Secondary Lake Inventory of
Unnamed Lake

Watershed Code: 480-697200-11500
Waterbody Identifier: 00891BABL

Located 11.6 km northwest of the outlet of Fulton Lake
and 8 km west of the village of Granisle

Prepared for

Houston Forest Products Co.
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March 31st, 2001

PROJECT SUMMARY SHEET

PROJECT REFERENCE INFORMATION

MELP Project #:	HFP-SKR-001-2001
FRBC Project #	000108
FRBC Activity #:	10447
FDIS Project #:	06-BABL-000001196-1999
MELP Region:	Skeena Region (06)
MELP District:	not applicable
FW Management Unit:	06-08
Fisheries Planning Units:	not applicable
DFO Subdistrict:	Prince Rupert (6)
Forest Region:	Prince Rupert
Forest District:	Morice Forest District
Forest Licensee:	Houston Forest Products
Tenure Number:	FLA – 16827
First Nations Claim Area:	Lake Babine Nation

WATERSHED INFORMATION

Watershed Group	BABL - Babine Lake Group
Watershed Code	480-697200-11500
Waterbody Identifier	00891BABL
UTM at Lake Outlet	9.671126.6085370
Order at Lake Outlet	2
Number of Inlets	5
Drainage Area	4.35 km^2
Magnitude	7
Elevation	970 m
NTS Map (1:50,000)	93L/16
TRIM Map	093L.089
BEC Zone	SBSmc
Air Photos	30BCC96152 No. 34

LAKE SAMPLING SUMMARY

Lake Survey Type	Secondary (1999, 2000 RIC Standards)
Water Surface Area	21.2 ha
Max. Depth	3.6 m
Secchi Depth	1.5 m
Lake Length	680 m
Number of Islands	0
Species Present in Lake	CT, LKC

CONTRACTOR INFORMATION

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DISCLAIMER

This product has been accepted as being in accordance with the approved standards within the limits of the Ministry quality assurance procedures. Users are cautioned that interpreted information on this product developed for the purposes of the Forest Practices Code Act and Regulations, for example stream classifications, is subject to review by a statutory decision maker for the purposes of determining whether or not to approve an operational plan.

ACKNOWLEDGEMENTS

Funding for this project was provided by Forest Renewal B.C., and administered by Houston Forest Products Co., Houston, B.C.. The contract was monitored by Deidre Quinlan (Houston Forest Products Co.). Melissa Todd and Deidre Quinlan (Houston Forest Products Co.) were invaluable in their support throughout this project. Editorial comments on drafts of this report were provided by Ron Saimoto (SKR Consultants Ltd.), Chris Schell (QA/QC Monitor), and Paul Giroux (B.C. Environment).

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LIST OF ATTACHMENTS AVAILABLE AT MELP OFFICE

Photograph Kodak CD's (2 sets)
Indexed negatives
Photodocumentation (in watershed report)
FDIS information (in watershed report)
Digital reports
Digital FDIS database

1.0 INTRODUCTION

A secondary lake inventory (RIC 1999, 2000) was conducted on Unnamed Lake (WBID 00891BABL, ILP 51148) located approximately 11.6 km northwest of the outlet of Fulton Lake and 8 km east of the village of Granisle. This lake survey was part of a reconnaissance level (1:20,000) fish and fish habitat reconnaissance inventory project conducted in the Fulton River watershed for Houston Forest Products Co. (HFP) in the summer and fall of 2000 (SKR 2001). The project was funded by Forest Renewal B.C. (FRBC). This report summarizes the results of the secondary lake inventory of Unnamed Lake (WSC 480-697200-11500, WBID 00891BABL, ILP 51148).

1.1 OBJECTIVES

The main objectives of the secondary lake inventory project conducted on Unnamed Lake (WBID 00891BABL) were:

- to review and summarize historical fisheries information for the lake,
- to determine fish species present in the lake, and
- to describe fish habitat characteristics.

1.2 LOCATION

Unnamed Lake (WBID 00891BABL, ILP 51148) is in the Skeena Region (B.C. Ministry of Environment, Lands and Parks), and in the Morice Forest District, Prince Rupert Forest Region within north-central British Columbia. The lake is part of a fourth order system, which drains directly into north shore of Fulton Lake, and is thus part of the Skeena River drainage (Figure 1). The lake is located within the moist cold subzone Sub-Boreal Spruce biogeoclimatic zone (SBSmc) (MoF 1988).

1.3 ACCESS

Unnamed Lake (WBID 00891BABL, ILP 51148) could only be accessed by helicopter at the time of survey. The lake is too small for float plane access, and an old road which comes to within 0.7 km of the lake was impassable. The lake is situated about 52.8 km ENE of the helicopter base used to access the lake, which located at the Smithers airport.

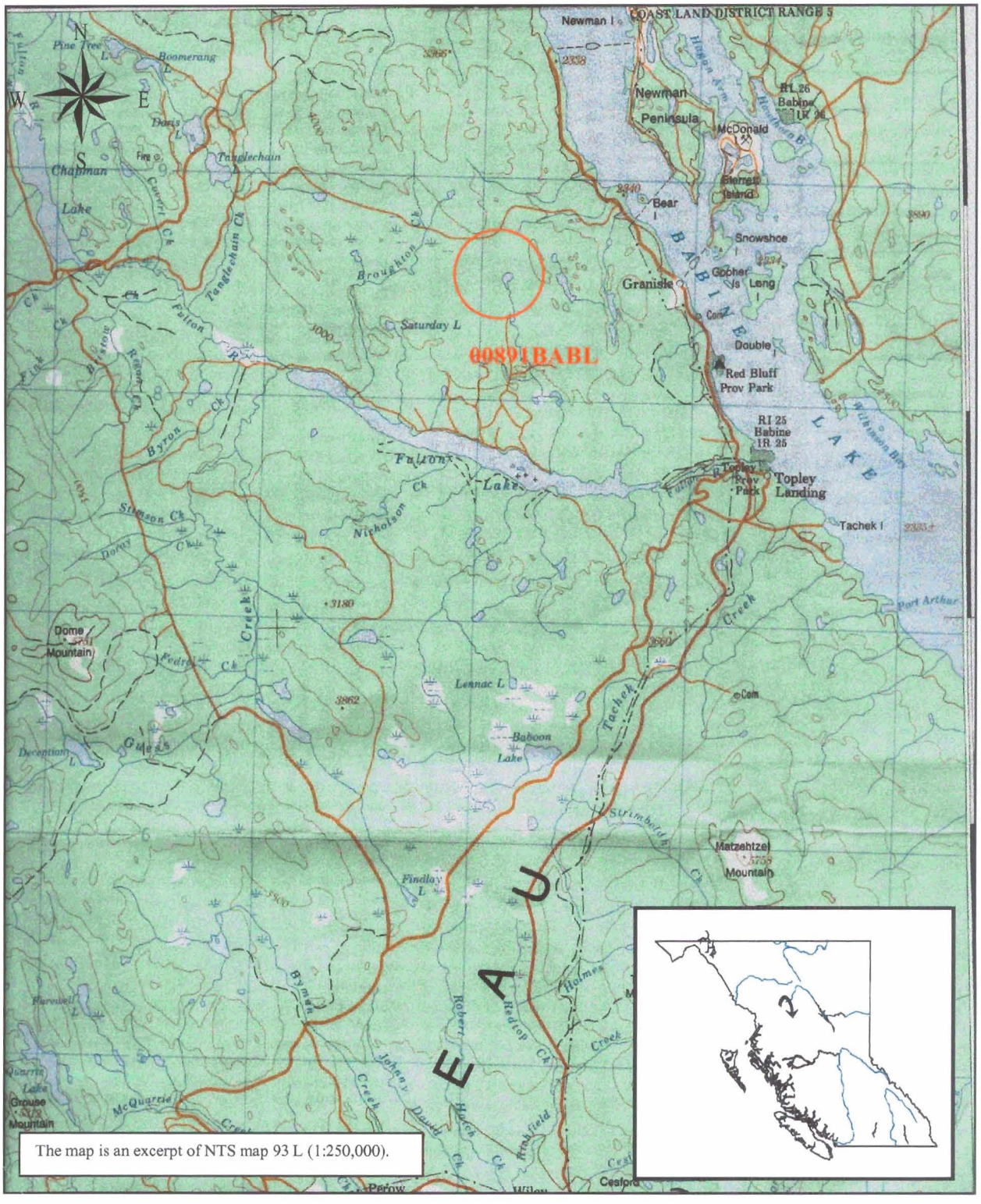

Figure 1. Overview map of the location of Unnamed Lake (WBID 00891BABL, ILP 51148) located about 11.6 km northwest of the outlet of Fulton Lake and 8 km west of the village of Granisle. The map is an excerpt of NTS map 93 L (1:250,000).

2.0 RESOURCE USE

The Unnamed Lake (WBID 00891BABL, ILP 51148) drainage basin is located within the Morrison Landscape Unit, which is public land and as such is utilized by several sectors.

1. First Nations issues and interests in the study area:
   - The Babine Lake Nation has claimed portions of the Tanglechain Landscape Unit as part of their traditional territories (B.C. Treaty Commission 2000).
2. Development and land use: forestry, mining, recreation:
   - The study area falls into forest licence FLA-16827 (HFP). No timber harvest has been proposed within 1 km of the lake shore over the next five years (HFP 1999). A harvest areas is located about 500 m ESE of the lake (HFP 1999).
   - No mineral tenures are located in the area (Ministry of Employment and Investment 2000).
   - The guide outfitter territory in the study area is 608G006, and the trapline territory is 608T008 (HFP 1999).
   - No B.C. Forest Service Recreation (BCFSR) sites or trail exist in the study area (MoF 1997).
3. Other developments, concerns or points of interest:
   - No Protected Areas Strategies (PAS) study sites are known to exist in the vicinity of Unnamed Lake (WBID 00891BABL, ILP 51148) (Land Use Coordination Office 2000).
   - No water licences or community watersheds are noted to be located in the vicinity of Unnamed Lake (WBID 00891BABL, ILP 51148) (B.C. Environment 2000).
4. Existing water quality data:
   - No existing water quality data was available for this lake at the time of survey (Giroux, pers. comm.).
5. Previous presence of fish in systems of interest:
   - Fish presence documented near Unnamed Lake (WBID 00891BABL, ILP 51148) is summarized in Table 1.

Table 1. A summary of fish previously documented present in Unnamed Creek (480-697200-11500).

Species	Code	Location	Reference
cutthroat trout	CT	Unnamed Creek (480-697200-11500)	SKR 2001
largescale sucker	CSU	Tributary to Unnamed Creek (480-697200-11500)	SKR 2001
lake chub	LKC	Tributary to Unnamed Creek (480-697200-11500)	SKR 2001

3.0 METHODS

3.1 LAKE ASSESSMENT

The secondary lake inventory of Unnamed Lake (480-697200-11500 WBID 00891BABL, ILP 51148) was conducted on July 13th, 2000. The lake was selected for inventory during phases I-III of the fish and fish habitat reconnaissance inventory project since little fisheries information existed for the watershed, and since the lake is a relatively large within the watershed drained by Unnamed Creek (480-697200-11500) (SKR 1999). Secondary lake inventory was utilized to assess fish presence and habitat value. Fish Data Information System (FDIS) lake survey form and fish collection cards were completed during the lake survey, following Resource Inventory Committee Standards (RIC 1998, 1999, 2000), and data were entered into the FDIS database. A list of sampling equipment used during this 1:20,000 secondary lake inventory is presented in Table 2.

All fish that were captured were identified to species using methods described in McPhail and Carveth (1994). Fork lengths and weights were recorded for a sub-sample of fish that were captured, and a scale sample was collected from all cutthroat trout captured during the lake survey. Doug MacKay and Ron Saimoto (SKR Consultants Ltd.) aged the scale sample using a dissecting microscope. Genetic samples (fin clips) were collected for a sub-sample of cutthroat trout and submitted to B.C. Environment, Skeena Region, for analysis.

Table 2. List of sampling equipment used during the 1:20,000 secondary lake inventory of Unnamed Lake (480-697200-11500), July 13th 2000.

Parameter	Intensity/Location	Method
date and time	as needed	wrist watch
water temperature profile	at deep station	Oxyguard Mark II oxygen & temperature metre with 30 m cable
oxygen profile	at deep station	Oxyguard Mark II oxygen & temperature metre with 30 m cable
water sampling (at depths)	at deep station	LaMotte van Doren Bottle
pH	at deep station	Oaktron pHTestr2
Secchi depth	at deep station	Secchi disk
conductivity	at deep station	Hanna HI 9033, Oaktron TDSTestr 3
fish presence	see Figure 2	minnow traps
photography	see Figure 3	Canon Sureshot A1, Minolta Weathermatic Dual 35
GPS	as needed	Garmen GPS 45
depth	transect along e-line	Lowrance X-16 echosounder mounted on a 3.3 m Polaris inflatable boat, sounding speed was ~ 1m/sec

3.2 DATA ANALYSIS

Physical and biological data collected during the secondary lake inventory of Unnamed Lake (WBID 00338 BABL, ILP 51069) were used to calculate shoreline development (a lake morphometry parameter) and Fulton's Condition Factor for fish captured in the lake.

3.2.1 Shoreline Development

Shoreline development (D_L) was calculated to compare the lake circumference to that of a circle with the same surface area (D_L =1) (Equation 1, Wetzel 1983). The general shape of the lake and the irregularity of the shoreline (e.g. points and bays) are reflected in D_L. Lakes with greater D_L commonly have a more pronounced littoral community in proportion to the lake volume (Wetzel 1983). The littoral area is the frequently the most productive area of the lake, and metabolic activities in the littoral and wetland areas of small and shallow lakes generally govern the productivity of the lake. An index of shoreline development is useful in that it reflects the potential for greater development of littoral communities area (as defined by the area vegetated by submergent and emergent macrophytes) in proportion to the volume of the lake (Wetzel 1983, Cole 1994).

Equation 1. $D_L = L / 2\sqrt{(\pi A)}$ where D_L = Shoreline development
L = Length of shoreline (m)
A = Surface area of the lake (m^2)

3.2.2 Fulton's Condition Factor

Fulton's condition factor (K) was calculated where possible for all fish, and means were generated for age one and age ≥ 3 classes. Fulton's condition factor (Equation 2) is useful as and indicator of fish condition where growth is isometric, and/or if the fish to be compared are of approximately the same length (Ricker 1975, Bagenal 1978).

Equation 2. $K = 10^5 (w / l^3)$ where K = Fulton's condition factor
w = weight (g)
l = length (mm)

4.0 RESULTS AND DISCUSSION

Unnamed Lake (480-697200-11500, WBID 00891BABL, ILP 51148) was surveyed on July 13th, 2000. The following sections describe physical, chemical and biological characteristics of the lake, as determined from the secondary lake survey, following the outline presented in the "Buba Lake Example Report" (B.C. Environment 1999).

4.1 LOGISTICS

No logistical problems were encountered during the 1:20,000 secondary lake inventory of Unnamed Lake (480-697200-11500, WBID 00891BABL, ILP 51148).

4.2 SURROUNDING COUNTRY

The lake is located among gently sloped terrain with some rolling hills, particularly to the east and northeast (Figures 2 and 3). The majority of the surrounding country is forested, while the entire immediate shoreline consists of a relatively wide wetland. The forested vegetation surrounding the lake consisted of spruce with some pine. Some forest harvest areas on a south-facing slope to the east and northeast of the lake were visible from the lake

4.3 IMMEDIATE SHORELINE

The shoreline of Unnamed Lake (WBID 00891BABL, ILP 51148) was relatively uniform, with few points and bays (Figures 2 and 3). The lake is generally tear drop in shape, and has a south aspect. Shoreline development (D_L) was calculated to be 1.36. This reflects the slightly elongated nature of the lake, and the presence of some points and bays, causing the D_L to have a value greater than 1. The entire shoreline is characterized by wetlands (Figure 4).

Figure 2. Panoramic views of the shoreline of Unnamed Lake (WBID 00891BABL) looking northwest (above) and west southwest (below).

Figure 3. Panoramic views of the shoreline of Unnamed Lake (WBID 00891BABL) southeast (above) and northeast (below).

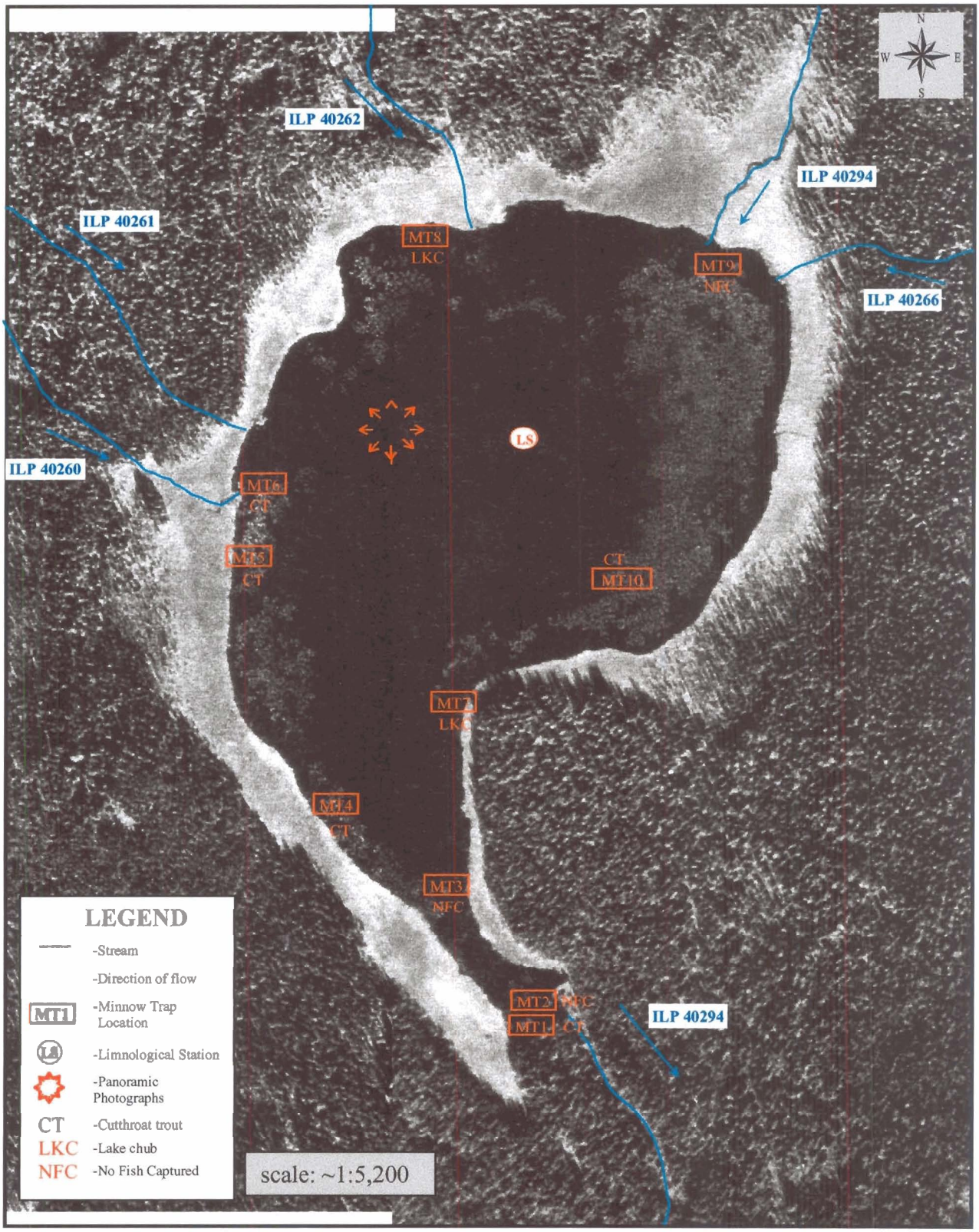

Figure 4. Annotated air photo (30BCC9152 No. 34) of Unnamed Lake (WBID 00891BABL, ILP 51148) surveyed on July 13th, 2000.

4.4 LAKE MORPHOLOGY AND AQUATICE VEGETATION

The lake bottom appears to be generally uniform in topography and substrate. The lake depth remains shallow (near 1 metre depth) to within 200 m of the south shore of the lake, but depth then increases relatively rapidly to the maximum depth of 3.5 metres (Figure 5). Lake depth decreases gradually along the north shore. The deep station is located just north of the center of the lake (Figure 6). The entire lake can be classified as littoral area, and maximum depth is 3.6 metres. Submergent aquatic vegetation was abundant, covering 75% of the surface area of the lake, and consisted of *Potamogeton richardsoni*, *P. natans, Ceratophyllum demersum*, and *Nuphar polysepalum*. Emergent aquatic vegetation was relatively sparse, and consisted of *Menyanthers trifoliata*, *Potentilla palustrus*, and *Carex spp.*. No floating algae were noted in the lake. The lake substrate consisted primarily of fines, with little gravels or cobbles.

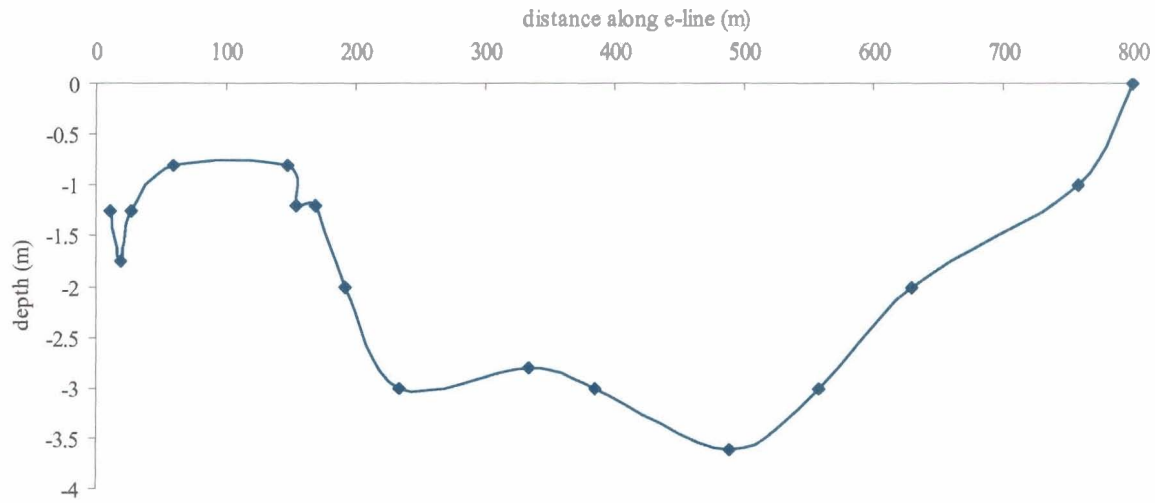

Figure 5. Bathymetric transect along the e-line in Unnamed Lake (WBID 00891BABL, ILP 51148). Distance along the e-line is measured from the south shore of the lake (*see* Figure 6 for details).

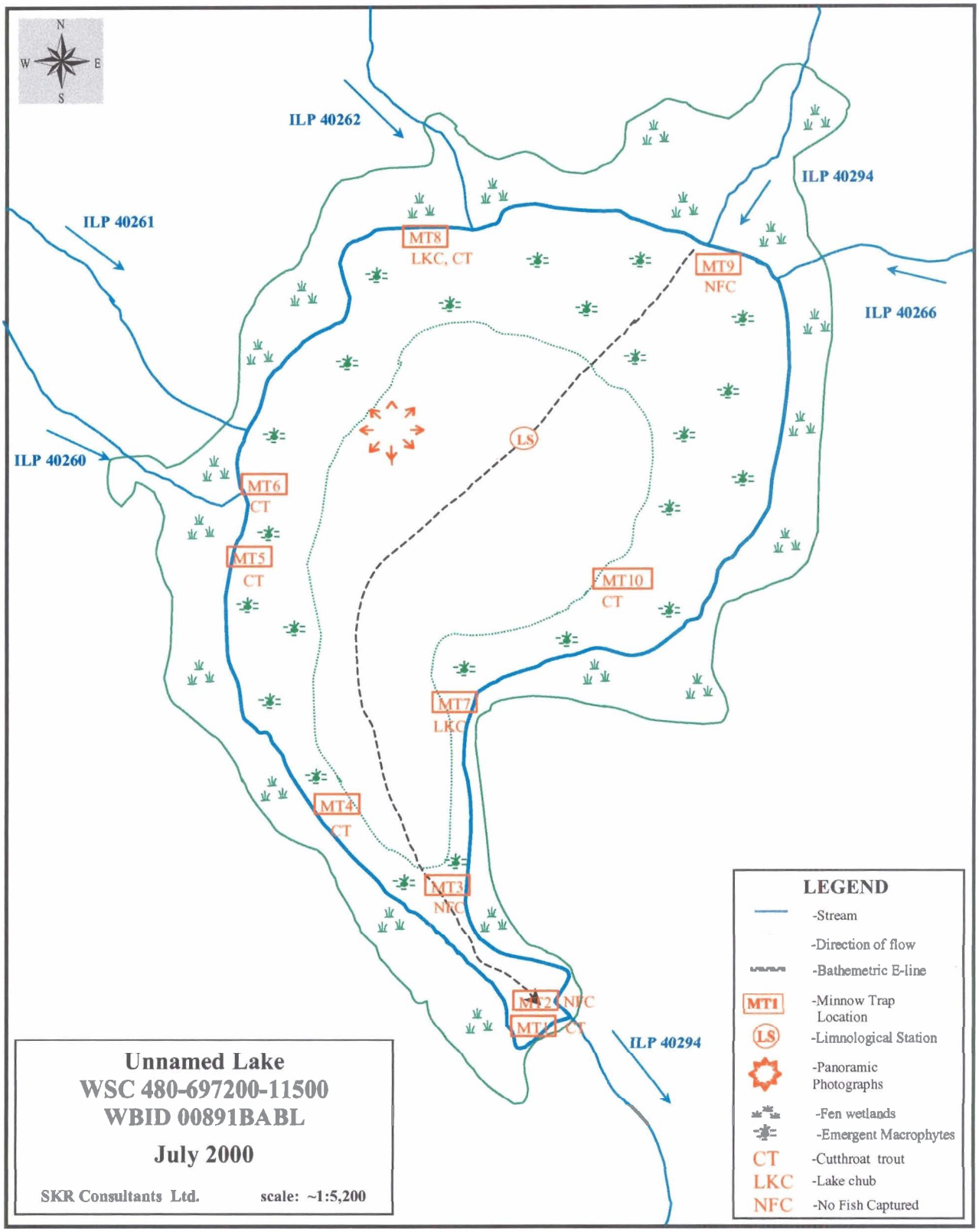

Figure 6. Lake outline map for Unnamed Lake (WSC 480-697200-11500 WBID 00891BABL, ILP 51148) surveyed on July 13th , 2000.

4.5 INLETS AND OUTLETS

Unnamed Lake (WBID 00891BABL, ILP 51148) has five inlet streams and one outlet stream. The lake outlet is located at the southern extent of the lake, forming an extension of the narrow portion of the tear shaped lake. Two of the inlet streams were noted to be permanent (ILP 40294 or WSC 480-697200-11500, and ILP 40260), while two of the inlet streams were ephemeral (ILP 40261, ILP 40266), and one of the inlet streams consisted of beaver dam ponds (ILP 40262). Stream sample sites were established in four of the five inlet streams (ILP 40294 or WSC 480-697200-11500 reach 16, ILP 40261 reach 2, ILP 40262 reach 2 and ILP 40260 reach 2). Each one of these streams was assessed upstream of the wetland surrounding the lake. While the two permanent inlet streams (ILP 40260 and ILP 40294) and the beaver dam complex (ILP 40262) offered some potential rearing and overwintering habitat, none of these inlet streams offered potential spawning habitat since gravels were not present in the substrate in any of these systems. The lake outlet is the only system that offers fluvial spawning habitat for fish in the lake (Figure 7). The spawning habitat in the lake outlet was rated as moderate to good during the lake survey. Cutthroat trout were captured in reach 10 of the lake outlet stream (SKR 2001). No fish were captured in the three inlet streams that were sampled by electroshocking (ILP 40260, ILP 40294, ILP 40262). Of these inlet streams, ILP 40260 was noted to offer slightly better rearing habitat than the other inlet streams, although overall rearing habitat quality was marginal.

Figure 7. Upstream view in reach 13 of the outlet of Unnamed Lake (WBID 00891BABL, ILP 51148).

4.6 SUMMARY OF DATA COLLECTION

Data collected during the secondary lake survey of Unnamed Lake (WSC 480-697200-11500, WBID 00891BABL, ILP 51148) include temperature and oxygen profiles for the lake, and length data for all fish captured. In addition, all cutthroat trout captured were weighed and aged using scale samples. The following sub-sections summarize the limnological and fish sampling information.

4.6.1 Limnological Summary

Water quality measurements were taken at the deep station of the lake (Limnological Station, *see* Figure 2) on July 13th, 2000 at 13:00 hrs. The weather at the time of limnological sampling was overcast (100% cloud cover) with light rain or drizzle. Secchi depth was recorded to be 1.5 m, and the water colour was brown. Field pH was recorded for surface and bottom samples, while conductivity was recorded at the surface only (Table 3). No hydrogen sulphide odour was detected in the bottom sample.

Oxygen and temperature data were obtained at the deep station of the lake (Limnological Station, see Figure 2) on July 13th, 2000 at 13:00 hrs. Readings were taken at 0, 1, 2, 2.5 and 3 metres. Oxygen and temperature profiles (Figure 8) show that the lake is weakly stratified, with the thermocline being located between 2 and 2.5 metres. The lake is well oxygenated in the epilimnion, but oxygen concentrations are below minimum requirements of salmonids (usually around 6.5 ppm, Nagpal 1995, Canadian Council of Resource and Environment Ministers 1983) at depths greater than 2.5 metres. The oxygen profile resembles that of a mesotrophic lake (Wetzel 1983), and the secchi disk depth is within the range reported for mesotrophic or eutrophic lakes (Wetzel 1983). Phosphate and Nitrogen concentrations would be beneficial for further identification of the trophic classification of the lake. The brown colour of the water indicates that allochthonous inputs dominate in this lake (Wetzel 1983).

Table 3. Conductivity and pH recorded in the field at the limnological station of Unnamed Lake (WBID 00520BABL) on July 13, 2000 at 13:00.

Parameter	Surface (0.1 m)	Bottom (3.0 m)
Field pH	7.2	6.9
conductivity	50 µS/cm	not recorded

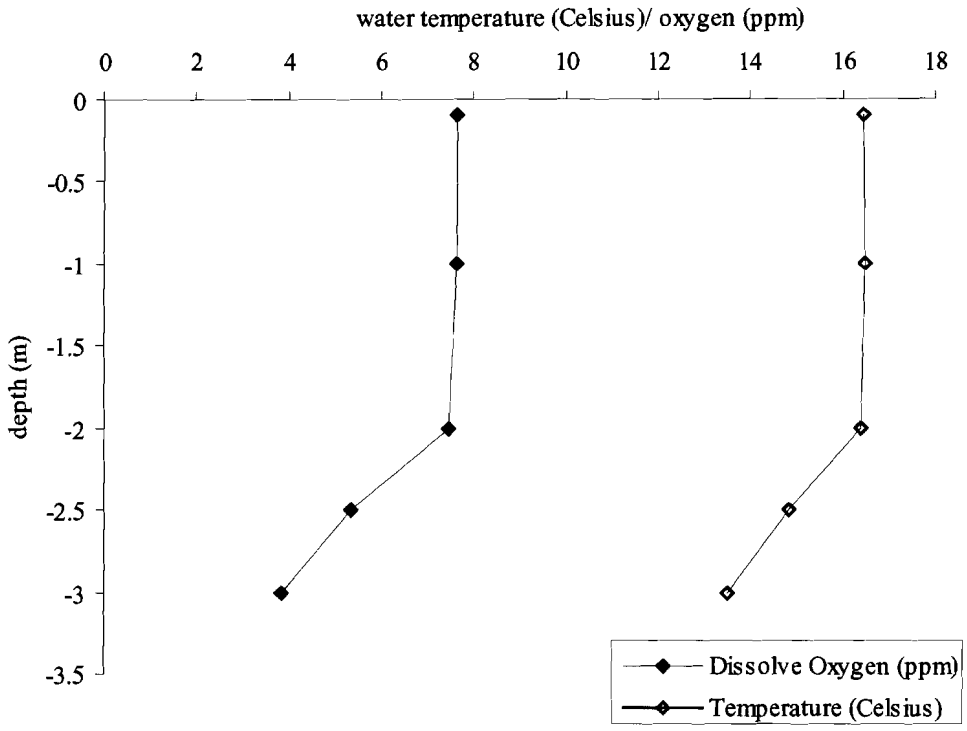

Figure 8. Oxygen and temperature profiles for Unnamed Lake (WBID 00891BABL, ILP 51148) on July 13th, 2000 at 13:00 hrs.

4.6.2 Fish Sampling Summary

Unnamed Lake (WBID 00891BABL, ILP 51148) was sampled by minnow trapping (Table 4). As a result, cutthroat trout (*Oncorhynchus clarki*) and lake chub (*Couesius plumbeus*) were captured in the lake (Table 4). No fish were captured in the three inlet streams sampled by electroshocking. Cutthroat trout have been captured in reach 10 of the lake outlet stream, however (SKR 2001).

Table 4. Fish Sampling summary for Unnamed Lake (WBID 00891BABL, ILP 51148) and associated streams on July 13, 2000. For species codes see Table 1.

Watershed Code	ILP	Reach	Stream Order	Site	Length Surveyed	Sampling Method	Catch
480-697200-11500 (WBID 00891)	40294	14	2		lake	MT	CT, LKC
480-697200-11500	40294	16	2	1	100	EF	NFC
	40260	2	1	12	200	EF	NFC
	40262	2	1	14	100	EF	NFC

4.7 FISH AGE, SIZE AND LIFE HISTORY

4.7.1 Cutthroat Trout

Eight cutthroat trout were captured in the ten minnow traps set in Unnamed Lake (WBID 00891BABL, ILP 51148). Length and weight data was recorded for all eight of the cutthroat trout captured, and scale samples for aging were retained from all but one of these fish. The seven cutthroat trout aged from scales were determined to be three years old. The cutthroat trout not aged was the smallest cutthroat trout captured (125 mm) and is estimated to be age 2 or 3. Since all of the aged fish are from one age class, length at age data analysis was not conducted.

Size data for the cutthroat trout captured in Unnamed Lake (WBID 00891 BABL) are summarized in Table 5. Fulton's condition factor (K) was calculated for the sample. However, the length to weight relationship for cutthroat trout (Figure 9) indicates that growth is not isometric, since the slope of the regression line is lower than 3 (Ricker 1975). The allometric condition factor ($10^{-4.1321}$ x 100,000) is 7.377.

Table 5. Summary of fork length (mm), weight (g) and Fulton's condition factor (K) data for the cutthroat trout captured by minnow trapping in Unnamed Lake (WBID 00891 BABL).

	age cutthroat trout				all cutthroat trout			
Parameter	N	Range	Mean	SE	N	Range	Mean	SE
Fork Length	7	129-157	140.1	3.19	8	125-157	138.25	3.347
Weight	7	19.8-34.0	27.03	1.669	8	19.8-34.0	26.17	1.684
K	7	0.88-1.06	0.977	0.0259	8	0.88-1.06	0.984	0.0234

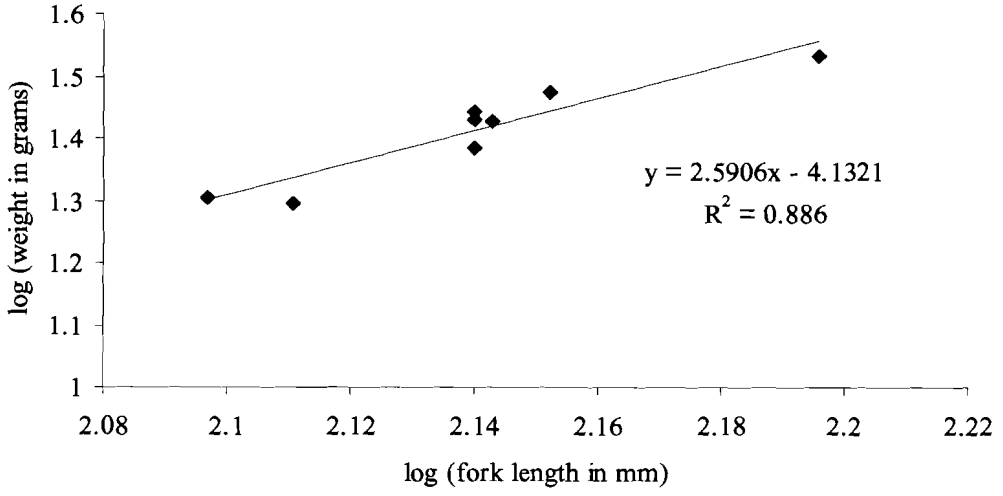

Figure 9. Length – weight relationship for cutthroat trout captured in Unnamed Lake (WBID 00891 BABL) on July 13, 2000. Both parameters are $\log_{10}$ transformed. The linear regression equation and correlation coefficient is inset in the graph.

4.7.2 Lake Chub

Eight lake chub were captured in the ten minnow traps set in Unnamed Lake (WBID 00891 BABL). Fork length was recorded for all of the lake chub captured. Lake chub ranged in length from 70 to 108 mm (mean = 95.5 mm, SE = 4.496). No aging structures were collected during the lake survey. Lake chub attain an average length of 102 mm, reach sexual maturity at 3 or 4 years of age, and appear to be unlikely to survive past age 5 (Scott and Crossman 1973). Based on this information, we speculate that at least the larger specimens sampled were near or at their maximum size, and are 3 or 4 years old.

4.8 SIGNIFICANT FEATURES AND FISHERIES OBSERVATIONS

4.6.1 Fish and Fish Habitat

Two species of fish, cutthroat trout and lake chub, were captured in Unnamed Lake (WBID 00891BABL, ILP 51148) during the 1:20,000 secondary lake survey. All of these fish were captured by minnow trapping, and no gill netting was conducted in the lake. The fact that these fish were captured in minnow traps may indicate that fish are relatively abundant in the lake. Dissolved oxygen concentrations and water conditions in general are adequate for salmonids in the upper two metres of the water column, but oxygen concentration are below desirable levels below this depth *(Canadian Council of Resource and Environment Ministers 1987, Nagpal 1985)*. Spawning habitat for the population of cutthroat trout in the lake was found only in the lake outlet stream, indicating that this population is lacustrine-adfluvial, and dependent on the maintenance of spawning habitat quality and quantity in the outlet stream of the lake. Cutthroat trout is blue listed by the Conservation Data Center (MELP 2001).

4.6.2 Habitat Concerns

4.6.2.1 Restoration and Rehabilitation Opportunities

No restoration or rehabilitation opportunities were identified at Unnamed Lake (WBID 00891BABL, ILP 51148).

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Appendix 1. FDIS Lake Summary Form and Fish Collection Form for Unnamed Lake (WBID 00891BABL, ILP 51148)

FDIS Lake Form

01/01/30

Reach #	ILP Map #	ILP #
14	093L.089	51148

Watershed Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

WATERBODY

Waterbody Type Primary **Sample Type** Secondary **Project ID** 06-BABL-000001202-1999

Lake Names Fish Form? ☒

Gaz **Local** **Ref**

Watershed Code 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

Reach # 14.0 **Air Photo** 30BCC96152 34 **Comment**

Waterbody ID 00891BABL **ILP Map #** 093L.089 **ILP #** 51148

NID Map # 093L.089 **NID #** 44086

UTM 9 671126 6085370 GIS

Incomplete ☐

	Magnitude	Source	Mthd
Surface Area	21.2	TRIM	PL
Elevation	970	TRIM	GIS
Biogeoclimatic Zone		SBS	

TERRAIN CHARACTERISTICS

Setting VF **Aspect** S

Hillslope Coupling DC **Basin Genesis** GL

Land Use NO AG FB FR MI PR UD OT

Percentage 100

SHORELINE CHARACTERISTICS

Shoreline Type i ii iii iv v

Percentage 100

Cover NO Resorts Camps Boatlaunch

Rec. Features 0 0 0

INLETS / OUTLETS

 # Inlets (Perm.) 2 **Inlets (Other)** 3 **Outlets:** 1 **Spawning hab. present?** ☒

I/O	Watershed Code	ILP Map #	ILP #	Comments
I		093L.089	40260	
I		093L.089	40261	
I		093L.089	40262	
I		093L.089	40294	
I		093L.089	40266	
O		093L.089	40294	

SURVEY INFORMATION

Date 2000/07/13 **to** 2000/07/13

Agency C141 **Crew** ML NF

AQUATIC FLORA

EMERGENT VEG. Sparse ☒ **OR** %

SUBMERGENT VEG. Sparse ☐ **OR** 80 %

Floating Algae? ☐

Voucher Specimen

Type	Dom. Species
EMERGENT	MENYANTHES TRIFOLIATA
EMERGENT	POTENTILLA PALUSTRUS
EMERGENT	CAREX SPP.
SUBMERGENT	POTAMAGETON RICHARDSONII
SUBMERGENT	NUPHAR POLYSEPALUM
SUBMERGENT	POTAMAGETON NATONS

ACCESS

Air ☐ FW ☒ H **Road** ☐ V2 ☐ V4 **Auto within**

Off Road ☐ FT ☐ ATV ☐ V4 **Distance**

BT ☐ HO ☐

Trail? ☐ **Distance**

Closest Community Gransile

Comments

accessed the site by helicopter

FDIS Lake Form

Reach #	ILP Map #	ILP #
14	093L.089	51148

01/01/30

Watershed Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

SUBMERGENT CERATOPHYLLUM DEMERSUM

LAKE BATHYMETRY

Type of Survey EL **Littoral Area** 100 % **Method** GE **Max. Depth** 3.6

Benchmark Height 0.1 **High Water Mark** 0.1

Benchmark Type/Location

Comments

PHOTO DOCUMENTATION

Photo (R/F)	Foc Lg	Dir	NID Map #	NID #	UTM (zone/easting/northing)	Method	Comments
TC07 / 01	STD	N					north view
TC07 / 02	STD	N					north north-east view
TC07 / 03	STD	E					east north-east view
TC07 / 04	STD	E					east view
TC07 / 05	STD	E					east south-east view
TC07 / 06	STD	S					south south-east view
TC07 / 07	STD	S					south view
TC07 / 08	STD	S					south sout-west view
TC07 / 09	STD	W					west south-west view
TC07 / 10	STD	W					west view
TC07 / 11	STD	W					west north-west view
TC07 / 12	STD	N					north-west view
TC07 / 13	STD	N					north north-west view

AQUATIC WILDLIFE OBSERVATIONS

Observations

AMP	Wood frog
MAM	cow/calf moose
MAM	beaver
BIR	common loon

LIMNOLOGICAL STATION
WATER QUALITY

Station No. 1 **Date** 2000/07/12 **Time:** 13:00

Location UTM 9 671200 6085650 MAP **EMS #**

WATER SAMPLE

Secchi Depth 1.5

Water Color BR

pH (surf/bottom) 7.2 6.9

Ice Depth

DISSOLVED OXYGEN, TEMPERATURE PROFILE AND CONDUCTIVITY

Depth	DO (d)	T(C)	DO (a)	T (C)	Cond.
.1	7.5	16.4	7.8	16.5	50
1.0	7.5	16.5	7.8	16.5	
2.0	7.5	16.5	7.4	16.3	
2.5	5.4	14.8	5.3	14.9	
3.0	3.9	13.5	31.8	13.5	50

FDIS Lake Form

01/01/30

Reach #	ILP Map #	ILP #
14	093L.089	51148

Watershed Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

H2S:

EQUIPMENT USED

pH	P2	**Water Temp**	T6	**Conductivity**	S4	**Dis. Oxygen**	D6

COMMENTS

Section	Comments
WEATHER	overcast; rain or drizzle all day
SURVEY INFORMATION	the outlet to this lake was the only place that spawning habitat was observed (moderate to good quality)
WATERBODY	the benchmark and high water level mark should be 0 or NS, but due to database restrictions .1 was entered for both

FDIS Fish Form

Reach #	ILP Map #	ILP #
14	093L.089	51148

01/01/30

Watershed Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

WATERBODY

Gazetted Name: **Local:**

WS Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** L

Waterbody ID: 00891BABL **ILP Map #:** 093L.089 **ILP #:** 51148

Project ID: 06-BABL-000001202-1999 **Reach #:** 14 **Lake From Date:** 2000/07/13

Fish Permit #: 144604 **Date:** 2000/07/13 **To:** 2000/07/13 **Agency** C141 **Crew:** ML/NF **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO		Temp	Cond	Turbid	Comment
93	093L.089	44806		MT	1	16.4	50		
94	093L.089	44806		MT	2	16.0	50		
95	093L.089	44806		MT	3	16.0	50		
96	093L.089	44806		MT	4	16.0	50		
97	093L.089	44806		MT	5	16.0	50		
98	093L.089	44806		MT	6	16.0	50		
99	093L.089	44806		MT	7	16.0	50		
100	093L.089	44806		MT	8	16.0	50		
101	093L.089	44806		MT	9	16.0	50		
102	093L.089	44806		MT	10	16.0	50		

A. GEAR SETTINGS

Site#	MTD/NO		H/P	Date In	Time In	Date Out	Time Out	Comment
93	MT	1	1	2000/07/13	07:12	2000/07/13	15:40	
94	MT	2	1	2000/07/13	07:12	2000/07/13	15:40	
95	MT	3	1	2000/07/13	07:12	2000/07/13	15:40	
96	MT	4	1	2000/07/13	07:12	2000/07/13	15:40	
97	MT	5	1	2000/07/13	07:12	2000/07/13	15:40	
98	MT	6	1	2000/07/13	07:12	2000/07/13	15:40	
99	MT	7	1	2000/07/13	07:12	2000/07/13	15:40	
100	MT	8	1	2000/07/13	07:12	2000/07/13	15:40	
101	MT	9	1	2000/07/13	07:12	2000/07/13	15:40	
102	MT	10	1	2000/07/13	07:12	2000/07/13	15:40	

B. NET/TRAP SPECIFICATIONS

Site #	MTD/NO.		H/P	Net Type	Length	Depth	Mesh	Set	Habitat
93	MT	1	1			0.4		BT	L
94	MT	2	1			0.5		BT	L
95	MT	3	1			0.6		BT	L
96	MT	4	1			0.6		BT	L
97	MT	5	1			0.5		BT	L
98	MT	6	1			0.5		BT	L
99	MT	7	1			0.7		BT	L
100	MT	8	1			0.4		BT	L

FDIS Fish Form

Reach #	ILP Map #	ILP #
14	093L.089	51148

01/01/30

Watershed Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

101	MT	9	1	1.0	BT	L
102	MT	10	1	0.4	BT	L

C. ELECTROFISHER SPECIFICATIONS

FISH SUMMARY

Site#	MTD/NO		H/P	Species	Stage	Age	Total #	Lgth (Min/Max)		FishAct	Comment
93	MT	1	1	CT	J	3	1	138	138	R	
94	MT	2	1	NFC			0				
95	MT	3	1	NFC			0				
96	MT	4	1	CT	J	3	2	142	142	R	
97	MT	5	1	CT	J	3	1	138	138	R	
98	MT	6	1	CT	J	3	1	139	139	R	
99	MT	7	1	LKC	NS		5	88	107	R	
100	MT	8	1	LKC	NS		3	70	108	R	
100	MT	8	1	CT	J		1	125	125	R	
101	MT	9	1	NFC			0				
102	MT	10	1	CT	J	3	2	129	138	R	

COMMENTS

FDIS Fish Form

Reach #	ILP Map #	ILP #
14	093L.089	51148

01/01/30

Watershed Code: 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

INDIVIDUAL FISH DATA

Site#	MTD/NO	H/P	Species	Length	Weight	Sex	Mat	Age Str/Smpl#	Age	Age	Vch#	Genetic Str/Smpl#	Genetic	Roll #	Frame#	Comment
100	MT 8	1	LKC	70		U	U									
100	MT 8	1	LKC	91		U	U									
100	MT 8	1	LKC	108		U	U									
99	MT 7	1	LKC	104		U	U									
99	MT 7	1	LKC	88		U	U									
99	MT 7	1	LKC	94		U	U									
99	MT 7	1	LKC	107		U	U									
99	MT 7	1	LKC	102		U	U									
102	MT 10	1	CT	138	26.9	U	U	SC	30	3		FR	1			
102	MT 10	1	CT	129	19.8	U	U	SC	31	3		FR	2			
97	MT 5	1	CT	138	24.3	U	U	SC	32	3		FR	3			
98	MT 6	1	CT	139	26.7	U	U	SC	33	3		FR	4			
100	MT 8	1	CT	125	20.1	U	U	SC	34			FR	5			no scales suitabl for aging
93	MT 1	1	CT	138	22.8	U	U	SC	35	3						
96	MT 4	1	CT	142	29.8	U	U	SC	36	3						
96	MT 4	1	CT	157	34.0	U	U	SC	37	3						

Appendix 2. FDIS Reach Cards and Site Photograph for the outlet of Unnamed Lake (WBID 00891BABL, ILP 51148)

Stream	ILP	Reach
outlet	40294	13
mainstem inlet #1	40294	15
inlet #2	40260	2
inlet #3	40261	2
inlet #4	40262	2
inlet #5	40266	1

FDIS Reach Card

Reach #	ILP Map #	ILP #
13.0 -	093L.089	40294

01/02/08

Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

PROJECT

Project Name **Project Code**

Stream Name (gaz.)

Project Watershed Code 480-697200-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Reach Watershed Code 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

ILP Map #	ILP #	Reach #	NID Map #	NID #	UTM(Zone/East/North/Method)
093L.089	40294	13.0 -			9 671126 6085370 GIS

Air Photos **Names**

LINE: **Gaz.** **Sample Type**

**Local** Unnamed Creek **Wetland** ☐

SURVEY INFO

Date 1999/03/16 **Agency** C141 **Crew**

ATTRIBUTES

Length (km) .76 **US Elev** 970

DS Elev. 956 **Magnitude**

Gradient 1.95 **Order** 3 **BGC Zone**

Setting

Open water

Confinement OC

Coupling

Valley Flat **C/D**

Active Floodplain Visible ☐ Est. Width:

Channel Pattern SI

DISTURBANCE INDICATORS O1 B1 B2 B3 D1 D2 D3 ☐ ☐ ☐ ☐ ☐ ☐ ☐

C1 C2 C3 C4 C5 S1 S2 S3 S4 S5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Islands

Bars ☐ N ☐ SIDE ☐ DIAG ☐ MID ☐ SPAN ☐ BR

Mass Movement

Riparian Veg.

Exposed/Eroded

Landuse

MAPS

FEATURES

PHOTOS

Photo			Foc Lg	Dir	Comments
TC0	F	16	STD	U	outlet stream of lake
TC0	F	17	STD	D	outlet stream of lake

COMMENTS

Outlet from Unnamed Lake (WBID 00891BABL, ILP 51148)
Unnamed Creek (ILP 40294) Reach 13

Upstream view (above) and downstream view (below).

FDIS Reach Card

Reach #	ILP Map #	ILP #
15.0 -	093L.089	40294

01/02/08

Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

PROJECT

Project Name **Project Code**

Stream Name (gaz.)

Project Watershed Code 480-697200-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Reach Watershed Code 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

ILP Map #	ILP #	Reach #	NID Map #	NID #	UTM(Zone/East/North/Method)
093L.089	40294	15.0 -			9 671330 6086398 GIS

Air Photos **Names**

LINE: **Gaz.** **Sample Type** N

**Local** Unnamed Creek **Wetland** ☒

SURVEY INFO

Date 1999/03/16 **Agency** C141 **Crew**

ATTRIBUTES

Length (km) .38 **US Elev** 970

DS Elev. 967 **Magnitude**

Gradient 0.8 **Order** 2 **BGC Zone**

Setting

Open water

Confinement OC

Coupling

Valley Flat **C/D**

Active Floodplain Visible ☐ Est. Width:

Channel Pattern SI

DISTURBANCE INDICATORS O1 B1 B2 B3 D1 D2 D3 ☐ ☐ ☐ ☐ ☐ ☐ ☐

C1 C2 C3 C4 C5 S1 S2 S3 S4 S5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Islands

Bars ☐ N ☐ SIDE ☐ DIAG ☐ MID ☐ SPAN ☐ BR

Mass Movement

Riparian Veg.

Exposed/Eroded

Landuse

MAPS

FEATURES

PHOTOS

Photo			Foc Lg	Dir	Comments
TC0	F	14	STD	U	inlet stream to lake
TC0	F	15	STD	D	inlet stream to lake

COMMENTS

Mainstem inlet #1 to Unnamed Lake (WBID 00891BABL, ILP 51148)
Unnamed Creek (ILP 40294) Reach 15

Upstream view (above) and downstream view (below).

FDIS Reach Card

Reach #	ILP Map #	ILP #
2.0 -	093L.089	40260

01/05/10

Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

PROJECT

Project Name Babine (Sub-unit 40) Fish Inventory **Project Code** 06-BABL-000001202-1999

Stream Name (gaz.)

Project Watershed Code 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Reach Watershed Code 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

ILP Map #	ILP #	Reach #	NID Map #	NID #	UTM(Zone/East/North/Method)
093L.089	40260	2.0 -			9 669903 6086584 GIS

Air Photos **Names**

LINE: **Gaz.** **Sample Type** R

**Local** Unnamed Creek **Wetland** ☐

SURVEY INFO

Date 1999/03/16 **Agency** C141 **Crew** RS DM

ATTRIBUTES

Length (km)	1.09	**US Elev**	994	**DISTURBANCE INDICATORS**	O1 B1 B2 B3 D1 D2 D3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
DS Elev.	972	**Magnitude**	1		C1 C2 C3 C4 C5 S1 S2 S3 S4 S5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Gradient	2	**Order**	1	**BGC Zone**	SBS
Setting	PN			**Islands**	N
Open water	P			**Bars**	☒ N ☐ SIDE ☐ DIAG ☐ MID ☐ SPAN ☐ BR
Confinement	OC			**Mass Movement**	L
Coupling	DC			**Riparian Veg.**	S
Valley Flat	B	**C/D**	C	**Exposed/Eroded**	N
Active Floodplain	Visible ☐	Est. Width:		**Landuse**	NO
Channel Pattern	SI				

MAPS

Map Type	Map #	Year
TRIM	093L.089	1994

FEATURES

PHOTOS

COMMENTS

Inlet #2 to Unnamed Lake (WBID 00891BABL, ILP 51148)
Unnamed Creek (ILP 40260) Reach 2

Upstream view (above) and downstream view (below).

FDIS Reach Card

Reach #	ILP Map #	ILP #
2.0 -	093L.089	40261

01/05/10

Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

PROJECT

Project Name Babine (Sub-unit 40) Fish Inventory **Project Code** 06-BABL-000001202-1999

Stream Name (gaz.)

Project Watershed Code 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Reach Watershed Code 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

ILP Map #	ILP #	Reach #	NID Map #	NID #	UTM(Zone/East/North/Method)
093L.089	40261	2.0 -			9 670262 6086608 GIS

Air Photos **Names**

LINE: **Gaz.** **Sample Type** B

**Local** Unnamed Creek **Wetland** ☐

SURVEY INFO

Date 1999/03/16 **Agency** C141 **Crew** RS DM

ATTRIBUTES

Length (km)	.85	**US Elev**	989	**DISTURBANCE INDICATORS**	O1 B1 B2 B3 D1 D2 D3 ☐ ☐ ☐ ☐ ☐ ☐ ☐
DS Elev.	970	**Magnitude**	1		C1 C2 C3 C4 C5 S1 S2 S3 S4 S5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Gradient	2.26	**Order**	1	**BGC Zone**	SBS
Setting	PN			**Islands**	N
Open water	A			**Bars**	☒ N ☐ SIDE ☐ DIAG ☐ MID ☐ SPAN ☐ BR
Confinement	FC			**Mass Movement**	L
Coupling	DC			**Riparian Veg.**	C
Valley Flat	B	**C/D**	NS	**Exposed/Eroded**	N
Active Floodplain	Visible ☐	Est. Width:		**Landuse**	NO
Channel Pattern	SI				

MAPS

Map Type	Map #	Year
TRIM	093L.089	1994

FEATURES

PHOTOS

COMMENTS

Inlet #3 to Unnamed Lake (WBID 00891BABL, ILP 51148)
Unnamed Creek (ILP 40261) Reach 2

Upstream view (above) and downstream view (below).

Inlet #4 to Unnamed Lake (WBID 00891BABL, ILP 51148)
Unnamed Creek (ILP 40262) Reach 2

Upstream view (above) and downstream view (below).

FDIS Reach Card

Reach #	ILP Map #	ILP #
2.0 -	093L.089	40262

01/05/10

Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

PROJECT

Project Name Babine (Sub-unit 40) Fish Inventory **Project Code** 06-BABL-000001202-1999

Stream Name (gaz.)

Project Watershed Code 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Reach Watershed Code 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

ILP Map #	ILP #	Reach #	NID Map #	NID #	UTM(Zone/East/North/Method)
093L.089	40262	2.0 -			9 670874 6086474 GIS

Air Photos **Names**

LINE: **Gaz.** **Sample Type** R

**Local** Unnamed Creek **Wetland** ☐

SURVEY INFO

Date 1999/03/16 **Agency** C141 **Crew** MJ SH

ATTRIBUTES

Length (km)	.21	**US Elev**	977	**DISTURBANCE INDICATORS**	O1 B1 B2 B3 D1 D2 D3
DS Elev.	972	**Magnitude**	2		☒ ☐ ☐ ☐ ☐ ☐ ☐
Gradient	2.35	**Order**	2	**BGC Zone**	SBS
					C1 C2 C3 C4 C5 S1 S2 S3 S4 S5
					☐ ☐ ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐
Setting	PN			**Islands**	N
Open water	P			**Bars**	☒ N ☐ SIDE ☐ DIAG ☐ MID ☐ SPAN ☐ BR
Confinement	OC			**Mass Movement**	L
Coupling	DC			**Riparian Veg.**	M
Valley Flat	B	**C/D**	NS	**Exposed/Eroded**	N
Active Floodplain	Visible ☐	Est. Width:		**Landuse**	NO
Channel Pattern	SI				

MAPS

Map Type	Map #	Year
TRIM	093L.089	1994

FEATURES

PHOTOS

COMMENTS

FDIS Reach Card

Reach #	ILP Map #	ILP #
1.0 -	093L.089	40266

01/02/08

Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

PROJECT

Project Name Babine (Sub-unit 40) Fish Inventory **Project Code** 06-BABL-000001202-1999

Stream Name (gaz.)

Project Watershed Code 480-697200-11500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Reach Watershed Code 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

ILP Map #	ILP #	Reach #	NID Map #	NID #	UTM(Zone/East/North/Method)
093L.089	40266	1.0 -			9 671414 6086055 GIS

Air Photos **Names**

LINE: **Gaz.** **Sample Type**

**Local** Unnamed Creek **Wetland** ☒

SURVEY INFO

Date 1999/03/16 **Agency** C141 **Crew**

ATTRIBUTES

Length (km) .09 **US Elev** 971

DS Elev. 968 **Magnitude**

Gradient 3.98 **Order** 1 **BGC Zone**

Setting

Open water

Confinement UN

Coupling

Valley Flat C/D

Active Floodplain Visible ☐ Est. Width:

Channel Pattern SI

DISTURBANCE INDICATORS O1 B1 B2 B3 D1 D2 D3 ☐ ☐ ☐ ☐ ☐ ☐ ☐

C1 C2 C3 C4 C5 S1 S2 S3 S4 S5 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Islands

Bars ☐N ☐SIDE ☐DIAG ☐MID ☐SPAN ☐BR

Mass Movement

Riparian Veg.

Exposed/Eroded

Landuse

MAPS

FEATURES

PHOTOS

COMMENTS

Appendix 3. Photodocumentation Form 1. Negatives and digital images of photos (2 copies) were submitted to B.C. Environment.

Photodocumentation Form 1 – Equipment Details

Survey Start Date:	2000/07/12	Survey End Date:	2000/07/12
Agency:	C141		
Crew:	ML/NF		

Camera #1:

Make and Model:	Canon Sureshot A1
Lense:	35 mm
Format:	135 mm, Kodak CD Rom

Roll and or Batches Detail:

Roll #	CD #	Camera	Output Medium	Film Type	ISO
TC7	Tanglechain #2	1	negative/CD Rom	colour print	200
TC8	Tanglechain #3	1	negative/CD Rom	colour print	200

For Photdocumentation Form 2, please see SKR (2001).