*2565.00/WP8344*

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

## *(Working Unit #4 - Boucher)*

*Prepared for:*

**Pacific Inland Resources (FRBC)**
PO Box 3130
Smithers, BC
V0J 2N0

April 1998

*Prepared by:*

TRITON
Environmental Consultants Ltd.
120 -13511 Commerce Parkway
Richmond, B.C. V6V 2L1
(604) 279-2093 Fax: (604) 279-2047

## 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 field crews in working unit 4. The historical records indicate the presence of the following species in this working area:

- sockeye and kokanee (*Oncorhynchus nerka*)
- coho (*O. kisutch*)
- chinook (*O. tshawytscha*)
- pink (*O. gorbuscha*)
- steel head and rainbow trout (*O. mykiss*)
- cutthroat trout (*O. clarkii*)
- mountain whitefish (*Prosopium williamsoni*)
- lake whitefish (*P. coulteri*)
- northern squawfish (*Ptychocheilus oregonensis*)
- lake trout (*Salvelinus namaycush*)
- Dolly Varden (*S. malma*)
- red sided shiner (*Richardsonius balteatus*)
- prickly sculpin (*Cottus asper*)
- burbot (*Lota lota*)
- suckers (*Catastomus spp.*)

A total of 91 sites were sampled between July 25 and October 2 1996 and July 5 and September 20 1997. Ten sites were classified as "Not A Creek" due to the lack of a defined channel. Fish were captured by electrofishing at 23 sites, by minnow trapping at 3 sites, and were visually observed at another 8 sites. The species sampled in unit 4 include: Dolly Varden rainbow trout, northern squawfish red sided shiner, coho, an unidentified sucker species and an unidentified chub species. A total of 14 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.

## TABLE OF CONTENTS

## LIST OF FIGURES

## LIST OF TABLES

## LIST OF APPENDICES

## ACKNOWLEDGMENTS

Triton Environmental Consultants Ltd.'s project team for this inventory project included:

| | |
|---|---|
| Mr. Adam Lewis, M.Sc., R.P. Bio. | Project Manager/Crew Leader |
| Ms. Julie Pavey, B.Sc., R.P. Bio. | Project Manager/Crew Leader |
| Dr. Guy Martel, Ph.D. | Crew Leader |
| Mr. Ryan Hill, MRM, R.P.Bio | Crew Leader |
| Mr. Arne Lorenz, B.Sc. | Crew Leader |
| Mr. Bruce Mattock, B.Sc.,R.P.Bio | Crew Leader |
| Mr. Steve Jennings, B.Sc. | Crew Leader |
| Mr. James Pegg, M.Sc. | Crew Leader |
| Mr. Peter Frederiksen | Crew Leader |
| Ms. Jennifer Haslett | Crew Leader |
| Mr. Darrel Davis | Crew Leader |
| Mr. Terry Davies | Crew Leader |
| Ms. Karla Graf | Crew Leader |
| Mr Ficus Chan | Field Technician |
| Mr. Lucas Eades | Field Technician |
| Ms. Heidi Schmit | Field Technician |
| Ms. Kirsten Aichberger | Field Technician |
| Mr. Eamon Miyagi | Field Technician |
| Mr. Jean-Francois Patenaude | Field Technician |
| Mr. Hubert Karas | Field Technician |
| Mr. Jim Lang | Field Technician |
| Mr. Dave Warburton | GIS Coordinator |
| Ms. Shannon Shields, B.A. | GIS Technician |
| Mr. Derik Woo, B.A. | GIS Technician |
| Ms Michelle King,B.A. | GIS Assistant |
| Mr. Edward Lem | GIS Assistant |
| Ms. Robyn Shortt, B.Sc. | Database Coordinator |

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 Inc. 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 in 1996 and 1997 (Figure 1). Existing information on fish distribution within the watersheds was summarized by SKR Consultants Ltd. Data from provincial and federal government sources such as the Stream Information Summary System (SISS) and the Fisheries Information Summary System (FISS) were reviewed. Stream classification is required under the Forest Practices Code (FPC) of British Columbia Act (Bill 40 - 1994) and the associated Operational Planning Regulation enacted in June 1995. Stream classification is used to determine the required width of riparian management areas. This report summarizes the historical and field data collected for working unit 4, which includes unnamed tributaries to Nilkitkwa Lake, Bairnsfather Creek (480-3781-000) and Boucher Creek (480-3782-000) (see Figure 1). The historical records indicate the presence of the following species in the sampling area :

- sockeye and kokanee
- coho
- chinook
- pink
- steel head and rainbow trout
- cutthroat trout
- mountain whitefish
- lake whitefish
- northern squawfish
- lake trout
- Dolly Varden
- red sided shiner
- prickly sculpin
- burbot
- suckers

## 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 requiring 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 maps covering the study area are : 93 M 036, 93 M 037, 93 M 038, 93 M 046, 93 M 047, 93 M 048, 93 M 058. This unit covers roughly 310 km$^2$ and comprises 3.9% of the study area (Saimoto 1996). Tributaries to Nilkitkwa Lake are the main focus of this working unit. Bairnsfather (480-3781-000) and Boucher Creeks (480-3782-000) were sampled in this inventory.

### 2.2 Access

Road access is present for most of the lower and mid section tributaries of Boucher Creek and Bairnsfather Creek, as well as the lower sections of the tributaries to the west side of Nilkitkwa Lake. Boat access exists for the eastern tributaries of Nilkitkwa Lake, located south of Boucher Creek (Saimoto 1996). Most of the sample sites in this unit were accessed by helicopter, with some road access.

### 2.3 Resource Use

Logging is the dominant resource activity in the watersheds studied.

## 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 ten person field crew working in five teams in 1996, and an eight person field crew working in four 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 3.

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 Attributes

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 $m^2$ 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, survey crews used the Field Key to the Freshwater Fishes of British Columbia (RIC Manual) to identify

fish to species. Additionally, bull trout were distinguished from Dolly Varden by a branchiostegal ray count and /or the Bull Trout and Dolly Varden LDF Identification Formula (Haas and McPhail 1991).

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

Records are available from 1 Water Survey of Canada (WSC) station within Unit 4. This station is located on the Babine River at the outlet of Nilkitkwa Lake (08EC013), data for this station is available for the period 1972 to 1995.

Babine River at the outlet of Nilkitkwa Lake has a drainage area of 6,790 $km^2$ and recorded a mean annual discharge (MAD) of 49.4 $m^3/s$. The recorded minimum and maximum mean daily discharges were 15.5 $m^3/s$ and 244 $m^3/s$, respectively.

Summary information and hydrograph are presented for this station in Appendix 1.

### 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 temperature, pH 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 µS. 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 water quality data collected in working unit 4. The pH measurements ranged from 6.01, taken in a wetland area, to 7.88, with an average value of 7.13. The water temperatures ranged from 4.0°C to 20.0°C, with an average value of

11.22°C. The conductivity measurements ranged from 30 to 229 µS, with an average value of 91.07µS.

## 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 91 sites were sampled, 10 of which were classified as "Not a creek" due to the absence of a defined channel. Fish were caught by electrofishing at 23 sites, by minnow trapping at 3 sites and were visually observed at 8 sites. The species sampled include Dolly Varden, rainbow trout, northern squawfish, red sided shiner, coho, an unidentified sucker species and an unidentified chub species. A total of 14 sites have been classified as non fish bearing, due in part to the presence of barriers preventing access upstream. A list of barriers identified in working unit 4 is provided in **Table 3**. The summary information for all sites in working unit 4 is listed in **Table 4**. This table is organized alphabetically, by sub-basin and includes fish data, stream classifications and methods of sampling. The stream cards and accompanying photos are in alphabetical, sub basin order and the appropriate cards and photos appear in this report after each sub-basin description. A summary of non fish bearing classifications established in this working unit are listed in **Table 5** and a summary of the sites for which future sampling is recommended is provided in **Table 6**. A summary of wildlife and wildlife signs observed in unit 4 is provided in **Table 7**. Individual fish data for this working unit have been summarized in Appendix 2. 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 Figures 2a through 2g.

## 5.1 Bairnsfather Creek (480-3781-000) (93 M 036, 93 M 037, 93 M 047)

### 5.1.1 Sensitive Habitats and Barriers

The Bairnsfather Creek mainstem is 12.3 km in length and is fed by 15 tributaries. Reach 1 has low gradient and is unconfined. Reach 2 has slightly steeper gradient and is somewhat confined. Reach 3 has steadily increasing gradient and confinement, which is consistent through reach 4. No barriers to fish passage to noted on this system, however, steep side slopes in reach 4 have resulted in non fish bearing classifications for the headwater tributaries. Fisheries sensitive zones and a small lake were noted in a tributary to reach 1 of the mainstem. Fish appear to have access to all mainstem reaches. This creek was sampled at 4 locations, including reach 1 of the mainstem.

### 5.1.2 Fish Summary Tables and Stream Classification

No historical information exists for this creek. Fish were caught by electrofishing at 3 sites. Dolly Varden were caught at site T118, while rainbow trout were caught at sites T118, H3 and H4. The mainstem was classified as an S3 in reach 1, based on an average channel width of 3.0 meters and the presence of fish in the sampling area. The 3 tributaries sampled in this inventory were classified as S3, based on average channel widths of 2.12 meters, 1.84 meters and 1.87 meters and the presence of fish or fish habitat in the sampling areas. Fish were caught at T18 and H3, but not at Z57. Future sampling is recommended for Z57 as this site has some great rearing habitat. The remaining tributaries to reaches 1 and 2 appear to be S3 and S4 sized streams, while the headwater tributaries would be classified as non fish bearing S6, based on steep gradient.

DFO/MoELP Stream Survey Form

**Site Number:** HASLETT 4 **Reach No.: 1**

**Bairnsfather Cr.**

TRITON Environmental Consultants Ltd.

**Location:** HASLETT 4, Unit 4, East of 539-1, see C5. **Stream (Gaz.):** Bairnsfather Creek **Watershed Code:** 480-3781-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 047 | Reach Length (km): 5.4 MW | Date: 26-Jul-96 | Time: 15:00 | Agency: TEC | Access: V2 | Fish Card: N | Field ☒ | Historical ☐

U.T.M. : 9 .6447 .61427 | Length surveyed (m): 150.0 GE | Survey Crew: JH \DD\ \ \ \ \ \ \ | Photos: H-1-5 | Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.0 | MS |
| Av. Wet. Width (m): | 2.8 | MS |
| Av. Max Riffle Depth (cm): | 27 | MS |
| Av. Max Pool Depth (cm): | 49 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 20 Riffle: 50 Run: 30 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 2.8 | 3.0 | 3.2 | 2.9 | 3.2 | 3.0 |
| 2.4 | 2.6 | 2.8 | 2.9 | 3.2 | 2.7 |
| 30 | 20 | 30 | | | |
| 45 | 50 | 40 | 60 | | |

## Bed Material

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

D90 (cm): 27 Compaction: Medium

## Cover

Cover Total % : 70 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 30 | 10 | 10 | 20 | 10 |

Crown Closure % : 50 Aspect : E

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.6 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.61 | F |
| Discharge (m3/s) : | 0.24 | F |

## Banks

Height (m): 0.3

% Unstable: 0

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.3

Bars (%): 40 pH: Braided: N

Water Temp. (°C): 12.0 02 (ppm):

Turb. (cm): 60 Cond. (µmhos):

## Reach Symbol

(Fish)

RB

3 B 1.0 | 3430

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | RB | 2 | 30-150 | J | | | | VO |

## Comments

C1 S3

C2 LS = 3%, RS=12%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 15 A model was, 305 seconds over 150 meters.

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 18.8°C

C8 This site has some good rearing habitat. LOD cover is particularly important.

C5 Lat N 55 24.119', Long W 126 44.337'

Photo #: H-1-5, 1996/07/26
Site #: H4, Looking downstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** HASLETT 3 **Reach No.: 1**

**Trib. to Bairnsfather Cr.**

TRITON Environmental Consultants Ltd.

**Location:** HASLETT 3, Unit 4, East of 539-1, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 480-3781-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 047 **Reach Length (km):** 0.9 MW **Date:** 26-Jul-96 **Time:** 14:00 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6448 .61429 **Length surveyed (m):** 100.0 GE **Survey Crew:** JH \DD \ \ \ \ \ \ \ **Photos:** H-1-4 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.1 | MS |
| Av. Wet. Width (m): | 2.0 | MS |
| Av. Max Riffle Depth (cm): | 8 | MS |
| Av. Max Pool Depth (cm): | 53 | MS |
| Gradient (%): | 0.5 | CL |
| Pool: 30 Riffle: 20 Run: 50 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 40 | GE |

**Specific Data**

| | | | | | |
|---|---|---|---|---|---|
| 1.6 | 1.8 | 1.8 | 2.3 | 1.4 | 3.8 |
| 1.6 | 1.8 | 1.8 | 2.4 | 0.4 | 3.8 |
| 7 | 10 | | | | |
| 60 | 45 | 53 | | | |

## Cover

Cover Total % : 60 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 30 | 30 | 0 | 10 | 30 | 0 |

Crown Closure % : 60 Aspect : E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 40 | 40 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 50 | 20 |
| | Lge cobble (128-256mm): | | 30 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 17 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.5 | MS |
| Mean Depth (m) : | 0.3 | MS |
| Mean Velocity (m/s) : | 0.01 | F |
| Discharge (m3/s) : | 0.00 | F |

## Banks

Height (m): 0.1

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: M Flood Signs Ht(m): 0.1

Bars (%): 20 pH: Braided: N

Water Temp. (°C): 17.0 02 (ppm):

Turb. (cm): 38 Cond. (µmhos):

## Reach Symbol

(Fish)

RB

2 C 0.5 | 4150

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| C4 | RB | 1 | 50 | J | | | | VO |

## Comments

C1 S3

C2 LS= 5%, RS= 3%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was 500 seconds over 70 meters.

C5 Lat N 55 24' 164", Long W 126 44' 390"

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 18.8°C

C8 This site has some good rearing habitat. Heavy siltation was noted at the road crossing.

Photo #: H-1-4, 1996/07/26
Site #: H3, Looking upstream, channel through marsh grass.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 18 Reach No.: 2

## Trib. to Bairnsfather Cr.

TRITON Environmental Consultants Ltd.

Location: TERRY 18, Unit 4, see C5. Stream (Gaz.): Unnamed Watershed Code: 480-3781-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 Reach Length (km): 1.2 MW Date: 27-Jul-96 Time: 20:15 Agency: TEC Access: V4 Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6425 .61414 Length surveyed (m): 50.0 GE Survey Crew: HS \TD\ \ \ \ \ \ \ Photos: T-1-21 Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.8 | MS |
| Av. Wet. Width (m): | 1.6 | MS |
| Av. Max Riffle Depth (cm): | 4 | MS |
| Av. Max Pool Depth (cm): | 20 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 40 Riffle: 30 Run: 30 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 70 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 2.1 | 2.0 | 1.3 | 2.2 | 1.6 |
| 1.4 | 1.6 | 1.2 | 2.1 | 1.9 |
| 3 | 4 | 5 | | |
| 20 | 18 | 22 | | |

## Cover

Cover Total % : 95 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 30 | 0 | 5 | 40 | 25 |

Crown Closure % : 95 Aspect : NE

## Bed Material

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

D90 (cm): 27 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.5 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.62 | F |
| Discharge (m3/s) : | 0.06 | F |

## Banks

Height (m): 0.2

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

DV RB

2 B 1.0 | 3520

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.15

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 16.0 02 (ppm):

Turb. (cm): 22 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | RB | 1 | 85 | J | | | | EL |
| | DV | 1 | 55 | J | | | | EL |

## Comments

C1 S3

C2 The side slopes were not measured at this site.

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 108 seconds over 50 meters.

C5 N 55 23' 53.4" W 125 44' 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 19.8°C

C8 This site provides rearing habitat. LOD and cutbanks are particularly prominent

Photo #: T-1-21, 1996/07/27
Site #: T18, Channel.

**DFO/MoELP Stream Survey Form**

# Site Number: Z57 Reach No.: 1

## Trib. to Bairnsfather Cr.

TRITON Environmental Consultants Ltd.

Location: Z57, Unit 4 | Stream (Gaz.): Unnamed | Watershed Code: 011-4900-000-000-000-000-000-000-000-000-000-

Map #: 93 M 047 | Reach Length (km): 0.7 MW | Date: 19-Jul-97 | Time: 12:23 | Agency: TEC | Access: H | Fish Card: N | Field ☒ Historical ☐

U.T.M.: 9 640061 614844 | Length surveyed (m): 100.0 GE | Survey Crew: JP\KG\ \ \ \ \ \ \ | Photos: Z-7-19,20 | Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.9 | MS |
| Av. Wet. Width (m): | 1.6 | MS |
| Av. Max Riffle Depth (cm): | 11 | MS |
| Av. Max Pool Depth (cm): | 36 | MS |
| Gradient (%): | 0.5 | CL |
| Pool: 20 Riffle: 25 Run: 55 Other: | 0 | |
| % Side Channel: | 10-40 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 10 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.8 | 1.8 | 2.7 | 1.6 | 1.5 | 1.8 |
| 1.5 | 1.7 | 2.0 | 1.4 | 1.4 | 1.6 |
| 11 | 10 | 16 | 7 | | |
| 36 | 48 | 20 | 40 | | |

## Cover

Cover Total %: 35 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 15 | 10 | 50 | 0 | 5 | 20 |

Crown Closure %: 10 Aspect: NE

## Bed Material

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

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m): | 1.7 | MS |
| Mean Depth (m): | 0.2 | MS |
| Mean Velocity (m/s): | 0.29 | F |
| Discharge (m3/s): | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

2 D 0.5 | 1450

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.7

Bars (%): 5 pH: 7.8 Braided: Y

Water Temp. (°C): 12.0 02 (ppm):

Turb. (cm): Cond. (µmhos): 70

## 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=0%, RS=0%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot Type 12 B POW model set at J, 5, 300V, was 233 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 13 C.

C7 There is some nice spawning sized substrate here, although the area does not have abundant rearing cover.

Photo #: Z-7-19, 19-Jul-97
Site #: Z57, Looking downstream at the channel

Photo #: Z-7-20, 19-Jul-97
Site #: Z57, Looking upstream at the channel

## 5.2 Boucher Creek (480-3782-000) (93 M 047, 93 M 048, 93 M 058, 93 M 059)

### 5.2.1 Sensitive Habitats and Barriers

The Boucher Creek mainstem is 40.8 km in length and is fed by 61 tributaries. Reach 1 of Boucher Creek has low gradient and is slightly confined. Reach 2 also has low gradient and is totally unconfined, meandering through a large network of wetlands, with multiple lakes identified as fisheries sensitive zones. Reach 3 has low to moderate gradient, with gradually increasing confinement. Reach 4 has low to moderate gradient and varied confinement. Boucher Creek provides a variety of habitat types. Reach 1 for example, has spawning habitat while reach 2 has some excellent rearing habitat, with multiple side channels and lakes. This watershed was sampled at 44 different locations, including reaches 1,3 and 4 of the mainstem.

### 5.2.2 Fish Summary Tables and Stream Classification

The historical records indicate the presence of pink, coho, chinook and steelhead in reach one of the mainstem. Fish were caught by electrofishing and minnow trapping at 13 sites in this inventory and were visually observed at 4. The species sampled include rainbow trout, Dolly Varden, red sided shiner, northern squawfish, prickly sculpin and an unidentified sucker species. In reach 4, Boucher Creek was classified as an S3 based on an average channel width of 4.0 meters and the presence of Dolly Varden in the sampling area. In reach 1 it was classified as an S2, based on an average channel width of 7.9 meters and the presence of fish habitat in an area with historical fisheries records. In reach 3, it was classified as an S2, based on an average channel width of 14.3 meters and the presence of Dolly Varden in the sampling area. The majority of the tributaries sampled in this inventory were classified as S3, however 10 non fishbearing classifications were assigned. These classifications were typically applied to reaches in the upper Boucher watershed and were associated with barriers downstream of the sample sites.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 23 **Reach No.: 1**

**Trib. to Acorn L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 23, Unit 4, South end of Acorn Lake, east of 614-7, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-5500-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 038 **Reach Length (km):** 0.3 MA **Date:** 27-Jul-96 **Time:** 11:00 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6558 .61412 **Length surveyed (m):** 300.0 GE **Survey Crew:** JP \KG\ \ \ \ \ \ \ **Photos:** J-2-3 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 3.9 | MS |
| | Av. Wet. Width (m): | 3.9 | MS |
| N | Av. Max Riffle Depth (cm): | 0 | MS |
| | Av. Max Pool Depth (cm): | 100 | MS |
| | Gradient (%): | 0.0 | CL |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | GE |
| | % Debris Area: | 0-5 | GE |
| | %Stable: | 80 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 4.0 | 4.3 | 4.4 | 3.6 | 3.3 |
| 4.0 | 4.3 | 4.4 | 3.6 | 3.3 |
| 96 | 103 | 87 | 114 | |

## Cover

Cover Total % : 80 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 50 | 5 | 0 | 45 | 0 | 0 |

Crown Closure % : 0 Aspect : N

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

RB, RSC

4 D 0.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 19.0 02 (ppm):

Turb. (cm): 114 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | RB | 10 | 130 | F | | | | VO |
| C4 | RSC | 2 | 38-42 | F | R | | | EL |

## Comments

C1 S3

C2 LS=2 RS=2

C3 A large swamp is associated with this site.

C4 The electroshocking effort, using a Smithroot 12 B POW model was 635 seconds over 80 meters.

C5 Lat N 55 23' 37", Long W 126 32" 39"

C6 No additional bank texture information.

C7 DO, pH, conducitivity were not measured at this site. the water was clear to the bottom. The mean air temperature on this day was 19.8°C

C8 This is a small tributary that was sampled very close to mouth. It is attached to a sizeable lake. A lot of instream vegetation cover, including lily pads, was noted. Tadpoles and 2 osprey were also observed at this site.

Photo #: J-2-3, 1996/07/27
Site #: J23, Small tributary to Acorn L.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 15

**Reach No.:** 3

**Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 15, Unit 4, see C5. **Stream (Gaz.):** Boucher Creek **Watershed Code:** 480-3782-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **U.T.M.:** 9 .6562 .61530 **Reach Length (km):** 13.7 MA **Length surveyed (m):** 102.0 HC **Date:** 25-Jul-96 **Time:** 12:51 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐ **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-20 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 14.3 | TA |
| Av. Wet. Width (m): | 9.5 | TA |
| Av. Max Riffle Depth (cm): | 23 | MS |
| Av. Max Pool Depth (cm): | 50 | MS |
| Gradient (%): | 3.0 | CL |
| Pool: 15 Riffle: 30 Run: 55 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 90 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 6.8 | 16.0 | 18.0 | 16.4 | 14.4 |
| 6.6 | 10.5 | 12.0 | 10.4 | 7.9 |
| 20 | 18 | 30 | | |
| 28 | 75 | 48 | | |

## Cover

Cover Total % : 25 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 15 | 75 | 5 | 0 | 5 | 0 |

Crown Closure % : 5 Aspect : S

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 10 | 10 |
| Gravels | Small (2-16mm): | 20 | 15 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 70 | 0 |
| | Lge cobble (128-256mm): | | 50 |
| | Bldr cobble (>256mm): | | 20 |
| Bedrock | | 0 | 0 |

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 6.5 | TA |
| Mean Depth (m) : | 0.4 | MS |
| Mean Velocity (m/s) : | 0.64 | F |
| Discharge (m3/s) : | 0.47 | F |

## Banks

Height (m): 0.4

% Unstable: 30

Fines ☐ Gravels ☒ Larges ☐ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: H Flood Signs Ht(m): 0

Bars (%): 20 pH: Braided: N

Water Temp. (°C): 10.5 02 (ppm):

Turb. (cm): 75 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

14 B 3.0 | 1270

(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 |
|---|---|---|---|---|---|---|---|---|
| | DV | 2 | 64-72 | J | R | | | EL |
| | DV | 1 | 31 | F | R | | | EL |

## Comments

C1 S2

C2 LS=1%, RS=1%

C3 No fisheries sensitive zones were noted at this site.

C4 The electrofishing effort, using a 12BPOW model, was not recorded at this site.

C5 Lat N 55 29' 59", Long W 126 31' 27"

C6 No additional bank texture information.

C7 DO, pH. conductivity were not measured at this site. The mean air temperature on this day was 19.2°C

C8 This site provides rearing habitat for Dolly Varden. LOD cover is particularly important at this site.

Photo #: J-1-20, 1996/07/26
Site #: J15, Looking upstream, wide channel with bars.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 2 **Reach No.: 1**

**Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 2, Unit 4, W 612 - 2A On RD 459, see C5. **Stream (Gaz.):** Boucher Creek **Watershed Code:** 480-3782-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 047 **Reach Length (km):** 7.9 MW **Date:** 24-Jul-96 **Time:** 16:45 **Agency:** TEC **Access:** V2 **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6475 .61452 **Length surveyed (m):** 300.0 HC **Survey Crew:** EM \JH \ \ \ \ \ \ **Photos:** R- 1 -1 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 7.9 | TA |
| Av. Wet. Width (m): | 7.8 | TA |
| Av. Max Riffle Depth (cm): | 65 | MS |
| Av. Max Pool Depth (cm): | 100 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 20 Riffle: 50 Run: 30 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | |
|---|---|---|---|
| 8.0 | 7.5 | 7.0 | 9.0 |
| 7.9 | 8.8 | 7.5 | 7.0 |
| 90 | 40 | 65 | |
| 100 | 90 | 110 | |

## Cover

Cover Total % : 30 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 20 | 20 | 0 | 30 | 10 |

Crown Closure % : 20 Aspect : SW

## 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 |
| | Bldr cobble (>256mm): | | 15 |
| Bedrock | | 0 | 0 |

D90 (cm): 30 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 10.0 | MS |
| Mean Depth (m) : | 0.6 | MS |
| Mean Velocity (m/s) : | 0.11 | F |
| Discharge (m3/s) : | 0.50 | F |

## Banks

Height (m): 0.2

% Unstable: 5

C6 Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: FC

C9 Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.5

C7 Bars (%): 0 pH: 7.8 Braided: N

Water Temp. (°C): 6.0 02 (ppm):

Turb. (cm): 110 Cond. (µmhos): 110

## Reach Symbol

(Fish)

(RB) (DV)

8 B 1.0 | 1450

(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 |
|---|---|---|---|---|---|---|---|---|
| C8 | NF | | | NA | | | | NA |

## Comments

C1 S2

C2 LS=23%, RS=11%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot Honda Mark 10 model was 393 seconds over 100 meters. This site was very difficult to shock. The crew could only access the edges of the creek.

C5 Lat N 55 25' 53.8", Long W 126 39' 56.5"

C6 Larges and fines make up the bank texture at this site.

C7 DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 17.5°C

C8 Dolly Varden and rainbow trout could use this reach.


Photo #: R-1-1, 1996/07/24
Site #: J2, Looking downstream from bridge on Rd. 459.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 9 **Reach No.:** 4

**Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 9, Unit 4, see C5. **Stream (Gaz.):** Boucher Creek **Watershed Code:** 480-3782-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 2.4 MA **Date:** 25-Jul-96 **Time:** 14:06 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6625 .61584 **Length surveyed (m):** 70.0 GE **Survey Crew:** JP\KG\ \ \ \ \ \ **Photos:** J-1-14 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.2 | MS |
| Av. Wet. Width (m): | 3.1 | MS |
| Av. Max Riffle Depth (cm): | 22 | MS |
| Av. Max Pool Depth (cm): | 44 | MS |
| Gradient (%): | 4.0 | CL |

Pool: 5 Riffle: 50 Run: 30 Other: 15

| | | |
|---|---|---|
| % Side Channel: | 0 | GE |
| % Debris Area: | 10 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | |
|---|---|---|---|
| 3.0 | 3.4 | 3.7 | 2.5 |
| 3.0 | 3.5 | 3.4 | 2.7 |
| 18 | 22 | 26 | |
| 38 | 50 | | |

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 0 | 0 |
| Gravels | Small (2-16mm): | 20 | 10 |
| | Large (16-64mm): | | 10 |
| Larges | Sm. cobble (64-128mm): | 80 | 10 |
| | Lge cobble (128-256mm): | | 40 |
| | Bldr cobble (>256mm): | | 30 |
| Bedrock | | 0 | 0 |

D90 (cm): 70 Compaction: Medium

## Cover

Cover Total % : 75 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 5 | 65 | 0 | 20 | 5 |

Crown Closure % : 10 Aspect : SW

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.3 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.59 | F |
| Discharge (m3/s) : | 0.20 | F |

## Banks

Height (m): 0.5

% Unstable: 0

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0.2

C6 Bars (%): 5 pH: Braided: N

Water Temp. (°C): 6.5 02 (ppm):

Turb. (cm): 50 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

3 D 4.0 | 0280

(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 |
|---|---|---|---|---|---|---|---|---|
| | DV | 1 | 76 | J | R | | | EL |

## Comments

C1 S3

C2 LB=15%, RB=5%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was 332 seconds over 60 meters. The Dolly Varden caught at this site was preserved, the specimen has 19 branchiostegal rays.

C5 N 55 32' 40" W 126 25' 30"

C6 No pH, DO, conductivity or turbidity tests were carried out at this site. The water was clear to the bottom.

C7 Some potential spawning habitat occurs at this site. The mean air temperature on this day was 19.2°C

Photo #: J-1-14, 1996/07/25
Site #: J9, Looking upstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** E254 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** E254, Unit 4, East of the fish weir on the Babine River. **Stream (Gaz.):** Unnamed **Watershed Code:** 081-9700-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 047 **Reach Length (km):** 2.0 MA **Date:** 05-Sep-97 **Time:** 11:15 **Agency:** TEC **Access:** V4 **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6486 .61458 **Length surveyed (m):** 100.0 GE **Survey Crew:** SJ \UL\ \ \ \ \ \ \ **Photos:** E-24B-7,8 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 0.8 | MS |
| Av. Wet. Width (m): | 0.6 | MS |
| Av. Max Riffle Depth (cm): | 3 | MS |
| Av. Max Pool Depth (cm): | 23 | MS |
| Gradient (%): | 4.0 | CL |
| Pool: 20 Riffle: 5 Run: 75 Other: | 0 | |
| % Side Channel: | 10-40 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 15 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 0.8 | 0.2 | 0.6 | 0.9 | 1.0 | 1.4 |
| 0.6 | 0.2 | 0.8 | 0.4 | 0.7 | 1.0 |
| 2 | 4 | 7 | 1 | 2 | |
| 26 | 14 | 25 | 25 | 27 | |

## Cover

Cover Total % : 30 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 30 | 20 | 0 | 10 | 10 | 30 |

Crown Closure % : 15 Aspect : SE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 90 | 90 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 0 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.1 | MS |
| Mean Depth (m) : | 0.0 | MS |
| Mean Velocity (m/s) : | 0.14 | F |
| Discharge (m3/s) : | 0.00 | F |

## Banks

Height (m): 0.1

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB) (DV)

I D 4.0 | 9100

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: L Flood Signs Ht(m): 0.1

Bars (%): 0 pH: 6.8 Braided: Y

Water Temp. (°C): 9.0 02 (ppm):

Turb. (cm): Cond. (µmhos): 90

## 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 = 2%, RS = 3%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model set at I-5-600V, was 199 seconds over 125 meters.

C5 No additional bank texture information.

C6 DO was not measured, the water was clear to the bottom.

C7 This reach is has no real spawning habitat, but does provide rearing cover in the form of pools, cutbank and overstream vegetation. Subterrainean flow and periodic undefined sections of channel were also noted.

Photo #: E-24B-7, 05-Sep-97
Site #: E254, Looking upstream at the channel

Photo #: E-24B-8, 05-Sep-97
Site #: E254, Looking downstream at the channel

**DFO/MoELP Stream Survey Form** **Site Number:** E255 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** E255, Unit 4, East of the babine River fisheries weir. **Stream (Gaz.):** Unnamed **Watershed Code:** 081-9800-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 047 **Reach Length (km):** 1.2 MA **Date:** 05-Sep-97 **Time:** 12:34 **Agency:** TEC **Access:** V4 **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6477 .614590 **Length surveyed (m):** 150.0 GE **Survey Crew:** SJ \JL \ \ \ \ \ \ \ **Photos:** E-24B-9,10 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 0.9 | MS |
| Av. Wet. Width (m): | 0.0 | GE |
| Av. Max Riffle Depth (cm): | 0 | GE |
| Av. Max Pool Depth (cm): | 0 | GE |
| Gradient (%): | 2.0 | CL |

N Pool: 0 Riffle: 0 Run: 0 Other: 0

| | | |
|---|---|---|
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 0 | GE |

*Specific Data*

0.7 0.5 0.7 0.9 1.2 1.4

## Cover

Cover Total % : 15 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 20 | 0 | 0 | 20 | 40 |

Crown Closure % : 10 Aspect : SW

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | | 0 |
| | Lge cobble (128-256mm): | 0 | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N 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): 0.2

% Unstable: 30

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: Dry Flood Signs Ht(m): 0.4

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 02 (ppm):

Turb. (cm): Cond. (µmhos):

## Reach Symbol

(Fish)

(RB) (DV)

I D 2.0 | F

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

## 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 = 8%, RS = 10%

C3 No fisheries sensitive zones noted.

C4 This dry site was not electrofished.

C5 No additional bank texture information.

C6 Water quality was not evaluated.

C7 When water is present, cutbank and pool cover is available for rearing fish. LOD cover was also noted. Spawning habitat was not observed in the sampling area. This appears to be a seasonally wet creek.


Photo #: E-24B-9, 05-Sep-97
Site #: E255, Looking upstream at the channel


Photo #: E-24B-10, 05-Sep-97
Site #: E255, Looking downstream at the channel

DFO/MoELP Stream Survey Form

**Site Number:** E3

**Reach No.:** 2

**Trib to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** E3, Unit 4 | **Stream (Gaz.):** Unnamed | **Watershed Code:** 014-3600-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 058 | **Reach Length (km):** 1.9 MA | **Date:** 09-Jul-97 | **Time:** 11:47 | **Agency:** TEC | **Access:** V4 | **Fish Card:** N | **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6567 .61558 | **Length surveyed (m):** 100.0 GE | **Survey Crew:** JL \EM\ \ \ \ \ \ \ | **Photos:** E-1-3,4 | **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 0.8 | MS |
| Av. Wet. Width (m): | 0.8 | MS |
| Av. Max Riffle Depth (cm): | 3 | MS |
| Av. Max Pool Depth (cm): | 22 | MS |
| Gradient (%): | 12.0 | CL |
| Pool: 20 Riffle: 20 Run: 40 Other: | 20 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 10 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 0.7 | 0.9 | 0.7 | 0.5 | 1.0 |
| 0.7 | 0.9 | 0.9 | 0.5 | 1.0 |
| 3 | 2 | 2 | 3 | 4 |
| 20 | 20 | 25 | 20 | 25 |

## Cover

Cover Total % : 20 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 40 | 0 | 0 | 20 | 20 |

Crown Closure % : 10 Aspect : SE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 90 | 90 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | | 0 |
| | Lge cobble (128-256mm): | 0 | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 1 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.0 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.12 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 70

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.4

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

Water Temp. (°C): 7.0 02 (ppm):

Turb. (cm): Cond. (µmhos): 70

## Reach Symbol

(Fish)

(RB)

1 B 12.0 | 9100

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

## Obstructions

## Fish Summary

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

## Comments

C6 DO was not measured at this site, the water was clear to bottom. The mean air temperature on this day was 12.0 C.

C7 There is lots of blowdown in the area. The loss of vegetation from a previous fire has resulted in bank erosion. The substrate is silty and a lot of instream debris. There is no suitable spawning habitat. Downstream of the site, the gradient lessens and the channel definition decreases.

C1 S4.

C2 LS=85%, RS=70%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model set at I, 5, was 150 seconds over 150 meters. No fish were caught.

C5 No additional bank texture information.

Photo #: E-1-3, 09-Jul-97
Site #: E3, Looking upstream with fireweed and dogwood

Photo #: E-1-4, 09-Jul-97
Site #: E3, Looking downstream with LOD, instream veg.

**DFO/MoELP Stream Survey Form**

**Site Number:** HASLETT 1 **Reach No.: 3**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** HASLETT 1, Unit 4, SE of 600-4, 1.2km NE of 465 rd, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 480-3782-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 047 | Reach Length (km): | 3.0 | MA | Date: | 25-Jul-96 | Time: | 10:00 | Agency: | TEC | Access: | V2 | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 .6510 .61501 | Length surveyed (m): | 200.0 | GE | Survey Crew: | JH \KA \ \ \ \ \ \ \ | | | Photos: | H- 1 - 2 | | | Air Photos: | | |

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 3.4 | MS |
| | Av. Wet. Width (m): | 3.4 | MS |
| N | Av. Max Riffle Depth (cm): | 0 | MS |
| | Av. Max Pool Depth (cm): | 199 | MS |
| | Gradient (%): | 0.0 | GE |
| | Pool: 0 Riffle: 0 Run: 0 Other: | 100 | |
| | % Side Channel: | 0 | GE |
| | % Debris Area: | >15 | GE |
| | %Stable: | 60 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 2.0 | 4.5 | 3.0 | 3.3 | 4.0 | 3.3 |
| 2.1 | 4.5 | 3.0 | 3.3 | 4.0 | 3.5 |
| | | | 0 | | |
| 215 | 200 | 220 | 130 | 230 | 200 |

## Cover

Cover Total % : 80 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 60 | 0 | 0 | 30 | 10 | 0 |

Crown Closure % : 0 Aspect : S

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

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

## Reach Symbol

(Fish)

RB

3 E 0.0 | F

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

## Banks

Height (m): 0.1

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: N/A

Valley : Channel Ratio N/A

Stage: M Flood Signs Ht(m): 0.1

C6 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 15.0 02 (ppm):

Turb. (cm): 80 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 |
|---|---|---|---|---|---|---|---|---|
| C8 | RB | 1 | 0 | N | | | | VO |

## Comments

C1 S3

C2 LS = 0%, RS = 0%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda gas shocker, was 320 seconds over 50 meters.

C5 N 55 28.438' W 126 36.738'

C6 No additional bank texture information.

C7 Water quality was not evaluated, the water was brown in colour at the time of sampling. The mean air temperature on this day was 19.2°C

C8 RB were observed surfacing in the attached lake.

Photo #: H-1-2, 1996/07/25
Site #: H1, Looking upstream, through marsh.

**DFO/MoELP Stream Survey Form**

**Site Number:** HASLETT 2 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** HASLETT 2, Unit 4, SWof block 600-4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 082-7500-000-000-000-000-000-000-000-000-000-

Map #: 93 M 047 Reach Length (km): 3.0 MA Date: 26-Jul-96 Time: 10:00 Agency: TEC Access: V2 Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6513 .61497 Length surveyed (m): 200.0 GE Survey Crew: JH \DD\ \ \ \ \ \ \ Photos: H-1-3 Air Photos:

## Channel Characteristics

| | | | Specific Data | | | | | |
|---|---|---|---|---|---|---|---|---|
| Av. Chan. Width (m): | 0.8 | MS | 0.9 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 |
| Av. Wet. Width (m): | 0.8 | MS | 0.9 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 |
| N Av. Max Riffle Depth (cm): | 0 | MS | | | | 0 | | |
| Av. Max Pool Depth (cm): | 71 | MS | 55 | 60 | 60 | 80 | 100 | |
| Gradient (%): | 0.0 | CL | | | | | | |

Pool: 100 Riffle: 0 Run: 0 Other: 0

% Side Channel: 0-10 GE

% Debris Area: >15 GE

%Stable: 70 GE

## Cover

Cover Total % : 80 GE

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

Crown Closure % : 0 Aspect : E

## Discharge

N Wetted Width (m) :

N Mean Depth (m) :

N Mean Velocity (m/s) :

N Discharge (m3/s) :

## Reach Symbol

(Fish)

CBC

I E 0.0 | F

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

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Blder cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Banks

Height (m): 0.1

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: N/A

Valley : Channel Ratio N/A

Stage: M Flood Signs Ht(m): 0.1

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 16.0 02 (ppm):

Turb. (cm): 40 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| C4 | CBC | 2 | 50-70 | J | | | | VO |

## Comments

C1 S4

C2 LS = 0%, RS = 0%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 15 A model was 350 seconds over 80 meters.

C5 Lat N 55 28' 33.8", Long W 126 36' 54.4"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured at this site. The water was brown in colour at the time of sampling. Discharge was not measured because only standing water was noted. The mean air temperature on this day was 18.8°C

C8 A great deal of algae was growing in this creek.

Photo #: H-1-3, 1996/07/26
Site #: H2, Looking upstream, through marsh.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 1 **Reach No.:** 1

**Trib. to Boucher Creek**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 1, Unit 4, Block 64-7, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 081-9900-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 047 **Reach Length (km):** 1.4 MW **Date:** 24-Jul-96 **Time:** 12:15 **Agency:** TEC **Access:** V2 **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6492 .61458 **Length surveyed (m):** 100.0 HC **Survey Crew:** TD \DD\ \ \ \ \ \ \ **Photos:** J-1-1 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.4 | MS |
| Av. Wet. Width (m): | 1.5 | MS |
| Av. Max Riffle Depth (cm): | 10 | MS |
| Av. Max Pool Depth (cm): | 38 | MS |
| Gradient (%): | 3.0 | CL |
| Pool: 20 Riffle: 60 Run: 20 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 60 | GE |

*Specific Data*

| | | | |
|---|---|---|---|
| 1.6 | 1.3 | 1.5 | 1.4 |
| 1.7 | 1.4 | 1.6 | 1.4 |
| 9 | 10 | 11 | |
| 52 | 25 | | |

## Cover

Cover Total % : 70 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 30 | 15 | 5 | 25 | 15 |

Crown Closure % : 60 Aspect : S

## Bed Material

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

D90 (cm): 32 Compaction: High

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.3 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.71 | F |
| Discharge (m3/s) : | 0.02 | F |

## Banks

Height (m): 0.2

% Unstable: 30

C6 Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

RB

1 D 3.0 | 3160

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.2

C7 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 13.0 02 (ppm):

Turb. (cm): 52 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 |
|---|---|---|---|---|---|---|---|---|
| | RB | 4 | 25-35 | F | R | | | EL |

## Comments

C1 S3. This reach has been upgraded to an S3 from an S4. Two of the four measured channel widths and the average wetted width, meet the S3 width requirement.

C2 RS = 38%, LS = 24%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model was 500 seconds over 100 meters.

C5 Lat N 55 26 16.8", Long W 126 38 29.2"

C6 Fines and gravels make up the bank texture at this site.

C7 DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 17.5°C

C8 This site has some excellent rearing cover.


Photo #: J-1-1, 1996/07/24
Site #: J1, Looking upstream.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 10 Reach No.: 2

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

Location: JULIE 10, Unit 4, see C5 | Stream (Gaz.): Unnamed | Watershed Code: 014-5700-000-000-000-000-000-000-000-000-000-

Map #: 93 M 058 | Reach Length (km): 0.3 MA | Date: 25-Jul-96 | Time: 14:58 | Agency: TEC | Access: FT | Fish Card: N | Field ☒ Historical ☐

U.T.M.: 9 .6619 .61614 | Length surveyed (m): 200.0 GE | Survey Crew: JP\KG\ \ \ \ \ \ \ | Photos: J-1-15 | Air Photos:

## Channel Characteristics

| | | | Specific Data | | | | |
|---|---|---|---|---|---|---|---|
| Av. Chan. Width (m): | 2.7 | MS | 2.8 | 2.9 | 2.2 | 3.3 | 2.2 |
| Av. Wet. Width (m): | 2.6 | MS | 2.6 | 2.7 | 2.7 | 3.0 | 2.0 |
| Av. Max Riffle Depth (cm): | 24 | MS | 37 | 17 | 18 | | |
| Av. Max Pool Depth (cm): | 20 | MS | 32 | 19 | 16 | 15 | |
| Gradient (%): | 19.0 | CL | | | | | |

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

% Side Channel: 0 GE

% Debris Area: 10 GE

%Stable: 90 GE

## Cover

Cover Total %: 50 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 20 | 60 | 0 | 0 | 10 |

Crown Closure %: 15 Aspect: NW

## Bed Material

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

D90 (cm): 80 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m): | 2.0 | MS |
| Mean Depth (m): | 0.2 | MS |
| Mean Velocity (m/s): | 1.06 | F |
| Discharge (m3/s): | 0.32 | F |

## Banks

Height (m): 0.4

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: H Flood Signs Ht(m): 0.2

C7 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 6.0 02 (ppm):

Turb. (cm): 32 Cond. (µmhos):

## Reach Symbol

(Fish)

(DV)

3 C 19.0 | 0271

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

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| C6 | 1 | C | 0.3 |

## 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 = 20%, RS = 23%

C3 No fisheries sensitive zones were noted at this site.

C4 This site was not electrofished as a fish was caught 400 meters downstream near the confluence of this tributary with Boucher Creek. The only possible limiting factor to fish distribution in this case is gradient, which exceeds 20% upstream of the sampling area. However, step pool habitat was observed.

C5 Lat N 55 34' 18", Long W 126 25' 53"

C6 No additional bank texture information.

C7 No pH, DO, conductivity tests were made at this site. The water was clear to the bottom. The mean air temperature on this day was 19.2°C

C8 Cascades ranging from .5 -.7 meters in height, were observed throughout the site.

Photo #: J-1-15, 1996/07/25
Site #: J10, Looking upstream.

**DFO/MoELP Stream Survey Form** **Site Number:** JULIE 11 **Reach No.:** 1

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 11, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-5500-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 058 **Reach Length (km):** 2.2 MA **Date:** 25-Jul-96 **Time:** 16:32 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6618 .61576 **Length surveyed (m):** 95.0 HC **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-16 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.4 | TA |
| Av. Wet. Width (m): | 3.3 | TA |
| Av. Max Riffle Depth (cm): | 11 | MS |
| Av. Max Pool Depth (cm): | 45 | MS |
| Gradient (%): | 10.0 | CL |
| Pool: 10 Riffle: 50 Run: 20 Other: | 20 | |
| % Side Channel: | 0 | GE |
| % Debris Area: 20 | | GE |
| %Stable: | 70 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 2.9 | 3.7 | 2.8 | 3.4 | 4.2 |
| 2.9 | 3.5 | 2.6 | 3.5 | 4.0 |
| 14 | 8 | 10 | 12 | |
| 40 | 50 | | | |

## Cover

Cover Total % : 55 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 30 | 40 | 0 | 10 | 10 |

Crown Closure % : 30 Aspect : N

## Bed Material

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

D90 (cm): 28 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.7 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 1.16 | F |
| Discharge (m3/s) : | 0.47 | F |

## Banks

Height (m): 0.6

% Unstable: 45

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(DV)

3 B 10.0 | 1360

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: H Flood Signs Ht(m): 0.2

C6 Bars (%): 5 pH: Braided: N

Water Temp. (°C): 6.0 02 (ppm):

Turb. (cm): 50 Cond. (µmhos):

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| | 1 | C | 0.8 |

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| C7 | NF | | | NA | | | | NA |

## Comments

C1 S3

C2 LS = 15%, RS = 25%

C3 No fisherics sensitive zones were noted at this site.

C4 The electroshocking effort, using a 12 B POW model, was 553 seconds over 150 meters.

C5 N 55 32'15" W 126 26'10"

C6 No additional bank tetxure information. Some sections of unstable slopes were seen at this site.

C7 No pH, DO or conductivity tests were carried out at this site. The water was clear to the bottom. The mean air temperature on this day was 19.2°C

C8 The gradient of this creek is steep. White water was observed. This site could provide Dolly Varden habitat. A lot of LOD cover and some spawning gravels were noted in the area.

Photo #: J-1-16, 1996/07/25
Site #: J11, Looking upstream, cascade/step pool habitat.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 13 **Reach No.: 2**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 13, Unit 4, Unnamed trib draining beaver ponds into Boucher Cr., see C5.

**Stream (Gaz.):** Unnamed

**Watershed Code:** 014-3900-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.8 MA **Date:** 26-Jul-96 **Time:** 9:50 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6568 .61564 **Length surveyed (m):** 97.0 HC **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-18 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.5 | MS |
| Av. Wet. Width (m): | 1.4 | MS |
| Av. Max Riffle Depth (cm): | 13 | MS |
| Av. Max Pool Depth (cm): | 14 | MS |
| Gradient (%): | 4.0 | CL |
| Pool: 30 Riffle: 60 Run: 10 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 90 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 1.6 | 1.8 | 1.1 | 1.2 | 1.5 |
| 1.3 | 1.8 | 1.0 | 1.2 | 1.5 |
| 12 | 10 | 17 | | |
| 12 | 13 | 16 | | |

## Cover

Cover Total % : 40 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 35 | 10 | 5 | 25 | 15 |

Crown Closure % : 15 Aspect : E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 10 | 10 |
| Gravels | Small (2-16mm): | 50 | 30 |
| | Large (16-64mm): | | 20 |
| Larges | Sm. cobble (64-128mm): | 40 | 20 |
| | Lge cobble (128-256mm): | | 15 |
| | Bldr cobble (>256mm): | | 5 |
| Bedrock | | 0 | 0 |

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.0 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.63 | F |
| Discharge (m3/s) : | 0.05 | F |

## Banks

Height (m): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

DV

2 D 4.0 | 1540

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 5 pH: Braided: N

Water Temp. (°C): 10.5 02 (ppm):

Turb. (cm): 16 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 |
|---|---|---|---|---|---|---|---|---|
| | DV | 3 | 101-130 | J | R | | | EL |
| | DV | 11 | 30 | F | R | | | EL |

## Comments

C1 S3

C2 LS=31%, RS=35%

C3 No fisheries sensitive zones were noted at this site.

C4 The electrofishing effort, using a 12BPOW model, was 362 seconds over 100 meters.

C5 Lat N 55 32' 06", Long W 126 31' 21"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 18.8°C

C8 The culvert at this site could use some more armouring at the outlet.

Photo #: J-1-18, 1996/07/26
Site #: J13, Looking upstream.

**DFO/MoELP Stream Survey Form** **Site Number:** JULIE 14 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 14, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-8300-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 058 **Reach Length (km):** 2.4 MA **Date:** 26-Jul-96 **Time:** 11:40 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6559 .61539 **Length surveyed (m):** 97.0 HC **Survey Crew:** JP \KG\ \ \ \ \ \ \ **Photos:** J-1-19 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.7 | MS |
| | Av. Wet. Width (m): | 1.7 | MS |
| N | Av. Max Riffle Depth (cm): | 0 | MS |
| | Av. Max Pool Depth (cm): | 48 | MS |
| | Gradient (%): | 0.0 | GE |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | GE |
| | % Debris Area: | 0 | GE |
| | %Stable: | 0 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 1.8 | 2.0 | 1.7 | 1.5 | 1.2 |
| 1.8 | 2.1 | 1.7 | 1.5 | 1.2 |
| | | | 0 | |
| 47 | 45 | 52 | | |

## Cover

Cover Total % : 35 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 60 | 0 | 0 | 15 | 25 | 0 |

Crown Closure % : 30 Aspect : SE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N 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): 0.3

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(DV)

2 E 0.0 | F

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

Confinement: N/A

Valley : Channel Ratio N/A

Stage: Flood Flood Signs Ht(m): 0

Bars (%): 0 pH: 6.6 Braided: N

Water Temp. (°C): 9.0 02 (ppm):

Turb. (cm): 52 Cond. (µmhos): 80

## 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 = 0%, RS = 0%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a 12 BPOW model, was 381 seconds over 97 meters.

C5 Lat N 55 30' 52" , Long W 126 32' 05"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 18.8°C

C8 No observable flow occured at this site at the time of sampling. A series of beaver dams that were not obstructions was observed. A strong sulphur smell, and a lot of organic matter instream, were noted. The only possible habitat at this site occurs in the beaver pond, which contains plenty of insect food. All channels were checked for rearing fish, but none were seen.

Photo #: J-1-19, 1996/07/26
Site #: J14, Channel through grass and alder.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 16 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 16, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-8300-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 048 **Reach Length (km):** 2.2 MA **Date:** 26-Jul-96 **Time:** 14:51 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6562 .61530 **Length surveyed (m):** 200.0 HC **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-22 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.3 | MS |
| Av. Wet. Width (m): | 1.4 | MS |
| Av. Max Riffle Depth (cm): | 6 | MS |
| Av. Max Pool Depth (cm): | 15 | MS |
| Gradient (%): | 2.0 | CL |

Pool: 50 Riffle: 30 Run: 20 Other: 0

| | | |
|---|---|---|
| % Side Channel: | 0 | GE |
| % Debris Area: | 25 | GE |
| %Stable: | 70 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 3.0 | 2.8 | 2.5 | 4.0 | 4.0 |
| 0.8 | 0.8 | 1.8 | 1.5 | 2.0 |
| 8 | 6 | 3 | | |
| 12 | 18 | 14 | | |

## Cover

Cover Total % : 60 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 30 | 10 | 10 | 10 | 35 | 5 |

Crown Closure % : 40 Aspect : E

## Bed Material

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

D90 (cm): 25 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.7 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.06 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 1.0

% Unstable: 20

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 30 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 18 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

3 D 2.0 | 2350

(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 |
|---|---|---|---|---|---|---|---|---|
| C4 | DV | 3 | 30-70 | J | R | | | EL |

## Comments

C1 S3

C2 LS=3%, RS=5%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a 12B POW model was not recorded at this site. However the distance fished was 200 meters. Both fry and larger juvenile fish were caught at this site.

C5 Lat N 55 29' 53.1", Long W 126 31' 37.8."

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 18.8°C

C8 This site connects with J14. No barriers to fish passage were observed. Algae was seen in the stream.

Photo #: J-1-22, 1996/07/26
Site #: J16, Algae bloom.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 17 **Reach No.:** 1

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 17, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-3400-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 058 **Reach Length (km):** 0.1 MA **Date:** 26-Jul-96 **Time:** 16:30 **Agency:** TEC **Access:** FT **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6570 .61547 **Length surveyed (m):** 100.0 GE **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-23 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.7 | MS |
| Av. Wet. Width (m): | 1.6 | MS |
| Av. Max Riffle Depth (cm): | 8 | MS |
| Av. Max Pool Depth (cm): | 14 | MS |
| Gradient (%): | 21.0 | CL |
| Pool: 30 Riffle: 10 Run: 10 Other: | 50 | |
| % Side Channel: | | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 0 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 1.6 | 3.9 | 3.1 | 2.2 | 2.4 |
| 1.6 | 1.2 | 1.0 | 2.0 | 2.2 |
| 10 | 9 | 5 | | |
| 24 | 11 | 7 | | |

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 0 | 0 |
| Gravels | Small (2-16mm): | 20 | 10 |
| | Large (16-64mm): | | 10 |
| Larges | Sm. cobble (64-128mm): | 60 | 5 |
| | Lge cobble (128-256mm): | | 20 |
| | Bldr cobble (>256mm): | | 35 |
| Bedrock | | 20 | 20 |

D90 (cm): 70 Compaction: High

## Cover

Cover Total % : 40 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 10 | 50 | 0 | 30 | 10 |

Crown Closure % : 70 Aspect : W

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.4 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.53 | F |
| Discharge (m3/s) : | 0.19 | F |

## Banks

Height (m): 0.1

% Unstable: 10

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: CO

Valley : Channel Ratio 0-2

Stage: H Flood Signs Ht(m): 0.2

Bars (%): 5 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 24 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

3 A 21.0 | 0262

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

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| C8 | 2 | C | 0.0 |
| | | | |

## Fish Summary

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

## Comments

C1: S6

C2: LS=60%, RS=60%

C3: No fisheries sensitive zones were noted.

C4: No electroshocking was carried out at this site as the gradient was deemed too steep to accomodate fish.

C5: Lat N 55 30' 47.2", Long W 126 30' 48.8"

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 18.8°C

C8: No spawning, rearing or overwintering habitat occurs at this site. Steep gradient and a series of cascades and step pools were observed close to the mouth. The gradient increases upstream. The steep gradient, 2 meter cascade and lack of suitable fish habitat noted by the crew have resulted in a non fish bearing classification for this tributary.

Photo #: J-1-23, 1996/07/26
Site #: J17, Looking upstream, cascades and pools.

**DFO/MoELP Stream Survey Form**

**Site Number: JULIE 18** **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

Location: JULIE 18, Unit 4, see C5. Stream (Gaz.): Unnamed Watershed Code: 014-3500-000-000-000-000-000-000-000-000-000-

Map #: 93 M 058 Reach Length (km): 0.2 MA Date: 26-Jul-96 Time: 16:30 Agency: TEC Access: FT Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6572 .61549 Length surveyed (m): 120.0 GE Survey Crew: JP\KG\ \ \ \ \ \ \ Photos: J-1-24 Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.2 | MS |
| Av. Wet. Width (m): | 1.8 | MS |
| Av. Max Riffle Depth (cm): | 3 | MS |
| Av. Max Pool Depth (cm): | 25 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 90 Riffle: 5 Run: 5 Other: 0 | | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 60 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 2.5 | 2.6 | 2.1 | 2.0 | 1.6 |
| 2.0 | 2.0 | 1.5 | 1.4 | 2.2 |
| 2 | 4 | | | |
| 29 | 25 | 20 | | |

## Cover

Cover Total % : 70 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 20 | 0 | 0 | 80 | 0 |

Crown Closure % : 30 Aspect : W

## Bed Material

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

D90 (cm): 7 Compaction: Low

## Discharge

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

## Banks

Height (m): 0.2

% Unstable: 40

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: H Flood Signs Ht(m): 0

Bars (%): 5 pH: Braided: N

Water Temp. (°C): 10.0 02 (ppm):

Turb. (cm): 29 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

2 B 1.0 | 5410

(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 |
|---|---|---|---|---|---|---|---|---|
| | DV | 1 | 170 | A | | | | EL |

## Comments

C1 S3

C2 LS = 70%, RS = 20%

C3 No fisheries sensitive zones were noted.

C4 The electroshocking effort, using a 12B POW, model was 98 seconds over 20 meters. The Dolly Varden was caught in a beaver pond with a clay bottom. The water in this pond was not moving.

C5 Lat N 55 30 53.4", Long W 126 30' 37.0"

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 18.8°C

C8 An aerial reconnaisance carried out above a small beaver dam, revealed a csacde/falls above the dam and no access to, or overwintering habitat in that area.

Photo #: J-1-24, 1996/07/26
Site #: J18, Looking cross-stream, clay substrate.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 3

**Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 3, Unit 4, West side of 612-3, see C5. **Stream (Gaz.):** Unnnamed **Watershed Code:** 081-9400-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 047 | Reach Length (km): | 4.3 | MA | Date: | 24-Jul-96 | Time: | 16:15 | Agency: | TEC | Access: | V2 | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 .6483 .61434 | Length surveyed (m): | 80.0 | GE | Survey Crew: | HS \JP\ \ \ \ \ \ \ | | | | | Photos: | J-1-2 | Air Photos: | | |

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.5 | MS |
| Av. Wet. Width (m): | 1.4 | MS |
| Av. Max Riffle Depth (cm): | 13 | MS |
| Av. Max Pool Depth (cm): | 21 | MS |
| Gradient (%): | 3.0 | CL |
| Pool: 30 Riffle: 20 Run: 50 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 40 | GE |
| %Stable: | 60 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 1.5 | 1.3 | 1.6 | 1.6 | 1.4 |
| 1.6 | 1.4 | 1.7 | 1.6 | 0.6 |
| 18 | 13 | 8 | | |
| 21 | 19 | 22 | | |

## Cover

Cover Total % : 90 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 20 | 5 | 0 | 70 | 5 |

Crown Closure % : 40 Aspect : NW

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 40 | 40 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 50 | 25 |
| | Lge cobble (128-256mm): | | 20 |
| | Bldr cobble (>256mm): | | 5 |
| Bedrock | | 0 | 0 |

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.1 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.21 | F |
| Discharge (m3/s) : | 0.03 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0.2

C6 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 12.5 02 (ppm):

Turb. (cm): 22 Cond. (µmhos):

## Reach Symbol

(Fish)

(RB)

2 D 3.0 | 4150

(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 |
|---|---|---|---|---|---|---|---|---|
| C7 | NF | | | NA | | | | NA |

## Comments

C1 S3

C2 LS= 3%, RS = 3%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model was 340 seconds over 80 meters. This site was difficult to shock due to the dense riparian vegetation.

C5 Lat N 55 25 02.4", Long W 126 39' 26.6"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not meausured at this site. The water was brown in colour. The mean air temperature on this day was 17.5°C

C8 This site could provide rearing habitat for juvenile rainbow trout. Minor siltation was noted at the road crossing.


Photo #: J-1-2, 1996/07/24
Site #: J3, Looking upstream through alder and dogwood.

**DFO/MoELP Stream Survey Form** **Site Number:** JULIE 4 **Reach No.:** 1

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 4, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 081-9500-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Map #:** | 93 M 047 | **Reach Length (km):** | 1.4 | MW | **Date:** | 24-Jul-96 | **Time:** | 17:10 | **Agency:** | TEC | **Access:** | V2 | **Fish Card:** | N | Field ☒ Historical ☐ |
| **U.T.M. :** | 9 .6482 .61442 | **Length surveyed (m):** | 100.0 | GE | **Survey Crew:** | HS \JP\ \ \ \ \ \ \ | | | | | **Photos:** | J-1-3 | **Air Photos:** | | |

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.0 | MS |
| Av. Wet. Width (m): | 0.9 | MS |
| Av. Max Riffle Depth (cm): | 8 | MS |
| Av. Max Pool Depth (cm): | 14 | MS |
| Gradient (%): | 3.0 | CL |
| Pool: 25 Riffle: 5 Run: 70 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: 35 | | GE |
| %Stable: | 60 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 1.0 | 0.8 | 1.0 | 1.1 | 1.2 |
| 0.9 | 0.8 | 0.9 | 0.8 | 0.9 |
| 10 | 7 | | | |
| 11 | 14 | 17 | | |

## Cover

Cover Total % : 60 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 30 | 5 | 0 | 55 | 10 |

Crown Closure % : 40 Aspect : W

## 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 | 30 |
| | Lge cobble (128-256mm): | | 15 |
| | Bldr cobble (>256mm): | | 5 |
| Bedrock | | 0 | 0 |

D90 (cm): 23 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.7 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.19 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

I D 3.0 | 5050

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0.2

C6 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 11.5 02 (ppm):

Turb. (cm): 17 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 |
|---|---|---|---|---|---|---|---|---|
| C7 | NF | | | NA | | | | NA |

## Comments

C1 S4

C2 LS = 28%, RS =25%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was 400 seconds over 50 meters. This site was difficult to shock due to the dense undergrowth.

C5 Lat N 55 25' 02.4", Long W 126 39' 26.6"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured at this site. The water was brown in colour. The mean air temperature on this day was 17.5°C

C8 This site has marginal fish habitat, but may support juvenile rainbow trout.


Photo #: J-1-3, 1996/07/24
Site #: J4, Looking upstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 1 **Reach No.: 3**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 1, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-4000-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.4 MA **Date:** 25-Jul-96 **Time:** 8:45 **Agency:** TEC **Access:** HL **Fish Card:** N : : **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6579 .61579 **Length surveyed (m):** 200.0 GE **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-2 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 0.9 | MS |
| Av. Wet. Width (m): | 1.1 | MS |
| Av. Max Riffle Depth (cm): | 8 | MS |
| Av. Max Pool Depth (cm): | 16 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 40 Riffle: 20 Run: 30 Other: | 10 | |
| % Side Channel: | 10-40 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 90 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 0.7 | 1.1 | 0.9 | 0.8 | 0.8 | 0.9 |
| 0.9 | 0.7 | 0.5 | 0.9 | 1.8 | 1.9 |
| 9 | 10 | 3 | 8 | | |
| 13 | 11 | 15 | 19 | 23 | |

## Cover

Cover Total % : 50 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 5 | 0 | 10 | 40 | 40 |

Crown Closure % : 5 Aspect : S

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 15 | 15 |
| Gravels | Small (2-16mm): | 70 | 20 |
| | Large (16-64mm): | | 50 |
| Larges | Sm. cobble (64-128mm): | 15 | 5 |
| | Lge cobble (128-256mm): | | 5 |
| | Bldr cobble (>256mm): | | 5 |
| Bedrock | | 0 | 0 |

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.6 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.13 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.1

% Unstable: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

1 E 1.0 | 1720

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

Confinement: N/A

Valley : Channel Ratio N/A

Stage: M Flood Signs Ht(m): 0

C6 Bars (%): 5 pH: 7.5 Braided: N

Water Temp. (°C): 7.0 02 (ppm):

Turb. (cm): 23 Cond. (µmhos): 136

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| C | 3 | C | 1.0 |

## Fish Summary

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

## Comments

C1: S6

C2: LB - 11% RB - 1%

C3: No fisheries sensitive zones were noted at this site.

C4: The electroshocking effort, using a 12 B POW model was 400 seconds over 200 meters.

C5: Lat N 55 32' 30", Long W 126 29' 52.5"

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 19.2°C

C8: Some excellent fish habitat was observed at this site but the 3m cascade downstream prevents fish passage upstream.

Photo #: R-1-2, 1996/07/25
Site #: R1, Looking downstream.

**DFO/MoELP Stream Survey Form**

# Site Number: RYAN 10 — Reach No.: 1

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

Location: RYAN 10, Unit 4, see C5. | Stream (Gaz.): Unnamed | Watershed Code: 002-0600-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 048 | Reach Length (km): 0.4 MA | Date: 26-Jul-96 | Time: 10:15 | Agency: TEC | Access: HL | Fish Card: N | Field ☒ Historical ☐

U.T.M.: 9 . 6560 . 61458 | Length surveyed (m): 200.0 GE | Survey Crew: RH \EM\ \ \ \ \ \ \ | Photos: None | Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.2 | MS |
| Av. Wet. Width (m): | 2.3 | MS |
| Av. Max Riffle Depth (cm): | 60 | MS |
| Av. Max Pool Depth (cm): | 130 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 30 Riffle: 10 Run: 60 Other: | 0 | |
| % Side Channel: | >40 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 5 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 2.6 | 2.4 | 2.2 | 2.0 | 1.9 | 2.0 |
| 3.4 | 2.4 | 2.1 | 2.0 | 2.0 | 2.1 |
| 70 | 60 | 50 | | | |
| 130 | 140 | 120 | | | |

## Cover

Cover Total %: 30 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 25 | 0 | 5 | 0 | 20 | 50 |

Crown Closure %: 15 | Aspect: SW

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 50 | 50 |
| Gravels | Small (2-16mm): | 35 | 15 |
| | Large (16-64mm): | | 20 |
| Larges | Sm. cobble (64-128mm): | 15 | 10 |
| | Lge cobble (128-256mm): | | 5 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 13 | Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m): | 3.3 | MS |
| Mean Depth (m): | 0.6 | MS |
| Mean Velocity (m/s): | 0.20 | F |
| Discharge (m3/s): | 0.30 | F |

## Banks

Height (m): 0.5

% Unstable: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: N/A

Valley : Channel Ratio: N/A

Stage: M | Flood Signs Ht(m): 0

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

Water Temp. (°C): 13.0 | 02 (ppm):

Turb. (cm): 140 | Cond. (µmhos):

## Reach Symbol

(Fish)

RB

2 E 1.0 | 5320

(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 |
|---|---|---|---|---|---|---|---|---|
| | RB | 3 | 200 | N | | | | VO |

## Comments

C1 S3

C2 LS=2, RS=1

C3 This site is associated with marsh.

C4 This site was not electrofished. The channel was too deep for effective shocking.

C5 Lat N 55 26' 0", Long W 126 32' 0"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 18.8°C

C8 This site provides rearing habitat for rainbow trout.

**DFO/MoELP Stream Survey Form**

# Site Number: RYAN 11 Reach No.: 1

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

**Location:** RYAN 11, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-7800-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Map #:** | 93 M 048 | **Reach Length (km):** | 0.6 | MA | **Date:** | 26-Jul-96 | **Time:** | 10:15 | **Agency:** | TEC | **Access:** | HL | **Fish Card:** N | Field ☒ Historical ☐ |
| **U.T.M. :** | 9 .6558 .61450 | **Length surveyed (m):** | 150.0 | HC | **Survey Crew:** | RH \EM\ \ \ \ \ \ \ | | | **Photos:** | R-1-9 | **Air Photos:** | | | |

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.2 | MS |
| Av. Wet. Width (m): | 4.1 | MS |
| Av. Max Riffle Depth (cm): | 30 | MS |
| Av. Max Pool Depth (cm): | 60 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 10 Riffle: 5 Run: 85 Other: | 0 | |
| % Side Channel: | 10-40 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 50 | GE |

**Specific Data**

| | | | |
|---|---|---|---|
| 4.5 | 4.4 | 4.3 | 3.5 |
| 4.5 | 4.3 | 4.1 | 3.4 |
| 25 | 35 | 30 | |
| 60 | 85 | 35 | |

## Cover

Cover Total % : 30 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 5 | 0 | 70 | 20 | 0 |

Crown Closure % : 5 Aspect : S

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | | 0 |
| | Lge cobble (128-256mm): | 0 | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 3.0 | MS |
| Mean Depth (m) : | 0.4 | MS |
| Mean Velocity (m/s) : | 0.20 | F |
| Discharge (m3/s) : | 0.18 | F |

## Banks

Height (m): 0.4

% Unstable: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: N/A

Valley : Channel Ratio N/A

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 85 Cond. (µmhos):

## Reach Symbol

(Fish)

(RB)

4 E 1.0 | F

(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 | | | | EL |

## Comments

C1: S3

C2: LS=2, RS=1

C3: This site is associated with marsh.

C4: The electroshocking effort, using a Smithroot 12 B POW model was 220 seconds over 100 meters.

C5: LatN 55 25' 31" , Long W 126 32' 18"

C6: No additional bank texture information.

C7: DO and conductivity were not measured at this site. The mean air temperature on this day was 18.8°C

C8: This site has good access for fish. The instream temperature was slightly high at the time of sampling, but the habitat is reasonably good overall.

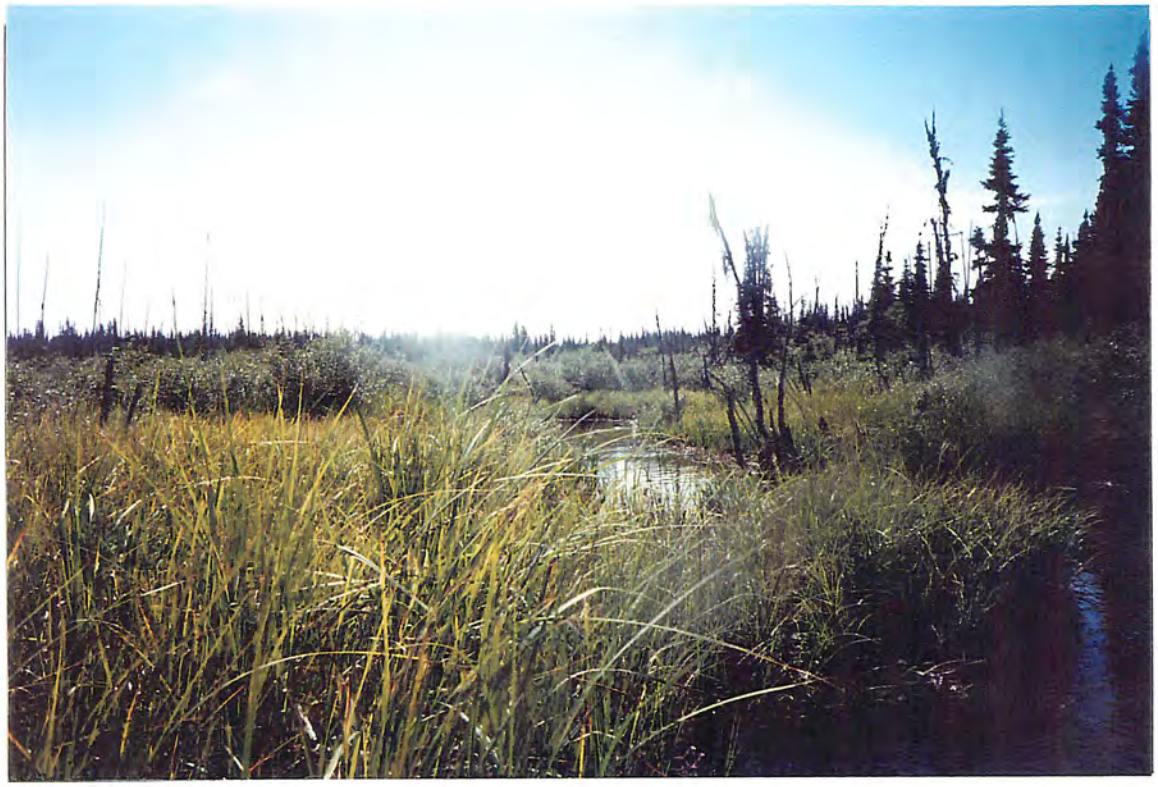


Photo #: R-1-9, 1996/07/26
Site #: R11, Looking upstream, marshy area.

**DFO/MoELP Stream Survey Form**

# Site Number: RYAN 12

**Reach No.: 1**

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

Location: RYAN 12, Unit 4, see C5. Stream (Gaz.): Unnamed Watershed Code: 011-7700-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 048 Reach Length (km): 0.5 MA Date: 25-Jul-96 Time: 13:30 Agency: TEC Access: HL Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 . 6552 . 61450 Length surveyed (m): 100.0 GE Survey Crew: RH \EM\ \ \ \ \ \ \ Photos: R-1-10 Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 0.8 | MS |
| Av. Wet. Width (m): | 0.8 | MS |
| Av. Max Riffle Depth (cm): | 28 | MS |
| Av. Max Pool Depth (cm): | 70 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 20 Riffle: 10 Run: 70 Other: | 0 | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 0.5 | 0.6 | 0.7 | 0.7 | 1.2 | 1.2 |
| 0.7 | 0.5 | 0.7 | 0.7 | 1.2 | 1.0 |
| 20 | 35 | | | | |
| 55 | 90 | 65 | | | |

## Cover

Cover Total % : 80 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 30 | 5 | 0 | 10 | 25 | 30 |

Crown Closure % : 10 Aspect : S

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 90 | 90 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 5 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.5 | MS |
| Mean Depth (m) : | 0.4 | MS |
| Mean Velocity (m/s) : | 0.26 | F |
| Discharge (m3/s) : | 0.04 | F |

## Banks

Height (m): 0.3

% Unstable: 20

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 15.0 02 (ppm):

Turb. (cm): 90 Cond. (µmhos):

## Reach Symbol

(Fish)

RB

I D 1.0 | 9100

(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 |
|---|---|---|---|---|---|---|---|---|
| | RB | 1 | 90 | J | R | | | EL |

## Comments

C1 S4

C2 LS=2%, RS=5%

C3 This site is associated with marsh.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was 100 seconds over 100 meters.

C5 Lat N 55 25' 28", Long W 126 32' 27"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.2°C

C8 This site has some good rearing habitat.

Photo #: R-1-10, 1996/07/26
Site #: R12, Looking upstream, channel through grassy area.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 13 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 13, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-7600-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 0.5 MA **Date:** 25-Jul-96 **Time:** 14:15 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6551 .61444 **Length surveyed (m):** 150.0 GE **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-11 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.4 | MS |
| Av. Wet. Width (m): | 1.5 | MS |
| Av. Max Riffle Depth (cm): | 26 | MS |
| Av. Max Pool Depth (cm): | 87 | MS |
| Gradient (%): | 1.0 | CL |
| Pool: 20 Riffle: 20 Run: 60 Other: | 0 | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 0 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 0.8 | 1.3 | 1.5 | 1.8 | 0.8 | 2.1 |
| 1.2 | 1.3 | 1.5 | 1.8 | 0.8 | 2.3 |
| 30 | 25 | 22 | | | |
| 80 | 82 | 100 | | | |

## Cover

Cover Total % : 60 GE

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

Crown Closure % : 40 Aspect : SE

## Bed Material

| | | 90 | 90 |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | | |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 6 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.6 | MS |
| Mean Depth (m) : | 0.5 | MS |
| Mean Velocity (m/s) : | 0.17 | F |
| Discharge (m3/s) : | 0.10 | F |

## Banks

Height (m): 0.6

% Unstable: 30

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.6

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 16.0 02 (ppm):

Turb. (cm): 100 Cond. (µmhos):

## Reach Symbol

(Fish)

RB

I D 1.0 | 9100

(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 |
|---|---|---|---|---|---|---|---|---|
| C6 | RB | 1 | 130 | J | R | | | VO |

## Comments

C1: S4

C2: LS=1%, RS=4%

C3: This site is associated with marsh.

C4: The electroshocking effort, using a Smithroot 12 B POW model, was 250 seconds over 150 meters.

C5: Lat N 55 25' 29", Long W 126 32' 29"

C6: No additional bank texture information.

C7: DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.2°C

C8: This site has some good fish habitat.

C9: Evidence of bear activity was also noted at this site.

Photo #: R-1-11, 1996/07/26
Site #: R13, Looking upstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 14 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 14, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 470-3782-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 048 | Reach Length (km): 0.4 MA | Date: 25-Jul-96 | Time: 15:30 | Agency: TEC | Access: HL | Fish Card: N | Field ☒ Historical ☐

U.T.M.: 9 .6550 .61438 | Length surveyed (m): 200.0 GE | Survey Crew: RH \EM\ \ \ \ \ \ \ | Photos: None | Air Photos:

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 2.0 | GE |
| | Av. Wet. Width (m): | 1.5 | GE |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 150 | GE |
| | Gradient (%): | 1.0 | GE |
| | Pool: 10 Riffle: 0 Run: 90 Other: 0 | | |
| | % Side Channel: | 0-10 | GE |
| | % Debris Area: | 0-5 | GE |
| | %Stable: | 0 | GE |

*Specific Data*

## Cover

Cover Total %: 10 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 70 | 0 | 0 | 30 | 0 | 0 |

Crown Closure %: 0 Aspect: SE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 90 | 90 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 5 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: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

2 D 1.0 | 9100

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: 6.8 Braided: N

N Water Temp. (°C): 8.5 02 (ppm):

Turb. (cm): 150 Cond. (µmhos): 40

## Obstructions

## Fish Summary

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

## Comments

C1 S3

C2 LS = 1%, RS = 1%

C3 No fisheries sensitive zones were noted.

C4 This site was not electrofished, the wading conditions were dangerous.

C5 Lat N 55 25' 0", Long W 126 34' 0"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured. The mean air temperature on this day was 19.2°C

C8 This site could provide some rearing habitat for rainbow trout.

Photo #: J-2-2, 1996/07/27
Site #: J22, Site J22, creek joining 2 lakes.

## 5.3 Unnamed Tributary to Boucher Creek (480-3782-000) (93 M 058)

### 5.3.1 Sensitive Habitats and Barriers

This tributary to reach 4 of Boucher Creek is 6.1 km in length and is fed by 18 smaller tributaries. Reach 1 is moderately steep and quite confined. This morphology is consistent through reach 2. Reach 3 is a small, high elevation lake, while reach 4 is moderately steep with some small lakes at the top end. Reach 5 is a fair sized high elevation lake fed by two small, high gradient tributaries. These lakes do not provide overwintering habitat and do not appear to support resident fish populations. No sensitive habitats were observed. An impassable 8 meter falls was noted at reach 2. No fish were caught above this falls and the main creek and all of its tributaries have been classified as non fish bearing above this barrier. This stream was sampled at 4 locations, including reaches 2 and 3 of the mainstem.

### 5.3.2 Fish Summary and Stream Classification

No historical records exist for this stream and no fish were caught in this survey. The reach below the falls flows directly into fish bearing Boucher Creek and has been classified as an S3. The mainstem was classified as an S5 based on an average channel width of 3.30 meters, the presence of the impassable 8 meter falls downstream, and the absence of a resident fish population in the sampling area. Reach 5 was also classified as an S5 and the tributaries were classified as S6 .

Photo #: J-1-4, 1996/07/25
Site #: J5, Looking upstream, cascade and pool habitat.

Photo #: J-1-5, 1996/07/25
Site #: J5, Looking downstream.

Photo #: J-1-6, 1996/07/25
Site #: J6, Looking cross-stream.

Photo #: J-1-7, 1996/07/25
Site #: J6, Looking downstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 7 **Reach No.:** 2

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 7, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 480-3782-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.6 MA **Date:** 25-Jul-96 **Time:** 12:35 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6625 .61606 **Length surveyed (m):** 100.0 HC **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-8,9,10,11 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.3 | MS |
| Av. Wet. Width (m): | 2.9 | MS |
| Av. Max Riffle Depth (cm): | 27 | MS |
| Av. Max Pool Depth (cm): | 77 | MS |
| Gradient (%): | 6.0 | CL |
| Pool: 5 Riffle: 75 Run: 15 Other: | 5 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 3.0 | 2.7 | 2.8 | 3.8 | 4.2 |
| 2.8 | 2.6 | 2.6 | 2.6 | 3.8 |
| 11 | 44 | 25 | | |
| 45 | 52 | 88 | 123 | |

## Cover

Cover Total % : 50 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 10 | 60 | 0 | 10 | 10 |

Crown Closure % : 5 Aspect : W

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 0 | 0 |
| Gravels | Small (2-16mm): | 20 | 10 |
| | Large (16-64mm): | | 10 |
| Larges | Sm. cobble (64-128mm): | 80 | 40 |
| | Lge cobble (128-256mm): | | 20 |
| | Blder cobble (>256mm): | | 20 |
| Bedrock | | 0 | 0 |

D90 (cm): 28 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.6 | MS |
| Mean Depth (m) : | 0.4 | MS |
| Mean Velocity (m/s) : | 0.44 | F |
| Discharge (m3/s) : | 0.34 | F |

## Banks

Height (m): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0.1

C7 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 8.0 02 (ppm):

Turb. (cm): 123 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

3 D 6.0 | 0280

(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 | | | | EL |

## Comments

C1 S5

C2: LS = 15%, RS = 15%

C3: No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a 12 B POW model, was 771 seconds over 100 meters.

C5 N 55 34'.46 W 126 25'.22

C6 No additional bank texture information.

C7 No pH, DO or conductivity tests were carried out. The water was clear to bottom. The mean air temperature on this day was 19.2°C

C8 Large pools, caused by avalanche activity, were sampled at this site. Some good habitat under log jams was shocked extensively but no fish were caught. Steep Gradient was observed downstream of this site, which is located roughly 500 meters above an 8 meter falls. The gradient and falls barriers downstream of the sampling area have resulted in a non fish bearing classification for this reach.

Photo #: J-1-8, 1996/07/25
Site #: J7, Looking upstream.

Photo #: J-1-9, 1996/07/25
Site #: J7, Avalanche site at site J7

Photo #: J-1-10, 1996/07/25
Site #: d/s J7, Barrier downstream of site J7.

Photo #: J-1-11, 1996/07/25
Site #: d/s J7, Barrier downstream of site J7.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 8 **Reach No.:** 2

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 8, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-5800-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.1 MA **Date:** 25-Jul-96 **Time:** 12:35 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M.:** 9 .6619 .61614 **Length surveyed (m):** 800.0 AE **Survey Crew:** JP\KG\ \ \ \ \ \ **Photos:** J-1-13 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.3 | MS |
| Av. Wet. Width (m): | 2.2 | MS |
| Av. Max Riffle Depth (cm): | 30 | AE |
| Av. Max Pool Depth (cm): | 80 | AE |
| Gradient (%): | 11.0 | CL |
| Pool: 5 Riffle: 55 Run: 10 Other: | 30 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 0 | GE |
| %Stable: | 0 | GE |

*Specific Data*

2.1 2.6 2.1
2.0 2.5 2.0
0

## Cover

Cover Total % : 40 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 0 | 90 | 0 | 0 | 10 |

Crown Closure % : 0 Aspect : S

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 0 | 0 |
| Gravels | Small (2-16mm): | 20 | 10 |
| | Large (16-64mm): | | 10 |
| Larges | Sm. cobble (64-128mm): | 80 | 20 |
| | Lge cobble (128-256mm): | | 30 |
| | Bldr cobble (>256mm): | | 30 |
| Bedrock | | 0 | 0 |

D90 (cm): 40 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: 30

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

## Reach Symbol

(Fish)

NF

2 D 11.0 | 0280

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

Confinement: UC
Valley : Channel Ratio 10+
Stage: H Flood Signs Ht(m): 0.1
C7 Bars (%): 0 pH: Braided: N
N Water Temp. (°C): 02 (ppm):
Turb. (cm): 80 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 | | | | VO |

## Comments

C1 S6

C2 LS = 10%, RS = 10%

C3 No fisheries sensitive zones were noted.

C4 This site was not electrofished.

C5 N 55 34'.18 W 126 25'.53

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 19.2°C

C8 This site was evaluted on the ground and from the air. A steep gradient barrier was observed downstream of the sampling area, and has resulted in a non fish bearing classification for the reach.

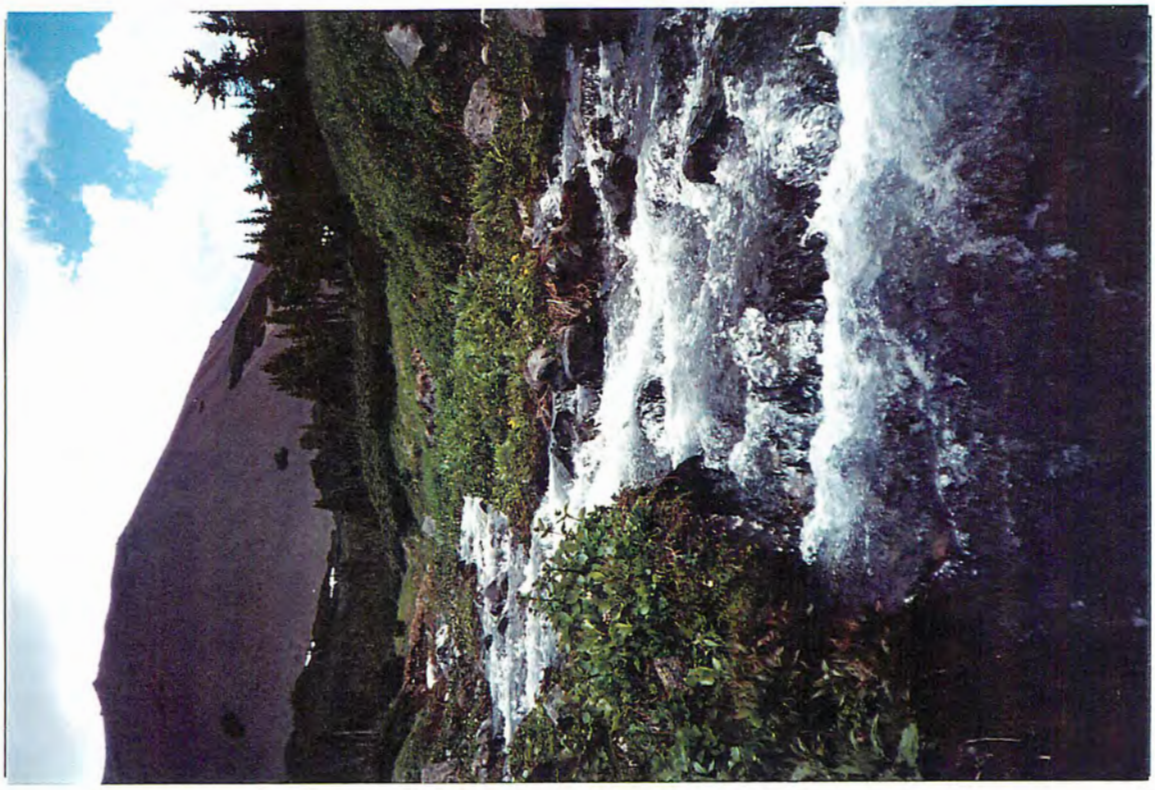


Photo #: J-1-13, 1996/07/25
Site #: J8, Looking upstream.

## 5.4 Unnamed Tributary to Boucher Creek (480-3782-008-060) (93 M 058)

### 5.4.1 Sensitive Habitats and Barriers

This unnamed tributary to reach 4 of Boucher Creek is 4.0 km in length and is fed by 18 tributaries. Reach 1 is moderately steep and occasionally confined. The gradient and confinement increase in reach 2 and reach 3 is very steep but unconfined. No sensitive habitats were identified in this system. A 2 meter falls was identified at reach 2, above which no fish were caught. This stream was sampled at 5 locations, including reaches 1 and 2 of the mainstem.

### 5.4.2 Fish Summary Tables and Stream Classification

No historical information exists for this small system, however Dolly Varden were caught by electrofishing in reach 1 of the main creek and in a tributary to reach 1. Reach 1 was classified as an S3 based on an average channel width of 3.62 meters and the presence of fish in the sampling area. The tributary was also classified as an S3 based on an average channel width of 2.73 meters and the presence of Dolly Varden in the sampling area. All reaches above the 2 meter falls on the mainstem have been classified as non fish bearing due to the absence of a resident population above the barrier. The mainstem was classified as an S6 in reach 2 based on an average channel width of 1.82 meters and the absence of fish in the sampling area.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 3 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 3, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-4700-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.2 MA **Date:** 25-Jul-96 **Time:** 11:45 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6597 .61588 **Length surveyed (m):** 400.0 HC **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-4 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.6 | TA |
| Av. Wet. Width (m): | 3.6 | TA |
| Av. Max Riffle Depth (cm): | 25 | MS |
| Av. Max Pool Depth (cm): | 62 | MS |
| Gradient (%): | 13.0 | CL |
| Pool: 10 Riffle: 70 Run: 10 Other: | 10 | |
| % Side Channel: | 10-40 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 3.2 | 3.3 | 4.3 | 4.7 | 2.7 | 3.5 |
| 3.4 | 3.3 | 4.3 | 4.5 | 2.7 | 3.5 |
| 30 | 15 | 29 | | | |
| 60 | 55 | 70 | | | |

## Cover

Cover Total % : 15 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 50 | 15 | 5 | 10 | 20 |

Crown Closure % : 30 Aspect : SW

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 10 | 10 |
| Gravels | Small (2-16mm): | 40 | 10 |
| | Large (16-64mm): | | 30 |
| Larges | Sm. cobble (64-128mm): | 50 | 20 |
| | Lge cobble (128-256mm): | | 20 |
| | Bldr cobble (>256mm): | | 10 |
| Bedrock | | 0 | 0 |

D90 (cm): 90 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.8 | TA |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 1.36 | F |
| Discharge (m3/s) : | 0.57 | F |

## Banks

Height (m): 0.3

% Unstable: 0

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: M Flood Signs Ht(m): 1.5

C6 Bars (%): 0 pH: 7.9 Braided: Y

Water Temp. (°C): 5.0 02 (ppm):

Turb. (cm): 70 Cond. (µmhos): 120

## Reach Symbol

(Fish)

DV

4 C 13.0 | 1450

(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 |
|---|---|---|---|---|---|---|---|---|
| | DV | 1 | 142 | J | R | | | EL |

## Comments

C1 S3

C2 LB - 22% RB - 12%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a 12 B POW model, was 260 seconds over 400 meters.

C5 Lat N 55 33'0", Long W 126 28'20"

C6 No additional bank texture information.

C7 No pH, DO or conductivity sampling was carried out at this site. The water was clear to the bottom. The mean air temperature on this day was 19.2°C

C8 LOD and cutbanks provide most of the cover for fish at this site.

Photo #: R-1-4, 1996/07/25
Site #: R3, Looking downstream.

**DFO/MoELP Stream Survey Form**

# Site Number: RYAN 4 Reach No.: 1

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

Location: RYAN 4, Unit 4, West Side of Boucher Cr., see C5. Stream (Gaz.): Unnamed Watershed Code: 014-4800-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 058 Reach Length (km): 1.5 MA Date: 25-Jul-96 Time: 12:30 Agency: TEC Access: HL Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6597 .61588 Length surveyed (m): 100.0 GE Survey Crew: RH \EM \ \ \ \ \ \ \ Photos: R-1-5 Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.7 | MS |
| Av. Wet. Width (m): | 2.5 | MS |
| Av. Max Riffle Depth (cm): | 10 | MS |
| Av. Max Pool Depth (cm): | 32 | MS |
| Gradient (%): | 12.0 | CL |
| Pool: 5 Riffle: 80 Run: 15 Other: 0 | | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 20 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 2.5 | 2.5 | 3.5 | 2.1 | 2.8 | 3.0 |
| 1.9 | 2.5 | 3.4 | 2.1 | 3.0 | 2.1 |
| 10 | 12 | 17 | 0 | | |
| 56 | 20 | 25 | 30 | 30 | |

## Cover

Cover Total % : 35 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 25 | 15 | 15 | 0 | 25 | 20 |

Crown Closure % : 30 Aspect : E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 5 | 5 |
| Gravels | Small (2-16mm): | 35 | 10 |
| | Large (16-64mm): | | 25 |
| Larges | Sm. cobble (64-128mm): | 60 | 25 |
| | Lge cobble (128-256mm): | | 25 |
| | Bldr cobble (>256mm): | | 10 |
| Bedrock | | 0 | 0 |

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.9 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.27 | F |
| Discharge (m3/s) : | 0.06 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

C6 Bars (%): 10 pH: Braided: N

Water Temp. (°C): 8.0 02 (ppm):

Turb. (cm): 56 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

3 D 12.0 | 1360

(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 |
|---|---|---|---|---|---|---|---|---|
| C4 | DV | 1 | 142 | J | | | | EL |

## Comments

C1 S3

C2 LB - 12% RB - 28%

C3 No fisheries sensitive zones were noted at this site.

C4 This site was not electrofished a a Dolly Varden was caught at the junction of this tributary and the one sampled at R3.

C5 Lat N 55 32' 55", Long W 126 28' 09"

C6 No additional bank tetxure information.

C7 DO, pH and conductivity were not measured at this site. The mean air temperature on this day was 19.2°C

C8 Deep pools and overstream vegetation comprise most of the cover for fish at this site.

Photo #: R-1-5, 1996/07/25
Site #: R4, Looking downstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 5 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 5, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-4900-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.9 MA **Date:** 25-Jul-96 **Time:** 13:30 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6596 .61597 **Length surveyed (m):** 250.0 GE **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-6 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.9 | MS |
| Av. Wet. Width (m): | 1.7 | MS |
| Av. Max Riffle Depth (cm): | 16 | MS |
| Av. Max Pool Depth (cm): | 25 | MS |
| Gradient (%): | 5.0 | CL |
| Pool: 20 Riffle: 60 Run: 10 Other: 10 | | |
| % Side Channel: | 0 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.8 | 2.1 | 2.4 | 2.1 | 2.2 | 2.0 |
| 1.5 | 1.6 | 1.6 | 2.0 | | |
| 14 | 14 | 20 | | | |
| 20 | 33 | 22 | | | |

## Cover

Cover Total % : 10 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 35 | 15 | 5 | 15 | 30 |

Crown Closure % : 25 Aspect : S

## Bed Material

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

D90 (cm): 27 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.8 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 1.11 | F |
| Discharge (m3/s) : | 0.30 | F |

## Banks

Height (m): 0.2

% Unstable: 10

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

C7 Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 8.0 02 (ppm):

Turb. (cm): 33 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

2 D 5.0 | 1360

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

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| C6 | 2 | F | 1.2 |

## 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 = 19%, RS = 25%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort using a 12 B POW model, was 370 seconds over 200 meters.

C5 Lat N 55 33'25", Long W 126 28' 12"

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 19.2°C

C8 A large falls, located 200 meters downstream from the confluenceof the tributary sampled at R5 and the one sampled at R6, prevents fish passage upstream.

Photo #: R-1-6, 1996/07/25
Site #: R5, Looking downstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 6 **Reach No.: 2**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 6, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-4700-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 2.0 MA **Date:** 25-Jul-96 **Time:** 15:15 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6603 .61604 **Length surveyed (m):** 350.0 GE **Survey Crew:** RH \EM \ \ \ \ \ \ **Photos:** R- 1 - 7 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.8 | MS |
| Av. Wet. Width (m): | 1.6 | MS |
| Av. Max Riffle Depth (cm): | 17 | MS |
| Av. Max Pool Depth (cm): | 37 | MS |
| Gradient (%): | 4.0 | CL |
| Pool: 40 Riffle: 30 Run: 30 Other: | 0 | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 50 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.5 | 2.0 | 1.6 | 2.0 | 2.1 | 1.7 |
| 1.4 | 1.9 | 1.5 | 1.7 | 1.8 | 1.4 |
| 20 | 10 | 20 | | | |
| 27 | 45 | 40 | | | |

## Cover

Cover Total % : 40 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 10 | 5 | 10 | 35 | 40 |

Crown Closure % : 10 Aspect : NE

## Bed Material

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

D90 (cm): 28 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.8 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.85 | F |
| Discharge (m3/s) : | 0.23 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 7.0 02 (ppm):

Turb. (cm): 45 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

2 D 4.0 | 1360

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

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| | 2 | F | 1.2 |

## 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 = 12%, RS = 10%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was 300 seconds over 400 meters. Every pool at this site was shocked and no fish were caught. A falls is located 1.2km downstream of the site.

C5 Lat N 55 33'48", Long W 126 27' 30"

C6 No additional bank texture information.

C7 No water quality tests done. The mean air temperature on this day was 19.2°C

C8 Cutbanks and overstream vegetation comprise most of the fish cover at this site.

Photo #: R-1-7, 1996/07/25
Site #: R6, Looking upstream, channel through meadow.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 7 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 7, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 014-4700-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 058 **Reach Length (km):** 1.7 MA **Date:** 25-Jul-96 **Time:** 15:45 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6603 .61604 **Length surveyed (m):** 200.0 GE **Survey Crew:** RH \EM \ \ \ \ \ \ \ **Photos:** R- 1 - 8 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.6 | MS |
| Av. Wet. Width (m): | 1.6 | MS |
| Av. Max Riffle Depth (cm): | 18 | MS |
| Av. Max Pool Depth (cm): | 29 | MS |
| Gradient (%): | 9.0 | CL |
| Pool: 10 Riffle: 85 Run: 5 Other: | 0 | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 70 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.3 | 1.1 | 1.6 | 1.7 | 2.4 | 1.6 |
| 1.3 | 1.1 | 1.6 | 1.7 | 2.3 | 1.6 |
| 17 | 20 | 17 | | | |
| 29 | | | | | |

## Cover

Cover Total % : 10 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 5 | 0 | 0 | 15 | 70 |

Crown Closure % : 10 Aspect : S

## Bed Material

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

D90 (cm): 20 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.0 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.91 | F |
| Discharge (m3/s) : | 0.14 | F |

## Reach Symbol

(Fish)

NF

2 D 9.0 | 1360

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

## Banks

Height (m): 0.2

% Unstable: 10

C6 Fines ☐ Gravels ☐ Larges ☒ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

C7 Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 5.0 02 (ppm):

Turb. (cm): 29 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 | | | | EL |

## Comments

C1 S6

C2 LS = 40%, RS = 40%

C3 No fisheries sensitive zones were noted.

C4 The electroshocking effort, using a 12B POW model, was 300 seconds over 200 meters.

C5 Lat N 55 33 '48", Long W 126 27' 30"

C6 Larges and some fines comprise the bank texture at this site.

C7 No water quality tests done. The mean air temperature on this day was 19.2°C

C8 The water temperature at this site was quite cool at the time of sampling. Fish access to this site is probably prevented by the falls located 1.2km downstream.

Photo #: R-1-8, 1996/07/25
Site #: R7, Looking downstream.

## 5.5 Unnamed Tributary to Boucher Creek (480-3782-002-670) (93 M 048, 93 M 058)

### 5.5.1 Sensitive Habitats and Barriers

This unnamed tributary is 14.1 km in length and is fed by 11 tributaries. The entire stream flows through a low gradient, unconfined area, into a highly productive fish bearing stream. Reaches 1 and 2 are very similar, with low gradient and numerous wetlands in contact with the channel. A slight increase in gradient in upper reach 2 was noted. No barriers to fish migration were observed in the main creek, however a series of beaver dams was observed in one of the tributaries to the mainstem. This stream was sampled at 7 locations including reaches 1 and 2 of the mainstem.

### 5.5.2 Fish Summary Tables and Stream Classification

No historical information was found for this stream however, rainbow trout and red sided shiner were caught by minnow trapping in reach 1 and Dolly Varden were caught by electrofishing in reach 2 (see Table 4).

The mainstem was classified as an S3 in reach 1 based on an average channel width of 1.5 meters and the presence of fish in the sampling area. Reach 2 has been classified as fish bearing based on an average channel width of 1.35 meters and the presence of Dolly Varden in the sampling area. The tributaries to this system have typically been classified as S3 based on average channel widths of 4.5 meters, 3.0 meters, 4.0 meters and 1.5 meters, and the presence of fish habitat in the sampling areas. Rainbow trout were visually observed at R16, located on a tributary to the main creek, just downstream of a large lake. Reach 3 of one of the tributaries to the main creek was classified as an "NC", based on the absence of a defined channel in the sampling area.

DFO/MoELP Stream Survey Form

**Site Number:** E293

**Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** E293, Unit 4, West of Sucker Lk. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6400-000-000-000-000-000-000-000-000-000-

Map #: 93 M 058 Reach Length (km): 3.4 MA Date: 11-Sep-97 Time: 18:35 Agency: TEC Access: V4 Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6540 .61532 Length surveyed (m): 100.0 GE Survey Crew: SJ \UL\ \ \ \ \ \ \ Photos: E-26-7,8 Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.3 | MS |
| Av. Wet. Width (m): | 1.3 | MS |
| Av. Max Riffle Depth (cm): | 0 | MS |
| Av. Max Pool Depth (cm): | 10 | MS |
| Gradient (%): | 5.0 | CL |
| Pool: 20 Riffle: 0 Run: 80 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 0 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.3 | 1.5 | 1.1 | 1.4 | 0.6 | 2.2 |
| 1.2 | 1.4 | 1.1 | 1.3 | 0.5 | 2.0 |
| 11 | 13 | 10 | 8 | 9 | |

## Cover

Cover Total % : 25 GE

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

Crown Closure % : 0 Aspect : S

## Bed Material

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

D90 (cm): 5 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.1 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.09 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 15

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: L Flood Signs Ht(m): 0.2

Bars (%): 0 pH: 6.8 Braided: N

Water Temp. (°C): 9.0 02 (ppm):

Turb. (cm): Cond. (µmhos): 30

## Reach Symbol

(Fish)

DV

1 D 5.0 | 6400

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | DV | 2 | 35-50 | F | | | | EL |

## Comments

C1 S4

C2 LS = 10%, RS = 9%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was not recorded at this site.

C5 No additional bank texture information.

C6 DO was not recorded, the water was clear to the bottom. The mean air temperature on this day was 10.7.C.

C7 This reach moves through an old burn. Rearing habitat is provided by deeply undercut banks, pools and LOD. Some spawning gravels were also noted.

Photo #: E-28-7, 11-Sep-97
Site #: E293, Looking upstream at the channel

Photo #: E-28-8, 11-Sep-97
Site #: E293, Looking downstream at the channel

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 19 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: JULIE 19, Unit 4, Northwest corner of 606-2, see C5. Stream (Gaz.): Unnamed Watershed Code: 072-8800-000-000-000-000-000-000-000-000-000-

Map #: 93 M 048 Reach Length (km): 0.0 MA Date: 27-Jul-96 Time: 8:10 Agency: TEC Access: FT Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 . 6544 . 61528 Length surveyed (m): 400.0 HC Survey Crew: JP \KG\ \ \ \ \ \ \ Photos: J-1-25 Air Photos:

## Channel Characteristics

| | | | |
|---|---|---|---|
| N | Av. Chan. Width (m): | 0.0 | GE |
| | Av. Wet. Width (m): | 1.6 | MS |
| N | Av. Max Riffle Depth (cm): | 0 | MS |
| | Av. Max Pool Depth (cm): | 19 | MS |
| | Gradient (%): | 0.0 | CL |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | |
| G | % Debris Area: | >15 | GE |
| | %Stable: | 80 | GE |

*Specific Data*

1.7 1.6 1.6 1.2 0

23 22 12

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Cover

Cover Total % : 70 GE

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

N Crown Closure % : 10 Aspect : E

## 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

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 9.0 02 (ppm):

Turb. (cm): 23 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

0 D 0.0 | F

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

## Obstructions

## Fish Summary

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

## Comments

C1 NC

C2 LS=15, RS=15

C3 No fisheries sensitive zones were noted at this site.

C4 This site was not electrofished.

C5 Lat N 55 29' 40", Long W 126 33' 40"

C6 Bank texture not applicable.

C7 DO, pH, conductivity and turbidity were not measured at this site.

C8 No defined channel was observed at this site. The banks are not defined, this is an alder swale.

Photo #: J-1-25, 1996/07/27
Site #: J19, Undefined channel, alder swale.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 20 Reach No.: 2

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

**Location:** JULIE 20 , Unit 4, west of 606-2, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6400-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 3.2 MA **Date:** 27-Jul-96 **Time:** 9:30 **Agency:** TEC **Access:** HL **Fish Card:** N : **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6536 .61518 **Length surveyed (m):** 500.0 AE **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-26 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | GE |
| | Av. Wet. Width (m): | 1.5 | GE |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 65 | GE |
| | Gradient (%): | 0.0 | CL |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | GE |
| | % Debris Area: | 0-5 | GE |
| | %Stable: | 100 | GE |

**Specific Data**

50 80 70 60

## Cover

Cover Total % : 65 GE

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

Crown Closure % : 0 Aspect : S

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

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

## Banks

C6 Height (m): 0.0 % Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(DV)

2 D 0.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0

Bars (%): 0 pH: 6.5 Braided: N

Water Temp. (°C): 5.0 02 (ppm):

Turb. (cm): 80 Cond. (µmhos): 60

## 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 | | | | MT |

## Comments

C1 S3

C2 LS= 2 RS=2

C3 This site is associated with marsh.

C4 This site was not electrofished. The channel was sampled at J19. Two minnow traps were set, with a 24 hr soak time.

C5 Lat N 55 29' 16.9", Long W 126 33' 45.5"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8 This site may provide rearing habitat.

Photo #: J-1-26, 1996/07/27
Site #: J20, Aerial photo of site J20.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 21 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 21, Unit 4, East of 602-4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6400-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 048 **Reach Length (km):** 7.0 MA **Date:** 27-Jul-96 **Time:** 10:42 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6537 .61501 **Length surveyed (m):** 400.0 AE **Survey Crew:** JP \KG\ \ \ \ \ \ \ **Photos:** J-2-1 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | GE |
| | Av. Wet. Width (m): | 1.5 | GE |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 70 | GE |
| | Gradient (%): | 1.0 | MA |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | GE |
| | % Debris Area: | 0-5 | GE |
| | %Stable: | 100 | GE |

**Specific Data**

1.4 1.3 1.7 1.6

1.4 1.3 1.7 1.6

60 80

## Cover

Cover Total % : 60 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 70 | 5 | 0 | 10 | 10 | 5 |

Crown Closure % : 5 Aspect : S

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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 ☐

## Reach Symbol

(Fish)

RB RSC

2 D 1.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 10.0 02 (ppm):

Turb. (cm): 80 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 |
|---|---|---|---|---|---|---|---|---|
| | RB | 10 | 180 | N | | | | MT |
| | RSC | 4 | 111 | N | | | | MT |

## Comments

C1 S3

C2 LS=5 RS=5

CZ A large swampy area is attached to this channel.

C4 Two minnow traps were set at this site. Tadpoles were also caught in the traps.

C5 Lat N 55 27' 39", Long W 126 35' 27"

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 19.8°C

Photo #: J-2-1, 1996/07/27
Site #: J21, Aerial photo of site J21.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 16

**Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 16, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6500-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 1.6 MA **Date:** 27-Jul-96 **Time:** 10:00 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 . 6549 . 61491 **Length surveyed (m):** 100.0 GE **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-13 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.5 | GE |
| Av. Wet. Width (m): | 4.5 | GE |
| Av. Max Riffle Depth (cm): | 45 | GE |
| Av. Max Pool Depth (cm): | 100 | GE |
| Gradient (%): | 2.0 | CL |

Pool: 15 Riffle: 20 Run: 65 Other: 0

| | | |
|---|---|---|
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 0 | GE |

*Specific Data*

## Cover

Cover Total % : 15 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 15 | 5 | 25 | 0 | 50 | 5 |

Crown Closure % : 20 Aspect : SE

## Bed Material

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

D90 (cm): 27 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 4.5 | GE |
| Mean Depth (m) : | 0.8 | GE |
| Mean Velocity (m/s) : | 0.20 | F |
| Discharge (m3/s) : | 0.54 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

RB

4 D 2.0 | 6130

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 100 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 |
|---|---|---|---|---|---|---|---|---|
| | RB | 10 | 100-200 | N | | | | VO |

## Comments

C1 S3

C2 LS=8 RS=6

C3 This site is associated with an extensive swampy area.

C4 This site was fly fished using a sinking nymph. The channel is too deep to wade at this site so it was not electrofished.

C5 Lat N 55 27' 50", Long W 126' 33"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8 This site provides rearing habitat fo rainbow trout.

Photo #: R-1-13, 1996/07/27
Site #: R16, Looking downstream through alder.

**DFO/MoELP Stream Survey Form**

# Site Number: RYAN 17 Reach No.: 1

## Trib. to Boucher Cr.

TRITON Environmental Consultants Ltd.

**Location:** RYAN 17, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6400-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 7.0 MA **Date:** 27-Jul-96 **Time:** 13:00 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 . 6523 . 61473 **Length surveyed (m):** 100.0 GE **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-14 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 3.0 | GE |
| | Av. Wet. Width (m): | 3.0 | GE |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 200 | GE |
| | Gradient (%): | 1.0 | CL |
| | Pool: 50 Riffle: 20 Run: 30 Other: 0 | | |
| | % Side Channel: | >40 | GE |
| | % Debris Area: | 0-5 | GE |
| | %Stable: | 50 | GE |

*Specific Data*

## Cover

Cover Total % : 15 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 40 | 40 | 0 | 20 | 0 | 0 |

Crown Closure % : 5 Aspect : SE

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | 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): 0.5

% Unstable: 40

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

3 D 1.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 15.0 02 (ppm):

Turb. (cm): 20 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 | | | | AG |

## Comments

C1 S3

C2 LS= 0 RS=4

C3 This site is associated with an extensive swampy area.

C4 This site was not electrofished. The channel was too deep to cross at the time of sampling.

C5 Lat N 55 27' 50", Long W 126' 33"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8 The channel width in this area is a function of beaver activity. This site could provide rearing habitat for rainbow trout.

Photo #: R-1-14, 1996/07/27
Site #: R17, Looking upstream through marshy area.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 18 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 18, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6700-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 0.5 MA **Date:** 27-Jul-96 **Time:** 14:00 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6522 .61476 **Length surveyed (m):** 150.0 GE **Survey Crew:** RH \EM\ \ \ \ \ \ \ **Photos:** R-1-15 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 4.0 | GE |
| | Av. Wet. Width (m): | 4.0 | GE |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 200 | GE |
| | Gradient (%): | 1.0 | GE |
| | Pool: 0 Riffle: 0 Run: 100 Other: 0 | | |
| | % Side Channel: | >40 | GE |
| | % Debris Area: | 5-15 | GE |
| | %Stable: | 20 | GE |

**Specific Data**

## Cover

Cover Total % : 15 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 5 | 0 | 40 | 55 | 0 |

Crown Closure % : 10 Aspect : SE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 0 Compaction: Low

## 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 | | | | VO |

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 3.0 | GE |
| Mean Depth (m) : | 1.5 | GE |
| Mean Velocity (m/s) : | 0.10 | F |
| Discharge (m3/s) : | 0.34 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Comments

C1 S3

C2 LS=1 RS=3

C3 A large marsh is associated with this site.

C4 This site was not electrofished. Bank instability made electroshocking dangerous.

C5 Lat N 55 27. 17', Long W 126 35.56'

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8 This site could provide rearing habitat for rainbow trout.

## Reach Symbol

(Fish)

(RB)

4 D 1.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: 6.0 Braided: N

Water Temp. (°C): 7.5 02 (ppm):

Turb. (cm): 20 Cond. (µmhos): 90

Photo #: R-1-15, 1996/07/27
Site #: R18, Looking cross-stream through meadow.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 19 **Reach No.: 1**

**Trib. to Boucher Cr.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 19, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-6900-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 1.2 MA **Date:** 27-Jul-97 **Time:** 14:30 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 . 6523 . 61478 **Length surveyed (m):** 100.0 GE **Survey Crew:** RH \EM \ \ \ \ \ \ \ **Photos:** R-1-16 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| C1 | Av. Chan. Width (m): | 1.5 | GE |
| | Av. Wet. Width (m): | 1.5 | GE |
| | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 200 | GE |
| | Gradient (%): | 1.0 | CL |
| | Pool: 0 Riffle: 0 Run: 100 Other: 0 | | |
| | % Side Channel: | >40 | GE |
| | % Debris Area: | 5-15 | GE |
| | %Stable: | 80 | GE |

*Specific Data*

## Cover

Cover Total % : 25 GE

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

Crown Closure % : 40 Aspect : SE

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

2 E 1.0 | F

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

Confinement: N/A

Valley : Channel Ratio N/A

Stage: M Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 20.0 02 (ppm):

Turb. (cm): 20 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. A defined channel was not observed at this site, however, a fish bearing classification has been applied because it is a part of a large area of interconnected swamps, supporting rainbow trout and sucker sp.

C2 The side slopes were not measured at this site.

C3 This site is associated with an extensive marsh.

C4 This site was not electrofished. Bank instability and deep water made electroshocking dangerous.

C5 N 55 27' 28" W 126 35' 49.4"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured at this site.

C8 No defined channel was observed in the sampling area, however, this area is associated with some extensive marsh and no barriers were noted to channels nearby. As such this site has been classified as fish bearing.

Photo #: R-1-16, 1996/07/27
Site #: R19, Beaver dam.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 26 — Reach No.: 4

## Trib. to Clota L.

TRITON Environmental Consultants Ltd.

**Location:** JULIE 26, Unit 4, West of 614-7, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 480-0000-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 038 **Reach Length (km):** 3.4 MA **Date:** 27-Jul-96 **Time:** 15:10 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M.:** 9 .6524 .61408 **Length surveyed (m):** 250.0 HC **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-2-6 **Air Photos:**

## Channel Characteristics

| | | | Specific Data | | | | |
|---|---|---|---|---|---|---|---|
| Av. Chan. Width (m): | 2.1 | MS | 1.9 | 1.8 | 2.2 | 2.4 | 1.9 |
| Av. Wet. Width (m): | 1.9 | MS | 1.8 | 1.6 | 2.0 | 2.3 | 1.7 |
| Av. Max Riffle Depth (cm): | 11. | MS | 17 | 9 | 6 | | |
| Av. Max Pool Depth (cm): | 20 | MS | 22 | 20 | 18 | | |
| Gradient (%): | 3.0 | CL | | | | | |
| Pool: 30 Riffle: 30 Run: 30 Other: | 10 | | | | | | |
| % Side Channel: | 0 | GE | | | | | |
| % Debris Area: | >15 | GE | | | | | |
| %Stable: | 80 | GE | | | | | |

## Cover

Cover Total % : 80 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 10 | 20 | 0 | 60 | 10 |

Crown Closure % : 30 Aspect : S

## Bed Material

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

D90 (cm): 26 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.4 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.20 | F |
| Discharge (m3/s) : | 0.02 | F |

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

RB

2 C 3.0 | 2260

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

Confinement: OC

Valley : Channel Ratio 5-10

Stage: H Flood Signs Ht(m): 0.1

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 22 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | RB | 1 | 170 | J | R | | | 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, was 302 seconds over 80 meters.

C5 Lat N 55 23' 31", Long W 126 35" 52"

C6 No additional bank texture information.

C7 DO, pH, and conducitivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8 Overstream vegetation and boulders provide most of the cover for fish at this site. A large amount of LOD was noted.

Photo #: J-2-6, 1996/07/27
Site #: J26, Channel through alder.

**DFO/MoELP Stream Survey Form**

**Site Number:** RYAN 20 **Reach No.: 4**

**Trib. to Clota L.**

TRITON Environmental Consultants Ltd.

**Location:** RYAN 20, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 480-0000-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 048 **Reach Length (km):** 3.4 MA **Date:** 27-Jul-96 **Time:** 16:15 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 . 6532 . 61422 **Length surveyed (m):** 100.0 GE **Survey Crew:** RH \EM \ \ \ \ \ \ \ **Photos:** R-1-17 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.1 | MS |
| Av. Wet. Width (m): | 1.1 | MS |
| Av. Max Riffle Depth (cm): | 9 | MS |
| Av. Max Pool Depth (cm): | 35 | MS |
| Gradient (%): | 3.0 | CL |
| Pool: 15 Riffle: 10 Run: 75 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 50 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 0.8 | 1.5 | 0.9 | 1.2 | 1.3 | 1.1 |
| 0.8 | 1.3 | 0.9 | 1.2 | 1.3 | 1.1 |
| 10 | 8 | | | | |
| 30 | 40 | | | | |

## Cover

Cover Total % : 75 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 15 | 15 | 5 | 0 | 50 | 15 |

Crown Closure % : 65 Aspect : S

## Bed Material

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

D90 (cm): 7 Compaction: Low

## 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: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(DV)

1 D 3.0 | 8210

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: L Flood Signs Ht(m): 0

Bars (%): 5 pH: Braided: N

Water Temp. (°C): 7.0 02 (ppm):

Turb. (cm): 40 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 | | | | NA |

## Comments

C1 S4

C2 LS=6 RS=4

C3 This site is associated with an extensive marsh.

C4 The electroshocking effort, using a 12 B POW model was 200 seconds over 100 meters.

C5 Lat N 55 24' 19", Long W 126 34' 41"

C6 No additional bank texture information.

C7 DO, pH, conductivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8 This site has some fair rearing habitat. The culvert would be a barrier to fish passage at low water.

Photo #: R-1-17, 1996/07/27
Site #: R20, Looking upstream from road.

## 5.6 Nilkitkwa Lake and Babine River Tributaries (480-0000-000) (93 M 036, 93 M 037, 93 M 038) (93 M 046, 93 M 047, 93 M 048) (93 M 057, 93 M 058)

### 5.6.1 Sensitive Habitats and Barriers

This section provides a general description of the unnamed tributaries to the Babine River and Nilkitkwa Lake. Approximately 23 tributaries flow into these bodies of water. Nilkitkwa Lake is 9.6 km in length , occurs in a gently sloping area and has a large number of wetlands lining its shores. The Babine River comprises both the inlet and the outlet of Nilkitkwa Lake. Several major and minor roads cross the tributaries to the west side of the Lake and the community of Fort Babine is located on the east bank of the Babine River, where it flows into Babine Lake. The unnamed tributaries to Babine River and Nilkitkwa Lake were sampled at 30 locations in this inventory.

### 5.6.2 Fish Summary Tables and Stream Classification

The following species have been recorded in Nilkitkwa Lake:

- Sockeye
- coho
- chinook
- steelhead
- Dolly Varden
- lake whitefish.
- lake trout
- rainbow trout
- pink
- cutthroat trout
- kokanee
- mountain whitefish
- northern squawfish
- sucker spp.
- red sided shiner
- prickly sculpin.

Fish were caught by electrofishing at 9 sites and were visually observed at 2. Rainbow trout, Dolly Varden and coho were caught in the tributaries to Nilkitkwa Lake. The Babine River was not sampled, however it is an S1-sized body of water. The tributaries sampled vary widely from S2 to S6, with S3 streams being the most common. Four sites were classified as "Not a Creek". Sites T4 and T12, were classified as S2 streams based on average channel widths of 6.9 meters and 5.3 meters and the presence of Dolly Varden in the sampling areas.

**DFO/MoELP Stream Survey Form**

**Site Number:** HASLETT 7 **Reach No.: 1**

**Trib. to Babine R.**

TRITON Environmental Consultants Ltd.

**Location:** HASLETT 7, Unit 4, junction of roads 456 and 455, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 081-5500-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 047 **Reach Length (km):** 2.7 MA **Date:** 27-Jul-96 **Time:** 9:00 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6448 .61445 **Length surveyed (m):** 150.0 HC **Survey Crew:** JH\KA\ \ \ \ \ \ \ **Photos:** H-1-8 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.3 | MS |
| Av. Wet. Width (m): | 1.3 | MS |
| Av. Max Riffle Depth (cm): | 5 | MS |
| Av. Max Pool Depth (cm): | 16 | MS |
| Gradient (%): | 2.5 | CL |
| Pool: 50 Riffle: 20 Run: 30 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 25 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.6 | 0.8 | 1.4 | 1.6 | 1.4 | 1.2 |
| 1.2 | 0.7 | 1.8 | 1.2 | 1.1 | 1.8 |
| 5 | 4 | 7 | 4 | | |
| 20 | 9 | 14 | 22 | | |

## Cover

Cover Total % : 60 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 40 | 0 | 20 | 20 | 20 |

Crown Closure % : 15 Aspect : E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 50 | 50 |
| Gravels | Small (2-16mm): | 10 | 5 |
| | Large (16-64mm): | | 5 |
| Larges | Sm. cobble (64-128mm): | 40 | 30 |
| | Lge cobble (128-256mm): | | 10 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 22 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.8 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.23 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 20

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

RB

1 D 2.5 | 5140

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.2

Bars (%): 20 pH: Braided: N

Water Temp. (°C): 11.0 02 (ppm):

Turb. (cm): 22 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | RB | 4 | 30-50 | F | R | | | VO |

## Comments

C1: S4

C2: LS=1, RS=2

No fisheries sensitive zones noted.

C4: The electroshocking effort, using a Smithroot 15 A model was 523 seconds over 150 meters. This site was also minnow trapped.

C5: Lat N 55 25' 34.4", Long W 126 42 .57.3"

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 19.8°C

C8: This site has some excellent rearing cover. LOD is particularly abundant.


Photo #: H-1-8, 1996/07/27
Site #: H7, Looking upstream.

**DFO/MoELP Stream Survey Form**

**Site Number:** PETER 110 **Reach No.:** 1

**Trib. to Babine R.**

TRITON Environmental Consultants Ltd.

**Location:** PETER 110, Unit 4, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 010-8200-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 1.5 MA **Date:** 24-Aug-96 **Time:** 12:19 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M.:** 9 .6502 .61337 **Length surveyed (m):** 100.0 HC **Survey Crew:** PF\KG\ \ \ \ \ \ \ **Photos:** P- 10 - 19 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 0.7 | 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 (%): | 8.0 | CL |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| N | % Side Channel: | | |
| N | % Debris Area: | >15 | GE |
| | %Stable: | 0 | GE |

*Specific Data*

0.6 0.5 1.2 0.8 0.7 0.6

## Cover

N Cover Total % : 0 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

N Crown Closure % : 0 Aspect : W

## Bed Material

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

D90 (cm): 26 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

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

1 B 8.0 | 2350

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: Dry N Flood Signs Ht(m): 0

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 S4

C2 LS - 45% RS - 70%

C3 No fisheries sensitive zones noted.

C4 This dry site was not electrofished.

C5 Lat N 55 19' 34" Long W 126 37' 43"

C6 No additional bank texture information.

C7 Water quality not applicable. The mean air temperature on this day was 12.5°C

C8 This site is accessible to fish and could provide seasonal rearing. Future sampling is recommended.


Photo #: P-10-19, 1996/08/24
Site #: P110, Downstream view.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 2 Reach No.: 1

## Trib. to Nilkiltkwa L.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 2, Unit 4, S of Plot 547-2, at Rd crossing, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-4700-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 2.3 MA **Date:** 24-Jul-96 **Time:** 16:40 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6464 .61398 **Length surveyed (m):** 100.0 GE **Survey Crew:** KA \KG \RH \ \ \ \ \ \ **Photos:** T-1- 4 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.2 | MS |
| Av. Wet. Width (m): | 1.0 | MS |
| Av. Max Riffle Depth (cm): | 9 | MS |
| Av. Max Pool Depth (cm): | 18 | MS |
| Gradient (%): | 2.0 | CL |
| Pool: 10 Riffle: 10 Run: 80 Other: | 0 | |
| % Side Channel: | >40 | GE |
| % Debris Area: 35 | | GE |
| %Stable: | 0 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 1.3 | 1.1 | 1.3 | 1.5 | 0.8 | 1.0 |
| 1.1 | 1.1 | 1.0 | 1.4 | 0.7 | 0.9 |
| 8 | 10 | | | | |
| 20 | 18 | 17 | | | |

## Cover

Cover Total % : 80 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 5 | 0 | 5 | 60 | 25 |

Crown Closure % : 80 Aspect : E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | | 0 |
| | Lge cobble (128-256mm): | 0 | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.8 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.14 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: L Flood Signs Ht(m): 0.2

C6 Bars (%): 5 pH: Braided: N

Water Temp. (°C): 11.0 02 (ppm):

Turb. (cm): 20 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

I D 2.0 | F

(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 S6

C2 LB = 15%, RB = 5%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model was 600 seconds over 100 meters (above the beaver dam). Minnow traps were set 50 meters downstream and no fish were caught.

C5 Lat N 55 22'. 88 6, Long W 126 40' 881

C6 DO, pH and conductivity were not measured.

C7 No additional bank texture information. The mean air temperature on this day was 17.5°C

C8 Overstream vegetation and cutbanks provide most of the cover for fish at this site.

Photo #: T-1-4, 1996/07/25
Site #: T2, Channel.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 156 **Reach No.: 1**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 156, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 010-8300-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 037 | Reach Length (km): | 0.2 | MA | Date: | 24-Aug-96 | Time: | 12:35 | Agency: | TEC | Access: | HL | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 .6500 .61530 | Length surveyed (m): | 600.0 | AE | Survey Crew: | JP \EM \ \ \ \ \ \ | | | Photos: | J-10 - 19,20 | | | Air Photos: | | |

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.0 | AE |
| | Av. Wet. Width (m): | 0.0 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| N | Av. Max Pool Depth (cm): | 0 | AE |
| | Gradient (%): | 10.0 | MW |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | AE |
| | % Debris Area: | 10 | AE |
| | %Stable: | 0 | AE |

*Specific Data*: 0

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 10 | 0 | 0 | 90 | 0 |

Crown Closure % : 30 Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: Dry Flood Signs Ht(m): 0.1

Bars (%): 0 pH: Braided: N

N Water Temp. (°C): 02 (ppm):

Turb. (cm): Cond. (µmhos):

## Reach Symbol

(Fish)

(RB DV)

I C 10.0 | F

(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 S4

C2 LS - 30% RS - 30%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 20' 20" Long. W 126 38' 00"

C6 No additional bank texture information.

C7 Water quality not applicable. The mean air temperature on this day was 12.5°C

C8 This site has very bad access. A small dry channel may extend 200 meters upstream. Then the drainage becomes an alder swale with no defined channel.

C9 Gravel deposits were not observed near the mouth. The entire area would be vulnerable to siltation. Adult salmon were observed in the Babine River.

Photo #: J-10-19, 1996/08/24
Site #: J156, Aerial photo of J156.

Photo #: J-10-20, 1996/08/24
Site #: J156, Aerial photo of J156.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 157 **Reach No.: 1**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 157, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1200-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 037 | Reach Length (km): | 1.2 | MW | Date: | 24-Aug-96 | Time: | 12:40 | Agency: | TEC | Access: | HL | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 .6501 .61358 | Length surveyed (m): | 700.0 | AE | Survey Crew: | JP \EM\ \ \ \ \ \ \ | | | Photos: | J- 10 - 21 | | | Air Photos: | | |

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.0 | AE |
| N | Av. Wet. Width (m): | 0.0 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| N | Av. Max Pool Depth (cm): | 0 | AE |
| | Gradient (%): | 4.0 | MA |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | AE |
| | % Debris Area: 10 | | AE |
| | %Stable: | 20 | AE |

*Specific Data*

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 20 | 0 | 0 | 80 | 0 |

Crown Closure % : 30 Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Blder cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

1 D 4.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: Dry Flood Signs Ht(m): 0.1

Bars (%): 0 pH: Braided: 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 S6

C2 LS - 5% RS - 5%

C3 No fisheries sensitive zones were noted.

C4 This dry site was not electrofished.

C5 Lat. N 55 20' 45" Long W 126 38' 00"

C6 No additional bank texture information.

C7 Water quality not applicable. The mean air temperature on this day was 12.5°C

C8 This is a small mud drainage. No gravel deposition was noted at the mouth. This drains into an Equisetum sp. meadow. No rearing, spawning, or overwintering was observed.

Photo #: J-10-21, 1996/08/24
Site #: J157, Photo taken from helicopter at ground level.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 158 **Reach No.:** 1

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 158 , Unit 4, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1300-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 3.0 MA **Date:** 24-Aug-96 **Time:** 13:20 **Agency:** TEC **Access:** HL **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M. :** 9 .6498 . 61363 **Length surveyed (m):** 700.0 HC **Survey Crew:** JP \EM \ \ \ \ \ \ \ **Photos:** J- 10 - 22,23,24 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.9 | MS |
| Av. Wet. Width (m): | 3.4 | MS |
| Av. Max Riffle Depth (cm): | 4 | MS |
| Av. Max Pool Depth (cm): | 62 | MS |
| Gradient (%): | 4.0 | CL |
| Pool: 30 Riffle: 35 Run: 35 Other: | 0 | |
| % Side Channel: | 10-40 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 60 | GE |

*Specific Data*

| | | | | | |
|---|---|---|---|---|---|
| 5.0 | 5.5 | 3.0 | 2.5 | 2.6 | 5.0 |
| 5.0 | 5.5 | 2.9 | 2.7 | 2.6 | 1.5 |
| 4 | 2 | 5 | | | |
| 80 | 41 | 64 | | | |

## Cover

Cover Total % : 85 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 30 | 10 | 0 | 25 | 30 | 5 |

Crown Closure % : 40 Aspect : W

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 30 | 30 |
| Gravels | Small (2-16mm): | 60 | 20 |
| | Large (16-64mm): | | 40 |
| Larges | Sm. cobble (64-128mm): | 10 | 5 |
| | Lge cobble (128-256mm): | | 5 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 15 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 3.0 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.03 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.3

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

RB

4 D 4.0 | 3610

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.3

Bars (%): 25 pH: Braided: N

Water Temp. (°C): 9.0 02 (ppm):

Turb. (cm): 80 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 | RB | 4 | 40-200 | J | R | | | EL |

## Comments

C1 S3 * An S2 classification is recommended for this highly productive site.

C2 LS- 3% RS - 3%

C3 No fisheries sensitive zones noted.

C4 The 200 mm fish caught at this site was suspected to be a rainbow trout. The fish were visually observed as the shocking conditions were poor at this site.

C5 Lat. N 55 21' 01.2" Long W 126 38' 13.1"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured. The mean air temperature on this day was 12.5°C

C8 This site has some excellent rearing habitat.

Photo #: J-10-22, 1996/08/24
Site #: J158, Photo taken from helicopter at ground level.

Photo #: J-10-23, 1996/08/24
Site #: J158, Looking downstream, channel through grassy area.

Photo #: J-10-24, 1996/08/24
Site #: J158, Looking downstream toward grassy area.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 161 **Reach No.: 1**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 161, Unit 4, see C5, drains beaver pond into lake **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1400-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 **Reach Length (km):** 0.6 MA **Date:** 24-Aug-96 **Time:** 15:15 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

U.T.M. : 9 .6497 .61363 **Length surveyed (m):** 300.0 AE **Survey Crew:** JP \EM\ \ \ \ \ \ \ **Photos:** J- 11 -1,2 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 4.0 | AE |
| | Av. Wet. Width (m): | 4.0 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| | Av. Max Pool Depth (cm): | 100 | AE |
| | Gradient (%): | 1.0 | MA |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0-10 | AE |
| | % Debris Area: | 0 | AE |
| | %Stable: | 0 | AE |

*Specific Data*

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 40 | 0 | 0 | 40 | 20 | 0 |

Crown Closure % : 0 Aspect : SW

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

4 D 1.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.2

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

N Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 100 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 -0% RS - 0%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat. N 55 29 53.1, Long W 126 31' 37.8"

C6 No additional bank texture information.

C7 Water quality was not evaluated. The mean air temperature on this day was 12.5°C

C8 This site could provide rearing habitat for rainbow trout. The channel drains through grasses and horsetails. No spawning gravel was observed near the mouth.


Photo #: J-11-1, 1996/08/24
Site #: J161, Aerial photo, channel through meadow.


Photo #: J-11-2, 1996/08/24
Site #: J161, Aerial photo, channel through meadow.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 162 Reach No.: 2

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** JULIE 162, Unit 4, see c5, downstream of J25 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1500-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 037 | Reach Length (km): | 3.8 | MA | Date: | 24-Aug-96 | Time: | 15:20 | Agency: | TEC | Access: | HL | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M.: | 9 .6501 .61374 | Length surveyed (m): | 2700.0 | AE | Survey Crew: | JP\EM\ \ \ \ \ \ \ | | | Photos: | | J- 11 - 3,4 | | Air Photos: | | |

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.0 | AE |
| Av. Wet. Width (m): | 3.0 | AE |
| Av. Max Riffle Depth (cm): | 5 | AE |
| Av. Max Pool Depth (cm): | 60 | AE |
| Gradient (%): | 4.0 | MA |
| Pool: 30 Riffle: 35 Run: 35 Other: | 0 | |
| % Side Channel: | 0-10 | AE |
| % Debris Area: | >15 | AE |
| %Stable: | 60 | AE |

*Specific Data*

## Cover

Cover Total % : 80 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 10 | 5 | 20 | 30 | 15 |

Crown Closure % : 40 Aspect : W

## Bed Material

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

N D90 (cm): 7 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 3.0 | AE |
| Mean Depth (m) : | 0.2 | AE |
| Mean Velocity (m/s) : | 0.03 | F |
| Discharge (m3/s) : | 0.02 | F |

## Banks

Height (m): 0.3

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

4 B 4.0 | 3610

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.3

Bars (%): 25 pH: Braided: N

N Water Temp. (°C): 02 (ppm):

Turb. (cm): 60 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 -20% RS - 20%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat. N 55 21' 37" Long. W 126 37' 50"

C6 No additional bank texture information.

C7 Water quality was not evaluated The mean air temperature on this day was 12.5°C

C8 This site could provide rearing habitat. The creek is heavily overgrown with willow and alder. It is a slo very similar to that of J158, so the same discharge measurements were used. This area was very difficult to access and is connected to the Nilkitkwa by a beaver pond.

Photo #: J-11-3, 1996/08/24
Site #: J162, Aerial photo, alder choked channel through mature spruce.

Photo #: J-11-4, 1996/08/24
Site #: J162, Aerial photo, alder choked channel through mature spruce.

DFO/MoELP Stream Survey Form

**Site Number:** JULIE 163 **Reach No.: 1**

**Trib. to Nilkitkwa**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 163, Unit 4, outlet of Clota Lk, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1400-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 2.1 MA **Date:** 24-Aug-96 **Time:** 15:25 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6506 .61385 **Length surveyed (m):** 2400.0 AE **Survey Crew:** JP \EM \ \ \ \ \ \ **Photos:** J- 11 - 5,6 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.0 | AE |
| Av. Wet. Width (m): | 3.0 | AE |
| Av. Max Riffle Depth (cm): | 5 | AE |
| Av. Max Pool Depth (cm): | 100 | AE |
| Gradient (%): | 4.0 | MA |
| Pool: 30 Riffle: 35 Run: 35 Other: | 0 | |
| % Side Channel: | 0-10 | AE |
| % Debris Area: | 5-15 | AE |
| %Stable: | 0 | AE |

*Specific Data*

## Cover

Cover Total % : 80 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 10 | 20 | 0 | 55 | 5 |

Crown Closure % : 30 Aspect : SW

## Bed Material

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

N D90 (cm): 13 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: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

4 B 4.0 | 3430

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.2

Bars (%): 20 pH: Braided: N

N Water Temp. (°C): 02 (ppm):

Turb. (cm): 100 Cond. (µmhos):

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| | 2 | BD | 2.1 |

## Fish Summary

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

## Comments

C1 S3

C2 LS - 30% RS - 30%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 22' 11" Long W 126 37'22"

C6 No additional bank texture information.

C7 Water quality was not measured. The mean air temperature on this day was 12.5°C

C8 This site connects Clota Lake and Nilkitkwa Lake, both fish bearing. This stream looks suitable for rearing (similar to J158 and J162).

Photo #: J-11-5, 1996/08/24
Site #: J163, Aerial photo, alder choked channel through mature spruce.

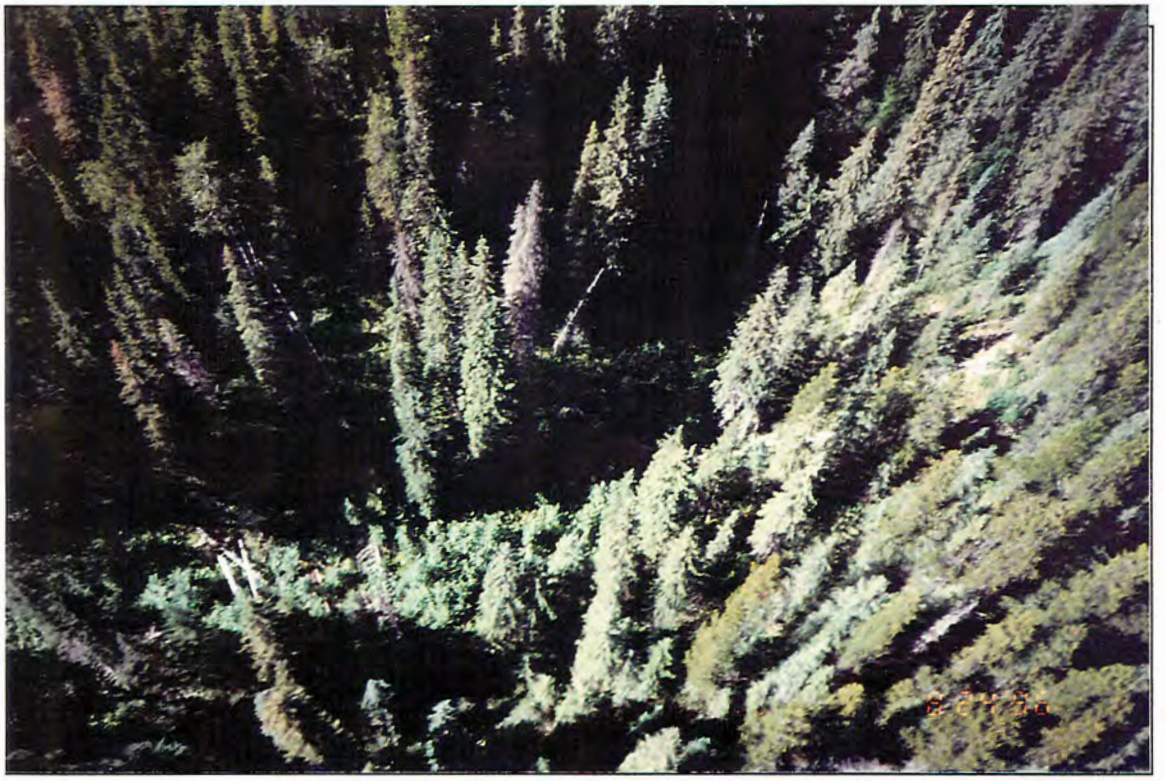


Photo #: J-11-6, 1996/08/24
Site #: J163, Aerial photo, alder choked channel through mature spruce.

**DFO/MoELP Stream Survey Form** **Site Number:** JULIE 164 **Reach No.: 1**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 164, Unit 4, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1600-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 0.2 MA **Date:** 24-Aug-96 **Time:** 15:30 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6513 .61392 **Length surveyed (m):** 800.0 AE **Survey Crew:** JP\EM\ \ \ \ \ \ \ **Photos:** J- 11 -7,8 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | AE |
| | Av. Wet. Width (m): | 1.5 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| | Av. Max Pool Depth (cm): | 60 | AE |
| | Gradient (%): | 2.0 | MA |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | AE |
| | % Debris Area: | 0 | AE |
| | %Stable: | 0 | AE |

*Specific Data*

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 60 | 0 | 0 | 20 | 20 | 0 |

Crown Closure % : 10 Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

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

## Reach Symbol

(Fish)

(RB)

2 D 2.0 | F

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

## Banks

Height (m): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: L N Flood Signs Ht(m): 0

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

Water Temp. (°C): 02 (ppm):

Turb. (cm): 60 Cond. (µmhos):

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| | 2 | BD | 0.4 |
| | 1 | BD | 3.0 |

## Fish Summary

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

## Comments

C1 S3

C2 LS -5% RS -5%

C3 No fisheries sensitive zones noted.

C5 Lat N 55 22' 33" Long W 126 36' 41"

C6 No additional bank texture information.

C7 Water quality not evaluated. The mean air temperature on this day was 12.5°C

C9 The habitat noted here may be suitable for rearing rainbow trout. Approximately 200 m upstream the creek becomes undefined. Only the first 200 meters, which are connected with a beaver dam, are accessible to fish.

Photo #: J-11-7, 1996/08/24
Site #: J164, Aerial photo, alder choked channel through mature spruce.

Photo #: J-11-8, 1996/08/24
Site #: J164, Aerial photo, channel through opening in spruce stand.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 165 **Reach No.: 2**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 165, Unit 4, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1400-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 0.8 MA **Date:** 24-Aug-96 **Time:** 15:35 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6511 .61396 **Length surveyed (m):** 800.0 AE **Survey Crew:** JP \EM\ \ \ \ \ \ \ **Photos:** J- 11- 9,10 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.0 | AE |
| Av. Wet. Width (m): | 3.0 | AE |
| Av. Max Riffle Depth (cm): | 10 | AE |
| Av. Max Pool Depth (cm): | 50 | AE |
| Gradient (%): | 3.0 | MA |

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

| | | |
|---|---|---|
| % Side Channel: | 0 | AE |
| % Debris Area: | 15 | AE |
| %Stable: | 60 | AE |

*Specific Data*

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 15 | 30 | 0 | 35 | 10 |

Crown Closure % : 60 Aspect : S

## Bed Material

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

N D90 (cm): 26 Compaction: Medium

## Obstructions

| C | Height (m) | Type | Location |
|---|---|---|---|
| | 1 | BD | 3.0 |

## Fish Summary

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

## Comments

C1: S3

C2: LS - 30% RS -30%

C3: No fisheries sensitive zones noted.

C4: This site was not electrofished.

C5: Lat N 55 22' 47" Long W 126 36' 54"

C6: No additional bank texture information.

C7: Water quality was not evaluated. The mean air temperature on this day was 12.5°C

C8: This site is in between two known fish bearing areas and may be suitable for rearing. No spawning gravels were evident. Beaver dams are present both up and downstream.

## 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: FC

Valley : Channel Ratio 2-5

Stage: M N Flood Signs Ht(m): 0

Bars (%): 10 pH: Braided: N

N Water Temp. (°C): 02 (ppm):

Turb. (cm): 50 Cond. (µmhos):

## Reach Symbol

(Fish)

(RB)

3 B 3.0 | 1360

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

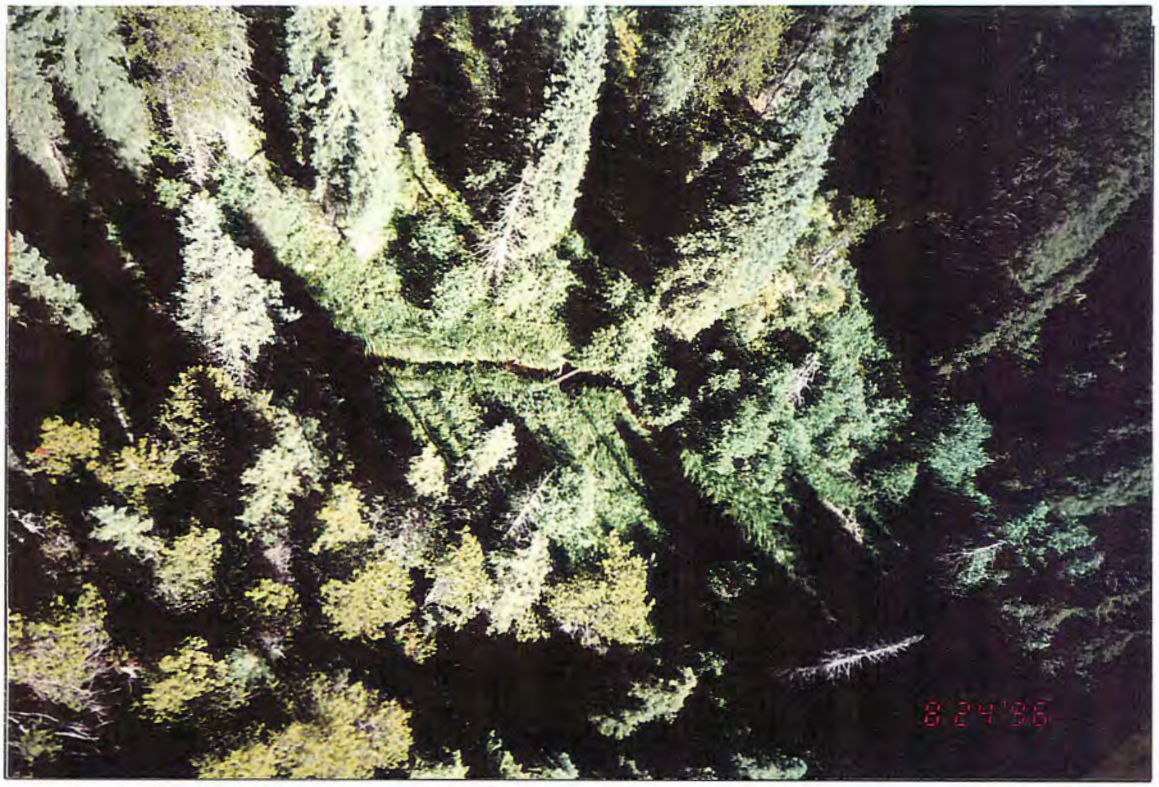



Photo #: J-11-9, 1996/08/24
Site #: J165, Aerial photo, alder choked channel through mature spruce stand.

Photo #: J-11-10, 1996/08/24
Site #: J165, Aerial photo, alder choked channel through mature spruce stand.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 166 **Reach No.: 1**

**Trib. to Nilkitkwa Lk.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 166, Unit 4 , see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 011-2000-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 1.4 MA **Date:** 24-Aug-96 **Time:** 15:40 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6495 .61379 . **Length surveyed (m):** 1400.0 AE **Survey Crew:** JP \EM\ \ \ \ \ \ \ **Photos:** J- 11 - 11,12 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | AE |
| | Av. Wet. Width (m): | 1.5 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| | Av. Max Pool Depth (cm): | 30 | AE |
| | Gradient (%): | 4.0 | MA |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0-10 | AE |
| | % Debris Area: | 5-15 | AE |
| | %Stable: | 40 | AE |

*Specific Data*

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 20 | 0 | 20 | 60 | 0 |

Crown Closure % : 60 Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

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

## Reach Symbol

(Fish)

(RB)

2 D 4.0 | F

(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

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

N Water Temp. (°C): 02 (ppm):

Turb. (cm): 30 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 | | | | VO |

## Comments

C1 S3

C2 LS - 5% RS - 5%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat. N 55 21' 54" Long. W 126 38' 27'

C6 No additional bank texture information.

C7 Water quality was not evaluated. The mean air temperature on this day was 12.5°C

C8 The channel is defined in the lower 300 m which directly connect to the lake. It then moves through a grassy area and into an alder swale, which was dry. No road or helicopter access was noted in this area.


Photo #: J-11-11, 1996/08/24
Site #: J166, Aerial photo, alder choked channel through mature spruce stand.

Photo #: J-11-12, 1996/08/24
Site #: J166, Aerial photo, channel in narrow winding meadow.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 167

**Reach No.: 1**

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

Location: JULIE 167, Unit 4, see C5. | Stream (Gaz.): Unnamed | Watershed Code: 480-0000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 | Reach Length (km): 2.2 MA | Date: 24-Aug-96 | Time: 15:45 | Agency: TEC | Access: HL | Fish Card: N | Field ☒ Historical ☐

U.T.M. : 9 .6488 .61393 | Length surveyed (m): 2200.0 AE | Survey Crew: JP\EM\ \ \ \ \ \ \ | Photos: J-11-13 | Air Photos:

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | AE |
| N | Av. Wet. Width (m): | 0.0 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| N | Av. Max Pool Depth (cm): | 0 | AE |
| | Gradient (%): | 5.0 | MA |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | AE |
| | % Debris Area: | 0-5 | AE |
| | %Stable: | 0 | AE |

### Specific Data

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 10 | 0 | 10 | 80 | 0 |

Crown Closure % : 50 | Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 | Compaction: Low

## Discharge

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

## Banks

N Height (m): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

2 C 5.0 | F

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

Confinement: OC

Valley : Channel Ratio 5-10

Stage: Dry | Flood Signs Ht(m): 0

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 - 30% RS - 30%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 22' 41" Long W 126 39' 02"

C6 No additional bank texture information.

C7 Water quality was not evaluated at this site. The mean air temperature on this day was 12.5°C

C8 The creek appeared to be dry at time of sampling.

C9 This site had very poor access. It could not be approached by helicopter or truck and the mouth was not visible by boat.

Photo #: J-11-13, 1996/08/24
Site #: J167, Aerial photo, alder choked channel through mature spruce.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 168 Reach No.: 1

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

Location: JULIE 168, Unit 4, see C5 | Stream (Gaz.): Unnamed | Watershed Code: 480-0000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 | Reach Length (km): 0.8 MA | Date: 24-Aug-96 | Time: 15:50 | Agency: TEC | Access: HL | Fish Card: N | Field ☒ | Historical ☐

U.T.M.: 9 .6488 .61402 | Length surveyed (m): 800.0 AE | Survey Crew: JP\EM\ \ \ \ \ \ \ | Photos: None | Air Photos:

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | AE |
| N | Av. Wet. Width (m): | 0.0 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| N | Av. Max Pool Depth (cm): | 0 | AE |
| | Gradient (%): | 6.0 | MA |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | AE |
| | % Debris Area: | 5-15 | AE |
| | %Stable: | 0 | AE |

**Specific Data**

## Cover

Cover Total % : 70 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 20 | 0 | 10 | 70 | 0 |

Crown Closure % : 60 | Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 | Compaction: Low

## 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 - 15% RS - 15%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 23' 08" Long. W 126 39' 00"

C6 No additional bank texture information. Water quality was not evaluated.

C7 Overstream vegetation provides cover at this site.

## Discharge

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

## Banks

N Height (m): 0.1 | % Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: Dry | Flood Signs Ht(m): 0

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

N Water Temp. (°C): | 02 (ppm):

Turb. (cm): | Cond. (µmhos):

## Reach Symbol

(Fish)

NF

2 C 6.0 | F

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

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 169 Reach No.: 1

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** JULIE 169, Unit 4, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 480-0000-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 2.4 MA **Date:** 24-Aug-96 **Time:** 15:55 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M.:** 9 .6491 . 61411 **Length surveyed (m):** 1600.0 AE **Survey Crew:** JP \EM \ \ \ \ \ \ **Photos:** J- 11 - 14,15 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 1.5 | AE |
| | Av. Wet. Width (m): | 1.5 | AE |
| N | Av. Max Riffle Depth (cm): | 0 | AE |
| | Av. Max Pool Depth (cm): | 40 | AE |
| | Gradient (%): | 4.0 | MA |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0-10 | AE |
| | % Debris Area: | 5-15 | AE |
| | %Stable: | 20 | AE |

**Specific Data**

## Cover

Cover Total % : 60 AE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 10 | 10 | 0 | 10 | 70 | 0 |

Crown Closure % : 40 Aspect : W

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

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

## Banks

N Height (m): 0.1

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

2 D 4.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: L Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

N Water Temp. (°C): O2 (ppm):

Turb. (cm): 40 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 | | | | VO |

## Comments

C1 S3

C2 LS - 5% RS - 5%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 23' 37" Long W 126 38' 45"

C6 No additional bank texture information.

C7 Water quality was not evaluated. The mean air temperature on this day was 12.5°C

C8 This site may be used for rearing. The channel connects directly to Nilkitkwa lake. No barriers were observed but the channel may not be continuous.

Photo #: J-11-14, 1996/08/24
Site #: J169, Aerial photo, alder choked channel through mature spruce.

Photo #: J-11-15, 1996/08/24
Site #: J169, Aerial photo, alder choked channel through mature spruce.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 25 **Reach No.: 2**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 25, Unit 4, see C5. **Stream (Gaz.):** Unnamed outlet of a small lake. **Watershed Code:** 011-1500-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 038 **Reach Length (km):** 3.7 MA **Date:** 27-Jul-96 **Time:** 13:45 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6531 .61388 **Length surveyed (m):** 400.0 HC **Survey Crew:** JP \KG\ \ \ \ \ \ \ **Photos:** J-2-5 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 1.7 | MS |
| Av. Wet. Width (m): | 1.7 | MS |
| Av. Max Riffle Depth (cm): | 13 | MS |
| Av. Max Pool Depth (cm): | 28 | MS |
| Gradient (%): | 1.5 | CL |
| Pool: 20 Riffle: 40 Run: 40 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 20 | GE |
| %Stable: | 80 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 2.0 | 1.8 | 1.4 | 1.7 | 1.8 |
| 2.0 | 1.7 | 1.4 | 1.7 | 1.8 |
| 19 | 8 | 12 | | |
| 30 | 26 | | | |

## Cover

Cover Total % : 80 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 20 | 10 | 5 | 45 | 20 |

Crown Closure % : 70 Aspect : S

## Bed Material

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

D90 (cm): 80 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.2 | MS |
| Mean Depth (m) : | 0.4 | MS |
| Mean Velocity (m/s) : | 0.14 | F |
| Discharge (m3/s) : | 0.05 | F |

## Banks

Height (m): 0.2

% Unstable: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: H Flood Signs Ht(m): 0.1

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 20.0 02 (ppm):

Turb. (cm): 30 Cond. (µmhos):

## Reach Symbol

(Fish)

RB RSC

2 C 1.5 | 1270

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| C4 | RB | 3 | 21-100 | J | R | | | EL |
| | RSC | 5 | | A | | | | MT |

## Comments

C1 S3

C2 LS=20 RS=20

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Smithroot 12 B POW model was 289 seconds over70 meters. In addition to the rainbow listed in the fish summary, 5 red side shiners and a 100 mm rainbow trout were caught in minnow traps. N 55 22' 29" W 126 35' 10"

C5 Lat N 55 22' 29", Long W 126 35' 10"

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 19.8°C

C8 This creek is the outlet of a small lake. The vegetation is dense in this area making access to the creek difficult.

Photo #: J-2-5, 1996/07/27
Site #: J25, LOD in channel through alder.

**DFO/MoELP Stream Survey Form**

# Site Number: JULIE 27 Reach No.: 2

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** JULIE 27, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-3000-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 038 **Reach Length (km):** 2.4 MA **Date:** 27-Jul-96 **Time:** 16:29 **Agency:** TEC **Access:** HL **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M. :** 9 .6523 .61537 **Length surveyed (m):** 800.0 AE **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-2-7 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 3.0 | GE |
| | Av. Wet. Width (m): | 3.0 | GE |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| | Av. Max Pool Depth (cm): | 180 | GE |
| | Gradient (%): | 0.0 | GE |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 10-40 | GE |
| | % Debris Area: | 5-15 | GE |
| | %Stable: | 100 | GE |

*Specific Data*

## Cover

Cover Total % : 90 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 60 | 10 | 0 | 10 | 20 | 0 |

Crown Closure % : 5 Aspect : NW

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

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

Height (m): 0.0

% Unstable: 5

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

(RB)

3 D 0.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: Flood Flood Signs Ht(m): 0

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 20.0 02 (ppm):

Turb. (cm): 180 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 = 0%, RS = 0%

C3: No fisheries sensitive zones noted.

C4: The conditions were dangerous at this site, so it was not electrofished.

C5: Lat N 55 23' 21", Long W 126 35' 52"

C6: No additional bank texture information.

C7: DO, pH, conducitivity were not measurerd at this site. The mean air temperature on this day was 19.8°C

C8: Instream vegetation provides most of the cover for fish at this site. Potential rearing habitat was found at this site. No obstructions were noted during the aerial reconnaisance in which the entire creek was flown.

Photo #: J-2-7, 1996/07/27
Site #: J27, Channel through grass and willows.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 1 **Reach No.: 2**

**Trib. to Nilkiltkwa Lk.**

TRITON Environmental Consultants Ltd.

**Location:** TERRY 1, Unit 4, East of Plot 571-4, 100 m below RD, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 081-4900-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 037 | Reach Length (km): | 3.5 | MA | Date: | 24-Jul-96 | Time: | 17:00 | Agency: | TEC | Access: | V2 | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 .6464 .61412 | Length surveyed (m): | 200.0 | HC | Survey Crew: | TD \DD \ \ \ \ \ \ \ | | | | | Photos: | T-1 -1,2,3 | Air Photos: | | |

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.8 | MS |
| Av. Wet. Width (m): | 1.9 | MS |
| Av. Max Riffle Depth (cm): | 8 | MS |
| Av. Max Pool Depth (cm): | 17 | MS |
| Gradient (%): | 2.0 | CL |
| Pool: 10 Riffle: 10 Run: 80 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 70 | GE |

*Specific Data*

| | | |
|---|---|---|
| 2.9 | 3.3 | 2.1 |
| 2.1 | 1.6 | 1.9 |
| 4 | 11 | 9 |
| 14 | 21 | 15 |

## Cover

Cover Total % : 90 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 10 | 20 | 0 | 55 | 10 |

Crown Closure % : 90 Aspect : E

## Bed Material

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

D90 (cm): 26 Compaction: High

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 0.5 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.17 | F |
| Discharge (m3/s) : | 0.01 | F |

## Banks

Height (m): 0.2

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

3 C 2.0 | 1360

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

Confinement: OC

Valley : Channel Ratio 5-10

Stage: M Flood Signs Ht(m): 0.2

C6 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 18.0 02 (ppm):

Turb. (cm): 21 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 | | | | EL |

## Comments

C1 S6

C2 LS = 12%, RS = 23%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model was 231 seconds over 200 meters. Minnow traps were also set in the beaver ponds 70 meters upstream of the road.

C5 Lat N 55 23' 665. Long W 126 41'.609

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured. The mean air temperature on this day was 17.5°C

C8 Beaver ponds were noted upstream of the road crossing. This reach was sampled downstream of the road crossing, where potential habitat was found.

C9 Tadpoles were caught in the gee traps set at this site.


Photo #: T-1-1, 1996/07/25
Site #: T1, Channel.


Photo #: T-1-2, 1996/07/25
Site #: T1, Downstream view.


Photo #: T-1-3, 1996/07/25
Site #: T1, Upstream view of beaver pond.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 6 **Reach No.: 2**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** TERRY 6, Unit 4, SE of 535-1 block, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-0100-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 Reach Length (km): 1.8 MA Date: 25-Jul-96 Time: 13:20 Agency: TEC Access: V2 Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6484 .61359 Length surveyed (m): 100.0 GE Survey Crew: TD \DD \HS \ \ \ \ \ \ Photos: T- - 1 -7 Air Photos:

## Channel Characteristics

| | | | Specific Data | | | |
|---|---|---|---|---|---|---|
| Av. Chan. Width (m): | 2.4 | MS | 2.8 | 1.9 | 2.9 | 2.2 |
| Av. Wet. Width (m): | 2.3 | MS | 2.5 | 2.5 | 2.0 | |
| Av. Max Riffle Depth (cm): | 5 | MS | 5 | | | |
| Av. Max Pool Depth (cm): | 22 | MS | 32 | 11 | | |
| Gradient (%): | 1.0 | CL | | | | |

Pool: 90 Riffle: 10 Run: 0 Other: 0

% Side Channel: 0 GE

% Debris Area: 5-15 GE

%Stable: 60 GE

## Cover

Cover Total % : 95 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 40 | 0 | 20 | 35 | 0 |

Crown Closure % : 80 Aspect : NE

## Discharge

| | | | |
|---|---|---|---|
| N | Wetted Width (m) : | | |
| N | Mean Depth (m) : | | |
| N | Mean Velocity (m/s) : | | |
| N | Discharge (m3/s) : | 0.00 | ge |

## Reach Symbol

(Fish)

NF

2 D 1.0 | F

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

## Bed Material

| | | | | |
|---|---|---|---|---|
| C6 | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Banks

Height (m): 0.1

% Unstable: 70

Fines ☐ Gravels ☒ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 1

C7 Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 12.0 02 (ppm):

Turb. (cm): 32 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 S6

C2 The side slopes were not measured.

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 229 seconds over 100 meters.

C5 Lat N 55 20 059, Long W 126 39 516"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured. The mean air temperature on this day was 19.2°C

C8 This site does not contain suitable fish habitat. The substrate contains mostly fines.


Photo #: T-1-7, 1996/07/25
Site #: T6, Channel.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 7 **Reach No.: 2**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** TERRY 7, Unit 4, 100 m E of 535-1 block, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-0000-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 Reach Length (km): 2.5 MA Date: 25-Jul-96 Time: 14:25 Agency: TEC Access: V2 Fish Card: N Field ☒ Historical ☐

U.T.M.: 9 .6481 .61348 Length surveyed (m): 50.0 GE Survey Crew: TD \DD \HS \ \ \ \ \ \ Photos: T- 1 - 8 Air Photos:

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.0 | GE |
| Av. Wet. Width (m): | 2.0 | GE |
| Av. Max Riffle Depth (cm): | 5 | GE |
| Av. Max Pool Depth (cm): | 22 | GE |
| Gradient (%): | 1.0 | GE |
| Pool: 90 Riffle: 10 Run: 0 Other: 0 | | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 60 | GE |

*Specific Data*

## Cover

Cover Total % : 95 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 40 | 0 | 20 | 35 | 0 |

Crown Closure % : 80 Aspect : E

## Bed Material

| | | | | |
|---|---|---|---|---|
| C6 | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N 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): 0.1

% Unstable: 70

Fines ☐ Gravels ☒ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

2 D 1.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0

C7 Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 12.0 02 (ppm):

Turb. (cm): 22 Cond. (µmhos):

## 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 The side slopes were not measured at this site.

C3 No fisheries sensitive zones noted.

C4 This site was not electroshocked.

C5 N 55 20 059 W 126 39 516

C6 No additional bank texture information.

C7 No water quality testing was carried out. The mean air temperature on this day was 19.2°C

C8 This site does not contain suitable fish habitat.

Photo #: T-1-8, 1996/07/25
Site #: T7, Channel.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 24 **Reach No.: 6**

**Trib. to Nilkitkwa R.**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 24, Unit 4, creek between 2 lakes, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-1500-000-000-000-000-000-000-000-000-000-

Map #: 93 M 038 Reach Length (km): 0.6 MA Date: 27-Jul-96 Time: 12:50 Agency: TEC Access: HL Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6538 .61395 Length surveyed (m): 100.0 HC Survey Crew: JP\KG\ \ \ \ \ \ \ Photos: J-2-4 Air Photos:

## Channel Characteristics

| | | | |
|---|---|---|---|
| | Av. Chan. Width (m): | 3.4 | MS |
| | Av. Wet. Width (m): | 2.5 | MS |
| N | Av. Max Riffle Depth (cm): | 0 | MS |
| | Av. Max Pool Depth (cm): | 28 | MS |
| | Gradient (%): | 0.5 | CL |
| | Pool: 80 Riffle: 0 Run: 10 Other: 10 | | |
| | % Side Channel: | 0 | GE |
| | % Debris Area: | >15 | GE |
| | %Stable: | 80 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 4.0 | 2.9 | 3.4 | 4.5 | 2.2 |
| 1.8 | 2.4 | 2.8 | 3.0 | 2.5 |
| 46 | 23 | 15 | | |

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 90 | 90 |
| Gravels | Small (2-16mm): | 10 | 10 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 1 Compaction: Low

## Cover

Cover Total % : 70 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 30 | 0 | 10 | 20 | 20 |

Crown Closure % : 30 Aspect : S

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.8 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.06 | F |
| Discharge (m3/s) : | 0.01 | F |

## Reach Symbol

(Fish)

RB, RSC

3 C 0.5 | 9100

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

## Banks

Height (m): 0.2

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: H Flood Signs Ht(m): 0.3

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 16.0 02 (ppm):

Turb. (cm): 46 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | RB | 3 | 130 | J | | | | VO |
| | RSC | 10 | 30-70 | J | | | | VO |

## Comments

C1: S3

C2: LS= 13 RS=15

C3: A large swampy area associated with the lake occurs at this site.

C4: This site was not electrofished due to bad access.

C5: Lat N 55 22' 39.6", Long W 126 34' 21.3"

C6: No fisheries sensitive zones noted.

C7: DO, pH and conducitivity were not measured at this site. The mean air temperature on this day was 19.8°C

C8: This creek connects two lakes. No barriers to fish passage were observed. Several debris jams and beaver dams were noted. The fish were visually observed upstream.

Photo #: J-2-4, 1996/07/27
Site #: J24, Small creek connecting 2 lakes.

## 5.7 Unnamed Tributary to Nilkitkwa Lake (480-4106-000) (93 M 037)

### 5.7.1 Sensitive Habitats and Barriers

This unnamed tributary is 10.8 km in length and is fed by 6 tributaries. No barriers to fish migration or sensitive habitats were identified by field crews working in this area. Some small wetlands were noted along the mainstem and one sampled tributary but no substantial side channels or other fisheries sensitive zones were observed. Reach 1 flows through an unconfined, low gradient area. Reach 2 has slightly more steep gradient and is occasionally confined. Reach 3 is moderately steep but has been classified as fish inferred. This tributary was sampled at 3 locations, including reaches 1 and 4 of the mainstem.

### 5.7.2 Fish Summary Tables and Stream Classification

No historical information was found for this creek. Coho and rainbow trout were caught by electroshocking at site T5 in reach 1. Fish were not caught in the remaining two sites on this system. The main creek was classified as an S3 in reach 1 based on the presence of fish and an average channel width of 4.58 meters. It was classified as an S3 in reach 2 based on an average channel width of 4.0 meters and the presence of fish habitat in the sampling area. The tributary to the main creek sampled in this inventory was classified as an S3 based on an average channel width of 1.5 meters and the presence of rearing habitat in the sampling area. The remaining tributaries are typically intermittent, S4 sized streams.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 5 — Reach No.: 1

## Trib. to Nilkitkwa Lk

TRITON Environmental Consultants Ltd.

**Location:** TERRY 5, Unit 4, E of North tip of 535 - 1, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-0200-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 2.2 MA **Date:** 25-Jul-96 **Time:** 11:00 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6484 .61359 **Length surveyed (m):** 100.0 GE **Survey Crew:** TD \DD \HS \ \ \ \ \ \ **Photos:** T-1-6 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.6 | MS |
| Av. Wet. Width (m): | 2.8 | MS |
| Av. Max Riffle Depth (cm): | 6 | MS |
| Av. Max Pool Depth (cm): | 50 | MS |
| Gradient (%): | 2.0 | CL |
| Pool: 40 Riffle: 10 Run: 50 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 5.0 | 6.3 | 3.4 | 4.3 | 3.9 |
| 1.2 | 3.7 | 2.7 | 3.1 | 3.5 |
| 6 | | | | |
| 38 | 52 | 58 | 54 | |

## Cover

Cover Total % : 70 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 30 | 0 | 5 | 60 | 5 |

Crown Closure % : 90 Aspect : E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 35 | 35 |
| Gravels | Small (2-16mm): | 55 | 30 |
| | Large (16-64mm): | | 25 |
| Larges | Sm. cobble (64-128mm): | 10 | 5 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 5 |
| Bedrock | | 0 | 0 |

D90 (cm): 27 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.5 | MS |
| Mean Depth (m) : | 0.4 | MS |
| Mean Velocity (m/s) : | 0.22 | F |
| Discharge (m3/s) : | 0.17 | F |

## Reach Symbol

(Fish)

RB CO

5 B 2.0 | 4510

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

## Banks

Height (m): 0.5

% Unstable: 75

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 1

C6 Bars (%): 0 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 58 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 |
|---|---|---|---|---|---|---|---|---|
| | RB | 2 | 109-132 | J | R | | | EL |
| | CO | 6 | 60-90 | J | R | | | EL |

## Comments

C1 S3

C2 LS = 18%, RS = 25%

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 36 seconds over 20 meters.

C5 Lat N 55 20'.544", Long W 126 39'.182"

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 19.2°C

C8 This site has some good rearing habitat. Overstream vegetation provides most of the cover.

Photo #: T-1-6, 1996/07/25
Site #: T5, Channel.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 8 Reach No.: 4

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 8, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-0200-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 3.2 MA **Date:** 25-Jul-96 **Time:** 8:45 **Agency:** TEC **Access:** V2 **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M.:** 9 .6486 .61345 **Length surveyed (m):** 100.0 GE **Survey Crew:** TD \DD \HS \ \ \ \ \ \ **Photos:** None **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.1 | MS |
| Av. Wet. Width (m): | 2.9 | MS |
| Av. Max Riffle Depth (cm): | 11 | MS |
| Av. Max Pool Depth (cm): | 30 | MS |
| Gradient (%): | 10.0 | CL |

Pool: 20 Riffle: 70 Run: 10 Other: 0

| | | |
|---|---|---|
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 60 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 5.4 | 6.3 | 4.2 | 2.7 | 1.8 |
| 3.3 | 4.8 | 2.5 | 2.6 | 1.4 |
| 8 | 14 | 11 | | |
| 24 | 36 | 29 | | |

## Cover

Cover Total %: 30 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 70 | 10 | 0 | 20 | 0 |

Crown Closure %: 20 Aspect: SW

## Bed Material

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

C6 D90 (cm): 27 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m): | 1.2 | MS |
| Mean Depth (m): | 0.2 | MS |
| Mean Velocity (m/s): | 1.11 | F |
| Discharge (m3/s): | 0.21 | F |

## Banks

Height (m): 0.2

% Unstable: 15

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: Flood Flood Signs Ht(m): 0.5

Bars (%): 30 pH: Braided: Y

C7 Water Temp. (°C): 13.0 02 (ppm):

Turb. (cm): 36 Cond. (µmhos):

## Reach Symbol

(Fish)

(DV)

4 C 10.0 | 0370

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

## 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 The side slopes were not measured.

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 349 seconds over 100 meters.

C5 Lat N 55 20' .288", Long W 126 44'.337

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 19.2°C

C8 This site provides some rearing habitat.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 10 Reach No.: 1

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 10, Unit 4, South of 523-3, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 480-0000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 4.7 MA **Date:** 26-Jul-96 **Time:** 13:30 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M.:** 9 . 6436 . 61355 **Length surveyed (m):** 400.0 GE **Survey Crew:** HS \TD\ \ \ \ \ \ \ **Photos:** T-1-10 **Air Photos:**

## Channel Characteristics

| | | | Specific Data | |
|---|---|---|---|---|
| Av. Chan. Width (m): | 1.5 | MS | 1.1 | 1.8 |
| Av. Wet. Width (m): | 1.1 | MS | 1.1 | 1.1 |
| Av. Max Riffle Depth (cm): | 6 | MS | 6 | 5 |
| Av. Max Pool Depth (cm): | 10 | MS | 11 | 10 |
| Gradient (%): | 1.0 | CL | | |

Pool: 35 Riffle: 35 Run: 30 Other: 0

| | | |
|---|---|---|
| % Side Channel: | 0 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 90 | GE |

## Cover

Cover Total % : 85 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 40 | 0 | 0 | 60 | 0 |

Crown Closure % : 40 Aspect : NE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 15 | 15 |
| Gravels | Small (2-16mm): | 35 | 15 |
| | Large (16-64mm): | | 20 |
| Larges | Sm. cobble (64-128mm): | 50 | 40 |
| | Lge cobble (128-256mm): | | 10 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 15 Compaction: Medium

## Discharge

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

## Banks

Height (m): 0.2

% Unstable: 10

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: M Flood Signs Ht(m): 0.3

Bars (%): 0 pH: Braided: N

Water Temp. (°C): 14.0 02 (ppm):

Turb. (cm): 11 Cond. (µmhos):

## Reach Symbol

(Fish)

(DV)

2 D 1.0 | 2350

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

## 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: 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 Honda Mark 10 model was 162 seconds over 40 meters.

C5: 55 20" 40.3' 126 44" 05.3'

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 18.8°C

C8: This site may provide rearing cover. The stream moves through a cutblock for 1 km then enters a wooded area.


Photo #: T-1-10, 1996/07/26
Site #: T10, Channel.

## 5.8 Unnamed Tributary to Nilkitkwa Lake (480-3972-000) (93 M 037)

### 5.8.1 Sensitive Habitats and Barriers

This tributary is 13.7 km in length and is fed by 12 tributaries. No barriers to fish migration were noted in this system. Reaches 1 and 2 are characterized by low gradient and are occasionally confined. Reach 3 is a set of small lakes surrounded by a fisheries sensitive wetland. Reach 4 has moderate to low gradient and is occasionally confined, while reach 5 has moderately steep gradient and is quite confined. Reach 6 is slightly more steep and has been classified as non fish bearing. This stream was sampled at 6 locations, including reaches 1 and 5 of the mainstem.

### 5.8.2 Fish Summary Tables and Stream Classification

No historical records were found for this creek however Dolly Varden were caught by electrofishing in reaches 1 and 5, in 3 tributaries to reach 4 and in a tributary to reach 1. Reach 1 was classified as an S2 based on an average channel width of 6.88 meters and the presence of Dolly Varden in the sampling area. Reach 5 was also classified as an S2 based on an average channel width of 5.28 meters and the presence of Dolly Varden in the sampling area. Five smaller tributaries to the main creek were sampled, 4 were classified as S3 based on average channel widths greater than 1.5 meters and the presence of Dolly Varden at all 4 sites. One tributary to this system was classified as "NC" due to the absence of a defined channel in the sampling area. This small system has varied gradient and confinement, and could provide habitat for both Dolly Varden and bull trout.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 4

**Reach No.: 1**

## Trib. to Nilkilkwa L.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 4, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-2100-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 3.8 MW **Date:** 25-Jul-96 **Time:** 9:45 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M.:** 9 .6475 .61387 **Length surveyed (m):** 100.0 GE **Survey Crew:** TD \DD \HS \ \ \ \ \ \ **Photos:** T- 1 - 5 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 6.9 | MS |
| Av. Wet. Width (m): | 6.2 | MS |
| Av. Max Riffle Depth (cm): | 6 | MS |
| Av. Max Pool Depth (cm): | 43 | MS |
| Gradient (%): | 10.0 | CL |
| Pool: 20 Riffle: 30 Run: 50 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 80 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 6.0 | 6.2 | 8.2 | 8.1 | 5.9 |
| 6.5 | 5.6 | 7.2 | 6.4 | 5.2 |
| 5 | 8 | | | |
| 42 | 43 | 45 | | |

## Cover

Cover Total %: 85 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 15 | 0 | 0 | 70 | 10 |

Crown Closure %: 90 Aspect: E

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 20 | 20 |
| Gravels | Small (2-16mm): | 20 | 5 |
| | Large (16-64mm): | | 15 |
| Larges | Sm. cobble (64-128mm): | 60 | 45 |
| | Lge cobble (128-256mm): | | 15 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 18 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m): | 5.3 | MS |
| Mean Depth (m): | 0.2 | MS |
| Mean Velocity (m/s): | 0.48 | F |
| Discharge (m3/s): | 0.38 | F |

## Banks

Height (m): 0.4

% Unstable: 80

Fines ☐ Gravels ☒ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

DV

7 C 10.0 | 2260

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

Confinement: OC

Valley : Channel Ratio 5-10

Stage: M Flood Signs Ht(m): 1

C6 Bars (%): 15 pH: Braided: Y

Water Temp. (°C): 10.0 02 (ppm):

Turb. (cm): 45 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 |
|---|---|---|---|---|---|---|---|---|
| | DV | 3 | 70-103 | J | R | | | EL |

## Comments

C1 S2

C2 The side slopes were not measured.

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 101 seconds over 50 meters.

C5 Lat N 55 22.241', Long W 126 40.127'

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 19.2°C

C8 This site provides some rearing habitat.

Photo #: T-1-5, 1996/07/25
Site #: T4, Downstream view.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 11 Reach No.: 2

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 11, Unit 4, North of 523-3, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-2400-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 037 | Reach Length (km): | 3.8 | MA | Date: | 26-Jul-96 | Time: | 14:15 | Agency: | TEC | Access: | V2 | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 . 6435 . 61363 | Length surveyed (m): | 50.0 | GE | Survey Crew: | HS \TD \ \ \ \ \ \ \ | | | Photos: | T-1-11,12,13 | | | Air Photos: | | |

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 4.1 | MS |
| Av. Wet. Width (m): | 3.9 | MS |
| Av. Max Riffle Depth (cm): | 5 | MS |
| Av. Max Pool Depth (cm): | 22 | MS |
| Gradient (%): | 8.0 | CL |
| Pool: 30 Riffle: 40 Run: 30 Other: | 0 | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 80 | GE |

*Specific Data*

| | | | |
|---|---|---|---|
| 4.0 | 6.5 | 2.9 | 3.0 |
| 4.2 | 6.5 | 2.3 | 2.6 |
| 5 | | | |
| 18 | 29 | 19 | |

## Cover

Cover Total % : 75 GE

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

Crown Closure % : 75 Aspect : NE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 10 | 10 |
| Gravels | Small (2-16mm): | 20 | 5 |
| | Large (16-64mm): | | 15 |
| Larges | Sm. cobble (64-128mm): | 70 | 35 |
| | Lge cobble (128-256mm): | | 20 |
| | Bldr cobble (>256mm): | | 15 |
| Bedrock | | 0 | 0 |

D90 (cm): 26 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.8 | MS |
| Mean Depth (m) : | 0.2 | MS |
| Mean Velocity (m/s) : | 0.86 | F |
| Discharge (m3/s) : | 0.23 | F |

## Banks

Height (m): 0.2

% Unstable: 20

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

DV

4 C 8.0 | 1270

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.4

Bars (%): 20 pH: Braided: Y

Water Temp. (°C): 10.5 02 (ppm):

Turb. (cm): 29 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| C4 | DV | 3 | 130-200 | J | | | | EL |

## Comments

C1: S3

C2: LS = 18%, RS = 5%

C4: This site was electroshocked, using a Honda Mark 10 model, for 180 seconds over 50 meters.

C5: Lat N 55 21" 06.2', Long W 126 44" 12.2'

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 18.8°C

C8: This site has some good rearing habitat.


Photo #: T-1-11, 1996/07/26
Site #: T11, Downstream view.

Photo #: T-1-12, 1996/07/26
Site #: T11, Upstream view.

Photo #: T-1-13, 1996/07/26
Site #: T11, Dead standing timber in pond.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 12 **Reach No.: 2**

**Trib. to Nilkitkwa L.**

TRITON Environmental Consultants Ltd.

**Location:** TERRY 12, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-2100-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 2.1 MA **Date:** 27-Jul-96 **Time:** 9:25 **Agency:** TEC **Access:** V2 **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6424 .61370 **Length surveyed (m):** 150.0 HC **Survey Crew:** TD \HS\ \ \ \ \ \ \ **Photos:** T-1-15 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 5.3 | GE |
| Av. Wet. Width (m): | 3.7 | GE |
| Av. Max Riffle Depth (cm): | 9 | GE |
| Av. Max Pool Depth (cm): | 47 | GE |
| Gradient (%): | 14.0 | CL |
| Pool: 30 Riffle: 30 Run: 40 Other: | 0 | |
| % Side Channel: | 0 | GE |
| % Debris Area: | 5-15 | GE |
| %Stable: | 70 | GE |

*Specific Data*

| | | | | |
|---|---|---|---|---|
| 5.7 | 4.6 | 6.3 | 4.9 | 4.9 |
| 3.7 | 4.0 | 4.1 | 3.4 | 3.4 |
| 8 | 10 | 9 | | |
| 63 | 37 | 41 | | |

## Cover

Cover Total % : 65 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 20 | 30 | 10 | 5 | 20 | 15 |

Crown Closure % : 80 Aspect : E

## Bed Material

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

D90 (cm): 27 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 3.8 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.72 | F |
| Discharge (m3/s) : | 0.21 | F |

## Banks

Height (m): 0.3

% Unstable: 15

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: OC

Valley : Channel Ratio 5-10

Stage: M Flood Signs Ht(m): 0.3

Bars (%): 20 pH: Braided: Y

Water Temp. (°C): 10.0 02 (ppm):

Turb. (cm): 63 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

5 C 14.0 | 2260

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| C4 | DV | 6 | 35-90 | J | | | | EL |

## Comments

C1 S2

C2 LS=20 RS=34

C3 No fisheries sensitive zones were noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 106 seconds over 40 meters.

C5 N 55 21' 33.8" W 126 45' 11.8"

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 19.8°C

C8 This site has some good rearing habitat. LOD cover is particularly prominent.


Photo #: T-1-15, 1996/07/27
Site #: T12, Upstream view.

DFO/MoELP Stream Survey Form

**Site Number:** TERRY 13 **Reach No.: 2**

**Trib. to Nilkitwa L.**

TRITON Environmental Consultants Ltd.

**Location:** TERRY 13, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-4100-000-000-000-000-000-000-000-000-000-0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map #: | 93 M 037 | Reach Length (km): | 1.3 | MA | Date: | 27-Jul-96 | Time: | 10:25 | Agency: | TEC | Access: | V2 | Fish Card: | N | Field ☒ Historical ☐ |
| U.T.M. : | 9 . 6424 . 61371 | Length surveyed (m): | 150.0 | GE | Survey Crew: | HS \TD\ \ \ \ \ \ \ | | | Photos: | T-1-16 | Air Photos: | | | | |

## Channel Characteristics

| | | | Specific Data | | | |
|---|---|---|---|---|---|---|
| Av. Chan. Width (m): | 2.0 | MS | 1.6 | 1.7 | 2.0 | 2.6 |
| Av. Wet. Width (m): | 1.3 | MS | 1.3 | 1.1 | 1.1 | 1.8 |
| Av. Max Riffle Depth (cm): | 7 | MS | 10 | 5 | 7 | |
| Av. Max Pool Depth (cm): | 24 | MS | 22 | 30 | 20 | |
| Gradient (%): | 7.0 | CL | | | | |

Pool: 20 Riffle: 40 Run: 40 Other: 0

| | | |
|---|---|---|
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 80 | GE |

## Cover

Cover Total % : 90 GE

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

Crown Closure % : 90 Aspect : SE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 15 | 15 |
| Gravels | Small (2-16mm): | 40 | 20 |
| | Large (16-64mm): | | 20 |
| Larges | Sm. cobble (64-128mm): | 45 | 35 |
| | Lge cobble (128-256mm): | | 10 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 13 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.2 | 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: 10

Fines ☐ Gravels ☒ Larges ☐ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.15

Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 9.5 02 (ppm):

Turb. (cm): 30 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

2 B 7.0 | 2440

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | DV | 2 | 35-75 | J | | | | EL |

## Comments

C1 S3

C2 LS=31 RS=16

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 103 seconds over 30 meters.

C5 N 55 21' 33.8" W 126 45'11.8"

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 19.8°C

C8 This site provides some rearing habitat.

Photo #: T-1-16, 1996/07/27
Site #: T13, Upstream view.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 14 Reach No.: 1

## Trib. to Nilkitkwa R.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 14, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-3500-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 4.1 MA **Date:** 27-Jul-96 **Time:** 12:20 **Agency:** TEC **Access:** V2 **Fish Card:** N ☐ Field ☒ Historical ☐

**U.T.M.:** 9 .6428 .61376 **Length surveyed (m):** 100.0 GE **Survey Crew:** HS \TD\ \ \ \ \ \ \ **Photos:** T-1-17 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 2.7 | MS |
| Av. Wet. Width (m): | 1.9 | MS |
| Av. Max Riffle Depth (cm): | 5 | MS |
| Av. Max Pool Depth (cm): | 18 | MS |
| Gradient (%): | 13.0 | CL |
| Pool: 30 Riffle: 40 Run: 30 Other: | 0 | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | 0-5 | GE |
| %Stable: | 30 | GE |

**Specific Data**

| | | | | |
|---|---|---|---|---|
| 2.4 | 3.2 | 3.1 | 3.1 | 1.7 |
| 1.6 | 2.3 | 2.0 | 2.0 | 1.7 |
| 6 | 5 | 3 | | |
| 14 | 21 | 25 | 14 | |

## Cover

Cover Total % : 90 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 5 | 20 | 10 | 5 | 50 | 10 |

Crown Closure % : 85 Aspect : NE

## Bed Material

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

D90 (cm): 29 Compaction: Medium

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 1.4 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.53 | F |
| Discharge (m3/s) : | 0.06 | F |

## Banks

Height (m): 0.2

% Unstable: 25

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

DV

3 B 13.0 | 1360

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

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 0.2

Bars (%): 0 pH: Braided: Y

Water Temp. (°C): 11.0 02 (ppm):

Turb. (cm): 25 Cond. (µmhos):

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | DV | 4 | 40-90 | J | | | | EL |

## Comments

C1 S3

C2 The side slopes were not measured.

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model was, 188 seconds over 60 meters.

C5 N 55 21.5' 51" W 126 44' 44.6"

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured. The mean air temperature on this day was 19.8°C

C8 This site provides rearing habitat.

Photo #: T-1-17, 1996/07/27
Site #: T14, Upstream view.

**DFO/MoELP Stream Survey Form**

# Site Number: TERRY 15 — Reach No.: 1

## Trib. to Nilkitkwa L.

TRITON Environmental Consultants Ltd.

**Location:** TERRY 15, Unit 4, see C5. **Stream (Gaz.):** Unnamed **Watershed Code:** 011-2900-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **U.T.M. :** 9 .6432 .61385 **Reach Length (km):** 3.1 MA **Length surveyed (m):** 100.0 GE **Date:** 27-Jul-96 **Time:** 14:10 **Agency:** TEC **Survey Crew:** HS \TD\ \ \ \ \ \ \ **Access:** V2 **Fish Card:** N Field ☒ Historical ☐ **Photos:** T-1-18 **Air Photos:**

## Channel Characteristics

| | | |
|---|---|---|
| Av. Chan. Width (m): | 3.1 | MS |
| Av. Wet. Width (m): | 2.7 | MS |
| Av. Max Riffle Depth (cm): | 5 | MS |
| Av. Max Pool Depth (cm): | 61 | MS |
| Gradient (%): | 3.0 | CL |
| Pool: 40 Riffle: 35 Run: 25 Other: 0 | | |
| % Side Channel: | 0-10 | GE |
| % Debris Area: | >15 | GE |
| %Stable: | 70 | GE |

### Specific Data

| | | | |
|---|---|---|---|
| 3.8 | 3.6 | 3.5 | 1.4 |
| 2.8 | 2.9 | 3.5 | 1.7 |
| 6 | 4 | 4 | |
| 39 | 23 | 120 | |

## Cover

Cover Total % : 60 GE

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

Crown Closure % : 50 Aspect : NE

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 45 | 45 |
| Gravels | Small (2-16mm): | 40 | 30 |
| | Large (16-64mm): | | 10 |
| Larges | Sm. cobble (64-128mm): | 15 | 10 |
| | Lge cobble (128-256mm): | | 5 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

D90 (cm): 27 Compaction: Low

## Discharge

| | | |
|---|---|---|
| Wetted Width (m) : | 2.7 | MS |
| Mean Depth (m) : | 0.1 | MS |
| Mean Velocity (m/s) : | 0.40 | F |
| Discharge (m3/s) : | 0.08 | F |

## Banks

Height (m): 0.5

% Unstable: 80

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: FC

Valley : Channel Ratio 2-5

Stage: M Flood Signs Ht(m): 1

Bars (%): 10 pH: Braided: Y

Water Temp. (°C): 10.5 02 (ppm):

Turb. (cm): 39 Cond. (µmhos):

## Reach Symbol

(Fish)

DV

3 C 3.0 | 4420

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

## Obstructions

## Fish Summary

| C | Species | Number | Size Range (mm) | Life Phase | Use 1 | Use 2 | Use 3 | Method |
|---|---|---|---|---|---|---|---|---|
| | DV | 12 | 30-130 | J | | | | EL |

## Comments

C1 S3

C2 LS=1 RS=38

C3 No fisheries sensitive zones noted.

C4 The electroshocking effort, using a Honda Mark 10 model, was 449 seconds over 100 meters.

C5 N 55 22' 12.3" W 126 44' 25.7

C6 No additional bank texture information.

C7 DO, pH and conductivity were not measured. The mean air temperature on this day was 19.8°C

C8 This site has some great rearing habitat.

Photo #: T-1-18, 1996/07/27
Site #: T15, Upstream view.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 16 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: TERRY 16, Unit 4, see C5. Stream (Gaz.): Unnamed Watershed Code: 480-0000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 Reach Length (km): 0.0 GE Date: 27-Jul-96 Time: 17:00 Agency: TEC Access: V2 Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 .6451 .61387 Length surveyed (m): 0.0 Survey Crew: HS \TD \ \ \ \ \ \ Photos: T-1-19 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 (%): | 0.0 | MA |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| N | % Side Channel: | | |
| N | % Debris Area: 0 | | GE |
| | %Stable: 0 | | GE |

*Specific Data*

## Cover

N Cover Total % : 0

| | Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|---|
| N | 0 | 0 | 0 | 0 | 0 | 0 |

N Crown Closure % : 0 N Aspect :

## 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 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| N | Bedrock | | 0 | 0 |

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 ☐

N Confinement: N/A

N Valley : Channel Ratio N/A

N Stage: Dry N Flood Signs Ht(m):

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

N Water Temp. (°C): 02 (ppm):

Turb. (cm): Cond. (µmhos):

## Reach Symbol

(Fish)

NF

0 E 0.0 | 0000

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

## Obstructions

## Fish Summary

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

## Comments

C1 NC

C2 Side slopes not applicable.

C3 No fisheries sensitive zones were noted.

C4 This site was not electrofished.

C5 Lat N 55 22 22.6, Long W 126 42 39.3

C6 Bank texture not applicable.

C7 Water quality not applicable.

C8 No fish habitat was observed at this site, which is an alder swale.

Photo #: T-1-19, 1996/07/27
Site #: T16, Not a creek.

**DFO/MoELP Stream Survey Form** **Site Number:** E256 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

**Location:** E256, Unit 4, East of the Babine River fish weir. **Stream (Gaz.):** Unnamed **Watershed Code:** 002-5600-000-000-000-000-000-000-000-000-000-

**Map #:** 93 M 047 **Reach Length (km):** 0.0 GE **Date:** 05-Sep-97 **Time:** 16:11 **Agency:** TEC **Access:** H **Fish Card:** N **Field** ☒ **Historical** ☐

**U.T.M.:** 9 6506 61447 **Length surveyed (m):** 100.0 GE **Survey Crew:** SJ \ JL \ \ \ \ \ \ \ **Photos:** E-24B-11 **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 |
| | Gradient (%): | 2.0 | MA |
| N | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| N | % Side Channel: | | GE |
| N | % Debris Area: 0 | | GE |
| | %Stable: | 0 | GE |

*Specific Data*

## Cover

Cover Total % : 0 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

Crown Closure % : 0 Aspect : S

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | Lge cobble (128-256mm): | | 0 |
| | Bldr cobble (>256mm): | | 0 |
| 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

N Height (m): 0.0

% Unstable: 0

N Fines ☐ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

0 D 2.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

N Stage: L N Flood Signs Ht(m):

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

N Water Temp. (°C): 02 (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 | | | | NA |

## Comments

C1 NC

C2 Side slopes not applicable.

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Bank texture information not applicable.

C6 Water quality not applicable.

C7 No defined channel was noted at this site. A boggy swale with interspersed pools was found.


Photo #: E-24B-11, 05-Sep-97
Site #: E256, Looking at an "NC"

**DFO/MoELP Stream Survey Form** **Site Number:** E257 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: E257, Unit 4, Est of the Babine River fish weir | Stream (Gaz.): Unnamed | Watershed Code: 082-0200-000-000-000-000-000-000-000-000-000-

Map #: 93 M 047 | Reach Length (km): 0.0 GE | Date: 05-Sep-97 | Time: 16:40 | Agency: TEC | Access: V4 | Fish Card: N | Field ☒ Historical ☐

U.T.M. : 9 .6509 .6145112 | Length surveyed (m): 100.0 GE | Survey Crew: SJ \JL \ \ \ \ \ \ \ | Photos: E-24B-12 | 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 |
| | Gradient (%): | 1.0 | MA |

N Pool: 100 Riffle: 0 Run: 0 Other: 0

N % Side Channel: GE

N % Debris Area: 0 GE

%Stable: GE

*Specific Data*

## Cover

N Cover Total % : 0 GE

| | Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|---|
| N | 0 | 0 | 0 | 0 | 0 | 0 |

Crown Closure % : 0 Aspect : S

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | 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

N Height (m): 0.0

% Unstable: 0

N Fines ☐ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

0 D 1.0 | F

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

Confinement: UC

Valley : Channel Ratio 10+

N Stage: L N Flood Signs Ht(m):

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

N Water Temp. (°C): 02 (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 | | | | NA |

## Comments

C1 NC

C2 Side slopes not applicable.

C3 No fisheries sensitive zones present.

C4 This site was not electrofished.

C5 Bank texture not applicable.

C6 Water quality was not evaluated at this site.

C7 No defined channel was observed in the sampling area. A boggy swale with isolated pools was found.


Photo #: E-24B-12, 05-Sep-97
Site #: E257, Looking at an "NC"

**DFO/MoELP Stream Survey Form** **Site Number:** JULIE 12 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 12, Unit 4, small creek in meadow just above Boucher Creek,see C5., **Stream (Gaz.):** Unnamed **Watershed Code:** 014-5400-000-000-000-000-000-000-000-000-000-000-

Map #: 93 M 058 **Reach Length (km):** 0.0 GE **Date:** 26-Jul-96 **Time:** 7:50 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

U.T.M. : 9 .6610 .61586 **Length surveyed (m):** 80.0 GE **Survey Crew:** JP\KG\ \ \ \ \ \ \ **Photos:** J-1-17 **Air Photos:**

## Channel Characteristics

| | | | |
|---|---|---|---|
| N | Av. Chan. Width (m): | 0.0 | MS |
| | Av. Wet. Width (m): | 0.5 | MS |
| N | Av. Max Riffle Depth (cm): | 0 | MS |
| | Av. Max Pool Depth (cm): | 12 | MS |
| | Gradient (%): | 1.0 | CL |
| | Pool: 100 Riffle: 0 Run: 0 Other: 0 | | |
| | % Side Channel: | 0 | |
| | % Debris Area: | 0-5 | GE |
| | %Stable: | 80 | GE |

*Specific Data*

0.5 0.4 0.2 0.8 0.6

0

16 10 9

## Cover

Cover Total % : 40 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 30 | 0 | 0 | 70 | 0 |

N Crown Closure % : 10 Aspect :

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

| | | | |
|---|---|---|---|
| | Wetted Width (m) : | 0.1 | MS |
| | Mean Depth (m) : | 0.2 | MS |
| | Mean Velocity (m/s) : | | |
| C8 | Discharge (m3/s) : | 0.01 | |

## Banks

Height (m): 0.0

% Unstable: 0

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

Confinement: UC

Valley : Channel Ratio 10+

Stage: H Flood Signs Ht(m): 0

Bars (%): 0 pH: 6.8 Braided: N

Water Temp. (°C): 11.0 02 (ppm):

Turb. (cm): 16 Cond. (µmhos): 250

## Reach Symbol

(Fish)

NF

0 D 1.0 | F

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

## Obstructions

## Fish Summary

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

## Comments

C1 NC

C2 LS = 3%, RS = 3%

C3 No fisheries sensitive zones were noted at this site.

C4 The electroshocking effort, using a Smithroot 12 B POW model, was 185 seconds over 80 meters at 200V. The machine shorted out at a higher voltage.

C5 Lat N 55 32' 47", Long W 126 26' 55"

C6 No additional bank texture information.

C7 DO, pH, conductivity and turbidity were not measured at this site. The water was clear to the bottom.

C8 The crew walked down to the bottom of drainage, to discover that it disappears underground. It is not suitable for overwintering, spawning or rearing and is not a creek by definition. It connects with Boucher Creek through groundwater only and its banks are not continuous and well defined. Finally, the substrate is 100% organic matter.

Photo #: J-1-17, 1996/07/26
Site #: J12, Not a creek.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 160 Unit 4 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

**Location:** JULIE 160 Unit 4, see C5 **Stream (Gaz.):** Unnamed **Watershed Code:** 000-0000-000-000-000-000-000-000-000-000-000-0

**Map #:** 93 M 037 **Reach Length (km):** 0.0 GE **Date:** 24-Aug-96 **Time:** 14:35 **Agency:** TEC **Access:** HL **Fish Card:** N Field ☒ Historical ☐

**U.T.M. :** 9 .6502 .61364 **Length surveyed (m):** 300.0 GE **Survey Crew:** JP \EM\ \ \ \ \ \ \ **Photos:** None **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 |
| | Gradient (%): | 2.0 | MA |

N Pool: 0 Riffle: 0 Run: 0 Other: 0

N % Side Channel: GE

N % Debris Area: 0 GE

%Stable: 0 GE

*Specific Data*

## Cover

N Cover Total % : 0 GE

| | Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|---|
| N | 0 | 0 | 0 | 0 | 0 | 0 |

Crown Closure % : 40 Aspect : N

## Bed Material

| | | | | |
|---|---|---|---|---|
| N | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| N | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction:

## 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 |

## 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

Fines ☒ Gravels ☐ Larges ☐ Bedrock ☐

## Reach Symbol

(Fish)

NF

0 E 2.0 | F

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

Confinement: N/A

Valley : Channel Ratio N/A

Stage: Dry N Flood Signs Ht(m): 0

N Bars (%): 0 pH: Braided:

N Water Temp. (°C): 02 (ppm):

Turb. (cm): Cond. (µmhos):

## 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 Lat N 55 21' 06.5", Long W 126 37' 51.2"

C6 Bank texture not applicable.

C7 Water quality not applicable.

C8 No defined channel was observed at this site, which is an alder swale.

**DFO/MoELP Stream Survey Form**

**Site Number:** JULIE 159 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: JULIE 159, Unit 4, see C5 | Stream (Gaz.): Unnamed | Watershed Code: 480-0000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 | Reach Length (km): 0.0 GE | Date: 24-Aug-96 | Time: 14:25 | Agency: TEC | Access: HL | Fish Card: N | Field ☒ Historical ☐

U.T.M.: 9 .6502 .61365 | Length surveyed (m): 500.0 GE | Survey Crew: JP \EM \ \ \ \ \ \ | Photos: J- 10 - 25 | 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 |
| | Gradient (%): | 0.5 | CL |

N Pool: 0 Riffle: 0 Run: 0 Other: 0

N % Side Channel:

N % Debris Area: 0 GE

%Stable: 0 GE

## Cover

N Cover Total % : 0

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

N Crown Closure % : 50 Aspect : N

## Bed Material

| | | | |
|---|---|---|---|
| Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| Gravels | Small (2-16mm): | 0 | 0 |
| | Large (16-64mm): | | 0 |
| Larges | Sm. cobble (64-128mm): | | 0 |
| | Lge cobble (128-256mm): | 0 | 0 |
| | Bldr cobble (>256mm): | | 0 |
| Bedrock | | 0 | 0 |

N D90 (cm): 0 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 ☐

Confinement: N/A

Valley : Channel Ratio N/A

Stage: Dry Flood Signs Ht(m):

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

N Water Temp. (°C): O2 (ppm):

Turb. (cm): Cond. (µmhos):

## Reach Symbol

(Fish)

NF

0 E 0.5 F

(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 | | | | EL |

## Comments

C1 NC

C2 LS - 2% RS -2%

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 21' 08.7" Long 126 37' 50.3"

C6 Bank texture not applicable.

C7 Water quality not applicable.

C8 The crew hiked up 743 meters from the mouth of the creek at (J158) and did not find a defined channel.

Photo #: J-10-25, 1996/08/24
Site #: J159, Not a creek.

**DFO/MoELP Stream Survey Form** **Site Number:** RYAN 8 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: RYAN 8, Unit 4, see C5. Stream (Gaz.): Unnamed Watershed Code: 011-8000-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 048 Reach Length (km): 0.0 GE Date: 26-Jul-96 Time: 8:00 Agency: TEC Access: HL Fish Card: N Field ☒ Historical ☐

U.T.M. : 9 . 6560 . 61470 Length surveyed (m): 100.0 GE Survey Crew: RH \EM\ \ \ \ \ \ \ Photos: None 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 |
| | Av. Max Pool Depth (cm): | 40 | GE |
| | Gradient (%): | 1.5 | MA |

N Pool: 0 Riffle: 0 Run: 100 Other: 0

N % Side Channel:

N % Debris Area: 0 GE

%Stable: 0 GE

**Specific Data**

35 25 60

## Cover

N Cover Total % : 0

| | Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|---|
| N | 0 | 0 | 0 | 0 | 0 | 0 |

N Crown Closure % : 80 Aspect : S

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | | 0 |
| | | Lge cobble (128-256mm): | 0 | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction: Low

## Discharge

| | | | |
|---|---|---|---|
| N | Wetted Width (m) : | | |
| N | Mean Depth (m) : | | |
| N | Mean Velocity (m/s) : | | |
| | Discharge (m3/s) : | 0.01 | GE |

## Banks

N Height (m): 0.0

% Unstable: 0

N Fines ☐ Gravels ☐ Larges ☐ Bedrock ☐

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): 60 Cond. (µmhos):

## Reach Symbol

(Fish)

NF

0 E 1.5 | F

(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 NC

C2 No LB/RB

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat N 55 26' 40", Long W 126 32' 00"

C6 Bank texture not applicable.

C7 Water quality not applicable.

C8 No defined channel was observed at this site, however, fish were seen feeding in the lake.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 17 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: TERRY 17, Unit 4, see C5. Stream (Gaz.): Unnamed Watershed Code: 480-0000-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 Reach Length (km): 0.0 GE Date: 27-Jul-96 Time: 0:00 Agency: TEC Access: V4 Fish Card: N Field ☒ Historical ☐

U.T.M.: 9 6428 61415 Length surveyed (m): 0.0 Survey Crew: HS \TD\ \ \ \ \ \ \ Photos: T-1-20 Air Photos:

## Channel Characteristics

| | | | |
|---|---|---|---|
| N | Av. Chan. Width (m): | 0.0 | GE |
| N | Av. Wet. Width (m): | 0.0 | |
| N | Av. Max Riffle Depth (cm): | 0 | GE |
| N | Av. Max Pool Depth (cm): | 0 | GE |
| N | Gradient (%): | 0.0 | ma |
| N | Pool: 0 Riffle: 0 Run: 0 Other: 0 | | |
| N | % Side Channel: | | |
| N | % Debris Area: 0 | | GE |
| | %Stable: | 0 | GE |

*Specific Data*

0

## Cover

N Cover Total % : 0

| | Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|---|
| N | 0 | 0 | 0 | 0 | 0 | 0 |

N Crown Closure % : 0 N Aspect :

## 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 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| N | Bedrock | | 0 | 0 |

N D90 (cm): 0 N Compaction:

## Discharge

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

## Reach Symbol

(Fish)

NF

0 E 0.0 | 0000

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

## Banks

N Height (m): 0.0

N % Unstable: 0

N Fines ☐ Gravels ☐ Larges ☐ Bedrock ☐

N Confinement: N/A

N Valley : Channel Ratio N/A

N Stage: Dry N Flood Signs Ht(m):

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

N Water Temp. (°C): 02 (ppm):

Turb. (cm): Cond. (µmhos):

## Obstructions

## Fish Summary

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

## Comments

C1 NC

C2 Side slopes not applicable.

C3 No fisheries sensitive zones were noted.

C4 No electroshocking was carried out.

C5 N 55 23 57.2 W 126 44 38.2

C6 This is an alder swale, not a creek.

Photo #: T-1-20, 1996/07/27
Site #: T17, Not a creek.

**DFO/MoELP Stream Survey Form**

**Site Number:** TERRY 3 **Reach No.: 0**

**Not a creek**

TRITON Environmental Consultants Ltd.

Location: TERRY 3, Unit 4, NE of 571- 4 block, see C5 Stream (Gaz.): Unnamed Watershed Code: 480-0000-000-000-000-000-000-000-000-000-000-0

Map #: 93 M 037 Reach Length (km): 0.0 MA Date: 25-Jul-96 Time: 8:10 Agency: TEC Access: V2 Fish Card: N. Field ☒ Historical ☐

U.T.M. : 9 .6459 .61419 Length surveyed (m): 50.0 GE Survey Crew: TD \DD \HS \ \ \ \ \ \ Photos: None 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 (%): | 0.0 | MA |

N Pool: 0 Riffle: 0 Run: 0 Other: 0

N % Side Channel:

N % Debris Area: 0 GE

%Stable: 0 GE

*Specific Data*

0

## Bed Material

| | | | | |
|---|---|---|---|---|
| | Fines | Clay, silt, sand (<2mm): | 100 | 100 |
| | Gravels | Small (2-16mm): | 0 | 0 |
| | | Large (16-64mm): | | 0 |
| | Larges | Sm. cobble (64-128mm): | 0 | 0 |
| | | Lge cobble (128-256mm): | | 0 |
| | | Bldr cobble (>256mm): | | 0 |
| | Bedrock | | 0 | 0 |

N D90 (cm): 0 Compaction:

## Cover

Cover Total % : 90 GE

| Pool | LOD | Bldr | In Veg | O Veg | Ctbnk |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

N Crown Closure % : 0 Aspect :

## 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

N Fines ☐ Gravels ☐ Larges ☐ Bedrock ☐

N Confinement: N/A

N 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):

## Reach Symbol

(Fish)

NF

0 E 0.0 | F

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

## Obstructions

## 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.

C3 No fisheries sensitive zones noted.

C4 This site was not electrofished.

C5 Lat: N 55 23.890' W 126 41.911'

C6 Bank texture not applicable.

C7 Water quality not applicable.

C8 This site does not contain fish habitat.

## 5.9 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 Figures 2a through 2g. Species caught in Working Unit 4 included rainbow trout, Dolly Varden, chub species, coho, northern squawfish, red sided shiner, and suckers (general). 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 4**

| | RB | DV | CBC | CO | NSC | RSC | SU |
|---|---|---|---|---|---|---|---|
| 0-25 | 2 | | | | | | |
| 25-50 | 8 | 9 | 1 | | | 3 | 1 |
| 50-75 | 1 | 6 | 1 | 1 | 1 | 1 | |
| 75-100 | 4 | 3 | | 1 | | 1 | |
| 100-125 | 1 | 2 | | | | 1 | |
| 125-150 | 7 | 4 | | | | | |
| 150-175 | 1 | 1 | | | | | |
| 175-200 | 4 | 1 | | | | | |
| 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 | | | | | | | |

## 5.10 Rare and Endangered Species

No rare or endangered species were observed in this working unit.

## 5.11 Wildlife Observations

Tadpoles, osprey and beaver sign were observed by survey crews in working unit 4. Beaver dams and ponds were the most commonly encountered wildlife signs in this inventory. Table 7 summarizes the wildlife and wildlife sign observations made in this unit.

## 5.12 Recommendations for Future Sampling.

A list of sites for which future sampling is recommended is provided in Table 6, the following reaches in particular should be revisited:

- T8 (93 M 037)
- T10 (93 M 037)
- J11 (93 M 058)

These reaches have been classified as fish inferred and appear to have suitable habitat. J11 looks as though it could have potential gradient problems (on the TRIM sheet, downstream from the sampling area); however Dolly Varden were caught upstream of this tributary and could use this reach for rearing. In addition, the unsampled reach below the 8 meter falls on the unnamed tributary to Boucher Creek, sampled above the falls at J5 through J8, should be surveyed. It too appears to have potential gradient problems, but could provide rearing habitat for Dolly Varden or possibly even bull trout.

# 6.0 CONCLUSION AND RECOMMENDATIONS

Fish distribution in working unit 4 has fewer gradient based limitations than many of the other working units. A large number of fish were caught in this unit and many other areas were classified as fish bearing despite the fact that no fish were caught in the sampling areas. Many of the tributaries to Boucher Creek drain fair sized lakes, which provide suitable rearing and overwintering habitat. Additionally some of the tributaries to Nilkitkwa Lake, which supports many different populations of fish, have low gradient high up into the watersheds, providing several kilometers of suitable habitat in some of the larger streams (see T12 TRIM sheet 93 M 037).

## 7.0 REFERENCES


Department of Fisheries & Oceans and Ministry of Environment. 1989. Fish Habitat Inventory & Information Program: Stream Survey Field Guide. Department of Fisheries & Oceans and Ministry of Environment.

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.

Province of British Columbia. 1993. Resource Inventory Committee (RIC): Field Key to the Freshwater Fishes of British Columbia.

Saimoto, R.S. 1996. Literature Review for Stream Inventory in the Bulkley Forest District.

## LEGEND

- River / Stream
- Lakes
- Highway
- Railway
- 093M.000 UTM Mapsheet
- Watershed Boundary
- Unit Boundaries (by mapsheet)
- Study Area (by mapsheet)


**INSET MAP**

BABINE RIVER WATERSHED
KISPIOX RIVER WATERSHED
BULKLEY RIVER WATERSHED
BABINE LAKE WATERSHED
BABINE RIVER WATERSHED

**UNIT 4**

HAZELTON
SOUTH HAZELTON
SMITHERS
TELKWA
HOUSTON

Skeena River
Nilkitkwa River
Babine River
Kispiox River
Nichyeskwa Cr.
Shegunia River
Driftwood River
Suskwa River
Harold Price Cr.
Kitwancool River
Skeena
Bulkley
Blunt Cr
Babine Lake
Kitseguecla River
Kitsuns Cr.
Fulton River
Red Canyon Cr.
Serb Cr.
Telkwa River
Zymoetz
Clore River
Kitnayakwa River

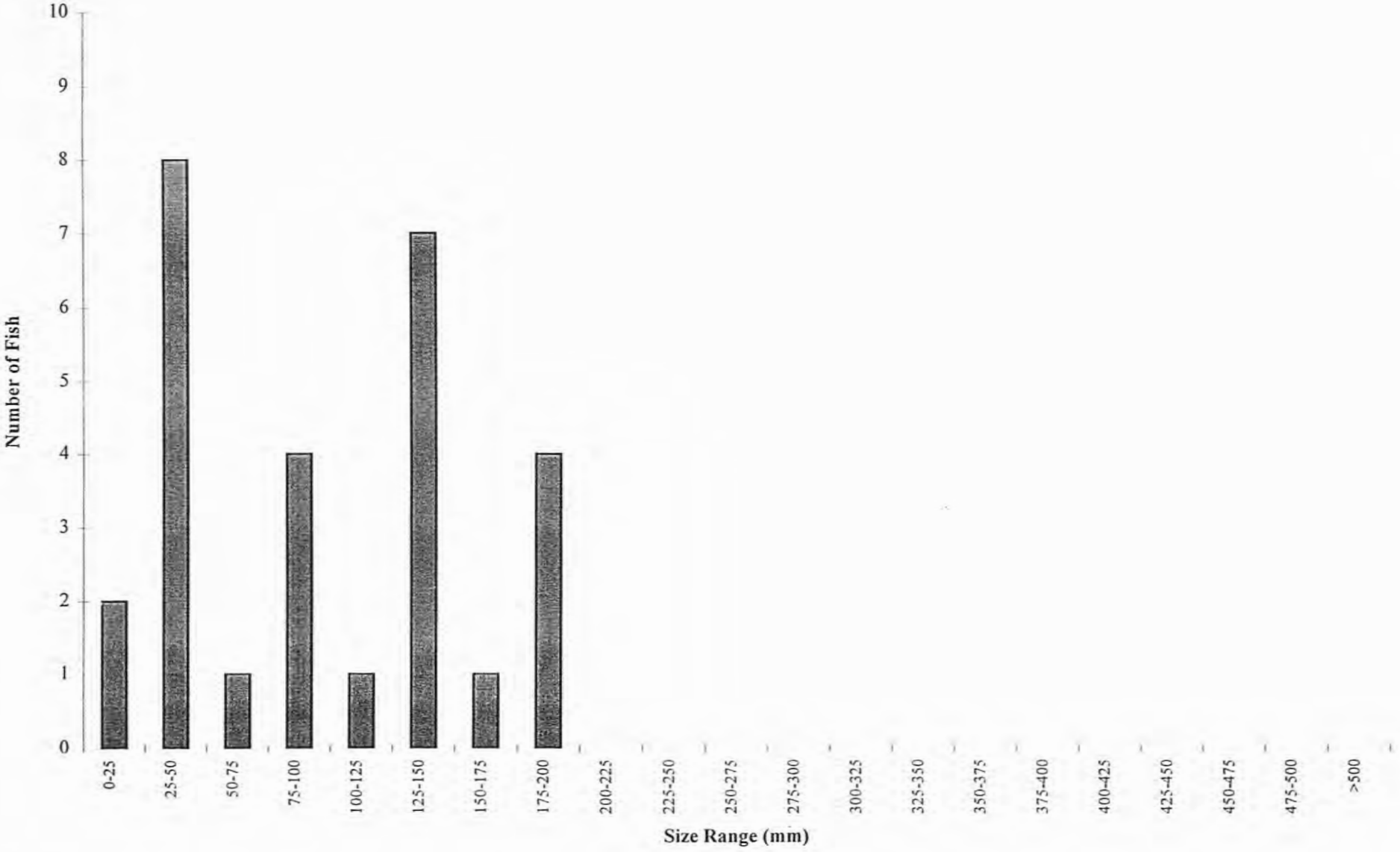
093M.095 093M.096
093M.085 093M.086 093M.087
093M.075 093M.076 093M.077
093M.067 093M.068
093M.066
093M.055 093M.056 093M.057 093M.058
093M.045 093M.046 093M.047 093M.048
093M.035 093M.036 093M.037 093M.038
093M.024 093M.025 093M.026 093M.027 093M.028
093M.013 093M.014 093M.015 093M.016 093M.017 093M.018
093M.002 093M.003 093M.004 093M.005 093M.006 093M.007 093M.008
103I.100 093L.091 093L.092 093L.093 093L.094 093L.095 093L.096 093L.097 093L.098
103I.090 093L.081 093L.082 093L.083 093L.084 093L.085 093L.086 093L.087 093L.088
103I.080 093L.071 093L.072 093L.073 093L.074 093L.075 093L.076 093L.077
093L.061 093L.062 093L.063 093L.064 093L.065 093L.066 093L.067
093L.052 093L.053 093L.054 093L.055 093L.056 093L.057
093L.042 093L.043 093L.044 093L.045

| | | |
|---|---|---|
| **FISH AND FISH HABITAT INVENTORY IN THE BULKLEY FOREST DISTRICT** | Sources : 1 : 20,000 TRIM<br>B.C. Watershed Atlas 1 : 50,000<br>M.O.E.L.P | 5 0 5 10 15 20 Kilometers<br>1 : 500,000 |
| **UNIT 4 OVERVIEW MAP**<br>Project ID : 2565 | Projection : UTM Zone 9<br>Datum : NAD83<br>Created : February, 1998 | TRITON Environmental Consultants Ltd. |

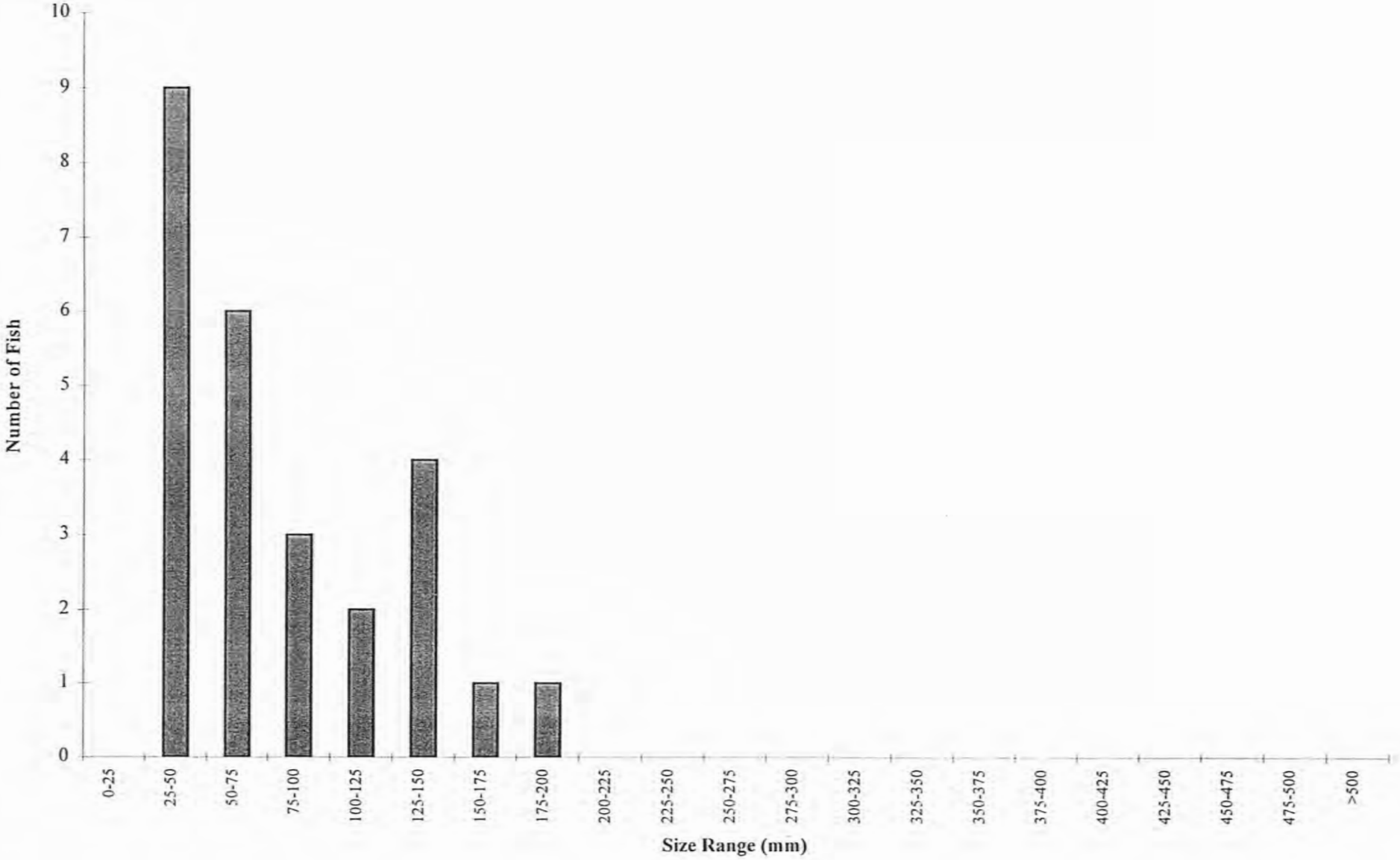
FIGURE 1

MAp 256506223

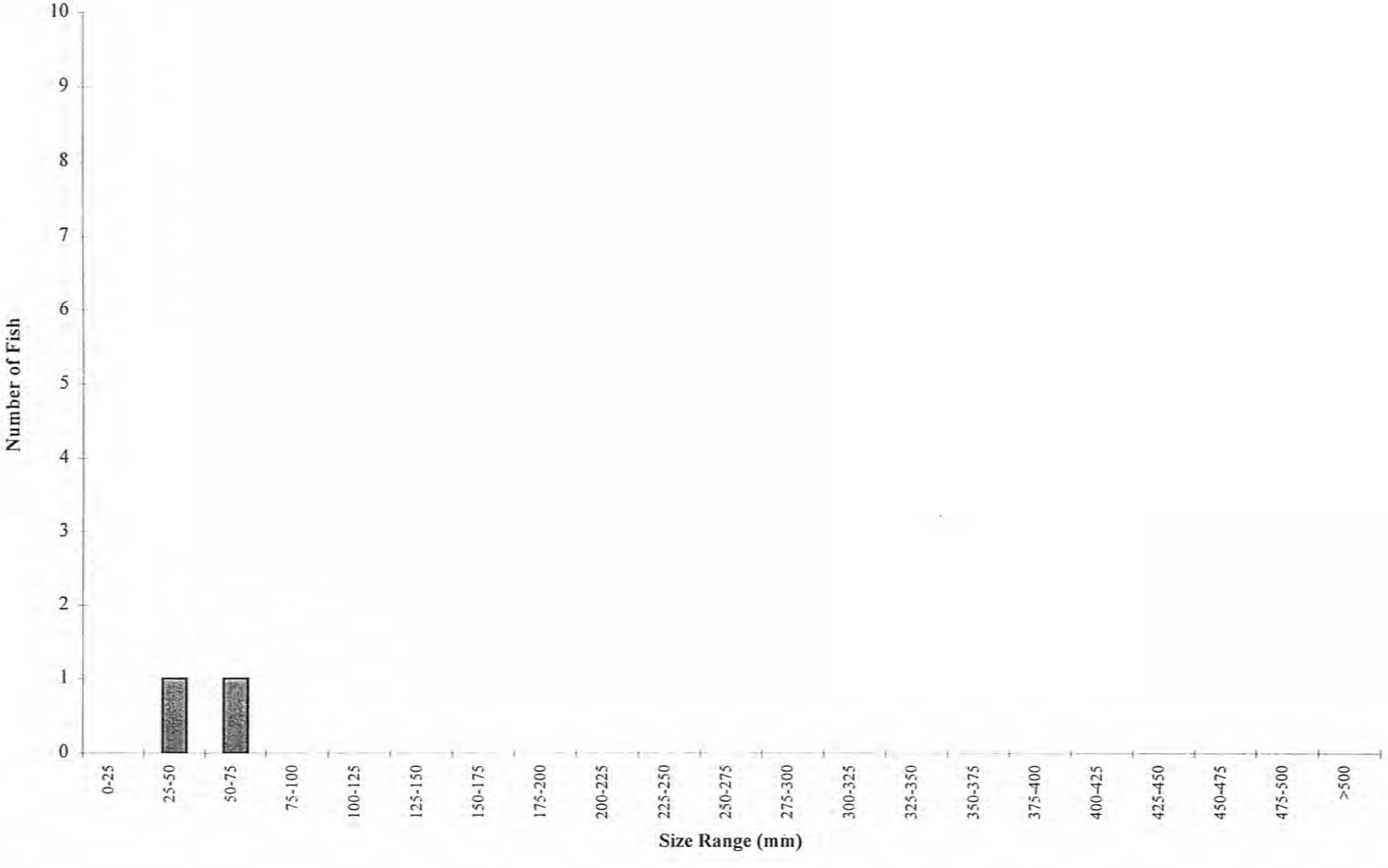
## Working Unit 4 - Rainbow Trout



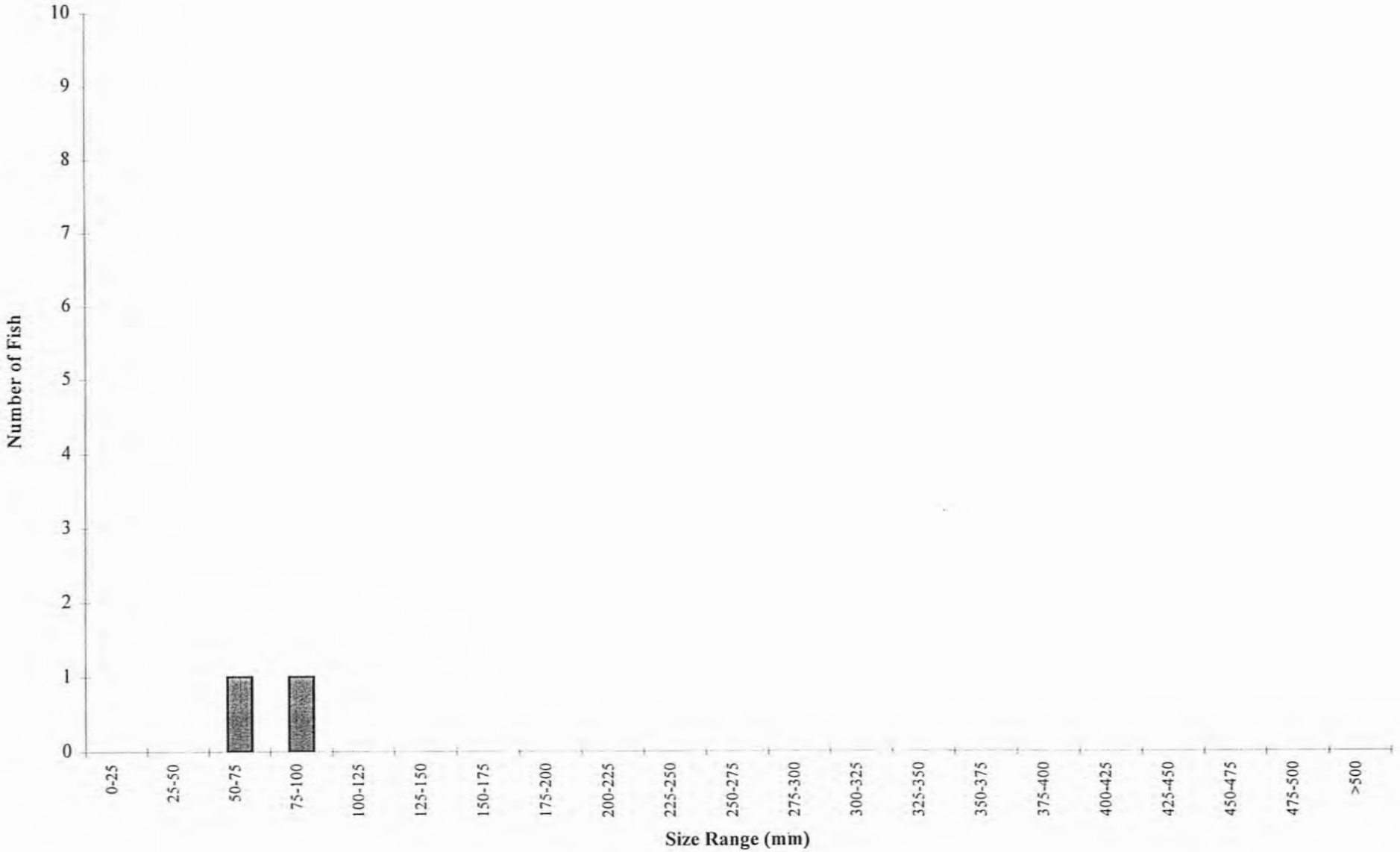
## Working Unit 4 - Dolly Varden



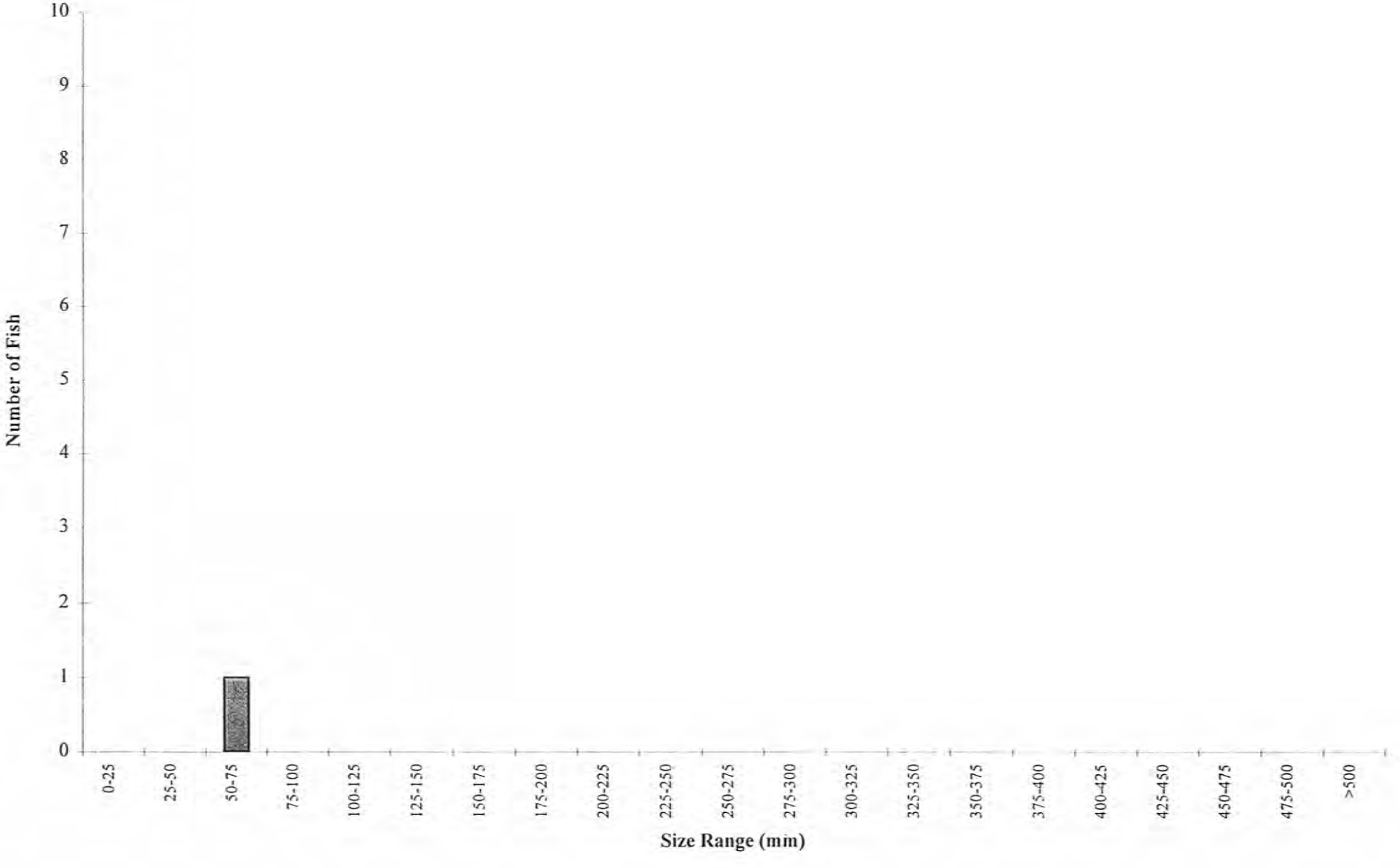
## Working Unit 4 - Chub Species



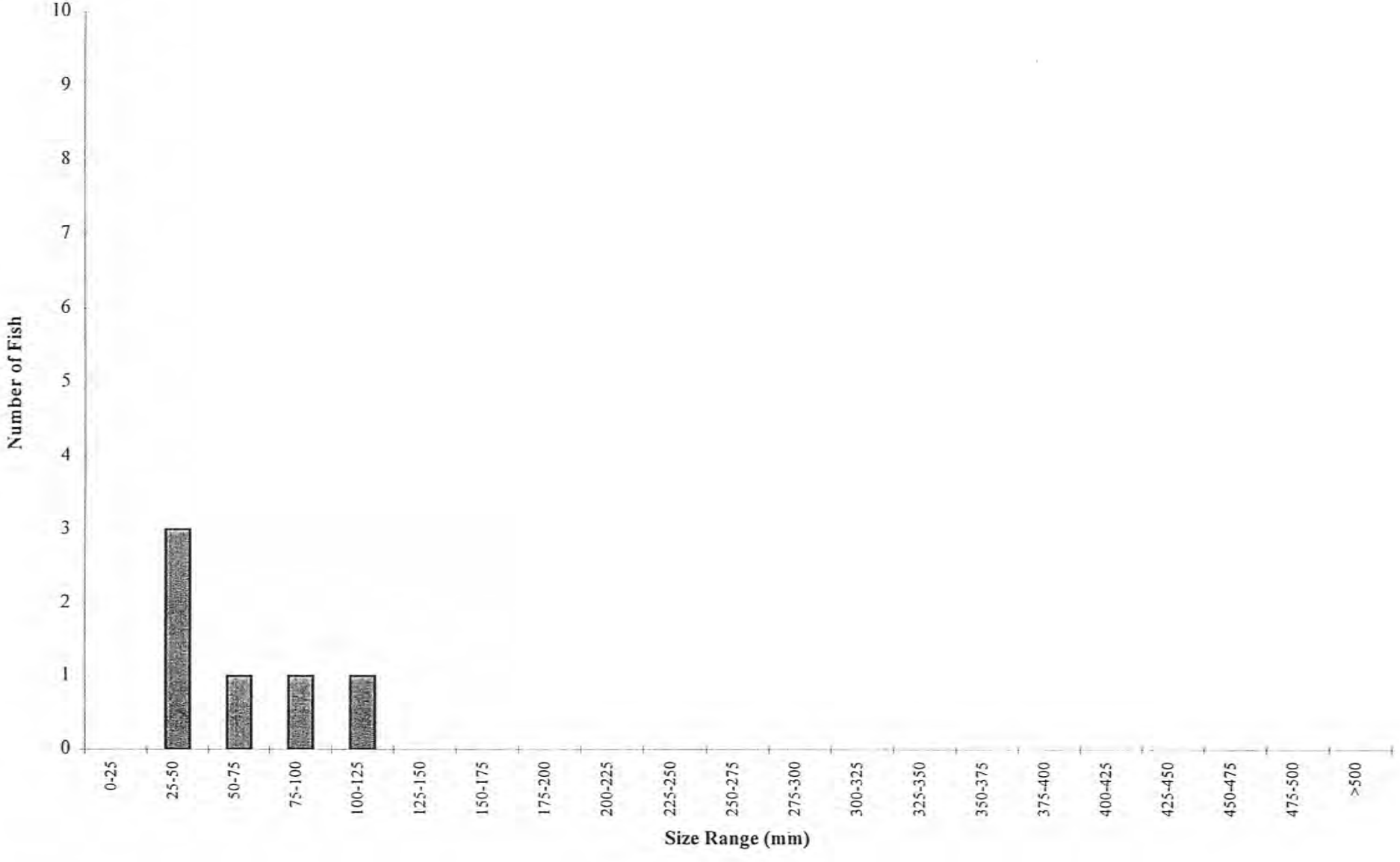
## Working Unit 4 - Coho



## Working Unit 4 - Northern Squawfish



## Working Unit 4 - Red Sided Shiner



## Working Unit 4 - Sucker

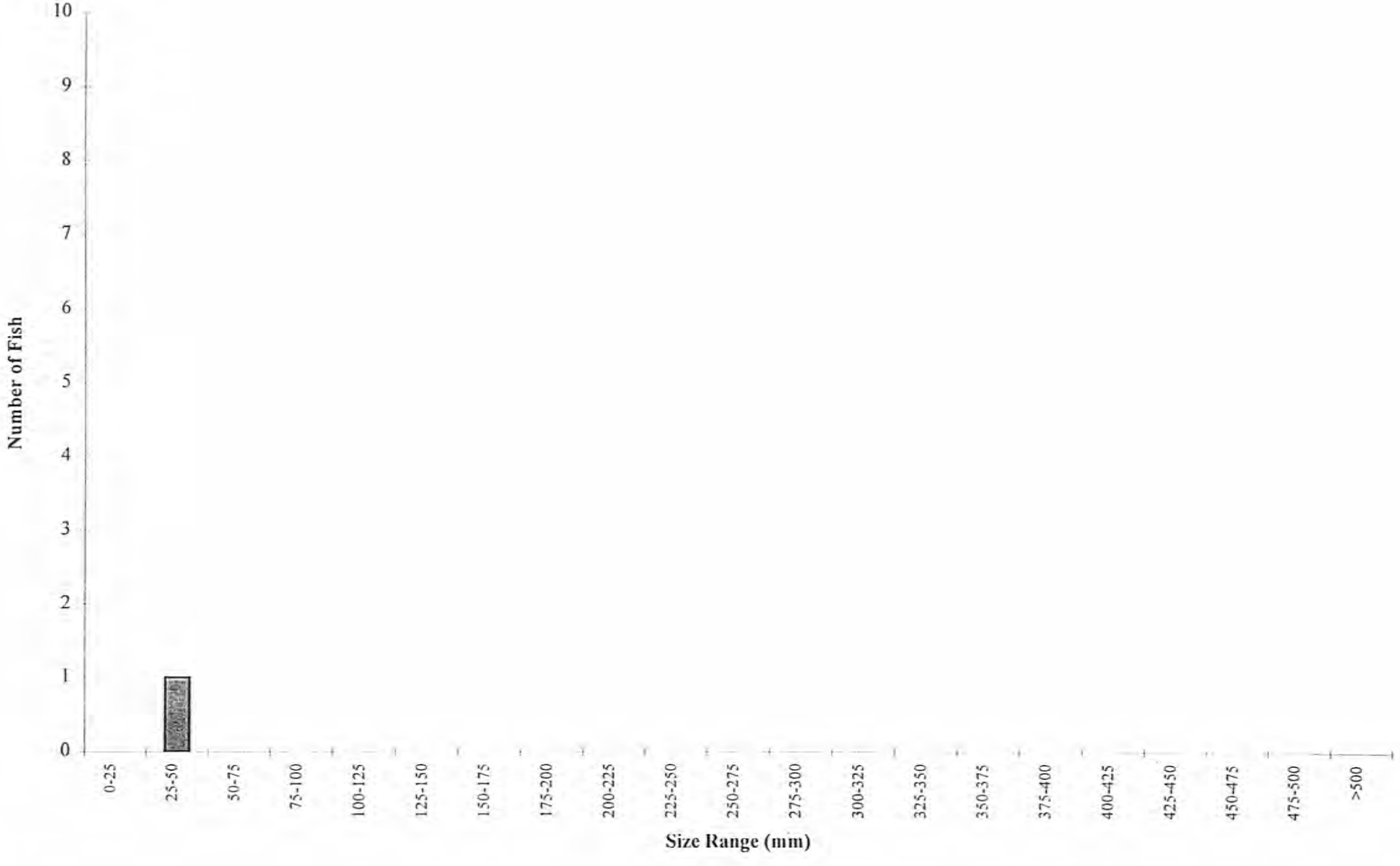


**Table 1. Riparian Management Areas and Stream Classification**

| | 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 4 in 1996 and 1997**

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | pH | Temp. (C) | Conductivity (umhos/cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| 011-5500-000-000-000 | Trib. to Acorn L. | JULIE 23, Unit 4 | 93 M 038 | 9 .6558 .61412 | 1 | 07/27/96 | TEC | | 19.00 | |
| 081-5500-000-000-000 | Trib. to Babine R. | HASLETT 7, Unit 4 | 93 M 047 | 9 .6448 .61445 | 1 | 07/27/96 | TEC | | 11.00 | |
| 010-8200-000-000-000 | Trib. to Babine R. | PETER 110, Unit 4 | 93 M 037 | 9 .6502 .61337 | 1 | 08/24/96 | TEC | | | |
| 480-3781-000-000-000 | Bairnsfather Cr. | HASLETT 4, Unit 4 | 93 M 047 | 9 .6447 .61427 | 1 | 07/26/96 | TEC | | 12.00 | |
| 480-3781-000-000-000 | Trib. to Bairnsfather Cr. | TERRY 18, Unit 4 | 93 M 037 | 9 .6425 .61414 | 2 | 07/27/96 | TEC | | 16.00 | |
| 480-3781-000-000-000 | Trib. to Bairnsfather Cr. | HASLETT 3, Unit 4 | 93 M 047 | 9 .6448 .61429 | 1 | 07/26/96 | TEC | | 17.00 | |
| 011-4900-000-000-000 | Trib. to Bairnsfather Cr. | Z57, Unit 4 | 93 M 047 | 9 .640061.614844 | 1 | 07/19/97 | TEC | 7.80 | 12.00 | 70.00 |
| 081-9900-000-000-000 | Trib. to Boucher Cr | JULIE 1, Unit 4 | 93 M 047 | 9 .6492 .61458 | 1 | 07/24/96 | TEC | | 13.00 | |
| 480-3782-000-000-000 | Boucher Cr. | JULIE 9, Unit 4 | 93 M 058 | 9 .6625 .61584 | 4 | 07/25/96 | TEC | 7.75 | 6.00 | 110.00 |
| 480-3782-000-000-000 | Boucher Cr. | JULIE 2, Unit 4 | 93 M 047 | 9 .6475 .61452 | 1 | 07/24/96 | TEC | | 15.00 | |
| 480-3782-000-000-000 | Boucher Cr. | JULIE 15, Unit 4 | 93 M 058 | 9 .6562 .61530 | 3 | 07/25/96 | TEC | | 10.50 | |
| 014-3600-000-000-000 | Trib to Boucher Cr. | E3, Unit 4 | 93 M 058 | 9 .6567 .61558 | 2 | 07/09/97 | TEC | 7.70 | 7.00 | 70.00 |
| 011-7700-000-000-000 | Trib. to Boucher Cr. | RYAN 12, Unit 4 | 93 M 048 | 9 . 6552 . 61450 | 1 | 07/25/96 | TEC | | 15.00 | |
| 011-7800-000-000-000 | Trib. to Boucher Cr. | RYAN 11, Unit 4 | 93 M 048 | 9 .6558 .61450 | 1 | 07/26/96 | TEC | | 14.00 | |
| 014-4600-000-000-000 | Trib. to Boucher Cr. | RYAN 2, Unit 4 | 93 M 058 | 9 .6592 .61586 | 2 | 07/25/96 | TEC | 7.50 | 6.00 | 229.00 |
| 011-7600-000-000-000 | Trib. to Boucher Cr. | RYAN 13, Unit 4 | 93 M 048 | 9 .6551 . 61444 | 1 | 07/25/96 | TEC | 7.69 | 8.00 | 120.00 |
| 011-8000-000-000-000 | Trib. to Boucher Cr. | RYAN 9, Unit 4 | 93 M 048 | 9 .6559 . 61460 | 1 | 07/24/96 | TEC | | 15.00 | |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | HASLETT 1, Unit 4 | 93 M 047 | 9 .6510 .61501 | 3 | 07/25/96 | TEC | | 15.00 | |
| 014-4700-000-000-000 | Trib. to Boucher Cr. | RYAN 7, Unit 4 | 93 M 058 | 9 .6603 .61604 | 1 | 07/25/96 | TEC | | 5.00 | |
| 014-4700-000-000-000 | Trib. to Boucher Cr. | RYAN 6, Unit 4 | 93 M 058 | 9 .6603 .61604 | 2 | 07/25/96 | TEC | | 7.00 | |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | E293, Unit 4 | 93 M 058 | 9 .6540 .61532 | 1 | 09/11/97 | TEC | 6.81 | 9.00 | 30.00 |
| 014-4900-000-000-000 | Trib. to Boucher Cr. | RYAN 5, Unit 4 | 93 M 058 | 9 .6596 .61597 | 1 | 07/25/96 | TEC | | 8.00 | |
| 470-3782-000-000-000 | Trib. to Boucher Cr. | RYAN 14, Unit 4 | 93 M 048 | 9 .6550 .61438 | 1 | 07/25/96 | TEC | 6.76 | 8.50 | 40.00 |
| 014-4700-000-000-000 | Trib. to Boucher Cr. | RYAN 3, Unit 4 | 93 M 058 | 9 .6597 .61588 | 1 | 07/25/96 | TEC | 7.88 | 5.00 | 120.00 |
| 002-0600-000-000-000 | Trib. to Boucher Cr. | RYAN 10, Unit 4 | 93 M 048 | 9 . 6560 . 61458 | 1 | 07/26/96 | TEC | | 13.00 | |
| 014-4000-000-000-000 | Trib. to Boucher Cr. | RYAN 1, Unit 4 | 93 M 058 | 9 .6579 .61579 | 3 | 07/25/96 | TEC | 7.50 | 7.00 | 136.00 |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | JULIE 6, Unit 4 | 93 M 058 | 9 .6627 .616078 | 2 | 07/25/96 | TEC | | 7.00 | |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | JULIE 5, Unit 4 | 93 M 058 | 9 .6272 .61625 | 4 | 07/25/96 | TEC | | 4.00 | |
| 014-5500-000-000-000 | Trib. to Boucher Cr. | JULIE 11, Unit 4 | 93 M 058 | 9 .6618 .61576 | 1 | 07/25/96 | TEC | | 6.00 | |
| 014-5700-000-000-000 | Trib. to Boucher Cr. | JULIE 10, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | | 6.00 | |
| 014-5800-000-000-000 | Trib. to Boucher Cr. | JULIE 8, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | | | |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | JULIE 7, Unit 4 | 93 M 058 | 9 .6625 .61606 | 2 | 07/25/96 | TEC | | 8.00 | |
| 081-9500-000-000-000 | Trib. to Boucher Cr. | JULIE 4, Unit 4 | 93 M 047 | 9 .6482 .61442 | 1 | 07/24/96 | TEC | | 11.50 | |
| 081-9400-000-000-000 | Trib. to Boucher Cr. | JULIE 3, Unit 4 | 93 M 047 | 9 .6483 .61434 | 1 | 07/24/96 | TEC | | 12.50 | |
| 014-4800-000-000-000 | Trib. to Boucher Cr. | RYAN 4, Unit 4 | 93 M 058 | 9 .6597 .61588 | 1 | 07/25/96 | TEC | | 8.00 | |
| 081-9700-000-000-000 | Trib. to Boucher Cr. | E254, Unit 4 | 93 M 047 | 9 .6486 .61458 | 1 | 09/05/97 | TEC | 6.84 | 9.00 | 90.00 |

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | pH | Temp. (C) | Conductivity (umhos/cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| 011-6500-000-000-000 | Trib. to Boucher Cr. | RYAN 16, Unit 4 | 93 M 048 | 9 . 6549 . 61491 | 1 | 07/27/96 | TEC | | 14.00 | |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | JULIE 21, Unit 4 | 93 M 048 | 9 .6537 .61501 | 1 | 07/27/96 | TEC | | 10.00 | |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | JULIE 20 , Unit 4 | 93 M 048 | 9 .6536 .61518 | 2 | 07/27/96 | TEC | 6.52 | 5.00 | 60.00 |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | RYAN 17, Unit 4 | 93 M 048 | 9 . 6523 . 61473 | 1 | 07/27/96 | TEC | | 15.00 | |
| 011-6700-000-000-000 | Trib. to Boucher Cr. | RYAN 18, Unit 4 | 93 M 048 | 9 .6522 .61476 | 1 | 07/27/96 | TEC | 6.01 | 7.50 | 30.00 |
| 011-7500-000-000-000 | Trib. to Boucher Cr. | RYAN 15, Unit 4 | 93 M 048 | 9 . 6547 . 61454 | 2 | 07/27/96 | TEC | | 14.00 | |
| 014-3900-000-000-000 | Trib. to Boucher Cr. | JULIE 13, Unit 4 | 93 M 058 | 9 .6568 .61564 | 2 | 07/26/96 | TEC | | 10.50 | |
| 011-6900-000-000-000 | Trib. to Boucher Cr. | RYAN 19, Unit 4 | 93 M 048 | 9 . 6523 . 61478 | 1 | 07/27/97 | TEC | 6.50 | 6.50 | 90.00 |
| 081-9800-000-000-000 | Trib. to Boucher Cr. | E255, Unit 4 | 93 M 047 | 9 .6477 .614590 | 1 | 09/05/97 | TEC | | | |
| 082-7500-000-000-000 | Trib. to Boucher Cr. | HASLETT 2, Unit 4 | 93 M 047 | 9 .6513 .61497 | 1 | 07/26/96 | TEC | | 16.00 | |
| 014-3500-000-000-000 | Trib. to Boucher Cr. | JULIE 18, Unit 4 | 93 M 058 | 9 .6572 .61549 | 1 | 07/26/96 | TEC | | 10.00 | |
| 014-3400-000-000-000 | Trib. to Boucher Cr. | JULIE 17, Unit 4 | 93 M 058 | 9 .6570 .61547 | 1 | 07/26/96 | TEC | | 14.00 | |
| 011-8300-000-000-000 | Trib. to Boucher Cr. | JULIE 16, Unit 4 | 93 M 048 | 9 .6562 .61530 | 1 | 07/26/96 | TEC | | 14.00 | |
| 011-8300-000-000-000 | Trib. to Boucher Cr. | JULIE 14, Unit 4 | 93 M 058 | 9 .6559 .61539 | 1 | 07/26/96 | TEC | 6.59 | 9.00 | 80.00 |
| 480-3782-000-000-000 | Boucher drainage | JULIE 22, Unit 4 | 93 M 048 | 9 . 6518 . 61528 | 5 | 07/27/96 | TEC | | 9.00 | |
| 480-0000-000-000-000 | Trib. to Clota L. | RYAN 20, Unit 4 | 93 M 048 | 9 . 6532 . 61422 | 4 | 07/27/96 | TEC | | 14.00 | |
| 480-0000-000-000-000 | Trib. to Clota L. | JULIE 26, Unit 4 | 93 M 038 | 9 .6524 .61408 | 4 | 07/27/96 | TEC | | 14.00 | |
| 011-2100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 4, Unit 4 | 93 M 037 | 9 .6475 .61387 | 1 | 07/25/96 | TEC | | 10.00 | |
| 081-4900-000-000-000 | Trib. to Nilkitkwa L | TERRY 1, Unit 4 | 93 M 037 | 9 .6464 .61412 | 2 | 07/24/96 | TEC | | 18.00 | |
| 011-4700-000-000-000 | Trib. to Nilkitkwa L. | TERRY 2, Unit 4 | 93 M 037 | 9 .6464 .61398 | 1 | 07/24/96 | TEC | | 11.00 | |
| 011-0200-000-000-000 | Trib. to Nilkitkwa L | TERRY 5, Unit 4 | 93 M 037 | 9 .6484 .61359 | 1 | 07/25/96 | TEC | | 14.00 | |
| 011-1400-000-000-000 | Trib. to Nilkitkwa L. | JULIE 163, Unit 4 | 93 M 037 | 9 .6506 .61385 | 1 | 08/24/96 | TEC | | | |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 169, Unit 4 | 93 M 037 | 9 .6491 . 61411 | 1 | 08/24/96 | TEC | | | |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 168, Unit 4 | 93 M 037 | 9 .6488 .61402 | 1 | 08/24/96 | TEC | | | |
| 011-2100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 12, Unit 4 | 93 M 037 | 9 .6424 .61370 | 2 | 07/27/96 | TEC | | 10.00 | |
| 011-1400-000-000-000 | Trib. to Nilkitkwa L. | JULIE 165, Unit 4 | 93 M 037 | 9 .6511 .61396 | 2 | 08/24/96 | TEC | | | |
| 011-0000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 7, Unit 4 | 93 M 037 | 9 .6481 .61348 | 2 | 07/25/96 | TEC | | 12.00 | |
| 011-1600-000-000-000 | Trib. to Nilkitkwa L. | JULIE 164, Unit 4 | 93 M 037 | 9 .6513 .61392 | 1 | 08/24/96 | TEC | | | |
| 011-1500-000-000-000 | Trib. to Nilkitkwa L. | JULIE 162, Unit 4 | 93 M 037 | 9 .6501 .61374 | 2 | 08/24/96 | TEC | | | |
| 011-1400-000-000-000 | Trib. to Nilkitkwa L. | JULIE 161, Unit 4 | 93 M 037 | 9 .6497 .61363 | 1 | 08/24/96 | TEC | | 14.00 | |
| 011-1300-000-000-000 | Trib. to Nilkitkwa L. | JULIE 158 , Unit 4 | 93 M 037 | 9 .6498 . 61363 | 1 | 08/24/96 | TEC | | 9.00 | |
| 011-1200-000-000-000 | Trib. to Nilkitkwa L. | JULIE 157, Unit 4 | 93 M 037 | 9 .6501 .61358 | 1 | 08/24/96 | TEC | | | |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 167, Unit 4 | 93 M 037 | 9 .6488 .61393 | 1 | 08/24/96 | TEC | | | |
| 010-8300-000-000-000 | Trib. to Nilkitkwa L. | JULIE 156, Unit 4 | 93 M 037 | 9 .6500 .61530 | 1 | 08/24/96 | TEC | | | |
| 011-2900-000-000-000 | Trib. to Nilkitkwa L. | TERRY 15, Unit 4 | 93 M 037 | 9 .6432 .61385 | 1 | 07/27/96 | TEC | | 10.50 | |
| 011-0200-000-000-000 | Trib. to Nilkitkwa L. | TERRY 8, Unit 4 | 93 M 037 | 9 .6486 .61345 | 4 | 07/25/96 | TEC | | 13.00 | |
| 011-0100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 6, Unit 4 | 93 M 037 | 9 .6484 .61359 | 2 | 07/25/96 | TEC | | 12.00 | |
| 011-2400-000-000-000 | Trib. to Nilkitkwa L. | TERRY 11, Unit 4 | 93 M 037 | 9 . 6435 . 61363 | 2 | 07/26/96 | TEC | | 10.50 | |
| 011-1500-000-000-000 | Trib. to Nilkitkwa L. | JULIE 25, Unit 4 | 93 M 038 | 9 .6531 .61388 | 2 | 07/27/96 | TEC | | 20.00 | |
| 011-3000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 27, Unit 4 | 93 M 038 | 9 .6523 . 61537 | 2 | 07/27/96 | TEC | | 20.00 | |

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | pH | Temp. (C) | Conductivity (umhos/cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 10, Unit 4 | 93 M 037 | 9 . 6436 . 61355 | 1 | 07/26/96 | TEC | | 14.00 | |
| 011-2000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 166, Unit 4 | 93 M 037 | 9 .6495 .61379 | 1 | 08/24/96 | TEC | | | |
| 011-4100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 13, Unit 4 | 93 M 037 | 9 . 6424 . 61371 | 2 | 07/27/96 | TEC | 7.17 | 9.50 | |
| 011-3500-000-000-000 | Trib. to Nilkitkwa R. | TERRY 14, Unit 4 | 93 M 037 | 9 .6428 .61376 | 1 | 07/27/96 | TEC | | 11.00 | |
| 011-1500-000-000-000 | Trib. to Nilkitkwa R. | JULIE 24, Unit 4 | 93 M 038 | 9 .6538 .61395 | 6 | 07/27/96 | TEC | | 16.00 | |

**Table3. Summary of Barriers Identified in Working Unit 4 in 1996**

| Watershed Code | Stream "Local" | Location | TRIM Number | Site UTM | Reach Number | Survey Date | Agency | Height (m) | Type | Location (km from the mouth) |
|---|---|---|---|---|---|---|---|---|---|---|
| 014-5700-000-000-000- | Trib. to Boucher Cr. | JULIE 10, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | 1.00 | C | 0.30 |
| 014-5500-000-000-000- | Trib. to Boucher Cr. | JULIE 11, Unit 4 | 93 M 058 | 9 .6618 .61576 | 1 | 07/25/96 | TEC | 1.00 | C | 0.80 |
| 014-3400-000-000-000- | Trib. to Boucher Cr. | JULIE 17, Unit 4 | 93 M 058 | 9 .6570 .61547 | 1 | 07/26/96 | TEC | 2.00 | C | 0.03 |
| 480-3782-0000-000-000 | Trib. to Boucher Cr. | JULIE 7, Unit 4 | 93 M 058 | 9 .6625 .61606 | 2 | 07/25/96 | TEC | 8.00 | F | 2.00 |
| 014-4000-000-000-000- | Trib. to Boucher Cr. | RYAN 1, Unit 4 | 93 M 058 | 9 .6579 .61579 | 3 | 07/25/96 | TEC | 3.00 | C | 0.97 |
| 014-4600-000-000-000- | Trib. to Boucher Cr. | RYAN 2, Unit 4 | 93 M 058 | 9 .6592 .61586 | 2 | 07/25/96 | TEC | 1.00 | C | 0.70 |
| 014-4600-000-000-000- | Trib. to Boucher Cr. | RYAN 2, Unit 4 | 93 M 058 | 9 .6592 .61586 | 2 | 07/25/96 | TEC | 1.00 | F | 0.70 |
| 014-4900-000-000-000- | Trib. to Boucher Cr. | RYAN 5, Unit 4 | 93 M 058 | 9 .6596 .61597 | 1 | 07/25/96 | TEC | 2.00 | F | 1.16 |
| 014-4700-000-000-000- | Trib. to Boucher Cr. | RYAN 6, Unit 4 | 93 M 058 | 9 .6603 .61604 | 2 | 07/25/96 | TEC | 2.00 | F | 1.16 |
| 011-1400-000-000-000- | Trib. to Nilkitkwa L. | JULIE 163, Unit 4 | 93 M 037 | 9 .6506 .61385 | 1 | 08/24/96 | TEC | 2.00 | BD | 2.10 |
| 011-1600-000-000-000- | Trib. to Nilkitkwa L. | JULIE 164, Unit 4 | 93 M 037 | 9 .6513 .61392 | 1 | 08/24/96 | TEC | 2.00 | BD | 0.40 |
| 011-1600-000-000-000- | Trib. to Nilkitkwa L. | JULIE 164, Unit 4 | 93 M 037 | 9 .6513 .61392 | 1 | 08/24/96 | TEC | 1.00 | BD | 3.00 |
| 011-1400-000-000-000- | Trib. to Nilkitkwa L. | JULIE 165, Unit 4 | 93 M 037 | 9 .6511 .61396 | 2 | 08/24/96 | TEC | 1.00 | BD | 3.00 |

**Table 4. Summary of Site Data Collected in Working Unit 4 in 1996 and 1997**

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | Average Channel Width (m) | Gradient (%) | Fish Species | Proposed Stream Class | Fishing Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 011-5500-000-000-000 | Trib. to Acorn L. | JULIE 23, Unit 4 | 93 M 038 | 9 .6558 .61412 | 1 | 07/27/96 | TEC | 3.92 | 0.00 | RB, RSC | S3 | EL |
| 081-5500-000-000-000 | Trib. to Babine R. | HASLETT 7, Unit 4 | 93 M 047 | 9 .6448 .61445 | 1 | 07/27/96 | TEC | 1.33 | 2.50 | RB | S4 | VO |
| 010-8200-000-000-000 | Trib. to Babine R. | PETER 110, Unit 4 | 93 M 037 | 9 .6502 .61337 | 1 | 08/24/96 | TEC | 0.73 | 8.00 | (RB) | S4 | NA |
| 480-3781-000-000-000 | Bairnsfather Cr. | HASLETT 4, Unit 4 | 93 M 047 | 9 .6447 .61427 | 1 | 07/26/96 | TEC | 3.02 | 1.00 | RB | S3 | VO |
| 480-3781-000-000-000 | Trib. to Bairnsfather Cr. | HASLETT 3, Unit 4 | 93 M 047 | 9 .6448 .61429 | 1 | 07/26/96 | TEC | 2.12 | 0.50 | RB | S3 | VO |
| 480-3781-000-000-000 | Trib. to Bairnsfather Cr. | TERRY 18, Unit 4 | 93 M 037 | 9 .6425 .61414 | 2 | 07/27/96 | TEC | 1.84 | 1.00 | DV RB | S3 | EL |
| 011-4900-000-000-000 | Trib. to Bairnsfather Cr. | Z57, Unit 4 | 93 M 047 | 9 .640061.614844 | 1 | 07/19/97 | TEC | 1.87 | 0.50 | (RB) | S3 | EL |
| 480-3782-000-000-000 | Boucher Cr. | JULIE 15, Unit 4 | 93 M 058 | 9 .6562 .61530 | 3 | 07/25/96 | TEC | 14.32 | 3.00 | DV | S2 | EL |
| 480-3782-000-000-000 | Boucher Cr. | JULIE 2, Unit 4 | 93 M 047 | 9 .6475 .61452 | 1 | 07/24/96 | TEC | 7.88 | 1.00 | (RB) (DV) | S2 | EL |
| 480-3782-000-000-000 | Boucher Cr. | JULIE 9, Unit 4 | 93 M 058 | 9 .6625 .61584 | 4 | 07/25/96 | TEC | 3.15 | 4.00 | DV | S3 | EL |
| 081-9700-000-000-000 | Trib. to Boucher Cr. | E254, Unit 4 | 93 M 047 | 9 .6486 .61458 | 1 | 09/05/97 | TEC | 0.82 | 4.00 | (RB) (DV) | S4 | EL |
| 081-9800-000-000-000 | Trib. to Boucher Cr. | E255, Unit 4 | 93 M 047 | 9 .6477 .614590 | 1 | 09/05/97 | TEC | 0.89 | 2.00 | (RB) (DV) | S4 | NA |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | E293, Unit 4 | 93 M 058 | 9 .6540 .61532 | 1 | 09/11/97 | TEC | 1.35 | 5.00 | DV | S4 | EL |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | HASLETT 1, Unit 4 | 93 M 047 | 9 .6510 .61501 | 3 | 07/25/96 | TEC | 3.40 | 0.00 | (RB) | S3 | VO |
| 082-7500-000-000-000 | Trib. to Boucher Cr. | HASLETT 2, Unit 4 | 93 M 047 | 9 .6513 .61497 | 1 | 07/26/96 | TEC | 0.78 | 0.00 | CBC | S4 | VO |
| 081-9900-000-000-000 | Trib. to Boucher Cr. | JULIE 1, Unit 4 | 93 M 047 | 9 .6492 .61458 | 1 | 07/24/96 | TEC | 1.44 | 3.00 | RB | S3 | EL |
| 014-5700-000-000-000 | Trib. to Boucher Cr. | JULIE 10, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | 2.68 | 19.00 | (DV) | S3 | VO |
| 014-5500-000-000-000 | Trib. to Boucher Cr. | JULIE 11, Unit 4 | 93 M 058 | 9 .6618 .61576 | 1 | 07/25/96 | TEC | 3.40 | 10.00 | (DV) | S3 | NA |
| 014-3900-000-000-000 | Trib. to Boucher Cr. | JULIE 13, Unit 4 | 93 M 058 | 9 .6568 .61564 | 2 | 07/26/96 | TEC | 1.45 | 4.00 | DV | S3 | EL |
| 011-8300-000-000-000 | Trib. to Boucher Cr. | JULIE 14, Unit 4 | 93 M 058 | 9 .6559 .61539 | 1 | 07/26/96 | TEC | 1.66 | 0.00 | NF | S3 | EL |
| 011-8300-000-000-000 | Trib. to Boucher Cr. | JULIE 16, Unit 4 | 93 M 048 | 9 .6562 .61530 | 1 | 07/26/96 | TEC | 3.27 | 2.00 | DV | S3 | EL |
| 014-3400-000-000-000 | Trib. to Boucher Cr. | JULIE 17, Unit 4 | 93 M 058 | 9 .6570 .61547 | 1 | 07/26/96 | TEC | 2.65 | 21.00 | NF | S6 | VO |
| 014-3500-000-000-000 | Trib. to Boucher Cr. | JULIE 18, Unit 4 | 93 M 058 | 9 .6572 .61549 | 1 | 07/26/96 | TEC | 2.16 | 1.00 | DV | S3 | EL |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | JULIE 20 , Unit 4 | 93 M 048 | 9 .6536 .61518 | 2 | 07/27/96 | TEC | 1.50 | 0.00 | (DV) | S3 | MT |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | JULIE 21, Unit 4 | 93 M 048 | 9 .6537 .61501 | 1 | 07/27/96 | TEC | 1.50 | 1.00 | RB RSC | S3 | MT |
| 081-9400-000-000-000 | Trib. to Boucher Cr. | JULIE 3, Unit 4 | 93 M 047 | 9 .6483 .61434 | 1 | 07/24/96 | TEC | 1.48 | 3.00 | (RB) | S3 | NA |
| 081-9500-000-000-000 | Trib. to Boucher Cr. | JULIE 4, Unit 4 | 93 M 047 | 9 .6482 .61442 | 1 | 07/24/96 | TEC | 1.01 | 3.00 | (RB) | S4 | NA |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | JULIE 5, Unit 4 | 93 M 058 | 9 .6272 .61625 | 4 | 07/25/96 | TEC | 3.62 | 5.00 | NF | S5 | EL |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | JULIE 6, Unit 4 | 93 M 058 | 9 .6627 .616078 | 2 | 07/25/96 | TEC | 4.08 | 9.00 | NF | S5 | EL |
| 480-3782-000-000-000 | Trib. to Boucher Cr. | JULIE 7, Unit 4 | 93 M 058 | 9 .6625 .61606 | 2 | 07/25/96 | TEC | 3.30 | 6.00 | NF | S5 | EL |
| 014-5800-000-000-000 | Trib. to Boucher Cr. | JULIE 8, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | 2.27 | 11.00 | NF | S6 | VO |
| 014-4000-000-000-000 | Trib. to Boucher Cr. | RYAN 1, Unit 4 | 93 M 058 | 9 .6579 .61579 | 3 | 07/25/96 | TEC | 0.87 | 1.00 | NF | S6 | EL |
| 002-0600-000-000-000 | Trib. to Boucher Cr. | RYAN 10, Unit 4 | 93 M 048 | 9 . 6560 . 61458 | 1 | 07/26/96 | TEC | 2.18 | 1.00 | RB | S3 | VO |
| 011-7800-000-000-000 | Trib. to Boucher Cr. | RYAN 11, Unit 4 | 93 M 048 | 9 .6558 .61450 | 1 | 07/26/96 | TEC | 4.18 | 1.00 | (RB) | S3 | EL |
| 011-7700-000-000-000 | Trib. to Boucher Cr. | RYAN 12, Unit 4 | 93 M 048 | 9 . 6552 . 61450 | 1 | 07/25/96 | TEC | 0.82 | 1.00 | RB | S4 | EL |

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | Average Channel Width (m) | Gradient (%) | Fish Species | Proposed Stream Class | Fishing Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 011-7600-000-000-000 | Trib. to Boucher Cr. | RYAN 13, Unit 4 | 93 M 048 | 9 .6551 . 61444 | 1 | 07/25/96 | TEC | 1.38 | 1.00 | RB | S4 | VO |
| 470-3782-000-000-000 | Trib. to Boucher Cr. | RYAN 14, Unit 4 | 93 M 048 | 9 .6550 .61438 | 1 | 07/25/96 | TEC | 2.00 | 1.00 | (RB) | S3 | VO |
| 011-7500-000-000-000 | Trib. to Boucher Cr. | RYAN 15, Unit 4 | 93 M 048 | 9 . 6547 . 61454 | 2 | 07/27/96 | TEC | 0.80 | 0.00 | (DV) | S4 | NA |
| 011-6500-000-000-000 | Trib. to Boucher Cr. | RYAN 16, Unit 4 | 93 M 048 | 9 . 6549 . 61491 | 1 | 07/27/96 | TEC | 4.50 | 2.00 | RB | S3 | VO |
| 011-6400-000-000-000 | Trib. to Boucher Cr. | RYAN 17, Unit 4 | 93 M 048 | 9 . 6523 . 61473 | 1 | 07/27/96 | TEC | 3.00 | 1.00 | (RB) | S3 | AG |
| 011-6700-000-000-000 | Trib. to Boucher Cr. | RYAN 18, Unit 4 | 93 M 048 | 9 .6522 .61476 | 1 | 07/27/96 | TEC | 4.00 | 1.00 | (RB) | S3 | VO |
| 011-6900-000-000-000 | Trib. to Boucher Cr. | RYAN 19, Unit 4 | 93 M 048 | 9 . 6523 . 61478 | 1 | 07/27/97 | TEC | 1.50 | 1.00 | (RB) | S3 | EL |
| 014-4600-000-000-000 | Trib. to Boucher Cr. | RYAN 2, Unit 4 | 93 M 058 | 9 .6592 .61586 | 2 | 07/25/96 | TEC | 1.26 | 15.00 | (DV) | S4 | EL |
| 014-4700-000-000-000 | Trib. to Boucher Cr. | RYAN 3, Unit 4 | 93 M 058 | 9 .6597 .61588 | 1 | 07/25/96 | TEC | 3.62 | 13.00 | DV | S3 | EL |
| 014-4800-000-000-000 | Trib. to Boucher Cr. | RYAN 4, Unit 4 | 93 M 058 | 9 .6597 .61588 | 1 | 07/25/96 | TEC | 2.73 | 12.00 | DV | S3 | EL |
| 014-4900-000-000-000 | Trib. to Boucher Cr. | RYAN 5, Unit 4 | 93 M 058 | 9 .6596 .61597 | 1 | 07/25/96 | TEC | 1.88 | 5.00 | NF | S6 | EL |
| 014-4700-000-000-000 | Trib. to Boucher Cr. | RYAN 6, Unit 4 | 93 M 058 | 9 .6603 .61604 | 2 | 07/25/96 | TEC | 1.82 | 4.00 | NF | S6 | EL |
| 014-4700-000-000-000 | Trib. to Boucher Cr. | RYAN 7, Unit 4 | 93 M 058 | 9 .6603 .61604 | 1 | 07/25/96 | TEC | 1.62 | 9.00 | NF | S6 | EL |
| 011-8000-000-000-000 | Trib. to Boucher Cr. | RYAN 9, Unit 4 | 93 M 048 | 9 .6559 . 61460 | 1 | 07/24/96 | TEC | 1.33 | 1.00 | SU | S4 | EL |
| 014-3600-000-000-000 | Trib. to Boucher Cr. | E3, Unit 4 | 93 M 058 | 9 .6567 .61558 | 2 | 07/09/97 | TEC | 0.76 | 12.00 | (RB) | S4 | EL |
| 480-3782-000-000-000 | Boucher drainage | JULIE 22, Unit 4 | 93 M 048 | 9 . 6518 . 61528 | 5 | 07/27/96 | TEC | 1.50 | 0.00 | RSC NSC | S3 | MT |
| 480-0000-000-000-000 | Trib. to Clota L. | JULIE 26, Unit 4 | 93 M 038 | 9 .6524 .61408 | 4 | 07/27/96 | TEC | 2.06 | 3.00 | RB | S3 | EL |
| 480-0000-000-000-000 | Trib. to Clota L. | RYAN 20, Unit 4 | 93 M 048 | 9 . 6532 . 61422 | 4 | 07/27/96 | TEC | 1.13 | 3.00 | (DV) | S4 | NA |
| 011-4700-000-000-000 | Trib. to Nilkiltkwa L. | TERRY 2, Unit 4 | 93 M 037 | 9 .6464 .61398 | 1 | 07/24/96 | TEC | 1.17 | 2.00 | (DV) | S4 | EL, MT |
| 011-2100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 4, Unit 4 | 93 M 037 | 9 .6475 .61387 | 1 | 07/25/96 | TEC | 6.88 | 10.00 | DV | S2 | EL |
| 010-8300-000-000-000 | Trib. to Nilkitkwa L. | JULIE 156, Unit 4 | 93 M 037 | 9 .6500 .61530 | 1 | 08/24/96 | TEC | 1.00 | 10.00 | (RB DV) | S4 | NA |
| 011-1200-000-000-000 | Trib. to Nilkitkwa L. | JULIE 157, Unit 4 | 93 M 037 | 9 .6501 .61358 | 1 | 08/24/96 | TEC | 1.00 | 4.00 | NF | S6 | NA |
| 011-1300-000-000-000 | Trib. to Nilkitkwa L. | JULIE 158 , Unit 4 | 93 M 037 | 9 .6498 . 61363 | 1 | 08/24/96 | TEC | 3.93 | 4.00 | RB | S3 | EL |
| 011-1400-000-000-000 | Trib. to Nilkitkwa L. | JULIE 161, Unit 4 | 93 M 037 | 9 .6497 .61363 | 1 | 08/24/96 | TEC | 4.00 | 1.00 | (RB) | S3 | NA |
| 011-1500-000-000-000 | Trib. to Nilkitkwa L. | JULIE 162, Unit 4 | 93 M 037 | 9 .6501 .61374 | 2 | 08/24/96 | TEC | 4.00 | 4.00 | (RB) | S3 | NA |
| 011-1400-000-000-000 | Trib. to Nilkitkwa L. | JULIE 163, Unit 4 | 93 M 037 | 9 .6506 .61385 | 1 | 08/24/96 | TEC | 4.00 | 4.00 | (RB) | S3 | VO |
| 011-1600-000-000-000 | Trib. to Nilkitkwa L. | JULIE 164, Unit 4 | 93 M 037 | 9 .6513 .61392 | 1 | 08/24/96 | TEC | 1.50 | 2.00 | (RB) | S3 | VO |
| 011-1400-000-000-000 | Trib. to Nilkitkwa L. | JULIE 165, Unit 4 | 93 M 037 | 9 .6511 .61396 | 2 | 08/24/96 | TEC | 3.00 | 3.00 | (RB) | S3 | VO |
| 011-2000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 166, Unit 4 | 93 M 037 | 9 .6495 .61379 | 1 | 08/24/96 | TEC | 1.50 | 4.00 | (RB) | S3 | VO |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 167, Unit 4 | 93 M 037 | 9 .6488 .61393 | 1 | 08/24/96 | TEC | 1.50 | 5.00 | (RB) | S3 | NA |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 168, Unit 4 | 93 M 037 | 9 .6488 .61402 | 1 | 08/24/96 | TEC | 1.50 | 6.00 | NF | S6 | EL |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 169, Unit 4 | 93 M 037 | 9 .6491 . 61411 | 1 | 08/24/96 | TEC | 1.50 | 4.00 | (RB) | S3 | VO |
| 011-1500-000-000-000 | Trib. to Nilkitkwa L. | JULIE 25, Unit 4 | 93 M 038 | 9 .6531 .61388 | 2 | 07/27/96 | TEC | 1.74 | 1.50 | RB RSC | S3 | EL MT |
| 011-3000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 27, Unit 4 | 93 M 038 | 9 .6523 . 61537 | 2 | 07/27/96 | TEC | 3.00 | 0.00 | (RB) | S3 | EL |
| 081-4900-000-000-000 | Trib. to Nilkitkwa L. | TERRY 1, Unit 4 | 93 M 037 | 9 .6464 .61412 | 2 | 07/24/96 | TEC | 2.77 | 2.00 | NF | S6 | EL |
| 480-0000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 10, Unit 4 | 93 M 037 | 9 . 6436 . 61355 | 1 | 07/26/96 | TEC | 1.47 | 1.00 | (DV) | S3 | EL |
| 011-2400-000-000-000 | Trib. to Nilkitkwa L. | TERRY 11, Unit 4 | 93 M 037 | 9 . 6435 . 61363 | 2 | 07/26/96 | TEC | 4.09 | 8.00 | DV | S3 | EL |
| 011-2100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 12, Unit 4 | 93 M 037 | 9 .6424 .61370 | 2 | 07/27/96 | TEC | 5.28 | 14.00 | DV | S2 | EL |
| 011-2900-000-000-000 | Trib. to Nilkitkwa L. | TERRY 15, Unit 4 | 93 M 037 | 9 .6432 .61385 | 1 | 07/27/96 | TEC | 3.06 | 3.00 | DV | S3 | EL |

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | Average Channel Width (m) | Gradient (%) | Fish Species | Proposed Stream Class | Fishing Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 011-0100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 6, Unit 4 | 93 M 037 | 9 .6484 .61359 | 2 | 07/25/96 | TEC | 2.44 | 1.00 | NF | S6 | EL |
| 011-0000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 7, Unit 4 | 93 M 037 | 9 .6481 .61348 | 2 | 07/25/96 | TEC | 2.00 | 1.00 | NF | S6 | NA |
| 011-0200-000-000-000 | Trib. to Nilkitkwa L. | TERRY 8, Unit 4 | 93 M 037 | 9 .6486 .61345 | 4 | 07/25/96 | TEC | 4.08 | 10.00 | (DV) | S3 | EL |
| 011-0200-000-000-000 | Trib. to Nilkitkwa L. | TERRY 5, Unit 4 | 93 M 037 | 9 .6484 .61359 | 1 | 07/25/96 | TEC | 4.58 | 2.00 | RB CO | S3 | EL |
| 011-4100-000-000-000 | Trib. to Nilkitkwa L. | TERRY 13, Unit 4 | 93 M 037 | 9 . 6424 . 61371 | 2 | 07/27/96 | TEC | 1.96 | 7.00 | DV | S3 | EL |
| 011-1500-000-000-000 | Trib. to Nilkitkwa R. | JULIE 24, Unit 4 | 93 M 038 | 9 .6538 .61395 | 6 | 07/27/96 | TEC | 3.40 | 0.50 | RB, RSC | S3 | VO |
| 011-3500-000-000-000 | Trib. to Nilkitkwa R. | TERRY 14, Unit 4 | 93 M 037 | 9 .6428 .61376 | 1 | 07/27/96 | TEC | 2.70 | 13.00 | DV | S3 | EL |
| 002-5600-000-000-000 | Not a creek | E256, Unit 4 | 93 M 047 | 9 .6506 .61447 | 0 | 09/05/97 | TEC | 0.00 | 2.00 | NF | NC | NA |
| 082-0200-000-000-000 | Not a creek | E257, Unit 4 | 93 M 047 | 9 .6509 .6145112 | 0 | 09/05/97 | TEC | 0.00 | 1.00 | NF | NC | NA |
| 014-5400-000-000-000 | Not a creek | JULIE 12, Unit 4 | 93 M 058 | 9 .6610 .61586 | 0 | 07/26/96 | TEC | 0.00 | 1.00 | NF | NC | EL |
| 480-0000-000-000-000 | Not a creek | JULIE 159, Unit 4 | 93 M 037 | 9 .6502 .61365 | 0 | 08/24/96 | TEC | 0.00 | 0.50 | NF | NC | EL |
| 000-0000-000-000-000 | Not a creek | JULIE 160, Unit 4 | 93 M 037 | 9 .6502 .61364 | 1 | 08/24/96 | TEC | 0.00 | 2.00 | NF | NC | NA |
| 072-8800-000-000-000 | Not a creek | JULIE 19, Unit 4 | 93 M 048 | 9 . 6544 . 61528 | 0 | 07/27/96 | TEC | 0.00 | 0.00 | NF | NC | NA |
| 011-8000-000-000-000 | Not a creek | RYAN 8, Unit 4 | 93 M 048 | 9 . 6560 . 61470 | 0 | 07/26/96 | TEC | 0.00 | 1.50 | NF | NC | NA |
| 480-0000-000-000-000 | Not a creek | TERRY 16, Unit 4 | 93 M 037 | 9 .6451 .61387 | 0 | 07/27/96 | TEC | 0.00 | 0.00 | NF | NC | EL |
| 480-0000-000-000-000 | Not a creek | TERRY 17, Unit 4 | 93 M 037 | 9 .6428 .61415 | 0 | 07/27/96 | TEC | 0.00 | 0.00 | NF | NC | NA |
| 480-0000-000-000-000 | Not a creek | TERRY 3, Unit 4 | 93 M 037 | 9 .6459 .61419 | 0 | 07/25/96 | TEC | 0.00 | 0.00 | NF | NC | NA |

**Table 5. Summary of Sites Classified as Non Fish Bearing in Working Unit 4 and 1996 and 1997**

| Watershed Code | Stream "Local" | Location | TRIM Number | UTM | Reach Number | Survey Date | Agency | Proposed Stream Class | Fishing Effort | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|
| 014-3400-000-000-000-000-000-000-000-000-000- | Trib. to Boucher Cr. | JULIE 17, Unit 4 | 93 M 058 | 9 .6570 .61547 | 1 | 07/26/96 | TEC | S6 | No electroshocking was carried out at this site as the gradient was deemed too steep to accommodate fish. | This reach was classified as non fish bearing due to steep gradient. |
| 480-3782-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | JULIE 5, Unit 4 | 93 M 058 | 9 .6272 .61625 | 4 | 07/25/96 | TEC | S5 | The electroshocking effort, using a12 B POW model, was 674 seconds over 200 meters. | This reach was classified as non fish bearing because it is located above an 8m falls, which prevents fish migration upstream. No resident population was found above this falls. |
| 480-3782-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | JULIE 6, Unit 4 | 93 M 058 | 9 .6627 .616078 | 2 | 07/25/96 | TEC | S5 | The electroshocking effort, using a 12 B POW model, was 680 seconds over 150 meters. | This reach was classified as non fish bearing because it is located above an 8m falls, which prevents fish migration upstream. No resident population was found above this falls. |
| 480-3782-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | JULIE 7, Unit 4 | 93 M 058 | 9 .6625 .61606 | 2 | 07/25/96 | TEC | S5 | The electroshocking effort, using a 12 B POW model, was 771 seconds over 100 meters. | This reach was classified as non fish bearing because it is located above an 8m falls, which prevents fish migration upstream. No resident population was found above this falls. |
| 014-5800-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | JULIE 8, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | S6 | This site was not electrofished. | This reach was classified as non fish bearing because it is located above an 8m falls, which prevents fish migration upstream. No resident population was found above this falls. |
| 014-4000-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | RYAN 1, Unit 4 | 93 M 058 | 9 .6579 .61579 | 3 | 07/25/96 | TEC | S6 | The electroshocking effort, using a 12 B POW model was 400 seconds over 200 meters. | This reach has been classified as non fish bearing because it is located above a series of impassable cascades and is too small to support a resident population. |
| 014-4900-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | RYAN 5, Unit 4 | 93 M 058 | 9 .6596 .61597 | 1 | 07/25/96 | TEC | S6 | The electroshocking effort using a 12 B POW model, was 370 seconds over 200 meters. | This reach has been classified as non fish bearing as it is located above an impassable 2m falls, no evidence of a resident population was found. |
| 014-4700-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | RYAN 6, Unit 4 | 93 M 058 | 9 .6603 .61604 | 2 | 07/25/96 | TEC | S6 | The electroshocking effort, using a Smithroot 12 B POW model, was 300 seconds over 400 meters. Every pool at this site was shocked and no fish were caught. A falls is located 1.2km downstream of the site. | This reach has been classified as non fish bearing as it is located above an impassable 2m falls, no evidence of a resident population was found. |
| 014-4700-000-000-000-000-000-000-000-000-000-000 | Trib. to Boucher Cr. | RYAN 7, Unit 4 | 93 M 058 | 9 .6603 .61604 | 1 | 07/25/96 | TEC | S6 | The electroshocking effort, using a 12B POW model. was 300 seconds over 200 meters. | This reach has been classified as non fish bearing as it is located above an impassable 2m falls, no evidence of a resident population was found. |
| 081-4900-000-000-000-000-000-000-000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 1, Unit 4 | 93 M 037 | 9 .6464 .61412 | 2 | 07/24/96 | TEC | S6 | The electroshocking effort, using a Honda Mark 10 model was 231 seconds over 200 meters. Minnow traps were also set in the beaver ponds 70 meters upstream of the road. | This reach has been classified as non fish bearing because no suitable fish habitat was found in the sampling area. |
| 011-1200-000-000-000-000-000-000-000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 157, Unit 4 | 93 M 037 | 9 .6501 .61358 | 1 | 08/24/96 | TEC | S6 | This dry site was not electrofished. | This reach has been classified as non fish bearing because no suitable fish habitat was found in the sampling area. |

| Watershed Code | Stream "Local" | Location | TRIM Number | UTM | Reach Number | Survey Date | Agency | Proposed Stream Class | Fishing Effort | Rationale |
|---|---|---|---|---|---|---|---|---|---|---|
| 480-0000-000-000-000-000-000-000-000-000-000-000 | Trib. to Nilkitkwa L. | JULIE 168, Unit 4 | 93 M 037 | 9 .6488 .61402 | 1 | 08/24/96 | TEC | S6 | This site was not electrofished. | This reach has been classified as non fish bearing because no suitable fish habitat was found in the sampling area. |
| 011-0100-000-000-000-000-000-000-000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 6, Unit 4 | 93 M 037 | 9 .6484 .61359 | 2 | 07/25/96 | TEC | S6 | The electroshocking effort, using a Honda Mark 10 model, was 229 seconds over 100 meters. | This reach has been classified as non fish bearing because no suitable fish habitat was found in the sampling area. |
| 011-0000-000-000-000-000-000-000-000-000-000-000 | Trib. to Nilkitkwa L. | TERRY 7, Unit 4 | 93 M 037 | 9 .6481 .61348 | 2 | 07/25/96 | TEC | S6 | This site was not electroshocked. | This reach has been classified as non fish bearing because no suitable fish habitat was found in the sampling area. |

**Table 6. Summary of Sites for Which Future Sampling is Recommended in Working Unit 4**

| Watershed Code | Stream "Local" | Location | Map # | UTM | Reach Number | Survey Date | Agency | Average Channel Width (m) | Gradient (%) | Fish Species | Proposed Stream Class | Fishing Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 010-8200-000-000-000- | Trib. to Babine R. | PETER 110, Unit 4 | 93 M 037 | 9 .6502 .61337 | 1 | 08/24/96 | TEC | 0.73 | 8.00 | (RB) | S4 | NA |
| 011-4900-000-000-000- | Trib. to Bairnsfather Cr. | Z57, Unit 4 | 93 M 047 | 9 .640061.614844 | 1 | 07/19/97 | TEC | 1.87 | 0.50 | (RB) | S3 | EL |
| 480-3782-000-000-000- | Boucher Cr. | JULIE 2, Unit 4 | 93 M 047 | 9 .6475 .61452 | 1 | 07/24/96 | TEC | 7.88 | 1.00 | (RB) (DV) | S2 | EL |
| 014-5700-000-000-000- | Trib. to Boucher Cr. | JULIE 10, Unit 4 | 93 M 058 | 9 .6619 .61614 | 2 | 07/25/96 | TEC | 2.68 | 19.00 | (DV) | S3 | VO |
| 014-5500-000-000-000- | Trib. to Boucher Cr. | JULIE 11, Unit 4 | 93 M 058 | 9 .6618 .61576 | 1 | 07/25/96 | TEC | 3.40 | 10.00 | (DV) | S3 | NA |
| 011-6400-000-000-000- | Trib. to Boucher Cr. | JULIE 20 , Unit 4 | 93 M 048 | 9 .6536 .61518 | 2 | 07/27/96 | TEC | 1.50 | 0.00 | (DV) | S3 | MT |
| 011-7500-000-000-000- | Trib. to Boucher Cr. | RYAN 15, Unit 4 | 93 M 048 | 9 . 6547 . 61454 | 2 | 07/27/96 | TEC | 0.80 | 0.00 | (DV) | S4 | NA |
| 014-4600-000-000-000- | Trib. to Boucher Cr. | RYAN 2, Unit 4 | 93 M 058 | 9 .6592 .61586 | 2 | 07/25/96 | TEC | 1.26 | 15.00 | (DV) | S4 | EL |
| 480-3782-000-000-000- | Trib. to Boucher Cr. | HASLETT 1, Unit 4 | 93 M 047 | 9 .6510 .61501 | 3 | 07/25/96 | TEC | 3.40 | 0.00 | (RB) | S3 | VO |
| 081-9400-000-000-000- | Trib. to Boucher Cr. | JULIE 3, Unit 4 | 93 M 047 | 9 .6483 .61434 | 1 | 07/24/96 | TEC | 1.48 | 3.00 | (RB) | S3 | NA |
| 081-9500-000-000-000- | Trib. to Boucher Cr. | JULIE 4, Unit 4 | 93 M 047 | 9 .6482 .61442 | 1 | 07/24/96 | TEC | 1.01 | 3.00 | (RB) | S4 | NA |
| 011-7800-000-000-000- | Trib. to Boucher Cr. | RYAN 11, Unit 4 | 93 M 048 | 9 .6558 .61450 | 1 | 07/26/96 | TEC | 4.18 | 1.00 | (RB) | S3 | EL |
| 470-3782-000-000-000- | Trib. to Boucher Cr. | RYAN 14, Unit 4 | 93 M 048 | 9 .6550 .61438 | 1 | 07/25/96 | TEC | 2.00 | 1.00 | (RB) | S3 | VO |
| 011-6400-000-000-000- | Trib. to Boucher Cr. | RYAN 17, Unit 4 | 93 M 048 | 9 . 6523 . 61473 | 1 | 07/27/96 | TEC | 3.00 | 1.00 | (RB) | S3 | AG |
| 011-6700-000-000-000- | Trib. to Boucher Cr. | RYAN 18, Unit 4 | 93 M 048 | 9 .6522 .61476 | 1 | 07/27/96 | TEC | 4.00 | 1.00 | (RB) | S3 | VO |
| 011-6900-000-000-000- | Trib. to Boucher Cr. | RYAN 19, Unit 4 | 93 M 048 | 9 . 6523 . 61478 | 1 | 07/27/97 | TEC | 1.50 | 1.00 | (RB) | S3 | EL |
| 081-9700-000-000-000- | Trib. to Boucher Cr. | E254, Unit 4 | 93 M 047 | 9 .6486 .61458 | 1 | 09/05/97 | TEC | 0.82 | 4.00 | (RB) (DV) | S4 | EL |
| 081-9800-000-000-000- | Trib. to Boucher Cr. | E255, Unit 4 | 93 M 047 | 9 .6477 .614590 | 1 | 09/05/97 | TEC | 0.89 | 2.00 | (RB) (DV) | S4 | NA |
| 014-3600-000-000-000- | Trib. to Boucher Cr. | E3, Unit 4 | 93 M 058 | 9 .6567 .61558 | 2 | 07/09/97 | TEC | 0.76 | 12.00 | (RB) | S4 | EL |
| 480-0000-000-000-000- | Trib. to Clota L. | RYAN 20, Unit 4 | 93 M 048 | 9 . 6532 . 61422 | 4 | 07/27/96 | TEC | 1.13 | 3.00 | (DV) | S4 | NA |
| 011-4700-000-000-000- | Trib. to Nilkitkwa L. | TERRY 2, Unit 4 | 93 M 037 | 9 .6464 .61398 | 1 | 07/24/96 | TEC | 1.17 | 2.00 | (DV) | S4 | EL, MT |
| 480-0000-000-000-000- | Trib. to Nilkitkwa L. | TERRY 10, Unit 4 | 93 M 037 | 9 . 6436 . 61355 | 1 | 07/26/96 | TEC | 1.47 | 1.00 | (DV) | S3 | EL |
| 011-0200-000-000-000- | Trib. to Nilkitkwa L. | TERRY 8, Unit 4 | 93 M 037 | 9 .6486 .61345 | 4 | 07/25/96 | TEC | 4.08 | 10.00 | (DV) | S3 | EL |
| 010-8300-000-000-000- | Trib. to Nilkitkwa L. | JULIE 156, Unit 4 | 93 M 037 | 9 .6500 .61530 | 1 | 08/24/96 | TEC | 1.00 | 10.00 | (RB DV) | S4 | NA |
| 011-1400-000-000-000- | Trib. to Nilkitkwa L. | JULIE 161, Unit 4 | 93 M 037 | 9 .6497 .61363 | 1 | 08/24/96 | TEC | 4.00 | 1.00 | (RB) | S3 | NA |
| 011-1500-000-000-000- | Trib. to Nilkitkwa L. | JULIE 162, Unit 4 | 93 M 037 | 9 .6501 .61374 | 2 | 08/24/96 | TEC | 4.00 | 4.00 | (RB) | S3 | NA |
| 011-1400-000-000-000- | Trib. to Nilkitkwa L. | JULIE 163, Unit 4 | 93 M 037 | 9 .6506 .61385 | 1 | 08/24/96 | TEC | 4.00 | 4.00 | (RB) | S3 | VO |
| 011-1600-000-000-000- | Trib. to Nilkitkwa L. | JULIE 164, Unit 4 | 93 M 037 | 9 .6513 .61392 | 1 | 08/24/96 | TEC | 1.50 | 2.00 | (RB) | S3 | VO |
| 011-1400-000-000-000- | Trib. to Nilkitkwa L. | JULIE 165, Unit 4 | 93 M 037 | 9 .6511 .61396 | 2 | 08/24/96 | TEC | 3.00 | 3.00 | (RB) | S3 | VO |
| 011-2000-000-000-000- | Trib. to Nilkitkwa L. | JULIE 166, Unit 4 | 93 M 037 | 9 .6495 .61379 | 1 | 08/24/96 | TEC | 1.50 | 4.00 | (RB) | S3 | VO |
| 480-0000-000-000-000- | Trib. to Nilkitkwa L. | JULIE 167, Unit 4 | 93 M 037 | 9 .6488 .61393 | 1 | 08/24/96 | TEC | 1.50 | 5.00 | (RB) | S3 | NA |
| 480-0000-000-000-000- | Trib. to Nilkitkwa L. | JULIE 169, Unit 4 | 93 M 037 | 9 .6491 . 61411 | 1 | 08/24/96 | TEC | 1.50 | 4.00 | (RB) | S3 | VO |
| 011-3000-000-000-000- | Trib. to Nilkitkwa L. | JULIE 27, Unit 4 | 93 M 038 | 9 .6523 . 61537 | 2 | 07/27/96 | TEC | 3.00 | 0.00 | (RB) | S3 | EL |

**Table 7. Summary of Wildlife and Wildlife Signs Observed in Working Unit 4 in 1996 and 1997**

| Watershed Code | TRIM Number | Location | UTM | Reach Number | Survey Date | Agency | Species or Sign Observed |
|---|---|---|---|---|---|---|---|
| 011-8300-000-000-000-000- | 93 M 058 | JULIE 14, Unit 4 | 9 .6559 .61539 | 1 | 07/26/96 | TEC | A series of beaver dams was noted. |
| 011-1600-000-000-000-000- | 93 M 037 | JULIE 164, Unit 4 | 9 .6513 .61392 | 1 | 08/24/96 | TEC | A beaver dam was noted in the sampling area. |
| 011-1400-000-000-000-000- | 93 M 037 | JULIE 165, Unit 4 | 9 .6511 .61396 | 2 | 08/24/96 | TEC | Beaver dams are present both up and downstream of the site. |
| 014-3500-000-000-000-000- | 93 M 058 | JULIE 18, Unit 4 | 9 .6572 .61549 | 1 | 07/26/96 | TEC | A large beaver pond was observed. |
| 014-3500-000-000-000-000- | 93 M 058 | JULIE 18, Unit 4 | 9 .6572 .61549 | 1 | 07/26/96 | TEC | A beaver dams was noted above the sample site. |
| 011-6400-000-000-000-000- | 93 M 048 | JULIE 21, Unit 4 | 9 .6537 .61501 | 1 | 07/27/96 | TEC | Tadpoles were caught in gee traps at this site. |
| 011-5500-000-000-000-000- | 93 M 038 | JULIE 23, Unit 4 | 9 .6558 .61412 | 1 | 07/27/96 | TEC | Tadpoles and 2 osprey were also observed at this site. |
| 011-1500-000-000-000-000- | 93 M 038 | JULIE 24, Unit 4 | 9 .6538 .61395 | 6 | 07/27/96 | TEC | Beaver dams were noted. |
| 011-6400-000-000-000-000- | 93 M 048 | RYAN 17, Unit 4 | 9 . 6523 . 61473 | 1 | 07/27/96 | TEC | The channel width in this area is a function of beaver activity. |
| 081-4900-000-000-000-000- | 93 M 037 | TERRY 1, Unit 4 | 9 .6464 .61412 | 2 | 07/24/96 | TEC | Beaver ponds were observed. |
| 081-4900-000-000-000-000- | 93 M 037 | TERRY 1, Unit 4 | 9 .6464 .61412 | 2 | 07/24/96 | TEC | Beaver ponds were noted upstream of the road crossing. |
| 081-4900-000-000-000-000- | 93 M 037 | TERRY 1, Unit 4 | 9 .6464 .61412 | 2 | 07/24/96 | TEC | Tadpoles were caught in the gee traps set at this site. |
| 010-9000-000-000-000-000- | 93 M 037 | TERRY 174, Unit 5, see | 9 .6461 .61321 | 1 | 08/26/96 | TEC | A 25m long beaver dam was noted at the junction with Tsezakwa Creek. |
| 011-4700-000-000-000-000- | 93 M 037 | TERRY 2, Unit 4 | 9 .6464 .61398 | 1 | 07/24/96 | TEC | A beaver dam was noted. |

# APPENDIX 1

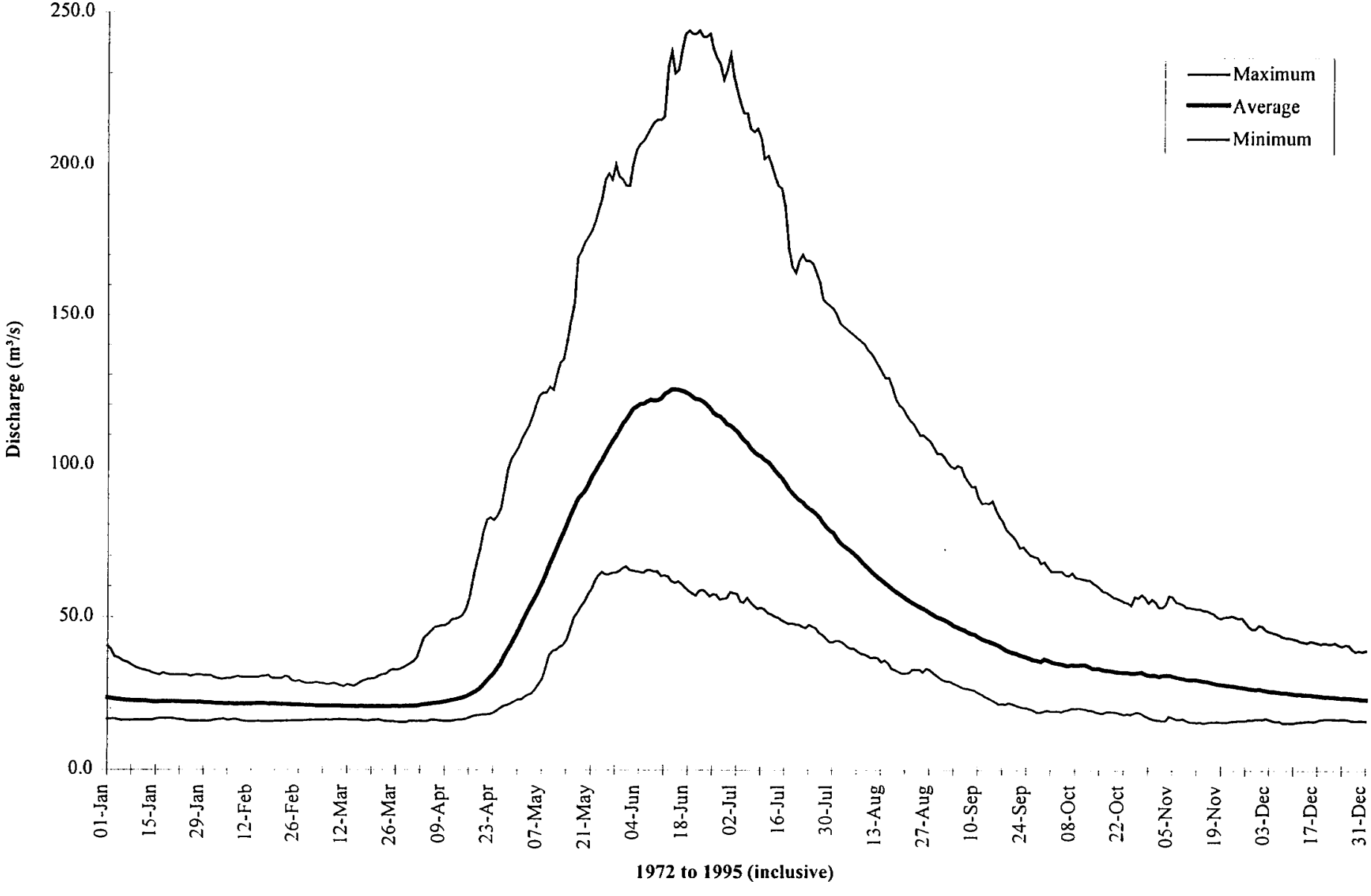
## Hydrological Data

**Station Number:** 08EC013
**Latitude:** 55:25:30N
**Longitude:** 126:42:10W
**Drainage Area (km²):** 6790
**Station Name:** BABINE RIVER AT OUTLET OF NILKITKWA LAKE

**MAD:** 49.4
**Min Mean Daily (All Records):** 15.5
**Max Mean Daily (All Records):** 244

| | Max. Instantaneous Discharge | | | Max. Daily Discharge | | Min. Daily Discharge | |
|---|---|---|---|---|---|---|---|
| 1972 | 249 | | 18-Jun | 244 | 18-Jun | | |
| 1973 | 155 | 3:00 | 14-Jun | 154 | 14-Jun | 25.3 | 30-Dec |
| 1974 | 189 | 7:10 | 16-Jun | 187 | 16-Jun | 21.9 | 13-Apr |
| 1975 | 86.1 | 21:30 | 18-Jun | 85.8 | 18-Jun | 19.5 | 01-Apr |
| 1976 | 243 | 2:06 | 19-Jun | 240 | 19-Jun | 26.8 | 31-Mar |
| 1977 | 120 | 6:58 | 01-Jun | 119 | 01-Jun | 24.4 | 21-Mar |
| 1978 | 103 | 3:11 | 04-Jun | 99.1 | 04-Jun | 21.4 | 16-Apr |
| 1979 | 127 | | 15-Jun | 126 | 14-Jun | 16.6 | 31-Dec |
| 1980 | | | | 66.6 | 31-May | 15.7 | 11-Feb |
| 1981 | 152 | 8:53 | 03-Jun | 151 | 03-Jun | 20.1 | 23-Mar |
| 1982 | 160 | 6:20 | 13-Jun | 159 | 12-Jun | 20.2 | 30-Dec |
| 1983 | 98.4 | 16:55 | 07-Jul | 93.2 | 08-Jul | 15.5 | 27-Mar |
| 1984 | 113 | 3:38 | 12-Jun | 112 | 12-Jun | 18.0 | 05-Mar |
| 1985 | 118 | 9:18 | 04-Jun | 117 | 04-Jun | 18.6 | 07-Feb |
| 1986 | | | | 127 | 27-Jun | 18.8 | 16-Feb |
| 1987 | | | | 122 | 29-May | 19.4 | 26-Jan |
| 1988 | 158 | 10:00 | 15-Jun | 157 | 15-Jun | 18.3 | 30-Mar |
| 1989 | 99.1 | 7:45 | 31-May | 98.3 | 31-May | 17.0 | 14-Nov |
| 1990 | 146 | 6:10 | 04-Jun | 144 | 04-Jun | 18.2 | 09-Mar |
| 1991 | 106 | 5:03 | 31-May | 105 | 28-May | 17.0 | 11-Apr |
| 1992 | 153 | 7:27 | 01-Jun | 153 | 01-Jun | 21.0 | 31-Dec |
| 1993 | 123 | 3:51 | 02-Jun | 121 | 02-Jun | 15.8 | 27-Mar |
| 1994 | 145 | 5:55 | 14-Jun | 141 | 14-Jun | 17.2 | 29-Dec |
| 1995 | 96.3 | 0:58 | 27-May | 96.0 | 27-May | 15.5 | 14-Nov |

## Mean Daily Discharges - BABINE RIVER AT OUTLET OF NILKITKWA LAKE, 1972 to 1995 (inclusive)



# APPENDIX 2

## Fish Data

**Appendix 2. Summary of Fish Data Collected in Working Unit 4 in 1996 and 1997**

| Watershed Code | Stream "Local" | Location | TRIM Number | UTM | Reach Number | Survey Date | Agency | Species | Number | Size Range | Life Phase | Fishing Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 011-5500-000-000-000- | Trib. to Acorn L. | JULIE 23, Unit 4 | 93 M 038 | 9 .6558 .61412 | 1 | 07/27/96 | TEC | RB | 10.00 | 130 | F | VO |
| 011-5500-000-000-000- | Trib. to Acorn L. | JULIE 23, Unit 4 | 93 M 038 | 9 .6558 .61412 | 1 | 07/27/96 | TEC | RSC | 2.00 | 38-42 | F | EL |
| 081-5500-000-000-000- | Trib. to Babine R. | HASLETT 7, Unit 4 | 93 M 047 | 9 .6448 .61445 | 1 | 07/27/96 | TEC | RB | 4.00 | 30-50 | F | VO |
| 480-3781-000-000-000- | Bairnsfather Cr. | HASLETT 4, Unit 4 | 93 M 047 | 9 .6447 .61427 | 1 | 07/26/96 | TEC | RB | 2.00 | 30-150 | J | VO |
| 480-3781-000-000-000- | Trib. to Bairnsfather Cr. | HASLETT 3, Unit 4 | 93 M 047 | 9 .6448 .61429 | 1 | 07/26/96 | TEC | RB | 1.00 | 50 | J | VO |
| 480-3781-000-000-000- | Trib. to Bairnsfather Cr. | TERRY 18, Unit 4 | 93 M 037 | 9 .6425 .61414 | 2 | 07/27/96 | TEC | RB | 1.00 | 85 | J | EL |
| 480-3781-000-000-000- | Trib. to Bairnsfather Cr. | TERRY 18, Unit 4 | 93 M 037 | 9 .6425 .61414 | 2 | 07/27/96 | TEC | DV | 1.00 | 55 | J | EL |
| 480-3782-000-000-000- | Boucher Cr. | JULIE 9, Unit 4 | 93 M 058 | 9 .6625 .61584 | 4 | 07/25/96 | TEC | DV | 1.00 | 76 | J | EL |
| 480-3782-000-000-000- | Boucher Cr. | JULIE 15, Unit 4 | 93 M 058 | 9 .6562 .61530 | 3 | 07/25/96 | TEC | DV | 2.00 | 64-72 | J | EL |
| 480-3782-000-000-000- | Boucher Cr. | JULIE 15, Unit 4 | 93 M 058 | 9 .6562 .61530 | 3 | 07/25/96 | TEC | DV | 1.00 | 31 | F | EL |
| 014-4700-000-000-000- | Trib. to Boucher Cr. | RYAN 3, Unit 4 | 93 M 058 | 9 .6597 .61588 | 1 | 07/25/96 | TEC | DV | 1.00 | 142 | J | EL |
| 014-4800-000-000-000- | Trib. to Boucher Cr. | RYAN 4, Unit 4 | 93 M 058 | 9 .6597 .61588 | 1 | 07/25/96 | TEC | DV | 1.00 | 142 | J | EL |
| 480-3782-000-000-000- | Trib. to Boucher Cr. | HASLETT 1, Unit 4 | 93 M 047 | 9 .6510 .61501 | 3 | 07/25/96 | TEC | RB | 1.00 | 0 | N | VO |
| 011-8000-000-000-000- | Trib. to Boucher Cr. | RYAN 9, Unit 4 | 93 M 048 | 9 .6559 . 61460 | 1 | 07/24/96 | TEC | SU | 1.00 | 45 | J | EL |
| 002-0600-000-000-000- | Trib. to Boucher Cr. | RYAN 10, Unit 4 | 93 M 048 | 9 . 6560 . 61458 | 1 | 07/26/96 | TEC | RB | 3.00 | 200 | N | VO |
| 011-7700-000-000-000- | Trib. to Boucher Cr. | RYAN 12, Unit 4 | 93 M 048 | 9 . 6552 . 61450 | 1 | 07/25/96 | TEC | RB | 1.00 | 90 | J | EL |
| 011-7600-000-000-000- | Trib. to Boucher Cr. | RYAN 13, Unit 4 | 93 M 048 | 9 .6551 . 61444 | 1 | 07/25/96 | TEC | RB | 1.00 | 130 | J | VO |
| 014-3900-000-000-000- | Trib. to Boucher Cr. | JULIE 13, Unit 4 | 93 M 058 | 9 .6568 .61564 | 2 | 07/26/96 | TEC | DV | 3.00 | 101-130 | J | EL |
| 014-3900-000-000-000- | Trib. to Boucher Cr. | JULIE 13, Unit 4 | 93 M 058 | 9 .6568 .61564 | 2 | 07/26/96 | TEC | DV | 11.00 | 30 | F | EL |
| 011-6400-000-000-000- | Trib. to Boucher Cr. | JULIE 21, Unit 4 | 93 M 048 | 9 .6537 .61501 | 1 | 07/27/96 | TEC | RB | 10.00 | 180 | N | MT |
| 011-6400-000-000-000- | Trib. to Boucher Cr. | JULIE 21, Unit 4 | 93 M 048 | 9 .6537 .61501 | 1 | 07/27/96 | TEC | RSC | 4.00 | 111 | N | MT |
| 011-6500-000-000-000- | Trib. to Boucher Cr. | RYAN 16, Unit 4 | 93 M 048 | 9 . 6549 . 61491 | 1 | 07/27/96 | TEC | RB | 10.00 | 100-200 | N | VO |
| 011-8300-000-000-000- | Trib. to Boucher Cr. | JULIE 16, Unit 4 | 93 M 048 | 9 .6562 .61530 | 1 | 07/26/96 | TEC | DV | 3.00 | 30-70 | J | EL |
| 014-3500-000-000-000- | Trib. to Boucher Cr. | JULIE 18, Unit 4 | 93 M 058 | 9 .6572 .61549 | 1 | 07/26/96 | TEC | DV | 1.00 | 170 | A | EL |
| 082-7500-000-000-000- | Trib. to Boucher Cr. | HASLETT 2, Unit 4 | 93 M 047 | 9 .6513 .61497 | 1 | 07/26/96 | TEC | CBC | 2.00 | 50-70 | J | VO |
| 011-6400-000-000-000- | Trib. to Boucher Cr. | E293, Unit 4 | 93 M 058 | 9 .6540 .61532 | 1 | 09/11/97 | TEC | DV | 2.00 | 35-50 | F | EL |
| 081-9900-000-000-000- | Trib. to Boucher Cr | JULIE 1, Unit 4 | 93 M 047 | 9 .6492 .61458 | 1 | 07/24/96 | TEC | RB | 4.00 | 25-35 | F | EL |
| 480-3782-000-000-000- | Boucher drainage | JULIE 22, Unit 4 | 93 M 048 | 9 . 6518 . 61528 | 5 | 07/27/96 | TEC | NSC | 1.00 | 70 | J | MT |
| 480-3782-000-000-000- | Boucher drainage | JULIE 22, Unit 4 | 93 M 048 | 9 . 6518 . 61528 | 5 | 07/27/96 | TEC | RSC | 90.00 | 110 | A | MT |
| 480-3782-000-000-000- | Boucher drainage | JULIE 22, Unit 4 | 93 M 048 | 9 . 6518 . 61528 | 5 | 07/27/96 | TEC | RB | 1.00 | | J | VO |
| 480-0000-000-000-000- | Trib. to Clota L. | JULIE 26, Unit 4 | 93 M 038 | 9 .6524 .61408 | 4 | 07/27/96 | TEC | RB | 1.00 | 170 | J | EL |
| 011-2100-000-000-000- | Trib. to Nilkitkwa L. | TERRY 4, Unit 4 | 93 M 037 | 9 .6475 .61387 | 1 | 07/25/96 | TEC | DV | 3.00 | 70-103 | J | EL |
| 011-1300-000-000-000- | Trib. to Nilkitkwa L. | JULIE 158 , Unit 4 | 93 M 037 | 9 .6498 . 61363 | 1 | 08/24/96 | TEC | RB | 4.00 | 40-200 | J | EL |
| 011-2400-000-000-000- | Trib. to Nilkitkwa L. | TERRY 11, Unit 4 | 93 M 037 | 9 . 6435 . 61363 | 2 | 07/26/96 | TEC | DV | 3.00 | 130-200 | J | EL |
| 011-1500-000-000-000- | Trib. to Nilkitkwa L. | JULIE 25, Unit 4 | 93 M 038 | 9 .6531 .61388 | 2 | 07/27/96 | TEC | RB | 3.00 | 21-100 | J | EL |
| 011-1500-000-000-000- | Trib. to Nilkitkwa L. | JULIE 25, Unit 4 | 93 M 038 | 9 .6531 .61388 | 2 | 07/27/96 | TEC | RSC | 5.00 | | A | MT |

| Watershed Code | Stream "Local" | Location | TRIM Number | UTM | Reach Number | Survey Date | Agency | Species | Number | Size Range | Life Phase | Fishing Method |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 011-2100-000-000-000- | Trib. to Nilkitkwa L. | TERRY 12, Unit 4 | 93 M 037 | 9 .6424 .61370 | 2 | 07/27/96 | TEC | DV | 6.00 | 35-90 | J | EL |
| 011-2900-000-000-000- | Trib. to Nilkitkwa L. | TERRY 15, Unit 4 | 93 M 037 | 9 .6432 .61385 | 1 | 07/27/96 | TEC | DV | 12.00 | 30-130 | J | EL |
| 011-0200-000-000-000- | Trib. to Nilkitkwa L. | TERRY 5, Unit 4 | 93 M 037 | 9 .6484 .61359 | 1 | 07/25/96 | TEC | RB | 2.00 | 109-132 | J | EL |
| 011-0200-000-000-000- | Trib. to Nilkitkwa L. | TERRY 5, Unit 4 | 93 M 037 | 9 .6484 .61359 | 1 | 07/25/96 | TEC | CO | 6.00 | 60-90 | J | EL |
| 011-1500-000-000-000- | Trib. to Nilkitkwa R. | JULIE 24, Unit 4 | 93 M 038 | 9 .6538 .61395 | 6 | 07/27/96 | TEC | RB | 3.00 | 130 | J | VO |
| 011-1500-000-000-000- | Trib. to Nilkitkwa R. | JULIE 24, Unit 4 | 93 M 038 | 9 .6538 .61395 | 6 | 07/27/96 | TEC | RSC | 10.00 | 30-70 | J | VO |
| 011-3500-000-000-000- | Trib. to Nilkitkwa R. | TERRY 14, Unit 4 | 93 M 037 | 9 .6428 .61376 | 1 | 07/27/96 | TEC | DV | 4.00 | 40-90 | J | EL |
| 011-4100-000-000-000- | Trib. to Nilkitkwa L. | TERRY 13, Unit 4 | 93 M 037 | 9 . 6424 . 61371 | 2 | 07/27/96 | TEC | DV | 2.00 | 35-75 | J | EL |

# APPENDIX 3

## Photodocumentation Summary

## Appendix 3. Photodocumentation Summary for Working Unit 4

| Group | Roll | Frame | Watershed Code | Survey Crew | Site Number | Unit Number | Agency | Survey Date | Stream "Local" | Map # | UTM Zone | UTM Northing | UTM Easting | Method | Reach Number | Aspect | Photo Direction | Photo Type | Scale Item | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | 7 | 9 | 08149000000000000 | TD DD | T1 | Unit 4 | TEC | 19/09/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6464000 | 614120 | GPS | 2 | E | Up | Ch | | Dry channel through aspen. |
| B | 7 | 10 | 08149000000000000 | TD DD | T1 | Unit 4 | TEC | 19/09/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6464000 | 614120 | GPS | 2 | E | Dn | Ch | Jim | Dry channel through alder. |
| B | 7 | 11 | 01147000000000000 | KA KG RH | T2 | Unit 4 | TEC | 19/09/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6464000 | 613980 | GPS | 1 | E | Dn | Ch | | Looking downstream. |
| B | 7 | 12 | 01147000000000000 | KA KG RH | T2 | Unit 4 | TEC | 19/09/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6464000 | 613980 | GPS | 1 | E | Up | Ch | Ryan | Looking upstream. |
| B | 7 | 16 | 01121000000000000 | TD DD HS | T4 | Unit 4 | TEC | 19/09/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6475000 | 613870 | GPS | 1 | E | Dn | Ch | Ryan | Looking downstream. |
| B | 7 | 15 | 01121000000000000 | TD DD HS | T4 | Unit 4 | TEC | 19/09/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6475000 | 613870 | GPS | 1 | E | Up | Ch | Ryan | Looking upstream. |
| B | 7 | 13 | 48000000000000000 | TD DD HS | T3 | Unit 4 | TEC | 19/09/96 | Not a creek | 93 M 037 | 9 | 6459000 | 614190 | GPS | 0 | | Dn | Ch | | Looking downstream. |
| B | 7 | 14 | 48000000000000000 | TD DD HS | T3 | Unit 4 | TEC | 19/09/96 | Not a creek | 93 M 037 | 9 | 6459000 | 614190 | GPS | 0 | | Up | Ch | Jim | Looking upstream through alder and willow. |
| E | 1 | 4 | 01436000000000000 | JL EM | E3 | Unit 4 | TEC | 09/07/97 | Trib to Boucher Cr. | 93 M 058 | 9 | 6567000 | 615580 | GPS | 2 | SE | Dn | Ch | photoboard | Looking downstream with LOD, instream veg. |
| E | 1 | 3 | 01436000000000000 | JL EM | E3 | Unit 4 | TEC | 09/07/97 | Trib to Boucher Cr. | 93 M 058 | 9 | 6567000 | 615580 | GPS | 2 | NW | Up | Ch | photoboard | Looking upstream with fireweed and dogwood |
| E | 24B | 7 | 08197000000000000 | SJ JL | E254 | Unit 4 | TEC | 05/09/97 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6486000 | 614580 | GPS | 1 | NW | Up | Ch | photoboard, crew member | Looking upstream at the channel |
| E | 24B | 8 | 08197000000000000 | SJ JL | E254 | Unit 4 | TEC | 05/09/97 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6486000 | 614580 | GPS | 1 | SE | Dn | Ch | photoboard, crew member | Looking downstream at the channel |
| E | 24B | 9 | 08198000000000000 | SJ JL | E255 | Unit 4 | TEC | 05/09/97 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6477000 | 614590 | GPS | 1 | NE | Up | Ch | photoboard, crew member | Looking upstream at the channel |
| E | 24B | 10 | 08198000000000000 | SJ JL | E255 | Unit 4 | TEC | 05/09/97 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6477000 | 614590 | GPS | 1 | SW | Dn | Ch | photoboard, crew member | Looking downstream at the channel |
| E | 24B | 11 | 00256000000000000 | SJ JL | E256 | Unit 4 | TEC | 05/09/97 | Not a creek | 93 M 047 | 9 | 6506000 | 614470 | GPS | 0 | NA | NA | Ve | crew member | Looking at an "NC" |
| E | 24B | 12 | 08202000000000000 | SJ JL | E257 | Unit 4 | TEC | 05/09/97 | Not a creek | 93 M 047 | 9 | 6509000 | 614511 | GPS | 0 | NA | NA | NA | photoboard | Looking at an "NC" |
| E | 28 | 7 | 01164000000000000 | SJ JL | E293 | Unit 4 | TEC | 11/09/97 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6540000 | 615320 | GPS | 1 | N | Up | Ch | photoboard | Looking upstream at the channel |
| E | 28 | 8 | 01164000000000000 | SJ JL | E293 | Unit 4 | TEC | 11/09/97 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6540000 | 615320 | GPS | 1 | S | Dn | Ch | photoboard | Looking downstream at the channel |
| H | 1 | 2 | 48037820000000000 | JH KA | H1 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6510000 | 615010 | GPS | 3 | S | Up | Ch | | Looking upstream, through marsh. |
| H | 1 | 3 | 08275000000000000 | JH DD | H2 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6513000 | 614970 | GPS | 1 | E | Up | Ch | Darrel | Looking upstream, through marsh. |
| H | 1 | 4 | 48037810000000000 | JH DD | H3 | Unit 4 | TEC | 26/07/96 | Trib. to Bairnsfather Cr. | 93 M 047 | 9 | 6448000 | 614290 | GPS | 1 | E | Up | Ch | | Looking upstream, channel through marsh grass. |
| H | 1 | 5 | 48037810000000000 | JH DD | H4 | Unit 4 | TEC | 26/07/96 | Bairnsfather Cr. | 93 M 047 | 9 | 6447000 | 614270 | GPS | 1 | E | Dn | Ch | Darrel | Looking downstream. |
| H | 1 | 8 | 08155000000000000 | JH KA | H7 | Unit 4 | TEC | 27/07/96 | Trib. to Babine R. | 93 M 047 | 9 | 6448000 | 614450 | GPS | 1 | E | Up | Ch | Jennifer | Looking upstream. |
| J | 10 | 19 | 01083000000000000 | JP EM | J156 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6500000 | 615300 | GPS | 1 | W | | O | | Aerial photo of J156. |
| J | 10 | 20 | 01083000000000000 | JP EM | J156 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6500000 | 615300 | GPS | 1 | W | | O | | Aerial photo of J156. |
| J | 10 | 21 | 01112000000000000 | JP EM | J157 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6501000 | 613580 | GPS | 1 | W | | Ch | | Photo taken from helicopter at ground level. |

| Group | Roll | Frame | Watershed Code | Survey Crew | Site Number | Unit Number | Agency | Survey Date | Stream "Local" | Map # | UTM Zone | UTM Northing | UTM Easting | Method | Reach Number | Aspect | Photo Direction | Photo Type | Scale Item | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J | 10 | 22 | 01113000000000000 | JP EM | J158 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6498000 | 613630 | GPS | 1 | W | Up | Ve | | Photo taken from helicopter at ground level. |
| J | 10 | 23 | 01113000000000000 | JP EM | J158 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6498000 | 613630 | GPS | 1 | W | Dn | Ve | | Looking downstream, channel through grassy area. |
| J | 10 | 24 | 01113000000000000 | JP EM | J158 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6498000 | 613630 | GPS | 1 | W | Dn | Ch | | Looking downstream toward grassy area. |
| J | 11 | 1 | 01114000000000000 | JP EM | J161 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6497000 | 613630 | GPS | 1 | | | O | | Aerial photo, channel through meadow. |
| J | 11 | 2 | 01114000000000000 | JP EM | J161 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6497000 | 613630 | GPS | 1 | | | O | | Aerial photo, channel through meadow. |
| J | 11 | 4 | 01115000000000000 | JP EM | J162 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6501000 | 613740 | GPS | 2 | W | | O | | Aerial photo, alder choked channel through mature spruce. |
| J | 11 | 3 | 01115000000000000 | JP EM | J162 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6501000 | 613740 | GPS | 2 | W | | O | | Aerial photo. alder choked channel through mature spruce. |
| J | 11 | 5 | 01114000000000000 | JP EM | J163 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6506000 | 613850 | GPS | 1 | SW | | O | | Aerial photo, alder choked channel through mature spruce. |
| J | 11 | 6 | 01114000000000000 | JP EM | J163 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6506000 | 613850 | GPS | 1 | SW | | O | | Aerial photo, alder choked channel through mature spruce. |
| J | 11 | 7 | 01116000000000000 | JP EM | J164 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6513000 | 613920 | GPS | 1 | W | | O | | Aerial photo, alder choked channel through mature spruce. |
| J | 11 | 8 | 01116000000000000 | JP EM | J164 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6513000 | 613920 | GPS | 1 | W | | O | | Aerial photo, channel through opening in spruce stand. |
| J | 11 | 10 | 01114000000000000 | JP EM | J165 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6511000 | 613960 | GPS | 2 | S | | O | | Aerial photo. alder choked channel through mature spruce stand. |
| J | 11 | 9 | 01114000000000000 | JP EM | J165 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6511000 | 613960 | GPS | 2 | S | | O | | Aerial photo, alder choked channel through mature spruce stand. |
| J | 11 | 12 | 01120000000000000 | JP EM | J166 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6495000 | 613790 | GPS | 1 | W | | O | | Aerial photo, channel in narrow winding meadow. |
| J | 11 | 11 | 01120000000000000 | JP EM | J166 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6495000 | 613790 | GPS | 1 | W | | O | | Aerial photo, alder choked channel through mature spruce stand. |
| J | 11 | 13 | 48000000000000000 | JP EM | J167 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6488000 | 613930 | GPS | 1 | W | | O | | Aerial photo, alder choked channel through mature spruce. |
| J | 11 | 15 | 48000000000000000 | JP EM | J169 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6491000 | 614110 | GPS | 1 | W | | O | | Aerial photo, alder choked channel through mature spruce. |
| J | 11 | 14 | 48000000000000000 | JP EM | J169 | Unit 4 | TEC | 24/08/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6491000 | 614110 | GPS | 1 | W | | O | | Aerial photo. alder choked channel through mature spruce. |
| J | 1 | 1 | 08199000000000000 | TD DD | J1 | Unit 4 | TEC | 24/07/96 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6492000 | 614580 | GPS | 1 | S | Up | Ch | meterstick @1M | Looking upstream. |
| J | 1 | 2 | 08194000000000000 | HS JP | J3 | Unit 4 | TEC | 24/07/96 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6483000 | 614340 | GPS | 1 | NW | Up | Ch | | Looking upstream through alder and dogwood. |
| J | 1 | 3 | 08195000000000000 | HS JP | J4 | Unit 4 | TEC | 24/07/96 | Trib. to Boucher Cr. | 93 M 047 | 9 | 6482000 | 614420 | GPS | 1 | W | Up | Ch | | Looking upstream. |
| J | 1 | 11 | 48037820000000000 | JP KG | J7 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6625000 | 616060 | GPS | 2 | W | | O | | Barrier downstream of site J7. |
| J | 1 | 9 | 48037820000000000 | JP KG | J7 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6625000 | 616060 | GPS | 2 | W | | | | Avalanche site at site J7 |

| Group | Roll | Frame | Watershed Code | Survey Crew | Site Number | Unit Number | Agency | Survey Date | Stream "Local" | Map # | UTM Zone | UTM Northing | UTM Easting | Method | Reach Number | Aspect | Photo Direction | Photo Type | Scale Item | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J | 1 | 10 | 48037820000000000 | JP KG | J7 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6625000 | 616060 | GPS | 2 | W | | O | | Barrier downstream of site J7. |
| J | 1 | 8 | 48037820000000000 | JP KG | J7 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6625000 | 616060 | GPS | 2 | W | Up | Ch | | Looking upstream. |
| J | 1 | 13 | 01458000000000000 | JP KG | J8 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6619000 | 616140 | GPS | 2 | S | Up | Ch | | Looking upstream. |
| J | 1 | 14 | 48037820000000000 | JP KG | J9 | Unit 4 | TEC | 25/07/96 | Boucher Cr. | 93 M 058 | 9 | 6625000 | 615840 | GPS | 4 | SW | Up | Ch | | Looking upstream. |
| J | 1 | 15 | 01457000000000000 | JP KG | J10 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6619000 | 616140 | GPS | 2 | NW | Up | Ch | | Looking upstream. |
| J | 1 | 16 | 01455000000000000 | JP KG | J11 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6618000 | 615760 | GPS | 1 | N | Up | Ch | | Looking upstream, cascade/step pool habitat. |
| J | 1 | 4 | 48037820000000000 | JP KG | J5 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6272000 | 616250 | GPS | 4 | S | Up | Ch | | Looking upstream, cascade and pool habitat. |
| J | 1 | 5 | 48037820000000000 | JP KG | J5 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6272000 | 616250 | GPS | 4 | S | Dn | Ch | | Looking downstream. |
| J | 1 | 7 | 48037820000000000 | JP KG | J6 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6627000 | 616078 | GPS | 2 | SW | Dn | Ch | | Looking downstream. |
| J | 1 | 6 | 48037820000000000 | JP KG | J6 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6627000 | 616078 | GPS | 2 | SW | Xs | Ch | Karla 1.65m | Looking cross-stream. |
| J | 1 | 18 | 01439000000000000 | JP KG | J13 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6568000 | 615640 | GPS | 2 | E | Up | Ch | | Looking upstream. |
| J | 1 | 19 | 01183000000000000 | JP KG | J14 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6559000 | 615390 | GPS | 1 | SE | | Ch | | Channel through grass and alder. |
| J | 1 | 20 | 48037820000000000 | JP KG | J15 | Unit 4 | TEC | 26/07/96 | Boucher Cr. | 93 M 058 | 9 | 6562000 | 615300 | GPS | 3 | S | Up | Ch | | Looking upstream, wide channel with bars. |
| J | 1 | 22 | 01183000000000000 | JP KG | J16 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6562000 | 615300 | GPS | 1 | E | | Ch | | Algae bloom. |
| J | 1 | 22 | 01183000000000000 | JP KG | J16 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6562000 | 615300 | GPS | 1 | SW | | Ch | | Algae bloom. |
| J | 1 | 23 | 01434000000000000 | JP KG | J17 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6570000 | 615470 | GPS | 1 | W | Up | Ch | | Looking upstream, cascades and pools. |
| J | 1 | 24 | 01435000000000000 | JP KG | J18 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6572000 | 615490 | GPS | 1 | W | Xs | Ch | | Looking cross-stream, clay substrate. |
| J | 2 | 2 | 48037820000000000 | JP KG | J22 | Unit 4 | TEC | 27/07/96 | Boucher drainage | 93 M 048 | 9 | 6518000 | 615280 | GPS | 5 | W | | Ch | | Site J22, creek joining 2 lakes. |
| J | 2 | 26 | 01164000000000000 | JP KG | J20 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6536000 | 615180 | GPS | 2 | S | Xs | Ch | | Aerial photo of site J20. |
| J | 2 | 1 | 01164000000000000 | JP KG | J21 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6537000 | 615010 | GPS | 1 | S | Xs | Ch | | Aerial photo of site J21. |
| J | 2 | 3 | 01155000000000000 | JP KG | J23 | Unit 4 | TEC | 27/07/96 | Trib. to Acorn L. | 93 M 038 | 9 | 6558000 | 614120 | GPS | 1 | N | Xs | Ch | | Small tributary to Acorn L. |
| J | 2 | 4 | 01115000000000000 | JP KG | J24 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa R. | 93 M 038 | 9 | 6538000 | 613950 | GPS | 6 | S | | Ch | | Small creek connecting 2 lakes. |
| J | 2 | 5 | 01115000000000000 | JP KG | J25 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa L. | 93 M 038 | 9 | 6531000 | 613880 | GPS | 2 | S | | Ch | | LOD in channel through alder. |
| J | 2 | 6 | 48000000000000000 | JP KG | J26 | Unit 4 | TEC | 27/07/96 | Trib. to Clota L. | 93 M 038 | 9 | 6524000 | 614080 | GPS | 4 | S | | Ch | | Channel through alder. |
| J | 2 | 7 | 01130000000000000 | JP KG | J27 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa L. | 93 M 038 | 9 | 6523000 | 615370 | GPS | 2 | NW | | Ch | | Channel through grass and willows. |
| J | 11 | 25 | 48000000000000000 | JP EM | J159 | Unit 4 | TEC | 24/08/96 | Not a creek | 93 M 037 | 9 | 6502000 | 613650 | GPS | 0 | N | | Ve | | Not a creek. |
| J | 1 | 17 | 01454000000000000 | JP KG | J12 | Unit 4 | TEC | 26/07/96 | Not a creek | 93 M 058 | 9 | 6610000 | 615860 | GPS | 0 | | Xs | O | bucket | Looking cross-stream, boggy area. |
| J | 1 | 25 | 07288000000000000 | JP KG | J19 | Unit 4 | TEC | 27/07/96 | Not a creek | 93 M 048 | 9 | 6544000 | 615280 | GPS | 0 | E | Xs | | | Undefined channel, alder swale. |
| P | 10 | 19 | 48000000000000000 | PF KG | P110 | Unit 4 | TEC | 24/08/96 | Trib. to Babine R. | 93 M 037 | 9 | 6502000 | 613370 | GPS | 1 | W | Dn | Ch | | Downstream view. |
| P | 11 | 1 | 48000000000000000 | PF KG | P110 | Unit 4 | TEC | 25/08/96 | Trib. to Babine R. | 93 M 037 | 9 | 6502000 | 613370 | GPS | 1 | W | Up | Ch | | Upstream view. |
| P | 11 | 2 | 48000000000000000 | PF KG | P110 | Unit 4 | TEC | 25/08/96 | Trib. to Babine R. | 93 M 037 | 9 | 6502000 | 613370 | GPS | 1 | W | Dn | Ch | | Downstream view, debris in channel. |
| P | 11 | 3 | 48000000000000000 | PF KG | P110 | Unit 4 | TEC | 25/08/96 | Trib. to Babine R. | 93 M 037 | 9 | 6502000 | 613370 | GPS | 1 | W | Up | Ch | | Upstream view, debris in channel. |
| R | 1 | 2 | 01440000000000000 | RH EM | R1 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6579000 | 615790 | GPS | 3 | S | Dn | Ch | Ryan | Looking downstream. |
| R | 1 | 4 | 01447000000000000 | RH EM | R3 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6597000 | 615880 | GPS | 1 | SW | Dn | Ch | | Looking downstream. |
| R | 1 | 5 | 01448000000000000 | RH EM | R4 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6597000 | 615880 | GPS | 1 | E | Dn | Ch | Ryan | Looking downstream. |
| R | 1 | 6 | 01449000000000000 | RH EM | R5 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6596000 | 615970 | GPS | 1 | S | Dn | Ch | bucket | Looking downstream. |

| Group | Roll | Frame | Watershed Code | Survey Crew | Site Number | Unit Number | Agency | Survey Date | Stream "Local" | Map # | UTM Zone | UTM Northing | UTM Easting | Method | Reach Number | Aspect | Photo Direction | Photo Type | Scale Item | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R | 1 | 7 | 01447000000000000 | RH EM | R6 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6603000 | 616040 | GPS | 2 | NE | Up | Ch | notebook | Looking upstream, channel through meadow. |
| R | 1 | 8 | 01447000000000000 | RH EM | R7 | Unit 4 | TEC | 25/07/96 | Trib. to Boucher Cr. | 93 M 058 | 9 | 6603000 | 616040 | GPS | 1 | S | Dn | Ch | | Looking downstream. |
| R | 1 | 9 | 01178000000000000 | RH EM | R11 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6558000 | 614500 | GPS | 1 | S | Dn | Ch | | Looking upstream, marshy area. |
| R | 1 | 10 | 01177000000000000 | RH EM | R12 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6552000 | 614500 | GPS | 1 | S | Up | Ve | Eamon | Looking upstream, channel through grassy area. |
| R | 1 | 11 | 01176000000000000 | RH EM | R13 | Unit 4 | TEC | 26/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6551000 | 614440 | GPS | 1 | SE | Up | Ch | Eamon | Looking upstream. |
| R | 1 | 12 | 01175000000000000 | RH EM | R15 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6547000 | 614540 | GPS | 2 | SE | Dn | Ve | | Looking downstream through meadow. |
| R | 1 | 13 | 01165000000000000 | RH EM | R16 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6549000 | 614910 | GPS | 1 | SE | Dn | Ch | | Looking downstream through alder. |
| R | 1 | 14 | 01164000000000000 | RH EM | R17 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6523000 | 614730 | GPS | 1 | SE | Up | Ch | | Looking upstream through marshy area. |
| R | 1 | 15 | 01167000000000000 | RH EM | R18 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6522000 | 614760 | GPS | 1 | SE | Xs | Ch | | Looking cross-stream through meadow. |
| R | 1 | 16 | 01169000000000000 | RH EM | R19 | Unit 4 | TEC | 27/07/96 | Trib. to Boucher Cr. | 93 M 048 | 9 | 6523000 | 614780 | GPS | 1 | SE | | O | | Beaver dam. |
| R | 1 | 17 | 48000000000000000 | RH EM | R20 | Unit 4 | TEC | 27/07/96 | Trib. to Clota L. | 93 M 048 | 9 | 6532000 | 614220 | GPS | 4 | S | Up | Ch | | Looking upstream from road. |
| T | 1 | 3 | 08149000000000000 | TD DD | T1 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6464000 | 614120 | GPS | 2 | E | Up | O | | Upstream view of beaver pond. |
| T | 1 | 2 | 08149000000000000 | TD DD | T1 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6464000 | 614120 | GPS | 2 | E | Dn | Ch | | Downstream view. |
| T | 1 | 1 | 08149000000000000 | TD DD | T1 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa Lk. | 93 M 037 | 9 | 6464000 | 614120 | GPS | 2 | E | | Ch | | Channel. |
| T | 1 | 4 | 01147000000000000 | KA KG RH | T2 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 7 | 6464000 | 613980 | GPS | 1 | E | | Ch | | Channel. |
| T | 1 | 5 | 01121000000000000 | TD DD HS | T4 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6475000 | 613870 | GPS | 1 | E | Dn | Ch | | Downstream view. |
| T | 1 | 6 | 01102000000000000 | TD DD HS | T5 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa Lk | 93 M 037 | 9 | 6484000 | 613590 | GPS | 1 | E | | Ch | | Channel. |
| T | 1 | 7 | 01101000000000000 | TD DD HS | T6 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6484000 | 613590 | GPS | 2 | NE | | Ch | | Channel. |
| T | 1 | 8 | 01100000000000000 | TD DD HS | T7 | Unit 4 | TEC | 25/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6481000 | 613480 | GPS | 2 | E | | Ch | | Channel. |
| T | 1 | 10 | 48000000000000000 | HS TD | T10 | Unit 4 | TEC | 26/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6436000 | 613550 | GPS | 1 | NE | | Ch | | Channel. |
| T | 1 | 13 | 01124000000000000 | HS TD | T11 | Unit 4 | TEC | 26/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6435000 | 613630 | GPS | 2 | NE | | O | | Dead standing timber in pond. |
| T | 1 | 12 | 01124000000000000 | HS TD | T11 | Unit 4 | TEC | 26/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6435000 | 613630 | GPS | 2 | NE | Up | Ch | | Upstream view. |
| T | 1 | 11 | 01124000000000000 | HS TD | T11 | Unit 4 | TEC | 26/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6435000 | 613630 | GPS | 2 | NE | Dn | Ch | | Downstream view. |
| T | 1 | 15 | 01121000000000000 | TD HS | T12 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6424000 | 613700 | GPS | 2 | E | Up | Ch | | Upstream view. |
| T | 1 | 16 | 01141000000000000 | HS TD | T13 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6424000 | 613710 | GPS | 2 | SE | Up | Ch | | Upstream view. |
| T | 1 | 17 | 01135000000000000 | HS TD | T14 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa R. | 93 M 037 | 9 | 6428000 | 613760 | GPS | 1 | NE | Up | Ch | | Upstream view. |
| T | 1 | 18 | 01129000000000000 | HS TD | T15 | Unit 4 | TEC | 27/07/96 | Trib. to Nilkitkwa L. | 93 M 037 | 9 | 6432000 | 613850 | GPS | 1 | NE | Up | Ch | | Upstream view. |
| T | 1 | 21 | 48037810000000000 | HS TD | T18 | Unit 4 | TEC | 27/07/96 | Trib. to Bairnsfather Cr. | 93 M 037 | 9 | 6425000 | 614140 | GPS | 2 | NE | | Ch | | Channel. |
| T | 1 | 19 | 48000000000000000 | HS TD | T16 | Unit 4 | TEC | 27/07/96 | Not a creek | 93 M 037 | 9 | 6451000 | 613870 | GPS | 0 | | | Ch | | Channel. |
| T | 1 | 20 | 48000000000000000 | HS TD | T17 | Unit 4 | TEC | 27/07/96 | Not a creek | 93 M 037 | 9 | 6428000 | 614150 | GPS | 0 | | | Ch | | Channel. |
| Z | 7 | 20 | 01149000000000000 | JP KG | Z57 | Unit 4 | TEC | 19/07/97 | Trib. to Bairnsfather Cr. | 93 M 047 | 9 | 6400610 | 614844 | GPS | 1 | SW | Up | Ch | photoboard | Looking upstream at the channel |
| Z | 7 | 19 | 01149000000000000 | JP KG | Z57 | Unit 4 | TEC | 19/07/97 | Trib. to Bairnsfather Cr. | 93 M 047 | 9 | 6400610 | 614844 | GPS | 1 | NE | Dn | Ch | fieldbook | Looking downstream at the channel |