**Specific Data**

Av. Chan. Width (m): 0.9 MS
 Av. Wet. Width (m): 0.7 MS
 N Av. Max Riffle Depth (cm): 0 MS
 Av. Max Pool Depth (cm): 5 MS
 Gradient (%): 8.0 CL
 Pool: 50 Riffle: 0 Run: 50 Other: 0
 % Side Channel: GE
 % Debris Area: 10 GE
 % Stable: 90 GE

1.0	0.4	0.9	1.1	1.0	0.8
0.6	0.3	0.7	0.8	1.0	0.8
3	5	2	6	10	

Bed Material

Fines	Clay, silt, sand (<2mm):	60	60
Gravels	Small (2-16mm):	20	15
	Large (16-64mm):		5
	Sm. cobble (64-128mm):		10
Larges	Lge cobble (128-256mm):	20	10
	Blder cobble (>256mm):		0
Bedrock		0	0

D90 (cm): 14 Compaction: Low

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	20	10	0	20	50

Crown Closure %: 65 Aspect: SW

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m³/s):

Reach Symbol

(Fish)

(RB)

1 E 8.0 6220

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m): 0.3

% Unstable: 0

Fines Gravels Larges Bedrock

Confinement: N/A

Valley: Channel Ratio N/A

Stage: L Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 3.0 02 (ppm):

Turb. (cm): 10 Cond. (µmhos):

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Comments

- C1: S4
 C2: LS = 5%, RS = 3%
 C3: No fisheries sensitive zones were noted at this site.
 C4: This site was not electrofished as there was no habitat to shock.
 C5: Lat N 54 58' 41.5", Long W 127 10' 01.8"
 C6: No additional bank texture information.
 C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
 C8: Very poor fish habitat was observed at this site, which drains a swamp. However rainbow trout were caught downstream of the area. The recently installed road and cutblock 375-8, do not appear to be impacting on the stream.



Photo #: A-4-6, 24-Sep-96
Site #: A34, Looking upstream.



Photo #: A-4-7, 24-Sep-96
Site #: A34, Looking downstream.

Location: ARNE 35, Unit 7, West of block 375-9, see C5. Stream (Gaz.): Unnamed Watershed Code: 001-0200-000-000-000-000-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 3.7 MA Date: 24-Sep-96 Time: 14:35 Agency: TEC Access: V2 Fish Card: N Field Historical

U.T.M.: 9 6180 60959 Length surveyed (m): 200.0 HC Survey Crew: AKL\JK\ \ \ \ \ \ \ \ \ \ \ Photos: A-4-8,9 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.1 MS
 Av. Wet. Width (m): 0.9 MS
 Av. Max Riffle Depth (cm): 2 MS
 Av. Max Pool Depth (cm): 16 MS
 Gradient (%): 3.0 CI
 Pool: 20 Riffle: 20 Run: 60 Other: 0
 % Side Channel: GE
 % Debris Area: 10 GE
 % Stable: 90 GE

Specific Data

0.6	1.4	1.2	1.2	1.4	0.8
0.5	1.5	0.9	0.9	1.0	0.8
4	1	2			
20	20	14	11		

Obstructions

C	Height (m)	Type	Location

Bed Material

	Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):		60	20
	Large (16-64mm):			40
	Sm. cobble (64-128mm):			20
Larges	Lge cobble (128-256mm):		30	10
	Blder cobble (>256mm):			0
Bedrock			0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 60 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	15	5	10	10	60

Crown Closure %: 30 Aspect: SW

D90 (cm): 15 Compaction: Medium

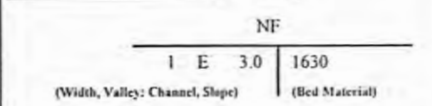
Discharge

Wetted Width (m): 0.3 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.18 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.4
 % Unstable: 0
 Fines Gravels Larges Bedrock

Reach Symbol



Confinement: N/A
 Valley: Channel Ratio N/A
 Stage: L Flood Signs Ht(m): 0.1
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 3.0 O2 (ppm):
 Turb. (cm): 20 Cond. (µmhos):

Comments

- C1: S6
- C2: The side slopes were not evaluated at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was electroshocked for 91 seconds with a Smithroot 15 A model.
- C5: Lat N 54 59' 45.5", Long w 127 09' 19.5"
- C6: No additional bank texture information.
- C7: DO, conductivity and pH, were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
- C8: Marginal to poor fish habitat was observed at this site. No overwintering or spawning habitat was seen in the sampling area. The tributaries to this mainstem are not creeks. This stream is significant only in that it feeds systems lower down in the watershed.



Photo #: A-4-8, 24-Sep-96
Site #: A35, Looking upstream.



Photo #: A-4-9, 24-Sep-96
Site #: A35, Looking downstream.



Location: RYAN 136, Unit 7, 2.1 km East of the Bulkley River, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2238-000-000-000-000-000-000-000-0

Map #: 93 L 094 Reach Length (km): 4.3 MA Date: 27-Sep-96 Time: 15:10 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6100 .60926 Length surveyed (m): 150.0 GE Survey Crew: RH\JL \ \ \ \ \ \ \ \ \ \ Photos: None Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.7 MS
 Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 8.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 80 GE

Specific Data

2.2	2.0	1.2	2.1	1.1	1.6
-----	-----	-----	-----	-----	-----

Obstructions

C	Height (m)	Type	Location

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	10	5	15	70	0

Crown Closure %: 70 Aspect: E

Bed Material

	Clay, silt, sand (<2mm):		
Fines		40	40
Gravels	Small (2-16mm):	45	25
	Large (16-64mm):		20
	Sm. cobble (64-128mm):		5
Larges	1ge cobble (128-256mm):	15	5
	Bldr cobble (>256mm):		5
Bedrock		0	0

D90 (cm): 26 Compaction: Low

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

C1: S3
 C2: LS = 7%, RS = 10%
 C3: No fisheries sensitive zones were noted at this site.
 C4: This dry site was not electrofished.
 C5: Lat N 54 58' 5.5", Long W 127 16' 51.5"
 C6: No additional bank texture information.
 C7: Water quality was not evaluated at this site. The mean air temperature on this day was 13.8°C
 C8: This stream runs through an agricultural area. Cattle tracks were noted in the sampling area.

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.2
 % Unstable: 5
 Fines Gravels Larges Bedrock

Confinement: U/C
 Valley : Channel Ratio 10+
 Stage: Dry Flood Signs Hit(m): 0.2
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)
 (RB)
 2 D 8.0 4510
 (Width, Valley: Channel, Slope) (Bed Material)

Location: RYAN 166, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-3700-000-000-000-000-000-000-000-0

Map #: 93 L 094 Reach Length (km): 0.4 MA Date: 30-Sep-96 Time: 16:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6135 60943 Length surveyed (m): 350.0 GE Survey Crew: RHJL \ \ \ \ \ \ \ \ \ \ Photos: R-11-1,2 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.2 MS
 Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 11.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 N % Side Channel: 0 GE
 N % Debris Area: >15 GE
 %Stable: 90 GE

Specific Data

2.2 2.4 1.9 2.4 2.0 2.3

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	30	10
	Large (16-64mm):		20
	Sm. cobble (64-128mm):		25
Larges	1ge cobble (128-256mm):	70	25
	Blder cobble (>256mm):		20
Bedrock		0	0
D90 (cm):	40	Compaction: Medium	

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Cover

N Cover Total %: 0 GE
 Pool LOD Bldr In Veg O Veg Ctnk
 N 0 0 0 0 0 0
 Crown Closure %: 40 Aspect: SW

Comments

- C1: S3
- C2: LS = 40%, RS = 50%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This dry site was not electrofished.
- C5: Lat N 54 59' 6.5", Long w 127 13' 34.5"
- C6: No additional bank texture information.
- C7: Water quality was not evaluated at this site.
- C8: The channel disappears upstream of the site into a boggy forest.

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.5
 % Unstable: 10
 Fines Gravels Larges Bedrock
 Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: Dry N Flood Signs Ht(m): 0
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)
 (RB)
 2 C 11.0 0370
 (Width, Valley: Channel, Slope) (Bed Material)



Photo #: R-11-1, 1996/09/30
Site #: R166, Looking downstream.



Photo #: R-11-2, 1996/09/30
Site #: R166, Looking upstream.

Location: RYAN 167, Unit 7, in the middle of block 079-1, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2238-003-940-039-500-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 2.9 MA Date: 30-Sep-96 Time: 17:15 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6161 60943 Length surveyed (m): 150.0 GE Survey Crew: RH\JL \ \ \ \ \ \ \ Photos: R-11-3,4 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.0 MS
 Av. Wet. Width (m): 0.7 MS
 Av. Max Riffle Depth (cm): 6 MS
 Av. Max Pool Depth (cm): 10 MS
 Gradient (%): 15.0 CL
 Pool: 5 Riffle: 20 Run: 75 Other: 0
 % Side Channel: GE
 % Debris Area: 20 GE
 % Stable: 80 GE

Specific Data

1.2	0.6	0.5	1.5	1.2	0.9
1.0	0.6	0.5	0.8	0.8	0.3
6	5				
12	7				

Obstructions

C	Height (m)	Type	Location

Bed Material

	Fines	Clay, silt, sand (<2mm):	55	55
Gravels	Small (2-16mm):	30	20	
	Large (16-64mm):		10	
Larges	Sm. cobble (64-128mm):		5	
	Lge cobble (128-256mm):	15	5	
Bedrock	Blder cobble (>256mm):		5	
		0	0	

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Comments

- C1: S6
- C2: LS = 22%, RS = 16%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site contained too little water at the time of sampling, and has too narrow a channel, to effectively electrofish.
- C5: Lat N 54 59' 04", Long W 127 11' 07"
- C6: No additional bank texture information.
- C7: DO, pH were not measured at this site.
- C8: The channel frequently moves underground at this site.

Cover

Cover Total % : 90 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	15	5	0	65	15

 Crown Closure % : 85 Aspect : NW
 D90 (cm): 26 Compaction: Low

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.3
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: OC
 Valley : Channel Ratio 5-10
 Stage: L Flood Signs H(m): 0.3
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 5.0 O2 (ppm):
 Turb. (cm): 12 Cond. (µmhos): 100

Reach Symbol

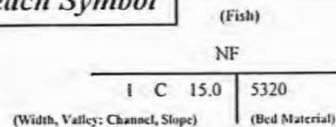




Photo #: R-11-3, 1996/09/30

Site #: R167, Looking downstream, channel through alder and willow.



Photo #: R-11-4, 1996/09/30

Site #: R167, Looking upstream.

Location: RYAN 168, Unit 7, in block 079-1, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-4100-000-000-000-000-000-000-000-0

Map #: 93 L 095 Reach Length (km): 2.4 MA Date: 30-Sep-96 Time: 17:40 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6161 .60950 Length surveyed (m): 150.0 GE Survey Crew: RH\JL \ \ \ \ \ \ \ \ Photos: None Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.0 GE
 Av. Wet. Width (m): 0.8 GE
 Av. Max Riffle Depth (cm): 6 GE
 Av. Max Pool Depth (cm): 13 GE
 Gradient (%): 12.0 CL
 Pool: 5 Riffle: 25 Run: 70 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 5-15 GE
 % Stable: 65 GE

Specific Data

[Empty box for Specific Data]

Obstructions

C	Height (m)	Type	Location

Bed Material

	Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):		40	10
	Large (16-64mm):			30
	Sm. cobble (64-128mm):			15
Larges	Lge cobble (128-256mm):		30	10
	Bllder cobble (>256mm):			5
Bedrock			0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	NF			NA				VO

Cover

Cover Total %: 50 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
0	15	5	0	60	20

 Crown Closure %: 45 Aspect: NW

D90 (cm): 25 Compaction: Medium

Comments

- C1: S4
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished as too little water was present in the channel at the time of sampling.
- C5: Lat N 54 59' 18", Long W 127 11' 07.7"
- C6: No additional bank texture information.
- C7: DO, pH were not measured at this site. The water was clear to the bottom.
- C8: Overstream vegetation and cutbanks comprise most of the fish cover at this site.

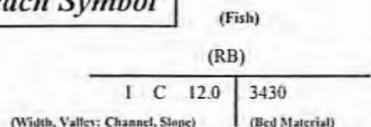
Discharge

Wetted Width (m):
 Mean Depth (m):
 Mean Velocity (m/s):
 Discharge (m3/s): 0.00

Banks

Height (m): 0.3
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: I Flood Signs Ht(m): 0.3
 Bars (%): 5 pH: Braided: N
 Water Temp. (°C): 5.0 02 (ppm):
 Turb. (cm): 13 Cond. (µmhos): 100

Reach Symbol



Location: JULIE 272, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-3600-000-000-000-000-000-000-000-0

Map #: 93 L.094 Reach Length (km): 0.8 | MW | Date: 30-Sep-96 Time: 16:20 Agency: TEC Access: 11 Fish Card: N Field Historical
 U.T.M.: 9 6137 60932 Length surveyed (m): 360.0 | IIC Survey Crew: JP\DD \ \ \ \ \ \ \ \ \ \ Photos: J-21-3,4 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.5 | MS|
 Av. Wet. Width (m): 0.0
 Av. Max Riffle Depth (cm): 0 | GE|
 Av. Max Pool Depth (cm): 0 | GE|
 Gradient (%): 20.0 | CL|
 Pool: Riffle: Run: Other:
 % Side Channel: 0 | GE|
 % Debris Area: 30 | GE|
 % Stable: 30 | GE|

Specific Data

1.4 1.8 1.8 1.5 1.5 1.0

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	30	15
	Large (16-64mm):		15
	Sm. cobble (64-128mm):		30
Larges	Lge cobble (128-256mm):	60	25
Bedrock	Blder cobble (>256mm):		5
		0	0
D90 (cm):	21	Compaction:	Low

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S6
- C2: LS=50%,RS=50%
- C3: No fisheries sensitive zones were noted in the sampling area
- C4: This dry site could not be electrofished.
- C5: Lat N 54 58' 25.1", Long W 127 13' 24.5"
- C6: No additional bank texture information
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 1.2 C
- C8: The channel was bone dry at time of sampling, and contained some twigs and woody debris.
- C9: The crew walked down the channel and took several gradient measurements which ranged from 20-30%. A large amount of LOD blowdown was observed in the channel.
- 1: Fish may move up to the bottom section for roughly 20m, but the gradient becomes too steep.

Cover

Cover Total %: 50 | GE|

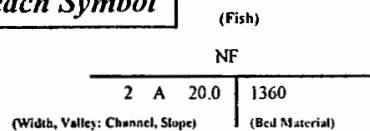
Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	20	30	0	20	30

 Crown Closure %: 20 Aspect: W

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Reach Symbol



Banks

Height (m): 0.2
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: CO
 Valley: Channel Ratio 0-2
 Stage: Dry Flood Signs Ht(m): 0.2
 Bars (%): 20 pH: Braided: Y
 Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):



Photo #: J-21-3, 1996/09/30
Site #: J272, Looking upstream in dry channel.



Photo #: J-21-4, 1996/09/30
Site #: J272, Looking downstream.

Trib to Gramophone Creek


TRITON
 Environmental Consultants Ltd.

Location: JULIE 273, Unit 7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2238-000-000-000-000-000-000-000-0

 Map #: 93 L 094 Reach Length (km): 3.5 MW Date: 30-Sep-96 Time: 17:00 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9. 6134 . 60941 Length surveyed (m): 100.0 HC Survey Crew: JP\DD \ \ \ \ \ \ \ \ \ \ Photos: J-21-5,6,7 Air Photos:
Channel Characteristics
 Av. Chan. Width (m): 5.5 MS
 Av. Wet. Width (m): 1.6 MS
 Av. Max Riffle Depth (cm): 13 MS
 Av. Max Pool Depth (cm): 29 MS
 Gradient (%): 9.0 Cl.
 Pool: 40 Riffle: 20 Run: 40 Other: 0
 % Side Channel: 10-40 GE
 % Debris Area: 10 GE
 % Stable: 60 GE
Specific Data

7.2	5.4	4.7	5.0	5.7	5.0
1.2	1.5	2.5	2.0	0.9	1.6
12	14				
23	28	37			

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
C4	RB	4	100-115	J	R			EL

Comments

- C1: S2
- C2: LS=55%, RS=55%
- C3: No fisheries sensitive zones were noted in the sampling area.
- C4: The electroshocking effort, using a 12 B POW model was 235 seconds over 40 sq. meters. Twelve rainbow trout, ranging in size from 100-120 mm were also visually observed. Fish were caught in every pool sampled. The creek appears to support a large number of rainbow trout.
- C5: Lat N 54 58' 50.2", Long W 127 13' 42.1"
- C6: No additional bank texture information.
- C7: DO measurements were not taken at this site. The water was clear to the bottom. The mean air temperature on this day was 1.2 C
- C8: The channel appears to carry high flows at certain times of the year. Large boulder/cobble/gravel bars were observed. Boulders and deep pools made up most of the cover for fish at this site.

Cover
 Cover Total %: 80 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
25	10	50	0	5	10

 Crown Closure %: 30 Aspect: SW
Bed Material

	Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	30	10	
	Large (16-64mm):		20	
	Sm. cobble (64-128mm):		20	
Larges	Lge cobble (128-256mm):	60	20	
	Bldr cobble (>256mm):		20	
Bedrock			0	0

 D90 (cm): 47 Compaction: Medium
Discharge
 Wetted Width (m): 1.0 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.20 F
 Discharge (m3/s): 0.02 F
Banks
 Height (m): 0.7
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: CO
 Valley : Channel Ratio 0-2
 Stage: M Flood Signs H(m): I
 Bars (%): 40 pH: 7.2 Braided: Y
 Water Temp. (°C): 5.0 O2 (ppm):
 Turb. (cm): 37 Cond. (µmhos): 100
Reach Symbol
 (Fish)
 RB

6	A	9.0	1360
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 (Width, Valley: Channel, Slope) (Bed Material)



Photo #: J-21-5, 1996/09/30
Site #: J273, Looking upstream, boulder cover.



Photo #: J-21-6, 1996/09/30
Site #: J273, hipchain string in photo



Photo #: J-21-7, 1996/09/30
Site #: J273, measuring RB in hand

5.4 Kwun Creek (460-1613-000) (93 M 004, 93 M 014, 93 M 015)

5.4.1 Sensitive Habitats and Barriers

The mainstem of Kwun Creek is 9.3 km in length and is fed by 10 tributaries. Reach 1 of Causqau Creek is occasionally confined with moderate gradient and reach 2 is characterized by gradually increasing gradient and confinement. Reach 3 of Kwun creek is very confined and has moderately steep gradient, which is consistent through reach 4. Reach 5 of Kwun Creek has moderate gradient and varied confinement. No sensitive habitats or barriers were identified in this system, however, steep side slopes, requiring special consideration in land use management plans, were noted in reach 3. The Kwun Creek system was sampled in 10 locations, including reaches 2 and 4 of the mainstem.

5.4.2 Fish Summary Tables and Stream Classification

No historical information exists for this creek and no fish were caught at any of the Kwun Creek sample sites, suggesting the presence of a barrier in reach 1 or 2. The system has been classified as fish bearing, as no obvious barriers were identified by field crews and suitable fish habitat was noted in the sampling areas. For example, excellent rearing habitat was described at site W144 in reach 4, however no fish were caught. Kwun Creek was classified as an S2 in reach 2 based on an average channel width of 6.8 meters and the presence of fish habitat at the sample site. This classification was consistent through reach 4 based on a slightly smaller average channel width of 5.05 meters and the presence of fish habitat on site. The tributaries to Kwun Creek range in classification from S6 to S3, with one "NC" identified in reach 5 of the mainstem. Site W285, a tributary to reach 5, was classified as an S3 based on an average channel width of 2.8 meters and the presence of rearing habitat in the sampling area.

Location: RYAN 135, Unit 7, trib to Bulkley River, see C5.

Stream (Gaz.): Kwun Creek

Watershed Code: 460-1613-000-000-000-000-000-000-000-0

Map #: 93 M 004 Reach Length (km): 3.9 MA Date: 27-Sep-96 Time: 12:25 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 .6097 .61067 Length surveyed (m): 250.0 GE Survey Crew: RH UL \ \ \ \ \ \ \ \ Photos: R-8-22.23 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 6.8 MS
 Av. Wet. Width (m): 4.2 MS
 Av. Max Riffle Depth (cm): 28 MS
 Av. Max Pool Depth (cm): 40 MS
 Gradient (%): 7.0 CL
 Pool: 20 Riffle: 75 Run: 5 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 0-5 GE
 % Stable: 20 GE

Specific Data

7.2	9.0	5.6	5.8	8.2	5.1
4.1	5.0	2.5	4.2	5.9	3.7
30	25	29			
43	30	40	49		

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S2
- C2: LS = 40%, RS = 42%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a Smithroot 15 A model was 900 seconds over 1680 square meters.
- C5: Lat N 55 05' 41.6", Long W 127 16' 51.4"
- C6: Fines, gravels and larges make up the bank texture at this site.
- C7: DO was not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
- C8: Boulder and deep pools provide most of the cover at this site.

Cover

Cover Total %: 45 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
30	10	35	0	10	15

Crown Closure %: 50 Aspect: SW

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	10	5
	Large (16-64mm):		5
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	85	10
	Blder cobble (>256mm):		65
Bedrock		0	0

D90 (cm): 80 Compaction: High

Discharge

Wetted Width (m): 1.5 MS
 Mean Depth (m): 0.2 MS
 Mean Velocity (m/s): 0.44 F
 Discharge (m3/s): 0.10 F

Banks

Height (m): 0.6
 % Unstable: 5

Fines Gravels Larges Bedrock

Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: M Flood Signs Ht(m): 0.6
 Bars (%): 0 pH: 7.7 Braided: N
 Water Temp. (°C): 7.0 O2 (ppm):
 Turb. (cm): 49 Cond. (µmhos): 100

Reach Symbol

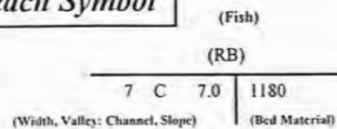




Photo #: R-8-22, 1996/09/27
Site #: R135, Looking upstream, cascade.



Photo #: R-8-23, 1996/09/27
Site #: R135, Looking downstream.



Location: W109, Unit 7; 5.4km up 210 road off 2000

Stream (Gaz.): Unnamed

Watershed Code: 005-3100-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 1.3 MA Date: 24-Jul-97 Time: 14:55 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9.6079 .61095 Length surveyed (m): 100.0 GE Survey Crew: KA J P \ \ \ \ \ \ \ \ \ \ Photos: W-12-10,11 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.0 MS
 Av. Wet. Width (m): 0.8 MS
 Av. Max Riffle Depth (cm): 8 MS
 Av. Max Pool Depth (cm): 22 MS
 Gradient (%): 8.0 CL
 Pool: 35 Riffle: 35 Run: 30 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 % Stable: 25 GE

Specific Data

1.4	0.9	1.1	0.9	1.3	0.6
1.3	0.5	1.1	0.7	0.9	0.6
6	5	12	7	6	11
17	20	27	19	27	24

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S4.
- C2: LS=16%, RS=16%
- C3: No fisheries sensitive zones noted.
- C4: This site was not electrofished.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 11.9 C.
- C7: The stream narrows in width to 0.7m and flows as a series of step/pools at the upstream end of the site. This reach has some good rearing habitat.

Cover

Cover Total %: 25 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
25	10	0	0	35	30

Crown Closure %: 50 Aspect: W

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	50	30
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	20	10
	Blder cobble (>256mm):		0
Bedrock		0	0

D90 (cm): 10 Compaction: Medium

Discharge

Wetted Width (m): 1.3 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.42 F
 Discharge (m3/s): 0.04 F

Banks

Height (m): 0.1
 % Unstable: 20

Fines Gravels Larges Bedrock

Confinement: CO
 Valley : Channel Ratio 2-5
 Stage: H Flood Signs Ht(m): 0.2
 Bars (%): 0 pH: 8.0 Braided: N
 Water Temp. (°C): 6.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 130

Reach Symbol

(Fish)

(DV)

1 B 8.0 3520

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: W-12-10, 24-Jul-97

Site #: W109, Looking upstream at a small cascade



Photo #: W-12-11, 24-Jul-97

Site #: W109, Looking downstream at the channel



Location: W110, Unit 7; 5.11km from 210 road off 200 road

Stream (Gaz.): Unnamed

Watershed Code: 005-3200-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 2.2 MA Date: 25-Jul-97 Time: 15:40 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9 .6079 .61093 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-12-12,13 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.4 MS
 Av. Wet. Width (m): 1.4 MS
 Av. Max Riffle Depth (cm): 13 GE
 Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 28.0 CL
 Pool: 0 Riffle: 100 Run: 0 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 0-5 GE
 %Stable: 30 GE

Specific Data

1.0	1.5	1.7	1.5	1.3	1.2
1.1	1.3	1.7	1.5	1.3	1.2
10	11	11	12	15	18

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S6.
- C2: LS= 4.4%, RS= 5.5%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 300V, was 81 seconds over 100 meters. High water velocity reduced the effectiveness of electroshocking at this site.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 13.8 C.
- C7: The stream has high gradient above and below the road crossing. Marginal to poor rearing habitat and no spawning habitat was observed.

Cover Cover Total % : 10 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	10	30	0	20	40

 Crown Closure % : 50 Aspect : W

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	30	15
	Large (16-64mm):		15
	Sm. cobble (64-128mm):		20
Larges	Lge cobble (128-256mm):	60	20
	Blder cobble (>256mm):		20
Bedrock		0	0

D90 (cm): 30 Compaction: Medium

Discharge

Wetted Width (m): 1.3 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.96 F
 Discharge (m3/s): 0.09 F

Banks

Height (m): 0.1
 % Unstable: 20
 Fines Gravels Larges Bedrock
 Confinement: CO
 Valley : Channel Ratio 2-5
 Stage: H Flood Signs Ht(m): 0.2
 Bars (%): 0 pH: 8.0 Braided: N
 Water Temp. (°C): 6.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 100

Reach Symbol

(Fish)
 NF

1	B	28.0	1360
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 (Width, Valley: Channel, Slope) (Bed Material)



Photo #: W-12-12, 24-Jul-97
Site #: W110, Looking upstream at the channel



Photo #: W-12-13, 24-Jul-97
Site #: W110, Looking downstream at the channel



Location: W111, Unit 7; 4.9km from 210 road off 200 road

Stream (Gaz.): Unnamed

Watershed Code: 002-8900-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 4.3 MW Date: 25-Jul-97 Time: 8:50 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9.6080 .61091 Length surveyed (m): 225.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-12-14,15,16 Air Photos:

Channel Characteristics

C1 Av. Chan. Width (m): 1.0 MS
 C1 Av. Wet. Width (m): 1.0 MS
 C1 Av. Max Riffle Depth (cm): 13 MS
 Av. Max Pool Depth (cm): 22 MS
 Gradient (%): 25.0 CL
 Pool: 5 Riffle: 90 Run: 5 Other: 0
 % Side Channel: 0 GE
 % Debris Area: 5-15 GE
 %Stable: 40 GE

Specific Data

1.5	1.0	0.6	1.4	0.5	0.6
1.4	0.8	0.7	1.4	0.4	0.7
6	7	18	12	16	14
10	42	20	27	12	

Obstructions

C	Height (m)	Type	Location
	2	C	3.0

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	40	20
	Large (16-64mm):		20
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	50	15
	Blder cobble (>256mm):		15
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total % : 10 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	20	30	0	20	30

Crown Closure % : 60 Aspect : W

D90 (cm): 27 Compaction: Medium

Discharge

Wetted Width (m) : 0.6 MS
 Mean Depth (m) : 0.2 MS
 Mean Velocity (m/s) : 0.78 F
 Discharge (m3/s) : 0.07 F

Banks

Height (m): 0.1
 % Unstable: 30
 Fines Gravels Larges Bedrock
 Confinement: CO
 Valley : Channel Ratio 2-5
 Stage: H Flood Signs Ht(m): 0.4
 Bars (%): 0 pH: 8.4 Braided: N
 Water Temp. (°C): 6.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 60

Reach Symbol

(Fish)
 NF
 1 B 25.0 | 1450
 (Width, Valley: Channel, Slope) | (Bed Material)

Comments

- C1: S6. One additional measurement was taken for channel width, wetted width and riffle depth; they were 1.5, 1.6 and 20 respectively.
- C2: LS= 9%, RS= 8%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 400V, was 93 seconds over 225 meters. Shocking conditions were marginal due to the gradient and lack of cover.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 13.8 C.
- C7: This stream flows as a continuous cascade, with occasional step/pools. High velocity and gradient and little availalbe cover were noted. A 1.0m falls was observed.



Photo #: W-12-14, 25-Jul-97

Site #: W111, Looking upstream at the channel and a small falls



Photo #: W-12-15, 25-Jul-97

Site #: W111, Looking downstream at the channel



Photo #: W-12-16, 25-Jul-97
Site #: W111, Looking upstream at the channel

Location: W112, Unit 7; 1km from fork of 210 road and 200 road

Stream (Gaz.): Unnamed

Watershed Code: 005-3000-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 1.6 MA Date: 25-Jul-97 Time: 9:22 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9.6085 .61082 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-12-17,18 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.4 MS
 Av. Wet. Width (m): 0.3 MS
 Av. Max Riffle Depth (cm): 1 MS
 Av. Max Pool Depth (cm): 6 MS
 Gradient (%): 10.0 CL
 Pool: 20 Riffle: 10 Run: 70 Other: 0
 % Side Channel: 0 GE
 % Debris Area: >15 GE
 % Stable: 80 GE

Specific Data

0.3	0.6	0.3	0.5	0.6	0.3
0.3	0.5	0.2	0.3	0.3	0.3
1	1	1	0	0	1
6	6	5	10	6	5

Obstructions

Bed Material

Fines	Clay, silt, sand (<2mm):	60	60
Gravels	Small (2-16mm):	30	15
	Large (16-64mm):		15
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	10	0
Bedrock	Blder cobble (>256mm):		0
		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Cover

Cover Total %: 5 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	25	0	0	50	25

Crown Closure %: 60 Aspect: W

D90 (cm): 9 Compaction: Medium

Discharge

Wetted Width (m): 0.5 MS
 Mean Depth (m): 0.3 MS
 Mean Velocity (m/s): 0.23 F
 Discharge (m3/s): 0.03 F

Banks

Height (m): 0.1
 % Unstable: 40

Fines Gravels Larges Bedrock

Confinement: CO

Valley: Channel Ratio 2-5

Stage: L Flood Signs Ht(m): 0.1

Bars (%): 0 pH: 8.0 Braided: N

Water Temp. (°C): 6.0 O2 (ppm):

Turb. (cm): Cond. (µmhos): 80

Reach Symbol

(Fish)

NF

1 B 10.0 6310

(Width, Valley: Channel, Slope)

(Bed Material)

Comments

- C1: S6
- C2: LS= 6%, RS= 2%
- C3: No fisheries sensitive zones noted.
- C4: This site was not electrofished due to low flows at the time of sampling.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 13.8 C.
- C7: The gradient below the road is 18 %. The flow was low at the time of sampling and no indication was found of much higher flow. This may limit the rearing potential of this reach.



Photo #: W-12-17, 25-Jul-97

Site #: W112, Looking upstream at the channel, covered by vegetation



Photo #: W-12-18, 25-Jul-97

Site #: W112, Looking downstream at the channel, covered by vegetation



Photo #: W-12-21, 25-Jul-97
Site #: W114, Looking upstream at the channel



Photo #: W-12-22, 25-Jul-97
Site #: W114, Looking downstream at the channel, note the LOD cover

Location: W115, Unit 7; 300m off 210 Rd off 12000 Rd

Stream (Gaz.): Unnamed

Watershed Code: 002-9000-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 1.3 MA Date: 25-Jul-97 Time: 12:22 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9.6107 .61077 Length surveyed (m): 100.0 GE Survey Crew: KA UP \ \ \ \ \ \ Photos: W-12-23,24 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.7 MS
 Av. Wet. Width (m): 0.6 MS
 Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 6.0 CL
 Pool: 0 Riffle: 30 Run: 70 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: >15 GE
 %Stable: 10 GE

Specific Data

0.6	0.5	0.8	0.8	0.6	1.0
0.5	0.5	0.8	0.7	0.6	0.8
0	0	0	0	0	0

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S6.
- C2: LS=4%, RS=4%
- C3: No fisheries sensitive zones noted.
- C4: This site was not electrofished due to low flows at the time of sampling.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 13.8 C.
- C7: Abundant small instream woody debris and unfavourable substrate limit the available fish habitat in the sampling area.

Bed Material

Fines	Clay, silt, sand (<2mm):	80	80
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		0
	Lge cobble (128-256mm):	0	0
Bedrock	Blder cobble (>256mm):		0
		0	0

Cover

Cover Total %: 5 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctbnk
0	30	0	0	35	35

 Crown Closure %: 5 Aspect: SW

D90 (cm): 6 Compaction: Low

Discharge

Wetted Width (m): 0.8 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.12 F
 Discharge (m3/s): 0.07 F

Banks

Height (m): 0.1
 % Unstable: 30
 Fines Gravels Larges Bedrock

Reach Symbol

(Fish)
 NF

1	C	6.0	8200
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 (Width, Valley: Channel, Slope) (Bed Material)

Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: L Flood Signs Ht(m): 0.1
 Bars (%): 0 pH: 7.8 Braided: Y
 Water Temp. (°C): 7.0 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 120



Photo #: W-12-23, 25-Jul-97

Site #: W115, Looking upstream at the channel, note the small woody debris



Photo #: W-12-24, 25-Jul-97

Site #: W115, Looking downstream at the channel



Location: W284, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 005-3400-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 1.2 MA Date: 17-Sep-97 Time: 11:00 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 .6122 .61082 Length surveyed (m): 150.0 GE Survey Crew: DD VFC \ \ \ \ \ \ \ \ Photos: W-R-21,22 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.1 MS
 Av. Wet. Width (m): 0.8 MS
 Av. Max Riffle Depth (cm): 1 MS
 Av. Max Pool Depth (cm): 12 MS
 Gradient (%): 12.5 CL
 Pool: 20 Riffle: 20 Run: 50 Other: 10
 % Side Channel: GE
 % Debris Area: 40 GE
 % Stable: 25 GE

Specific Data

0.9	1.3	1.1	0.9	1.1	1.4
0.2	1.5	0.8	0.8	0.8	0.8
1	1	2	1	1	1
11	11	11	10	18	9

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S4
- C2: LS = 20%, RS = 12%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model, set at I-5-500V, was 63 seconds over 100 meters. The large amount of woody debris in the stream made shocking difficult.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to the bottom. The air temperature at this site was 9.C.
- C7: This stream has been heavily impacted by logging, which has taken place directly down to the stream banks. A large amount of woody debris has been introduced into the stream. Some rearing pools were noted, but overall the habitat is not ideal. Overstream vegetation shading is abundant and the instream debris is moss covered.

Cover

Cover Total %: 15 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
20	20	40	0	10	10

Crown Closure %: 10 Aspect: S

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	10	5
	Large (16-64mm):		5
Larges	Sm. cobble (64-128mm):		10
	Lge cobble (128-256mm):	60	30
	Blder cobble (>256mm):		20
Bedrock		0	0

D90 (cm): 43 Compaction: Medium

Discharge

Wetted Width (m): 0.3 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.11 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.1
 % Unstable: 50

Fines Gravels Larges Bedrock

Confinement: OC
 Valley: Channel Ratio 5-10
 Stage: L Flood Signs Ht(m): 0.3
 Bars (%): 20 pH: 7.7 Braided: Y
 Water Temp. (°C): 5.5 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 80

Reach Symbol

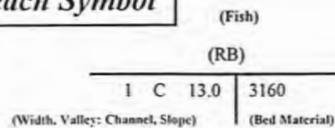




Photo #: W-R-21, 17-Sep-97
Site #: W284, Looking upstream at the channel



Photo #: W-R-22, 17-Sep-97
Site #: W284, Looking downstream at the channel



Location: W285, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 005-3500-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 2.0 MA Date: 17-Sep-97 Time: 13:20 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9 .6127 .61085 Length surveyed (m): 100.0 GE Survey Crew: DD \FC \ \ \ \ \ \ Photos: W-R-23,24 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.8 MS
 Av. Wet. Width (m): 2.7 MS
 Av. Max Riffle Depth (cm): 3 MS
 Av. Max Pool Depth (cm): 29 MS
 Gradient (%): 11.5 CL
 Pool: 20 Riffle: 30 Run: 30 Other: 20
 % Side Channel: >40 GE
 % Debris Area: >15 GE
 % Stable: 70 GE

Specific Data

2.9	2.8	2.6	3.0	2.4	3.1
2.3	3.0	2.2	3.0	2.4	3.3
2	3	3	4	2	3
27	43	30	23	28	22

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA	I			EL

Comments

- C1: S3.
- C2: LS=15%, RS=12%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at J, 5, 400V, was 235 seconds over 100 meters.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The air temperature at this site was 5.0 C.
- C7: The rearing habitat in this stream is quite good with lots of debris jams creating plunge pools. There is plenty of boulder and cutbank cover habitat. Barring any barriers downstream fish would have access to this reach. Low water temperatures may have prompted downstream migration of summer fish populations. There is no overwintering habitat.

Cover

Cover Total %: 30 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
30	15	10	0	30	15

Crown Closure %: 60 Aspect: SW

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		35
	Lge cobble (128-256mm):	70	25
	Blder cobble (>256mm):		10
Bedrock		0	0

D90 (cm): 27 Compaction: Medium

Discharge

Wetted Width (m): 1.1 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.96 F
 Discharge (m³/s): 0.08 F

Banks

Height (m): 0.1
 % Unstable: 20

Fines Gravels Larges Bedrock

Confinement: OC

Valley : Channel Ratio 5-10

Stage: M Flood Signs Ht(m): 0.6

Bars (%): 10 pH: 8.1 Braided: Y

Water Temp. (°C): 3.8 O₂ (ppm):

Turb. (cm): Cond. (µmhos): 120

Reach Symbol

(Fish)

(RB) (DV)

3 C 12.0 | 1270

(Width, Valley: Channel, Slope) | (Bed Material)



Photo #: W-R-23, 17-Sep-97
Site #: W285, Looking upstream at the channel



Photo #: W-R-24, 17-Sep-97
Site #: W285, Looking downstream at the channel



Location: W286, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 005-4000-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 1.2 MA Date: 17-Sep-97 Time: 15:30 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 .6142 .61091 Length surveyed (m): 100.0 GE Survey Crew: DD\FC \ \ \ \ \ \ \ \ Photos: W-R-25,W-S-1 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.9 MS
 Av. Wet. Width (m): 0.8 MS
 Av. Max Riffle Depth (cm): 1 MS
 Av. Max Pool Depth (cm): 16 MS
 Gradient (%): 6.0 CL
 Pool: 20 Riffle: 20 Run: 50 Other: 10
 % Side Channel: 0 GE
 % Debris Area: >15 GE
 %Stable: 75 GE

Specific Data

0.8	1.0	0.8	1.0	1.1	0.8
0.8	0.7	0.5	1.0	1.0	0.6
2	2	1	1	1	1
15	12	16	15	17	23

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S4.
- C2: LS=25%, RS=30%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at I, 5, 400V, was 280 seconds over 100 meters.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The air temperature at this site was 7.0 C.
- C7: There is good rearing habitat here with lots of LOD, pool and cutbank cover. There is only marginal spawning habitat and no overwintering habitat.

Bed Material

Fines	Clay, silt, sand (<2mm):	20	20
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		40
	Lge cobble (128-256mm):	60	20
	Blder cobble (>256mm):		0
Bedrock		0	0

D90 (cm): 20 Compaction: Medium

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
20	30	0	0	20	30

Crown Closure %: 60 Aspect: S

Discharge

Wetted Width (m): 0.3 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.22 F
 Discharge (m3/s): 0.05 F

Banks

Height (m): 0.1
 % Unstable: 20

Fines Gravels Larges Bedrock

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: M Flood Signs Ht(m): 0.3
 Bars (%): 0 pH: 8.0 Braided: Y
 Water Temp. (°C): 4.8 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 100

Reach Symbol

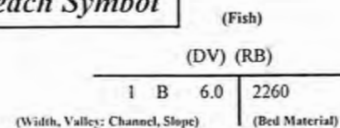




Photo #: W-R-25, 17-Sep-97
Site #: W286, Looking upstream at the channel



Photo #: W-S-1, 17-Sep-97
Site #: W286, Looking downstream at the channel

5.5 Meed Creek (460-2612-000) (93 L 094, 93 L 095)

5.5.1 Sensitive Habitats and Barriers

The Meed Creek mainstem is 8.4 km in length and is fed by 11 tributaries. Reach 1 has somewhat steep gradient at the mouth, coupled with moderate confinement, while reach 2 is typically unconfined and has low, but steadily increasing gradient. Reach 3 is quite confined, with moderately steep gradient, which is consistent through reach 4. The headwaters of Meed Creek, drain a low gradient wetland. The TRIM sheet indicates some potential falls barriers in reach 1. The tributary to reach 1 of Meed Creek, sampled at W246, has a series of wetlands in contact with the channel which have been identified as fisheries sensitive zones. The main creek is crossed by two roads and four of the tributaries are also crossed by roads. Meed Creek was sampled in 4 locations, including reaches 1, 3 and 5 of the mainstem.

5.5.2 Fish Summary Tables and Stream Classification

No historical records exist for Meed Creek. Three sites were electrofished and no fish were caught. The mainstem was classified as an S3 in reaches 1 and 3, based on average channel widths of 3.80 meters and 3.30 meters and the presence of suitable fish habitat in the sampling areas. Spawning habitat was observed by the survey crew sampling in reach 3. Reach 4 was classified as an S6 based on a lack of fish habitat. In particular, the crew described the lack of suitable substrate for fish. One tributary to reach 2 of the mainstem was sampled and classified as an S3 based on an average channel width of 1.83 meters and the presence of some suitable fish habitat, though the channel was dry at the time of survey.



Location: ARNE 32, Unit 7, at the headwaters of Meed Creek, see C5...

Stream (Gaz.): Meed Creek

Watershed Code: 460-2612-000-000-000-000-000-000-000-000-000-000-000

Map #: 93 L 095 Reach Length (km): 1.4 MA Date: 24-Sep-96 Time: 10:50 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6180 60922 Length surveyed (m): 300.0 GE Survey Crew: AKL\HK \ \ \ \ \ \ Photos: A-4-2,3 Air Photos:

Channel Characteristics**Specific Data**

Av. Chan. Width (m): 1.2 MS
 Av. Wet. Width (m): 0.9 MS
 N Av. Max Riffle Depth (cm): 0 MS
 Av. Max Pool Depth (cm): 23 MS
 Gradient (%): 1.0 CL
 Pool: 90 Riffle: 0 Run: 10 Other: 0
 % Side Channel: GE
 % Debris Area: 5 GE
 % Stable: 95 GE

1.3	1.1	0.8	1.2	1.6	1.2
1.1	1.0	0.2	1.0	1.4	0.9
17	9	30	9	10	65

Obstructions

C	Height (m)	Type	Location

Bed Material

	Fines	Clay, silt, sand (<2mm):	50	50
Gravels	Small (2-16mm):		0	0
	Large (16-64mm):			0
Larges	Sm. cobble (64-128mm):		50	20
	Lge cobble (128-256mm):			30
	Blder cobble (>256mm):			0
Bedrock			0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1 S6
 C2 LS = 0%, RS = 0%
 C3 No fisheries sensitive zones noted.
 C4 The electroshocking effort, using a Smithroot 15 A model, was 423 seconds over 260 square meters.
 C5 Lat N 54 57' 45.9", Long W 127 09' 25"
 C6 No additional bank texture information. The substrate at this site consists of angular cobbles covered in fines.
 C7 DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
 C8 No fish habitat was observed at this site, which mainly consisted of standing pools at the time of sampling. Mosses made up the bulk of the instream vegetation at this site.

Cover

Cover Total % : 35 GE

Pool LOD Bldr In Veg O Veg Ctnk
 0 20 10 30 20 20
 Crown Closure % : 5 Aspect : SW

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m³/s):

Reach Symbol

(Fish)

NF

1 E 1.0 5050

(Width, Valley: Channel, Slope)

(Bed Material)

Banks

Height (m): 0.3
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: N/A
 Valley: Channel Ratio N/A
 Stage: L Flood Signs Ht(m): 0.15
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 2.0 O2 (ppm):
 Turb. (cm): 65 Cond. (µmhos):



Photo #: A-4-2, 24-Sep-96
Site #: A32, Looking downstream.



Photo #: A-4-3, 24-Sep-96
Site #: A32, Looking upstream.



Location: ARNE 33, Unit 7, at an old road running into a cutblock, see C5.

Stream (Gaz.): Meed Creek

Watershed Code: 460-2612-000-000-000-000-000-000-000-0

Map #: 93 L 094 Reach Length (km): 1.8 MA Date: 24-Sep-96 Time: 12:22 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6145 .60909 Length surveyed (m): 200.0 GE Survey Crew: AKL\HKV \ \ \ \ \ \ \ \ Photos: A-4-4,5 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.3 MS
 Av. Wet. Width (m): 1.3 MS
 Av. Max Riffle Depth (cm): 7 MS
 Av. Max Pool Depth (cm): 26 MS
 Gradient (%): 7.0 CL
 Pool: 55 Riffle: 20 Run: 25 Other: 0
 % Side Channel: GE
 % Debris Area: 15 GE
 % Stable: 80 GE

Specific Data

3.4	3.9	3.7	2.6	3.0
1.2	1.3	1.3	0.9	1.8
8	7	6	8	
25	24	20	34	

Obstructions

C	Height (m)	Type	Location
	1	X	3.1

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	25	10
	Large (16-64mm):		15
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	75	30
	Blder cobble (>256mm):		25
Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Cover

Cover Total %: 35 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	25	25	0	45	5

Crown Closure %: 60 Aspect: S

D90 (cm): 35 Compaction: High

Discharge

Wetted Width (m): 0.4 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.20 F
 Discharge (m3/s): 0.01 F

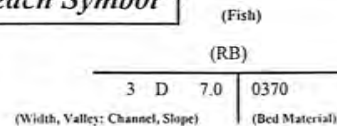
Banks

Height (m): 0.7
 % Unstable: 0

Fines Gravels Larges Bedrock

Confinement: UC
 Valley : Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 0.7
 Bars (%): 15 pH: Braided: N
 Water Temp. (°C): 4.8 O2 (ppm):
 Turb. (cm): 34 Cond. (µmhos):

Reach Symbol



Comments

- C1: S3
- C2: LS = 6%, RS = 5%
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a Smithroot 15 A model, was 500 seconds over 200 square meters. The fish may have moved out of this site due to low flows.
- C5: Lat N 54 57' 06", Long w 127 12' 20"
- C6: No additional bank texture information.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 5.5°C
- C8: Some good step pool rearing habitat, but limited spawning habitat was observed in the sampling area. The debris jam is not a permanent or a high flow barrier to fish passage upstream. The removal of an old bridge at this site, has resulted in road traffic through the creek.



Photo #: A-4-4, 24-Sep-96
Site #: A33, Looking downstream.



Photo #: A-4-5, 24-Sep-96
Site #: A33, Looking upstream.



Location: ARNE 52, Unit 7, Telkwa Hi rd, see C5.

Stream (Gaz.): Meed Creek

Watershed Code: 460-2612-000-000-000-000-000-000-000-0

Map #: 93 L 094 Reach Length (km): 0.6 MA Date: 27-Sep-96 Time: 15:30 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9 .6118 .60901 Length surveyed (m): 400.0 GE Survey Crew: AKL\BLA \ \ \ \ \ \ Photos: A-5-20,21,22 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.8 MS
 Av. Wet. Width (m): 1.4 MS
 Av. Max Riffle Depth (cm): 6 MS
 Av. Max Pool Depth (cm): 77 MS
 Gradient (%): 4.0 CL
 Pool: 40 Riffle: 20 Run: 40 Other: 0
 % Side Channel: GE
 % Debris Area: 5-15 GE
 %Stable: 75 GE

Specific Data

2.6	4.1	3.7	4.0	4.5	3.9
1.2	1.6	1.8	1.0	1.7	1.3
8	3	5	8		
100	60	70			

Obstructions

C	Height (m)	Type	Location
	1	CV	0.6
	1	R	0.5

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1 S3
- C2 LS = 40%, RS = 60%
- C3 No fisheries sensitive zones were noted at this site.
- C4 The electroshocking effort, using a 12 B POW model was 400 seconds over 700 square meters.
- C5 Lat N 54 56' 43.1", Long W 127 15' 16.4"
- C6 Fines and bedrock make up the bank texture at this site.
- C7 DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
- C8 Some excellent rearing and some good spawning habitat was observed at this site.
- C9 Excessive erosion was noted at the downstream end of the culvert. The clay banks are beginning to be exposed. Downstream of the road, a bedrock canyon was seen with three, 50 - 100 cm drops. A well in this creek was photographed A-5-22.

Cover Cover Total % : 45 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
10	30	10	0	20	30

 Crown Closure % : 20 Aspect : W

Bed Material

Fines	Clay, silt, sand (<2mm):	25	25
Gravels	Small (2-16mm):	25	15
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		15
	Lge cobble (128-256mm):	35	10
Bedrock	Blder cobble (>256mm):		10
		15	15

D90 (cm): 27 Compaction: Medium

Discharge

Wetted Width (m): 0.8 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.51 F
 Discharge (m3/s): 0.01 F

Banks

Height (m): 1.0
 % Unstable: 60
 Fines Gravels Larges Bedrock
 Confinement: UC
 Valley : Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 1.4
 Bars (%): 25 pH: Braided: N
 Water Temp. (°C): 9.5 02 (ppm):
 Turb. (cm): 100 Cond. (µmhos):

Reach Symbol

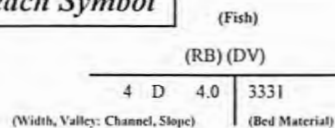




Photo #: A-5-20, 27-Sep-96
Site #: A52, Looking upstream.



Photo #: A-5-21, 27-Sep-96
Site #: A52, Looking downstream, gravel bar with debris.



Photo #: A-5-22, 27-Sep-96
Site #: A52, Looking downstream, well in creek.



Location: W246, Unit 7; north of Meed Cr. and east of Bulkley R.

Stream (Gaz.): Unnamed

Watershed Code: 001-7600-000-000-000-000-000-000-000-000-

Map #: 93 L 094 Reach Length (km): 2.3 MA Date: 07-Sep-97 Time: 9:30 Agency: TEC Access: FT Fish Card: N Field Historical
 U.T.M.: 9 .6119 .60914 Length surveyed (m): 100.0 GE Survey Crew: DD JP \ \ \ \ \ \ \ \ Photos: W-O-5,6 Air Photos:

Channel Characteristics

Specific Data

Av. Chan. Width (m): 1.8 MS
 N Av. Wet. Width (m): 0.0 GE
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 4.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0 GE
 % Debris Area: >15 GE
 % Stable: 70 GE

1.8	1.8	2.0	2.0	1.6	1.8
-----	-----	-----	-----	-----	-----

Bed Material

Fines	Clay, silt, sand (<2mm):	30	30
Gravels	Small (2-16mm):	30	15
	Large (16-64mm):		15
Larges	Sm. cobble (64-128mm):		20
	Lge cobble (128-256mm):	40	10
	Bldr cobble (>256mm):		10
Bedrock		0	0

D90 (cm): 35 Compaction: Medium

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S3.
- C2: LS=15%, RS=15%
- C3: No fisheries sensitive zones noted.
- C4: This site was not electrofished as the channel was dry.
- C5: No additional bank texture information.
- C6: Water quality was not evaluated at this site. The air temperature at this site was 11.0 C.
- C7: This stream was dry at the time of sampling and is heavily impacted by livestock. The banks have been trampled. Upstream of the pasture, the channel is better defined and contains cobble substrate. It could provide rearing habitat when water is flowing.

Cover

Cover Total %: 20 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
20	30	20	0	20	10

Crown Closure %: 60 Aspect: S

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.1
 % Unstable: 50

Fines Gravels Larges Bedrock

Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: Dry Flood Signs Ht(m): 0.5
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

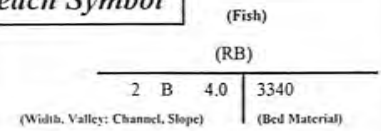




Photo #: W-O-5, 08-Sep-97

Site #: W246, Looking upstream at a muddy channel



Photo #: W-O-6, 08-Sep-97

Site #: W246, Looking downstream at the channel

5.6 Wiggs Creek (460-2238-107) (93 L 094, 93 M 004, 93 M 005)

5.6.1 Sensitive Habitats and Barriers

The Wiggs Creek mainstem is 10.9 km in length and is fed by 6 tributaries. Reach 1 has low gradient and is unconfined. Reach 2 has relatively steep gradient and is quite confined, while reach 3 is characterized by steep gradient. A series of wetlands and small lakes associated with reach 1 have been identified as fisheries sensitive zones. Reach 1 is crossed by two roads. The outlet of Duckwing Lake, which is 1.2 km in length and historically supports rainbow trout, flows into reach one of Wiggs Creek. This system was sampled at 6 locations.

5.6.2 Fish Summary Tables and Stream Classification

The only historical records for this system are associated with Duckwing Lake, which contains rainbow trout. Two sites were electrofished and no fish were caught. The mainstem was classified as an S3 in reach one based on the presence of fish habitat and an average channel width of 1.8 meters in the sampling area. Five tributaries were sampled. 5 were classified as S3 and 1 was classified as S6. The remaining unsampled creeks appear to be S4 streams.



Location: RYAN 108, Unit 7, block 036-3, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 460-2238-107-000-000-000-000-000-000-000-0

Map #: 93 M 005 Reach Length (km): 1.1 MA Date: 24-Sep-96 Time: 16:00 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6156.60975 Length surveyed (m): 250.0 GE Survey Crew: RH UL \ \ \ \ \ \ Photos: None Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.6 MS
 N Av. Wet. Width (m): 0.0 MS
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 5.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: 0-10 GE
 % Debris Area: 80 GE
 % Stable: 90 GE

Specific Data

0.6	0.8	1.0	0.2	0.6	0.4
-----	-----	-----	-----	-----	-----

Obstructions

C	Height (m)	Type	Location

Bed Material

Fines	Clay, silt, sand (<2mm):	90	90
Gravels	Small (2-16mm):	10	5
	Large (16-64mm):		5
	Sm. cobble (64-128mm):		0
Larges	Lge cobble (128-256mm):	0	0
	Blder cobble (>256mm):		0
Bedrock		0	0

D90 (cm): 5 Compaction: Low

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1 S6
- C2 LS = 16%, RS = 15%
- C3 No fisheries sensitive zones were noted at this site.
- C4 This dry site was not electrofished.
- C5 Lat N 55 00' 51.7", Long W 127 1' 33.7"
- C6 No additional bank texture information.
- C7 Water quality was not evaluated at this dry site. The mean air temperature on this day was 5.5°C
- C8 This channel is intermittent and provides no access to fish. Farther up in the reach, some water was noted in the channel, but the flow was barely detectable.

Cover

N Cover Total % : 0 GE
 Pool LOD Bldr In Veg O Veg Ctbk
 N 0 0 0 0 0 0
 Crown Closure % : 35 Aspect : SW

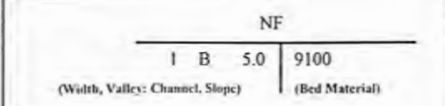
Discharge

N Wetted Width (m) :
 N Mean Depth (m) :
 N Mean Velocity (m/s) :
 N Discharge (m³/s) :

Banks

Height (m): 0.1
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: FC
 Valley : Channel Ratio 2-5
 Stage: Dry Flood Signs Ht(m): 0.1
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol





Location: ARNE 53, Unit 7, 231 rd in block 046-7, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-2900-000-000-000-000-000-000-000-000-

 Map #: 93 L 094 Reach Length (km): 2.6 MA Date: 27-Sep-96 Time: 16:43 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6111 .60956 Length surveyed (m): 200.0 GE Survey Crew: AKL\BL \ \ \ \ \ \ Photos: A-5-23,24 Air Photos:
Channel Characteristics
 Av. Chan. Width (m): 1.8 MS
 Av. Wet. Width (m): 0.9 MS
 Av. Max Riffle Depth (cm): 4 MS
 Av. Max Pool Depth (cm): 26 MS
 Gradient (%): 1.5 CL
 Pool: 20 Riffle: 20 Run: 60 Other: 0
 % Side Channel: GE
 % Debris Area: 20 GE
 % Stable: 80 GE
Specific Data

2.3	1.6	1.7	0.8	2.0	2.2
0.9	1.1	0.9	1.0	0.9	0.6
2	5	3	4		
30	22				

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S3
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones were noted at this site.
- C4: The electroshocking effort, using a Smithroot 12 B POW model, was 150 seconds. Relatively little habitat was available for electroshocking at this site.
- C5: Lat N 54 49' 41.5", Long W 127 15' 48"
- C6: No additional bank texture information.
- C7: DO, pH, conductivity were not measured at this site. The water was clear to the bottom. The mean air temperature on this day was 13.8°C
- C8: This stream contains good spawning and rearing habitat at the road site. Overwintering habitat was not observed.
- C9: The road is partially deactivated at this site, vehicles have to travel through the stream, which runs beside the road for 40 m. The culvert is inactive because it is 10 cm above grade.

Cover

Cover Total %: 40 GE

Pool	LOD	Blidr	In Veg	O Veg	Ctbnk
0	30	0	0	45	25

Crown Closure %: 80 Aspect: W

Bed Material

Fines	Clay, silt, sand (<2mm):	0	0
Gravels	Small (2-16mm):	70	30
	Large (16-64mm):		40
Larges	Sm. cobble (64-128mm):		25
	Lge cobble (128-256mm):	30	5
	Blidr cobble (>256mm):		0
Bedrock		0	0

D90 (cm): 12 Compaction: Medium

Discharge
 Wetted Width (m): 0.9 MS
 Mean Depth (m): 0.0 MS
 Mean Velocity (m/s): 0.15 F
 Discharge (m³/s): 0.00 F
Banks

Height (m): 0.5

% Unstable: 0

Fines Gravels Larges Bedrock

Confinement: N/A

Valley: Channel Ratio N/A

Stage: L Flood Signs Ht(m): 0.3

Bars (%): 5 pH: 7.7 Braided: N

Water Temp. (°C): 11.0 02 (ppm):

Turb. (cm): 30 Cond. (µmhos): 120

Reach Symbol

(Fish)

(RB) (DV)

2 E 1.5 | 0730

(Width, Valley: Channel, Slope)

(Bed Material)



Photo #: A-5-23, 27-Sep-96
Site #: A53, Looking upstream, channel beside road.



Photo #: A-5-24, 27-Sep-96
Site #: A53, Looking downstream, new channel below road.



Location: ARNE 57, Unit 7, SE of Duckwing Creek, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-4200-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 1.1 MW Date: 28-Sep-96 Time: 14:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 61120 .60966 Length surveyed (m): 100.0 GE Survey Crew: AKL\BRLA \ \ \ \ \ \ Photos: A-6-7,8 Air Photos:

Channel Characteristics

Specific Data

Av. Chan. Width (m): 1.6 MS
 Av. Wet. Width (m): 0.0 GE
 Av. Max Riffle Depth (cm): 0 GE
 Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 6.0 CL
 Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel:
 % Debris Area: 0 GE
 % Stable: 0 GE

1.4	2.0	1.9	1.5	1.6	1.4
-----	-----	-----	-----	-----	-----

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Bed Material

Fines	Clay, silt, sand (<2mm):	5	5
Gravels	Small (2-16mm):	35	5
	Large (16-64mm):		30
Larges	Sm. cobble (64-128mm):		40
	Lge cobble (128-256mm):	60	20
	Bllder cobble (>256mm):		0
Bedrock		0	0

Comments

- C1: S3
- C2: Bank slopes not available.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished.
- C5: Lat N 55 00' 20.1" Long W 127 15' 29.5"
- C6: No additional bank information.
- C7: Water quality could not be evaluated at this dry site. The mean air temperature on this day was 10.5°C
- C8: Fish migration in this stream is possible at higher flows, in spring or early summer.
- C9: The riparian vegetation at this site includes rose, birch, fir, pine, alder, cranberry, snowberry, thimbleberry.

Cover

Cover Total %: 25 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	0	5	10	85	0

Crown Closure %: 50 Aspect: W

D90 (cm): 18 Compaction: Medium

Discharge

Wetted Width (m):
 Mean Depth (m):
 Mean Velocity (m/s):
 Discharge (m3/s):

Banks

Height (m): 0.5
 % Unstable: 5
 Fines Gravels Larges Bedrock

Confinement: N/A
 Valley : Channel Ratio N/A
 Stage: Dry Flood Signs Ht(m): 0.5
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): O2 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

(Fish)

(RB)

2 E 6.0 | 0460

(Width, Valley; Channel, Slope)

(Bed Material)



Photo #: A-6-7, 28-Sep-96
Site #: A57, Looking upstream, meterstick across channel.



Photo #: A-6-8, 28-Sep-96
Site #: A57, Looking downstream.

Trib to Wiggs Creek



TRITON

Environmental Consultants Ltd.

Location: ARNE 58, Unit 7, SE of Duckwing lake, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-3000-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 2.8 MW Date: 28-Sep-96 Time: 15:30 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9 6109 60972 Length surveyed (m): 100.0 GE Survey Crew: AKLABRLA \ \ \ \ \ Photos: A-6-9,10 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.1 MS
 Av. Wet. Width (m): 0.0 GE
 Av. Max Riffle Depth (cm): 0 GE
 Av. Max Pool Depth (cm): 0 GE
 Gradient (%): 10.0 CL
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 % Side Channel: GE
 % Debris Area: 0 GE
 % Stable: 0 GE

Specific Data

1.7	2.1	2.3	2.1	1.9	2.4
-----	-----	-----	-----	-----	-----

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Bed Material

0	Fines	Clay, silt, sand (<2mm):	10 10
	Gravels	Small (2-16mm):	20 10
		Large (16-64mm):	10
	Larges	Sm. cobble (64-128mm):	40
		Lge cobble (128-256mm):	70 20
		Bllder cobble (>256mm):	10
	Bedrock		0 0

Comments

- C1: S3
- C2: Bank slope data not available.
- C3: No fisheries sensitive zones were noted at this site.
- C4: This site was not electrofished.
- C5: Lat N 55 00' 33.4", Long W 127 15' 57.0"
- C6: No additional bank information available.
- C7: Water quality was not evaluated at this site. The mean air temperature on this day was 10.5°C
- C8: This reach has potential spawning habitat when flow is present.

Cover

Cover Total %: 20 GE

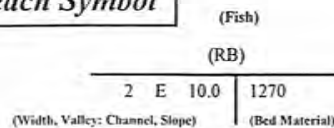
Pool	LOD	Blldr	In Veg	O Veg	Ctbnk
0	0	10	10	80	0

 Crown Closure %: 60 Aspect: SW

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Reach Symbol



Banks

Height (m): 0.3
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: N/A
 Valley : Channel Ratio N/A
 Stage: Dry Flood Signs Ht(m): 0.4
 Bars (%): 0 pH: Braided: N
 Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):



Photo #: A-6-9, 28-Sep-96
Site #: A58, Looking upstream.



Photo #: A-6-10, 28-Sep-96
Site #: A58, Looking downstream.



Location: ARNE 59, Unit 7, S. of Duckwing Lake, see C5.

Stream (Gaz.): Unnamed

Watershed Code: 002-4100-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 2.7 MA Date: 28-Sep-96 Time: 16:39 Agency: TEC Access: H Fish Card: N Field Historical
 U.T.M.: 9.6105 60968 Length surveyed (m): 100.0 GE Survey Crew: AKL\BRL\ \ \ \ \ \ Photos: A-6-11,12,13,14,15 Air Photos:

Channel Characteristics

CI Av. Chan. Width (m): 1.5 GE
 CI Av. Wet. Width (m): 0.0 GE
 Av. Max Riffle Depth (cm): 0 GE
 Av. Max Pool Depth (cm): 20 GE
 Gradient (%): 0.0 CL
 Pool: 100 Riffle: 0 Run: 0 Other: 0
 % Side Channel: GE
 % Debris Area: 5-15 GE
 % Stable: 100 GE

Specific Data

20

Obstructions

C	Height (m)	Type	Location

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: S3
- C2: LS=0%, RS=0%
- C3: No fisheries sensitive zones were noted at this site.
- C4: This dry site was not electrofished.
- C5: Lat N 55 00' 20.8" Long W 127 16' 20.1"
- C6: No defined channel.
- C7: DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 10.5°C
- C8: This site has marginal fish habitat. Several beaver dams were observed in this area which have obscured the original channel. Fish may have access to this area which is why it has been given a fish bearing classification.

Cover

Cover Total %: 30 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
0	5	0	20	75	0

Crown Closure %: 10 Aspect: S

Bed Material

	Fines	Clay, silt, sand (<2mm):	100	100
Gravels	Small (2-16mm):		0	0
	Large (16-64mm):			
Larges	Sm. cobble (64-128mm):			
	Lge cobble (128-256mm):		0	0
	Blder cobble (>256mm):			
Bedrock			0	0

D90 (cm): 0 Compaction: Low

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks

Height (m): 0.0
 % Unstable: 0
 Fines Gravels Larges Bedrock
 Confinement: UC
 Valley : Channel Ratio 10+
 Stage: L Flood Signs Ht(m): 0
 Bars (%): 0 pH: 7.9 Braided: N
 Water Temp. (°C): 10.0 O2 (ppm):
 Turb. (cm): 20 Cond. (µmhos): 160

Reach Symbol

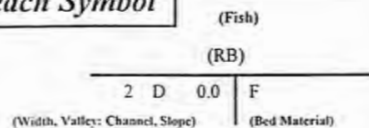




Photo #: A-6-11, 28-Sep-96
Site #: A59, Looking downstream.



Photo #: A-6-12, 28-Sep-96
Site #: A59, Looking upstream, no channel.



Photo #: A-6-13, 28-Sep-96
Site #: A59, Aerial photo of pond.



Photo #: A-6-14, 28-Sep-96
Site #: A59, Aerial photo of pond.



Photo #: A-6-15, 28-Sep-96
Site #: A59, Aerial photo, series of beaver ponds.



Location: W245, Unit 7; 4km east of Duckwing Lk and 3km south of Causqua Cr.

Stream (Gaz.): Unnamed

Watershed Code: 002-2900-000-000-000-000-000-000-000-000-

Map #: 93 M 004 Reach Length (km): 0.7 MA Date: 07-Sep-97 Time: 16:40 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6141 .60970 Length surveyed (m): 200.0 GE Survey Crew: DDJP \ \ \ \ \ \ \ \ \ \ Photos: W-O-3,4 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 2.0 MS
 Av. Wet. Width (m): 1.2 MS
 Av. Max Riffle Depth (cm): 2 MS
 Av. Max Pool Depth (cm): 24 MS
 Gradient (%): 11.0 CL
 Pool: 20 Riffle: 30 Run: 40 Other: 10
 % Side Channel: 0 GE
 % Debris Area: 0.5 GE
 % Stable: 25 GE

Specific Data

1.7	2.0	2.4	2.1	1.7	2.0
1.2	1.8	1.0	1.3	0.9	0.9
2	3	2	1	2	2
28	24	23	25	17	29

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				EL

Comments

- C1: S3.
- C2: LS=30%, RS=50%
- C3: No fisheries sensitive zones noted.
- C4: The electroshocking effort, using a Smithroot 12 B POW model set at 1, 5, 500V, was 327 seconds over 200 meters.
- C5: No additional bank texture information.
- C6: DO was not measured at this site, the water was clear to bottom. The air temperature at this site was 15.5 C.
- C7: This is a well shaded stream containing step pool rearing habitat. There is marginal spawning habitat. Livestock have access to the channel.

Cover

Cover Total %: 35 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnk
30	15	30	0	15	10

Crown Closure %: 60 Aspect: SW

Bed Material

Fines	Clay, silt, sand (<2mm):	10	10
Gravels	Small (2-16mm):	20	10
	Large (16-64mm):		10
Larges	Sm. cobble (64-128mm):		35
	Lge cobble (128-256mm):	70	25
	Blder cobble (>256mm):		10
Bedrock		0	0

D90 (cm): 43 Compaction: Medium

Discharge

Wetted Width (m): 0.6 MS
 Mean Depth (m): 0.1 MS
 Mean Velocity (m/s): 0.10 F
 Discharge (m3/s): 0.00 F

Banks

Height (m): 0.1
 % Unstable: 20

Fines Gravels Larges Bedrock

Confinement: OC
 Valley : Channel Ratio 5-10
 Stage: M Flood Signs Ht(m): 0.5
 Bars (%): 20 pH: 7.9 Braided: N
 Water Temp. (°C): 6.5 O2 (ppm):
 Turb. (cm): Cond. (µmhos): 100

Reach Symbol

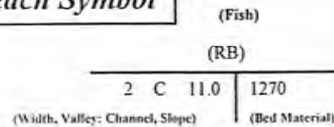




Photo #: W-O-3, 07-Sep-97
Site #: W245, Looking upstream at the channel



Photo #: W-O-4, 07-Sep-97
Site #: W245, Looking downstream at the channel, note the boulder/cobble cover

Not a creek



Location: W247, Unit 7; east of Bulkley R.

Stream (Gaz.): Unnamed

Watershed Code: 001-7300-000-000-000-000-000-000-000-000-

Map #: 93 L 094 Reach Length (km): 0.0 MA Date: 08-Sep-97 Time: 11:00 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6135 .60885 Length surveyed (m): 50.0 GE Survey Crew: DDJP \ \ \ \ \ \ \ \ Photos: W-O-7 Air Photos:

Channel Characteristics

N Av. Chan. Width (m): 0.0 GE
 N Av. Wet. Width (m): 0.0 GE
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 N Gradient (%): 2.0 MA
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 N % Side Channel: 0 GE
 N % Debris Area: 0 GE
 % Stable: 0 GE

Specific Data

[Empty box for Specific Data]

Obstructions

[Empty box for Obstructions]

Bed Material

N	Fines	Clay, silt, sand (<2mm):	0	0
N	Gravels	Small (2-16mm):	0	0
		Large (16-64mm):		0
N	Larges	Sm. cobble (64-128mm):		0
		Lge cobble (128-256mm):	0	0
		Bllder cobble (>256mm):		0
N	Bedrock		0	0

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Comments

- C1: NC.
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones noted.
- C4: This site was not electrofished.
- C5: No additional bank texture information.
- C6: Water quality was not evaluated at this site.
- C7: There is a culvert on the Telkwa High Road at this site. The gradient from the road to the Bulkley River is approximately 65%. No channel was found above or below the culvert road drainage.

Cover

N Cover Total %: 0 GE

Pool	LOD	Bldr	In Veg	O Veg	Ctnbk
0	0	0	0	0	0

 N Crown Closure %: 0 N Aspect: S

Banks

N Height (m): 0.0
 N % Unstable: 0
 N Fines Gravels Larges Bedrock

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Confinement: N/A
 Valley : Channel Ratio N/A
 N Stage: Dry N Flood Signs Ht(m): 0
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): O2 (ppm):
 Turb. (cm): Cond. (µmhos):

Reach Symbol

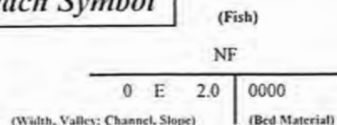




Photo #: W-O-7, 08-Sep-97
Site #: W247, Looking at an "NC"



Location: W287, Unit 7

Stream (Gaz.): Unnamed

Watershed Code: 005-4100-000-000-000-000-000-000-000-000-

Map #: 93 M 014 Reach Length (km): 0.0 MA Date: 12-Sep-97 Time: 16:30 Agency: TEC Access: V2 Fish Card: N Field Historical
 U.T.M.: 9.6145 .61093 Length surveyed (m): 80.0 GE Survey Crew: DD \FC \ \ \ \ \ \ Photos: W-S-2 Air Photos:

Channel Characteristics

Specific Data

N Av. Chan. Width (m): 0.0 GE
 N Av. Wet. Width (m): 0.0 GE
 N Av. Max Riffle Depth (cm): 0 GE
 N Av. Max Pool Depth (cm): 0 GE
 N Gradient (%): 6.0 MA
 N Pool: 0 Riffle: 0 Run: 0 Other: 0
 N % Side Channel: 0 GE
 N % Debris Area: 0 GE
 % Stable: 0 GE

[Empty box for Specific Data]

Obstructions

Fish Summary

C	Species	Number	Size Range (mm)	Life Phase	Use 1	Use 2	Use 3	Method
	NF			NA				NA

Bed Material

N	Fines	Clay, silt, sand (<2mm):	0	0
N	Gravels	Small (2-16mm):	0	0
		Large (16-64mm):		0
		Sm. cobble (64-128mm):		0
N	Larges	Lge cobble (128-256mm):	0	0
		Blder cobble (>256mm):		0
N	Bedrock		0	0

Comments

- C1: NC.
- C2: The side slopes were not measured at this site.
- C3: No fisheries sensitive zones noted.
- C4: This site was not electrofished.
- C5: No additional bank texture information.
- C6: Water quality was not evaluated at this site.
- C7: This is just a boggy alder swale. Pooling of water at a culvert associated with road construction was observed in the sampling area. The position was checked with the GPS unit. As the gradient increases toward the mainstem, there may be some increased channel definition, but there is no creek in the sampling area. There are a number of unmapped creeks in this area.

Cover N Cover Total %: 0 GE
 Pool LOD Bldr In Veg O Veg Ctnk
 N 0 0 0 0 0 0
 N Crown Closure %: 0 N Aspect: S

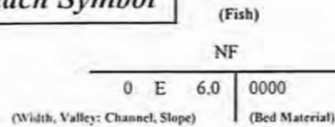
N D90 (cm): 0 N Compaction:

Discharge

N Wetted Width (m):
 N Mean Depth (m):
 N Mean Velocity (m/s):
 N Discharge (m3/s):

Banks N Height (m): 0.0
 % Unstable: 0
 N Fines Gravels Larges Bedrock

Reach Symbol



Confinement: N/A
 Valley : Channel Ratio N/A
 N Stage: Dry N Flood Signs Ht(m): 0
 N Bars (%): 0 pH: Braided: N
 N Water Temp. (°C): 02 (ppm):
 Turb. (cm): Cond. (µmhos):



Photo #: W-S-2, 17-Sep-97
Site #: W287, Looking at an "NC"

5.7 Fish Age, Growth and Other Observations

Fish catch data were compiled for all records that contained a discrete size measurement. These data were summarised and plotted in histograms by species, the results are presented in Figure 2a. Rainbow trout was the only species caught in unit 7. The following table summarises the numbers of fish caught in each size class.

Table 8. Catch Data by Species and by Size Class (mm) in Working Unit 7

	RB
0-25	
25-50	
50-75	
75-100	3
100-125	5
125-150	
150-175	1
175-200	
200-225	
225-250	
250-275	
275-300	
300-325	
325-350	
350-375	
375-400	
400-425	
425-450	
450-475	
475-500	
>500	

5.8 Rare and Endangered Species

No rare or endangered species were observed in this working unit.

5.9 Wildlife Observations,

Several beaver dams were noted at site A59, in the outlet of Duckwing Lake. No other wildlife signs were reported in this working unit. The summary information for this site is available in Table 7.

5.10 Recommendations for Future Sampling

A list of all sites in working unit 7 for which future sampling is recommended is provided in Table 6. At a minimum, future sampling should be carried out in the following reaches :

- A33, reach 3 of Meed Creek
- A59, the outlet of Duckwing Lake
- R103, reach 3 of Gramophone Creek
- R135, reach 2 of Kwun Creek

A33, R103 and R135, all have either rearing or spawning habitat, or both, and no fish were caught at the time of survey. The channel was ill defined at site A59, and consisted of a series of old beaver ponds and dams. Though the habitat quality is poor in this reach, at high water it may be connected to Duckwing Lake, which historically contains rainbow trout, therefore future sampling is recommended.

6.0 CONCLUSION AND RECOMMENDATIONS

Fish sampling was somewhat limited in this inventory by field conditions, as 11 sites classified as fish bearing were dry at the time of sampling and another 19 were at low flow. Fish were caught at only 3 sites in working unit 7, in the lower reaches of Gramophone and Causqua Creeks. Working unit 7 appears to be the least productive of all the Bulkley working units for fish and the limitations to fish distribution are associated with low flows, Bulkley mainstem confinement, and the presence of impassable barriers on Causqua Creek, a large watershed in this working unit. Additionally, streams like Gramophone Creek have gradient and confinement problems beginning low in the system, that become steadily worse through to the headwaters, resulting in limited fish access and use.

7.0 REFERENCES

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- Haas, G.R. and JD McPhail. 1991. Systematics and distributions of Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) in North America. Canadian Journal of Fisheries and Aquatic Sciences 48:2191-2211.
- Province of British Columbia. 1996. Resource Inventory Committee (RIC): Fish Sampling Manual (Originally called Fish Collection, Preservation, Measurement and Enumeration Manual, RIC Draft 1994).
- Province of British Columbia. 1995a. Forest Practices Code: Fish-stream Identification Guidebook, July 1995.
- Province of British Columbia. 1995b. Forest Practices Code: Riparian Management Area Guidebook, Draft 2.
- Province of British Columbia. 1995c. Gully Assessment Procedure Guidebook, April 1995.
- Province of British Columbia. 1995d. Resource Inventory Committee (RIC): BC Standards, Specifications and Guidelines for Resource Surveys Using Global Positioning Systems (GPS) Technology.
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Working Unit 7 - Rainbow Trout

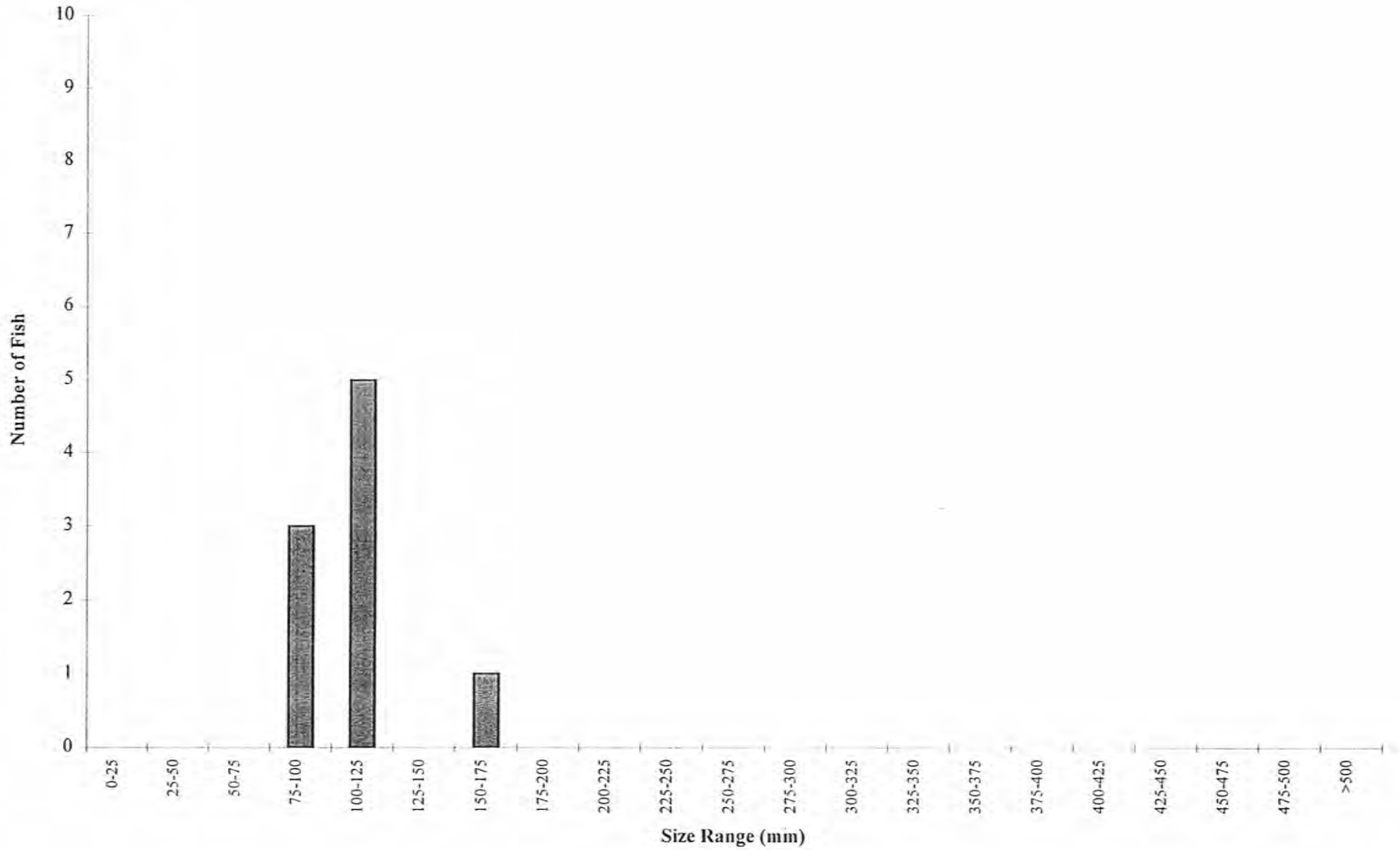


Table 1. Riparian Management Areas and Stream Classification

	Channel Width(m)	Reserve Zone	Management Zone Width	Total RMA Width
Fish Bearing				
S1	>20.0	50	20	70
S2	>5.0-20.0	30	20	50
S3	1.5-5.0	20	20	40
S4	<1.5	0	30	30
Non Fish Bearing				
S5	≥ 3.0	0	30	30
S6	<3.0	0	20	20

Table 2. Summary of Water Quality Data Collected in Working Unit 7 in 1996 and 1997

Watershed Code	Stream "Local"	Location	Map #	UTM	Reach Number	Survey Date	Agency	pH	Temp. (C)	Conductivity (umhos/cm)
002-6600-000-000-000-	Trib to Bulkley R.	ARNE 49, Unit 7	93 M 004	9 .6102 .61058	1	09/27/96	TEC	7.96	7.50	110.00
002-7500-000-000-000-	Trib to Bulkley R.	ARNE 48, Unit 7	93 M 004	9 .6106 .61046	1	09/27/96	TEC	7.91	8.50	130.00
002-4700-000-000-000-	Trib to Bulkley R.	ARNE 51, Unit 7	93 M 004	9 .6082 .60976	2	09/27/96	TEC	7.72	11.50	200.00
460-0000-000-000-000-	Trib. to Bulkley R.	RYAN 137, Unit 7	93 L 094	9 .6134 .60888	1	09/27/96	TEC			
002-7600-000-000-000-	Trib. to Bulkley R.	RYAN 134, Unit 7	93 M 004	9 .6105 .61050	2	09/27/96	TEC		7.00	
002-6800-000-000-000-	Trib to Bulkley R.	RYAN 132, Unit 7	93 M 004	9 .6097 .61022	1	09/27/96	TEC		7.50	
002-6700-000-000-000-	Trib to Bulkley R.	ARNE 47, Unit 7	93 M 004	9 .6098 .61024	1	09/27/96	TEC		7.00	
002-6700-000-000-000-	Trib to Bulkley R.	W100, Unit 7	93 M 004	9 .6166 .61024	2	07/23/97	TEC		9.00	
002-6800-000-000-000-	Trib to Bulkley R.	W244, Unit 7	93 M 004	9 .6117 .61012	2	09/07/97	TEC	7.56	9.00	100.00
460-1760-000-000-000-	Trib to Bulkley R.	ARNE 55, Unit 7	93 M 004	9 .6149 .61045	3	09/28/96	TEC	8.00	5.00	
460-1760-000-370-000-	Trib to Bulkley R.	ARNE 54, Unit 7	93 M 004	9 .6150 .61039	3	09/28/96	TEC		5.00	
460-2685-003-390-000-	Trib. to Bulkley R.	BRUCE 98, Unit 7	93 L 095	9 .6166 .60904	3	08/26/96	TEC			
002-7400-000-000-000-	Trib. to Bulkley R.	RYAN 133, Unit 7	93 M 004	9 .6107 .61041	2	09/27/96	TEC	7.70	7.50	150.00
001-1700-000-000-000-	Trib. to Bulkley R.	BRUCE 99, Unit 7	93 L 095	9 .6162 .60905	1	08/26/96	TEC			
005-3600-000-000-000-	Trib. to Bulkley R.	W113, Unit 7	93 M 014	9 .6120 .61086	1	07/25/97	TEC	8.00	6.00	50.00
460-2685-005-270-000-	Trib. to Bulkley R.	BRUCE 101, Unit 7	93 L 095	9 .6156 .60897	1	08/26/96	TEC			
460-2685-000-000-000-	Trib. to Bulkley R.	BRUCE 100, Unit 7	93 L 095	9 .6155 .60897	2	08/26/96	TEC			
002-6600-000-000-000-	Trib. to Bulkley R.	ARNE 56, Unit 7	93 M 004	9 .6140 .61062	2	09/28/96	TEC		5.50	
460-1883-000-000-000-	Causqua Cr.	Y268, Unit 7	93 M 005	9 .622490.610477	6	09/15/97	TEC	7.83	4.50	50.00
000-9500-000-000-000-	Trib to Causqua Cr.	Y269, Unit 7	93 M 005	9 .62274 .610160	1	09/15/97	TEC			
000-8700-000-000-000-	Trib to Causqua Cr.	RYAN 146, Unit 7	93 M 005	9 .6201 .61018	1	09/28/96	TEC		5.50	
000-8500-000-000-000-	Trib to Causqua Cr.	RYAN 143, Unit 7	93 M 005	9 .61931 .61016	1	09/28/96	TEC		5.50	
000-8600-000-000-000-	Trib to Causqua Cr.	RYAN 144, Unit 7	93 M 005	9 .6199 .61018	1	09/28/96	TEC		6.00	
000-8900-000-000-000-	Trib to Causqua Cr.	RYAN 147, Unit 7	93 M 005	9 .6207 .61011	1	09/28/96	TEC		3.00	
000-8300-000-000-000-	Trib to Causqua Cr.	RYAN 139, Unit 7	93 M 005	9 .6200 .60994	2	09/28/96	TEC		3.00	
000-7900-000-000-000-	Trib to Causqua Cr.	RYAN 149, Unit 7	93 M 005	9 .6170 .60997	2	09/28/96	TEC			
460-1883-000-000-000-	Causqua Cr.	ARNE 50, Unit 7	93 M 004	9 .6087 .61005	1	09/27/96	TEC		8.50	
460-1883-000-000-000-	Causqua Cr.	RYAN 140, Unit 7	93 M 005	9 .6179 .60998	1	09/28/96	TEC	8.00	5.00	50.00
460-1883-000-000-000-	Causqua Cr.	RYAN 145, Unit 7	93 M 005	9 .6201 .61018	4	09/28/96	TEC			
000-4100-000-000-000-	Trib to Causqua Cr.	RYAN 141, Unit 7	93 M 005	9 .6180 .60998	1	09/28/96	TEC		4.00	
000-8400-000-000-000-	Trib to Causqua Cr.	RYAN 142, Unit 7	93 M 005	9 .6193 .61016	1	09/28/96	TEC		5.50	
460-1883-000-000-000-	Trib to Causqua Cr.	RYAN 148, Unit 7	93 M 005	9 .6168 .61024	2	09/28/96	TEC		3.00	
110-0500-000-000-000-	Trib to Causqua Cr.	W99, Unit 7	93 M 004	9 .6137 .61017	2	07/23/97	TEC		6.00	
000-9200-000-000-000-	Trib. to Causqua Cr.	W282, Unit 7	93 M 005	9 .6222 .61016	1	09/15/97	TEC	7.17	2.00	30.00
000-9400-000-000-000-	Trib. to Causqua Cr.	Y267, Unit 7	93 M 005	9 .622429.6101389	1	09/15/97	TEC	7.75	5.50	60.00
000-9100-000-000-000-	Trib. to Causqua Cr.	W283, Unit 7	93 M 005	9 .6199 .61016	1	09/15/97	TEC	7.66	2.00	50.00
002-5200-000-000-000-	Trib to Causqua R.	W101, Unit 7	93 M 004	9 .6102 .60995	2	07/23/97	TEC		10.00	
460-2238-000-000-000-	Trib. to Gramophone Cr.	RYAN 136, Unit 7	93 L 094	9 .6100 .60926	1	09/27/96	TEC			

Watershed Code	Stream #Local#	Location	Map#	UTM	Reach Number	Survey Date	Agency	pH	Temp. (C)	Conductivity (umhos/cm)
460-2238-000-000-000-	Gramophone Cr.	RYAN 138, Unit 7	93 L 094	9 .6126 .60940	1	09/27/96	TEC	7.75	10.00	90.00
460-2238-000-000-000-	Gramophone Cr.	RYAN 103, Unit 7	93 M 005	9 .6191 .60979	3	09/24/96	TEC		2.00	
002-4100-000-000-000-	Trib to Gramophone Cr.	RYAN 168, Unit 7	93 L 095	9 .6161 .60950	1	09/30/96	TEC		5.00	100.00
002-3700-000-000-000-	Trib to Gramophone Cr.	RYAN 166, Unit 7	93 L 094	9 .6135 .60943	1	09/30/96	TEC			
460-2238-003-940-039-	Trib to Gramophone Cr.	RYAN 167, Unit 7	93 L 095	9 .6161 .60943	1	09/30/96	TEC		5.00	100.00
460-2238-000-000-000-	Trib to Gramophone Cr.	JULIE 273, Unit 7	93 L 094	9 .6134 .60941	1	09/30/96	TEC	7.20	5.00	100.00
002-3600-000-000-000-	Trib to Gramophone Cr.	JULIE 272, Unit 7	93 L 094	9 .6137 .60932	1	09/30/96	TEC			
001-0200-000-000-000-	Trib. to Gramophone Cr.	ARNE 35, Unit 7	93 L 095	9 .6180 .60959	1	09/24/96	TEC		3.00	
460-2238-000-000-000-	Trib. to Gramophone Cr.	RYAN 107, Unit 7	93 M 005	9 .6164 .60964	1	09/24/96	TEC		3.50	
000-7600-000-000-000-	Trib. to Gramophone Cr.	RYAN 106, Unit 7	93 M 005	9 .6164 .60964	1	09/24/96	TEC	7.20	3.00	
000-7300-000-000-000-	Trib. to Gramophone Cr.	RYAN 105, Unit 7	93 M 005	9 .6192 .60964	1	09/24/96	TEC			
000-7500-000-000-000-	Trib. to Gramophone Cr.	RYAN 104, Unit 7	93 M 005	9 .6191 .60976	1	09/24/06	TEC		2.00	
460-2238-003-940-065-	Trib. to Gramophone cr.	ARNE 34, Unit 7	93 L 095	9 .6173 .60939	2	09/24/96	TEC		3.00	
460-1613-000-000-000-	Kwun Cr.	RYAN 135, Unit 7	93 M 004	9 .6097 .61067	2	09/27/96	TEC	7.70	7.00	100.00
002-8900-000-000-000-	Trib to Kwun Cr.	W111, Unit 7	93 M 014	9 .6080 .61091	1	07/25/97	TEC	8.40	6.00	60.00
005-3000-000-000-000-	Trib to Kwun Cr.	W112, Unit 7	93 M 014	9 .6085 .61082	1	07/25/97	TEC	8.00	6.00	80.00
005-3200-000-000-000-	Trib to Kwun Cr.	W110, Unit 7	93 M 014	9 .6079 .61093	1	07/25/97	TEC	8.00	6.00	100.00
005-3500-000-000-000-	Trib to Kwun Cr.	W285, Unit 7	93 M 014	9 .6127 .61085	1	09/17/97	TEC	8.11	3.80	120.00
002-9000-000-000-000-	Trib to Kwun Cr.	W115, Unit 7	93 M 014	9 .6107 .61077	2	07/25/97	TEC	7.80	7.00	120.00
005-3100-000-000-000-	Trib to Kwun Cr.	W109, Unit 7	93 M 014	9 .6079 .61095	3	07/24/97	TEC	8.00	6.00	130.00
460-1613-000-000-000-	Trib to Kwun Cr.	W114, Unit 7	93 M 014	9 .6124 .61082	3	07/24/97	TEC	7.80	5.00	70.00
005-4000-000-000-000-	Trib. to Kwun Cr.	W286, Unit 7	93 M 014	9 .6142 .61091	1	09/17/97	TEC	8.00	4.80	100.00
005-3400-000-000-000-	Trib. to Kwun Cr.	W284, Unit 7	93 M 014	9 .6122 .61082	1	09/17/97	TEC	7.74	5.50	80.00
460-2612-000-000-000-	Meed Cr.	ARNE 52, Unit 7	93 L 094	9 .6118 .60901	1	09/27/96	TEC		9.50	
460-2612-000-000-000-	Meed Cr.	ARNE 33, Unit 7	93 L 094	9 .6145 .60909	3	09/24/96	TEC		4.80	
460-2612-000-000-000-	Meed Cr.	ARNE 32, Unit 7	93 L 095	9 .6180 .60922	4	09/24/96	TFC		2.00	
001-7600-000-000-000-	Trib to Meed Cr.	W246, Unit 7	93 L 094	9 .6119 .60914	1	09/07/97	TEC			
002-2900-000-000-000-	Trib to Wiggs Cr.	ARNE 53, Unit 7	93 L 094	9 .6111 .60956	1	09/27/96	TEC	7.65	11.00	120.00
002-3000-000-000-000-	Trib to Wiggs Cr.	ARNE 58, Unit 7	93 M 004	9 .6109 .60972	1	09/28/96	TEC			
002-2900-000-000-000-	Trib to Wiggs Cr.	W245, Unit 7	93 M 004	9 .6141 .60970	3	09/07/97	TEC	7.87	6.50	100.00
460-2238-107-000-000-	Trib. to Wiggs Cr.	RYAN 108, Unit 7	93 M 005	9 .6156 .60975	1	09/24/96	TFC			
002-4200-000-000-000-	Trib. to Wiggs Cr.	ARNE 57, Unit 7	93 M 004	9 .61120 .60966	1	09/28/96	TFC			
002-4100-000-000-000-	Trib. to Wiggs Cr.	ARNE 59, Unit 7	93 M 004	9 .6105 .60968	3	09/28/96	TEC	7.93	10.00	160.00

Table 3. Summary of Barriers Observed on Working Unit 7 in 1996 and 1997

Watershed Code	Stream "Local"	Location	Map #	UTM	Reach Number	Survey Date	Agency	Obstruction 1 Ht(m)	Type 1	Location 1
002-6600-000-000-000-	Trib to Bulkley R	ARNE 49, Unit 7	93 M 004	9 .6102 .61058	1	09/27/96	TEC	0.90	CV	2.80
002-7500-000-000-000-	Trib to Bulkley R	ARNE 48, Unit 7	93 M 004	9 .6106 .61046	1	09/27/96	TEC	1.10	CV	3.40
002-4700-000-000-000-	Trib to Bulkley R	ARNE 51, Unit 7	93 M 004	9 .6082 .60976	2	09/27/96	TEC	0.60	CV	0.80
002-7600-000-000-000-	Trib. to Bulkley R	RYAN 134, Unit 7	93 M 004	9 .6105 .61050	2	09/27/96	TEC	0.50	C	1.00
002-6700-000-000-000-	Trib to Bulkley R	ARNE 47, Unit 7	93 M 004	9 .6098 .61024	1	09/27/96	TEC	0.90	CV	2.50
002-6800-000-000-000-	Trib to Bulkley R	RYAN 132, Unit 7	93 M 004	9 .6097 .61022	1	09/27/96	TEC	0.70	CV	1.60
002-6600-000-000-000-	Trib. to Bulkley R	ARNE 56, Unit 7	93 M 004	9 .6140 .61062	2	09/28/96	TEC	0.40	CV	7.20
460-1883-000-000-000-	Causqau Cr	Y268, Unit 7	93 M 005	9 .622490.610477	6	09/15/97	TEC	30.00	F	3.06
460-1883-000-000-000-	Causqau Cr	Y268, Unit 7	93 M 005	9 .622490.610477	6	09/15/97	TEC	10.00	F	13.00
000-8600-000-000-000-	Trib to Causqua Cr	RYAN 144, Unit 7	93 M 005	9 .6199 .61018	1	09/28/96	TEC	2.00	C	0.00
460-1883-000-000-000-	Causqua Cr	ARNE 50, Unit 7	93 M 004	9 .6087 .61005	1	09/27/96	TEC	1.00	F	0.84
460-1883-000-000-000-	Causqua Cr	RYAN 140, Unit 7	93 M 005	9 .6179 .60998	1	09/28/96	TEC	30.00	F	0.00
460-1883-000-000-000-	Causqua Cr	RYAN 145, Unit 7	93 M 005	9 .6201 .61018	4	09/28/96	TEC	10.00	F	12.30
000-4100-000-000-000-	Trib to Causqua Cr	RYAN 141, Unit 7	93 M 005	9 .6180 .60998	1	09/28/96	TEC	1.50	F	0.10
000-9400-000-000-000-	Trib. to Causqua Cr	Y267, Unit 7	93 M 005	9 .622429.6101389	1	09/15/97	TEC	0.70	C	0.00
002-8900-000-000-000-	Trib to Kwun Cr	W111, Unit 7	93 M 014	9 .6080 .61091	1	07/25/97	TEC	1.50	C	3.00
460-2612-000-000-000-	Meed Cr	ARNE 33, Unit 7	93 L 094	9 .6145 .60909	3	09/24/96	TEC	1.00	X	3.10
460-2612-000-000-000-	Meed Cr	ARNE 52, Unit 7	93 L 094	9 .6118 .60901	1	09/27/96	TEC	1.10	CV	0.60
460-2612-000-000-000-	Meed Cr	ARNE 52, Unit 7	93 L 094	9 .6118 .60901	1	09/27/96	TEC	1.00	R	0.50

Table 4. Summary of Site Data Collected in Working Unit 7 in 1996 and 1997

Watershed Code	Stream "Local"	Location	Map #	UTM	Reach Number	Survey Date	Agency	Average Channel Width (m)	Gradient (%)	RS Species	Proposed Stream Class	Fishing Method
002-6600-000-000-000	Trib to Bulkley R.	ARNE 49, Unit 7	93 M 004	9.6102 .61058	1	09/27/96	TEC	3.57	9.00	(RB) (DV)	S3	EL
002-7500-000-000-000	Trib to Bulkley R.	ARNE 48, Unit 7	93 M 004	9.6106 .61046	1	09/27/96	TEC	2.05	17.00	(RB) (DV)	S3	EL
460-0000-000-000-000	Trib. to Bulkley R.	RYAN 137, Unit 7	93 L 094	9.6134 .60888	1	09/27/96	TEC	2.37	6.00	(RB)	S3	NA
002-4700-000-000-000	Trib to Bulkley R.	ARNE 51, Unit 7	93 M 004	9.6082 .60976	2	09/27/96	TEC	1.82	19.00	NF	S6	NA
002-7600-000-000-000	Trib. to Bulkley R.	RYAN 134, Unit 7	93 M 004	9.6105 .61050	2	09/27/96	TEC	0.75	8.00	NF	S6	VO
002-7400-000-000-000	Trib. to Bulkley R.	RYAN 133, Unit 7	93 M 004	9.6107 .61041	2	09/27/96	TEC	2.98	11.00	(RB)	S3	EL
002-6700-000-000-000	Trib to Bulkley R.	ARNE 47, Unit 7	93 M 004	9.6098 .61024	1	09/27/96	TEC	4.92	5.00	(RB) (DV)	S3	EL
002-6800-000-000-000	Trib to Bulkley R.	RYAN 132, Unit 7	93 M 004	9.6097 .61022	1	09/27/96	TEC	2.23	6.00	(RB)	S3	VO
460-1760-000-370-000	Trib to Bulkley R.	ARNE 54, Unit 7	93 M 004	9.6150 .61039	3	09/28/96	TEC	1.70	6.00	(RB) (DV)	S3	EL
460-2685-000-000-000	Trib. to Bulkley R.	BRUCE 100, Unit 7	93 L 095	9.6155 .60897	2	08/26/96	TEC	2.50	13.00	(DV)	S3	NA
460-2685-005-270-000	Trib. to Bulkley R.	BRUCE 101, Unit 7	93 L 095	9.6156 .60897	1	08/26/96	TEC	1.50	18.00	(DV)	S3	NA
002-6700-000-000-000	Trib to Bulkley R.	W100, Unit 7	93 M 004	9.6166 .61024	2	07/23/97	TEC	4.67	5.00	(RB) (DV)	S3	EL
001-1700-000-000-000	Trib. to Bulkley R.	BRUCE 99, Unit 7	93 L 095	9.6162 .60905	1	08/26/96	TEC	0.90	13.00	(DV)	S4	NA
002-6600-000-000-000	Trib. to Bulkley R.	ARNE 56, Unit 7	93 M 004	9.6140 .61062	2	09/28/96	TEC	1.43	4.00	(DV)	S4	EL
460-2685-003-390-000	Trib. to Bulkley R.	BRUCE 98, Unit 7	93 L 095	9.6166 .60904	3	08/26/96	TEC	0.60	8.00	(DV)	S4	NA
005-3600-000-000-000	Trib. to Bulkley R.	W113, Unit 7	93 M 014	9.6120 .61086	1	07/25/97	TEC	1.07	5.00	(DV)	S4	EL
002-6800-000-000-000	Trib to Bulkley R.	W244, Unit 7	93 M 004	9.6117 .61012	2	09/07/97	TEC	3.28	36.00	NF	S5	EL
460-1760-000-000-000	Trib to Bulkley R.	ARNE 55, Unit 7	93 M 004	9.6149 .61045	3	09/28/96	TEC	1.25	1.00	NF	S6	EL
460-1883-000-000-000	Causqau Cr.	Y268, Unit 7	93 M 005	9.622490.610477	6	09/15/97	TEC	2.90	3.00	NF	S6	EL
000-9500-000-000-000	Trib to Causqau Cr.	Y269, Unit 7	93 M 005	9.62274 .610160	1	09/15/97	TEC	0.82	8.00	NF	S6	EL
460-1883-000-000-000	Causqua Cr.	ARNE 50, Unit 7	93 M 004	9.6087 .61005	1	09/27/96	TEC	15.62	4.00	RB	S2	AG
460-1883-000-000-000	Causqua Cr.	RYAN 140, Unit 7	93 M 005	9.6179 .60998	1	09/28/96	TEC	14.02	3.00	NF	S5	EL
460-1883-000-000-000	Causqua Cr.	RYAN 145, Unit 7	93 M 005	9.6201 .61018	4	09/28/96	TEC	3.97	3.50	NF	S5	EL
000-7900-000-000-000	Trib to Causqua Cr.	RYAN 149, Unit 7	93 M 005	9.6170 .60997	2	09/28/96	TEC	1.40	10.00	NF	S6	VO
000-8300-000-000-000	Trib to Causqua Cr.	RYAN 139, Unit 7	93 M 005	9.6200 .60994	2	09/28/96	TEC	1.75	10.00	NF	S6	EL
000-8500-000-000-000	Trib to Causqua Cr.	RYAN 143, Unit 7	93 M 005	9.61931 .61016	1	09/28/96	TEC	0.90	8.00	NF	S6	VO
000-8600-000-000-000	Trib to Causqua Cr.	RYAN 144, Unit 7	93 M 005	9.6199 .61018	1	09/28/96	TEC	0.65	7.00	NF	S6	VO
000-8700-000-000-000	Trib to Causqua Cr.	RYAN 146, Unit 7	93 M 005	9.6201 .61018	1	09/28/96	TEC	1.83	7.00	NF	S6	VO
000-8900-000-000-000	Trib to Causqua Cr.	RYAN 147, Unit 7	93 M 005	9.6207 .61011	1	09/28/96	TEC	1.62	15.00	NF	S6	VO
000-4100-000-000-000	Trib to Causqua Cr.	RYAN 141, Unit 7	93 M 005	9.6180 .60998	1	09/28/96	TEC	3.68	24.00	NF	S5	EL
000-8400-000-000-000	Trib to Causqua Cr.	RYAN 142, Unit 7	93 M 005	9.6193 .61016	1	09/28/96	TEC	2.55	7.00	NF	S6	EL
000-9400-000-000-000	Trib. to Causqua Cr.	Y267, Unit 7	93 M 005	9.622429.6101389	1	09/15/97	TEC	0.78	9.00	NF	S6	EL
110-0500-000-000-000	Trib to Causqua Cr.	W99, Unit 7	93 M 004	9.6137 .61017	2	07/23/97	TEC	2.82	2.00	NF	S6	EL
460-1883-000-000-000	Trib to Causqua Cr.	RYAN 148, Unit 7	93 M 005	9.6168 .61024	2	09/28/96	TEC	1.08	8.00	NF	S6	EL
000-9100-000-000-000	Trib. to Causqua Cr.	W283, Unit 7	93 M 005	9.6199 .61016	1	09/15/97	TEC	1.00	8.00	NF	S6	EL
000-9200-000-000-000	Trib. to Causqua Cr.	W282, Unit 7	93 M 005	9.6222 .61016	1	09/15/97	TEC	1.15	7.00	NF	S6	EL

Watershed Code	Stream "Local"	Location	Map #	UTM	Reach Number	Survey Date	Agency	Average Channel Width (m)	Gradient (%)	RS Species	Proposed Stream Class	Fishing Method
002-5200-000-000-000	Trib to Causqua R.	W101, Unit 7	93 M 004	9.6102 .60995	2	07/23/97	TEC	2.18	2.00	(RB)	S3	EL
460-2238-000-000-000	Gramophone Cr.	RYAN 138, Unit 7	93 L 094	9.6126 .60940	1	09/27/96	TEC	6.14	2.00	RB	S2	EL
460-2238-000-000-000	Trib. to Gramophone Cr.	RYAN 136, Unit 7	93 L 094	9.6100 .60926	1	09/27/96	TEC	1.70	8.00	(RB)	S3	NA
460-2238-000-000-000	Gramophone Cr.	RYAN 103, Unit 7	93 M 005	9.6191 .60979	3	09/24/96	TEC	1.40	6.00	(DV)	S4	EL
000-7600-000-000-000	Trib. to Gramophone Cr.	RYAN 106, Unit 7	93 M 005	9.6164 .60964	1	09/24/96	TEC	2.10	13.00	(DV)	S3	EL
002-3700-000-000-000	Trib to Gramophone Cr.	RYAN 166, Unit 7	93 L 094	9.6135 .60943	1	09/30/96	TEC	2.20	11.00	(RB)	S3	NA
460-2238-000-000-000	Trib. to Gramophone Cr.	RYAN 107, Unit 7	93 M 005	9.6164 .60964	1	09/24/96	TEC	2.75	12.00	(DV)	S3	EL
002-4100-000-000-000	Trib to Gramophone Cr.	RYAN 168, Unit 7	93 L 095	9.6161 .60950	1	09/30/96	TEC	1.00	12.00	(RB)	S4	VO
460-2238-003-940-065	Trib. to Gramophone cr.	ARNE 34, Unit 7	93 L 095	9.6173 .60939	2	09/24/96	TEC	0.87	8.00	(RB)	S4	VO
000-7300-000-000-000	Trib. to Gramophone Cr.	RYAN 105, Unit 7	93 M 005	9.6192 .60964	1	09/24/96	TEC	0.93	15.00	NF	S6	NA
000-7500-000-000-000	Trib. to Gramophone Cr.	RYAN 104, Unit 7	93 M 005	9.6191 .60976	1	09/24/06	TEC	0.95	8.00	NF	S6	VO
001-0200-000-000-000	Trib. to Gramophone Cr.	ARNE 35, Unit 7	93 L 095	9.6180 .60959	1	09/24/96	TEC	1.10	3.00	NF	S6	EL
460-2238-003-940-039	Trib to Gramophone Cr.	RYAN 167, Unit 7	93 L 095	9.6161 .60943	1	09/30/96	TEC	0.98	15.00	NF	S6	VO
460-2238-000-000-000	Trib to Gramophone Cr.	JULIE 273, Unit 7	93 L 094	9.6134 .60941	1	09/30/96	TEC	5.50	9.00	RB	S2	EL
002-3600-000-000-000	Trib to Gramophone Cr.	JULIE 272, Unit 7	93 L 094	9.6137 .60932	1	09/30/96	TEC	1.50	20.00	NF	S6	NA
460-1613-000-000-000	Kwun Cr.	RYAN 135, Unit 7	93 M 004	9.6097 .61067	2	09/27/96	TEC	6.82	7.00	(RB)	S2	EL
460-1613-000-000-000	Kwun Cr.	W114, Unit 7	93 M 014	9.6124 .61082	4	07/24/97	TEC	5.05	4.00	(DV)	S2	EL
005-3500-000-000-000	Trib to Kwun Cr.	W285, Unit 7	93 M 014	9.6127 .61085	1	09/17/97	TEC	2.80	11.50	(RB) (DV)	S3	EL
005-3400-000-000-000	Trib. to Kwun Cr.	W284, Unit 7	93 M 014	9.6122 .61082	1	09/17/97	TEC	1.12	12.50	(RB)	S4	EL
005-3100-000-000-000	Trib to Kwun Cr.	W109, Unit 7	93 M 014	9.6079 .61095	3	07/24/97	TEC	1.03	8.00	(DV)	S4	NA
005-4000-000-000-000	Trib. to Kwun Cr.	W286, Unit 7	93 M 014	9.6142 .61091	1	09/17/97	TEC	0.92	6.00	(DV) (RB)	S4	EL
005-3000-000-000-000	Trib to Kwun Cr.	W112, Unit 7	93 M 014	9.6085 .61082	1	07/25/97	TEC	0.44	10.00	NF	S6	NA
002-9000-000-000-000	Trib to Kwun Cr.	W115, Unit 7	93 M 014	9.6107 .61077	2	07/25/97	TEC	0.72	6.00	NF	S6	NA
005-3200-000-000-000	Trib to Kwun Cr.	W110, Unit 7	93 M 014	9.6079 .61093	1	07/25/97	TEC	1.37	28.00	NF	S6	EL
002-8900-000-000-000	Trib to Kwun Cr.	W111, Unit 7	93 M 014	9.6080 .61091	1	07/25/97	TEC	1.00	25.00	NF	S6	EL
460-2612-000-000-000	Meed Cr.	ARNE 33, Unit 7	93 L 094	9.6145 .60909	3	09/24/96	TEC	3.32	7.00	(RB)	S3	EL
460-2612-000-000-000	Meed Cr.	ARNE 52, Unit 7	93 L 094	9.6118 .60901	1	09/27/96	TEC	3.80	4.00	(RB) (DV)	S3	EL
460-2612-000-000-000	Meed Cr.	ARNE 32, Unit 7	93 L 095	9.6180 .60922	5	09/24/96	TEC	1.20	1.00	NF	S6	EL
001-7600-000-000-000	Trib to Meed Cr.	W246, Unit 7	93 L 094	9.6119 .60914	1	09/07/97	TEC	1.83	4.00	(RB)	S3	NA
001-7300-000-000-000	Not a creek	W247, Unit 7	93 L 094	9.6135 .60885	0	09/08/97	TEC	0.00	2.00	NF	NC	NA
005-4100-000-000-000	Not a creek	W287, Unit 7	93 M 014	9.6145 .61093	0	09/12/97	TEC	0.00	6.00	NF	NC	NA
002-2900-000-000-000	Trib to Wiggs Cr.	ARNE 53, Unit 7	93 L 094	9.6111 .60956	1	09/27/96	TEC	1.77	1.50	(RB) (DV)	S3	EL
002-3000-000-000-000	Trib to Wiggs Cr.	ARNE 58, Unit 7	93 M 004	9.6109 .60972	1	09/28/96	TEC	2.08	10.00	(RB)	S3	NA
002-4100-000-000-000	Trib. to Wiggs Cr.	ARNE 59, Unit 7	93 M 004	9.6105 .60968	3	09/28/96	TEC	1.50	0.00	(RB)	S3	NA
002-4200-000-000-000	Trib. to Wiggs Cr.	ARNE 57, Unit 7	93 M 004	9.61120 .60966	1	09/28/96	TEC	1.63	6.00	(RB)	S3	NA
002-2900-000-000-000	Trib to Wiggs Cr.	W245, Unit 7	93 M 004	9.6141 .60970	3	09/07/97	TEC	1.98	11.00	(RB)	S3	EL
460-2238-107-000-000	Trib. to Wiggs Cr.	RYAN 108, Unit 7	93 M 005	9.6156 .60975	1	09/24/96	TEC	0.60	5.00	NF	S6	NA

Watershed Code	Stream "Local"	Location	TRIM Number	UTM	Reach Number	Survey Date	Agency	Proposed Stream Class	Fishing Effort	Rationale
000-8900-000-000-000-000-000-000-000-000-000	Trib to Causqua Cr.	RYAN 147, Unit 7	93 M 005	9 .6207 .61011	1	09/28/96	TEC	S6	The mainstem was electroshocked for 1400 seconds, not this tributary, poor shocking conditions.	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
000-7900-000-000-000-000-000-000-000-000-000	Trib to Causqua Cr.	RYAN 149, Unit 7	93 M 005	9 .6170 .60997	2	09/28/96	TEC	S6	The mainstem was shocked for 1400 seconds, not this tributary.	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
460-1883-000-000-000-000-000-000-000-000-000	Causqua Cr.	RYAN 140, Unit 7	93 M 005	9 .6179 .60998	3	09/28/96	TEC	S5	This site was electroshocked for 1400 seconds over 650 meters using a Smithroot 12 B POW model	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
460-1883-000-000-000-000-000-000-000-000-000	Causqua Cr.	RYAN 145, Unit 7	93 M 005	9 .6201 .61018	4	09/28/96	TEC	S5	This site was electrofished for 1300 seconds over 900 meters using a Smithroot 12 B POW model	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
000-4100-000-000-000-000-000-000-000-000-000	Trib to Causqua Cr.	RYAN 141, Unit 7	93 M 005	9 .6180 .60998	1	09/28/96	TEC	S5	The electroshocking effort, using a Smithroot 12 B POW model was 1400 seconds at the confluence with the mainstem	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
000-8400-000-000-000-000-000-000-000-000-000	Trib to Causqua Cr.	RYAN 142, Unit 7	93 M 005	9 .6193 .61016	1	09/28/96	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model was 1400 seconds on the mainstem	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
460-1883-000-000-000-000-000-000-000-000-000	Trib to Causqua Cr.	RYAN 148, Unit 7	93 M 005	9 .6168 .61024	2	09/28/96	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model, was 250 seconds over 200 meters.	This reach has been classified as non fish bearing because it is located above a 30 m falls on the mainstem and no evidence of a resident population was found in the sampling area.
110-0500-000-000-000-000-000-000-000-000-000	Trib to Causqua Cr.	W99, Unit 7	93 M 004	9 .6137 .61017	2	07/23/97	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model set at 400V, was 311 seconds over 100 meters.	This reach has been classified as non fish bearing because it is located above a 10m falls and a 30m falls and no evidence of a resident population of fish was found in the sampling area.
000-9200-000-000-000-000-000-000-000-000-000	Trib. to Causqua Cr.	W282, Unit 7	93 M 005	9 .6222 .61016	1	09/15/97	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model set at J-4-800V, was 346 seconds over 100 meters.	This reach has been classified as non fish bearing because it is located above a 10m falls and a 30m falls and no evidence of a resident population of fish was found in the sampling area.
000-9100-000-000-000-000-000-000-000-000-000	Trib. to Causqua Cr.	W283, Unit 7	93 M 005	9 .6199 .61016	1	09/15/97	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model set at J-4-600V, was 277 seconds over 150 meters.	This reach has been classified as non fish bearing because it is located above a 10m falls and a 30m falls and no evidence of a resident population of fish was found in the sampling area.
000-9400-000-000-000-000-000-000-000-000-000	Trib. to Causqua Cr.	Y267, Unit 7	93 M 005	9 .622429.6101389	1	09/15/97	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model set at I-5-500V, was 111 seconds over 100 meters.	This reach has been classified as non fish bearing because it is located above a 10m falls and a 30m falls and no evidence of a resident population of fish was found in the sampling area.
460-2238-003-940-039-500-000-000-000-000-000-000	Trib to Gramophone Cr.	RYAN 167, Unit 7	93 L 095	9 .6161 .60943	1	09/30/96	TEC	S6	This site contained too little water at the time of sampling, and has too narrow a channel, to effectively electrofish.	This tributary has been classified as non fish bearing because the channel is intermittent in the sampling area, posing multiple barriers to fish passage upstream.

Watershed Code	Stream "Local"	Location	TRIM Number	UTM	Reach Number	Survey Date	Agency	Proposed Stream Class	Fishing Effort	Rationale
001-0200-000-000-000-000-000-000-000-000-000	Trib. to Gramophone Cr.	ARNE 35, Unit 7	93 L 095	9 .6180 .60959	1	09/24/96	TEC	S6	This site was electroshocked for 91 seconds with a Smithroot 15 A model.	This tributary has been classified as non fish bearing because it lacks suitable fish habitat. No overwintering or spawning habitat was observed and the possibility of a resident population in the stream is low.
000-7500-000-000-000-000-000-000-000-000-000	Trib. to Gramophone Cr.	RYAN 104, Unit 7	93 M 005	9 .6191 .60976	1	09/24/06	TEC	S6	This site was not electrofished, subterranean flow and low flow made shocking ineffective	This site lacks suitable fish habitat and has subterranean flow.
000-7300-000-000-000-000-000-000-000-000-000	Trib. to Gramophone Cr.	RYAN 105, Unit 7	93 M 005	9 .6192 .60964	1	09/24/96	TEC	S6	This dry site was not electrofished.	This tributary has been classified as non fish bearing because the channel is intermittent, moving underground frequently and posing multiple barriers to fish migration.
002-3600-000-000-000-000-000-000-000-000-000	Trib to Gramophone Creek	JULIE 272, Unit 7	93 L 094	9 .6137 .60932	1	09/30/96	TEC	S6	This dry site could not be electrofished.	This reach has been classified as non fish bearing because it has a steep gradient range of 20-30% and lacks suitable fish habitat.
005-3200-000-000-000-000-000-000-000-000-000	Trib to Kwun Cr.	W110, Unit 7	93 M 014	9 .6079 .61093	1	07/25/97	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model set at 300V, was 81 seconds over 100 meters. High water velocity reduced the effectiveness of electroshocking at this site.	This reach has been classified as non fish bearing due to steep gradient and a lack of suitable habitat in the sampling area
002-8900-000-000-000-000-000-000-000-000-000	Trib to Kwun Cr.	W111, Unit 7	93 M 014	9 .6080 .61091	1	07/25/97	TEC	S6	The electroshocking effort, using a Smithroot 12 B POW model set at 400V, was 93 seconds over 225 meters. Shocking conditions were marginal due to the gradient and lack of cover.	This reach has been classified as non fish bearing because no suitable fish habitat was observed in the sampling area.
005-3000-000-000-000-000-000-000-000-000-000	Trib to Kwun Cr.	W112, Unit 7	93 M 014	9 .6085 .61082	1	07/25/97	TEC	S6	This site was not electrofished due to low flows at the time of sampling.	This reach has been classified as non fish bearing because no suitable fish habitat was observed in the sampling area.
002-9000-000-000-000-000-000-000-000-000-000	Trib to Kwun Cr.	W115, Unit 7	93 M 014	9 .6107 .61077	2	07/25/97	TEC	S6	This site was not electrofished due to low flows at the time of sampling.	This reach has been classified as non fish bearing because no suitable fish habitat was observed in the sampling area.
460-2612-000-000-000-000-000-000-000-000-000	Meed Cr.	ARNE 32, Unit 7	93 L 095	9 .6180 .60922	5	09/24/96	TEC	S6	The electroshocking effort, using a Smithroot 15 A model , was 423 seconds over 260 square meters.	This reach, located in the headwaters of the stream, has been classified as non fish bearing because it lacks suitable fish habitat. The substrate is comprised of angular cobble covered in fines
460-2238-107-000-000-000-000-000-000-000-000	Trib. to Wiggs Cr.	RYAN 108, Unit 7	93 M 005	9 .6156 .60975	1	09/24/96	TEC	S6	This dry site was not electrofished.	This tributary has been classified as non fish bearing because the channel is intermittent in some areas, posing multiple barriers to fish passage upstream.

Table 6. Summary of Sites in Working Unit 7 for Which Future Sampling is Recommended

Watershed Code	Stream "Local"	Location	TRIM Number	UTM	Reach Number	Survey Date	Agency	Average Channel Width (m)	Gradient (%)	Fish Species	Proposed Stream Class	Fishing Method
460-0000-000-000-000-000-000	Trib. to Bulkley R.	RYAN 137, Unit 7	93 L 094	9 .6134	1	09/27/96	TEC	2.37	6.00	(RB)	S3	NA
002-7500-000-000-000-000-000	Trib. to Bulkley R.	ARNE 48, Unit 7	93 M 004	9 .6106	1	09/27/96	TEC	2.05	17.00	(RB) (DV)	S3	EL
002-6600-000-000-000-000-000	Trib. to Bulkley R.	ARNE 49, Unit 7	93 M 004	9 .6102	1	09/27/96	TEC	3.57	9.00	(RB) (DV)	S3	EL
460-2685-003-390-000-000-000	Trib. to Bulkley R.	BRUCE 98, Unit 7	93 L 095	9 .6166	3	08/26/96	TEC	0.60	8.00	(DV)	S4	NA
001-1700-000-000-000-000-000	Trib. to Bulkley R.	BRUCE 99, Unit 7	93 L 095	9 .6162	1	08/26/96	TEC	0.90	13.00	(DV)	S4	NA
460-2685-000-000-000-000-000	Trib. to Bulkley R.	BRUCE 100, Unit 7	93 L 095	9 .6155	2	08/26/96	TEC	2.50	13.00	(DV)	S3	NA
460-2685-005-270-000-000-000	Trib. to Bulkley R.	BRUCE 101, Unit 7	93 L 095	9 .6156	1	08/26/96	TEC	1.50	18.00	(DV)	S3	NA
002-6600-000-000-000-000-000	Trib. to Bulkley R.	ARNE 56, Unit 7	93 M 004	9 .6140	2	09/28/96	TEC	1.43	4.00	(DV)	S4	EL
005-3600-000-000-000-000-000	Trib. to Bulkley R.	W113, Unit 7	93 M 014	9 .6120	1	07/25/97	TEC	1.07	5.00	(DV)	S4	EL
002-6800-000-000-000-000-000	Trib. to Bulkley R.	RYAN 132, Unit 7	93 M 004	9 .6097	1	09/27/96	TEC	2.23	6.00	(RB)	S3	VO
002-7400-000-000-000-000-000	Trib. to Bulkley R.	RYAN 133, Unit 7	93 M 004	9 .6107	2	09/27/96	TEC	2.98	11.00	(RB)	S3	EL
002-6700-000-000-000-000-000	Trib. to Bulkley R.	W100, Unit 7	93 M 004	9 .6166	2	07/23/97	TEC	4.67	5.00	(RB) (DV)	S3	EL
002-6700-000-000-000-000-000	Trib. to Bulkley R.	ARNE 47, Unit 7	93 M 004	9 .6118	1	09/27/96	TEC	4.92	5.00	(RB) (DV)	S3	EL
460-1760-000-370-000-000-000	Trib. to Bulkley R.	ARNE 54, Unit 7	93 M 004	9 .6150	3	09/28/96	TEC	1.70	6.00	(RB) (DV)	S3	EL
002-5200-000-000-000-000-000	Trib to Causqua R.	W101, Unit 7	93 M 004	9 .6102	2	07/23/97	TEC	2.18	2.00	(RB)	S3	EL
460-2238-000-000-000-000-000	Gramophone Cr.	RYAN 103, Unit 7	93 M 005	9 .6191	3	09/24/96	TEC	1.40	6.00	(DV)	S4	EL
460-2238-000-000-000-000-000	Trib. to Gramophone Cr.	RYAN 136, Unit 7	93 L 094	9 .6100	1	09/27/96	TEC	1.70	8.00	(RB)	S3	NA
000-7600-000-000-000-000-000	Trib. to Gramophone Cr.	RYAN 106, Unit 7	93 M 005	9 .6164	1	09/24/96	TEC	2.10	13.00	(DV)	S3	EL
460-2238-000-000-000-000-000	Trib. to Gramophone Cr.	RYAN 107, Unit 7	93 M 005	9 .6164	1	09/24/96	TEC	2.75	12.00	(DV)	S3	EL
460-2238-003-940-065-600-000	Trib. to Gramophone Cr.	ARNE 34, Unit 7	93 L 095	9 .6173	2	09/24/96	TEC	0.87	8.00	(RB)	S4	VO
002-3700-000-000-000-000-000	Trib to Gramophone Cr.	RYAN 166, Unit 7	93 L 094	9 .6135	1	09/30/96	TEC	2.20	11.00	(RB)	S3	NA
002-4100-000-000-000-000-000	Trib to Gramophone Cr.	RYAN 168, Unit 7	93 L 095	9 .6161	1	09/30/96	TEC	1.00	12.00	(RB)	S4	VO
460-1613-000-000-000-000-000	Kwun Cr.	RYAN 135, Unit 7	93 M 004	9 .6097	2	09/27/96	TEC	6.82	7.00	(RB)	S2	EL
005-3100-000-000-000-000-000	Trib to Kwun Cr.	W109, Unit 7	93 M 014	9 .6079	3	07/24/97	TEC	1.03	8.00	(DV)	S4	NA
460-1613-000-000-000-000-000	Trib to Kwun Cr.	W114, Unit 7	93 M 014	9 .6124	3	07/24/97	TEC	5.05	4.00	(DV)	S2	EL
005-4000-000-000-000-000-000	Trib. to Kwun Cr.	W286, Unit 7	93 M 014	9 .6142	1	09/17/97	TEC	0.92	6.00	(DV) (RB)	S4	EL
005-3400-000-000-000-000-000	Trib. to Kwun Cr.	W284, Unit 7	93 M 014	9 .6122	1	09/17/97	TEC	1.12	12.50	(RB)	S4	EL
005-3500-000-000-000-000-000	Trib to Kwun Cr.	W285, Unit 7	93 M 014	9 .6127	1	09/17/97	TEC	2.80	11.50	(RB) (DV)	S3	EL
460-2612-000-000-000-000-000	Meed Cr.	ARNE 33, Unit 7	93 L 094	9 .6145	3	09/24/96	TEC	3.32	7.00	(RB)	S3	EL
460-2612-000-000-000-000-000	Meed Cr.	ARNE 52, Unit 7	93 L 094	9 .6118	1	09/27/96	TEC	3.80	4.00	(RB) (DV)	S3	EL
001-7600-000-000-000-000-000	Trib to Meed Cr.	W246, Unit 7	93 L 094	9 .6119	1	09/07/97	TEC	1.83	4.00	(RB)	S3	NA
002-2900-000-000-000-000-000	Trib to Wiggs Cr.	ARNE 53, Unit 7	93 L 094	9 .6111	1	09/27/96	TEC	1.77	1.50	(RB) (DV)	S3	EL
002-4200-000-000-000-000-000	Trib. to Wiggs Cr.	ARNE 57, Unit 7	93 M 004	9 .61120	1	09/28/96	TEC	1.63	6.00	(RB)	S3	NA
002-4100-000-000-000-000-000	Trib. to Wiggs Cr.	ARNE 59, Unit 7	93 M 004	9 .6105	3	09/28/96	TEC	1.50	0.00	(RB)	S3	NA
002-2900-000-000-000-000-000	Trib to Wiggs Cr.	W245, Unit 7	93 M 004	9 .6141	3	09/07/97	TEC	1.98	11.00	(RB)	S3	EL
002-3000-000-000-000-000-000	Trib to Wiggs Cr.	ARNE 58, Unit 7	93 M 004	9 .6109	1	09/28/96	TEC	2.08	10.00	(RB)	S3	NA

Table 7. Summary of Wildlife Signs Observed in Working Unit 7 in 1996 and 1997

Watershed Code	TRIM Number	Location	UTM	Reach Number	Survey Date	Agency	Comment
002-4100-000-000-	93 M 004	ARNE 59, Unit 7	9 .6105 .60968	1	09/28/96	TEC	Several beaver dams were observed in this area.

APPENDIX 1

Fish Data

Appendix 1. Summary of Fish Data Collected in Working Unit 7 in 1996 and 1997

Watershed Code	Stream "Local"	Location	Map #	UTM	Reach Number	Survey Date	Agency	Species	Number	Size Range	Life Phase	Fishing Method
460-2238-000-000-000-000-	Gramophone Cr.	RYAN 138, Unit 7	93 L 094	9 .6126 .60940	1	09/27/96	TEC	RB	7.00	80-120	J	EL
460-2238-000-000-000-000-	Trib to Gramophone Cr	JULIE 273, Unit 7	93 L 094	9 .6134 .60941	1	09/30/96	TEC	RB	4.00	100-115	J	EL
460-1883-000-000-000-000-	Causqua Cr.	ARNE 50, Unit 7	93 M 004	9 .6087 .61005	1	09/27/96	TEC	RB	1.00	175	J	AG

APPENDIX 2
Photodocumentation

Appendix 2. Photodocumentation Summary for Working Unit 7

Group	Roll	Frame	Watershed Code	Survey Crew	Site Number	Unit Number	Agency	Survey Date	Stream "Local"	Map #	UTM Zone	UTM Northing	UTM Easting	Reach Number	Aspect	Photo Direction	Photo Type	Scale Item	Comments
B	7	25	460268500339000000000000	BM DD	B98	Unit 7	TEC	26/08/96	Trib. Bulkley R.	93 L 095	9	6166000	609040	3	SW		Ch	notebook	book in dry channel
B	7	1	001170000000000000000000	BM DD	B99	Unit 7	TEC	26/08/96	Trib. to Bulkley R.	93 L 095	9	6162000	609050	1	SW	Bd	Ch	notebook	Dry channel.
B	7	1B	001170000000000000000000	BM DD	B99	Unit 7	TEC	26/08/96	Trib. to Bulkley R.	93 L 095	9	6162000	609050	1	SW	Bd	Ch	notebook	Dry channel.
B	7	2	460268500000000000000000	BM DD	B100	Unit 7	TEC	26/08/96	Trib. to Bulkley R.	93 L 095	9	6155000	608970	2	SW	Up	Ch		Dry channel with moss-covered LOD.
B	7	3	460268500527000000000000	BM DD	B101	Unit 7	TEC	26/08/96	Trib. to Bulkley R.	93 L 095	9	6156000	608970	1	SW	Up	Ch		Large cobble in dry channel.
R	6	12	460223800000000000000000	RH JL	R103	Unit 7	TEC	24/09/96	Gramophone Cr.	93 M 005	9	6191000	609790	3	W	Up	Ch		Looking upstream, cutbank cover habitat.
R	6	15	000750000000000000000000	RH JL	R104	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 M 005	9	6191000	609760	1	NW	Up	Ch		Looking upstream.
R	6	17	000730000000000000000000	RH JL	R105	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 M 005	9	6192000	609640	1	W	Dn	Ch		Looking downstream.
R	6	19	000760000000000000000000	RH JL	R106	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 M 005	9	6164000	609640	1	SW	Dn	Ch		Looking downstream, LOD and pool.
R	6	18	000760000000000000000000	RH JL	R106	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 M 005	9	6164000	609640	1	SW	Up	Ch		Looking upstream.
A	4	2	460261200000000000000000	AKL HK	A32	Unit 7	TEC	24/09/96	Meed Cr.	93 L 095	9	6180000	609220	4	SW	Dn	Ch	meterstick	Looking downstream.
A	4	3	460261200000000000000000	AKL HK	A32	Unit 7	TEC	24/09/96	Meed Cr.	93 L 095	9	6180000	609220	4	SW	Up	Ch		Looking upstream.
A	4	4	460261200000000000000000	AKL HK	A33	Unit 7	TEC	24/09/96	Meed Cr.	93 L 094	9	6145000	609090	3	S	Dn	Ch	meterstick	Looking downstream.
A	4	5	460261200000000000000000	AKL HK	A33	Unit 7	TEC	24/09/96	Meed Cr.	93 L 094	9	6145000	609090	3	S	Up	Ch		Looking upstream.
A	4	6	460223800394006560000000	AKL HK	A34	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 L 095	9	6173000	609390	2	SW	Up	Ch	notebook	Looking upstream.
A	4	7	460223800394006560000000	AKL HK	A34	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 L 095	9	6173000	609390	2	SW	Dn	Ch		Looking downstream.
A	4	9	001020000000000000000000	AKL HK	A35	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 L 095	9	6180000	609590	1	SW	Dn	Ch		Looking downstream.
A	4	8	001020000000000000000000	AKL HK	A35	Unit 7	TEC	24/09/96	Trib. to Gramophone Cr.	93 L 095	9	6180000	609590	1	SW	Up	Ch		Looking upstream.
R	8	17	002680000000000000000000	RH JL	R132	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6097000	610220	1	W	Up	O		Looking upstream toward culvert.
R	8	15	002680000000000000000000	RH JL	R132	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6097000	610220	1	W	Dn	Ch	Jim	Looking downstream.
R	8	16	002680000000000000000000	RH JL	R132	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6097000	610220	1	W	Up	Ch		Looking upstream.
R	8	18	002740000000000000000000	RH JL	R133	Unit 7	TEC	27/09/96	Trib. to Bulkley R.	93 M 004	9	6107000	610410	2	W	Up	Ch		Looking upstream.
R	8	19	002740000000000000000000	RH JL	R133	Unit 7	TEC	27/09/96	Trib. to Bulkley R.	93 M 004	9	6107000	610410	2	W	Dn	Ch		Looking downstream.
R	8	20	002760000000000000000000	RH JL	R134	Unit 7	TEC	27/09/96	Trib. to Bulkley R.	93 M 004	9	6105000	610500	2	W	Dn	Ch		Looking downstream.
R	8	21	002760000000000000000000	RH JL	R134	Unit 7	TEC	27/09/96	Trib. to Bulkley R.	93 M 004	9	6105000	610500	2	W	Up	Ch		Looking upstream, LOD in channel.
R	8	22	460161300000000000000000	RH JL	R135	Unit 7	TEC	27/09/96	Kwun Cr.	93 M 004	9	6097000	610670	2	SW	Up	Ch	notebook	Looking upstream, cascade.
R	9	23	460161300000000000000000	RH JL	R135	Unit 7	TEC	27/09/96	Kwun Cr.	93 M 004	9	6097000	610670	2	SW	Dn	Ch		Looking downstream.
R	9	4	460223800000000000000000	RH JL	R138	Unit 7	TEC	27/09/96	Gramophone Cr.	93 L 094	9	6126000	609400	1	W	Dn	Ch	hat	Looking downstream, boulder cover.
R	9	5	460223800000000000000000	RH JL	R138	Unit 7	TEC	27/09/96	Gramophone Cr.	93 L 094	9	6126000	609400	1	W	Up	Ch		Looking upstream toward bridge.
R	9	3	460223800000000000000000	RH JL	R138	Unit 7	TEC	27/09/96	Gramophone Cr.	93 L 094	9	6126000	609400	1	W	Bd	Fi		Rainbow trout caught by electrofishing.
A	5	10	002670000000000000000000	AKL BL	A47	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6098000	610240	1	NW	Up	Ch	notebook	Looking upstream.
A	5	9	002670000000000000000000	AKL BL	A47	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6098000	610240	1	NW	Dn	Ch		Looking downstream.
A	5	12	002750000000000000000000	AKL BL	A48	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6106000	610460	1	W	Up	Ch		Looking upstream toward culvert. old logging debris.

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A	5	11	0027500000000000000000	AKL BL	A48	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6106000	610460	1	W	Dn	Ch		Looking downstream.
A	5	13	0026600000000000000000	AKL BL	A49	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6102000	610580	1	W	Up	Ch		Looking upstream.
A	5	14	0026600000000000000000	AKL BL	A49	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6102000	610580	1	W	Dn	Ch		Looking downstream, gravel bar and alders.
A	5	17	4601883000000000000000	AKL BL	A50	Unit 7	TEC	27/09/96	Causqua Cr.	93 M 004	9	6087000	610050	1	S	Up	Ch		Looking upstream, waterfall and cascades.
A	5	16	4601883000000000000000	AKL BL	A50	Unit 7	TEC	27/09/96	Causqua Cr.	93 M 004	9	6087000	610050	1	S	Up	Ch		Looking upstream, blowdowns over creek.
A	5	15	4601883000000000000000	AKL BL	A50	Unit 7	TEC	27/09/96	Causqua Cr.	93 M 004	9	6087000	610050	1	S	Dn	Ch		Looking downstream.
A	5	19	0024700000000000000000	AKL BL	A51	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6082000	609760	2	W	Up	Ch	hat	Looking upstream.
A	5	18	0024700000000000000000	AKL BL	A51	Unit 7	TEC	27/09/96	Trib to Bulkley R.	93 M 004	9	6082000	609760	2	W	Dn	Ve	Brian	Looking downstream.
A	5	20	4602612000000000000000	AKL BL	A52	Unit 7	TEC	27/09/96	Meed Cr.	93 L 094	9	6118000	609010	1	W	Up	Ch		Looking upstream.
A	5	21	4602612000000000000000	AKL BL	A52	Unit 7	TEC	27/09/96	Meed Cr.	93 L 094	9	6118000	609010	1	W	Dn	Ch		Looking downstream, gravel bar with debris.
A	5	22	4602612000000000000000	AKL BL	A52	Unit 7	TEC	27/09/96	Meed Cr.	93 L 094	9	6118000	609010	1	W	Dn	Ch		Looking downstream, well in creek.
A	5	23	0022900000000000000000	AKL BL	A53	Unit 7	TEC	27/09/96	Trib to Wiggis Cr.	93 L 094	9	6111000	609560	1	W	Up	Ch		Looking upstream, channel beside road.
R	9	8	0008300000000000000000	RH JL	R139	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6200000	609940	2	W	Up	Ch		Looking upstream, channel through willows.
R	9	7	0008300000000000000000	RH JL	R139	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6200000	609940	2	W	Dn	Ch	hat	Looking downstream.
R	9	10	4601883000000000000000	RH JL	R140	Unit 7	TEC	28/09/96	Causqua Cr.	93 M 005	9	6179000	609980	3	W	Up	Ch	Dave	Looking upstream, wide channel, large bars.
R	9	11	0004100000000000000000	RH JL	R141	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6180000	609980	1	NW	Up	Ch		Looking upstream at confluence, cascade over LOD.
R	9	14	0008400000000000000000	RH JL	R142	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6193000	610160	1	S	Up	Ch	hat	Looking upstream.
R	9	16	0008500000000000000000	RH JL	R143	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6193100	610160	1	S	Up	Ve		Looking upstream, willows over channel.
R	9	17	0008600000000000000000	RH JL	R144	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6199000	610180	1	SW	Up	Ve		Looking upstream, willows over channel.
R	9	18	4601883000000000000000	RH JL	R145	Unit 7	TEC	28/09/96	Causqua Cr.	93 M 005	9	6201000	610180	4	W	Up	Ch	Jim	Looking upstream.
R	9	19	4601883000000000000000	RH JL	R145	Unit 7	TEC	28/09/96	Causqua Cr.	93 M 005	9	6201000	610180	4	W	Dn	Ch		Looking downstream.
R	9	20	0008900000000000000000	RH JL	R147	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6207000	610110	1	NW	Dn	Ch	hat	Looking downstream.
R	9	21	0008900000000000000000	RH JL	R147	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6207000	610110	1	NW	Up	Ch	Ryan	Looking upstream, LOD in channel.
R	9	22	4601883000000000000000	RH JL	R148	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6168000	610240	2	SW	Up	Ch	hat	Looking upstream, moss-covered bedrock.
R	9	23	4601883000000000000000	RH JL	R148	Unit 7	TEC	28/09/96	Trib to Causqua Cr.	93 M 005	9	6168000	610240	2	SW	Dn	Ch		Looking downstream.
A	6	2	4601760000370000000000	AKL BL	A54	Unit 7	TEC	28/09/96	Trib to Bulkley R.	93 M 004	9	6150000	610390	3	SW	Dn	Ch		Looking downstream, LOD across channel.
A	6	1	4601760000370000000000	AKL BL	A54	Unit 7	TEC	28/09/96	Trib to Bulkley R.	93 M 004	9	6150000	610390	3	SW	Up	Ch		Looking upstream, moss-covered banks.
A	6	4	4601760000000000000000	AKL BL	A55	Unit 7	TEC	28/09/96	Trib to Bulkley R.	93 M 004	9	6149000	610450	3	W	Up	Ve		Looking upstream.

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A	6	3	4601760000000000000000	AKL BL	A55	Unit 7	TEC	28/09/96	Trib to Bulkley R.	93 M 004	9	6149000	610450	3	W	Dn	Ve		Looking downstream.
A	6	7	0024200000000000000000	AKLBRL	A57	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6112000	609660	1	W	Up	Ch	meterstick	Looking upstream, meterstick across channel.
A	6	8	0024200000000000000000	AKLBRL	A57	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6112000	609660	1	W	Dn	Ch		Looking downstream.
A	6	9	0023000000000000000000	AKLBRL	A58	Unit 7	TEC	28/09/96	Trib to Wiggs Creek	93 M 004	9	6109000	609720	1	SW	Up	Ch	notebook	Looking upstream.
A	6	10	0023000000000000000000	AKLBRL	A58	Unit 7	TEC	28/09/96	Trib to Wiggs Creek	93 M 004	9	6109000	609720	1	SW	Dn	Ve		Looking downstream.
A	6	14	0024100000000000000000	AKLBRL	A59	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6105000	609680	3	S	Dn	Ch		Aerial photo of pond.
A	6	15	0024100000000000000000	AKLBRL	A59	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6105000	609680	3	S	Dn	Ch		Aerial photo, series of beaver ponds.
A	6	13	0024100000000000000000	AKLBRL	A59	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6105000	609680	3	S	Dn	Ch		Aerial photo of pond.
A	6	11	0024100000000000000000	AKLBRL	A59	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6105000	609680	3	S	Dn	Ch	Arne	Looking downstream.
A	6	12	0024100000000000000000	AKLBRL	A59	Unit 7	TEC	28/09/96	Trib. to Wiggs Cr.	93 M 004	9	6105000	609680	3	S	Up	Ve		Looking upstream, no channel.
A	6	5	0026600000000000000000	AKLBRL	A56	Unit 7	TEC	28/09/96	Trib to Bulkley R.	93 M 004	9	6140000	610620	2	W	Up	Ch		Looking upstream.
A	6	6	0026600000000000000000	AKLBRL	A56	Unit 7	TEC	28/09/96	Trib to Bulkley R.	93 M 004	9	6140000	610620	2	W	Dn	Ch		Looking downstream through alders.
R	11	2	0023700000000000000000	RH JL	R166	Unit 7	TEC	30/09/96	Trib to Gramophone Cr.	93 L 094	9	6135000	609430	1	SW	Up	Ch		Looking upstream.
R	11	1	0023700000000000000000	RH JL	R166	Unit 7	TEC	30/09/96	Trib to Gramophone Cr.	93 L 094	9	6135000	609430	1	SW	Dn	Ch	Jim	Looking downstream.
R	11	3	46022380039400395000000	RH JL	R167	Unit 7	TEC	30/09/96	Trib to Gramophone Cr.	93 L 095	9	6161000	609430	1	NW	Dn	Ch	brown hat	Looking downstream, channel through alder and willow.
R	11	4	46022380039400395000000	RH JL	R167	Unit 7	TEC	30/09/96	Trib to Gramophone Cr.	93 L 095	9	6161000	609430	1	NW	Up	Ch		Looking upstream.
J	21	3	0023600000000000000000	JP DD	J272	Unit 7	TEC	30/09/96	Trib to Gramophone Creek	93 L 094	9	6137000	609320	1	W	Up	Ch	Darrel	Looking upstream in dry channel.
J	21	4	0023600000000000000000	JP DD	J272	Unit 7	TEC	30/09/96	Trib to Gramophone Creek	93 L 094	9	6137000	609320	1	W	Dn	Ch		Looking downstream.
J	21	7	4602238000000000000000	JP DD	J273	Unit 7	TEC	30/09/96	Trib to Gramophone Creek	93 L 094	9	6134000	609410	1	SW	Fi			measuring RB in hand
J	21	5	4602238000000000000000	JP DD	J273	Unit 7	TEC	30/09/96	Trib to Gramophone Creek	93 L 094	9	6134000	609410	1	SW	Up	Ch		Looking upstream, boulder cover.
J	21	6	4602238000000000000000	JP DD	J273	Unit 7	TEC	30/09/96	Trib to Gramophone Creek	93 L 094	9	6134000	609410	1	SW	Dn	Ch		hipchain string in photo
W	11	13	1100500000000000000000	KA JP	W99	Unit 7	TEC	23/07/97	Trib to Causqua Cr.	93 M 004	9	6137000	610170	2	NE	Up	Ch	fieldbook	Looking upstream at the channel, note the abundant instream LOD
W	11	14	0026700000000000000000	KA JP	W100	Unit 7	TEC	23/07/97	Trib to Bulkley R.	93 M 004	9	6166000	610240	2	NW	Dn	Ch	NA	Looking downstream at the channel
W	11	15	0026700000000000000000	KA JP	W100	Unit 7	TEC	23/07/97	Trib to Bulkley R.	93 M 004	9	6166000	610240	2	SE	Up	Ch	photoboard	Looking upstream at the channel
W	11	16	0025200000000000000000	KA JP	W101	Unit 7	TEC	23/07/97	Trib to Causqua R.	93 M 004	9	6102000	609950	2	W	Dn	Ch	photoboard	Looking downstream at the channel
W	11	17	0025200000000000000000	KA JP	W101	Unit 7	TEC	23/07/97	Trib to Causqua R.	93 M 004	9	6102000	609950	2	E	Up	Ve/Ch	photoboard	Looking at small falls through devil's club
W	11	18	0025200000000000000000	KA JP	W101	Unit 7	TEC	23/07/97	Trib to Causqua R.	93 M 004	9	6102000	609950	2	W	Dn	Ch	photoboard	Looking downstream at the channel
W	12	10	0053100000000000000000	KA JP	W109	Unit 7	TEC	24/07/97	Trib to Kwun Cr.	93 M 014	9	6079000	610950	3	W	Dn	Ch	fieldbook	Looking upstream at a small cascade
W	12	11	0053100000000000000000	KA JP	W109	Unit 7	TEC	24/07/97	Trib to Kwun Cr.	93 M 014	9	6079000	610950	3	W	Dn	Ch	hat	Looking downstream at the channel
W	12	12	0053200000000000000000	KA JP	W110	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6079000	610930	1	E	Up	Ch	anode pole	Looking upstream at the channel
W	12	13	0053200000000000000000	KA JP	W110	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6079000	610930	1	W	Dn	Ch	NA	Looking downstream at the channel
W	12	16	0028900000000000000000	KA JP	W111	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6080000	610910	1	E	Up	Ch	NA	Looking upstream at the channel
W	12	14	0028900000000000000000	KA JP	W111	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6080000	610910	1	E	Up	Ch	photoboard	Looking upstream at the channel and a small falls
W	12	15	0028900000000000000000	KA JP	W111	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6080000	610910	1	W	Dn	Ch	photoboard	Looking downstream at the channel

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W	12	17	00530000000000000000	KA JP	W112	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6085000	610820	1	E	Up	Ve	photoboard	Looking upstream at the channel, covered by vegetation
W	12	18	00530000000000000000	KA JP	W112	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6085000	610820	1	W	Dn	Ve	photoboard	Looking downstream at the channel, covered by vegetation
W	12	19	00536000000000000000	KA JP	W113	Unit 7	TEC	25/07/97	Trib. to Bulkley R.	93 M 014	9	6120000	610860	1	NA	X	Ch	photoboard	Looking across stream at the channel
W	12	20	00536000000000000000	KA JP	W113	Unit 7	TEC	25/07/97	Trib. to Bulkley R.	93 M 014	9	6120000	610860	1	NA	X	Ch	NA	Looking across stream at the channel
W	12	21	46016130000000000000	KA JP	W114	Unit 7	TEC	24/07/97	Trib to Kwun Cr.	93 M 014	9	6124000	610820	3	E	Up	Ch	photoboard	Looking upstream at the channel
W	12	22	46016130000000000000	KA JP	W114	Unit 7	TEC	24/07/97	Trib to Kwun Cr.	93 M 014	9	6124000	610820	3	W	Dn	Ch	photoboard	Looking downstream at the channel, note the LOD cover
W	12	23	00290000000000000000	KA JP	W115	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6107000	610770	2	NE	Up	Ch	photoboard	Looking upstream at the channel, note the small woody debris
W	12	24	00290000000000000000	KA JP	W115	Unit 7	TEC	25/07/97	Trib to Kwun Cr.	93 M 014	9	6107000	610770	2	SW	Dn	Ch	photoboard	Looking downstream at the channel
W	O	1	00268000000000000000	DD JP	W244	Unit 7	TEC	07/09/97	Trib to Bulkley R.	93 M 004	9	6117000	610120	2	E	Up	Ch	crew member	Looking upstream at the channel
W	O	2	00268000000000000000	DD JP	W244	Unit 7	TEC	07/09/97	Trib to Bulkley R.	93 M 004	9	6117000	610120	2	W	Dn	Ch	meterstick	Looking downstream at the channel
W	O	4	00229000000000000000	DD JP	W245	Unit 7	TEC	07/09/97	Trib to Wiggs Cr.	93 M 004	9	6141000	609700	3	SW	Dn	Ch	hat	Looking downstream at the channel, note the boulder/cobble cover
W	O	3	00229000000000000000	DD JP	W245	Unit 7	TEC	07/09/97	Trib to Wiggs Cr.	93 M 004	9	6141000	609700	3	NE	Up	Ch	hat	Looking upstream at the channel
W	O	6	00176000000000000000	DD JP	W246	Unit 7	TEC	07/09/97	Trib to Meed Cr.	93 L 094	9	6119000	609140	1	S	Dn	Ch	NA	Looking downstream at the channel
W	O	5	00176000000000000000	DD JP	W246	Unit 7	TEC	07/09/97	Trib to Meed Cr.	93 L 094	9	6119000	609140	1	N	Up	Ch	hat	Looking upstream at a muddy channel
W	O	7	00173000000000000000	DD JP	W247	Unit 7	TEC	08/09/97	Not a creek	93 L 094	9	6135000	608850	0	NA	NA	O	NA	Looking at an "NC"
W	R	16	00092000000000000000	DD JP	W282	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6222000	610160	1	E	Up	Ch	NA	Looking upstream at a 30m falls/barrier on Causqua Creek mainstem
W	R	17	00092000000000000000	DD JP	W282	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6222000	610160	1	N	Up	Ch	flagging tape	Looking upstream at the channel
W	R	18	00092000000000000000	DD JP	W282	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6222000	610160	1	S	Dn	Ch	flagging tape	Looking downstream at the channel, note the willow cover
W	R	20	00091000000000000000	DD JP	W283	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6199000	610160	1	N	Dn	Ch	hat	Looking downstream at the channel
W	R	19	00091000000000000000	DD JP	W283	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6199000	610160	1	S	Up	Ch	hat	Looking upstream at the channel
W	R	21	00534000000000000000	DD FC	W284	Unit 7	TEC	17/09/97	Trib. to Kwun Cr.	93 M 014	9	6122000	610820	1	N	Up	Ch	GPS and fieldbook	Looking upstream at the channel
W	R	22	00534000000000000000	DD FC	W284	Unit 7	TEC	17/09/97	Trib. to Kwun Cr.	93 M 014	9	6122000	610820	1	S	Dn	Ch	hat and fieldbook	Looking downstream at the channel
W	R	23	00535000000000000000	DD FC	W285	Unit 7	TEC	17/09/97	Trib to Kwun Cr.	93 M 014	9	6127000	610850	1	NE	Up	Ch	fieldbook	Looking upstream at the channel
W	R	24	00535000000000000000	DD FC	W285	Unit 7	TEC	17/09/97	Trib to Kwun Cr.	93 M 014	9	6127000	610850	1	SW	Dn	Ch	crew member	Looking downstream at the channel
W	R	25	00540000000000000000	DD FC	W286	Unit 7	TEC	17/09/97	Trib. to Kwun Cr.	93 M 014	9	6142000	610910	1	N	Up	Ch	fieldbook	Looking upstream at the channel
W	S	1	00540000000000000000	DD FC	W286	Unit 7	TEC	17/09/97	Trib. to Kwun Cr.	93 M 014	9	6142000	610910	1	S	Dn	Ch	fieldbook	Looking downstream at the channel
W	S	2	00541000000000000000	DD FC	W287	Unit 7	TEC	12/09/97	Not a creek	93 M 014	9	6145000	610930	0	NA	NA	O	flagging tape	Looking at an "NC"
Y	32	16	00094000000000000000	JP FC	Y267	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6224290	610138	1	S	Up	Ch	photoboard, meterstick	Looking upstream at the channel

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Y	32	14	0009400000000000000000	JP FC	Y267	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6224290	610138	1	S	Up	Ch	photoboard	Looking upstream, note steep gravel right bank
Y	32	15	0009400000000000000000	JP FC	Y267	Unit 7	TEC	15/09/97	Trib. to Causqua Cr.	93 M 005	9	6224290	610138	1	N	Dn	Ch	photoboard, meterstick	Looking downstream , note heavy willow cover
Y	32	24	4601883000000000000000	JP FC	Y268	Unit 7	TEC	15/09/97	Causqau Cr.	93 M 005	9	6224900	610477	6	E	Up	Ch	photoboard and meterstick	Looking upstream at the channel, note boulder cover
Y	32	25	4601883000000000000000	JP FC	Y268	Unit 7	TEC	15/09/97	Causqau Cr.	93 M 005	9	6224900	610477	6	W	Dn	Ch	photoboard and meterstick	Looking downstream at the channel