



HQ1029
(3 of 3)
ENVIRONMENTAL DYNAMICS INC.

Natural Resource Consultants

1995 AND 1996 FISH AND FISH HABITAT INVENTORY

WITHIN THE STUART LAKE AND BABINE LAKE

WATERSHED GROUPS

Volume 3 of 3

Prepared for:

Canadian Forest Products Ltd.

Fort St. James Division

Box 254

Fort St. James, BC

V0J 1P0

Prepared by:

N. Hamel-Pendergast and J.J. Melnik

EDI ENVIRONMENTAL DYNAMICS INC.

9031 North Nechako Road

Prince George, BC

V2K 4Z8

EDI Project No. 500-04

August, 1997

EDI Environmental Dynamics Inc.

IMPORTANT NOTE
RE: USE OF THE FOLLOWING INFORMATION

Please note that the printed version of the DFO/MoELP Stream Survey Form is not true to the data present in the digital database. Discrepancies between the digital database and the printed forms have been noted for the following categories:

Header Information (Reach Length)
Channel Characteristics (% Debris Area, Avg Max Pool Depth Method)
Bed Material (Compaction)
Banks (Height)

Please consult the digital database prior to using any of the following data to ensure its accuracy.

RE: DATABASE

This report consists of inventory data collected in both 1995 and 1996. Only the 1996 inventory was funded through the Forest Renewal BC Resources Inventory Program and therefore only the 1996 data was reviewed and audited accordingly.

Lynn Blouw
Regional Fish/ Habitat Inventory Specialist
Ministry of Environment
May 1998

4.1.22 Whitefish Creek (Watershed 182-9146)

Whitefish Creek Watershed (182-9146) is located within BC Environment Management Unit 7-25 (BC Recreational Atlas 1993) within the southwestern portion of the Stuart Lake Watershed Group, on the south side of Stuart Lake (Fig. 23). Whitefish Creek flows directly into Stuart Lake and the boundary is surrounded by Watersheds 182-9126, 182-8934 and 182-8138 to the north, Watershed 182-9146-127 to the west, Watershed 182-7851-337 to the east and Babine Lake Watershed Group to the south. Occupying 8,608 ha of the Stuart Lake Provincial Forest, the geographical relief ranges from approximately 670 m at Stuart Lake to approximately 1,160 m in the headwaters (BC Environment 1995; Department of Energy, Mines and Resources 1977).

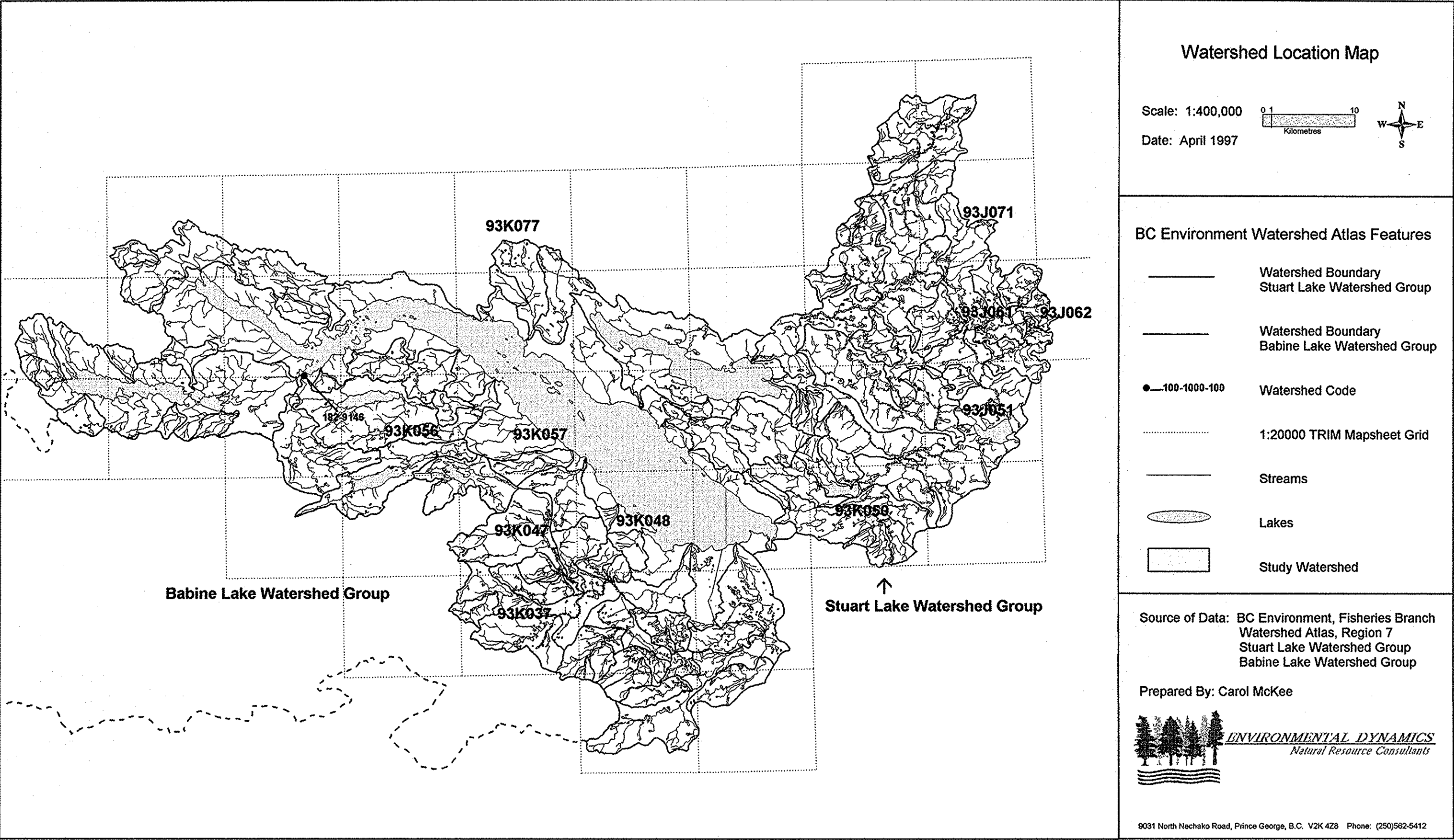
This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Stuart Dry Warm Sub-Boreal Spruce sub-zone (SBSdw3), and the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) (DeLong et al. 1993).

According to BC Environment lake inventory files (1970-1996), the following fish species have been documented within this watershed: lake chub, longnose dace, rainbow trout, longnose sucker, lake whitefish (BC Environment 1997b).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. A WMC is located along the northern boundary of Whitefish Lake and continues east towards Stuart Lake before traveling south through Watershed 182-7851 and into Babine Lake Watershed Group (Canfor 1996).

Since this watershed lies within a portion of Canfor's Whitefish Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

Figure 23. Location of Whitefish Creek Watershed (182-9146) within the Stuart Lake Watershed Group



4.1.22.1 Stream 182-9146-525

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-525
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	036
Operating Area	Whitefish
Development Type	Right-of-Way and Cutblock
Survey Date	29-Jun-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	9
Stream Width (m)	0.6
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (5.0%) reach is located along the western boundary of the cutblock and flows northeasterly. A total cover of 50% was comprised of 90% overhanging vegetation. Bed materials of this confined reach are made up of fines (90%), gravels (5%), and larges (5%). The lower portion of this reach contained a definable channel and flowing water. The upper limit was located approximately 500 m upstream of Whitefish Lake. It was at this point that the gradient increased dramatically (30%), and the definable channel disappeared. Fish sampling was not conducted in this reach due to the low water level. No fish were observed. This reach contained low quality fish habitat and was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-525-000-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-525-000-000-000-000-000-000-000-000
 Location: 36 Whitefish

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10.374990.6049080

Date: 29/06/97 Time: 13:30 Agency: EDI Survey Crew: R/VASCOLA \ \ \ \ \

Access:

1 Reach Length (km):

0 Length surveyed (m):

N Field: Yes

7:8 Air Photos:

FT

4 Method: MW

400.0 Method: MW

Historical: No

Channel Characteristics

Av. Chan. Width (m): 0.6 Method Av. Chan. Width (m): TF
 Av. Wet Width (m): 0.4 Method Av. Wet Width (m): TF
 Av. Max. R/L Depth (cm): 3 Av. Max. R/L Depth (cm): TF
 Av. Max. Pool Depth (cm): 8 Av. Max. Pool Depth (cm): 3
 Gradient (%): 5.0 Method Gradient: CL
 % Pool: 10 % Riffle: 30 % Run: 60 % Other: 0 Method: GE
 % Side Channel: 0 Method Side Channel: GE
 % Debris Area: 0-10 Method Debris Area: GE

Specific Data

0.5 0.7 0.7 0.6 0.6 0.6

Cover

Cover Total %: 50 Method Cover Total %: GE
 Dp Pool: 0 L.O.D.: 0 Boulder: 0 In Veg.: 0 Over Veg.: 90 Cutbanks: 10
 Crown Closure %: 70 Method Crown Closure: GE Aspect: NE Method Aspect: C

Discharge

Wetted Width (m): 0.3 Method Wetted Width (m): MS
 Mean Depth (m): 0.0 Method Mean Depth (m): MS
 Mean Velocity (m/s): 0.33 Method Mean Velocity (m/s): F
 Discharge (m³/s): Method Discharge (m³/s):

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 90 % Fines (<2mm): 90
 % Gravels: 5 Small (2-16mm): 5
 Large (16-64mm): 5
 % Largest: 5 Small cobble (64-128mm): 5
 Large cobble (128-256mm):
 Boulder cobble (>256mm):
 % Bedrock: 0 % Bedrock:
 D90 (cm): Medium

Banks

Height (m): 0.3 % Unstable: No
 Textures Fines: Yes Gravel: No Larges: No Bedrock: No
 Confinement: 2
 Valley: Chan. Ratio: L
 Stage: L
 Flood Signs Ht(m): N
 Braided: N
 Bars (%):
 pH:
 Method pH:
 Method Dissolved Oxygen:
 02 (ppm): 9.0
 Water Temp. (°C):
 Turb. (cm):
 Method Turbidity:
 Cond. (µmhos):
 Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-525-000-000-000-000-000-000-000

Waterbed Code:

Fish Summary

Obstructions

Comments

C1

Film 7: 8 w/s.

Fish sampling was not conducted in this reach. No fish were observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 178. Upstream view of Stream 182-9146-525 at Reach 1.

4.1.22.2 Stream EDI-502

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	502
Nearest Downstream Watershed Code	182-9146-02
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	036
Operating Area	Whitefish
Development Type	Right-of-Way and Cutblock
Survey Date	29-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	200
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located in the eastern portion of the cutblock and drains north. A continuous definable channel was not located and the only water present consisted of standing pools. Fish sampling was not conducted and no fish were observed. This is a seepage and not a stream, therefore, it does not require classification under the Forest Practices Code.	

4.1.22.3 Stream 182-9146-622

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-622
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	032
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	10-Jun-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	8.0
Stream Width (m)	1.53
Length Surveyed (m)	1200
Habitat Type	Stream
Stream Order (1:20,000)	2, 3
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB- Rainbow Trout
Description: This small, low gradient (6.0%) reach flows in a westerly direction through the middle of the cutblock. A total cover of 20% is comprised of 20% deep pool, L.O.D., boulder, overhanging vegetation and undercut banks. Bed materials of this confined reach are made up of larges (70%), fines (20%) and gravels (10%). Fish sampling (electroshocking) was conducted for 349 sec. One rainbow trout was captured and two other unidentified fish were observed. This reach offers excellent rearing and some potential spawning habitat. Since regionally significant fish were captured, it was classified as S-3 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-622-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 182-9146-622-000-000-000-000-000-000-000
Location: Whi 32

Stream "Local": N/A

Map #: 93K/10
U.T.M.: 10.378510.6048510

Date: 10/06/96 Time: 14:00 Agency: EDI Survey Crew: RVS/NC/WC \ \ \ \ \

Access: FT
Reach No.: 999 Reach Length (km): 1.20000 Method: MW
Site No.: 0 Length surveyed (m): 1200.0 Method: MW
Fish Card: N Field: Yes Historical: No
Photos: #5: 10, 11 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.5 Method Av. Chan. Width (m): MS
Av. Wet. Width (m): 1.3 Method Av. Wet. Width (m): MS
Av. Max. Riff. Depth (cm): 12 Av. Max. Riffle Depth (cm): MS
Av. Max. Pool Depth (cm): 30 Av. Max. Pool Depth (cm): 12
Gradient (%): 6.0 Method Gradient: CL
% Pool: 20 % Riffle: 20 % Run: 50 % Other: 10 Method: GE
% Side Channel: 0 Method Side Channel: GE
% Debris Area: 10-40 Method Debris Area: GE

Specific Data

1.1	2.0	1.3	1.9	1.3	1.6
-----	-----	-----	-----	-----	-----

Cover

Cover Total %: 20 Method Cover Total %: GE
Dp Pool: 20 L.O.D.: 20 Boulder: 20 In Veg.: 0 Over Veg.: 20 Cutbank: 20
Crown Closure %: 5 Method Crown Closure: GE Aspect: W Method Aspect: C

Discharge

Wetted Width (m): 1.3 Method Wetted Width (m): MS
Mean Depth (m): 0.2 Method Mean Depth (m): MS
Mean Velocity (m/s): 0.40 Method Mean Velocity (m/s): F
Discharge (m³/s): 0.10 Method Discharge (m³/s): F

Specific Data

Reach Symbol

(Fish)

(Width, Valley, Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 20 % Fines (<2mm): 20
% Gravels: 10 Small (2-16mm): 5
Large (16-64mm): 5
% Largest: 70 Small cobble (64-128mm): 30
Large cobble (128-256mm): 30
Boulder cobble (>256mm): 10
% Bedrock: 0 % Bedrock: 0
D90 (cm): 40 Compaction: Low

Banks

Height (m): 0.5 % Unstable: No Largest: No Bedrock: No
Texture Fines: Yes Gravel: No
Confinement: 2
Valley: Chan. Ratio: M
Stage: 0.6 Method Flood Signs: MS
Flood Signs Ht(m): N Method Braided: MS
Braided: N Method Bars: MS
Bars (%): Method pH:
pH: Method Dissolved Oxygen:
02 (ppm): Method Temperature: HT
Water Temp. (°C): 8.0
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-622-000-000-000-000-000-000-000-000

Waterbed Code:

Fish Summary

RB	150.0	J	R	EL

Obstructions

Comments

C1

Film 5: 10 u/s, 11 d/s.

Reach was labelled '999' but this means reach 'A'.

Fish sampling (electroshocking) was conducted for 349 seconds and one Rb was caught. Two other fish were observed but not identified.

The good fish habitat combined with the presence of regionally significant fish in this reach have determined that this stream be classified an S-3 under the Forest Practices Code.



Photo 179. Upstream view of Stream 182-9146-622 at Reach A.



Photo 180. Downstream view of Stream 182-9146-622 at Reach A.

4.1.22.4 Stream 182-9146-622-158

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-622-158
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	032
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	10-Jun-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	900
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located along the northern boundary of the cutblock and drains west. A gully containing alder and devil's club existed in this area. Some flowing water over moss was found, but no definable channel could be located. Fish sampling was not conducted in this seepage area and no fish were observed. Since this is a seepage and not a stream, it does not require classification under the Forest Practices Code.	

4.1.22.5 Stream 182-9146-622-391

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-622-391
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	032
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	11-Jun-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	8.5
Stream Width (m)	1.6
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None

Description:

This low gradient (3.0%) reach is located east of the cutblock and flows southeasterly. A total cover of 20% is comprised of 35% L.O.D., 30% deep pools, 25% overhanging vegetation and 10% undercut banks. Bed materials of this occasionally confined reach are made up of fines (70%), gravels and larges (15% each).

Fish sampling (electroshocking) was conducted for 75 sec. However no fish were captured or observed.

This reach provides good rearing habitat in the form of pools and L.O.D. Since regionally significant fish were captured in a downstream system (stream 182-9146-622) and no barriers were found, it was defaulted to S-3* classification under the Forest Practices Code.

Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution.

DFO/MoELP Stream Survey Form

Stream: Unnamed

20-Aug-97

Stream Survey Report

Watershed Code:

182-9146-622-391-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 182-9146-622-391-000-000-000-000-000-000-000
Location: Whi 32

Stream "Local": N/A
Map #: 93K/10
U.T.M.: 10.379000.6048370
Survey Crew: RV/S/NO/WC

Date: 11/06/96 Time: 15:30 Agency: EDI

Access: FT
Reach No.: 1 Reach Length (km): 0.30000 Method: MW
Site No.: 0 Length surveyed (m): 300.0 Method: MW
Fish Card: N Field: Yes Historical: No
Photos: #5: 14, 15 All Photos:

Channel Characteristics

Av. Chan. Width (m): 1.6 Method Av. Chan. Width (m): MS
Av. Wet. Width (m): 1.2 Method Av. Wet. Width (m): MS
Av. Max. Rif. Depth (cm): 10 Av. Max. Riffle Depth (cm): MS
Av. Max. Pool Depth (cm): 50 Av. Max. Pool Depth (cm): 10
Gradient (%): 3.0 Method Gradient: CL
% Pool: 25 % Riffle: 10 % Run: 65 % Other: 0 Method: GE
% Side Channel: 0 Method Side Channel: GE
% Debris Area: >40 Method Debris Area: GE

Specific Data

1.5	1.3	1.6	1.7	2.0	1.6
-----	-----	-----	-----	-----	-----

Cover

Cover Total %: 20 Method Cover Total %: GE
Dp Pool: 30 L.O.D.: 35 Boulder: 0 In Veg: 0 Over Veg: 25 Cutbank: 10
Crown Closure %: Method Crown Closure: Aspect: SE Method Aspect: C

Discharge

Wetted Width (m): 1.2 Method Wetted Width (m): MS
Mean Depth (m): 0.3 Method Mean Depth (m): MS
Mean Velocity (m/s): 0.50 Method Mean Velocity (m/s): F
Discharge (m³/s): 0.14 Method Discharge (m³/s): F

Specific Data

Reach Symbol

(Fish)

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

Bed Material

% Fines (<2mm): 70 % Fines (<2mm): 70
% Gravels: 15 Small (2-16mm): 10
Large (16-64mm): 5
% Larges: 15 Small cobble (64-128mm): 15
Large cobble (128-256mm): 0
Boulder cobble (>256mm): 0
% Bedrock: 0 % Bedrock: 0
D90 (cm): 0 Compaction: High

Banks

Height (m): 0.4 % Unstable: 5
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 4
Valley: Chan. Ratio: M
Stage: M
Flood Signs Ht(m): Method Flood Signs:
Bralded: Method Bralded: N
Bars (%): Method Bars:
pH: Method pH:
02 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 8.5 Method Temperature:
Turb. (cm): Method Turbidity:
Cond. (umhos): Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-622-391-000-000-000-000-000-000-000

Watershed Code:

Fish Summary**Obstructions****Comments**

C1

Film 5: 14 d/s, 15 u/s.

Fish sampling (electrofishing) was conducted for 75 seconds and no fish were caught or observed.

This stream has good rearing habitat and flows into a stream containing Rb. As a result, this stream has been defaulted to an S-3 stream under the Forest Practices Code, even though no fish were caught.



Photo 181. Upstream view of Stream 182-9146-622-391 at Reach 1.



Photo 182. Downstream view of Stream 182-9146-622-391 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-622-391
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	22-Nov-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	0.94
Length Surveyed (m)	1000
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This unmapped stream reach is located in the northern region of the cutblock and flows north. Due to snow and low temperatures, standard data (channel width and gradient) required for Forest Practices Code Stream Classification was only information that could be collected accurately. This information is included in this report to identify the location of the unmapped reach in anticipation of conducting a standard stream inventory in the future. Fish sampling was not conducted and fish were not observed. Since this reach flows into a fish bearing stream (stream 182-9146-622), this reach has been defaulted to a S-4* classification under the Forest Practices Code. Recommendation: Further survey is recommended to determine the lower limit of this reach, fish presence and an upper limit of fish distribution within this system. Note: ~ means the stream was not indicated on the TRIM base map.	

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-622-391
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	22-Nov-96
Reach Number	B
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	1.20
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None

Description:

This unmapped stream reach is located in the northern region of the cutblock and flows north. Due to snow and low temperatures, standard data (channel width and gradient) required for Forest Practices Code Stream Classification was only information that could be collected accurately. This information is included in this report to identify the location of the unmapped reach in anticipation of conducting a standard stream inventory in the future.

Approximately the first 75 m of this reach had a 20% gradient. This steep section was considered an anomaly since the gradient upstream of this section ranged between 10 -14%. Due to the deep snow at the time of survey, it was impossible to determine if the steep sections had step pools which would assist fish in upstream migration. The upper section of this reach was braided in three sections.

Fish sampling was not conducted and fish were not observed.

Since this reach flows into a fish bearing stream (stream 182-9146-622) this reach was defaulted to S-4* classification under the Forest Practices Code.

Recommendation: Further sampling is recommended to complete a stream inventory card, to determine fish presence, and to locate an upper limit of fish distribution within the system.

Note: ~ means the stream was not indicated on the TRIM base map.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-622-391
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	22-Nov-96
Reach Number	C
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	1.00
Length Surveyed (m)	250
Habitat Type	Stream
Stream Order (1:20,000)	1~
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None

Description:

This unmapped stream reach is located in the northern region of the cutblock and flows north. Due to snow and low temperatures, standard data (channel width and gradient) required for Forest Practices Code Stream Classification was only information that could be collected accurately. This information is included in this report to identify the location of the unmapped reach in anticipation of conducting a standard stream inventory in the future.

This reach had an average gradient of 21%.

Fish sampling was not conducted and fish were not observed.

Due to the high gradient, this reach was classified as S-6 under the Forest Practices Code.

Recommendation: Further survey is recommended to determine an upper reach break, in this area and to fish the rest of the this system located inside the proposed cutblock.

Note: ~ means the stream is not indicated on the TRIM base map.

4.1.22.6 Stream EDI-845

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	845
Nearest Downstream Watershed Code	182-9146-622-391
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Sept-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	6.0
Stream Width (m)	0.51
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small stream is located in the northwestern corner of the cutblock and flows north. In this reach, the stream had a high gradient (36%), and was frequently confined. This reach was characterized by 85% cascade and 10% riffle and 5% pool. There was only 10% total cover of which 80% was provided by overhanging vegetation. Bed material consisted of 55% larges, 30% fines, and 15% gravels. The lower limit of this reach is just outside the block boundary. Downstream from this reach break there is a 400 m section of seepage. This seepage area extends downstream to the main confluence with another system. Fish sampling (electroshocking) was conducted for 75 sec and no fish were captured or observed. The electroshocker was set at a frequency of M7 and at a voltage of 300. This stream's downstream section is a seepage area that is an impass to fish migration. This reach contained low quality fish habitat and is, therefore, classified as S-6 under the Forest Practices Code	

Stream Survey Report

Watershed Code:

30

20

5

Abstract

20

DFO/MoELP Stream Survey Form

21-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-622-391-9999-000-000-000-000-000-000

Watershed Code:

Fish Summary***Obstructions******Comments***

C2

Note: The "other" category refers to cascade.

C1

Film 76: 14 d/s, 15 u/s.

Fish sampling (electrofishing) was conducted for 75 seconds and no fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 183. Upstream view of Stream EDI-845 at Reach 1.



Photo 184. Downstream view of Stream EDI-845 at Reach 1.

4.1.22.7 Stream EDI-536

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	536
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	19-Sept-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	7.0
Stream Width (m)	1.30
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4
Fish Species Identified	RB-Rainbow Trout
Description: This stream is located along the eastern boundary of the cutblock and flows north into Tandat Lake. The lower limit of this low gradient (3%) reach is Tandat Lake. This reach is characterized by run (55%) and riffle (30%). The 20% total cover was mainly provided by overhanging vegetation (45%) and L.O.D. (20%). Bed material was dominated by larges (55%) and fines (30%) and there was some gravels (15%) present. This reach runs through an old clear cut and there was a lot of blow down over the channel. Fish sampling (electroshocking) was conducted and a juvenile rainbow trout was captured. This reach provides good rearing and spawning habitat and regionally significant fish were captured. Therefore it was classified as S-4 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

21-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-622-999-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-622-999-000-000-000-000-000-000-000
 Location: ND/WSC: 182-9146-622-01; 314-006 Whitefish

Stream "Local": EDI 536

Map #: 93K/10

U.T.M.: 10.380606.6047998

Date: 19/09/96

Time: 15:30

Agency: EDI

Survey Crew: JAA DT \ \ \ \ \ \ \ \

Access:

Reach No.: 1 Reach Length (km): 0.40000 Method: MW
 Site No.: 0 Length surveyed (m): 400.0 Method: MW
 Fish Card: N Field: Yes Historical: No
 Photos: 76; 24; 100; 2 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 1.3 Method Av. Chan. Width (m): MS
 Av. Wet Width (m): 0.8 Method Av. Wet Width (m):
 Av. Max. Riff. Depth (cm): 5 Av. Max. Riffle Depth (cm):
 Av. Max. Pool Depth (cm): 20 Av. Max. Pool Depth (cm): 5
 Gradient (%): 3.0 Method Gradient: CL
 % Pool: 15 % Riffle: 30 % Run: 55 % Other: 0 Method: GE
 % Side Channel: 0 Method Side Channel: GE
 % Debris Area: 10-40 Method Debris Area: GE

Specific Data

1.1	1.3	1.1	1.3	1.7	1.5
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm): 30 % Fines (<2mm): 30
 % Gravels: 15 Small (2-16mm): 10
 Large (16-64mm): 5
 % Larges: 55 Small cobble (64-128mm): 10
 Large cobble (128-256mm): 15
 Boulder cobble (>256mm): 30
 % Bedrock: 0 % Bedrock: 0
 D90 (cm): 43 Compaction: Medium

Cover

Cover Total %: 20 Method Cover Total %: GE
 Dp Pool: 10 L.O.D.: 20 Boulder: 15 In Veg.: 0 Over Veg.: 45 Curbank: 10
 Crown Closure %: 5 Method Crown Closure: GE Aspect: S Method Aspect: C

Discharge

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

Specific Data

Reach Symbol

(Fish)

(Width, Valley, Channel, Slope)

(Bed Material)

Banks

Height (m): 0.4 % Unstable: No
 Textures Fines: Yes Gravel: No Larges: Yes Bedrock: No
 Confinement: 3
 Valley: Chan. Ratio: 5
 Stage: L
 Flood Signs Ht(m): 0.35 Method Flood Signs: MS
 Braided: N Method Braided:
 Bars (%): Method Bars:
 pH: Method pH:
 O2 (ppm): Method Dissolved Oxygen:
 Water Temp. (°C): 7.0 Method Temperature:
 Turb. (cm): Method Turbidity:
 Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form
20-Aug-97

Stream: Unnamed

Stream Survey Report
182-9146-622-000-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

RB	130.0	J	U	EL
----	-------	---	---	----

Obstructions

Comments

CI

Film 76: 24 d/s; 100: 2 w/s.

Fish sampling (electrofishing) was conducted and a juvenile rainbow trout was captured.

This section of stream has been classified as a S-4 under the Forest Practices Code.

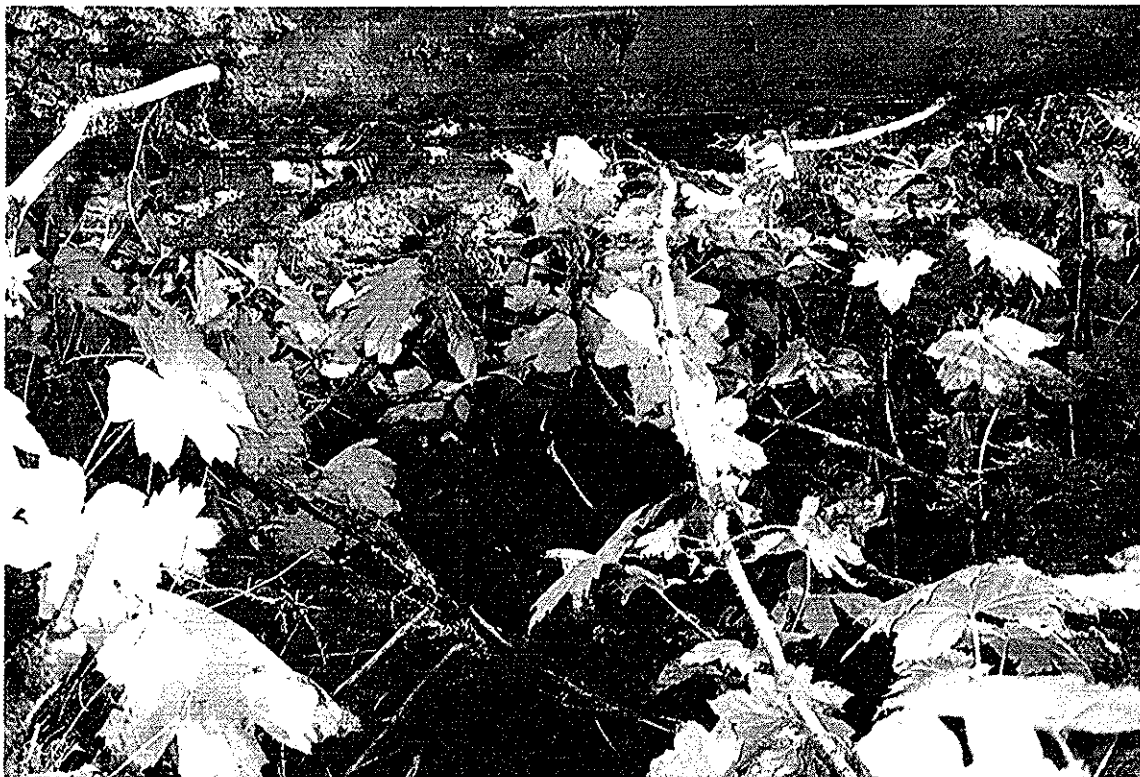


Photo 185. Downstream view of Stream EDI-536 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	536
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	18-Sept-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	7.5
Stream Width (m)	1.15
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4
Fish Species Identified	RB - Rainbow Trout
Description: This stream is located along the eastern boundary of the cutblock and flows north into Tandat Lake. This low gradient reach was unconfined. This reach was characterized by 80% glide, 10% run and only 5% each for pool and riffle. The 10% total cover was predominantly provided by overhanging vegetation (75%). Bed material consisted of 85% fines, 10% gravels, and 5% larges. Fish sampling (electroshocking) was conducted for 175 sec and rainbow trout were captured. The electroshocker was set at a frequency of M7 at a voltage of 300. Regionally significant fish were captured in this reach, therefore, it has been classified as S-4 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

Stream: Unnamed

21-Aug-97

Stream Survey Report

Watershed Code:

182-9146-622-999-000-000-000-000-000-000

Header Information

Stream Name: Unnamed Stream "Local": EDI 536

Access: FT

Watershed Code: 182-9146-622-999-000-000-000-000-000-000-000

Reach No.: 2 Reach Length (km): 0.40000 Method: M/W

Location: ND/WSC: 182-9146-622; 314-006 Whitefish

Site No.: 0 Length surveyed (m): 400.0 Method: M/W

Date: 18/09/96 Time: 11:00 Agency: EDI Survey Crew: BR/JM/DTI \ \ \ \ \

Fish Card: N Field: Yes Historical: No

Photos: 76: 16, 17 Air Photos:

Channel Characteristics

Specific Data

0.8 0.9 1.5 1.6 1.3 0.9

Av. Chan. Width (m): 1.1 Method Av. Chan. Width (m): MS

Av. Wet. Width (m): 0.9 Method Av. Wet. Width (m): MS

Av. Max. Riff. Depth (cm): 2 Av. Max. Riffle Depth (cm): MS

Av. Max. Pool Depth (cm): 18 Av. Max. Pool Depth (cm): 2

Gradient (%): 2.0 Method Gradient: CL

% Pool: 5 % Riffle: 5 % Run: 10 % Other: 80 Method: GE

% Side Channel: 0-10 Method Side Channel: GE

% Debris Area: 10-40 Method Debris Area: GE

Cover

Cover Total %: 10 Method Cover Total %: GE

Dp Pool: 5 L.O.D.: 10 Boulder: 0 In Veg.: 0 Over Veg.: 75 Cutbank: 10

Crown Closure %: 15 Method Crown Closure: GE Aspect: NW Method Aspect: C

Discharge

Wetted Width (m): Method Wetted Width (m):

Mean Depth (m): Method Mean Depth (m):

Mean Velocity (m/s): Method Mean Velocity (m/s)

Discharge (m³/s): Method Discharge (m³/s):

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 85

% Gravels: 10

% Large: 5

% Largest: 5

% Bedrock: 0

D90 (cm): 2

Compaction: High

Banks

Height (m): 0.3

Textures Fines: Yes

Confinement: 5

Valley: Chan. Ratio: L

Stage: N

Flood Signs Ht(m): Method Flood Signs:

Braided: Method Braided:

Bars (%): Method Bars:

pH: Method pH:

O₂ (ppm): Method Dissolved Oxygen:

Water Temp. (°C): Method Temperature:

Turb. (cm): Method Turbidity:

Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-622-000-000-000-000-000-000-000-000

Waterbed Code:

Fish Summary

RB	30-50	J	U	EL

Obstructions**Comments**

C2 The 'other' category refers to a glide (slow flowing, shallow, unrippled water that was approximately 6 cm deep on average).

C1 Film 76: 16 w/s, 17 d/s.

Fish sampling (electroshocking) was conducted for 175 seconds. Rainbow trout were captured.

This reach has been given a S-4 classification under the Forest Practices Code.



Photo 186. Upstream view of Stream EDI-536 at Reach 2.



Photo 187. Downstream view of Stream EDI-536 at Reach 2.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	536
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	19-Sept-96
Reach Number	3
Site Number	Not Applicable
Water Temperature (°C)	6.0
Stream Width (m)	0.82
Length Surveyed (m)	100
Habitat Type	Wetland
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This reach is located along the eastern boundary of the cutblock and flows north into Tandat Lake. This reach card was done within the wetland above reaches. This reach had a low gradient and was unconfined. It was characterized by 85% glide and 15% pool. Bed material was 100% fines and the 10% total cover was mainly provided by deep pools (35%) and undercut banks (30%). The channel within the wetland was intermittent and in some sections spread out creating ponded areas. This area is accessible to fish during high water and, therefore, is a Fisheries Sensitive Zone. Fish sampling (electroshocking) was conducted for 247 sec and no fish were captured or observed. The electroshocker was set at M7 with a voltage of 300. The channel within this wetland is classified as defaulted S-4* as regionally significant fish were captured downstream. Fish can access this wetland during high water, therefore, it is a Fisheries Sensitive Zone and should receive a wetland classification. Recommendation: Further survey is recommended to determine fish presence within this reach.	

DFO/MoELP Stream Survey Form
31-Dec-97

Stream: Unnamed

Stream Survey Report

182-9146-622-999-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 76: 20u/s, 21 d/s.

Fish sampling (electroshocking) was conducted for 247 seconds. No fish were captured or observed.

This reach was given a defaulted S-4 classification under the Forest Practices Code.



Photo 188. Upstream view of Stream EDI-536 at Reach 3.



Photo 189. Downstream view of Stream EDI-536 at Reach 3.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	536
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	19-Sept-96
Reach Number	4
Site Number	Not Applicable
Water Temperature (°C)	7.0
Stream Width (m)	0.76
Length Surveyed (m)	900
Habitat Type	Stream
Stream Order (1:20,000)	2, 1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This stream is located along the eastern boundary of the cutblock and flows north into Tandat Lake. The lower limit of this reach is a wetland and the upper limit is bound by a 500 m long seepage area. This reach is unconfined and has a moderate gradient. The reach was characterized by moderate gradient. The reach was characterized by 65% run and 20% riffle and had sections of sub-surface flow. Bed material was mainly fines (70%) with some larges and gravels (5% and 25% respectively). Reach 4 is almost entirely within an old clear cut. Windfall is abundant and the stream is diverted by skidder tracks in some sections. Fish sampling (electroshocking) was conducted for 98 sec and no fish were captured or observed. The electroshocker was set at a frequency of M7 and a voltage of 300. This reach has poor fish habitat since it lacks water, pools and sufficient cover. It has, therefore, been classified as S-6 stream under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

12-Dec-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-622-999-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 182-9146-622-999-000-000-000-000-000-000-000
Location: ND/WSC: 182-9146-622; 314-006 Whitefish

Stream "Local": EDI 536

Map #: 93K/10

U.T.M.: 10.381060.6047257

Access: FT
Reach No.: 4 Reach Length (km): 0.9 Method: MW
Site No.: 0 Length surveyed (m): 900.0 Method: MW
Fish Card: N Field: Yes Historical: No
Photos: 76, 22, 23 Air Photos:

Date: 9/19/96 Time: 11:15

Agency: EDI

Survey Crew: DTM \ \ \ \ \ \ \ \ \ \

Channel Characteristics

Av. Chan. Width (m): 0.8 Method Av. Chan. Width (m): MS
Av. Wet. Width (m): 0.6 Method Av. Wet. Width (m): MS
Av. Max. Rif. Depth (cm): 1 Av. Max. Rifle Depth (cm): MS
Av. Max. Pool Depth (cm): 17 Av. Max. Pool Depth (cm): 1
Gradient (%): 9.0 Method Gradient: CL
% Pool: 15 % Riffle: 20 % Run: 65 % Other: 0 Method: GE
% Side Channel: 0-10 Method Side Channel: GE
% Debris Area: 10-40 Method Debris Area: GE

Specific Data

0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
-----	-----	-----	-----	-----	-----	-----	-----

Cover

Cover Total %: 10 Method Cover Total %: GE
Dp Pool: 15 L.O.D.: 20 Boulder: 0 In Veg.: 0 Over Veg.: 50 Cutbank: 15
Crown Closure %: 20 Method Crown Closure: GE Aspect: W Method Aspect: C

Discharge

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

Specific Data

Reach Symbol

(Fish)

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

Bed Material

% Fines (<2mm): 70 % Fines (<2mm): 70
% Gravels: 5 Small (2-16mm): 5
Large (16-64mm): 0
% Larges: 25 Small cobble (64-128mm): 10
Large cobble (128-256mm): 15
Boulder cobble (>256mm): 0
% Bedrock: 0 % Bedrock: 0
D90 (cm): 23 Compaction: High

Banks

Height (m): 15.0 % Unstable: 10
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 5
Valley: Chan. Ratio: L
Stage: L
Flood Signs Ht(m): Method Flood Signs:
Braided: Method Braided:
Bars (%): Method Bars:
pH: Method pH:
O₂ (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 7.0 Method Temperature:
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

Stream: Unnamed

12-Dec-97

Stream Survey Report

182-9146-622-999-000-000-000-000-000-000-000

Waterbed Code:

Fish Summary

Obstructions

Comments

C1

Film 76: 22 d/s, 23 w/s.

Fish sampling (electroshocking) was conducted for 98 seconds. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 190. Upstream view of Stream EDI-536 at Reach 4.



Photo 191. Downstream view of Stream EDI-536 at Reach 4.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	536
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	18-Sept-96
Reach Number	4
Site Number	1
Water Temperature (°C)	7.0
Stream Width (m)	1.03
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This stream is located along the eastern boundary of the cutblock and flows north into Tandat Lake. This site card was completed approximately 75 m downstream from the upper limit of Reach 3. The stream at this site had a low gradient and was occasionally confined. This site was characterized by 60% run and 35% riffle. The 20% total cover was provided mainly by overhanging vegetation (65%) and L.O.D. (20%). Bed material was dominated by fines (75%) and larges (20%). This site card was completed outside of the old clear cut within cutblock 314-6. The channel width was greater at this site than at the reach card location as it was not directly affected by logging. Fish sampling (electroshocking) was conducted for 32 sec and no fish were caught or observed. The electroshocker was set at M7 with a voltage of 300. This site card was completed within a reach 4 that has a S-6 stream classification under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

26-Feb-98 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-622-999-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-622-999-000-000-000-000-000-000-000
 Location: ND/WSC: 182-9146-622: 314-006 Whitefish
 Date: 9/6/98 Time: 16:45 Agency: EDI Survey Crew: DTN \ \ \ \ \

Stream "Local": EDI 536
 Map #: 93K/10
 U.T.M.: 10381040.6046720

Access: FT
 Reach No.: 0 Reach Length (km): Method:
 Site No.: 1 Length surveyed (m): 100.0 Method: MW
 Fish Card: N Field: Yes Historical:
 Photos: 76, 18, 19 Air Photos: No

Channel Characteristics

Av. Chan. Width (m): 1.0 Method Av. Chan. Width (m): MS
 Av. Wet. Width (m): 0.6 Method Av. Wet. Width (m): MS
 Av. Max. Rif. Depth (cm): 2 Av. Max. Rif. Depth (cm): MS
 Av. Max. Pool Depth (cm): 12 Av. Max. Pool Depth (cm): 2
 Gradient (%): 6.0 Method Gradient: CL
 % Pool: 5 % Riffle: 35 % Run: 60 % Other: 0 Method: GE
 % Side Channel: 0 Method Side Channel: GE
 % Debris Area: 10-40 Method Debris Area: GE

Bed Material

% Fines (<2mm): 75 % Fines (<2mm): 75
 % Gravels: 5 Small (2-16mm): 5
 Large (16-64mm): 0
 % Large: 20 Small cobble (64-128mm): 5
 Large cobble (128-256mm): 10
 Boulder cobble (>256mm): 5
 % Bedrock: 0 % Bedrock: 0
 D90 (cm): 28 Compaction: High

Cover

Cover Total %: 20 Method Cover Total %: GE
 Dp Pool: 0 L.O.D.: 20 Boulder: 5 In Veg: 0 Over Veg: 65 Cutbank: 10
 Crown Closure %: 15 Method Crown Closure: GE Aspect: N Method Aspect: C

Banks

Height (m): 0.2 % Unstable: No Larges: No Bedrock: No
 Textures Fines: Yes Gravel: No
 Confinement: 4
 Valley: Chan. Ratio: L
 Stage: L
 Flood Signs Ht(m): N
 Braided: N
 Bars (%): N
 pH: Method pH:
 02 (ppm): Method Dissolved Oxygen:
 Water Temp. (°C): 7.0 Method Temperature:
 Turb. (cm): Method Turbidity:
 Cond. (µmhos): Method Conductivity:

Discharge

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

Specific Data

Reach Symbol

(Fish)

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

DFO/MoELP Stream Survey Form
26-Feb-98

Stream: Unnamed

Stream Survey Report
182-9146-622-999-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

CI

Film 76: 18 d/s, 19 u/s.

Fish sampling (electroshocking) was conducted for 32 seconds. No fish were captured or observed.

This site was given a S-6 classification under the Forest Practices Code.



Photo 192. Upstream view of Stream EDI-536 at Site 1.



Photo 193. Downstream view of Stream EDI-536 at Site 1.

4.1.22.8 Stream EDI-531

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	531
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	18-Sept-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	1150
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None

Description:

This seepage area is located in the northern region of the cutblock and drains easterly. This area contained no defined channel or banks, and no alluvial substrates. The seepage had no flow and water that was present was pooled over organic matter. Vegetation consisted of alder, devil's club, ferns and horsetails.

Fish sampling was not conducted and no fish were observed.

This seepage area does not require a stream classification under the Forest Practices Code.

4.1.22.9 Stream EDI-521

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	521
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	18-Sept-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	1000
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located in the eastern region of the cutblock and drains northeasterly into a S-6 stream. This seepage area extends for 750 m. Approximately 350 m was surveyed above this seepage area and no seepage characteristics were found. Fish sampling was not conducted and no fish were observed. Since this is a seepage area no stream classification is required under the Forest Practices Code.	

4.1.22.10 Stream EDI-524

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	524
Nearest Downstream Watershed Code	182-9146-622-01
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	314
Cutblock Number	006
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	18-Sept-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	700
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage area is located in the eastern region of the cutblock and drains easterly. There were some sections where water was present and there was a channelized stream, however, these section were not continuous. Vegetation in this area consisted of alder and devil's club. Substrates consisted of 70% fines and 30% cobbles where a defined channel was present. Fish sampling was not conducted and no fish were observed. Since this is a seepage area no stream classification is required under the Forest Practices Code.	

4.1.22.11 Stream 182-9146-725

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-725
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Oct-96
Reach Number	A
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded.
Stream Width (m)	<1.5 m
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not applicable
Fish Species Identified	None

Description:

This reach is located along the northwestern boundary of the proposed cutblock flowing southeasterly with a varying gradient of 10%-15%. Cover was low in this reach and bed materials were dominated by fines with large cobbles. Subsurface flow was periodic throughout this reach creating an impass to fish. Pooling water was observed.

Fish sampling was not conducted and no fish were observed.

This reach does not provide fish habitat.

Note: A full inventory could not be conducted on this reach because of heavy overnight snow fall. Environmental Dynamics felt that the information collected in the field should be provided in this report to assist in future inventory work.

Recommendation: Caution should be taken during logging to prevent siltation of the defaulted S-4* below this reach.

4.1.22.12 Stream EDI-818

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	818
Nearest Downstream Watershed Code	182-9146-725
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	Not Recorded
Stream Width (m)	< 1.5
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	Not applicable
Fish Species Identified	None
Description: This reach is located along the northwestern boundary of the proposed cutblock flowing easterly. Fish sampling was not conducted. No fish were observed. This reach contained poor fisheries habitat. Note: A full inventory could not be conducted on this reach because of heavy overnight snow fall. Environmental Dynamics felt that the information collected in the field should be provided in this report to assist in future inventory work. Recommendation: Caution should be taken during logging to avoid siltation of the defaulted S-4* located below this reach.	

4.1.22.13 Stream 182-9146-727

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-727
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	007
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	03-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	5.0
Stream Width (m)	3.60
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None

Description:

This moderately sized stream is located along the southwestern boundary of the cutblock and flows in a northwesterly direction. In this reach, this stream has a low gradient and was frequently confined. The 15% total cover was basically evenly distributed between boulders (30%), L.O.D. and deep pools (20% each), and overhanging vegetation and undercut banks (15% each). Bed material was dominated by 55% larges and 40% gravels. This reach flows directly into a larger system containing rainbow trout.

Fish sampling (electroshocking) was conducted for 96 sec. The frequency was set at M7 and the voltage at 300. No fish were captured or observed.

In this reach this stream had good rearing and spawning habitat. No fish were captured in this reach, therefore, it has been defaulted to S-3* classification under the Forest Practices Code.

Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

DFO/MoELP Stream Survey Form

20-Aug-97

Stream Survey Report

Watershed Code:

182-9146-727-000-000-000-000-000-000-000

Stream: Unnamed

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-727-000-000-000-000-000-000-000-000
 Location: 007 Whitefish
 Date: 03/10/96 Time: 13:50 Agency: EDI Survey Crew: DTUNHPA \ \ \ \ \ \ \ \

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10.377084.6047310

Access:

Reach No.: 1 Reach Length (km): 0.30000 Method: MW
 Site No.: 0 Length surveyed (m): 300.0 Method: MW
 Fish Card: N Field: Yes Historical: No
 Photos: 88: 21, 22 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.6 Method Av. Chan. Width (m): TF
 Av. Wet. Width (m): 1.8 Method Av. Wet. Width (m): MS
 Av. Max. Rif. Depth (cm): 8 Av. Max. Rifle Depth (cm): MS
 Av. Max. Pool Depth (cm): 25 Av. Max. Pool Depth (cm): 8
 Gradient (%): 7.0 Method Gradient: CL
 % Pool: 20 % Riffle: 35 % Run: 45 % Other: 0 Method: GE
 % Side Channel: 0 Method Side Channel: GE
 % Debris Area: 0-10 Method Debris Area: GE

Specific Data

4.0	3.2	3.7	3.9	3.2	3.8
-----	-----	-----	-----	-----	-----

Cover

Cover Total %: 15 Method Cover Total %: GE
 Dip Pool: 20 L.O.D.: 20 Boulder: 30 In Veg: 0 Over Veg: 15 Cutbank: 15
 Crown Closure %: 10 Method Crown Closure: GE Aspect: NW Method Aspect: C

Discharge

Wetted Width (m): 0.5 Method Wetted Width (m): MS
 Mean Depth (m): 0.1 Method Mean Depth (m): MS
 Mean Velocity (m/s): 0.20 Method Mean Velocity (m/s): F
 Discharge (m³/s): 0.01 Method Discharge (m³/s): F

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 5 % Fines (<2mm): 5
 % Gravels: 40 Small (2-16mm): 25
 % Large (16-64mm): 15
 % Large: 55 Small cobble (64-128mm): 15
 Large cobble (128-256mm): 10
 Boulder cobble (>256mm): 30
 % Bedrock: 0 % Bedrock: 0
 D90 (cm): 17 Compaction: High

Banks

Height (m): 0.5 % Unstable: No
 Textures Fines: Yes Gravel: No Large: No Bedrock: No
 Confinement: 3
 Valley: Chan. Ratio: 2
 Stage: L
 Flood Signs Ht(m): Method Flood Signs:
 Braided: N Method Braided:
 Bars (%): Method Bars:
 pH: Method pH:
 02 (ppm): Method Dissolved Oxygen:
 Water Temp. (°C): 5.0 Method Temperature:
 Turb. (cm): Method Turbidity:
 Cond. (umhos): Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

182-9146-727-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 88: 21u/s, 22 d/s.

Fish sampling (electroshocking) was conducted for 96 seconds. No fish were captured or observed.

This reach was defaulted to a S-3 classification under the Forest Practices Code.



Photo 194. Upstream view of Stream 182-9146-727 at Reach 1.



Photo 195. Downstream view of Stream 182-9146-727 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-727
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	007
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	03-Oct-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	4.0
Stream Width (m)	3.00
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None
Description: This moderately sized stream is located along the southwestern boundary of the cutblock and flows in a northwesterly direction. This stream flows into a larger system where rainbow trout were captured. The stream in this reach had a moderate gradient and was confined. Substrates in this reach were dominated by 55% larges and 40% gravels. The 20% total cover was dominated by undercut banks (35%) and then fairly evenly distributed between deep pools, L.O.D. and boulders. Fish sampling (electroshocking) was conducted for 266 sec and no fish were captured or observed. The electroshocker was set at a frequency of M7 and a voltage of 300. In this reach this stream had good rearing and spawning habitat. No fish were captured in this reach, therefore, it was defaulted to a S-3* classification under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within the system.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-727-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 182-9146-727-000-000-000-000-000-000-000-000
Location: 007 Whitefish

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10377291.6047159

Date: 03/10/96 Time: 11:40 Agency: EDI Survey Crew: DTNHPA \ \ \ \ \ \ \ \

Photos: 88: 21, 22

Access:

Reach No.: 2 Reach Length (km): 0.20000 Method: MW
Site No.: 0 Length surveyed (m): 200.0 Method: MW
Fish Card: N Field: Yes Horizontal: No

Channel Characteristics

Av. Chan. Width (m): 3.0 Method Av. Chan. Width (m): MS
Av. Wet Width (m): 1.6 Method Av. Wet Width (m): MS
Av. Max. Riff. Depth (cm): 8 Av. Max. Riffle Depth (cm): MS
Av. Max. Pool Depth (cm): 32 Av. Max. Pool Depth (cm): 8
Gradient (%): 11.0 Method Gradient: CL
% Pool: 15 % Riffle: 55 % Run: 30 % Other: 0 Method: GE
% Side Channel: 0-10 Method Side Channel: GE
% Debris Area: 10-40 Method Debris Area: GE

Specific Data

	2.4	3.4	2.7	2.6	3.0	4.0

Cover

Cover Total %: 20 Method Cover Total %: GE
Dp Pool: 15 L.O.D.: 20 Boulder: 25 In Veg: 0 Over Veg: 5 Cutbank: 35
Crown Closure %: 5 Method Crown Closure: GE Aspect: N Method Aspect: C

Discharge

Wetted Width (m): 1.7 Method Wetted Width (m): MS
Mean Depth (m): 0.2 Method Mean Depth (m): MS
Mean Velocity (m/s): 0.13 Method Mean Velocity (m/s): F
Discharge (m³/s): 0.03 Method Discharge (m³/s):

Specific Data

MS
MS
F

Reach Symbol

(Fish)

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

Bed Material

% Fines (<2mm): 5 % Fines (<2mm): 5
% Gravel: 40 Small (2-16mm): 25
Large (16-64mm): 15
% Largest: 55 Small cobble (64-128mm): 15
Large cobble (128-256mm): 10
Boulder cobble (>256mm): 30
% Bedrock: 0 % Bedrock: 0
D90 (cm): 22 Compaction: High

Banks

Height (m): 1.2 % Unstable: Yes Gravel: Yes Largest: Yes Bedrock: No
Textures Fines: Yes
Confinement: 2
Valley: Chan. Ratio: 5
Stage: L
Flood Signs H(m): 1 Method Flood Signs:
Braided: N Method Braided:
Bars (%): Method Bars:
pH: Method pH:
02 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 4.0 Method Temperature:
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form
20-Aug-97

Stream: Unnamed

Stream Survey Report

182-9146-727-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 88: 18 u/s, 19 d/s.

Fish sampling (electrofishing) was conducted for 266 seconds. No fish were captured or observed.

This reach has been given a defaulted S-3 classification under the Forest Practices Code.



Photo 196. Upstream view of Stream 182-9146-727 at Reach 2.



Photo 197. Downstream view of Stream 182-9146-727 at Reach 2.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-727
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	007
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	03-Oct-96
Reach Number	3
Site Number	Not Applicable
Water Temperature (°C)	5.0
Stream Width (m)	2.16
Length Surveyed (m)	400
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3*
Fish Species Identified	None

Description:

This moderately sized stream is located along the southwestern boundary of the cutblock and flows in a northwesterly direction. The upper limit of this reach is a beaver dam. It does not pose as an impass to fish migration as it has small channels on both sides. Pools created from the beaver dam could provide over-wintering habitat. The 30% total cover for this reach was dominated by boulders (30%) and undercut banks and L.O.D. (20% each). Substrates in this reach were dominated by larges (50%) and gravels 40%).

Fish sampling (electroshocking) was conducted for 321 sec and no fish were captured or observed. The electroshocker was set at a frequency of M7 and a voltage of 300.

This reach provides good rearing and spawning habitat and as no fish were captured has been defaulted to S-3* under the Forest Practices Code.

Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution.

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-727-000-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-727-000-000-000-000-000-000-000-000
 Location: 007 Whitefish

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10.377583.6946744

Date: 03/10/96 Time: 09:30 Agency: EDI Survey Crew: DNNHFA \ \ \ \ \ \ \ \

Access:

Reach No.: 3 Reach Length (km): 0.40000 Method: MW
 Site No.: 0 Length surveyed (m): 400.0 Method: MW
 Fish Card: N Field: Yes Historical: No
 Photos: 88, 16, 17 Air Photos:

Channel Characteristics

		Specific Data					
		2.2	2.0	2.2	2.1	2.3	2.1
Av. Chan. Width (m):	2.2 Method Av. Chan. Width (m):	TF					
Av. Wet. Width (m):	1.3 Method Av. Wet. Width (m):	MS					
Av. Max. Riff. Depth (cm):	10 Av. Max. Riffle Depth (cm):	MS					
Av. Max. Pool Depth (cm):	25 Av. Max. Pool Depth (cm):	10					
Gradient (%):	7.0 Method Gradient:	CL					
% Pool: 30	% Riffle: 40 % Run: 30 % Other: 0	Method: GE					
% Side Channel:	0 Method Side Channel:	GE					
% Debris Area:	>40 Method Debris Area:	GE					

Cover

Cover Total %: 30 Method Cover Total %: GE
 Dp Pool: 15 L.O.D.: 20 Boulder: 30 In Veg: 5 Over Veg: 10 Cutbank: 20
 Crown Closure %: 5 Method Crown Closure: GE Aspect: N Method Aspect: C

Discharge

Wetted Width (m): 0.7 Method Wetted Width (m): MS
 Mean Depth (m): 0.1 Method Mean Depth (m): MS
 Mean Velocity (m/s): 0.20 Method Mean Velocity (m/s): F
 Discharge (m³/s): 0.01 Method Discharge (m³/s):

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 10 % Fines (<2mm): 10
 % Gravels: 40 Small (2-16mm): 30
 Large (16-64mm): 10
 % Larges: 50 Small cobble (64-128mm): 0
 Large cobble (128-256mm): 15
 Boulder cobble (>256mm): 35
 % Bedrock: 0 % Bedrock: 0
 D90 (cm): 35 Compaction: High

Banks

Height (m): 40.0 % Unstable: 15
 Textures Fines: Yes Gravel: No Larges: No Bedrock: No
 Confinement: 3
 Valley: Chan. Ratio: 2
 Stage: L
 Flood Signs H(m): Method Flood Signs:
 Braided: Method Braided:
 Bars (%): Method Bars:
 pH: Method pH:
 O2 (ppm): Method Dissolved Oxygen:
 Water Temp. (°C): 5.0 Method Temperature:
 Turb. (cm): Method Turbidity:
 Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-727-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

CI

Film 88: 16 d/s, 17 w/s

Fish sampling (electroshocking) was conducted for 321 seconds. No fish were captured or observed.

This section of stream was defaulted to a S-3 classification under the Forest Practices Code.



Photo 198. Upstream view of Stream 182-9146-727 at Reach 3.



Photo 199. Downstream view of Stream 182-9146-727 at Reach 3.

4.1.22.14 Stream 182-9146-786

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-786
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	02-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	4
Stream Width (m)	0.91
Length Surveyed (m)	100
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This small, mid-gradient (11%) reach is located south of the cutblock and flowing southeasterly. A total cover of 30% is comprised of 30% L.O.D. and boulder, 20% undercut bank and 10% deep pool and overhanging vegetation. Bed materials of this confined reach made up of larges (60%), fines (30%), and gravels (10%). Fish sampling (electroshocking) was conducted for 90 sec (setting M-7; 300 V), however, no fish were captured or observed. This reach offers good rearing habitat, although no fish were captured, it flows directly into a fish bearing lake. Due to these reasons, it was defaulted to S-4* classification under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.	

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-786-000-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-786-000-000-000-000-000-000-000-000
 Location: 009 Whitefish

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10.375580.6046640

Date: 02/10/96

Time: 13:20

Agency: EDI

Survey Crew: N/A DT

Access:

Reach No.: 1

Reach Length (km): 0.10000

Site No.: 0

Length surveyed (m): 100.0

Fish Card: N

Field: Yes

Historical: No

Photos: 88, 7, 8 Air Photos:

FT

MW

MW

No

Channel Characteristics

Av. Chan. Width (m): 0.9 Method Av. Chan. Width (m): MS
 Av. Wet. Width (m): 0.8 Method Av. Wet. Width (m): MS
 Av. Max. Rif. Depth (cm): 2 Av. Max. Rifle Depth (cm): MS
 Av. Max. Pool Depth (cm): 12 Av. Max. Pool Depth (cm): 2
 Gradient (%): 11.0 Method Gradient: CL
 % Pool: 20 % Riffle: 80 % Run: 0 % Other: 0 Method: GE
 % Side Channel: 0-10 Method Side Channel: GE
 % Debris Area: 10-40 Method Debris Area: GE

Specific Data

0.6	1.0	1.4	1.0	0.7	0.8
-----	-----	-----	-----	-----	-----

Cover

Cover Total %: 30 Method Cover Total %: GE
 Dp Pool: 10 L.O.D.: 30 Boulder: 30 In Veg: 0 Over Veg: 10 Cutbank: 20
 Crown Closure %: 10 Method Crown Closure: GE Aspect: SE Method Aspect: C

Discharge

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

Specific Data

Reach Symbol

(Fish)

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

Bed Material

% Fines (<2mm): 30 % Fines (<2mm): 30
 % Gravels: 10 Small (2-16mm): 5
 Large (16-64mm): 5
 % Large: 60 Small cobble (64-128mm): 15
 Large cobble (128-256mm): 25
 Boulder cobble (>256mm): 20
 % Bedrock: 0 % Bedrock: 0
 D90 (cm): 20 Compaction: High

Banks

Height (m): 0.2 % Unstable: No
 Textures Fines: No Gravel: No Large: No Bedrock: No
 Confinement: 2
 Valley: Chan. Ratio: L
 Stage: L
 Flood Signs Hit(m): N
 Braided: N
 Bars (%): N
 pH: N
 02 (ppm): N
 Water Temp. (°C): 4.0
 Turb. (cm): N
 Cond. (µmhos): N

HT

DFO/MoELP Stream Survey Form

21-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-786-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 88: 7 u/s, 8 d/s

Fish sampling was conducted for 90 seconds (Setting M7, 300V). No fish were captured or observed.

This reach was defaulted to a S-4 classification under the Forest Practices Code.



Photo 200. Upstream view of Stream 182-9146-786 at Reach 1.



Photo 201. Downstream view of Stream 182-9146-786 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-786
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	02-Oct-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	4
Stream Width (m)	0.63
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-4*
Fish Species Identified	None
Description: This small, low gradient (5.0%) reach is located in the southwestern portion of the cutblock and flows southeasterly. A total cover of 20% is comprised of 40% undercut bank, 30% L.O.D. and 20% overhanging vegetation. Bed materials of this occasionally confined reach are made up of fines (55%) and gravels (40%). Fish sampling (electroshocking) was conducted for 83 sec (setting M-7; 300 V). However no fish were captured or observed. This reach provides potentially good spawning and rearing habitat, and because it flows into a fish bearing lake, it was defaulted to S-4* classification under the Forest Practices Code. Recommendation: Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.	

16-Aug-97

Stream: Unnamed

Watershed Code:

182-9146-786-000-000-000-000-000-000

[illegible]

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-786-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 88: 8 d/s, 9 u/s.

Fish sampling (electrofishing) was conducted for 83 seconds. No fish were captured or observed.

This reach was defaulted to a S-4 classification under the Forest Practices Code.



Photo 202. Upstream view of Stream 182-9146-786 at Reach 2.



Photo 203. Downstream view of Stream 182-9146-786 at Reach 2.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-786
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	16-Oct-96
Reach Number	3
Site Number	Not Applicable
Water Temperature (°C)	2
Stream Width (m)	0.5
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (3.0%) reach is located in the western portion of the cutblock and flows southeasterly. A total cover of 15% is comprised of 45% overhanging vegetation, 25% L.O.D. and 20% undercut bank. Bed materials of this frequently confined reach are made up of a fines (85%), with some larges (15%). This reach contains random sections of subsurface flow which likely pose impediments to fish migration. Fish sampling (electroshocking) was conducted of 73 sec (setting M-7; 300 V). However no fish were captured or observed. Due to the random sections of subsurface flow and low quality fish habitat this reach was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-786-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed Stream "Local": N/A Access: FT
Watershed Code: 182-9146-786-000-000-000-000-000-000-000-000 Reach No.: 3 Reach Length (km): 0.20000 Method: MW
Location: 009 Whitefish Map #: 93K/10 Site No.: 0 Length surveyed (m): 200.0 Method: MW
Date: 16/10/96 Time: 13:20 Agency: EDI Survey Crew: DTJ,JA \ \ \ \ \ \ \ \ \ \ Fish Card: Yes Historical: No
Photos: 60, 4, 5 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.5 Method Av. Chan. Width (m): MS
Av. Wet Width (m): 0.5 Method Av. Wet Width (m): MS
Av. Max. Riff. Depth (cm): 4 Av. Max. Riff. Depth (cm): MS
Av. Max. Pool Depth (cm): 10 Av. Max. Pool Depth (cm): 4
Gradient (%): 3.0 Method Gradient: CL
% Pool: 40 % Riffle: 20 % Run: 15 % Other: 25 Method: GE
% Side Channel: 0-10 Method Side Channel: GE
% Debris Area: 0-10 Method Debris Area: GE

Bed Material

% Fines (<2mm): 85 % Fines (<2mm): 85
% Gravels: 0 Small (2-16mm): 0
Large (16-64mm): 0
% Larges: 15 Small cobble (64-128mm): 10
Large cobble (128-256mm): 5
Boulder cobble (>256mm): 0
% Bedrock: 0 % Bedrock: 0
D90 (cm): High

Cover

Cover Total %: 15 Method Cover Total %: GE
Dp Pool: 10 L.O.D.: 25 Boulder: 0 In Veg.: 0 Over Veg.: 45 Cutbank: 20
Crown Closure %: 10 Method Crown Closure: GE Aspect: SE Method Aspect: C

Discharge

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

Reach Symbol

(Fish)

(Width, Valley, Channel, Slope)

(Bed Material)

Banks

Height (m): 0.1 % Unstable: 5
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 3
Valley: Chan. Ratio: L
Stage: Method Flood Signs:
Flood Signs H(m): N Method Braided:
Braided: Method Bars:
Bars (%): Method pH:
pH: Method Dissolved Oxygen:
02 (ppm): Method Temperature:
Water Temp. (°C): 2.0 Method Turbidity:
Turb. (cm): Method Conductivity:
Cond. (umhos):

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-786-000-000-000-000-000-000-000

Waterbed Code:

Fish Summary

Obstructions

Comments

C1

Film 60: 4 d/s, 5 u/s.

Fish sampling (electroshocking) was conducted for 73 seconds. No fish were captured or observed.

This reach was classified as a S-6 under the Forest Practices Code.



Photo 204. Upstream view of Stream 182-9146-786 at Reach 3.



Photo 205. Downstream view of Stream 182-9146-786 at Reach 3.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	182-9146-786
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	16-Oct-96
Reach Number	4
Site Number	Not Applicable
Water Temperature (°C)	2
Stream Width (m)	0.35
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, high gradient (17%) reach is located in the western portion of the cutblock and flows southeasterly. A total cover of 15% is comprised of 45% overhanging vegetation, 35% L.O.D., and 10% boulder and undercut bank. Bed materials of this confined reach are made up of fines (50%), larges (30%) and gravels (20%). This reach contained sections of sub-surface flow which may impede fish movement. Beyond the upper limit of this reach, seepage persists. Two additional seepage areas drain into this main seepage from the west. Fish sampling (electroshocking) was conducted for 77 sec (setting M-7; 300 V). However no fish were captured or observed. Due to the sections of sub-surface flow and low quality fish habitat, this reach was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-786-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 182-9146-786-000-000-000-000-000-000-000
Location: 009 Whitefish
Date: 16/10/96 Time: 16:00 Agency: EDI Survey Crew: JMD/DTA \ \ \ \ \ \ \ \

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10.374990.6047330

Access:

Reach No.: 4 Reach Length (km): 0.20000 Method: MW
Site No.: 0 Length surveyed (m): 200.0 Method: MW
Fish Card: N Field: Yes Historical: No
Photos: 60; 8, 9 Air Photos:

FT

Channel Characteristics

Av. Chan. Width (m): 0.3 Method Av. Chan. Width (m): MS
Av. Wet. Width (m): 0.3 Method Av. Wet. Width (m): MS
Av. Max. Riff. Depth (cm): 7 Av. Max. Riffle Depth (cm): MS
Av. Max. Pool Depth (cm): 10 Av. Max. Pool Depth (cm): 7
Gradient (%): 17.0 Method Gradient: CL
% Pool: 25 % Riffle: 35 % Run: 15 % Other: 25 Method: GE
% Side Channel: 0-10 Method Side Channel: GE
% Debris Area: 0-10 Method Debris Area: GE

Bed Material

% Fines (<2mm): 50 % Fines (<2mm): 50
% Gravels: 20 Small (2-16mm): 10
Large (16-64mm): 10
% Larges: 30 Small cobble (64-125mm): 10
Large cobble (128-256mm): 15
Boulder cobble (>256mm): 5
% Bedrock: 0 % Bedrock: 0
D90 (cm): 22 Compaction: High

Cover

Cover Total %: 15 Method Cover Total %: GE
Dp Pool: 0 L.O.D.: 35 Boulder: 10 In Veg: 0 Over Veg: 45 Cutbank: 10
Crown Closure %: 10 Method Crown Closure: GE Aspect: SE Method Aspect: C

Discharge

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

Reach Symbol

(Fish)

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

Banks

Height (m): 0.1 % Unstable: 5
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 2
Valley: Chan. Ratio: L
Stage: Method Flood Signs:
Flood Signs H(m): Method Braided:
Braided: Method Bars:
Bars (%): Method pH:
pH: Method Dissolved Oxygen:
O2 (ppm): Method Temperature:
Water Temp. (°C): 2.0 Method Turbidity:
Turb. (cm): Method Conductivity:
Cond. (umhos):

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

182-9146-786-000-000-000-000-000-000-000

Watershed Code:

Fish Summary***Obstructions******Comments***

C2

The clinometer read between 15 and 19% for approximately 200 m, then the ground flattened out at the top and became a serpage.

C3

The "other" category refers to cascades.

C1

Film 60: 8 d/s, 9 u/s.

Fish sampling (electroshocking) was conducted for 77 seconds. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 206. Upstream view of Stream 182-9146-786 at Reach 4.



Photo 207. Downstream view of Stream 182-9146-786 at Reach 4.

4.1.22.15 Stream EDI-508

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	508
Nearest Downstream Watershed Code	182-9146-786
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	02-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	4
Stream Width (m)	0.5
Length Surveyed (m)	150
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (4.0%) reach is located in the southwestern portion of the cutblock and flows easterly. A total cover of 30% is comprised of 35% undercut bank, 30% L.O.D., and 15% deep pool and overhanging vegetation. Bed materials of this occasionally confined reach are made up of fines (80%), gravels and larges (10% each). The lower limit of this reach is at a confluence of another system, while the upper limit is located where seepage prevails. This seepage area extends for approximately 100 m, after which another reach is present. Fish sampling (electroshocking) was conducted in this reach, however, no fish were captured or observed. This reach did not provide fish habitat and was classified as S-6 under the Forest Practices Code.	

Stream Survey Report

Stream: Unnamed

Watershed Code:

182-9146-786-999-000-000-000-000-000-000

Reach No.:	1	Reach Length (km):	0.15000	Method:	MW
Site No.:	0	Length surveyed (m):	150.0	Method:	MW
Fish Card:	N	Field:	Yes	Historical:	No
Photos:	88: 11, 12	Air Photos:			

Bed Material

% Fines (<2mm):	80	% Fines (<2mm):	80
% Gravels:	10	Small (2-16mm):	5
		Large (16-64mm):	5
% Larges:	10	Small cobble (64-128mm):	5
		Large cobble (128-256mm):	5
		Boulder cobble (>256mm):	0
% Bedrock:	0	% Bedrock:	0
D90 (cm):	10	Compaction:	High

Banks

<i>Banks</i>	Height (m):	0.1	% Unstable:	5
Textures Fines:		Yes	Gravel: No	Larges: No
				Bedrock: No

Specific Data

Stage:	L
Flood Signs H(m):	
Braided:	N
Bars (%):	
pH:	
02 (ppm):	
Water Temp. (°C):	4.0
Turb. (cm):	
Cond. (µmhos):	
Method Flood Signs:	
Method Braided:	
Method Bars:	
Method pH:	
Method Dissolved O ₂ :	
Method Temperature:	
Method Turbidity:	
Method Conductivity:	

pH:
O₂ (ppm):
Water Temp. (°C):
Turb. (cm):
Cond. (µmhos):

(Fish)	(E)
Width Valley Channel Slope	

DFO/MoELP Stream Survey Form

21-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-786-999-000-000-000-000-000-000

Waterbed Code:

Fish Summary

Obstructions

Comments

C1

Film 88: 11 d/s, 12 u/s

Fish sampling (electroshocking) was conducted in this reach. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.

C2

Note: Cover does not include sub-surface area.



Photo 208. Upstream view of Stream EDI-508 at Reach 1.



Photo 209. Downstream view of Stream EDI-508 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	508
Nearest Downstream Watershed Code	182-9146-786
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	009
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Oct-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	1
Stream Width (m)	0.5
Length Surveyed (m)	500
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (6.0%) reach is located in the western portion of the cutblock, flowing southeasterly. A total cover of 15% was comprised of 45% overhanging vegetation, 30% L.O.D. and 15% undercut bank. Bed materials of this frequently confined reach are made up of fines (55%), larges (25%) and gravels (20%). This reach contains sections of subsurface flow which may impede fish migration. The upper and lower limits of this reach are bound by seepage. Fish sampling (electroshocking) was conducted for 102 sec (setting M-7; 300 V). However, no fish were captured or observed. Due to sections of subsurface flow and the reach being inaccessible to fish, this reach was classified as S-6 under the Forest Practices Code.	

Stream Survey Report

Watershed Code:

182-9146-786-999-000-000-000-000-000-000

DFO/MoELP Stream Survey Form

Stream: Unnamed

21-Aug-97

Header Information

Stream Name: Unnamed
 Watershed Code: 182-9146-786-999-000-000-000-000-000-000-000
 Location: ND/WSC: 182-9146-786; 009 Whitefish

Stream "Local": EDI 508

Map #: 93K/10

U.T.M.: 10.374890.6047140

Date: 17/10/96 Time: 11:30 Agency: EDI Survey Crew: JMDT \ \ \ \ \ \ \ \

Access:
 Reach Length (km): 2
 Length surveyed (m): 0
 Field: Yes
 Fish Card: N
 Photos: 60: 10, 11
 Air Photos:

FT
 Method: MW
 Method: MW
 Historical: No

Channel Characteristics

Av. Chan. Width (m): 0.5 Method Av. Chan. Width (m): MS
 Av. Wet. Width (m): 0.4 Method Av. Wet. Width (m): MS
 Av. Max. Riff. Depth (cm): 2 Av. Max. Riff. Depth (cm): MS
 Av. Max. Pool Depth (cm): 20 Av. Max. Pool Depth (cm): 2
 Gradient (%): 6.0 Method Gradient: CL
 % Pool: 30 % Riffle: 10 % Run: 45 % Other: 15 Method: GE
 % Side Channel: 0 Method Side Channel: GE
 % Debris Area: 0-10 Method Debris Area: GE

Specific Data

0.5 0.6 0.5 0.2 0.8 0.3

Cover

Cover Total %: 15 Method Cover Total %: GE
 Dp Pool: 5 L.O.D.: 30 Boulder: 5 In Veg.: 0 Over Veg.: 45 Cutbank: 15
 Crown Closure %: 10 Method Crown Closure: GE Aspect: SE Method Aspect: C

Discharge

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

Specific Data

Reach Symbol

(Fish)

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

Bed Material

% Fines (<2mm): 55
 % Gravels: 20
 % Large: 25
 % Bedrock: 0
 D90 (cm): 35
 % Fines (<2mm): 55
 Small (2-16mm): 5
 Large (16-64mm): 15
 Small cobble (64-128mm): 10
 Large cobble (128-256mm): 10
 Boulder cobble (>256mm): 5
 % Bedrock: 0
 Compaction: Medium

Banks

Height (m): 0.1
 Textures Fines: Yes
 Confinement: 3
 Valley: Chan. Ratio: M
 Stage: N
 Flood Signs Ht(m): N
 Braided: N
 Bars (%): N
 pH: N
 02 (ppm): 1.0
 Water Temp. (°C):
 Turb. (cm):
 Cond. (µmhos):
 % Unstable: No
 Gravel: No
 Larges: Yes
 Bedrock: No
 Method Flood Signs:
 Method Braided:
 Method Bars:
 Method pH:
 Method Dissolved Oxygen:
 Method Temperature:
 Method Turbidity:
 Method Conductivity:

DFO/MoELP Stream Survey Form

21-Aug-97 Stream: Unnamed

Stream Survey Report

182-9146-786-999-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 60: 10 d/s, 11 u/s.

Fish sampling (electroshocking) was conducted for 102 seconds. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.



Photo 210. Upstream view of Stream EDI-508 at Reach 2.



Photo 211. Downstream view of Stream EDI-508 at Reach 2.

4.1.22.16 Stream EDI-505

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	505
Nearest Downstream Watershed Code	182-9146-04
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	Whi
Cutblock Number	010
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	02-Oct-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	4
Stream Width (m)	0.78
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small mid-gradient (9.0%) reach is located along the southwestern boundary of the cutblock, flowing southeasterly. A total cover of 25% was comprised of 40% overhanging vegetation, 35% L.O.D., and 10% deep pool and boulder. Bed materials of this unconfined reach are made up of fines (50%), larges (40%), and gravels (10%). This reach has been affected by previous logging of an adjacent cutblock (50-27). Skidder tracks have altered stream flow and influenced the substrate composition. Large amounts of woody debris and sections of subsurface flow are apparent throughout the reach, making fish migration difficult. Approximately 100 m upstream of the road crossing, this reach spreads out into seepage. Fish sampling (electroshocking) was conducted for 290 secs at a setting of M7-10; 200-400 volts. No fish were captured or observed. Due to the low quality fish habitat present, it was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

21-Aug-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

182-9146-999-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 182-9146-999-000-000-000-000-000-000-000-000
Location: ND/WSC: 182-9146; 10 Whitefish

Stream "Local": EDI 505
Map #: 93K/10
U.T.M.: 10.374253.6046309

Date: 02/10/96 Time: 10:30 Agency: EDI Survey Crew: DTNHPA \ \ \ \ \ \ \ \ \ \

Access: FT
Reach No.: 1 Reach Length (km): 0.30000 Method: MW
Site No.: 0 Length surveyed (m): 300.0 Method: MW
Fish Card: N Field: Yes Historical: No
Photos: 93: 23, 24 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.8 Method Av. Chan. Width (m): MS
Av. Wet Width (m): 0.8 Method Av. Wet Width (m): MS
Av. Max. Riff. Depth (cm): 2 Av. Max. Riffle Depth (cm): MS
Av. Max. Pool Depth (cm): 20 Av. Max. Pool Depth (cm): 2
Gradient (%): 9.0 Method Gradient: CL
% Pool: 15 % Riffle: 35 % Run: 50 % Other: 0 Method: GE
% Side Channel: 10-40 Method Side Channel: GE
% Debris Area: >40 Method Debris Area: GE

Specific Data

0.8	0.9	0.8	0.8	0.8	0.6
-----	-----	-----	-----	-----	-----

Cover

Cover Total %: 25 Method Cover Total %: GE
Dp Pool: 10 L.O.D.: 35 Boulder: 10 In Veg.: 0 Over Veg: 40 Cutbank: 5
Crown Closure %: 0 Method Crown Closure: GE Aspect: SE Method Aspect: C

Discharge

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

Specific Data

Reach Symbol

(Fish)

(Width, Valley: Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 50 % Fines (<2mm): 50
% Gravels: 10 Small (2-16mm): 5
% Large (16-64mm): 5
% Large: 40 Small cobble (64-128mm): 15
Large cobble (128-256mm): 15
Boulder cobble (>256mm): 10
% Bedrock: 0 % Bedrock: 0
D90 (cm): 15 Compaction: High

Banks

Height (m): 0.3 % Unstable: 10
Textures Fines: Yes Gravel: No Largest: No Bedrock: No
Confinement: 5
Valley: Chan. Ratio: L
Stage: L
Flood Signs Ht(m): N Method Flood Signs:
Braided: N Method Braided:
Bars (%): N Method Bars:
pH: Method pH:
02 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 4.0 Method Temperature:
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

DFO/MoELP Stream Survey Form

21-Aug-97

Stream: Unnamed

Stream Survey Report

182-9146-999-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 93: 23 u/s, 24 d/s

Fish sampling (electroshocking) was conducted for 290 seconds. No fish were captured or observed.

This reach was given a S-6 classification under the Forest Practices Code.

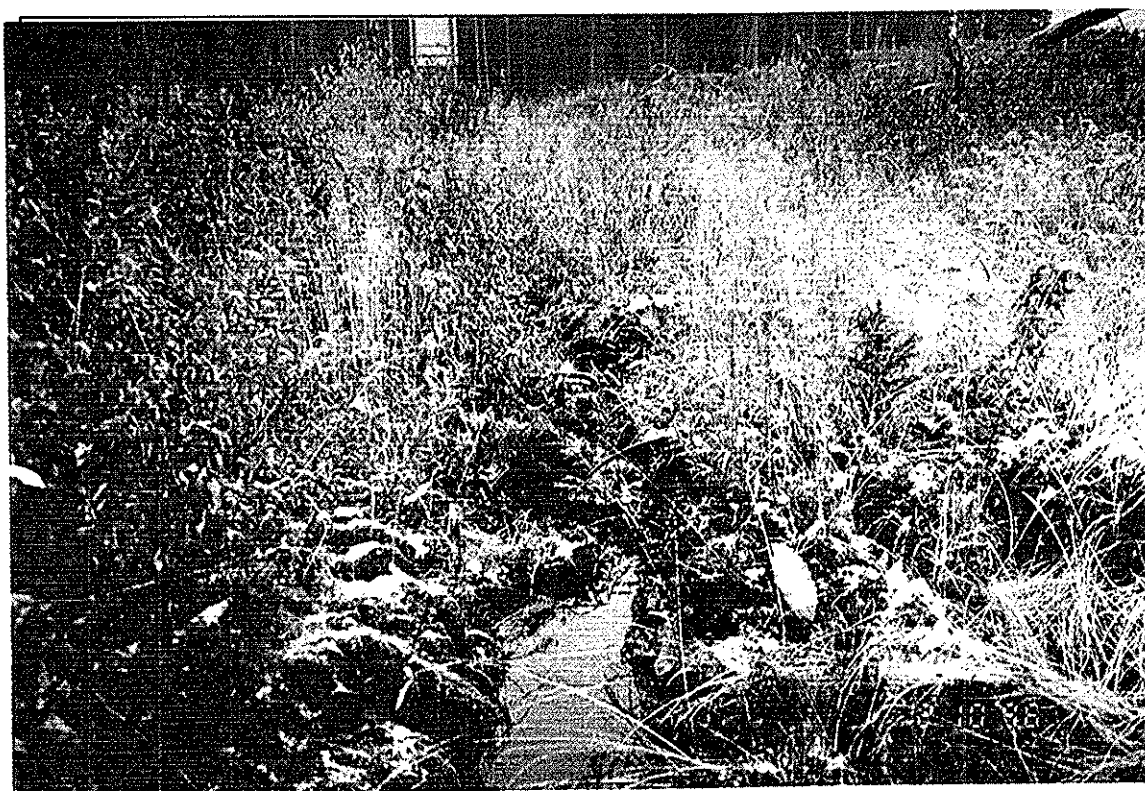


Photo 212. Upstream view of Stream EDI-505 at Reach 1.

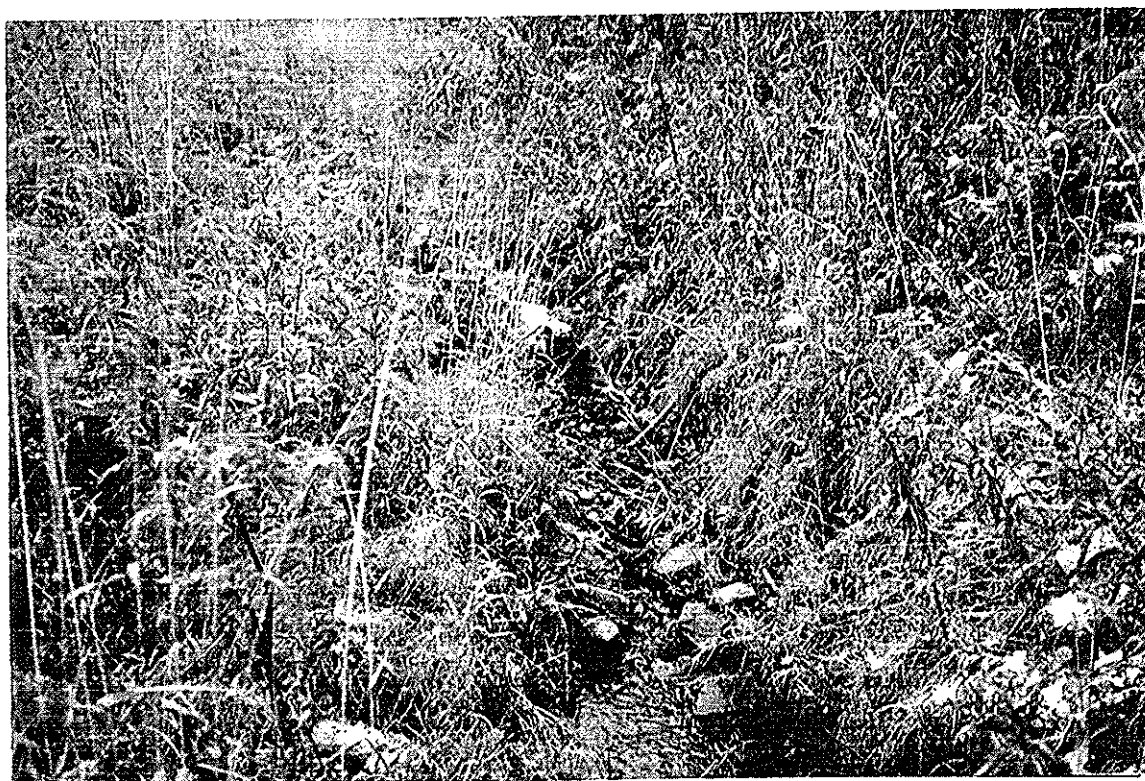


Photo 213. Downstream view of Stream EDI-505 at Reach 1.

4.2. Babine Lake Watershed Group

4.2.1 Shass Creek Watershed (480-9936-187)

Shass Creek Watershed is located within BC Environment Management Unit 6-6 (BC Recreational Atlas 1993) within the northeastern portion of the Babine Lake Watershed Group, surrounding Camsell Lake (Fig. 24). The main system flows into Sutherland River and eventually into Babine Lake. It is surrounded by the Stuart Lake Watershed Group to the north, Sutherland River to the west and south and Grassham Lake to the east. Occupying 6,126 ha of the Babine Provincial Forest, the elevation ranges from approximately 730 m at the confluence of Sutherland River to approximately 1,070 m in the headwaters of Camsell and Ogston lakes (BC Environment 1995; Department of Energy, Mines and Resources 1978). Only a small section in the northern portion of this watershed was surveyed by *Environmental Dynamics* in 1995.

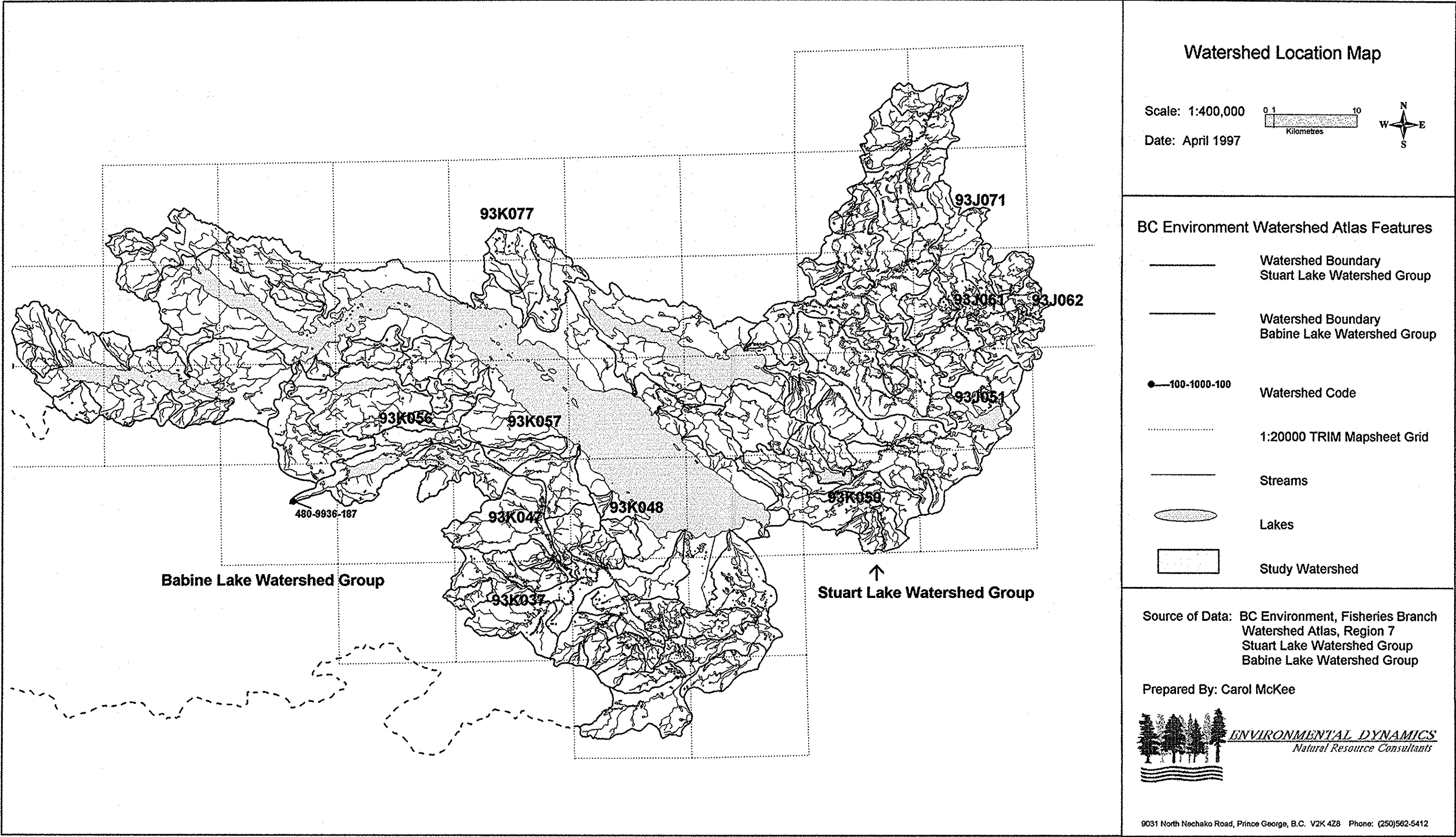
This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) and the Nechako Moist Very Cold Engelmann Spruce-Subalpine Fir (ESSFmv1) (DeLong et al. 1993).

According to BC Environment lake inventory files (1970-1996), the only fish species documented in Shass Creek Watershed is rainbow trout. The lakes which have been inventoried in this watershed are Camsell Lake and Ogston Lake (BC Environment 1997b).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. A WMC is located in the southern portion of Watershed 480-9936-187 fringing the southern edge of Camsell Lake, continuing east to Grassham Lake and finally south to Shass Mountain outside of Watershed 480-9936-187 (Canfor 1996).

Since this watershed lies within a portion of Canfor's Whitefish Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

Figure 24. Location of Shass Creek Watershed (480-9936-187) within the Babine Lake Watershed Group



4.2.1.1 Stream 480-9936-187

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	480-9936-187
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	055
Cutblock Number	045
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	30-Jun-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	24
Stream Width (m)	3.6
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-3
Fish Species Identified	RB - Rainbow Trout
Description: This low gradient (3.5%) reach flows west along the northwestern boundary of the cutblock. A total cover of 15% was provided by boulders (40%), overhanging vegetation (30%), large organic debris (20%) and deep pools (10%). Bed materials of this confined reach consisted of 70% larges, 20% fines and 10% gravels. The reach drains into Camsell Lake and the upper limit is a breached beaver dam which is 1.5 m high. Fish sampling (electroshocking) was conducted for 205 sec, however, no fish were captured or observed. Previous sampling on June 14, 1995 resulted in the capture of rainbow trout near the mouth of this reach. This reach provides good spawning potential and rearing habitat and since regionally significant fish were captured, it was classified as S-3 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

17-Dec-97 Stream: Unnamed

Stream Survey Report

Watershed Code:

480-9936-187-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 480-9936-187-000-000-000-000-000-000-000-000
Location: 055-045 Whitefish
Date: 6/30/95 Time: 15:00 Agency: EDI Survey Crew: RVA SC \ \ \ \ \ \ \ \

Stream "Local": N/A

Map #: 93K/10

U.T.M.: 10.379940.6042940

Access:
Reach No.: 1 Reach Length (km): 0.30000 Method: GE
Site No.: 0 Length surveyed (m): 300.0 Method: GE
Fish Card: N Field: Yes Historical: No
Photos: 11: 11 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 3.7 Method Av. Chan. Width (m): TF
Av. Wet Width (m): 3.6 Method Av. Wet Width (m): TF
Av. Max. Rif. Depth (cm): 8 Av. Max. Riffle Depth (cm): MS
Av. Max. Pool Depth (cm): 40 Av. Max. Pool Depth (cm): 8
Gradient (%): 3.5 Method Gradient: CL
% Pool: 10 % Riffle: 20 % Run: 70 % Other: 0 Method: GE
% Side Channel: 0-10 Method Side Channel: GE
% Debris Area: 10-40 Method Debris Area: GE

Specific Data

5.1 3.2 3.6 3.1 3.3

Cover

Cover Total %: 15 Method Cover Total %: GE
Dp Pool: 10 L.O.D.: 20 Boulder: 40 In Veg.: 0 Over Veg.: 30 Cutbank: 0
Crown Closure %: 15 Method Crown Closure: GE Aspect: W Method Aspect: C

Discharge

Wetted Width (m): 2.5 Method Wetted Width (m):
Mean Depth (m): 0.1 Method Mean Depth (m):
Mean Velocity (m/s): 0.50 Method Mean Velocity (m/s):
Discharge (m³/s): Method Discharge (m³/s):

Reach Symbol

(Fish)

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

Bed Material

% Fines (<2mm): 20 % Fines (<2mm): 20
% Gravels: 10 Small (2-16mm): 5
Large (16-64mm): 5
% Larges: 70 Small cobble (64-128mm): 15
Large cobble (128-256mm): 15
Boulder cobble (>256mm): 40
% Bedrock: 0 % Bedrock: 0
D90 (cm): Compaction: Medium

Banks

Height (m): 0.3 % Unstable: 0
Textures Fines: Yes Gravel: No Larges: No Bedrock: No
Confinement: 2
Valley: Chan. Ratio: M
Stage: Method Flood Signs:
Flood Signs Ht(m): Method Braided:
Braided: N Method Bars:
Bars (%): Method pH:
pH: Method Dissolved Oxygen:
02 (ppm): Method Temperature:
Water Temp. (°C): 24.0 Method Turbidity:
Turb. (cm): Method Conductivity:
Cond. (µmhos):

DFO/MoELP Stream Survey Form

17-Dec-97 Stream: Unnamed

Stream Survey Report

480-9936-187-000-000-000-000-000-000-000

Watershed Code:

Fish Summary

Species	Number	Size (mm)	Depth	Phase	Sex	Age	Size	Weight	Length
RB	2			A	S				EL

Obstructions**Comments**

- C2 There is a beaver dam located at the top of the reach. It may be passable through a breach in the bottom.
Note: Two rainbow trout were caught. One was an adult in spawning condition and the second was a juvenile using the stream in a rearing capacity.
- C1 Film 11: 11 d/s
Fish sampling (electrofishing) was conducted for 205 seconds and rainbow trout were captured.
This section of stream is classified as a S-3 stream under the Forest Practices Code.



Photo 214. Downstream view of Stream 480-9936-187 at Reach 1.

4.2.1.2 Stream EDI-790

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	790
Nearest Downstream Watershed Code	480-9936-187
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	055
Cutblock Number	045
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	30-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	450
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This wetland is located along the northeastern boundary of the cutblock and drains northwest. The surveyed area is quite flat and wide (approximately 20 m). It does not contain a continuous definable channel or flowing water. Overall, this wetland provided low quality fish habitat. Fish sampling was not conducted in this wetland and no fish were observed. Since this is a wetland, a stream classification is not required under the Forest Practices Code.	

4.2.1.3 Stream 480-9936-187-726

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	480-9936-187-726
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	055
Cutblock Number	045
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	30-Jun-95
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	21
Stream Width (m)	10
Length Surveyed (m)	700
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-2
Fish Species Identified	RB - Rainbow Trout
Description: This large, low gradient (6.0%) reach flows west along the southern boundary of the cutblock. A total cover of 70% is comprised of 40% boulders, 30% overhanging vegetation, 20% pools and 10% large organic debris. Bed materials of this confined reach are made up of larges (70%), gravels and fines (15% each). The lower limit of this reach is Camself Lake, while the upper limit is a long narrow unnamed lake. Rainbow trout were observed in this upstream lake. Fish sampling (electroshocking) was conducted for 315 sec resulting in the capture of 3 juvenile rainbow trout. This reach contains potentially excellent spawning and rearing habitat, and since regionally significant fish were captured, it was classified as S-2 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

20-Aug-97

Stream: Unnamed

Stream Survey Report

Watershed Code: 480-9936-187-726-000-000-000-000-000-000-000

Header Information

Stream Name: Unnamed
Watershed Code: 480-9936-187-726-000-000-000-000-000-000-000-000
Location: 055-045 Whitefish

Stream "Local": N/A
Map #: 93K/10
U.T.M.: 10-380080.6042627

Date: 30/06/95 Time: 13:40 Agency: EDI Survey Crew: RV/SC

Access:
Reach No.: 1 Reach Length (km): 0.7 Method: GE
Site No.: 0 Length surveyed (m): 700.0 Method: GE
Fish Card: N Field: Yes Historical: No
Photos: 11:10 Air Photos:

FT
GE
GE
No

Channel Characteristics

Av. Chan. Width (m): 10.0 Method Av. Chan. Width (m): TF
Av. Wet. Width (m): 9.3 Method Av. Wet. Width (m): TF
Av. Max. Riff. Depth (cm): 15 Av. Max. Riffle Depth (cm): TF
Av. Max. Pool Depth (cm): 40 Av. Max. Pool Depth (cm): 15
Gradient (%): 6.0 Method Gradient: CL
% Pool: 10 % Riffle: 50 % Run: 40 % Other: 0 Method: GE
% Side Channel: 0-10 Method Side Channel: GE
% Debris Area: 10-40 Method Debris Area: GE

Specific Data

10.0 9.3 10.7

Cover

Cover Total %: 70 Method Cover Total %: GE
Dp Pool: 20 L.O.D.: 10 Boulder: 40 In Veg.: 0 Over Veg.: 30 Cutbank: 0
Crown Closure %: 5 Method Crown Closure: GE Aspect: W Method Aspect: C

Discharge

Wetted Width (m): 10.0 Method Wetted Width (m): MS
Mean Depth (m): 0.2 Method Mean Depth (m): MS
Mean Velocity (m/s): 0.80 Method Mean Velocity (m/s): F
Discharge (m³/s): Method Discharge (m³/s):

Specific Data

Reach Symbol

(Fish)

(Width, Valley, Channel, Slope)

(Bed Material)

Bed Material

% Fines (<2mm): 15 % Fines (<2mm): 15
% Gravels: 15 Small (2-16mm): 5
Large (16-64mm): 10
% Larges: 70 Small cobble (64-128mm): 10
Large cobble (128-256mm): 10
Boulder cobble (>256mm): 50
% Bedrock: 0 % Bedrock: 0
D90 (cm): Compaction: Low

Banks

Height (m): 0.3 % Unstable: No Larges: No Bedrock: No
Textures Fines: Yes Gravel: No
Confinement: 2
Valley: Chan. Ratio: M
Stage: M
Flood Signs Ht(m): N
Braided: N
Bars (%): Method Bars:
pH: Method pH:
02 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 21.0 Method Temperature:
Turb. (cm): Method Turbidity:
Cond. (umhos): Method Conductivity:

DFO/MoELP Stream Survey Form

20-Aug-97 Stream: Unnamed

Stream Survey Report

480-9936-187-726-000-000-000-000-000-000

Watershed Code:

Fish Summary

RB	380-100	J	R	EL

Obstructions**Comments**

CI

Film 11: 10 w/s

Fish sampling (electrofishing) was conducted for 315 seconds and resulted in the capture of 3 rainbow trout.

This section of stream is classified as a S-2 stream under the Forest Practices Code.

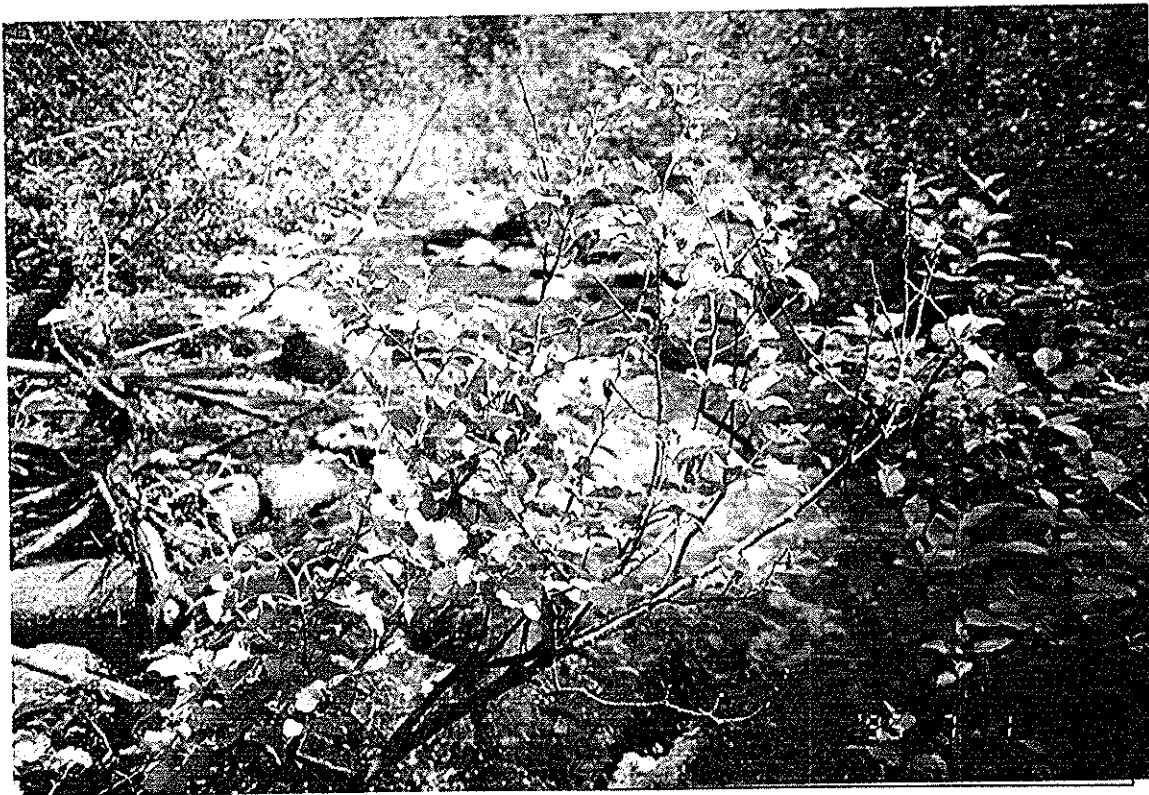


Photo 215. Upstream view of Stream 480-9936-187-726 at Reach 1.

4.2.2 Watershed 480-9936-187-799

Watershed 480-9936-187-799 is located within BC Environment Management Unit 6-6 (BC Recreational Atlas 1993) within the northeastern portion of the Babine Lake Watershed Group, surrounding Camsell Lake (Fig. 25). The main system flows into Sutherland River and eventually into Babine Lake. It is surrounded by the Stuart Lake Watershed Group to the east, Ogston Lake to the north, Camsell Lake to the west and Shass Mountain to the south. Occupying 4,259 ha of the Babine Provincial Forest, the geological relief ranges from approximately 950 m at the confluence of Sutherland River to approximately 1,560 m in the headwaters of Camsell and Ogston lakes (BC Environment 1995; Department of Energy, Mines and Resources 1978). Only a small section in the northern portion of this watershed was surveyed by *Environmental Dynamics* in 1995.

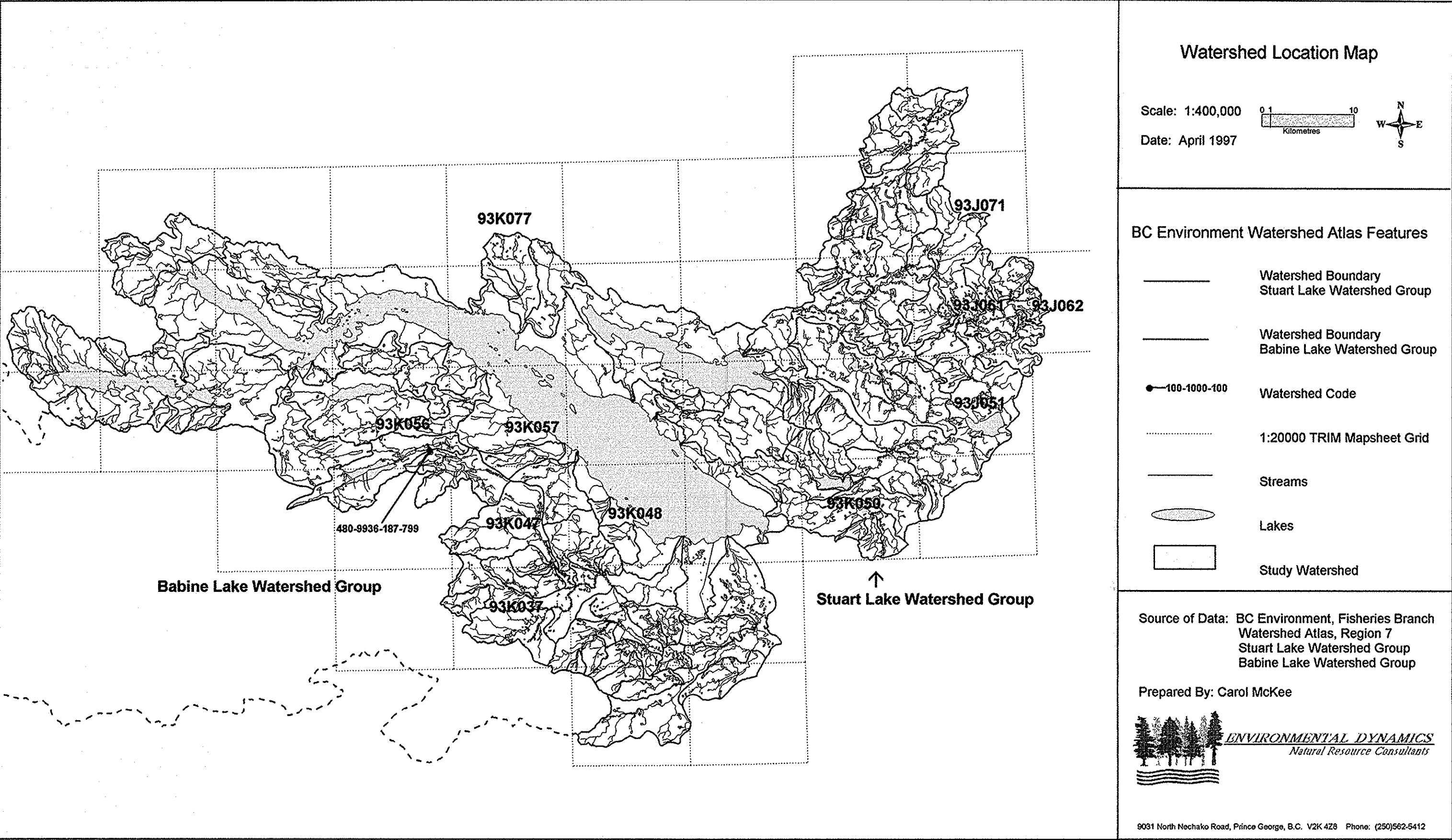
This watershed is dominated by two sub-zones/variants according to the biogeoclimatic units of the Prince George Forest Region. These units include: the Babine Moist Cold Sub-Boreal Spruce sub-zone (SBSmc2) and the Nechako Moist Very Cold Engelmann Spruce-Subalpine Fir (ESSFmv1) (DeLong et al. 1993).

According to BC Environment lake inventory files (1970-1996), the only fish species documented in Watershed 480-9936-187-799 is rainbow trout (BC Environment 1997b). The lakes which have been inventoried in this watershed are Jenny Lake and Grassham Lake (BC Environment 1997b).

Canfor together with BC Environment have created Wildlife Movement Corridors (WMC) to be included in Canfor's five year development plans. These WMC's provide cover and allow animals to travel through non-logged areas. A WMC is located in the southern portion of Watershed 480-9936-187-799 fringing the southern edge of Camsell Lake, continuing east into Grassham Lake within Watershed 480-9936-187-799 and finally south to Shass Mountain (Canfor 1996).

Since this watershed lies within a portion of Canfor's Whitefish Operating Area, linear development is common throughout the area (Ministry of Forests 1995; Canfor 1996). The major gravel roads located in this watershed are the Cunningham FSR and its adjoining sideroads (Canfor 1996).

Figure 25. Location of Watershed 480-9936-187-799 within the Babine Lake Watershed Group



4.2.2.1 Stream EDI-568

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	568
Nearest Downstream Watershed Code	480-9936-187-799
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	055
Cutblock Number	048
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	14-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	300
Habitat Type	Dry Depression
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This dry depression is located with the eastern portion of the cutblock and drains in an easterly direction. The block had already been logged at the time of survey. This steep sided gully contained a large amount of post-logging debris which restricted any flow of water. Some sections of pooled water existed but a continuous definable channel or flowing water were not evident. Fish sampling was not conducted in this dry depression and no fish were observed. Dry depressions do not require classification under the Forest Practices Code.	

4.2.2.2 Stream EDI-569

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	569
Nearest Downstream Watershed Code	480-9936-187-799
NTS Map (1:50,000)	93K/10
TRIM Map	93K046
Cutting Permit	055
Cutblock Number	048
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	14-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	200
Habitat Type	Dry Depression
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This dry depression is located with the western portion of the cutblock and drains in an easterly direction. The block had already been logged at the time of survey. This steep sided gully contained a large amount of post-logging debris which restricted any flow of water. Some sections of pooled water existed but a continuous definable channel or flowing water were not evident. Fish sampling was not conducted in this dry depression and no fish were observed. Dry depressions do not require classification under the Forest Practices Code.	

4.2.2.3 Stream EDI-787

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	787
Nearest Downstream Watershed Code	480-9936-187-799
NTS Map (1:50,000)	93K/10
TRIM Map	93K047
Cutting Permit	314
Cutblock Number	004
Operating Area	Whitefish
Development Type	None
Survey Date	16-Sep-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: The TRIM map indicated a stream near the southeastern boundary of the cutblock. Ground survey indicated that a stream was not located in this area. This stream does not exist.	

4.2.2.4 Stream EDI-592

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	592
Nearest Downstream Watershed Code	480-9936-187-779
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	314
Cutblock Number	004
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Sep-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	30
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seasonally flooded wetland is located along the southern boundary of the cutblock and drains in a northwesterly direction. This area is a back water area of Grassham Lake. There was minimal water in this area at time of survey, but it would likely become flooded and accessible to fish during periods of high water. This area extends for approximately 30 m inland from Grassham Lake. The substrate was organic substrate content and the area lacked deep pools. Spawning habitat was non-existent. Fish sampling was not conducted in this area and no fish were observed. This area contained low quality fish habitat, but may be accessible to fish during periods of high water. It should, therefore, be considered a fisheries sensitive zone.	

4.2.2.5 Stream 480-9936-187-799-369

Gazetted Stream Name	Unnamed Stream
Local Stream Name	Not Applicable
Watershed Code	480-9936-187-799-369
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	314
Cutblock Number	004
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Sep-96
Reach Number	1
Site Number	Not Applicable
Water Temperature (°C)	5.5
Stream Width (m)	1.4
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None

Description:

This low gradient (1.0%) reach flows in a westerly direction along the southern portion of the cutblock. Limited rearing habitat was provided by a few pools (15%) and standing water (30%). Total cover of 10% was comprised of 55% overhanging vegetation, and 30% instream vegetation. Bed materials consisted entirely of fines (85%) and larges (15%), indicating poor spawning potential. An abundance of moss within the wetted channel width and stagnant pools of water indicated limited flow. The lower limit of this reach is Grassham Lake, and the upper limit is a seepage area. This seepage extends for approximately 50 m and contains no definable channel or flowing water.

Fish sampling (electroshocking) was conducted for 165 sec. No fish were captured or observed.

As this reach provided low quality fish habitat, it was classified as S-6 under the Forest Practices Code.

DFO/MoELP Stream Survey Form

Stream: Unnamed Stream

02-Sep-97

Stream Survey Report

480-9936-187-799-369-000-000-000-000-000-000

Watershed Code:

Header Information

Stream Name: Unnamed Stream
Watershed Code: 480-9936-187-799-369-000-000-000-000-000-000-000-000
Location: 314-4 Whitefish

Stream "Local": N/A

Map #: 93K/10
U.T.M.: 10.384610.6041550

Survey Crew: DT BRUM

Agency: EDI

Time: 11:30

Access:

Reach No.: 1

Site No.: 0

Fish Card: N

Photos: 76, 8, 9

Reach Length (km): 0.20000

Length surveyed (m): 200.0

Field: Yes

Air Photos:

FT

MW

MW

No

Historical:

Method:

Method:

Method:

Method:

Bed Material

Specific Data

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

Cover

Cover Total %: 10 Method Cover Total %: GE

Dp Pool: 5 L.O.D.: 5 Boulder: 5 In Veg.: 30 Over Veg.: 55 Outbank: 0

Crown Closure %: 20 Method Crown Closure: GE Aspect: W Method Aspect: C

Discharge

Wetted Width (m): Method Wetted Width (m):

Mean Depth (m): Method Mean Depth (m):

Mean Velocity (m/s): Method Mean Velocity (m/s)

Discharge (m³/s): Method Discharge (m³/s):

Reach Symbol

(Fish)

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

Banks

Height (m): 0.1

Textures Fines: Yes

Gravel: No

Larges: No

Bedrock: No

D90 (cm): 10

Compaction: High

Specific Data

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

1.4 1.2 1.5 1.9 1.6 1.1

DFO/MoELP Stream Survey Form

02-Sep-97 Stream: Unnamed Stream

Stream Survey Report

480-9936-187-799-369-000-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 76: 8 d/s, 9 w/s.

Fish sampling (electrofishing) was conducted for 165 seconds. No fish were captured or observed.

This section of stream is classified as a S-6 stream under the Forest Practices Code.



Photo 216. Upstream view of Stream 480-9936-187-799-369 at Reach 1.



Photo 217. Downstream view of Stream 480-9936-187-799-369 at Reach 1.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	480-9936-187-799-369
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	314
Cutblock Number	004
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Sep-96
Reach Number	2
Site Number	Not Applicable
Water Temperature (°C)	7
Stream Width (m)	0.7
Length Surveyed (m)	300
Habitat Type	Stream
Stream Order (1:20,000)	1
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (1%) reach flows in a westerly direction through the middle of the cutblock. Total cover of 15% is comprised of 55% overhanging vegetation, 25% large organic debris, and 20% deep pool. Bed materials of this unconfined reach were dominated by fines (100%), indicating no spawning potential. As there was low flow and shallow pools, rearing potential is minimal. The lower limit of this reach was a treed wetland containing no channel, while the upper limit was a small seepage extending for approximately 100 m. The seepage had some flow, however, there was no continuous channel. Fish sampling (electroshocking) was conducted for 156 sec (setting M7, 300V). No fish were captured or observed. As this reach provides low quality fish habitat and the downstream wetland impedes fish migration, it was classified as S-6 under the Forest Practices Code.	

DFO/MoELP Stream Survey Form

02-Sep-97 Stream: Unnamed

Stream Survey Report

480-9936-187-799-369-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

C1

Film 76: 10 d/s, 11 u/s.

Fish sampling (electroshocking) was conducted for 156 seconds. No fish were captured or observed.

This reach is classified as S-6 under the Forest Practices Code.



Photo 218. Upstream view of Stream 480-9936-187-799-369 at Reach 2.



Photo 219. Downstream view of Stream 480-9936-187-799-369 at Reach 2.

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	480-9936-187-799-369
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	314
Cutblock Number	004
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Sep-96
Reach Number	3
Site Number	Not Applicable
Water Temperature (°C)	10
Stream Width (m)	0.8
Length Surveyed (m)	200
Habitat Type	Stream
Stream Order (1:20,000)	2
Forest Practices Code Stream Classification	S-6
Fish Species Identified	None
Description: This small, low gradient (3%) reach flows in a westerly direction along the northern portion of the cutblock. Rearing habitat is minimal as a result of low total cover (10%) and limited pooling. In addition, the high content of fine (80%) substrate limited spawning potential. The lower limit of this reach was at a seepage area, while the upper limit is Cunningham FSR. The upper portions of this reach contain slightly more water than the lower sections due to run off from Cunningham FSR. Fish sampling (electroshocking) was conducted for 98 sec (setting M7, 300V). No fish were captured or observed. Since this reach provided low quality fish habitat and an impediment to fish migration (seepage area) was located downstream, it was classified as S-6 under the Forest Practices Code.	

Stream Survey Report

480-9936-187-799-369-000-000-000-000-000-000

Watershed Code:

DFO/MoELP Stream Survey Form

Stream: Unnamed

02-Sep-97

Header Information

Stream Name: Unnamed
Watershed Code: 480-9936-187-799-369-000-000-000-000-000-000-000-000
Location: 314-4 Whitefish

Stream "Local": N/A
Map #: 93K/10
U.T.M.: 10.385810.6041850

Date: 9/17/96 Time: 15:25 Agency: EDI Survey Crew: DT UBR UM \ \ \ \ \ \ \

Access: FT
Reach No.: 3 Reach Length (km): 0.20000 Method: MW
Site No.: 0 Length surveyed (m): 200.0 Method: MW
Fish Card: N Field: Yes Historical: No
Photos: 76, 12, 13 Air Photos:

Channel Characteristics

Av. Chan. Width (m): 0.8 Method Av. Chan. Width (m): MS
Av. Wet. Width (m): 0.9 Method Av. Wet. Width (m): MS
Av. Max. Rif. Depth (cm): 3 Av. Max. Rifle Depth (cm): MS
Av. Max. Pool Depth (cm): 14 Av. Max. Pool Depth (cm): 3
Gradient (%): 3.0 Method Gradient: CL
% Pool: 10 % Riffle: 30 % Run: 40 % Other: 20 Method: GE
% Side Channel: 0 Method Side Channel: GE
% Debris Area: 0 Method Debris Area: GE

Specific Data

0.9	0.8	0.8	0.7	0.8	0.7
-----	-----	-----	-----	-----	-----

Bed Material

% Fines (<2mm): 80 % Fines (<2mm): 80
% Gravels: 15 Small (2-16mm): 5
Large (16-64mm): 10
% Large: 5 Small cobble (64-128mm): 5
Large cobble (128-256mm): 0
Boulder cobble (>256mm): 0
% Bedrock: 0 % Bedrock: 0
D90 (cm): 3 Compaction: High

Cover

Cover Total %: 10 Method Cover Total %: GE
Dp Pool: 0 L.O.D.: 5 Boulder: 0 In Veg.: 5 Over Veg.: 90 Cutbank: 0
Crown Closure %: 10 Method Crown Closure: GE Aspect: W Method Aspect: C

Discharge

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

Specific Data

Banks

Height (m): 0.1 % Unstable: No
Textures Fines: Yes Gravel: No Largest: No Bedrock: No
Confinement: 4
Valley: Chan. Ratio: M
Stage: M
Flood Signs Ht(m):
Braided: N Method Flood Signs:
Bars (%): Method Braided:
pH: Method Bars:
Method pH:
02 (ppm): Method Dissolved Oxygen:
Water Temp. (°C): 10.0 Method Temperature:
Turb. (cm): Method Turbidity:
Cond. (µmhos): Method Conductivity:

Reach Symbol

(Fish)

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

DFO/MoELP Stream Survey Form

02-Sep-97 Stream: Unnamed

Stream Survey Report

480-9936-187-799-369-000-000-000-000-000

Watershed Code:

Fish Summary

Obstructions

Comments

CI

Film 76: 12 d/s, 13 u/s

Fish sampling (electroshocking) was conducted for 98 seconds. No fish were captured or observed.

This reach is classified as S-6 under the Forest Practices Code.



Photo 220. Upstream view of Stream 480-9936-187-799-369 at Reach 3.

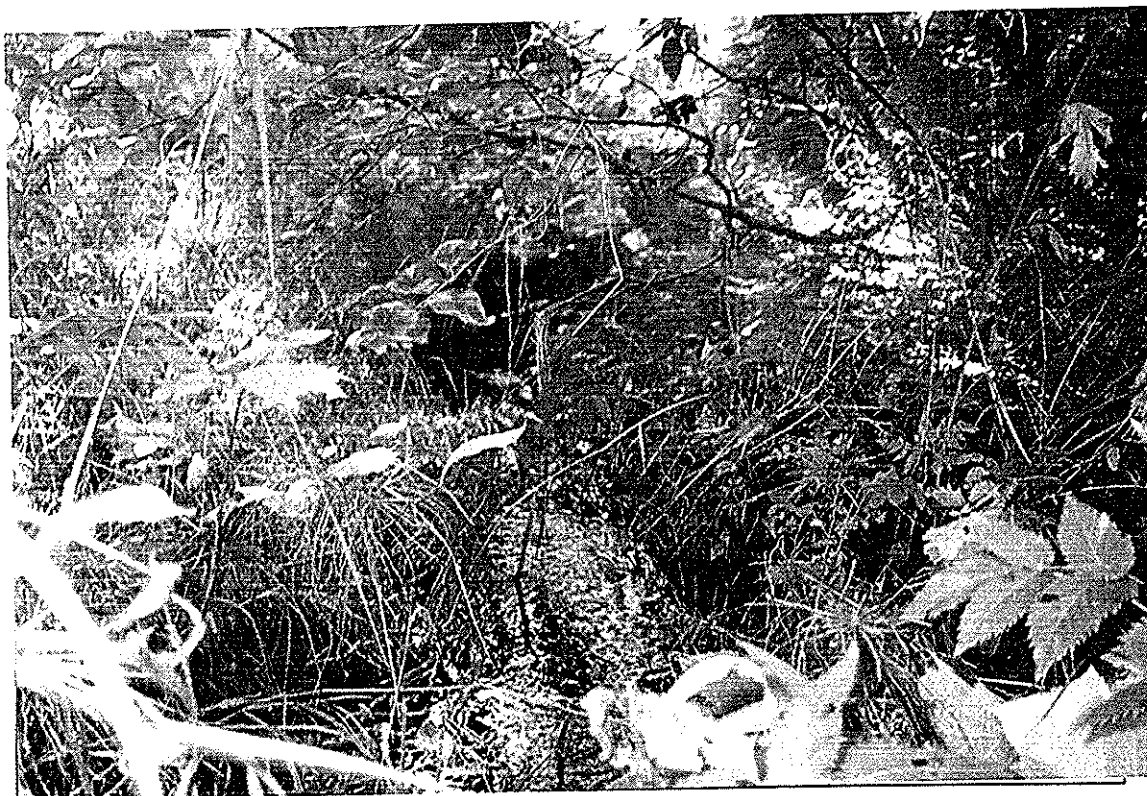


Photo 221. Downstream view of Stream 480-9936-187-799-369 at Reach 3.

Gazetted Stream Name	Not Applicable
Local Stream Name	Not Applicable
Watershed Code	480-9936-187-799-369
EDI-Code	Not Applicable
Nearest Downstream Watershed Code	Not Applicable
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	092
Cutblock Number	001
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	13-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	600
Habitat Type	Seepage
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This seepage is located just south of the cutblock and draining southwest. A definable channel or flowing water was not found in this area. There was a small section of flowing water located near the culvert at the Cunningham FSR, but not enough to characterize it as a stream. This seepage contains swampy, wet areas. This area is the headwaters of stream EDI-573. Fish sampling was not conducted in this seepage area, and no fish were observed. Since this is a seepage area and not a stream, it does not require a stream classification under the Forest Practices Code.	

4.2.2.6 Stream EDI-789

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Applicable
EDI-Code	789
Nearest Downstream Watershed Code	480-9936-187-799
NTS Map (1:50,000)	93K/10
TRIM Map	93K057
Cutting Permit	314
Cutblock Number	004
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	17-Sep-96
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	500
Habitat Type	Not Applicable
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: The TRIM map indicated a stream near the southeastern boundary of the cutblock. The ground survey, however found that a stream was not located in this area. This stream does not exist.	

4.2.2.7 Stream EDI-790

Gazetted Stream Name	Unnamed
Local Stream Name	Not Applicable
Watershed Code	Not Available
EDI-Code	790
Nearest Downstream Watershed Code	480-9936-187
NTS Map (1:50,000)	93K/10
TRIM Map	93K056
Cutting Permit	055
Cutblock Number	045
Operating Area	Whitefish
Development Type	Cutblock
Survey Date	30-Jun-95
Reach Number	Not Applicable
Site Number	Not Applicable
Water Temperature (°C)	Not Applicable
Stream Width (m)	Not Applicable
Length Surveyed (m)	450
Habitat Type	Wetland
Stream Order (1:20,000)	Not Applicable
Forest Practices Code Stream Classification	Not Applicable
Fish Species Identified	None
Description: This wetland is located along the northeastern boundary of the cutblock and drains northwest. The surveyed area is quite flat and wide (approximately 20 m). It does not contain a continuous definable channel or flowing water. Overall, this wetland provided low quality fish habitat. Fish sampling was not conducted in this wetland and no fish were observed. Since this is a wetland, a stream classification is not required under the Forest Practices Code.	

4.3 Summary of Documented Fish Species Within the Stuart Lake Watershed Group Study Area.

The summary of fish species information within the Stuart Lake Watershed Group was gathered from updated FISS maps (BC Environment 1995), BC Environment lake inventory files (1997) and 1995 and 1996 stream and lake inventories conducted by *Environmental Dynamics*. The information is presented below by individual watershed.

Table 5: Summary of fish species documented in the Stuart Lake Watershed Group.

Basin Watershed Code	Specific Watershed Code	Fish Species																NFD	SP
		CH	CSU	*DV	KO	LKC	LNC	LSU	LW	MW	NSC	RB	RDC	RSC	SK	SU			
182	Stuart Lake 182	F		F	F						F	F			F				
182-5941	Nahounli Creek 182-5941											C							
	Spad Lake 182-5941-307 01					L		L				L							
182-5941-454	Unnamed Lake (alias: Bone Lake) 182-5941-454 02		L			L													
182-5941-711	182-5941-711											C							
	EDI- 575 N D/S 182-5941-711																	C	
	182-5941-711-544																	C	
182-6350-570	Nielsp Creek 182-6350-570																	C	
	182-6350-570-365																	C	
	182-6350-570-401																	C	
	182-6350-570-401-205																	C	
	182-6350-570-438											C						C	
	EDI- 509 N D/S 182-6350-570-627																	C	
	182-6350-570-765																	C	
182-6350-570-145	Karena Lake 182-6350-570-145 01		L					L					L	L					
	EDI- 760 N D/S 182-6350-570-145-378											C						C	
	EDI- 819 N D/S 182-6350-570-145-378																	C	
	182-6350-570-145-378-278																	C	
182-6350-570-189	182-6350-570-189											C						C	
182-6976-879-131	182-6976-879-131-821																	C	
182-6976-879-779	182-6976-879-779-227													C				C	
182-6976-928	EDI-793 N D/S 182-6976-928											C						C	
	182-6976-928-613											C						C	
	182-6976-928-704											C						C	
	182-6976-928-740											C						C	
	182-6976-928-932																	C	
	182-6976-928-932-660																	C	
	EDI- 574 N D/S 182-6976-928-932													C				C	
	182-6976-928-965																	C	
182-6976-928-682	182-6976-928-682																	C	
	EDI- 816 N D/S 182-6976-928-682											C						C	
	182-6976-928-682-476																	C	
182-6976-928-761-582	182-6976-928-761-582							C				C							
	182-6976-928-761-582-098													C					
182-7856	182-7856-815																	C	
182-9146	Whitefish Lake 182-9146 02					L	L	L	L			L							
	Tomas Lake 182-9146 04											L							
	182-9146-622											C						C	
	EDI- 536 N D/S 182-9146-622 01											C						C	
	182-9146-622-391																	C	
	182-9146-727																	C	
	182-9146-786																	C	

Species Codes

(CH)	Chinook Salmon (<i>Oncorhynchus tshawytscha</i>) •	(NFD)	No Fish Documented
(CSU)	Largescale Sucker (<i>Catostomus macrocheilus</i>)	(NSC)	Northern Squawfish (<i>Ptychocheilus oregonensis</i>)
(DV)	Dolly Varden (<i>Salvelinus malma</i>) ≈	(RB)	Rainbow trout (<i>Oncorhynchus mykiss</i>) ≈
(KO)	Kokanee (<i>Oncorhynchus nerka</i>) ≈	(RDC)	Northern Redbelly Dace (<i>Phoxinus eas.</i>)
(LKC)	Lake Chub (<i>Couesius plumbeus</i>)	(RSC)	Redside shiner (<i>Richardsonius balteatus</i>)
(LNC)	Longnose Dace (<i>Rhinichthys cataractae</i>)	(SK)	Sockeye Salmon (<i>Oncorhynchus nerka</i>) •
(LSU)	Longnose Sucker (<i>Catostomus catostomus</i>)	(SP)	Species Present, not identified
(LW)	Lake Whitefish (<i>Coregonus clupeaformis</i>) ≈	(SU)	General Sucker (<i>Catostomus spp.</i>)
(MW)	Mountain Whitefish (<i>Prosopium williamsoni</i>) ≈		

Fish Species With Management Concerns

- Anadromous salmonid
- ≈ Freshwater game fish
- ◇ Regionally important fish

Information Source

- C Current study
- F FISS database
- L BC Environment lake inventory files

4.4 Summary of Documented Fish Species Within the Babine Lake Watershed Group Study Area.

The summary of fish species information within the Babine Lake Watershed Group study area was gathered from updated FISS maps (BC Environment 1995), BC Environment lake inventory files (1997) and 1996 stream and lake inventories conducted by *Environmental Dynamics*. The information is presented below by individual watershed.

Table 6. Summary of fish species documented in the Babine Lake Watershed Group study area.

Basin Watershed Code	Specific Watershed Code	Fish Species:
		RB
480-9936-187	480-9936-187	C
	Ogston Lake 480-9936-187 02	L
	480-9936-187-726	C
480-9936-187-799	Grassham Lake 480-9936-187-799 02	L

Information Source

C - Current study

L - BC Environment lake inventory files

Fish Species With Management Concerns

≈ - Freshwater game fish

Species Code

(RB) - Rainbow trout (*Oncorhynchus mykiss*) ≈

5.0 RECOMMENDATIONS

The following recommendations are presented to identify further requirements on the study streams. Several streams have been defaulted to fish-bearing status on the basis of habitat parameters only. Additional surveying, sampling, and/or monitoring may be required in these streams.

1) Stream 182-5941-711

Three reaches were delineated on this system during surveys conducted on May 30, 1995. Rainbow trout were captured approximately 100 m upstream of the confluence within Reach 1. Reach A was surveyed further upstream on the southwest corner of cutblock 15-35 and was classified as a S-6 under the Forest Practices Code. Reach B is located along the eastern border of cutblock Necoslie 51 and was also classified as a S-6 stream under the Forest Practices Code. Further sampling on this system would be required to determine the upper limit of fish distribution.

2) Stream EDI-575

The lower two reaches of this stream were surveyed on June 23, 1996, along the eastern boundaries of the proposed cutblock Necoslie 15-35. Reach 1 provided potential spawning habitat and good quality rearing habitat. Reach 2 contains undercut banks and deep pools providing good quality rearing habitat. These reaches were defaulted to fisheries classifications, as regionally significant fish (rainbow trout)

were captured on the downstream tributary. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

3) Stream 182-5941-711-544

Two reaches were delineated on this stream during a survey on May 22, 1996. They were surveyed for the proposed cutblocks Necoslie 40 and Necoslie 42. Both reaches A and B provided good potential rearing habitat. This system is a tributary to a fisheries stream and was, therefore, defaulted to S-4* classification under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

4) Stream EDI-545

The first reach of this system was surveyed on May 22, 1996, along the southern boundary of Necoslie 40. This reach was delineated and classified as S-6 stream under the Forest Practices Code as it contained poor fish habitat. However, as this system flows into a defaulted S-4* stream (Stream 182-5941-711-544), caution should be taken during logging to avoid siltation further downstream.

5) Stream 182-5941-711-544-842

A wetland/pond area has been created on the lower limit of Reach 2 of this system, by an improperly installed culvert. Although fish passage is not an issue here as this reach has a S-6 classification, this culvert should be examined from a maintenance perspective in order to prevent road erosion during high water periods.

6) Nielsen Creek (Stream 182-6350-570)

Three reaches were delineated on Nielsen Creek during surveys on June 6 and 7, 1995 and on June 16, 1996. They were surveyed for the proposed cutblocks Karena 30-44, Karena 109 and Karena 742-57. The lower reach surveyed, provided good potential rearing habitat and was defaulted to S-2* classification under the Forest Practices Code. The upper two reaches provided good quality spawning and rearing habitat and both were defaulted to S-3* classifications under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

7) Stream 182-6350-570-365

Four reaches were delineated on this stream on June 19, 1996 along the eastern and northern boundaries of the proposed cutblock Karena 51. Reach A provided potential spawning habitat and good quality rearing habitat. Reach B contains deep pools and undercut banks providing good quality rearing habitat. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system. At the lower limit of Reach C, the stream flows down the road for approximately 75m. Although this reach did not provide fish habitat and was classified as a S-6 under the Forest Practices Code, maintenance of this diversion is recommended prior to road use. Restoration would avoid further siltation of potential fish-bearing waters downstream.

8) Stream 182-6350-570-401

Three reaches were delineated on this stream on June 11, 1996 along the eastern and northern boundaries of the proposed cutblock Karena 28. Reach A had been delineated previously on June 11, 1995 along the eastern boundary of the proposed cutblock Karena 742-53. All four reaches provided good quality spawning and rearing habitat and were defaulted to S-4* classifications under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

9) Stream 182-6350-570-401-205

Two reaches were delineated on this stream along the eastern boundary of cutblock Karena 742-53 and along the southern boundary of the proposed cutblock Karena 95. Both reaches provided adequate cover for good quality rearing habitat. Reach 1 was defaulted to S-4* classification and Reach 2 was defaulted to S-3* classification under the Forest Practices Code. Further survey is recommended on Reach 1 along the western boundary of cutblock Karena 742-53 for channel assessment. Restoration may be required as the channel was diverted into a drainage ditch during logging. Both reaches may require further survey to determine fish presence and to located an upper limit of fish distribution within this system.

10) Stream EDI-506

A survey was conducted on June 12, 1995 along the northern boundary of cutblock Karena 742-53. This area had previously been logged and during the logging process, the channel had been destroyed. A complete stream inventory could not be conducted because the original banks were no longer evident. Further survey is recommended to assess the possibility of fish inhabitancy and to determine if stream rehabilitation may be required if fish presence is determined downstream on Stream 182-6350-570-401-205.

11) Stream EDI-529

EDI-529 was surveyed on June 11, 1996 along the western boundary of the proposed cutblock Karena 28. The area surveyed was classified as seepage excluding the lower 50 m which was classified as a Fisheries Sensitive Zone. This area drains into a wetland located on Stream 182-6350-570-401 which has good potential to support fish. It is recommended that caution be taken when logging around the seepage area to maintain the integrity of the water entering the wetland.

12) Stream 182-6350-570-438

Two reaches were delineated on this stream on June 5 and 6, 1995 along the southern boundary of cutblock Karena 30-12 and the northern boundary of cutblock Karena 73-11. In Reach A, regionally significant fish (rainbow trout) were caught and the reach was given a S-3 classification under the Forest Practices Code. As regionally significant fish were not caught in Reach B, it was classified by default as S-4* under the Forest Practices Code. Further survey is recommended to determine fish presence within Reach B and to locate an upper limited of fish distribution within this system. It should be noted that

the TRIM-based mapping of this reach did not correspond with the ground survey. The ground survey location of this reach is indicated on Stream Inventory Map 93K047 (Appendix 3).

13) Stream EDI-509

A reach was delineated on this stream on September 23, 1996 along the north-eastern boundary of the proposed cutblock Karena 313-3. Since this reach is accessible to fish and provides good quality fish habitat, it was defaulted to S-4* classification under the Forest Practices Code. Further survey is recommended to determine fish presence within this system.

14) Stream 182-6350-570-765

A reach was delineated on this stream on June 19, 1996 along the north and east boundaries of the proposed cutblock Karena 109. As this reach provided potential spawning habitat and good quality rearing habitat it was defaulted to S-3* classification under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

15) Stream EDI-760

Three reaches were delineated on this stream on August 21, 1996 outside of the southern boundary of the proposed cutblock Karena 41. The lower two reaches contained regionally significant fish and were given S-3 classifications under the Forest Practices Code. Since regionally significant fish were caught in Reach A, careful road construction practices are recommended at the proposed right-of-way to maintain the integrity of this stream as it potentially provides good spawning habitat. Reach C of this system was located above a 3.5 m high waterfall barrier (see Photos 65 and 66, p.227) and was classified as S-6 under the Forest Practices Code. A similar recommendation is made for the proposed road crossing in Reach C. This reach is not fish-bearing, however, it is imperative to keep the present state of good quality water flowing into fish-bearing waters downstream during road development.

16) Stream 182-6350-570-145-378-657

Two reaches were delineated on this stream on June 11, 1996 and a site was surveyed on August 20, 1996. All surveys were situated along the southern boundary of the proposed cutblock Karena 41. Both reaches were given S-6 classifications due to a high gradient barrier (23%) and a 3.5 m high waterfall (see Photo 72 and 73 p.244) located downstream on Stream EDI-760. Caution should be taken during road construction in Reach A in order to maintain the present quality of the fish habitat since stocking of Dawn Lake maybe a consideration.

17) Stream EDI-570

A site was surveyed on this stream on August 20, 1996, located south of the proposed cutblock Karena 41. The site was given a S-6 classification under the Forest Practices Code due to an impassable gradient of 39%. It is recommended that caution be taken during road construction to maintain the present state of water quality and to avoid siltation of the lower tributaries.

18) Stream EDI-819

A site was surveyed on this stream on August 21, 1996, located approximately 3 km south of the proposed cutblock Karena 41. Although there was minimal fish habitat noted, this section of stream was within close proximity of fish-bearing waters (Stream EDI-760) and was classified by default as S-4* under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

19) Stream 182-6350-570-145-378-278

A reach was surveyed on this stream on September 30, 1996 outside of the proposed cutblock Karena 313-1. This reach contained good potential rearing habitat and was accessible from the lake which may provide over-wintering habitat. It was, therefore, classified by default as S-4* under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

20) Stream 182-6976-879-131-821

A section of this stream was surveyed on October 4, 1995. It contained good rearing and spawning habitat, provided by the cover features and moderate amount of gravels. Further survey is recommended to determine fish presence and to locate the upper limit of fish distribution.

21) Stream 182-6976-879-779-227

The first reach of this system was surveyed and delineated on June 18, 1996. There was potential rearing and spawning habitat noted within the first reach. One redbreasted shiner was captured and other unidentified fish were observed. This system may require further surveying to determine the presence of regionally significant fish.

22) Stream EDI-793

Two reaches of this system were surveyed on the southeastern border of cutblock Zap-Carrier 87 on May 25, 1996. Both reaches A and B contained good rearing and spawning habitat, and were in close proximity to a small unnamed lake which may provide over-wintering habitat. This stream is a direct tributary to the Ocock River which is known to contain regionally significant fish. These reaches were defaulted to S-4* classifications as they possessed a high potential to contain fish. Further surveying is recommended to determine fish presence and to find the upper limit of fish distribution within this system.

23) Stream 182-6976-928-704

The first five reaches of this stream was surveyed on May 15 and 16, 1996. These reaches flow in a northeasterly direction along the northern border of cutblock Ocock 167. The first reach was classified as a S-3 stream as regionally significant fish (rainbow trout) were captured. The Ocock Main road crosses the second reach, approximately 300 m upstream of the lower limit. The crossing has a 600 mm

CSP, which was too small to accommodate the high water velocity at the time of survey. In addition, large pools had formed on either side of the culvert, due to the insufficient size. Therefore, a larger culvert will be required to accommodate seasonal highwater flows. BC Environment captured regionally significant fish (rainbow trout) in 1995 at this road crossing (Guy Hall, 1996). The absence of fish in reaches 3, 4 and 5 may be due to the impediment created by this culvert. These upper three reaches were defaulted to fisheries streams as there are no natural barriers to fish movement and the habitat appears to have the capability to support fish.

24) Stream 182-6976-928-740

The first two reaches of this stream were surveyed and delineated on July 15 and 16, 1996. Regionally significant fish (rainbow trout) were captured during these surveys. Reach A, located further upstream along the northern boundary of cutblock Ocock 28-143, was surveyed on October 6, 1995. Although fish were not captured in Reach A, it contained good rearing potential, and was, therefore, defaulted to S-4* classification under the Forest Practices Code. Further surveying on this system is recommended to determine the upper limit of fish distribution.

25) Stream 182-6976-928-932

Two reaches of this stream were surveyed and delineated on June 19, 1996. Reaches A and B were delineated along the east to the southwest border of cutblock North Salmon 38, flowing in a southerly direction into the Ocock River. Both reaches provided good quality rearing habitat, and were, therefore, defaulted to S-4* classifications under the Forest Practices Code. Further survey is recommended to determine fish presence and to find the upper limit of distribution within this system.

26) Stream 182-6976-928-682

A section of this stream was surveyed on May 27, 1996, outside the eastern boundary of the proposed cutblock Zap Carrier 258. At this site, the habitat provided good rearing and spawning potential. Although there were no fish captured, this system is a direct tributary to the Ocock River, and it was, therefore, defaulted to a S-3* classification under the Forest Practices Code. Further survey is recommended to determine the presence of regionally significant fish and the upper limit of fish distribution within this system.

27) Stream EDI-816

The first reach on this stream was surveyed and delineated on May 27, 1996. This reach is located along the east border of cutblock Zap Carrier 258 and it flows into a defaulted S-3* stream. This stream provides fair rearing habitat and it is within close proximity to the Ocock River. It was, therefore, defaulted to a S-4* classification under the Forest Practices Code. Further survey is recommended to determine the presence of regionally significant fish and the upper limit of fish distribution within this system.

28) Stream 182-6976-928-682-476

The first two reaches of this stream was surveyed and delineated on June 4, 1995, outside the northern and eastern boundary of cutblock Zap Carrier 18-146. The habitat of Reach 1 provided rearing potential, as there was cover due to deep pools. Sampling of Reach 2 revealed the presence of northern squawfish and suckers. Reach 2 had good rearing and spawning habitat. At the upper limit of Reach 2 there was a culvert jammed with debris. No fish were captured when minnow traps were set at the inlet of the culvert. This debris jam will need to be removed, and the culvert should be reassessed to determine if it is of sufficient size to accommodate the water volume at higher flows. These two reaches were defaulted to S-3* classifications under the Forest Practices Code. Further surveying is recommended to determine the presence of regionally significant fish.

29) Stream 182-6976-928-761-582

This system was surveyed for 600 m near the southeastern border of cutblock Zap Carrier 194. A stream channel (~7 to 10 m wide) flowed through a large wetland. Electroshocking could not be conducted due to the hazardous terrain, however many small unidentified fish were observed rising within the stream channel. The stream was defaulted to a S-2* classification under the Forest Practices Code. Since this stream flows through a large wetland it should be protected accordingly.

30) Stream 182-6976-928-761-582-098

The first reach of this stream was inventoried on May 28, 1996, north of Zap Carrier 194. This reach flows in a easterly direction between two lakes, and it is surrounded by wetlands on either side of the reach limits. Fish sampling revealed the presence of redbside shiner, and an unidentified fish was observed near the lower limit. This stream was defaulted to a S-4* classification under the Forest Practices Code. Further surveying is recommended to determine the presence of regionally significant fish.

31) Stream EDI-526

Two sections of this wetland were surveyed on October 18, 1996, along the southern boundaries of the proposed cutblocks Whitefish 314-05 and 314-06. This survey took place at the end of the field season when snow prevented a thorough survey. This southern area requires a wetland classification, however, further survey is recommended in the future to determine if a channel is present within the wetland and to determine fish presence within this system.

32) Stream 182-7856

A seasonally flooded wetland was surveyed on June 4, 1996 along the eastern boundary of the proposed cutblock Kuskwa 17. This wetland was an extension of the lakeshore and was classified as a Fisheries Sensitive Zone under the Forest Practices Code. Further survey is recommended to determine fish presence within the lake.

33) Stream 182-7856-815-396

A wetland was surveyed on this system on June 5, 1996 along the western and southern boundaries of the proposed cutblock Kuzkwa 124. Further survey is recommended, starting from the mouth at Stuart Lake, to determine fish presence and to locate an upper limit of fish distribution within this system.

34) Stream EDI-542

A wetland was surveyed on this system on June 4, 1996 along the northeastern boundary of the proposed cutblock Kuzkwa 125. Above the wetland, a large lake was located which may be used as overwintering habitat, however, a channel connecting the two bodies of water could not be located. This system also flows indirectly into Stuart Lake without apparent fish barriers and would, therefore, be accessible to fish. Further survey is recommended, starting from the mouth at Stuart Lake, to determine the upper limit of fish distribution within Stream 182-7856 and to locate a channel east of the proposed cutblock connecting the wetland and the large lake above it.

35) Stream 182-9146-622-391

Four reaches were delineated on this stream on June 11, 1996, east of the proposed cutblock Whitefish 32 and on November 22, 1996, in the northern region of the proposed cutblock Whitefish 314-06. Reach 1 provided good rearing habitat and flowed directly into fish-bearing waters (Stream 182-9146-622). It was, therefore, classified as a S-4* by default under the Forest Practices Code. The other three reaches were surveyed at the end of the field season and due to deep snow, a detailed stream inventory survey was unable to be completed. Reaches A and B were defaulted to S-4* classifications under the Forest Practices Code and Reach C was classified as a S-6 under the Forest Practices Code due to a high gradient fish barrier. Further survey is recommended to determine fish presence within the defaulted reaches and to finish the stream inventory survey within reaches A-C. It should be noted that the TRIM-based mapping of reaches A-C did not correspond with the ground survey. The ground survey location of these reaches is indicated on Stream Inventory Map 93K056 (Appendix 3).

36) Stream EDI-536

Three reaches were surveyed on this stream on September 19, 1996 along the eastern boundary of the proposed cutblock Whitefish 314-06. Regionally significant fish were caught within the reaches 1 and 2 and both were classified as S-4 under the Forest Practices Code. Reach 3 was an intermittent channel located in a wetland which would only be accessible to fish during high water periods. Fish were not captured and Reach 3 was classified by default as S-4* under the Forest Practices Code. Further survey is recommended to determine fish presence within Reach 3. In Reach 1, blowdown was abundant in the lower limits which may have damaged the bank structure and log jams may impede fish migration. It is recommended to assess the possibility of stream rehabilitation of Reach 1 near the lower limits of Tandat Lake.

37) Stream 182-9146-725

A reach was delineated on this stream on October 17, 1996 along the northwestern boundary of the proposed cutblock Whitefish 09. The reach did not provide fish habitat and was classified as S-6 under the Forest Practices Code. Caution should be taken during logging, however, to maintain the present state of water quality flowing downstream as the downstream reaches have potential to contain fish. A full stream inventory could not be completed on this system before snowfall and should be completed in the future.

38) Stream EDI-818

A reach was delineated on this stream on October 17, 1996 along the northwesternern boundary of the proposed cutblock Whitefish 09. The reach did not provide fish habitat and was classified as S-6 under the Forest Practices Code. Caution should be taken during logging, however, to maintain the present state of water quality flowing downstream as the downstream reaches have potential to contain fish. A full stream inventory was not completed on this system before snowfall and should be completed in the future.

39) Stream 182-9146-727

Three reaches were delineated on this stream on October 3, 1996 along the southwestern boundary of the proposed cutblock Whitefish 07. All three reaches provided good quality rearing habitat and potential spawning habitat. They were, therefore, given S-3* classifications by default under the Forest Practices Code. Further survey is recommended to determine fish presence and to locate an upper limit of fish distribution within this system.

40) Stream 182-9146-786

Four reaches were surveyed on this stream on October 2 and 16, 1996 along the southern and western portions of the proposed cutblock Whitefish 09. Reach 1 provided good cover for rearing habitat and Reach 2 provided good quality rearing habitat and good potential spawning habitat. As this stream has potential to support fish and also flows into a fish-bearing lake, both reaches were given S-4* classifications by default under the Forest Practices Code. Reaches 3 and 4 several sections of sub-surface flow which were impassable to fish migration. Both reaches were classified as S-6 under the Forest Practices Code. Further survey is recommended in reaches 1 and 2 to determine fish presence within the lower limits of this system.

6.0 ACKNOWLEDGEMENTS

Funding for this project was provided by Forest Renewal BC (Project Number OP-96-003).

Ted Zimmerman, Regional Fisheries Inventory Specialist, BC Environment, Prince George, BC, served as contract monitor for this project and provided valuable technical review.

Wayne Cochrane, Forestry Supervisor and Rob Miller, Mapping Technician, Canfor's Fort St. James Division, Fort St. James, BC, provided forest development maps, airphotos, and valuable local knowledge. Eric Anderson, GIS Mapping Specialist, Canfor's Fort St. James Division, provided development plan maps for use in this study.

Forey Management Ltd., Prince George, BC, provided the base station files used by *Environmental Dynamics* for differentially correcting GPS files.

The following *Environmental Dynamics* staff members were involved in this project. The field work was conducted by Bob Redden, Rob Van Schubert, Tara White, Erik Luiker, Pat Tobler, Rod Drummond, Warren Coughlin, Lori Logan, Nikki Crowe, Bill Cranston, Mark Sloat Ross Mabee, and Dan Turner. Data entry was performed by Lori Logan and Tara White. Kourtney Dawley, Shawn Tyerman, and Kristina Hanson assisted in the preparation of this report. Bob Redden provided valuable contributions and technical direction for this report. Tara White constructed the stream inventory database and was responsible for editing the draft results section. Donna Nolan, Carol McKee and Rod Drummond produced the maps for the report. Dwight Hickey, RPBio., Senior Fisheries Biologist and Project Manager provided technical direction and final editorial review.

Jason Cox, Simon Crawley and Ed Daburger, GPS Technicians, with Terrapro GPS Surveys Ltd, Prince George, BC, conducted the GPS field work in 1995.

7.0 REFERENCES CITED

- BC Environment.** 1995. Fisheries Information Summary System (FISS) maps and data base updated by EDI Environmental Dynamics Inc., Prince George, B.C. BC Environment, Prince George, B.C.
- BC Environment.** 1997a. Stuart Lake and Babine Lake watershed groups (ArcInfo export files) downloaded from ftp site: ftp.env.gov.bc.ca/ dist/arcwhse/ watershed atlas/ region 7.
- BC Environment.** 1997b. Lake Inventory files for lake surveys conducted from 1970 to 1996. BC Environment, Prince George, B.C.
- BC Ministry of Environment, Lands and Parks.** 1993. British Columbia Recreational Atlas. BC Ministry of Environment, Lands and Parks. Victoria, B.C. 143 pp.
- BC Ministry of Environment, Lands and Parks.** 1995. Resources Inventory Committee (RIC) Lake and Stream Inventory Standards and Procedures (Draft May, 1995). BC Ministry of Environment, Lands and Parks, Fisheries Branch, Inventory Unit, Victoria, B.C. 228 pp.
- BC Ministry of Forests.** 1985. Map of Biogeoclimatic Units of the Prince George Forest Region (1:600,000 scale). BC Ministry of Forests.
- BC Ministry of Forests.** 1995. Fort St. James Forest District Recreation Map (1:400 000 scale). BC Ministry of Forests.
- BC Ministry of Forests and BC Ministry of Environment.** 1995a. Fish-Stream Identification Guidebook. BC Ministry of Forests, Victoria, B.C. 39 pp.
- BC Ministry of Forests and BC Ministry of Environment.** 1995b. Riparian Management Area Guidebook. BC Ministry of Forests, Victoria, B.C. 68 pp.
- Canfor.** 1996. Forest Development Plan Map. Whitefish, Necoslie, Karena, Kuzkwa, North Salmon, McNab, Zap Carrier, Sqawfish and Ocock operating areas (1:50,000 scale).
- DeLong, C., Tanner, D., and M.J. Jull.** 1993. A Field Guide for Site Identification and Interpretation for the Southwest Portion of the Prince George Forest Region. Crown Publications Inc., Victoria, B.C. Handbook No. 24. 290 pp.
- Department of Energy, Mines and Resources.** 1977-1986. National Topographic Series (1:50,000 scale maps), 93J/5 2nd edition, 93J/12 2nd edition, 93K/7 2nd edition, 93K/8 2nd edition, 93K/9 2nd edition, 93K/10 2nd edition. Ottawa, ON.
- Department of Fisheries and Oceans.** 1995. Stream Card Digital Data Entry System. Department of Fisheries and Oceans. Habitat Management Branch, Vancouver, B.C.

- Department of Fisheries and Oceans and BC Ministry of Environment.** 1989. Fish Habitat Inventory and Information Program (Stream Survey Field Guide). Department of Fisheries and Oceans and BC Ministry of Environment, Vancouver, B.C. 33 pp.
- Haas, G.R. and J.D. McPhail.** 1991. Systematics and distributions of Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) in North America. Can. J. Fish. Aquat. Sci. 48:2191-221.
- Hickey, D.G.** 1997. Senior Fisheries Biologist, Environmental Dynamics Inc., Prince George B.C. Personal communication.
- Holland, S.** 1976. Landforms of British Columbia: A Physiographic Outline. Bulletin 48. British Columbia Department of Mines and Petroleum Resources, Victoria, B.C. 138 pp.
- Hall, W.G.** 1997. Forestry Supervisor, Canfor, Fort St. James Division, Fort St. James, B.C. Personal communication.
- Johnston, N.T. and P.A. Slaney.** 1996. Fish Habitat Assessment Procedures. Watershed Restoration. Technical Circular No. 8. Revised April 1996. Watershed Restoration Program, Ministry of Environment, Lands and Parks and Ministry of Forests, Vancouver, BC.97p.
- Langer, O.E., B. MacDonald, J. Patterson, B. Schouwenburg, P. Harder, T. Harding, M. Miles, and M. Walmsley.** 1992. Strategic Review of Fisheries Resources and Management Objectives. Stuart/Takla Habitat Management Area. Fraser River Action Plan and Department of Fisheries and Oceans, Vancouver, B.C. 188 pp.
- MacKinnon, A., C. DeLong, and D. Meidinger.** 1990. A Field Guide for Identification and Interpretation of Ecosystems of the Northwest Portion of the Prince George Forest Region. Crown Publications Inc., Victoria, B.C. Handbook No. 21. 116 pp.
- Meidinger, D. and J. Pojar.** 1991. Ecosystems of British Columbia. BC Ministry of Forests, Victoria, B.C. 330 pp.
- Smith-Root, Inc.** 1996. Model 12-B backpack electrofisher manual. Vancouver, WA. 25pp.