Reconnaissance (1:20,000) Fish and Fish Habitat Inventory of Selected Inlet Streams to the East Shore of the Northwest Arm of Babine Lake

Watershed Code: 480-000000

Prepared for

Houston Forest Products Co.
Box 5000
Houston, B.C.
V0J 1Z0

Prepared by

SKR Consultants Ltd.
RR#1, Site 11, Comp. 4
Smithers, B.C.
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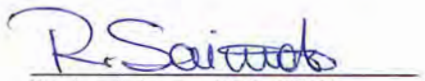

Regina Saimoto, M.Sc.RPBio.
Biologist
SKR Consultants Ltd.

March 31, 2001

PROJECT SUMMARY SHEET

PROJECT REFERENCE INFORMATION

MELP Project #:	HFP-SKR-001-2001
FRBC Project #	000108
FRBC Activity #:	10447
FDIS Project #:	06-BABL-00001172-1999
MELP Region:	Skeena Region (06)
FW Management Unit:	06-08
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
Watershed Name	Face units to Babine Lake
Watershed Code	480-000000
UTM at Mouth	Several inlet streams were surveyed
Watershed Area	51.875 km^2 (study areas only)
Total of all Stream Lengths	86.5 km (study areas only)
Stream Order	4^{th} (study areas only)
NTS Maps (1:50,000)	93M/1, 93M/2, 93M/7, 93M/8 (study areas only)
TRIM Maps	093M.018, 093M.028 (study areas only)
BEC Zone	SBSmc
Air Photos for study area	30BCC 93036 No. 111-116, 176-177, 267-270. 30BCC 93038 No. 195-202, 271-273. 30BCC 93039 No. 27-35, 45-49, 123-127, 139-144, 226-232, 280-284.

SAMPLING DESIGN

Total # of Reaches	129
Random Sampling Sites	5 (5 proposed)
Discretionary Sample Sites	3 (3 proposed)
Value Added Sites	2 (1 random, 1 discretionary)
Total Sample Sites	10 (8 proposed)
Secondary Lake Inventory	1 (1 proposed)
Field Sampling Dates	July 11^{th} and July 26^{th}, 2000
Fish Species in Watershed	CO, RB, CT, DV, BB, CSU, LKC, LNC, WSU

CONTRACTOR INFORMATION

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Report edited by:	*Names:*	Regina Saimoto
Scales aged by:	*Names:*	Douglas MacKay and Ron Saimoto
Maps prepared by:	*Name:*	Nancy Elliot, John Rustad
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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 Houston Forest Products Co. (HFP), Houston, B.C. The contract was administered and monitored by Deidre Quinlan for HFP. Melissa Todd, Paul Ross and Deidre Quinlan (HFP) were invaluable in their support throughout this project. Western Geographic Information Systems Inc. (Prince George, B.C.) conducted all digital mapping for the project, and produced the project overview map, the fisheries project maps, and the fisheries interpretive maps. Editorial comments on drafts of this report were provided by Regina Saimoto (SKR Consultants Ltd.), Chris Schell (QA/QC Monitor), and Paul Giroux (B.C. Environment).

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LIST OF APPENDICES

LIST OF ATTACHMENTS AVAILABLE AT MELP OFFICE

Digital Overview Map
Digital Fisheries Project/Interpretive Maps
Photograph Kodak CD's (2 sets)
Indexed negatives
Digital reports
Digital FDIS database

OVERVIEW MAP

Some small order Watersheds in the Babine Lake Watershed Group

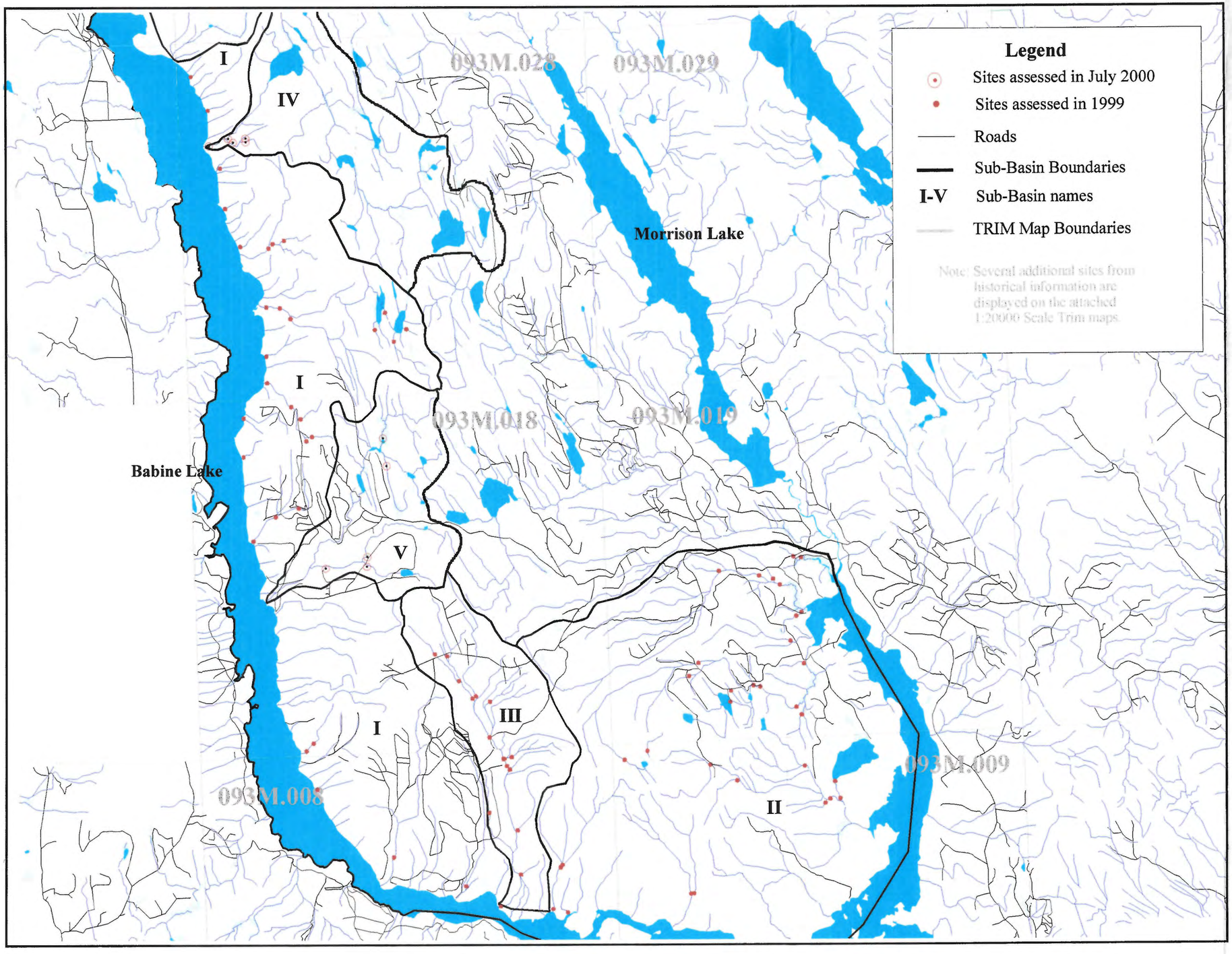
Scale ~1:124,000

N
W E
S

PROJECT CODE: HFP-SKR-001-2001
DATE: 2001/01/15
INVENTORY COMPANY: SKR Consultants Ltd.
Printed in Canada by: SKR Consultants Ltd. and WGIS Inc.

Location of the Morice Forest District in B.C.

Location of the Study Area in the Morice Forest District



1.0 INTRODUCTION

SKR Consultants Ltd. was retained by Houston Forest Products Co. (HFP) to conduct a reconnaissance (1:20:000) fish and fish habitat inventory in a northeast portion of the Babine Lake watershed under joint funding from Forest Renewal B.C. (FRBC) and HFP. Selected inlet streams that drain into the east shore of Babine Lake between Morrison Arm and Fort Babine were identified for inventory. In addition, one lake within the study area (WBID 00433 BABL) was sampled (SKR 2001). Three of the five sub-basins identified in the study area (Sub-basins I, II, and III) were inventoried in 1999 (SKR 2000a). Initially, only four of the five sub-basins were planned to be inventoried, but the fifth sub-basin (Sub-basin V - Aven Lake Sub-basin) was added during the planning phase of the second year of this study (March 2000). Sub-basins IV and V were inventoried during July 2000. The five sub-basins in this study area include:

- Sub-basin I: Inlet streams to Babine Lake along the western boundary of the study area
- Sub-basin II: Inlet streams to Babine Lake along the southern and eastern boundary of the study area
- Sub-basin III: Fourth order watershed (ILP 10844; WSC 480-559500) draining into Babine Lake at the southern boundary of the study area
- **Sub-basin IV: Fourth order watershed (ILP 10864; WSC 480-502100) draining into Babine Lake along the western boundary of the study area.**
- **Sub-basin V Fourth order watershed (ILP 10362; WSC 480-445700) draining into Babine Lake along the western boundary of the study area.**

Note: Sub-basins in **Bold Text** were inventoried in 2000,
Sub-basins in Normal text were inventoried in 1999.

1.1 OBJECTIVES

The main objectives of the reconnaissance (1:20,000) fish and fish habitat stream inventory project within selected inlet streams to Babine Lake were:

- to review and summarize historical fisheries information for the study area,
- to undertake a reconnaissance level stream inventory to describe fish distribution and diversity,
- to document barriers to fish passage,
- to document fish habitat characteristics,
- to conduct a secondary lake inventory at a lake in Sub-basin IV where stream sampling could not confirm absence,
- to identify further sampling requirements, and
- to classify reaches sampled according to the B.C. Forest Practices Code Fish – Stream Identification guidebook (1998).

1.2 LOCATION

Inlet streams to the east shore of Babine Lake between Morrison Creek and Fort Babine are located in the Skeena Region (B.C. Environment), and in the Morice Forest District, Prince Rupert Forest Region (Figure 1). Babine Lake is a large headwater lake to the Babine River, a major tributary to the Skeena River system. The Babine River is a heritage river (Anonymous 1997) and it is one of five Class I classified waters in British Columbia (Morten 1998, Anonymous 1997). The system offers world renowned angling and wilderness experience (Morten 1998). The area surveyed during this reconnaissance fish and fish habitat inventory project is located approximately 87 km north of Houston, B.C. (Figure 1).

1.2.1 Access

Access to this study area included four wheel drive road access, and boat access to the streams inventoried in sub-basin V. The Morrison Logging Camp was used as the main base for work in sub-basin IV, and a boat launch at Babine Lake Resort was used to access streams in sub-basin V.

Directions from Granisle B.C. to HFP Morrison Logging Camp:

- Turn left from the Granisle Highway approximately 7 kilometers south of Granisle onto the Michell Bay Road to the Nose Bay barge terminal.
- Cross Babine Lake on the barge to Nose Bay (Permit is required)
- Travel 9 km north on Jinx Main Forest Road
- Turn left on Hagen Forest Road and travel 39 km to the Morrison Creek bridge
- Continue travelling along the Hagen Forest Road to km 42
- Turn left onto the Morrison Main Forest Road
- Travel 6 km south on the Morrison Main Forest Road

Directions to Babine Lake Resort boat launch from Smithers, B.C.

- Turn left from Highway 16 approximately 6 km southeast of Smithers onto Babine Lake Road
- Continue travelling on Babine Lake Road past the Chapman Bridge and past the turn-off for the Doris Lake BCFS Recreation Site
- At 53 km, turn left onto the Nilkitkwa FSR (4000 Rd).
- At approximately 41 km on the Nilkitkwa FSR, turn right onto the access road for the Babine Lake Resort (there is a sign at the turn-off). Signs on the resort property guide you to the boat launch.

1.3 HISTORICAL INFORMATION

A relatively large amount of fisheries information was available for Babine Lake and the upper portions of the sub-basins that were inventoried in the second year of this study (FISS). Inlet streams to Babine Lake are known to support a variety of fish, including anadromous and non-anadromous species (Table 1).

Historical information pertaining to the streams draining into the east shore of Babine Lake (FISS) between Morrison Arm and Fort Babine indicates that rainbow trout, cutthroat trout, coho, and burbot may utilize available habitat in lower reaches of these inlet streams. Rainbow trout, longnose and coarse scale suckers, and lake chub have been documented in mid and upper reaches of inlet streams to Babine Lake and Morrison Arm (FISS, SKR 1997, 1998a, 1998b, 1998c, 1999a, 1999b, 2000a). Burbot and white suckers have been identified present in a small lake in the Sub-basin V (FISS). In addition, cutthroat trout, peamouth chub, northern pikeminnow, and mountain whitefish have been documented in Sub-basin III, but neither Sub-basins IV or V (SKR 2000a).

A five metre waterfall has been identified in reach 3 of the mainstem (ILP 10864, WSC: 480-502100) in sub-basin IV (FISS), and no fish have been captured above this barrier (SKR 1997, SKR 1998b, SKR 1998c). A twenty metre waterfall on the mainstem in Sub-basin V has been identified approximately 1.3 km upstream of Babine Lake (SKR 1998a). Lake chub, longnose suckers, coarse scale suckers, white suckers, and burbot have been captured upstream of this barrier (Degisi and Schell, 1997).

Table 1. A summary of fish previously documented in Sub basins IV and V of the Babine Lake study area.

Species	Code	Location	Reference
Coho – *Oncorhynchus kisutch*	CO	Babine Lake watershed Sub-basins I, II, III Sub-basin IV Sub-basin V	FISS SKR 1997, 1998a, 1998b, 2000a FISS FISS
Rainbow trout/ Steelhead – *O. mykiss*	RB	Babine Lake watershed Sub-basins I, II, III Sub-basin IV Sub-basin V	FISS SKR 1998a, 1998b, 2000a FISS FISS
Burbot – *Lota lota*	BB	Babine Lake watershed Sub-basin V	FISS FISS
White sucker – *Catostomus commersoni*	WSU	Babine Lake watershed Sub-basin V	FISS FISS
Longnose sucker-*Catostomus catostomus*	LNC	Babine Lake watershed Sub-basin V	FISS SKR 1997, FISS
Coarse scale sucker – *Catostomus macrocheilus*	CSU	Babine Lake watershed Sub-basin V	FISS SKR 1997, FISS
Lake chub – *Couesius plumbeus*	LKC	Babine Lake watershed Sub-basin V	FISS SKR 1997, FISS
Cutthroat trout – *O. clarki*	CT	Babine Lake watershed Sub-basin III	FISS SKR 2000a

2.0 RESOURCE USE

The study area within the Babine Lake Basin is public land and as such is utilized by several different resource sectors.

1. First Nations issues and interests in the study area:
   - Land claimed by the Lake Babine Nation as part of their traditional territories includes the entire study area (B.C. Treaty Commission 2000). The Lake Babine Nation is currently at stage four of the Treaty Negotiation Process (Andrew Goulet 2000, pers. comm.).
2. Development and land use: forestry, mining, recreation:
   - The study area falls into tree farm license FLA-16827 which is managed by Houston Forest Products Co.. Harvest in the study area has been proposed to this year (2000)(HFP 1999).
   - There are no placer stakes or coal licenses in the study area, however one mineral claim (Mor 1, tenure # 356734) exists in Sub-basin V (Ministry of Employment and Investment 2000).
   - The guide outfitter territory in the study area is 608G003, and the four trap line territories are 608T020, 608T023, 608T024 and 608T025. (HFP 1999)
   - The study area has little recreational value with no recreational sites or trails indicated on the Ministry of Forest Morice District Recreation Map (MoF 1997).
3. Other developments, concerns or points of interest:
   - No higher level plans are in place for the study area (Land Use Coordination Office 2000).
   - No water licenses have been recorded for the study area (B.C. Environment 2000b, pers. comm.).
4. Existing water quality data:
   - No existing water quality data is known to exist within the study area (Giroux 1999, pers. comm.)
5. Previous presence of fish in systems of interest:
   - Fish presence previously documented in the Babine Lake drainage and Sub-basins IV and V are summarized in Table 1.

3.0 METHODS

This project closely follows all applicable RIC Standards (1998a, 1999, 2000) and the Forest Practice Code fish - stream identification guidebook (1998). Details on methodologies and value added attributes of sampling site selection, field assessments, and digital mapping are provided in the following sub-sections.

3.1 SAMPLE SITE SELECTION

Sample sites were selected by conducting reach break analysis and random sampling queries using the Fish Data Information System (FDIS) ACCESS 2.0 data tool for each of the sub-basins in the study area. All streams on the 1:20,000 TRIM map scale were identified numerically by assigning an Interim Location Point (ILP) or watershed code, following 1:20,000 fish and fish habitat inventory standards (RIC 1998a, 1999, 2000). Streams were divided into reaches based on map and air photo interpretation. Necessary reach information was entered in the FDIS database, following Resource Inventory Committee standards (RIC 1998a, 1999, 2000). Version 7.0 of the FDIS ACCESS 2.0 data tool was used to randomly select sampling sites to determine the general distribution and total number of sites required in the study area. Some sites were deleted or moved based on previous fish sampling in the watershed and site accessibility. Random and biased sampling sites were mapped on 1:20,000 scale, along with existing fisheries information for presentation to the contract monitor and the ministry representative. The sampling plan was summarized in a project plan (SKR 1999a, 2000c) for ministry and contract monitor approval. Following reach data analysis, the FDIS database was upgraded to FDIS version 7.2

3.2 STREAM ASSESSMENT

All stream assessments were conducted in 2000. Stream sites in Sub-basin IV were accessed by four wheel drive vehicle and sites in Sub-basin V were accessed by boat. Stream sections of interest were assessed to determine fish presence and habitat values. Fish Data Information System (FDIS) site cards and fish collection cards were completed at sample sites, following Resource Inventory Committee Standards (RIC 1998a, 1999), and data were entered into the FDIS database using the FDIS data entry tool. Following data entry, the databases were updated to FDIS version 7.2.

A list of sampling equipment used during this 1:20,000 reconnaissance level fish and fish habitat inventory project is presented in Table 2.

Table 2. List of sampling equipment used during the 1:20,000 reconnaissance fish and fish habitat inventory project.

Parameter	Sampling Intensity	Method
date and time	each site	wrist watch
water temperature	each site	alcohol thermometer
pH	each site	Oaktron pHTestr2
Conductivity	each site	Hanna HI 9033, Oaktron TDSTestr 3
Water clarity	each site	Visual
fish presence	as required to determine fish presence	Smith Root Model 15C and 12B, minnow traps
Photography	each site	Canon Sureshot A1
GPS	where available	Garmen GPS 45
Gradient	each site	Abney Level or Suunto clinometer

3.3 MAPPING

Reach break analysis was conducted during phase II of this reconnaissance (1:20000) fish and fish habitat inventory project (RIC 1998a, 1999, 2000) by SKR Consultants Ltd. (SKR) and Western Geographic Information Systems Inc. (WGIS)(SKR 1999c). The majority of reach break information for the FDIS database was obtained from TRIM map and air photograph interpretations by SKR. WGIS provided lengths, gradients, and UTM coordinates for all reaches in the study area after linking new spatial data to TRIM map data that was obtained from the FTP//...TRIM library (MELP). All reach break mapping closely followed the RIC standards for reach analysis (1998a, 1999, 2000) and digital mapping (1998b).

After completing the field portion (Phase IV) of this study, SKR provided WGIS with the completed FDIS database and draft hardcopy maps. Data presented on the maps included sub-basin boundaries, sample site locations, significant features, and historical information within the study area. In addition, SKR identified reaches with known fish presence, suspected fish presence, suspected fish absence, and known fish absence for presentation of fish distribution on the interpretive maps. The criteria used by SKR for determining fish presence and absence are presented in Table 3. Digitizing of all spatial data for the final mapping deliverables of this project was conducted by WGIS.

Final digital mapping and hardcopy deliverables were provided by Nancy Elliot (WGIS), under supervision of John Rustad (WGIS), following RIC (1998b) and B.C. Environment (Skeena Region) mapping standards.

Table 3. Criteria used to evaluate fish distribution for presentation on the Interpretive Hardcopy Maps (Appendix 4) of this study area.

Fish Present _____	• Stream reaches where fish have been captured or can be classified as fish bearing based on fish captured upstream. NOTE: fish distribution may not always extend to the upper limit of all reaches symbolized as fish bearing
Fish Suspected Present ----------	• Stream reaches with gradients less than 21% and with any potential for fish presence, excluding first order streams less than 1 km in length on 1:20000 TRIM map
Fish Suspected Absent ----------	• First order streams less than 1 km in total length on 1:20000 TRIM map • Streams visited with limited potential for fish presence, but no definable barriers to fish passage following RIC standards, thus still requiring resampling
Fish Absent _____	• Reaches with no fish captured in two seasons upstream of natural obstructions to fish migration • Reaches upstream of identified natural barriers to fish migration following intensive sampling in one season • First and small second order streams flowing into non fish bearing reaches • Reaches with gradients exceeding 20% (Note: the location of lower reach break is not defined until field sampling is conducted)

4.0 RESULTS AND DISCUSSION

In conjunction with extensive historical information, ten of the 129 stream reaches in the study areas (Sub-basins IV, and V) and one lake in Sub-basin IV were sampled during July 2000. The general intent of fish inventory in these two areas was to better identify fish distribution and habitat use, and to document and map all fisheries information within the licensed area of HFP that is within the Babine Lake watershed. Of the ten sites that were sampled during the field portion of this project, six sites were randomly selected reaches, and four were discretionary reaches. In addition, one secondary lake inventory was conducted to confirm fish absence from a small drainage upstream of a waterfall in Sub-basin IV. The following sections summarize the results from this field inventory project in context with historical information available for the study area, as outlined in the "Buba Creek Example Report" (B.C. Environment 2000a).

4.1 LOGISTICS

No logistical problems were encountered during the implementation of the field phase of this project.

4.2 SUMMARY OF SUB-BASIN BIOPHYSICAL INFORMATION

Sub-basins IV and V are both relatively small sub-watersheds draining into the eastern shore of Babine Lake (*for details see* Table 4). Both of these drainages are located within the moist-cold subzone of the Sub-Boreal Spruce (SBS) biogeoclimatic zone (*for details see* Tables 5). No glaciers are within the study area (Sub-basins I-V). The terrain within the two sub-basins inventoried is characterized by mostly gentle rolling terrain. There are nine lakes within the Sub-basin V, including Aven Lake (72.4 ha), one other similar sized Unnamed Lake (84.8 ha), four small lakes (14.4 – 23.2 ha), and three very small lakes (ranging from 1.6-6.4 ha). In sub-basin IV, there are 8 lakes, all of which are <10ha (ranging from 7.6 – 0.4 ha).

Table 4. Summary of watershed information for the five sub-basins identified along the east shore of Babine Lake drainage between Morrison Creek and Fort Babine.

Gazetted Name	Watershed Code	Watershed Area (km^2)	Stream Length (km)	Stream Order	NTS Maps	BEC Zone(s)	Named Lakes	Wetlands
Sub-Basin I East Babine Face Units	480	158.03	177.12	3	93M/01 93M/02	SBSmc ESSFk	None	2.70 km^2 (18 areas)
Sub-Basin II West Babine Face Units	480	91.60	144.44	4	93M/02 93M/07 93M/08	SBSmc	None	2.37 km^2 (25 areas)
Sub-Basin III Unnamed Creek UTM 9.6102899.663328	480-559500	20.55	48.65	4	93M/01	SBSmc	None	none
Sub-basin IV **Unnamed Creek** UTM 9.645475.6113057	**480-502100**	**23.85**	**30.97**	**4**	**93M/07** **93M/08**	**SBSmc**	**None**	**0.61 km^2** **(22 areas)**
Sub-basin V **Aven Lake** UTM 9.633500.6124848	**480-445700**	**33.72**	**50.09**	**4**	**93M/07** **93M/08**	**SBSmc**	**None**	**2.75 km^2** **(13 areas)**

Note: Bold text refers to the two sub-basins that were sampled in 2000.

Conductivity, pH, water temperature, and turbidity were recorded where possible (8 of the 10 sites). Conductivity ranged from 40 µS/cm to 230 µS/cm, and water temperatures ranged between 10°C and 16° Celsius. Measurements recorded for pH indicated a slightly basic trend, with readings ranging from 7.0 to 8.0. Water was observed to be clear at all locations. Water quality data that relates to specific sampling sites is presented on site cards in Appendix 1.

Table 5. Biogeoclimatic and Ecoregion Units present in Sub-basins IV and V (MOF 1988).

Unit	Type
Ecodomain	Humid Temperate
Ecodivision	Humid Continental Highlands
Ecoprovince	Central Interior
Ecoregion	Fraser Basin
Ecosections	Babine Upland
Biogeoclimatic Zone	Sub-boreal Spruce
Biogeoclimatic Subzone	Moist cold SBS (SBSmc)

4.3 HABITAT AND FISH DISTRIBUTION

Coho, cutthroat trout, and rainbow trout were the only three FPC listed species captured in streams during this survey. Prickly sculpin, peamouth chub, coarse scale suckers, and Pacific lamprey were also present in the study area. Burbot and white suckers have also been documented to be present in Unnamed Lake (ILP 51066) near the headwaters of Sub-basin V (FISS). Coho were only captured in the lower kilometre of the mainstems of both Sub-basin IV and V. Cutthroat trout were only captured in one tributary in Sub-basin IV. Rainbow trout was the most widely distributed species in the study area and was identified in almost all available fish habitat in streams that were sampled.

The four fish species listed in the Forest Practice Code (1998) that were captured in July 2000 were distributed iamong 8.4 of the 81.9 kilometres of streams (10.3 %) that are displayed on 1:20,000 scale TRIM maps in Sub-basins IV and V (Figure 2, Tables 6-9, Appendix 4). Lakes in Sub-basin V are also suspected to contain burbot since burbot were documented in one of the lakes during a primary lake inventory (Degisi and Schell 1997). Overall, important fish habitat in the study area was identified to be the lakes in Sub-basin V, and the mainstems downstream of barrier waterfalls in both Sub-basins IV and V (Table 10). No fish were captured upstream of the waterfall in Sub-basin IV during a secondary lake inventory (SKR 2001) or stream surveys conducted during this study. A small second order tributary draining into reach two of Sub-basin IV was shown to contain valuable habitat for juvenile cutthroat and rainbow trout.

The limited amount of stream habitat in this study area (i.e. 8.4 kms of stream) is primarily due to waterfall barriers in both sub-basins (Table 10). In total, only 2.2 km of fourth order reaches, 2.9 kilometres of third order reaches, no second order reaches, and 3.3 kilometers of first order reaches have been identified to be fish bearing (Figure 2, Tables 6-9). Another 3.4 kilometres of fourth order reaches have some potential to be fish bearing in Sub-basin V (Figure 2, Tables 6-9). Fish are confirmed or suspected to be absent from the remaining 42.7 kilometres of first order reaches, 16.2 kilometres of second order reaches, and 11.3 kilometres of third order reaches in this study area (Figure 2, Tables 6-8). Overall, the quantity of productive fish habitat in the area inventoried appears to be limited relative to other sub-basins in the Babine Lake watershed (SKR 2000a).

Table 6. Fish presence/absence in first order reaches in Sub-basins IV and V located along the northeast shore of Babine Lake.

% Gradient Range	1st order reaches (km)			
	Fish Confirmed Present	Fish Suspected Present	Fish Absent/ Suspected Absent	**Totals**
0-2	0.1	----	17.9	**18.0**
2-10	3.2	----	23.0	**26.2**
10-20	----	----	1.6	**1.6**
>20	----	----	0.2	**0.2**
Totals	**3.3** (7.2 %)	----	**42.7** (92.8 %)	**46.0**

Table 7. Fish presence/absence in second order reaches in Sub-basins IV and V located along the northeast shore of Babine Lake.

% Gradient Range	2nd order reaches (km)			
	Fish Confirmed Present	Fish Suspected Present	Fish Absent/ Suspected Absent	**Totals**
0-2	----	----	6.5	**6.5**
2-10	----	----	9.6	**9.6**
10-20	----	----	----	**----**
>20	----	----	----	**----**
Totals	**----**	**----**	**16.1** (100 %)	**16.1**

Table 8. Fish presence/absence in third order reaches in Sub-basins IV and V located along the northeast shore of Babine Lake.

% Gradient Range	3rd order reaches (km)			
	Fish Confirmed Present	Fish Suspected Present	Fish Absent/ Suspected Absent	**Totals**
0-2	----	----	5.0	**5.0**
2-10	2.9	----	6.3	**9.2**
10-20	----	----	----	**----**
>20	----	----	----	**----**
Totals	**2.9** (20.4 %)	**----**	**11.3** (79.6 %)	**14.2**

Table 9. Fish presence/absence in fourth order reaches in Sub-basins IV and V located along the northeast shore of Babine Lake.

% Gradient Range	4th order reaches (km)			
	Fish Confirmed Present	Fish Suspected Present	Fish Absent/ Suspected Absent	**Totals**
0-2	----	3.4	----	**3.4**
2-10	2.2	----	----	**2.2**
10-20	----	----	----	**----**
>20	----	----	----	**----**
Totals	**2.2** (39.3 %)	**3.4** (60.7 %)	**----**	**5.6**

Table 10. Summary of historic and new barriers to fish migration found in streams within sub-basins IV and V (sorted by ILP and reach number).

Stream	Reach	Sub-Basin	TRIM Map #	Barrier			
				Type	Height (m) /Length(m)	Verified in field	Description
ILP 10362 Aven Lake outlet WSC – 480-445700	2	V	093M.028	F	20	Y	a 20 metre waterfall was identified to be a barrier to rainbow trout/steelhead, coho, cutthroat trout, and Dolly Varden, but burbot, suckers and lake chub have been documented upstream.
ILP 10829 Unnamed Creek 2a1 (SKR 1997)	2	IV	093M.018	C	11/5 1	Y	a 21% gradient boulder/bedrock cascade was identified during field investigation to be a definite barrier to fish migration
ILP 10864 Unnamed Creek 2 (SKR 1997)	3	IV	093M.018	F	5	Y	an approximately 5 metre waterfall is documented in FISS and was confirmed to be a limit to fish distribution by intensive stream sampling (SKR 1997, 1998) and a secondary lake inventory (SKR 2001) that were conducted upstream

FSB = underground flow, NVC = no visible channel, NCD = non-classified drainage, F = falls

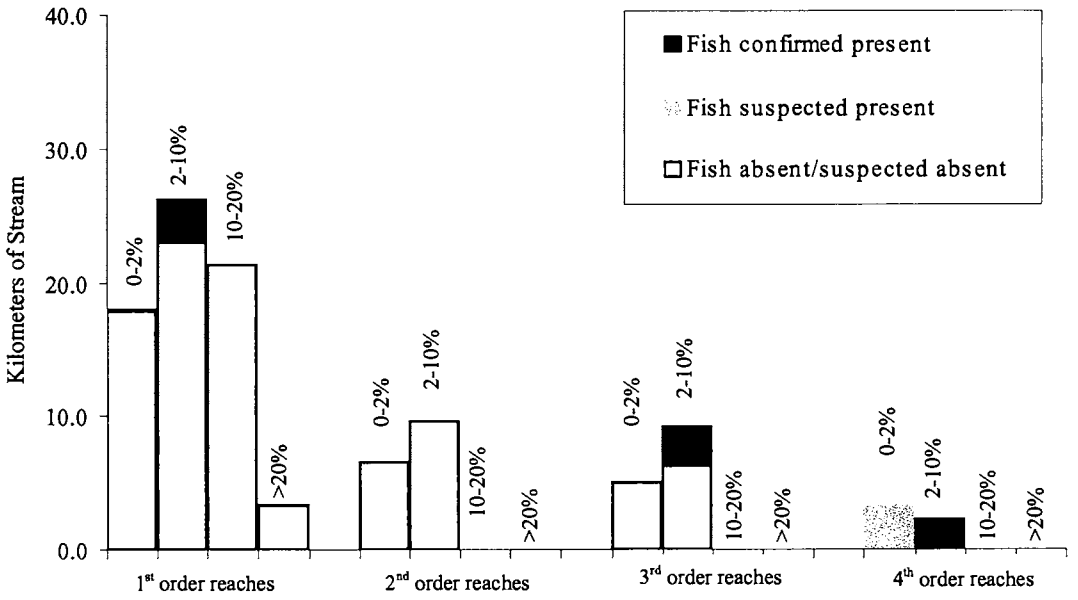


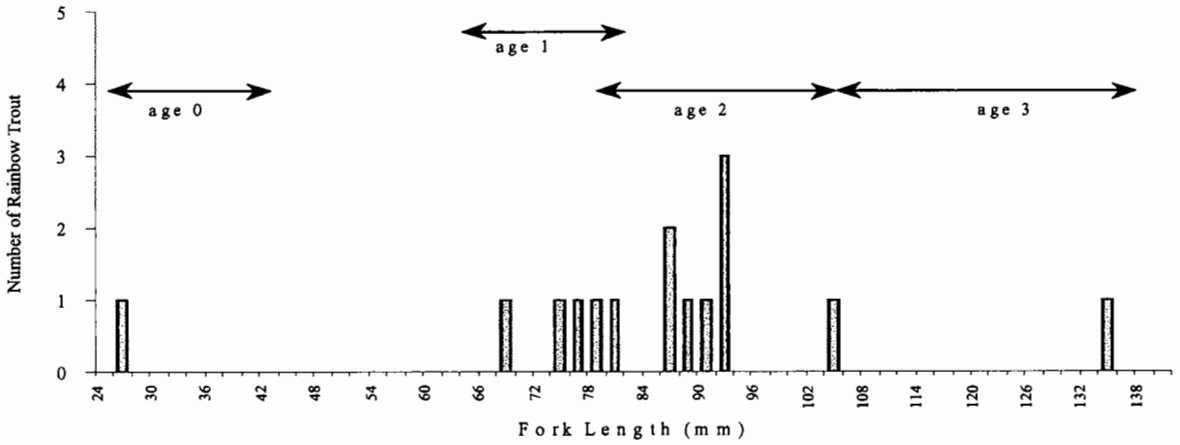
Figure 2. Distribution of fish presence in different order and gradient classes of stream reaches within Sub-basins IV and V in the study area along the northeast shore of Babine Lake. Data labels represent the gradient classes (%) within each stream order.

4.4 FISH AGE, SIZE AND LIFE HISTORY

Coho, cutthroat trout, and rainbow trout were the salmonid species captured in streams and lakes inventoried during this study. In addition, prickly sculpin, peamouth chub, largescale suckers and pacific lamprey were captured in some of the reaches sampled. The following sections provide a summary of the fish data collected during this study.

4.4.1 Rainbow Trout

In total, 15 rainbow trout were captured in streams sampled in Sub-basins IV and V. The largest rainbow trout (136 mm fork length) was estimated to be 3 years old by scale aging. Fork lengths of rainbow trout captured in stream reaches ranged between 67 and 134 millimeters (mean =84.80, SD = 22.25). Fork length frequency distribution (Figure 3) suggests that four age classes are present in the sample of rainbow trout obtained from the streams sampled. The low abundance of fry indicates that they were just beginning to emerge from the gravel at the time of survey in mid July which is not uncommon in this region (Scott and Crossman 1973). Rainbow trout captured in the study area likely exhibit a lacustrine-adfluvial life history, as suggested by the juvenile age classes and the proximity of capture locations to Babine Lake.

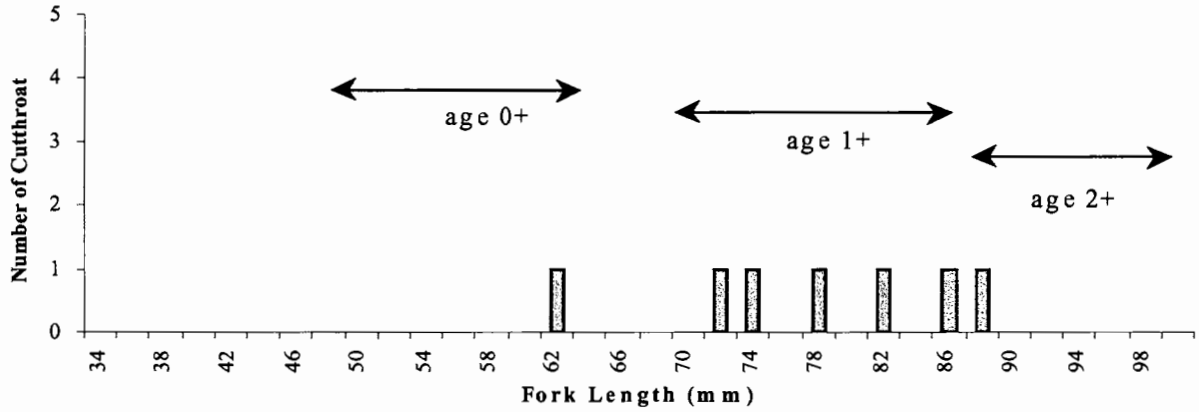


Note: Age classes were estimated based on ages obtained from 11 scales samples.

Figure 3. Length frequency histogram of rainbow trout captured in the inlet streams to the east shore of Babine Lake (N=15) on July 7th and 26th 2000.

4.4.2 Cutthroat Trout

Seven cutthroat trout were captured in Sub-basin IV along the northeast shore of Babine Lake (ILP 10864) on July 26th 2000. Three age classes of cutthroat trout are represented in the sample obtained during this study, as indicated by the length frequency distribution (Figure 4). Length frequency data for cutthroat trout captured in inlet streams to the northeast shore of Babine Lake are summarized in Figure 4. Fork length for cutthroat trout estimated to be age 0+ coincide with fork length ranges reported for this age group in the literature (Scott and Crossman 1973). Cutthroat trout captured in the study area likely have a lacustrine-adfluvial life history, as indicated by the proximity of the capture locations to Babine Lake and the presence of only limited overwintering habitat in the mainstem of this sub-basin.

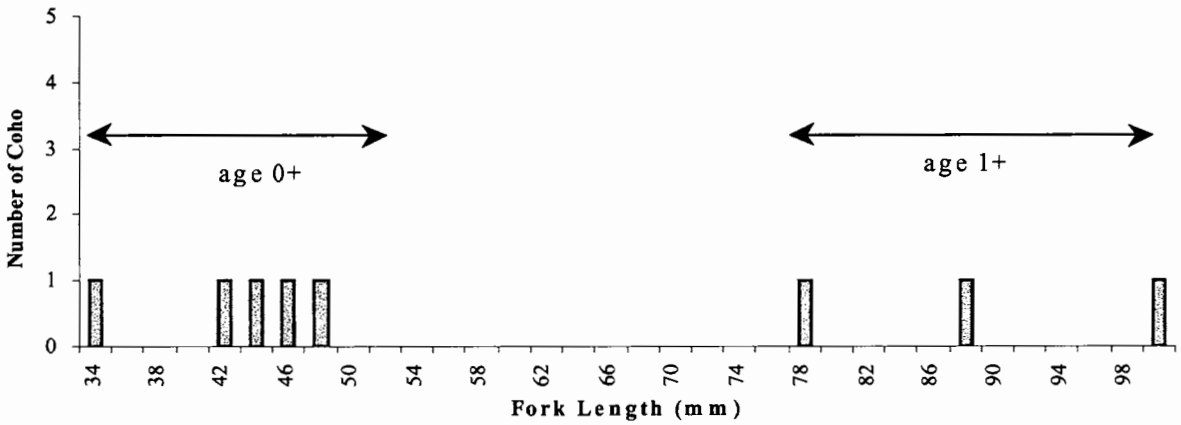


Note: Age classes were estimated based on ages obtained from 6 scales samples.

Figure 4. Length frequency histogram of cutthroat trout captured in the inlet streams to the east shore of Babine Lake (N=7, Sub-basin IV) on July 26th 2000.

4.4.3 Coho

Fork lengths for eight coho that were captured in inlet streams to the northeast shore of Babine Lake were documented. In addition, 15 coho fry (35-40 mm) were identified and released without accurate measurements to reduce handling. All of these fish were captured in close proximity to Babine Lake. Fork length frequency distribution (Figure 5) and length at age data reported in the literature (Sandercock 1991) suggests that the coho captured are age 0+ and 1+ years. Fork length of fry ranged between 35 and 49 millimeters and fork length of 1+ year old juveniles ranged from 79 and 100 millimetres. All coho captured in the inlet streams to the northeast shore of Babine Lake exhibit an anadromous life history, and the lack of coho older than 1+ suggests that juvenile coho from this stream may smolt at age 2.



Note: Age classes were estimated based on ages obtained from 3 scales samples from fish >75 mm.

Figure 5. Length frequency histogram of coho captured in the inlet streams to the east shore of Babine Lake (N=8).

4.4.4 Other Species

In addition to salmon and trout, prickly sculpin, peamouth chub, largescale suckers, and pacific lamprey were captured in the study area. Eleven prickly sculpin, three peamouth chub, and two largescale suckers were captured in the study. These species generally exhibit a lacustrine or lacustrine-adfluvial life history (Scott and Crossman 1973). The two Pacific lamprey that were captured may be anadromous (Scott and Crossman 1973) or have lacustrine-adfluvial life histories using Babine Lake for adult rearing. Fork lengths or total lengths for these species are presented on fish forms in Appendix 1.

4.5 SIGNIFICANT FEATURES AND FISHERIES OBSERVATIONS

Some of the inlet streams draining into the northeast shore of Babine Lake between Fort Babine and Morrison Creek provide some good habitat for rainbow trout and cutthroat trout, as well as for coho in the first reach of the larger inlet streams. The following sections describe interesting features related to fish, fish habitat, and habitat protection concerns in the study area based on historical information and the findings from this study.

4.5.1 Fish and Fish Habitat

Sub-basins IV and V in the Babine Lake Watershed offer some good, but a limited amount of available fish habitat. Accessible habitat is limited in both sub-basins is limited by waterfalls in their lower reaches. Interestingly, burbot are present at a lake near the headwaters of Sub-basin V (Unnamed Lake, ILP 51066)(Degisi and Schell 1997), but no FPC listed species have been identified in stream reaches upstream of the 20 metre waterfall located at the reach 2/3 break of the mainstem. Although burbot are known to primarily spawn in lakes from January to March, they are also known to move into rivers to spawn (Scott and Crossman 1973). It is suspected that the larger mainstem reaches in Sub-basin V should either receive fish bearing status or winter sampling should be conducted to adequately confirm fish absence and only lacustrine life histories of the burbot in this system.

4.5.2 Habitat Protection Concerns

4.5.2.1 Fisheries Sensitive Zones

No fisheries sensitive zones were identified during the site assessments of this study.

4.5.2.2 Fish above 20% gradient

No fish were captured in reaches with gradients greater than 20% or reaches upstream of 20% gradient barriers within any inlet streams to the northeast shore of Babine Lake.

4.5.2.3 Rare and Endangered Species

No rare or endangered species were identified within the inlet streams or lakes to the northeast shore of Babine Lake.

4.5.2.4 Restoration and Rehabilitation Opportunities

No significant restoration or rehabilitation opportunities were identified during this study of two small sub-basins in the Babine Lake watershed.

4.6 FISH BEARING STATUS

Fish distribution is primarily limited by impassable waterfalls in the lower reaches of both Sub-Basins IV and V (Table 10). Results from this study combined with historical information provide good interpretation of fish distribution in this study area. Fish bearing reaches are summarized in Table 11, while proposed non-fish bearing reaches are summarized in Table 12. Reaches located upstream of barriers to fish migration in which no fish were captured, or where no perennial fish habitat was identified, are classified as non-fish bearing based on one season of sampling. Results from a primary lake inventory in Sub-basin V (FISS), and a secondary lake inventory in Sub-basin IV (SKR 2001) were also used to confirm fish distribution limits in this study area. Confirmed and/or suspected fish distribution for all reaches in the study area are displayed on the Fisheries Project/Interpretive Maps (Appendix 4).

4.6.1 Fish Bearing Reaches

Fish bearing status was assigned to all reaches in which species listed in the Forest Practices Code Fish Stream Identification guidebook were captured (FPC 1998). Table 11 summarizes information obtained for the five reaches that were documented to be fish bearing during this study. Other reaches in the study area with documented fish presence or some potential to be fish bearing are identified on the Fisheries Project/Interpretive Maps (Appendix 4).

4.6.2 Non - Fish Bearing Reaches

Non-fish bearing status was assigned to reaches that were intensively sampled upstream of barriers to fish migration and no fish were captured, or no perennial fish habitat was present upstream of a barrier to fish migration. Table 12 summarizes the information obtained for the five reaches that were documented to be non-fish bearing. Other non-fish bearing reaches with gradients exceeding 20% are indicated on the interpretation map (Appendix 4).

4.6.3 Follow – Up Sampling Required

Resampling is not recommended for any of the ten reaches that were sampled during this study.

Table 11. Summary of data from the 5 fish bearing reaches (sorted by site #) sampled in the study area on July 11th and 26th, 2000 (*for details see* Appendix 1).

Sample Site #	Stream Name	ILP	TRIM Map #	Reach	Species*	Channel			Comments
						Width (m)	Site gradient (%)	Proposed Riparian Class.	
1	Unnamed Creek	10362	093M.028	1	CO, CAS, CSU, PCC	4.4	1.5	**S3**	Captured 7 coho, 11 sculpin, 2 largescale suckers, and 2 chub
2	Unnamed Creek	10362	093M.028	2	CO, RB/ST	4.0	6	**S3**	Captured 16 juvenile coho, and 2 rainbow trout/steelhead
6	Unnamed Creek	10210	093M.018	2	RB/ST, CT	1.4	10	**S4**	Captured 1 juvenile rainbow trout/steelhead, 4 juvenile cutthroat trout, and 1 RB/ST/CT fry
7	Unnamed Creek	10210	093M.018	1	RB/ST, CT	2.6	8	**S3**	Captured 7 juvenile rainbow trout/steelhead, 2 juvenile cutthroat trout
8	Unnamed Creek	10212	093M.018	1	RB/ST, CT	1.7	1	**S3**	Captured 4 juvenile rainbow trout/steelhead, 1 juvenile cutthroat trout

Table 12. Summary of data from the 5 non-fish bearing reaches (sorted by site #) in the study area from July 11th and 26th, 2000 (*for details see* Appendix 1).

Sample Site #	ILP	Reach	TRIM Map #	Gradient (%)	Electrofishing Specifications								Proposed Riparian Class.	Comments
					Channel Width (m)	Dist. (m)	Time (s)	Cond. (µS)	Temp. °C	Stage	Turbidity	Date (2000)		
3	10364	1	093M.028	12.5	0.9	100	377	40	11	L	C	07/11	**S6**	The initial 60 metres of this stream has 42% gradient and was identified in the field as a barrier to fish migration. No perennial fish habitat was identified upstream of the barrier due to no overwintering habitat in this small stream (max. pool depth observed was 5 cm) or its tributary (*see* site 5). In addition, no fish were captured in all available habitat in a 100 metre section upstream of the barrier.
4	10364	2	093M.028	3.5	0.9	---	---	40	11	M	C	07/11	**S6**	Moderate gradient, minimal discharge at the time of survey, and no overwintering habitat due to the lack of pools upstream of a 42% gradient cascade confirms non fish bearing status for this reach. Fish absence was also confirmed in reach 1 with electrofishing (*see above*).
5	10365	1	093M.028	7.5	1.1	---	---	---	---	L	---	07/11	**S6**	Fish absence was confirmed in reach 1 of the mainstem (ILP 10364 R1) of this first order tributary (*see above*). Stream was dry at time of survey, thus no perennial habitat (max pool depth was 6 cm).
9	10187	3	093M.018	0.5	3.7	100	522	100	16	M	C	07/26	**S5**	Fish absence was confirmed upstream of a 5 metre waterfall at reach 2/3 of the mainstem (ILP 10864) of this stream due to no fish captured during a secondary lake inventory (SKR 2001b) and previous stream sampling upstream of the falls (SKR 1997, 1998a). In addition, no fish were captured or observed during electrofishing at this site.
10	10202	1	093M.018	2.0	---	---	---	---	---	---	---	07/26	**NCD**	Fish absence was confirmed upstream of a 5 metre waterfall at reach 2/3 of the mainstem (ILP 10864) of this stream due to no fish captured during a secondary lake inventory (SKR 2001b) and previous stream sampling upstream of the falls (SKR 1997, 1998a). No defined or continuous channel was identified in the 330 metre section of the reach that was surveyed, indicating a lack of fish habitat.

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Appendix 1. Sample Site Information Including FDIS Site Cards, Fish Cards, and Site Photographs (sorted by Site Number).

ILP	REACH	SITE	TRIM MAP	Page #
10362	1	1	093M.028	Site - 1
10362	2	2	093M.028	Site - 2
10364	1	3	093M.028	Site - 3
10364	2	4	093M.028	Site - 4
10365	1	5	093M.028	Site - 5
10210	2	6	093M.018	Site - 6
10210	1	7	093M.018	Site - 7
10212	1	8	093M.018	Site - 8
10187	3	9	093M.018	Site - 9
10202	1	10	093M.018	Site - 10

Note: Digital versions of all forms are available on the Field Data Information System (FDIS) databases delivered to B.C. Environment, Skeena Region and Houston Forest Products, Houston, B.C..

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1–	093M.028	10362	1

01/01/20

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

PROJECT

Project Name Babine (Sub-unit 26) Fish Inventory **Project Code** 06-BABL-000001175-1999

Stream Name (gaz.)

Project Watershed Code 480-598800-47500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.028 **ILP #** 10362 **Reach #** 1 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
1	093M.028	54019		100	HC	B	☒

Date 2000/07/11 **Time** 09:55 **Agency** C141 **Crew** ML NF **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	T	4.10	4.70	5.10	3.60	4.30	4.60				
Wetted Width (m)	T	2.30	4.00	3.40	2.00	3.70	3.10				
Pool Depth (m)	MS	0.17	0.24	0.19	0.34	0.21	0.27				

	grad	grad	method
Method I	1.0	1.5	AL
Method II			AL

COVER Total A

SWD	LWD	B	C	DP	OV	IV
T	D	T	S	S	D	N

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD F
DIST E
LB SHP S
Texture ☒ F ☒ G ☒ U ☐ B ☐ R ☐ A
RB SHP S
Texture ☒ F ☒ G ☒ U ☐ B ☐ R ☐ A

Wb Depth .4 .4 .4 **Method** MS
Stage ☐ L ☒ M ☐ H
No Vis.Ch. ☐ **Intermittent** ☐
Dw ☐ **Tribs.** ☐

CROWN CLOSURE
2 21-40%

INSTREAM VEG ☒ N ☐ A ☐ M ☐ V
RIP S
STG SHR
RIP S
STG SHR

WATER

FLOOD SIGNS **Req #**
NONE Method GE **EMS**
Temp 13 Method T3 **Cond.** 60 **Method:** S4
pH 7.6 Method FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: G Subdom: C
D95: 14.00 **D (cm):** 10.00 **Morph:** RPGW
Pattern SI
Islands N
Bars ☐ N ☒ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR
Coupling DC **Confinement** UN

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☒	☐	☐	☐	☒	☒	☒

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1—	093M.028	10362	1

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	good
Rearing Habitat	excellent
Spawning Habitat	excellent

PHOTO DOCUMENTATION

Photo				Foc Lg	Dir	Comments
Roll	M01	**Frame**	02	ST	U	100m upstream of inlet to Babine Lake
Roll	M01	**Frame**	03	ST	D	100m upstream of inlet to Babine Lake

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	50m upstream of inlet to Babine Lake
SURVEY LOCATION	surveyed entire reach
RIPARIAN VEGETATION	alder, twinberry, willow, devil's clib (10 to 30m band on left and right riparian)
LARGE WOODY DEBRIS	is dependent

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.028	10362

01/01/20 **Watershed Code:** 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** S

Waterbody ID: **ILP Map #:** 093M.028 **ILP #:** 10362

Project ID: 06-BABL-000001175-1999 **Reach #:** 1 - **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/11 **To:** 2000/07/11 **Agency** C141 **Crew:** NF ML **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO	Temp	Cond	Turbid	Comment
1	093M.028	54019		EF 1	13.0	60	C	

A. GEAR SETTINGS

Site#	MTD/NO	H/P	Date In	Time In	Date Out	Time Out	Comment
1	EF 1	1	2000/07/11	09:55	2000/07/11	10:15	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO	H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
1	EF 1	1	O	773	100.0	3.0	600	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO	H/P	Species	Stage	Age	Total #	Lgth (Min/Max)		FishAct	Comment
1	EF 1	1	CO	J		7	35	89	R	
1	EF 1	1	PCC	J		2	49	66	R	
1	EF 1	1	CAS	J		11	34	86	R	
1	EF 1	1	CSU	J		2	91	106	R	
1	EF 1	1	PL	NS		2	152	156	R	

COMMENTS

Section	Comments
PERCENT OF HABITAT SHOCKED	50% beaver ponds, 30% glide, 20% riffles
WATERBODY	beaver ponds with fines, good fish rearing, riffles with clumped; few large woody debris

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.028	10362

01/01/20

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

INDIVIDUAL FISH DATA

Site#	MTD/NO	H/P	Species	Length	Weight	Sex	Mat	Age Str/Smpl#/Age			Vch#	Genetic Str/Smpl#	Roll #	Frame#	Comment
1	EF	1	CSU	106		U	IM								
1	EF	1	CSU	91		U	IM								
1	EF	1	CO	89		U	IM	SC	01	1+					
1	EF	1	CAS	86		U	IM								voucher
1	EF	1	PCC	69		U	IM								
1	EF	1	CO	79		U	IM	SC	02	1+					
1	EF	1	CAS	70		U	IM								
1	EF	1	CO	43		U	IM								
1	EF	1	CO	49		U	IM								
1	EF	1	PCC	66		U	IM								
1	EF	1	PCC	49		U	IM								
1	EF	1	CAS	60		U	IM								
1	EF	1	CAS	37		U	IM								voucher
1	EF	1	CO	46		U	IM								
1	EF	1	CAS	37		U	IM								
1	EF	1	CO	35		U	IM								
1	EF	1	CAS	37		U	IM								
1	EF	1	CAS	36		U	IM								
1	EF	1	CAS	34		U	IM								
1	EF	1	CO	45		U	IM								
1	EF	1	CAS	38		U	IM								
1	EF	1	CAS	65		U	IM								voucher
1	EF	1	CAS	66		U	IM								
1	EF	1	PL	152		U	U								
1	EF	1	PL	156		U	U								

SITE 1

Unnamed Creek (ILP 10362) Reach 1

Upstream view (above) and downstream view (below)

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
2–	093M.028	10362	2

01/01/20

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

PROJECT

Project Name Babine (Sub-unit 26) Fish Inventory **Project Code** 06-BABL-000001175-1999

Stream Name (gaz.)

Project Watershed Code 480-598800-47500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.028 **ILP #** 10362 **Reach #** 2 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
2	093M.028	54020		100	HC	FT	☒

Date 2000/07/11 **Time** 12:55 **Agency** C141 **Crew** ML NF **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	T	4.30	4.40	3.40	3.90	4.50	3.70				
Wetted Width (m)	T	2.90	2.20	3.00	3.10	3.30	2.80				
Pool Depth (m)	MS	0.40	0.16	0.25	0.30	0.19	0.10				

	grad	grad	method
Method I	6.0		AL
Method II			AL

COVER Total A

SWD	LWD	B	C	DP	OV	IV
T	S	D	T	S	T	N

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD F

DIST E

LB SHP V

Texture ☒ F ☒ G ☒ U ☒ B ☐ R ☐ A

RB SHP V

Texture ☒ F ☒ G ☒ U ☒ B ☒ R ☐ A

Wb Depth .5 .5 .5 **Method** MS

Stage ☐ L ☒ M ☐ H

No Vis.Ch. ☐ **Intermittent** ☐

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

1 1-20%

INSTREAM VEG ☒ N ☐ A ☐ M ☐ V

RIP M

STG MF

RIP M

STG MF

WATER

FLOOD SIGNS **Req #**

NONE Method GE **EMS**

Temp 13 Method T3 **Cond.** 60 **Method:** S4

pH 7.8 Method FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: C Subdom: B

D95: 37.00 **D (cm):** 13.00 **Morph:** CP

Pattern SI

Islands N

Bars ☐ N ☒ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR

Coupling CO **Confinement** CO

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
2—	093M.028	10362	2

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	good
Rearing Habitat	excellent
Spawning Habitat	good

PHOTO DOCUMENTATION

Photo				Foc Lg	Dir	Comments
Roll	M01	**Frame**	04	ST	U	50m upstream of confluence with ILP 10364
Roll	M01	**Frame**	05	ST	D	50m upstream of confluence with ILP 10364

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	started at confluence with ILP 10364
SURVEY LOCATION	surveyed 600m starting at reach break 1/2 around 300m upstream of Babine Lake
RIPARIAN VEGETATION	left and right riparian consists of a 1 to 5m band of devil's club, alder, fir and twinberry
LARGE WOODY DEBRIS	is dependent

FDIS Fish Form

Reach #	ILP Map #	ILP #
2	093M.028	10362

01/01/20

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

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** S

Waterbody ID: **ILP Map #:** 093M.028 **ILP #:** 10362

Project ID: 06-BABL-000001175-1999 **Reach #:** 2 **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/11 **To:** 2000/07/11 **Agency** C141 **Crew:** ML NF **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO	Temp	Cond	Turbid	Comment
2	093M.028	54020		EF 1	13.0	60	C	

A. GEAR SETTINGS

Site#	MTD/NO	H/P	Date In	Time In	Date Out	Time Out	Comment
2	EF 1	1	2000/07/11	12:15	2000/07/11	13:00	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO	H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
2	EF 1	1	O	359	100.0	2.0	800	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO	H/P	Species	Stage	Age	Total #	Lgth (Min/Max)		FishAct	Comment
2	EF 1	1	RB	J		2	92	105	R	
2	EF 1	1	CO	F		15	35	40	R	
2	EF 1	1	CO	J		1	100	100	R	

COMMENTS

Section	Comments
PERCENT OF HABITAT SHOCKED	cascade pool, shocked glides, cobble substrate, focused on boulder/back eddy habitat

FDIS Fish Form

Reach #	ILP Map #	ILP #
2	093M.028	10362

01/01/20

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

INDIVIDUAL FISH DATA

Site#	MTD/NO	H/P	Species	Length	Weight	Sex	Mat	Age Str/Smpl#	Age	Age	Vch#	Genetic Str/Smpl#	Roll #	Frame#	Comment
2	EF 1	1	RB	92		U	IM	SC	1	2					
2	EF 1	1	RB	105		U	IM	SC	2						regen scale
2	EF 1	1	CO	100		U	IM	SC	3	1+					

SITE 2

Unnamed Creek (ILP 10362) Reach 2

Upstream view (above) and downstream view (below)

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1	093M.028	10364	3

01/01/20

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

PROJECT

Project Name Babine (Sub-unit 26) Fish Inventory **Project Code** 06-BABL-000001175-1999

Stream Name (gaz.)

Project Watershed Code 480-598800-47500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.028 **ILP #** 10364 **Reach #** 1 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
3	093M.028	54021		100	HC	FT	☒

Date 2000/07/11 **Time** 13:55 **Agency** C141 **Crew** ML NF **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	1.00	0.80	0.90	1.20	1.00	0.70				
Wetted Width (m)	MS	0.20	0.10	0.30	0.30	0.20	0.50				
Pool Depth (m)	MS	0.02	0.01	0.02	0.04	0.03	0.05				

	grad	grad	method
Method I	11.0	14.0	AL
Method II			AL

COVER Total A

SWD	LWD	B	C	DP	OV	IV
T	T	T	T	T	D	N

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD F
DIST E
LB SHP V
Texture ☒ F ☒ G ☒ U ☐ B ☐ R ☐ A
RB SHP V
Texture ☒ F ☒ G ☒ U ☐ B ☐ R ☐ A

Wb Depth .4 .4 .4 **Method** MS
Stage ☒ L ☐ M ☐ H
No Vis.Ch. ☐ **Intermittent** ☒
Dw ☐ **Tribs.** ☐
CROWN CLOSURE
2 21-40%

INSTREAM VEG ☒ N ☐ A ☐ M ☐ V
RIP C
STG MF
RIP C
STG MF

WATER

FLOOD SIGNS **Req #**
NONE Method GE **EMS**
Temp 11 Method T3 **Cond.** 40 **Method:** S4
pH 7.7 Method FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: C Subdom: G
D95: 18.00 D (cm): 8.00 Morph: CP
Pattern SI
Islands N
Bars ☒ N ☐ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR
Coupling CO **Confinement** CO

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1–	093M.028	10364	3

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	none (very limited discharge)
Rearing Habitat	fair (limited discharge significantly reduces habitat quality)
Spawning Habitat	fair (substrate is available but very limited discharge)

PHOTO DOCUMENTATION

Photo				Foc Lg	Dir	Comments
Roll	M01	**Frame**	06	ST	U	view of 42% gradient barrier
Roll	M01	**Frame**	07	ST	U	200m upstream of confluence with ILP 10362
Roll	M01	**Frame**	08	ST	D	200m upstream of confluence with ILP 10362

WILDLIFE

C OMMENT

Section	Comments
SITE LOCATION	180m upstream of confluence with ILP 10362
SURVEY LOCATION	surveyed 300m starting at confluence with ILP 10362
SURVEY DESCRIPTION	no perennial habitat available upstream of gradient barrier
RIPARIAN VEGETATION	1 to 8m band of devil's club, alder and fir
LARGE WOODY DEBRIS	is not dependant due to steep gradient and thick riparian vegetation
SITE CARD	Barrier: 42% gradient barrier (60m long) starts 5m upstream of confluence with ILP 10362

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.028	10364

01/01/20

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

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** S

Waterbody ID: **ILP Map #:** 093M.028 **ILP #:** 10364

Project ID: 06-BABL-000001175-1999 **Reach #:** 1 - **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/11 **To:** 2000/07/11 **Agency** C141 **Crew:** ML NF **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO	Temp	Cond	Turbid	Comment
3	093M.028	54021		EF 1	11.0	40	C	

A. GEAR SETTINGS

Site#	MTD/NO	H/P	Date In	Time In	Date Out	Time Out	Comment
3	EF 1	1	2000/07/11	13:55	2000/07/11	14:15	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO	H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
3	EF 1	1	O	377	100.0	1.0	1000	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO	H/P	Species	Stage	Age	Total #	Lgth (Min/Max)	FishAct	Comment
3	EF 1	1	NFC			0			

COMMENTS

Section	Comments
ELECTROSHOCKING EFFICIENCY	electroshocked over all available habitat in sampling area

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.028	10364

01/01/20

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

INDIVIDUAL FISH DATA

SITE 3

Unnamed Creek (ILP 10364) Reach 1

Upstream view (top left) and downstream (bottom left) of site; upstream view of 42% gradient barrier (above).

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
2–	093M.028	10364	4

01/01/20

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

PROJECT

Project Name Babine (Sub-unit 26) Fish Inventory **Project Code** 06-BABL-000001175-1999

Stream Name (gaz.)

Project Watershed Code 480-598800-47500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.028 **ILP #** 10364 **Reach #** 2 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
4	093M.028	54081		100	HC	FT	☐

Date 2000/07/11 **Time** 14:45 **Agency** C141 **Crew** ML NF **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	0.90	0.70	1.20	0.80	0.60	0.90				
Wetted Width (m)	MS	0.70	0.70	0.80	0.60	0.60	0.70				
Pool Depth (m)	MS	0.10	0.12	0.05	0.08	0.10	0.05				

	grad	grad	method
Method I	3.5		AL
Method II			AL

Wb Depth .3 .4 .3 **Method** MS

Stage ☐L ☒M ☐H

COVER Total A

No Vis.Ch. ☐ **Intermittent** ☐

SWD	LWD	B	C	DP	OV	IV
S	S	N	T	T	D	N

Dw ☐ **Tribs.** ☐

CROWN CLOSURE 1 1-20%

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

INSTREAM VEG ☐N ☐A ☒M ☐V

LWD F

DIST E

LB SHP S

RIP C

STG MF

Texture ☒F ☐G ☐U ☐B ☐R ☐A

RIP C

STG MF

RB SHP S

Texture ☒F ☐G ☐U ☐B ☐R ☐A

WATER

FLOOD SIGNS **Req #**

NONE Method GE **EMS**

Temp 11 Method T3 **Cond.** 40 **Method:** S4

pH 7.7 Method FD **Turb.** ☐T ☐M ☐L ☒C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: F Subdom: NA

D95: 0.01 **D (cm):** 0.01 **Morph:** RP

Pattern SI

Islands N

Bars ☒N ☐SIDE ☐DIA ☐MID ☐SPAN ☐BR

Coupling DC **Confinement** FC

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
2—	093M.028	10364	4

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	poor (lack of deep pools)
Rearing Habitat	moderate
Spawning Habitat	none (substrate exclusively fines)

PHOTO DOCUMENTATION

Photo	Foc Lg	Dir	Comments
Roll M01 **Frame** 09	ST	U	200m upstream of confluence with ILP 10365
Roll M01 **Frame** 10	ST	D	200m upstream of confluence with ILP 10365

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	140m upstream of confluence with ILP 10365
SURVEY LOCATION	surveyed 350m starting at confluene with ILP 10365
RIPARIAN VEGETATION	left: 1 to 5m band, right: 1 to 12m band consisting of devil's club, alder, ferns, twinberry
LARGE WOODY DEBRIS	dependent
SITE CARD	Barrier: 42% gradient section downstream in reach 1 appears to be a barrier

SITE 4

Unnamed Creek (ILP 10364) Reach 2

Upstream view (above) and downstream view (below)

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1—	093M.028	10365	5

01/01/20

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

PROJECT

Project Name Babine (Sub-unit 26) Fish Inventory **Project Code** 06-BABL-000001175-1999

Stream Name (gaz.)

Project Watershed Code 480-598800-47500-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.028 **ILP #** 10365 **Reach #** 1 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
5	093M.028	54022		100	HC	FT	☐

Date 2000/07/11 **Time** 14:40 **Agency** C141 **Crew** NF ML **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	0.60	1.30	1.00	1.20	1.50	1.00				
Wetted Width (m)	MS										
Pool Depth (m)	MS	0.06	0.04	0.05							

	grad	grad	method
Method I	8.0	7.0	AL
Method II			AL
COVER			Total

SWD	LWD	B	C	DP	OV	IV

Wb Depth .3 .4 .4 **Method** MS

Stage ☒L ☐M ☐H

No Vis.Ch. ☐ **Intermittent** ☒

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

1 1-20%

Loc: P/S/O ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

LWD F

DIST E

LB SHP V

Texture ☒F ☒G ☒U ☐B ☐R ☐A

RB SHP S

Texture ☒F ☒G ☒U ☐B ☐R ☐A

INSTREAM VEG ☐N ☐A ☐M ☐V

RIP C

STG MF

RIP S

STG SHR

WATER

FLOOD SIGNS **Req #**

NONE Method GE **EMS**

Temp Method T3 **Cond.** **Method:** S4

pH Method FD **Turb.** ☐T ☐M ☐L ☐C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: G Subdom: C

D95: 17.00 **D (cm):** 9.00 **Morph:** CP

Pattern SI

Islands N

Bars ☒N ☐SIDE ☐DIA ☐MID ☐SPAN ☐BR

Coupling PC **Confinement** FC

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1–	093M.028	10365	5

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
Other	no fish habitat available at time of survey due to lack of wetted channel over most of surveyed section

PHOTO DOCUMENTATION

Photo				Foc Lg	Dir	Comments
Roll	M01	Frame	11	ST	U	150m upstream of confluence with ILP 10364
Roll	M01	Frame	12	ST	D	150m upstream of confluence with ILP 10364

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	100m upstream of confluence with ILP 10362
SURVEY LOCATION	surveyed 300m starting at confluence with ILP 10362
SURVEY DESCRIPTION	lower 80m was wetted but very low discharge; no perennial habitat
RIPARIAN VEGETATION	left riparian: 1 to 5m, right riparian: 5 to 20m, consists of devil's club, alder, elderberry and ferns
SITE CARD	Barrier: 42% gradient section downstream in Reach 1 of ILP 10364 appears to be a barrier

SITE 5

Unnamed Creek (ILP 10365) Reach 1

Upstream view (above) and downstream view (below)

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
2—	093M.018	10210	6

01/01/20

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 480-502100-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.018 **ILP #** 10210 **Reach #** 2 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
6	093M.018	54047		100	HC	V4	☒

Date 2000/07/26 **Time** 13:58 **Agency** C141 **Crew** DM MJ **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	1.50	1.80	1.30	1.10	1.60	1.20				
Wetted Width (m)	MS	0.80	0.80	1.00	0.90	0.90	0.70				
Pool Depth (m)	MS	0.12	0.16	0.09	0.18	0.21	0.08				

	grad	grad	method
Method I	10.0		AL
Method II			AL

COVER Total A

SWD	LWD	B	C	DP	OV	IV
S	S	S	T	T	D	N

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD F

DIST E

LB SHP U

Texture ☒ F ☒ G ☐ U ☐ B ☐ R ☐ A

RB SHP U

Texture ☒ F ☒ G ☐ U ☐ B ☐ R ☐ A

Wb Depth .3 .3 .4 **Method** MS

Stage ☐ L ☒ M ☐ H

No Vis.Ch. ☐ **Intermittent** ☐

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

3 41-70%

INSTREAM VEG ☒ N ☐ A ☐ M ☐ V

RIP C

STG MF

RIP C

STG MF

WATER

FLOOD SIGNS **Req #**

.46M HIGH DEBRIS **Method** MS **EMS**

Temp 11 **Method** T3 **Cond.** 140 **Method:** S4

pH 7.6 **Method** FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: G Subdom: F

D95: 18.00 **D (cm):** 18.00 **Morph:** CPCW

Pattern ST

Islands N

Bars ☐ N ☒ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR

Coupling DC **Confinement** UN

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☒

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
2—	093M.018	10210	6

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	poor - lack of depth
Rearing Habitat	fair to good - cover but poor depth
Spawning Habitat	good - small pockets up to 3m

PHOTO DOCUMENTATION

Photo	Foc Lg	Dir	Comments
Roll M06 **Frame** 10	ST	D	190m upstream of reach 1
Roll M06 **Frame** 11	ST	U	step with meter stick (133 above Reach 1)
Roll M06 **Frame** 09	ST	U	190m upstream of reach 1

WILDLIFE

C OMMENT

Section	Comments
SITE LOCATION	180m above reach 1
SURVEY LOCATION	210m starting 120m above reach 1
SURVEY DESCRIPTION	gradient decreases at top of survey location, some steps formed by gravel buildup behind large woody debris to 0.9m but fish caught above this (photo 11)
RIPARIAN VEGETATION	left = 18m band, right = 15m band, both consist of alder, thimbleberry, horsetail, ferns, cottonwood

FDIS Fish Form

Reach #	ILP Map #	ILP #
2	093M.018	10210

01/01/20

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

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** S

Waterbody ID: **ILP Map #:** 093M.018 **ILP #:** 10210

Project ID: 06-BABL-000001172-1999 **Reach #:** 2 **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/26 **To:** 2000/07/26 **Agency** C141 **Crew:** MJ DM **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO		Temp	Cond	Turbid	Comment
6	093M.018	54047		EF	1	11.0	140	C	

A. GEAR SETTINGS

Site#	MTD/NO		H/P	Date In	Time In	Date Out	Time Out	Comment
6	EF	1	1	2000/07/26	14:00	2000/07/26	14:10	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO		H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
6	EF	1	1	O	437	100.0	1.0	700	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO		H/P	Species	Stage	Age	Total #	Lgth (Min/Max)		FishAct	Comment
6	EF	1	1	RB/CT	F		1	27	27	R	
6	EF	1	1	RB	J		1	86	86	R	
6	EF	1	1	CT	J		4	63	88	R	

COMMENTS

Section	Comments
PERCENT OF HABITAT SHOCKED	40% pool over gravel and cobble, 40% glide over gravels and cobble, 20% riffle/cascade over cobbles, boulders
ELECTROSHOCKING EFFICIENCY	good

FDIS Fish Form

Reach #	ILP Map #	ILP #
2	093M.018	10210

01/01/20

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

INDIVIDUAL FISH DATA

Site#	MTD/NO	H/P	Species	Length	Weight	Sex	Mat	Age Str/Smpl#	Age	Age	Vch#	Genetic Str/Smpl#	Roll #	Frame#	Comment
6	EF 1	1	CT	73		U	IM	SC	119	1					CT 119 (scale sample voucher
6	EF 1	1	CT	88		U	IM	SC	120	2					CT 120
6	EF 1	1	CT	78		U	IM	SC	121	1					CT 121
6	EF 1	1	RB	86		U	IM	SC	122	2					RB 122
6	EF 1	1	CT	63		U	IM	SC	123	0+					CT 123
6	EF 1	1	RB/CT	27		U	IM								

SITE 6

Unnamed Creek (ILP 10210) Reach 2

Upstream view (top left) and downstream view (bottom left) of site; upstream view of an 0.8m step within this reach (above).

FDIS Site Card

01/01/20

Reach #	ILP Map #	ILP Number	Site
1	093M.018	10210	7

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 480-502100-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.018 **ILP #** 10210 **Reach #** 1 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
7	093M.018	54046		100	HC	V4	☒

Date 2000/07/26 **Time** 11:22 **Agency** C141 **Crew** DM MJ **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	3.40	1.70	2.20	2.10	3.10	2.90				
Wetted Width (m)	MS	2.70	1.70	1.80	1.20	3.00	2.80				
Pool Depth (m)	MS	0.18	0.21	0.29	0.27	0.19	0.16				

	grad	grad	method
Method I	8.0		AL
Method II			AL

COVER Total A

SWD	LWD	B	C	DP	OV	IV
S	S	S	S	S	D	N

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD F

DIST E

LB SHP S

Texture ☒ F ☒ G ☐ U ☐ B ☐ R ☐ A

RB SHP U

Texture ☒ F ☒ G ☐ U ☐ B ☐ R ☐ A

Wb Depth .3 .2 .2 **Method** MS

Stage ☐ L ☒ M ☐ H

No Vis.Ch. ☐ **Intermittent** ☐

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

2 21-40%

INSTREAM VEG ☒ N ☐ A ☐ M ☐ V

RIP C

STG MF

RIP C

STG MF

WATER

FLOOD SIGNS **Req #**

.11M HIGH DEBRIS **Method** MS **EMS**

Temp 10 **Method** T3 **Cond.** 230 **Method:** S4

pH 8.0 **Method** FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: G Subdom: B

D95: 0.60 **D (cm):** 0.28 **Morph:** CP

Pattern SI

Islands N

Bars ☐ N ☒ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR

Coupling CO **Confinement** CO

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1—	093M.018	10210	7

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	fair - some pools near to 40cm
Rearing Habitat	good - large woody debris created plunge pools, undercut
Spawning Habitat	good - abundance of gravel

PHOTO DOCUMENTATION

Photo	Foc Lg	Dir	Comments
Roll M06 **Frame** 05	ST	U	~490m upstream of confluence with ILP 10864
Roll M06 **Frame** 06	ST	D	~490m upstream of confluence with ILP 10864

WILDLIFE

C OMMENT

Section	Comments
SITE LOCATION	440m upstream of confluence with ILP 10864
SITE LOCATION	230m heading upstream from 400m above confluence with ILP 10864
RIPARIAN VEGETATION	right riparian: 5m band of alder, devil's club, fir. left riparian: 4m band of devil's club, fir, moss, horsetail, alder, twistedstalk and ladyfern

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.018	10210

01/01/20

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

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** S

Waterbody ID: **ILP Map #:** 093M.018 **ILP #:** 10210

Project ID: 06-BABL-000001172-1999 **Reach #:** 1 **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/26 **To:** 2000/07/26 **Agency** C141 **Crew:** MJ DM **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO		Temp	Cond	Turbid	Comment
7	093M.018	54046		EF	1	10.0	230	C	

A. GEAR SETTINGS

Site#	MTD/NO		H/P	Date In	Time In	Date Out	Time Out	Comment
7	EF	1	1	2000/07/26	11:00	2000/07/26	11:13	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO		H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
7	EF	1	1	O	719	100.0	2.0	600	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO		H/P	Species	Stage	Age	Total #	Lgth (Min/Max)		FishAct	Comment
7	EF	1	1	RB	A		1	134	134	R	
7	EF	1	1	RB	J		6	68	87	R	
7	EF	1	1	CT	J		2	82	86	R	

COMMENTS

Section	Comments
PERCENT OF HABITAT SHOCKED	40% pool over gravel and cobble, 400% glide over gravel, cobble and boulder, 20% riffle over cobble and boulder
ELECTROSHOCKING EFFICIENCY	moderate to good - large substrate offered good hiding places for stunned fish

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.018	10210

01/01/20

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

INDIVIDUAL FISH DATA

Site#	MTD/NO	H/P	Species	Length	Weight	Sex	Mat	Age Str/Smpl#	Age	Vch#	Genetic Str/Smpl#	Roll #	Frame#	Comment
7	EF 1	1	RB	134		U	M	SC	105 3					
7	EF 1	1	RB	78		U	IM	SC	106 1					
7	EF 1	1	CT	82		U	IM	SC	107 1					
7	EF 1	1	RB	87		U	IM	SC	108 2					
7	EF 1	1	RB	81		U	IM	SC	109 2					
7	EF 1	1	CT	86		U	IM	SC	110 1					
7	EF 1	1	RB	76		U	IM	SC	111 1					
7	EF 1	1	RB	74		U	IM	SC	112 1					
7	EF 1	1	RB	68		U	IM	SC	113 1					

SITE 7

Unnamed Creek (ILP 10210) Reach 1

Upstream view (above) and downstream view (below)

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1—	093M.018	10212	8

01/01/20

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 480-502100-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.018 **ILP #** 10212 **Reach #** 1 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
8	093M.018	54045		100	HC	V4	☒

Date 2000/07/26 **Time** 12:50 **Agency** C141 **Crew** DM MJ **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	1.30	1.60	1.50	1.40	1.70	2.20				
Wetted Width (m)	MS	1.00	1.30	1.20	0.90	1.40	0.90				
Pool Depth (m)	MS	0.11	0.17	0.38	0.10	0.41	0.23				

	grad	grad	method
Method I	1.0		AL
Method II			AL

COVER Total A

SWD	LWD	B	C	DP	OV	IV
S	S	T	S	S	D	N

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD F

DIST E

LB SHP U

Texture ☒ F ☐ G ☒ U ☐ B ☐ R ☐ A

RB SHP U

Texture ☒ F ☐ G ☒ U ☐ B ☐ R ☐ A

Wb Depth .4 .5 .3 **Method** MS

Stage ☐ L ☒ M ☐ H

No Vis.Ch. ☐ **Intermittent** ☐

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

2 21-40%

INSTREAM VEG ☒ N ☐ A ☐ M ☐ V

RIP C

STG MF

RIP C

STG MF

WATER

FLOOD SIGNS **Req #**

.7M HIGH FLOOD CHAN. Method MS **EMS**

Temp 11 Method T3 **Cond.** 170 **Method:** S4

pH 8.0 Method FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: C Subdom: F

D95: 13.00 **D (cm):** 18.00 **Morph:** RP

Pattern SI

Islands N

Bars ☐ N ☒ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR

Coupling DC **Confinement** UN

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1–	093M.018	10212	8

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	poor - not deep enough
Rearing Habitat	good - lots of pool areas, undercut banks and large woody debris
Spawning Habitat	poor - few gravels and those are inundated with fines

PHOTO DOCUMENTATION

Photo	Foc Lg	Dir	Comments
Roll M06 **Frame** 07	ST	U	small falls over small woody debris 330m upstream of ILP 10210
Roll M06 **Frame** 08	ST	D	small falls over small woody debris 330m upstream of ILP 10210

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	280m upstream of confluence with ILP 10210
SURVEY LOCATION	200m starting 180m above confluence with ILP 10210
SURVEY DESCRIPTION	seems like a flashy stream due to flood signs and deep moss covered banks. Obviously flows at higher level for short periods
RIPARIAN VEGETATION	4.5m strip of twinberry, horsetail, twisted stalk, cow parsnip, and devil's club, cottonwood spruce and fir
SITE CARD	obvious lack of moderate sized vegetation

FDIS Fish Form

Reach #	ILP Map #	ILP #
1	093M.018	10212

01/01/20

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

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** S

Waterbody ID: **ILP Map #:** 093M.018 **ILP #:** 10212

Project ID: 06-BABL-000001172-1999 **Reach #:** 1 **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/26 **To:** 2000/07/26 **Agency** C141 **Crew:** DM MJ **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO		Temp	Cond	Turbid	Comment
8	093M.018	54045		EF	1	11.0	170	C	

A. GEAR SETTINGS

Site#	MTD/NO		H/P	Date In	Time In	Date Out	Time Out	Comment
8	EF	1	1	2000/07/26	12:42	2000/07/26	13:08	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO		H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
8	EF	1	1	O	521	100.0	1.1	600	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO		H/P	Species	Stage	Age	Total #	Lgth (Min/Max)		FishAct	Comment
8	EF	1	1	RB	J		4	88	93	R	
8	EF	1	1	CT	J		1	74	74	R	

COMMENTS

Section	Comments
PERCENT OF HABITAT SHOCKED	50% glide over fines and cobble, 30% riffle over wood and boulder, 20% pool - fines
ELECTROSHOCKING EFFICIENCY	good

FDIS Fish Form

01/01/20

Reach #	ILP Map #	ILP #
1	093M.018	10212

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

INDIVIDUAL FISH DATA

Site#	MTD/NO	H/P	Species	Length	Weight	Sex	Mat	Age Str/Smpl#	Age	Age	Vch#	Genetic Str/Smpl#	Roll #	Frame#	Comment
8	EF 1	1	RB	88		U	IM	SC	114	2					
8	EF 1	1	RB	92		U	IM	SC	115	2					
8	EF 1	1	RB	91		U	IM	SC	116						regen scale
8	EF 1	1	CT	74		U	IM	SC	117						no useable scale
8	EF 1	1	RB	93		U	IM	SC	118	2					

SITE 8

Unnamed Creek (ILP 10212) Reach 1

Upstream view (above) and downstream view (below)

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
3—	093M.018	10187	9

01/01/20

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 480-502100-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.018 **ILP #** 10187 **Reach #** 3 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
9	093M.018	54043		100	HC	V4	☒

Date 2000/07/26 **Time** 08:05 **Agency** C141 **Crew** DM MJ **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS	3.40	3.60	3.60	3.90	4.10	3.70				
Wetted Width (m)	MS	3.30	3.60	3.50	3.70	4.00	3.70				
Pool Depth (m)	MS	0.00	0.00	0.00							

	grad	grad	method
Method I	0.5		AL
Method II			AL

COVER Total M

SWD	LWD	B	C	DP	OV	IV
N	N	N	N	S	S	D

Loc: P/S/O ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐ ☒☐☐

LWD N

DIST NA

LB SHP S

Texture ☒ F ☐ G ☐ U ☐ B ☐ R ☐ A

RB SHP S

Texture ☒ F ☐ G ☐ U ☐ B ☐ R ☐ A

Wb Depth 1.5 1.3 1.7 **Method** MS

Stage ☐ L ☒ M ☐ H

No Vis.Ch. ☐ **Intermittent** ☐

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

0 0%

INSTREAM VEG ☐ N ☐ A ☐ M ☒ V

RIP G

STG NA

RIP G

STG NA

WATER

FLOOD SIGNS **Req #**

N/A Method GE **EMS**

Temp 16 Method T3 **Cond.** 100 **Method:** S4

pH 7.0 Method FD **Turb.** ☐ T ☐ M ☐ L ☒ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: F Subdom: NA

D95: 0.01 **D (cm):** 0.01 **Morph:** LC

Pattern IM

Islands N

Bars ☒ N ☐ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR

Coupling DC **Confinement** UN

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
3—	093M.018	10187	9

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
OverWinter Habitat	good - lots of depth over 40cm
Rearing Habitat	fair - good depth lots of instream vegetation for cover
Spawning Habitat	none - no substrates

PHOTO DOCUMENTATION

Photo	Foc Lg	Dir	Comments
Roll M06 **Frame** 01	ST	U	200m upstream of Reach 2 break
Roll M06 **Frame** 02	ST	D	200m upstream of Reach 2 break

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	200m upstream of Reach 2 break
SURVEY LOCATION	340m starting 160m upstream of reach 2
RIPARIAN VEGETATION	right riparian: 60m wetland, sedges, and willow, pine, spruce on fringes. left riparian: 120m wetland, sedges and willow, pine and spruce on fringes
FISH PRESENCE	known falls below

FDIS Fish Form

Reach #	ILP Map #	ILP #
3	093M.018	10187

01/01/20

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

WATERBODY

Gazetted Name: **Local:** Unnamed Creek

WS Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000 **Lake/Stream:** W

Waterbody ID: **ILP Map #:** 093M.018 **ILP #:** 10187

Project ID: 06-BABL-000001172-1999 **Reach #:** 3 **Lake From Date:**

Fish Permit #: 144604K **Date:** 2000/07/26 **To:** 2000/07/26 **Agency** C141 **Crew:** DM MJ **Resample:** ☐

SITE / METHOD

Site#	NID Map	NID #	UTM:Zone/East/North/Mthd	MTD/NO		Temp	Cond	Turbid	Comment
9	093M.018	54043		EF	1	16.0	100	C	

A. GEAR SETTINGS

Site#	MTD/NO		H/P	Date In	Time In	Date Out	Time Out	Comment
9	EF	1	1	2000/07/26	08:00	2000/07/26	08:10	

B. NET/TRAP SPECIFICATIONS

C. ELECTROFISHER SPECIFICATIONS

Site#	MTD/NO		H/P	Encl	Sec	Lnth	Wdth	Voltage	Frequency	Pulse	Make	Model
9	EF	1	1	O	522	100.0	1.5	600	60	6	SMITH-ROOT	15C

FISH SUMMARY

Site#	MTD/NO		H/P	Species	Stage	Age	Total #	Lgth (Min/Max)	FishAct	Comment
9	EF	1	1	NFC			0			

COMMENTS

Section	Comments
PERCENT OF HABITAT SHOCKED	100% large channel around 3m wide, all fine/organic substrate
ELECTROSHOCKING EFFICIENCY	could only electroshock 1.5m (length of anode) from right bank channel, too deep to safely wade. Excellent deep pool, instream vegetation and overvegetation

FDIS Fish Form

Reach #	ILP Map #	ILP #
3	093M.018	10187

01/01/20

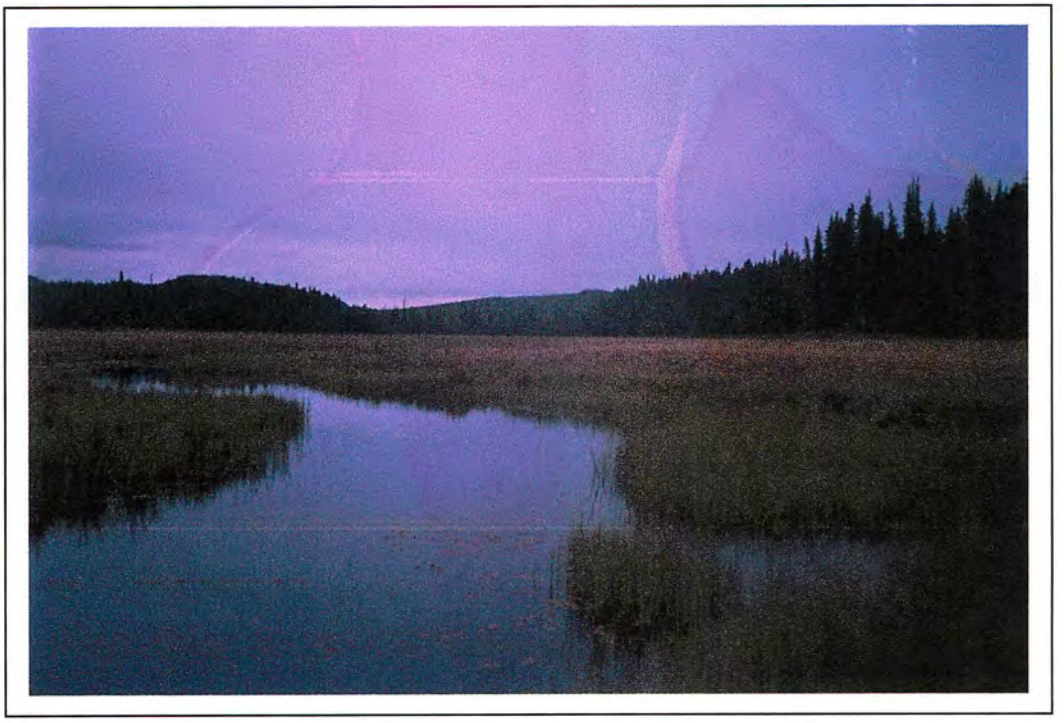
Watershed Code: 000-000000-00000-00000-0000-0000-000-000-000-000-000-000

INDIVIDUAL FISH DATA

SITE 9

Unnamed Creek (ILP 10187) Reach 3

Upstream view (above) and downstream view (below)



FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1—	093M.018	10202	10

01/01/20

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 480-502100-00000-00000-0000-0000-000-000-000-000-000-000

WATERSHED

Gazetted Name **Local Name** Unnamed Creek

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

ILP Map# 093M.018 **ILP #** 10202 **Reach #** 1 **Ref. Name**

Site #	NID Map #	NID #	UTM(Zone/East/North/Method)	Site Lg	Method	Access	Fish Crd?
10	093M.018	54044		100	HC	V4	☐

Date 2000/07/26 **Time** 08:56 **Agency** C141 **Crew** MJ DM **Incomplete** ☐

CHANNEL

	mtd	width	width	width	width	width	width	width	width	width	width
Channel Width (m)	MS										
Wetted Width (m)	MS										
Pool Depth (m)	MS										

	grad	grad	method
Method I	2.0		AL
Method II			AL
COVER			Total

SWD	LWD	B	C	DP	OV	IV

Loc: P/S/O ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

LWD

DIST

LB SHP

Texture ☐ F ☐ G ☐ U ☐ B ☐ R ☐ A

RB SHP

Texture ☐ F ☐ G ☐ U ☐ B ☐ R ☐ A

Wb Depth **Method** MS

Stage ☐ L ☐ M ☐ H

No Vis.Ch. ☐ **Intermittent** ☒

Dw ☐ **Tribs.** ☐

CROWN CLOSURE

4 71-90%

INSTREAM VEG ☐ N ☐ A ☐ M ☐ V

RIP C

STG MF

RIP C

STG MF

WATER

FLOOD SIGNS **Req #**

EMS Method MS

Temp Method T3 **Cond.** **Method:** S4

pH Method FD **Turb.** ☐ T ☐ M ☐ L ☐ C **Method:** GE

MORPHOLOGY

BED MATERIAL Dominant: Subdom:

D95: **D (cm):** **Morph:**

Pattern

Islands

Bars ☐ N ☐ SIDE ☐ DIA ☐ MID ☐ SPAN ☐ BR

Coupling DC **Confinement** UN

DISTURBANCE INDICATORS

O1	B1	B2	B3	D1	D2	D3
☐	☐	☐	☐	☐	☐	☐

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

FDIS Site Card

Reach #	ILP Map #	ILP Number	Site
1—	093M.018	10202	10

01/01/20

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

FEATURE

FSZ ☐

HABITAT QUALITY

Name	Comments
Other	no defined channel, water spread out through riparian, many disconnected stagnant pools

PHOTO DOCUMENTATION

Photo	Foc Lg	Dir	Comments
Roll M06 **Frame** 03	ST	U	260m upstream of confluence with ILP 10864
Roll M06 **Frame** 04	ST	D	260m upstream of confluence with ILP 10864

WILDLIFE

COMMENT

Section	Comments
SITE LOCATION	200m upstream of confluence with ILP 10864
SURVEY LOCATION	330m starting 500m downstream of confluence with ILP 10866 and heading upstream
RIPARIAN VEGETATION	35m strip of willow, alder, twinberry, and spruce
BARRIERS	known falls below

SITE 10

Unnamed Creek (ILP 10202) Reach 1

Upstream view (above) and downstream view (below)

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

Photo Survey Form 1 – Equipment Details

Survey Start Date:	2000/07/11	Survey End Date:	2000/07/26
Agency:	C141		
Crew:	ML/MJ/DM/NF		

Camera:

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

Roll and or Batches Detail:

Roll #	CD #	Output Medium	Film Type	ISO
M01	Babine / Morrison 1	Negative / CD Rom	colour print	200
M06	Babine / Morrison 2	Negative / CD Rom	colour print	200
M10	Babine / Morrison 3	Negative / CD Rom	colour print	200

01/01/31

Photo Documentation Report

Roll	Frame	Neg	CD #	Image #	Type	Project WS Code / WS Code	Reach	Site	ILP MAP #	ILP #	Comment
M01	02	2A	1	1	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	1	093M.028	10362	100m upstream of inlet to Babine Lake
M01	03	3A	1	2	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	1	093M.028	10362	100m upstream of inlet to Babine Lake
M01	04	4A	1	3	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	2	093M.028	10362	50m upstream of confluence with ILP 10364
M01	05	5A	1	4	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	2	093M.028	10362	50m upstream of confluence with ILP 10364
M01	06	6A	1	5	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	3	093M.028	10364	view of 42% gradient barrier
M01	07	7A	1	6	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	3	093M.028	10364	200m upstream of confluence with ILP 10362
M01	08	8A	1	7	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	3	093M.028	10364	200m upstream of confluence with ILP 10362
M01	09	9A	1	8	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	4	093M.028	10364	200m upstream of confluence with ILP 10365
M01	10	10A	1	9	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	4	093M.028	10364	200m upstream of confluence with ILP 10365
M01	11	11A	1	10	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	5	093M.028	10365	150m upstream of confluence with ILP 10364
M01	12	12A	1	11	SITE	480-598800-47500-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	5	093M.028	10365	150m upstream of confluence with ILP 10364
M06	01	1	2	1	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	3.0-	9	093M.018	10187	200m upstream of Reach 2 break
M06	02	2	2	2	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	3.0-	9	093M.018	10187	200m upstream of Reach 2 break

Roll	Frame	Neg	CD #	Image #	Type	Project WS Code / WS Code	Reach	Site	ILP MAP #	ILP #	Comment
M06	03	3	2	3	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	10	093M.018	10202	260m upstream of confluence with ILP 10864
M06	04	4	2	4	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	10	093M.018	10202	260m upstream of confluence with ILP 10864
M06	05	5	2	5	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	7	093M.018	10210	~490m upstream of confluence with ILP 10864
M06	06	6	2	6	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	7	093M.018	10210	~490m upstream of confluence with ILP 10864
M06	07	7	2	7	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	8	093M.018	10212	small falls over small woody debris 330m upstream of ILP 10210
M06	08	8	2	8	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	1.0-	8	093M.018	10212	small falls over small woody debris 330m upstream of ILP 10210
M06	09	9	2	9	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	6	093M.018	10210	190m upstream of reach 1
M06	10	10	2	10	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	6	093M.018	10210	190m upstream of reach 1
M06	11	11	2	11	SITE	480-502100-00000-00000-0000-0000-000-000-000-000-000-000000-00000-00000-0000-0000-000-000-000-000-	2.0-	6	093M.018	10210	step with meter stick (133 above Reach 1)
M10	01	1	3	1	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000-480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				water sedge plant
M10	02	2	3	2	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000-480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				coontail sample
M10	03	3	3	3	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000-480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				inlet stream ILP 10684, R7 upstream view
M10	04	4	3	4	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000-480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				inlet stream ILP 10864, R7 downstream view
M10	05	5	3	5	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000-480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				inlet stream ILP 10206 R1, NCD upstream view

Roll	Frame	Neg	CD #	Image #	Type	Project WS Code / WS Code	Reach	Site	ILP MAP #	ILP #	Comment
M10	06	6	3	6	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				inlet stream ILP 10206, R1, NCD downstream view
M10	07	7	3	7	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				outlet stream ILP 10864, R5 upstream view
M10	08	8	3	8	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				outlet stream ILP 10864, R5 downstream view
M10	09	9	3	9	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				panoramic lake view (ILP 10864, R6)
M10	10	10	3	10	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				north north-east
M10	11	11	3	11	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				east north-east
M10	12	12	3	12	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				east
M10	13	13	3	13	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				east south-east
M10	14	14	3	14	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				south south-east
M10	15	15	3	15	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				south
M10	16	16	3	16	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				south south-west
M10	17	17	3	17	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				west south-west
M10	18	18	3	18	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				west
M10	19	19	3	19	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				west north-west

Roll	Frame	Neg	CD #	Image #	Type	Project WS Code / WS Code	Reach	Site	ILP MAP #	ILP #	Comment
M10	20	20	3	20	LAKE	480-502100-00000-00000-0000-0000-000-000-000-000- 480-502100-00000-00000-0000-0000-000-000-000-000-	6.0-				north north-west

Appendix 3. QA/QC Results

August 2, 2000

Deidre Quinlan,
FRBC Co-ordinator, Houston Forest Products

Deidre:

The stage 2 quality assurance (QA) audits of the 1:20k stream inventory field data collection performed by SKR Environmental Consultants Ltd. has been completed. Resources Inventory Committee standard QA forms were completed during the audit and are included with this letter. These forms list objectives that were met and comments pertaining to any problems that were identified during the QA evaluation.

The audit of stream sites went very well and the crew demonstrated an ability to collect data for the site card and fish collection card. I had discussions with different crew members concerning various aspects of data collection and was generally satisfied with the responses. I made a couple of suggestions concerning alternate means for measuring and recording channel width, bank height, riparian vegetation and stage, but departures from RIC standards were not noted during this audit. All field staff were familiar with recent RIC errata to the standards and I am pleased to note that all past problems with site lengths, fish sampling and site locations, etc., have been addressed. The audit of the lake sampling also found no departures from RIC standards.

My only comment involves the condition of the electrofishing units. Three shockers were running and two were in poor condition. Both anodes had missing triggers, one trigger unit had separated and wires (still insulated) were visible between the two pieces, one electrofisher frame was cracked, and the wires connecting the generators to the units were in very poor condition with duck tape replacing much of the exterior insulation. While I was conducting the audit, one of the crews had to stop work and repair one of the generator wires. Electrofishing units in dis-repair represents a safety concern and these units will not pass WCB inspection as required for next year. Ron Saimoto stated that this is the last year these units will be used but the safety concern for this year remains.

This letter concludes the stage 2 QA audit and reporting. If you have any questions regarding the information presented in this memo or in the QA forms please contact me by e-mail (schell@bulkley.net) or by telephone (250-847-0180).

Sincerely,

Chris Schell
Quality Assurance Monitor
Fish and Fish Habitat Inventory

cc. Ron and Regina Saimoto, SKR Environmental Consultants Ltd., Smithers, BC

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: HFP 1:20k Aquatic Inventory - 2000

FRBC project number: _____ **MELP project number:** _____

Contractor: SKR Environmental Consultants Ltd.

Field audit by: Chris Schell **Site identifier:** na **Field audit date:** July 2000

FORM 2A FIELD AUDIT: CREW INFORMATION, PERMITS AND SAFETY

Crew information

Crew members' names	Listed in contract or plan	Area of expertise (bio, geo, other)	First aid		Electrofishing	
			Level 1	Transport-ation	Crew member	Crew leader
Ron Saimoto	Y	Bio	Y	Y		Y
Mark LeRuez	Y	Bio	Y	Y		Y
Matt Jessop	Y	Bio	Y	Y		Y
Shawna Hartman	Y	Bio	Y	Y		Y
Neal Foord	Y	Bio	Y	Y		Y
Doug McKay	Y	Bio	Y	Y		Y

QA comments about crew and/or certifications:

Permits and safety equipment

Group	Item	Acceptable		Specify problem
		Y	N	
Permits	MELP fish collection permit	Y		
	DFO fish collection permit	Y		
Safety plan	Safety plan in place	Y		
	Is safety plan followed	Y		

QA comments about permits and safety:

Note: If any obvious WCB regulations are contravened, the QA team must immediately inform the responsible contract manager and the ministry representative.

Field Audit Confirmation

Field audit leader: Chris Schell _____ For field crew: All _____

FORM 2B **CONTINUED – PAGE 2 OF 2**

Group	Item	Acceptable		Note
		Tech.	Data	
Channel (continued)	Residual pool depth	Y	Y	
	Bankfull depth	Y	Y	
	Gradient	Y	Y	
	Stage	Y	Y	
	NVC; Dry/Int; DW; Tribs	Y	Y	
Cover	Total cover	Y	Y	
	Cover elements			
	• amount	Y	Y	
	• location	Y	Y	
	Crown closure	Y	Y	
	Large woody debris	Y	Y	
	• function	Y	Y	
	• distribution	Y	Y	
	Instream vegetation	Y	Y	
	Left and right bank shape	Y	Y	1
	Texture	Y	Y	
	Riparian vegetation	Y	Y	2
	Stage	Y	Y	2
Morphology	Flood signs	Y	Y	
	Bed material	Y	Y	
	D95	Y	Y	3
	D	Y	Y	
	Morhpology	Y	Y	
	Disturbance indicators	Y	Y	4
	Channel pattern	Y	Y	

Group	Item	Acceptable		Notes
		Tech.	Data	
Morphology (cont.)	Islands	Y	Y	
	Bars	Y	Y	
	Coupling	Y	Y	
	Confinement	Y	Y	
Water	Equipment	Y	Y	
	Temperature	Y	Y	
	pH	Y	Y	
	Conductivity	Y	Y	
	Turbidity	Y	Y	
Features	NID map #, NID	Y	Y	
	Type	Y	Y	
	Height, length	Y	Y	
	Photo	Y	Y	
Habitat quality	Keywords	Y	Y	
	Relevant comments	Y	Y	
	FSZ	Y	Y	
Photodocu-mentation	Roll #	Y	Y	
	Photo #	Y	Y	
	Focal length	Y	Y	
	Direction	Y	Y	
	NID #, NID map #	Y	Y	
	UTM and method	Y	Y	
Wildlife	Group	Y	Y	
	Relevant comment	Y	Y	

Notes:

1) Discussed with Mark and Ron
2) Discussed with all crews ie: structural stage as opposed to successional stage
3) Discussed with Matt

Notes:

4) Matt demonstrated an excellent knowledge of disturbance indicators. Ron correctly applied "no pools" in a difficult situation but mis-applied "extensive riffles"

Field Audit Confirmation:

Field audit leader: Chris Schell _____ For field crew: ALL _____

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: HFP 1:20k Aquatic Inventory - 2000

FRBC project number: _____ **MELP project number:** _____

Contractor: SKR Environmental Consultants Ltd.

Field audit by: Chris Schell **Site identifier:** na **Field audit date:** July 2000

FORM 2B **FIELD AUDIT FOR STREAM SURVEYS: SITE CARD PROCEDURES CHECK – PAGE 1 OF 2**

Materials present in field	Y	N	Notes
Site cards	Y		
Field reference materials	Y		
Field maps	Y		

List equipment used	Calibrated (Y/N)	Proper use (Y/N)	Notes
pH – electric meter (pH tester 3)	Y	Y	1
Conductivity – electronic meter	Y	Y	
Temperature – alcohol therm.	na	Y	

Group	Item	Acceptable		Notes
		Tech.	Data	
Site selection	Representative site	Y	Y	
Reference	Stream name (Gaz)	Y	Y	
	Alias	Y	Y	
	WSD code or	Y	Y	
	ILP # and ILP map #	Y	Y	
	Map NID and NID map #	Y	Y	
	Field UTM (and method)	Y	Y	
	Reach number	Y	Y	
	Site number	Y	Y	
	Site length (and method)	Y	Y	
	Access	Y	Y	
	Date, time	Y	Y	
	Agency	Y	Y	
	Crew	Y	Y	
	Fish form	Y	Y	
Channel	Equipment	Y	Y	
	Channel widths	Y	Y	2
	Wetted widths	Y	Y	

Notes:

1) problem with conductivity meter was noted during calibration

2) channel widths are being measured ~ every channel width. I recommended every 9m or so measured with a hip chain.

Notes:

Field Audit Confirmation:

Field audit leader: Chris Schell _____ For field crew: ALL _____

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: HFP 1:20k Aquatic Inventory - 2000
FRBC project number: _____ **MELP project number:** _____
Contractor: SKR Environmental Consultants Ltd.
Field audit by: Chris Schell ____ **Site identifier:** na **Field audit date:** July 2000

FORM 2C

FIELD AUDIT FOR LAKE SURVEYS: LAKE SURVEY PROCEDURES CHECK – PAGE 1 OF 3

Materials present in field	Y	N	Notes
Lake survey forms	Y		
Field data reference	Y		
Lake outline maps	Y		
Field maps	Y		

List equipment used and available	Calibrated (Y/N)	Proper use (Y/N)	Notes
pH - pocket meter	Y	Y	
conductivity - pocket meter	Y	Y	
Temp/ oxygen (Oxyguard MK2)	Y	Y	

Group		Acceptable		Notes
		Tech.	Data	
Waterbody	Class of wetland or lake	Y	Y	
	Fish collection form	Y	Y	
	Lake name (Gaz, local)	Y	Y	
	Watershed code or	Y	Y	
	ILP#, ILP map #	Y	Y	
	Waterbody ID	Y	Y	
	Reach #	Y	Y	
	Project ID	Y	Y	
	NID map #, NID #	Y	Y	
	UTM	Y	Y	
	Magnitude	Y	?	1
	Surface area, source	Y	Y	
	TRIM map #, year	Y	Y	
	Air photo reference	Y	Y	
	Elevation, source	Y	Y	
	Biogeoclimatic zone	Y	Y	
Terrain characteristics	Setting	Y	Y	
	Aspect	Y	Y	
	Hillslope coupling	Y	Y	

Notes:
1) magnitude taken from FDIS was incorrect.

Field Audit Confirmation:
Field audit leader: Chris Schell _____ For field crew: Ron S. and Mark L. _____

FORM 2C **CONTINUED – PAGE 2 OF 3**

Group	Item	Acceptable		Notes
		Tech.	Data	
Terrain characteristics	Lake basin genesis	Y	Y	
	Land use %	Y	Y	
Shoreline characteristics	Shoreline type %	Y	Y	
	Cover	Y	Y	
	Recreational features	Y	Y	
Inlets/Outlets	Inlets/outlets (#)	Y	Y	
	Inlet spawning	Y	Y	
	List of inlets/outlets	Y	Y	
	Watershed code or	Y	Y	
	ILP #, ILP map #	Y	Y	
Survey information	Start, end dates	Y	Y	
	Agency	Y	Y	
	Crew	Y	Y	
Access	Mode (air/road)	Y	Y	
	Auto within	Y	Y	
	Off road and distance	Y	Y	
	Trail, distance	Y	Y	
	Closest community	Y	Y	
	Comments	Y	Y	
Aquatic flora	Emergent vegetation	Y	Y	
	Dominant species	Y	Y	
	Submergent vegetation	Y	Y	
	Dominant species	Y	Y	
	Floating algae	Y	Y	

Notes:

Group	Item	Acceptable		Notes
		Tech.	Data	
Aquatic flora (continued)	Species list	Y	Y	
	Voucher specimens	Y	Y	
Lake bathymetry	Equipment	Y	Y	
	Bathymetry techniques	Y	Y	
	Bathymetric data recording	Y	Y	
	Type of survey	Y	Y	
	Littoral area	Y	Y	
	Maximum depth	Y	Y	
	Benchmark height	na	na	
	Benchmark type/location	na	na	
	Maximum water level	Y	Y	
Photodocu-mentation	Roll #	Y	Y	
	Photo #	Y	Y	
	Focal length	Y	Y	
	Direction	Y	Y	
	NID #, NID map #	Y	Y	
	UTM and method	Y	Y	
Aquatic wildlife	Group	Y	Y	
	Species/Comments	Y	Y	
Weather	Visual observations	Y	Y	
Limnological station	Properly located	Y	Y	
	Equipment	Y	Y	
	Station no.	Y	Y	
	Date, time	Y	Y	
	UTM			NID
	EMS no.	Y	Y	

Notes:

Field Audit Confirmation:

Field audit leader: Chris Schell _____ For field crew: Ron S. and Mark L. _____

FORM 2C **CONTINUED – PAGE 3 OF 3**

Group	Item	Acceptable		Notes
		Tech.	Data	
Limnological station (cont.)	Secchi depth	Y	Y	
	Water colour	Y	Y	
	pH (surface and bottom)	Y	Y	
	Ice depth	Y	Y	
Water samples	Depth	Y	Y	
	Requisition #	Y	Y	
	Processing, labeling and transport to lab	Y	Y	
Profiles	Depth	Y	Y	
	Dissolved oxygen	Y	Y	
	Temperature	Y	Y	
	Conductivity	Y	Y	
	H_2S presence	Y	Y	
Equipment used		Y	Y	

Notes:

Field Audit Confirmation:

Field audit leader: Chris Schell _____ For field crew: Ron S. and Mark L. _____

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: HFP 1:20k Aquatic Inventory - 2000
FRBC project number: _____ **MELP project number:** _____
Contractor: SKR Environmental Consultants Ltd.
Field audit by: Chris Schell **Site identifier:** na **Field audit date:** July 2000

FORM 2D

FIELD AUDIT: FISH COLLECTION CHECK – PAGE 1 OF 3

Materials present in field	Y	N	Notes
Fish collection forms	X		
Individual fish data forms	X		
Field data reference	X		
Field key to freshwater fishes of BC	X		
Approved electroshocker		X	1
Ancillary fish capture equipment (buckets, dip nets, stop net)	X		no stop net
Measuring board/ruler	X		
Weigh scale	X		
Fish samples (e.g., scale envelopes, tissue vials)	X		
Voucher containers, preservative, labels	X		

Sampling technique		Acceptable Y	Acceptable N	Notes
Lakes	Number and duration of gill nets set	Y		
	Number and duration of minnow traps set	Y		
	Other	Y		
Streams	Site selection and length	Y		
	Number and duration of minnow traps set	Y		
	Other			
Electrofisher function	Tilt/safety switch	x	x	2
	Main power switch	Y		generator
	Anode deadman's switch	Y		
	Quick release harness	Y		
	Anode clean	Y		
Electrofishing techniques	Safe operation and signals	Y		
	Site coverage – all habitats	Y		
	Effective fish capture	Y		
	Impact on fish	Y		
Fish handling	Impacts on fish	Y		

1) 2 electroshockers with several problems, missing and broken switch assemblies, wires have obviously been extensively repaired with duck tape, frame was cracked, one shocker required repair during field visit.
2) check not performed by any crew

Notes:

Field Audit Confirmation:
Field audit leader: Chris Schell _____ For field crew: All _____

FORM 2D **CONTINUED – PAGE 2 OF 3**

Sampling technique		Acceptable Y	Acceptable N	Notes
Fish identification	Correct identification	Y		
	Correct use of fish key	Y		
	Unidentified fish procedure	Y		voucher
Fish samples	Age sampling, labeling	na		
	Voucher storage, labeling	na		

Group	Item	Acceptable Tech.	Acceptable Data	Notes
Header	Name	Y	Y	
	Stream/Lake/Wetland	Y	Y	
	Watershed code or ILP	Y	Y	
	Waterbody ID	Y	Y	
	ILP map #	Y	Y	
	Project ID	Y	Y	
	Reach #	Y	Y	
	MELP fish permit #	Y	Y	
	Date start, end	Y	Y	
	Agency, crew	Y	Y	
	Resample	Y	Y	
Site/Method	Site #	Y	Y	
	NID map #, NID #	Y	Y	
	Site UTM	Y	Y	
	Method, method no.	Y	Y	
	Temp, cond., turbidity	Y	Y	

Group	Item	Acceptable Tech.	Acceptable Data	Notes
Fish summary	Site #	Y	Y	
	Method, method no.	Y	Y	
	Haul/Pass (H/P)	Y	Y	
	Species, stage, total #	Y	Y	
	Min. length	Y	Y	
	Fish activity	Y	Y	
Gear specifications	Site #	Y	Y	
	Method, method no.	Y	Y	
	Haul	Y	Y	
	Date, time in	Y	Y	
	Date, time out	Y	Y	
	Net type, length & depth	Y	Y	
	Mesh size	Y	Y	
	Set, habitat	Y	Y	
Electrofisher specifications	Site #	Y	Y	
	Method, method no.	Y	Y	
	Pass	Y	Y	
	Time in, time out	Y	Y	
	EF sec.	Y	Y	
	Length, width	Y	Y	1
	Enclosure	Y	Y	
	Voltage, freq., pulse	Y	Y	
	Make, model	Y	Y	
Individual fish data	Fish collection form #	Y	Y	
	Site #	Y	Y	

Notes:
1) Matt shut down fish sampling early due to concern for high numbers of juvenile RB captured. There is an issue with missed diversity, but I believe he made the correct decision. Only 30 m were sampled.

Notes:

Field Audit Confirmation:

Field audit leader: Chris Schell _____ For field crew: All _____

FORM 2D **CONTINUED – PAGE 3 OF 3**

Group	Item	Acceptable		Notes
		Tech.	Data	
Individual fish data continued	Method, method no.	Y	Y	
	Haul/Pass	Y	Y	
	Species	Y	Y	
	Length	Y	Y	
	Weight	na	na	
	Sex	na	na	
	Maturity	na	na	
	Age structure	na	na	
	Age sample #	na	na	
	Age	na	na	
	Voucher	na	na	
	Genetic structure	na	na	
	Genetic sample #	na	na	
	Photos	na	na	
	Number of fish sampled	na	na	

Notes:

Notes:

Field Audit Confirmation:

Field audit leader: Chris Schell _____ For field crew: All _____

April 6, 2001

Deidre Quinlan,
FRBC Co-ordinator, Houston Forest Products
Box 5000
Houston, BC, V0J 2Z0

Re: QA of Fish and Fish Habitat Inventory performed by SKR Consulting Ltd. for Houston Forest Products Co.

Deidre,

The stage 3 quality assurance (QA) review of the final deliverables for the 1:20k stream inventory re-sampling program performed by SKR Consulting Ltd. has been completed. Resources Inventory Committee standard QA forms were completed during the audit and are included with this letter. All forms list objectives that were met and comments pertaining to any problems that were identified during the QA evaluation.

In general the deliverables package was complete. SKR is aware of most of the missing components and will provide these (digital mapping files and digital QA of same) with the final deliverables package. The site card, fish collection and lake survey form consistency checks found an acceptable number or errors for most checks except for the lake survey forms. Many of the errors associated with the lakes are due to missing lake summary symbols on the maps, though there is a significant problem with lake site NIDs. The FDIS database is still being upgraded to 7.3 format (2000 standards) and this will have to be completed before I can grant final QA approval. The lake report check found only a few errors, all of which are listed on the forms. The annotated air photo and outline map contained no formatting errors.

The check of the watershed reports found only a few errors, all of which are listed on the QA form. The photodocumentation package was mostly complete and the FISS deliverables were to standards of content and format.

The project maps were first drafts and contain a distracting number of errors – typical of maps at this stage. During their own internal QA, SKR found almost all the errors I noted during my review. I listed the few errors I found on the last page of this letter. I will need to check the final versions of these maps before final QA approval but foresee no major problems at this time.

I would ask SKR to respond to the comments on the QA forms. Once we have agreed how each comment will be addressed, a corrected set of deliverables can be forwarded to me for final QA approval. If you have any questions regarding the information presented in this memo or in the QA forms please contact me by e-mail (schell@bulkley.net) or by telephone (250-847-0180).

Sincerely,

Chris Schell

cc. Ron and Regina Saimoto, SKR Consultants Ltd., Smithers, BC

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3A DATA COMPILATION AND REPORTING DELIVERABLES FOR QA – PAGE 1 OF 1

Deliverable		Hardcopy	Digital	Comments
Watershed reporting	Watershed report	Y	Y	
	Appendices			
	I. FDIS summary and photographs	Y	Y	
	II. Hardcopy maps	Y	Y	
	Attachments			
	I. Pre-field planning document	na	na	
	II. Field notes and forms	Y	na	
	III. Fish aging structures	Y	na	
	IV. Fish samples and vouchers	na	na	
	V. Photodocumentation	Y	Y	
	VI. Digital data	na	N	mapping files
	VII. FISS update data	Y	na	
	VIII. Aerial photography	na	na	
Individual lake reporting (for each lake)	Lake report	Y	Y	
	Appendices			
	I. Lake survey form	Y	Y	
	II. Water chemistry data	na	na	
	III. Fish collection forms	Y	Y	
	IV. Tributary summary	Y	Y	
	V. Photographs	Y	Y	
	VI. Bathymetric map	na	na	
	Attachments			
	I. Photodocumentation	Y	Y	
	II. Digital data	na	Y	
	III. FISS update data	Y	na	
	IV. Phase completion reports	Y	Y	
	V. Field notes and forms	Y	Y	
	VI. Aerial photography	na	na	
	VII. Fish ageing structures	Y	na	
	VIII. Fish samples and vouchers	na	na	

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3B DIGITAL DATA CHECKING – PAGE 1 OF 1

For each FDIS file provided:

FDIS filename:

	Acceptable		Comments
	Y	N	
Conversions done:			
• ILP to WSC	Y		not completed and not expected
• NID-UTM		N	not completed
• Update bathymetry	na	na	
FDIS QA report attached			
• Acceptable error report	Y		only acceptable errors found

For each FDIS file and digital map file set:

ARCView fish QA tool

	Filename	Acceptable		Comments
		Y	N	
Digital map files				To be included with final deliverables
• Metadata table			N	missing
• Map attributes table			N	missing
FDIS data check				
• Sequential reach numbering:			N	missing
• Point locations on TRIM streams:			N	missing
Copy of ARCView fish QA tool error report attached				
• Acceptable error report			N	missing

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3C

CONSISTENCY CHECK: STREAM CARDS, FDIS, PROJECT, INTERPRETIVE MAPS

PAGE 1 OF 6 (1-3 Tahtsa, 4-7 Whitesail & Tahtsa, 8-10 Fulton)

	1	2	3	4	5	6	7	8	9	10
Site #	21	37	61	19	41	58	83	17	38	59
NID map #	12178	12128	60730	25043	25082	25056	25019	44039	44044	44029
NID #	93e.076	93e.076	93e.065	93e.066	93e.066	93e.065	93e.066	93l.099	93l.099	93l.098

Record errors below with an 'x.' An error occurs if there is any inconsistency among: 1) field site cards, 2) FDIS, 3) project maps and 4) interpretive maps, as specified for each attribute.

Card section	Attribute	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Stream name	1, 2, 3, 4											
	Watershed code or ILP map # and ILP #	1, 2, 3, 4											
	NID map # and NID #	1, 2											
	Reach #	1, 2, 3, 4											
	Site #	1, 2, 3, 4											
	Site length	1, 2											
	Access	1, 2											
	Survey date	1, 2, 3, 4											
	Agency conducting survey	1, 2, 3, 4											
	Time of survey	1, 2						X					
	Crew conducting survey	1, 2											
	Fish form completed	1, 2											
Channel	Channel width	1, 2, 3, 4											
	Wetted width	1, 2	X										
	Residual pool depth	1, 2											
	Gradient	1, 2, 3, 4											
	Bankfull depth	1, 2											
	Stage	1, 2											
	No Vis. Ch., DW, and Dry/Int.	1, 2, 3, 4											
	Tribs	1, 2, 3, 4											
Cover	Total cover	1, 2											
	Cover elements	1, 2											
	Functional LWD (amount, distribution)	1, 2											
	Crown closure	1, 2											
	Instream vegetation	1, 2											
	Bank shape, texture, riparian vegetation	1, 2			X								

FORM 3C **CONTINUED – PAGE 2 OF 6**

Card section	Attribute	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Water	EMS #	1, 2, 3, 4											
	Temperature, pH	1, 2											
	Water chemistry requisition #	1, 2											
	Conductivity, turbidity	1, 2											
Channel - morpho logy	Flood signs	1, 2											
	Bed material	1, 2, 3											
	D95, D	1, 2											
	Morphology	1, 2, 3											
	Disturbance indicators	1, 2, 3											
	Pattern	1, 2, 3											
	Islands, bars, coupling	1, 2											
	Confinement	1, 2, 3											
Features	NID map # and NID #	1, 2											
	Type, height/length	1, 2, 3, 4											
	Photo, comments	1, 2, 3, 4											
	UTM	1, 2											
Habitat quality	General comments	1, 2											
	Fisheries sensitive zones	1, 2											
Photo-documen-tation	Roll #	1, 2											
	Frame #	1, 2											
	Focal length	1, 2											
	Direction	1, 2											
	Comments	1, 2											
Wildlife	Group	1, 2											
	Observations	1, 2											
Comments	General comments	1, 2											
Total errors:			1	0	1	0	0	1	0	0	0	0	3

Comments:
1) Typo in wetted width, card has 0.1, FDIS has 1.0.
3) Typo in right bank shape, V on card, S in FDIS. Printing error makes this site symbol difficult to read on the map.
5) Typo in time of survey, card says 17:30, FDIS has 14:30. I hate to see mistakes in vital pieces of data like this!

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3C

CONSISTENCY CHECK: STREAM CARDS, FDIS, PROJECT, INTERPRETIVE MAPS

PAGE 3 OF 6 (1 Fulton, 1 inlets to Babine Lake, 3-10 Nadina)

	1	2	3	4	5	6	7	8	9	10
Site #	81	6	26	47	70	98	122	148	173	194
NID map #	40081	54047	20351	35146	35089	35190	35175	35003	35056	35022
NID #	93I.098	93m.018	93I.001	93e.097	93e.096	93e.086	93e.086	93e.086	93e.095	93e.095

Record errors below with an 'x.' An error occurs if there is any inconsistency among: 1) field site cards, 2) FDIS, 3) project maps and 4) interpretive maps, as specified for each attribute.

Card section	Attribute	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Stream name	1, 2, 3, 4											
	Watershed code or ILP map # and ILP #	1, 2, 3, 4											
	NID map # and NID #	1, 2											
	Reach #	1, 2, 3, 4											
	Site #	1, 2, 3, 4											
	Site length	1, 2											
	Access	1, 2											
	Survey date	1, 2, 3, 4					X						
	Agency conducting survey	1, 2, 3, 4											
	Time of survey	1, 2											
	Crew conducting survey	1, 2											
	Fish form completed	1, 2											
Channel	Channel width	1, 2, 3, 4											
	Wetted width	1, 2											
	Residual pool depth	1, 2											
	Gradient	1, 2, 3, 4											
	Bankfull depth	1, 2											
	Stage	1, 2											
	No Vis. Ch., DW, and Dry/Int.	1, 2, 3, 4											
	Tribs	1, 2, 3, 4											
Cover	Total cover	1, 2											
	Cover elements	1, 2											
	Functional LWD (amount, distribution)	1, 2											
	Crown closure	1, 2											
	Instream vegetation	1, 2											
	Bank shape, texture, riparian vegetation	1, 2											

FORM 3C **CONTINUED – PAGE 4 OF 6**

Card section	Attribute	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Water	EMS #	1, 2, 3, 4											
	Temperature, pH	1, 2											
	Water chemistry requisition #	1, 2											
	Conductivity, turbidity	1, 2											
Channel - morpho logy	Flood signs	1, 2											
	Bed material	1, 2, 3											
	D95, D	1, 2											
	Morphology	1, 2, 3											
	Disturbance indicators	1, 2, 3											
	Pattern	1, 2, 3											
	Islands, bars, coupling	1, 2											
	Confinement	1, 2, 3											
Features	NID map # and NID #	1, 2											
	Type, height/length	1, 2, 3, 4											
	Photo, comments	1, 2, 3, 4											
	UTM	1, 2											
Habitat quality	General comments	1, 2											
	Fisheries sensitive zones	1, 2											
Photo-documen-tation	Roll #	1, 2											
	Frame #	1, 2											
	Focal length	1, 2											
	Direction	1, 2					X						
	Comments	1, 2											
Wildlife	Group	1, 2											
	Observations	1, 2											
Comments	General comments	1, 2											
Total errors:			0	0	0	0	2	0	0	0	0	0	2

Comments:
5) Typo in date. Card says 07/17 and FDIS says 09/17. Photo directions reversed in FDIS for the first 2 frames.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3C

CONSISTENCY CHECK: STREAM CARDS, FDIS, PROJECT, INTERPRETIVE MAPS – PAGE 5 OF 6 (1 Nadina, 2-5 Andrews & Ootsa, 6-8 Morrison, 9-10 Owen resampling)

	1	2	3	4	5	6	7	8	9	10
Site #	221	22	53	67	94	16	47	60	3	10
NID map #	35060	12009	12038	12046	12506	54056	54025	54018	10001	10008
NID #	93e.094	93e.087	93e.086	93e.086	93e.085	93m.018	93m.028	93m.049	93l.016	93l.017

Record errors below with an 'x.' An error occurs if there is any inconsistency among: 1) field site cards, 2) FDIS, 3) project maps and 4) interpretive maps, as specified for each attribute.

Card section	Attribute	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Stream name	1, 2, 3, 4											
	Watershed code or ILP map # and ILP #	1, 2, 3, 4											
	NID map # and NID #	1, 2											
	Reach #	1, 2, 3, 4											
	Site #	1, 2, 3, 4											
	Site length	1, 2											
	Access	1, 2											
	Survey date	1, 2, 3, 4				X							
	Agency conducting survey	1, 2, 3, 4											
	Time of survey	1, 2											
	Crew conducting survey	1, 2											
	Fish form completed	1, 2											
Channel	Channel width	1, 2, 3, 4											
	Wetted width	1, 2											
	Residual pool depth	1, 2											
	Gradient	1, 2, 3, 4											
	Bankfull depth	1, 2											
	Stage	1, 2											
	No Vis. Ch., DW, and Dry/Int.	1, 2, 3, 4											
	Tribs	1, 2, 3, 4											
Cover	Total cover	1, 2											
	Cover elements	1, 2											
	Functional LWD (amount, distribution)	1, 2											
	Crown closure	1, 2											
	Instream vegetation	1, 2											
	Bank shape, texture, riparian vegetation	1, 2											

Card section	Attribute	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Water	EMS #	1, 2, 3, 4											
	Temperature, pH	1, 2											
	Water chemistry requisition #	1, 2											
	Conductivity, turbidity	1, 2											
Channel - morpho logy	Flood signs	1, 2											
	Bed material	1, 2, 3											
	D95, D	1, 2											
	Morphology	1, 2, 3											
	Disturbance indicators	1, 2, 3											
	Pattern	1, 2, 3											
	Islands, bars, coupling	1, 2											
	Confinement	1, 2, 3											
Features	NID map # and NID #	1, 2											
	Type, height/length	1, 2, 3, 4											
	Photo, comments	1, 2, 3, 4											
	UTM	1, 2											
Habitat quality	General comments	1, 2											
	Fisheries sensitive zones	1, 2											
Photo-documen-tation	Roll #	1, 2											
	Frame #	1, 2											
	Focal length	1, 2											
	Direction	1, 2											
	Comments	1, 2											
Wildlife	Group	1, 2											
	Observations	1, 2											
Comments	General comments	1, 2											
Total errors:			0	0	0	1	0	0	0	0	0	0	1

Summary of stream site information check:

Number of marks (# cards * 52): 1560 Maximum number of errors acceptable (5%): 78

Number of errors found: 6 Is the number of errors acceptable: Yes

Comments:

4) time wrong, card says 12:30, FDIS says 14:30.

Fish Inventory Quality Assurance Check Form

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3D

CONSISTENCY CHECK: LAKE CARDS, FDIS, BATHYMETRIC MAP, LAKE OUTLINE MAP AND PROJECT MAP – PAGE 1 OF 4

Lake Name: various
Watershed code: **Waterbody ID:** See below
Record errors below with an 'x.' An error occurs if there is inconsistency among 1) lake cards, 2) FDIS, and/or 3) bathymetric maps, and/or 4) outline maps, and/or 5) project maps, as specified for each attribute.

	Attribute (max # errors)	Where to check	00338 BABL	00891 BABL	01172 FRAN	00867 BABL	01919 FRAN
Waterbody	Type of wetland or lake	1, 2, 5					
	Fish collection form	1, 2					
	Lake name	1, 2, 3, 4					
	WSC or ILP map # and ILP #	1, 2, 3, 4					
	Reach #	1, 2, 4					
	Air photo reference	1, 2, 3, 4					
	Waterbody ID	1, 2, 3, 4					
	Project ID	1, 2, 3, 4					
	Magnitude	1, 2					
	NID map # and NID #	1, 2					
	UTM	1, 2, 3, 4, 5	X	X		X	
	Surface area	1, 2, 3, 4, 5	X	X		X	
	Elevation	1, 2, 3, 4					
	Biogeoclimatic zone	1, 2, 3, 4					
Terrain characteristics	Setting, aspect	1, 2					X
	Coupling, genesis	1, 2					
Shoreline characteristics	Shoreline type %	1, 2					
	Land use %	1, 2					
	Cover	1, 2					
	Recreational features	1, 2, 4					
Inlets/Outlets	# Inlets/Outlets	1, 2, 3, 4					
	Spawning present (2°)	1, 2, 4					
	WSC or ILP map # and ILP #	1, 2, 3, 4					
Survey information	Start date	1, 2, 3, 4					
	End date	1, 2					
	Agency, crew	1, 2, 3, 4					
Access	Mode (Air/Road/Off road/Trail)	1, 2					
	Auto within	1, 2			X		X
	Distance from road	1, 2					
	Closest community, comments	1, 2				X	

	Attribute (max # errors)	Where to check	00338 BABL	00891 BABL	01172 FRAN	00867 BABL	01919 FRAN
Aquatic flora	Emergent and submergent	1, 2, 4					
	Dominant species	1, 2					
	Floating algae	1, 2, 4					
	Species list	1, 2					
Lake bathymetry	Type of survey	1, 2					
	Littoral area (%)	1, 2, 3, 5	X	X		X	
	Maximum depth	1, 2, 3, 5	X	X		X	
	Benchmark height	1, 2, 4					
	Benchmark type/location	1, 2, 4					
	Maximum water level	1, 2, 3, 4					
Photo documentation	Roll #, frame #, direction	1, 2, 4					
	Focal length	1, 2					
	NID map # and NID #	1, 2					
	UTM	1, 2					
Aquatic wildlife observations	Group	1, 2					
	Species/Comments	1, 2					
Water quality	Station no., UTM	1, 2					
	Date, time	1, 2					
	EMS no.	1, 2, 4					
	Secchi depth, colour	1, 2					
	pH (surface and bottom)	1, 2, 5	X	X		X	
Water sample	Depth	1, 2					
	Requisition #	1, 2					
Dissolved temperature, oxygen, and conductivity profiles	Depth	1, 2					
	Dissolved oxygen, temp.	1, 2					X
	Conductivity	1, 2, 5	X	X		X	
	Descend and ascend	1, 2					
	H_2S presence	1, 2					
Equipment	Equipment class	1, 2			X		
Total errors:		24	6	6	2	7	3

Comments:

00338 BABL: Lake summary symbol missing from project map.

00891 BABL: Lake summary symbol missing from project map.

01172 FRAN: equipment states you used an alcohol thermometer for your temp. profile; "auto within" should be in metres, not kilometers, lake summary symbol is missing from the project map but SKR is aware of this.

00867 BABL: no access description.

01919 FRAN: aspect in FDIS is different than the form and wrong; "access auto within" should be in metres, not kilometers; typo in upward temp. profile., Lake summary symbol missing from project map but SKR is aware of this.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3D

CONSISTENCY CHECK: LAKE CARDS, FDIS, BATHYMETRIC MAP, LAKE OUTLINE MAP AND PROJECT MAP – PAGE 3 OF 4

Lake name: "Star Lake and Unnamed Lake
Watershed code: **Waterbody ID:** See below
Record errors below with an 'x.' An error occurs if there is inconsistency among 1) lake cards, 2) FDIS, and/or 3) bathymetric maps, and/or 4) outline maps, and/or 5) project maps, as specified for each attribute.

	Attribute (max # errors)	Where to check	00950 FRAN	00892 FRAN	00433 BABL	00412 BABL
Waterbody	Type of wetland or lake	1, 2, 5				
	Fish collection form	1, 2				
	Lake name	1, 2, 3, 4				
	WSC or ILP map # and ILP #	1, 2, 3, 4				
	Reach #	1, 2, 4				
	Air photo reference	1, 2, 3, 4				
	Waterbody ID	1, 2, 3, 4				
	Project ID	1, 2, 3, 4				
	Magnitude	1, 2				
	NID map # and NID #	1, 2				
	UTM	1, 2, 3, 4, 5	X		X	X
	Surface area	1, 2, 3, 4, 5	X		X	X
	Elevation	1, 2, 3, 4				
	Biogeoclimatic zone	1, 2, 3, 4				
Terrain characteristics	Setting, aspect	1, 2				
	Coupling, genesis	1, 2				
Shoreline characteristics	Shoreline type %	1, 2				
	Land use %	1, 2				
	Cover	1, 2				
	Recreational features	1, 2, 4				
Inlets/Outlets	# Inlets/Outlets	1, 2, 3, 4				
	Spawning present (2°)	1, 2, 4				
	WSC or ILP map # and ILP #	1, 2, 3, 4				
Survey information	Start date	1, 2, 3, 4				
	End date	1, 2				
	Agency, crew	1, 2, 3, 4				
Access	Mode (Air/Road/Off road/Trail)	1, 2				
	Auto within	1, 2	X			
	Distance from road	1, 2				
	Closest community, comments	1, 2				

	Attribute (max # errors)	Where to check	00950 FRAN	00892 FRAN	00433 BABL	00412 BABL
Aquatic flora	Emergent and submergent	1, 2, 4				
	Dominant species	1, 2				
	Floating algae	1, 2, 4				
	Species list	1, 2				
Lake bathymetry	Type of survey	1, 2				
	Littoral area (%)	1, 2, 3, 5	X		X	X
	Maximum depth	1, 2, 3, 5	X		X	X
	Benchmark height	1, 2, 4				
	Benchmark type/location	1, 2, 4				
	Maximum water level	1, 2, 3, 4				
Photo documentation	Roll #, frame #, direction	1, 2, 4				
	Focal length	1, 2				
	NID map # and NID #	1, 2				
	UTM	1, 2				
Aquatic wildlife observations	Group	1, 2				
	Species/Comments	1, 2				
Water quality	Station no., UTM	1, 2				
	Date, time	1, 2				
	EMS no.	1, 2, 4				
	Secchi depth, colour	1, 2				
	pH (surface and bottom)	1, 2, 5	X		X	X
Water sample	Depth	1, 2				
	Requisition #	1, 2				
Dissolved temperature, oxygen, and conductivity profiles	Depth	1, 2				
	Dissolved oxygen, temp.	1, 2				
	Conductivity	1, 2, 5	X		X	X
	Descend and ascend	1, 2				
	H_2S presence	1, 2				
Equipment	Equipment class	1, 2	X	X		
Total errors:		21	8	1	6	6

Summary of lake information check:

Number of marks (# cards * 85): 765 Maximum number of errors acceptable (5%): 38
Number of errors found: 45 Is the number of errors acceptable: N
most of the errors are due to missing lake summary symbols on project maps

Comments:

00950 FRAN: "auto within" should be in meters; you did your profile using a alcohol thermometer? Lake summary symbol missing from the project map.

00892 FRAN: pH, temp, and dis. oxygen methods all appear to be wrong in FDIS. Lake summary symbol is missing on project map, but SKR is aware of this.

00433BABL: Lake summary symbol is missing from project map.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3E

CONSISTENCY CHECK: STREAM FISH COLLECTION FORM, FDIS, PROJECT MAP, INTERPRETIVE MAP, – PAGE 1 OF 6

	1	2	3	4	5	6	7	8	9	10
Site #	21	37	61	19	41	58	83	17	38	59
NID map #	12178	12128	60730	25043	25082	25056	25019	44039	44044	44029
NID #	93e.076	93e.076	93e.065	93e.066	93e.066	93e.065	93e.066	931.099	931.099	931.098

Record errors below with an 'x'. An error occurs if there is inconsistency among 1) fish collection forms, 2) FDIS, 3) project maps, and 4) interpretive maps, and/or 5) lake outline maps, as specified for each attribute.

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Name	1, 2, 3, 4, 5											
	Stream/Lake/Wetland	1, 2, 3											
	Watershed code or ILP	1, 2, 3, 4, 5											
	Waterbody ID	1, 2, 5											
	ILP map #	1, 2											
	Reach #	1, 2, 3, 4, 5											
	MELP fish permit #	1, 2											
	Date start, end	1, 2											
	Agency, crew	1, 2											
	Resample	1, 2											
Site/Method	Site #	1, 2, 3, 4, 5											
	NID map #, NID #	1, 2											
	Site UTM	1, 2											
	Method, method no.	1, 2											
	Temp, turbidity	1, 2											
	Conductivity	1, 2, 3, 4											
Fish summary	Method, method no.	1, 2											
	Haul/Pass (H/P)	1, 2											
	Species	1, 2, 3, 4											
	Stage, total #	1, 2											
	Min. length	1, 2											
	Fish activity	1, 2											

FORM 3E	CONTINUED – PAGE 2 OF 6

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Gear specifications	Method, method no.	1, 2											
	Haul	1, 2											
	Date, time in/out	1, 2											
	Net type, lgth, dpth	1, 2											
	Mesh size	1, 2											
	Set, habitat	1, 2											
Electrofisher specifications	Method, method no.	1, 2											
	Pass	1, 2											
	Time in, time out	1, 2											
	EF sec.	1, 2											
	Length, width	1, 2						X					
	Enclosure	1, 2											
	Voltage, freq., pulse	1, 2											
	Make, model	1, 2											
		Total:	0	0	0	0	0	1	0	0	0	0	1

Comments:
5) typo in width. Card says 1.0, FDIS has 0.1.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3E

CONSISTENCY CHECK: STREAM FISH COLLECTION FORM, FDIS, PROJECT MAP, INTERPRETIVE MAP – PAGE 3 OF 6

	1	2	3	4	5	6	7	8	9	10
Site #	81	6	26	47	70	98	122	148	173	194
NID map #	40081	54047	20351	35146	35089	35190	35175	35003	35056	35022
NID #	931.098	93m.018	931.001	93e.097	93e.096	93e.086	93e.086	93e.086	93e.095	93e.095

Record errors below with an 'x'. An error occurs if there is inconsistency among 1) fish collection forms, 2) FDIS, 3) project maps, and 4) interpretive maps, and/or 5) lake outline maps, as specified for each attribute.

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Name	1, 2, 3, 4, 5											
	Stream/Lake/Wetland	1, 2, 3											
	Watershed code or ILP	1, 2, 3, 4, 5											
	Waterbody ID	1, 2, 5											
	ILP map #	1, 2											
	Reach #	1, 2, 3, 4, 5											
	MELP fish permit #	1, 2											
	Date start, end	1, 2											
	Agency, crew	1, 2											
	Resample	1, 2											
Site/Method	Site #	1, 2, 3, 4, 5											
	NID map #, NID #	1, 2											
	Site UTM	1, 2											
	Method, method no.	1, 2											
	Temp, turbidity	1, 2											
	Conductivity	1, 2, 3, 4											
Fish summary	Method, method no.	1, 2											
	Haul/Pass (H/P)	1, 2											
	Species	1, 2, 3, 4											
	Stage, total #	1, 2											
	Min. length	1, 2											
	Fish activity	1, 2											

FORM 3E	CONTINUED – PAGE 4 OF 6

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Gear specifications	Method, method no.	1, 2											
	Haul	1, 2											
	Date, time in/out	1, 2											
	Net type, lgth, dpth	1, 2											
	Mesh size	1, 2											
	Set, habitat	1, 2											
Electrofisher specifications	Method, method no.	1, 2											
	Pass	1, 2											
	Time in, time out	1, 2											
	EF sec.	1, 2											
	Length, width	1, 2											
	Enclosure	1, 2											
	Voltage, freq., pulse	1, 2											
	Make, model	1, 2											
		Total:	0	0	0	0	0	0	0	0	0	0	

Comments:

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3E CONSISTENCY CHECK: STREAM FISH COLLECTION FORM, FDIS, PROJECT MAP, INTERPRETIVE MAP – PAGE 5 OF 6

	1	2	3	4	5	6	7	8	9	10
Site #	221	22	53	67	94	16	47	60	3	10
NID map #	35060	12009	12038	12046	12506	54056	54025	54018	10001	10008
NID #	93e.094	93e.087	93e.086	93e.086	93e.085	93m.018	93m.028	93m.049	93l.016	93l.017

Record errors below with an 'x'. An error occurs if there is inconsistency among 1) fish collection forms, 2) FDIS, 3) project maps, and 4) interpretive maps, and/or 5) lake outline maps, as specified for each attribute.

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Name	1, 2, 3, 4, 5											
	Stream/Lake/Wetland	1, 2, 3											
	Watershed code or ILP	1, 2, 3, 4, 5											
	Waterbody ID	1, 2, 5											
	ILP map #	1, 2											
	Reach #	1, 2, 3, 4, 5											
	MELP fish permit #	1, 2											
	Date start, end	1, 2											
	Agency, crew	1, 2											
	Resample	1, 2											
Site/Method	Site #	1, 2, 3, 4, 5											
	NID map #, NID #	1, 2											
	Site UTM	1, 2											
	Method, method no.	1, 2											
	Temp, turbidity	1, 2											
	Conductivity	1, 2, 3, 4											
Fish summary	Method, method no.	1, 2											
	Haul/Pass (H/P)	1, 2											
	Species	1, 2, 3, 4											
	Stage, total #	1, 2											
	Min. length	1, 2											
	Fish activity	1, 2											

FORM 3E	CONTINUED – PAGE 6 OF 6

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Gear specifications	Method, method no.	1, 2											
	Haul	1, 2											
	Date, time in/out	1, 2											
	Net type, lgth, dpth	1, 2											
	Mesh size	1, 2											
	Set, habitat	1, 2											
Electrofisher specifications	Method, method no.	1, 2											
	Pass	1, 2											
	Time in, time out	1, 2											
	EF sec.	1, 2											
	Length, width	1, 2											
	Enclosure	1, 2											
	Voltage, freq., pulse	1, 2											
	Make, model	1, 2											
		Total:	0	0	0	0	0	0	0	0	0	0	

Number of marks (# cards * 36): _1080__
Number of errors found: __1___

Maximum number of errors acceptable (5%): _54___
Is the number of errors acceptable: Yes

Comments:

Very nice.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3E

CONSISTENCY CHECK: LAKE FISH COLLECTION FORM, FDIS, PROJECT MAP, INTERPRETIVE MAP, LAKE OUTLINE MAP – PAGE 1 OF 2

	1	2	3	4	5	6	7	8	9	10
Lake WBID	00338 BABL	00891 BABL	01172 FRAN	00867 BABL	01919 FRAN	00950 FRAN	00892 FRAN	00433 BABL	00412 BABL	

Record errors below with an 'x'. An error occurs if there is inconsistency among 1) fish collection forms, 2) FDIS, 3) project maps, and 4) interpretive maps, and/or 5) lake outline maps, as specified for each attribute.

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Header	Name	1, 2, 3, 4, 5											
	Stream/Lake/Wetland	1, 2, 3											
	Watershed code or ILP	1, 2, 3, 4, 5											
	Waterbody ID	1, 2, 5											
	ILP map #	1, 2											
	Reach #	1, 2, 3, 4, 5											
	MELP fish permit #	1, 2											
	Date start, end	1, 2											
	Agency, crew	1, 2											
	Resample	1, 2											
Site/Method	Site #	1, 2, 3, 4, 5											
	NID map #, NID #	1, 2	X	X	X	X	X	X	X	X	X		
	Site UTM	1, 2											
	Method, method no.	1, 2											
	Temp, turbidity	1, 2											
	Conductivity	1, 2, 3, 4											
Fish summary	Method, method no.	1, 2											
	Haul/Pass (H/P)	1, 2											
	Species	1, 2, 3, 4	X	X									
	Stage, total #	1, 2											
	Min. length	1, 2											
	Fish activity	1, 2											

FORM 3E	CONTINUED – PAGE 2 OF 2

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Gear specifications	Method, method no.	1, 2											
	Haul	1, 2											
	Date, time in/out	1, 2		X		X							
	Net type, lgth, dpth	1, 2											
	Mesh size	1, 2											
	Set, habitat	1, 2											
Electrofisher specifications	Method, method no.	1, 2											
	Pass	1, 2											
	Time in, time out	1, 2											
	EF sec.	1, 2											
	Length, width	1, 2											
	Enclosure	1, 2											
	Voltage, freq., pulse	1, 2											
	Make, model	1, 2											
		Total:	2	3	1	2	1	1	1	1	1		13

Number of marks (# cards * 36): _324__
Number of errors found: __13___

Maximum number of errors acceptable (5%): _16___
Is the number of errors acceptable: Yes

Comments:

ALL) If you have different sites, you need a different NID for each, and a different UTM imported from the GIS products.
00338 BABL) Outline map, MT2 missing LSU, MT5 missing WSU, MT9 missing WSU.
00891 BABL) All times in – times out are the same and different then the card, MT8 has LKC and CT, but the lake outline map shows only LKC.
00867 BABL) All times in are the same and most are wrong. Data are missing on the card, and all the same in FDIS.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3F **CONSISTENCY CHECK: INDIVIDUAL FISH DATA CARD, FDIS, LAKE OUTLINE MAP - PAGE 1 OF 1** ALL LAKES WITH INDIVIDUAL FISH DATA.

	1	2	3	4	5	6	7	8	9	10
Lake WBID	00338 BABL	00891 BABL	00867 BABL	01919 FRAN	00950 FRAN	00892 FRAN	00412 BABL			

Record errors below with an 'x'. An error occurs if there is inconsistency among 1) individual fish data cards and 2) FDIS, as specified for each attribute.

Group	Item	Where to check	1	2	3	4	5	6	7	8	9	10	Error locations
Individual fish data	Site #	1, 2			-								
	Method, method no.	1, 2			-								
	Haul/Pass	1, 2			-								
	Species	1, 2			-								
	Length	1, 2			-								
	Weight	1, 2			-								
	Sex	1, 2			-								
	Maturity	1, 2			-								
	Age structure	1, 2			-								
	Age sample #	1, 2			-								
	Age	1, 2			-								
	Voucher	1, 2			-								
	Genetic structure	1, 2			-								
	Genetic sample #	1, 2			-								
	Photos	1, 2			-								
		Totals	0	0	-								

Number of marks (# cards * 15): 105
Number of errors found: 15
Maximum number of errors acceptable (5%): 5
Is the number of errors acceptable: Y

Comments:
1) Individual fish data report is missing for this lake in report appendix. Data in FDIS looks fine however.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3G **INDIVIDUAL LAKE REPORT – PAGE 1 OF 3**

Report section	Attribute	Accept. (√/x)	Notes
Title page	Proper title	√	
	Watershed code below title	√	
	Prepared for...	√	
	Prepared by...	√	
	Signature of R.P.Bio	√	
Reference information	Project reference information	√	
	Watershed information	x	1
	Lake sampling summary	√	
	Contractor information	x	2
Disclaimer	Standard wording disclaimer	√	
Acknowledgements		√	
Table of contents	Page numbering correct	x	3
	Report outline follows standard	√	
Lists	List of Tables	x	3
	List of Figures	x	3
	List of Appendices	√	
	List of Attachments	x	4

Report section	Attribute	Accept. (√/x)	Notes
Introduction			
Project scope/objectives		√	
Location	Description; map	√	
Access	Detailed description	√	
Resource Information	First Nations	√	
	Land use, logging, recreation, ...	√	
	Impacts and uses by wildlife	√	
	Existing water quality data	√	
	Previous fish presence	√	
Methods	Reference to RECCE standards	√	5
	Reference to project plan	√	
	Deviations from standards	√	
	Deviations from project plan	√	
	List of sampling equip. used	√	
Results and Discussion			
Logistics	Problems encountered	√	

Notes:
1) magnitude in WS info is 21, 18 in FDIS (01919FRAN).
2) my phone number is under the age interpretation contractor (00891BABL)
3) various mistakes. All are marked on the individual reports
4) photodoc and FDIS info is located with information from the watershed project. This should be noted in this section so that it will be easier to locate these deliverables later.

Notes:
5) no need to describe how you calculated Condition Factor when you didn't (no fish captured or no sport fish captured)

FORM 3G **CONTINUED – PAGE 2 OF 3**

Lake Report Format

Report section	Attribute	Accept. (√/x)	Notes
Immediate shoreline		√	1
Terrain		√	
Aquatic flora		√	
Site summary	Lake outline map; description	√	
Bathymetry	Table of statistics; map	√	
Limnological sampling	Table of results; T/O_2 profile	√	
Inlets, outlets		√	
Fish age, size and life history	Fish sampling summary	√	
	Fish capture summary	√	
	Summary of life history, etc	√	
	Length-frequency histograms	√	
	Summary of Length-at-age	√	
	Data presented by species	√	
	Age classes appear correct	√	
Significant features and fisheries observations	Fish and fish habitat		
	Critical habitats	√	
	Special populations	√	
	Wild stocks	na	
	Rare stocks or species	na	
	High value sport fishing	√	
	NO management recommend.	√	
	Habitat concerns	√	
Wildlife observations		√	

Report section	Attribute	Accept. (√/x)	Notes
References	All sources in report listed	√	
	According to CBE style manual	√	

Lake Report Appendices

Report section	Attribute	Accept. (√/x)	Notes
Appendix I. Lake survey form		√	
Appendix II. Water chemistry summary		na	
Appendix III. Fish data collection form		√	
Appendix IV. FDIS tributary summary	In ascending order by WSC	√	
	Grouped by site	na	
	FDIS reach card printouts	√	
	FDIS site card printouts	√	
	Fish data collection form	√	
	Photos (min. 1, max. 4)	√	
	All photos entered in FDIS	√	
	Explanatory photo captions	√	
	Photos in colour (final only)	√	
Appendix V. Photos		√	
Appendix VI. Bathymetric map	Proper size ("C" or "D" size)	na	
	Folded in pocket in report	na	

Notes:

1) in several of the reports you comment that the shape of the lake caused the relative shoreline to be greater than 1. It's mathematically impossible for this value to be less than 1. It would be more useful to discuss what the value says about lake productivity, etc.

Lake Report Attachments

Attachment I. Photodocumentation	Table: Photo summary report	√	
	Colour thumbnail reference	√	
	Photo CD	√	
	CD image #s match digital	√	
	Negatives in plastic sleeves	√	
	Negatives labelled	√	
	Negative #s match digital	√	
	Prints in plastic sleeves	X	
	Prints labelled	X	
Attachment II. Digital data	Budget breakdown by phase	na	
	Project sampling design	-	phase 1
	References, contacts list	-	phase 1
	Table of vouchers collected	√	
	Table of DNA collected	√	
	Photo summary report	√	
	Report tables, figures	√	
	Report text	√	
	FDISDAT.MDB	√	
	Bathymetric map file	na	
Attachment III. Reference material	FISS data forms and maps	√	
	Copies of reference material	√	
	Data on forms match FDIS	√	
Attachment IV. Phase completion reports	Hardcopy contract phase completion reports	√	

Report section	Attribute	Accept. (√/x)	Notes
Attachment V. Field notes	Field book or facsimile	√	
	Lake survey forms	√	
	Fish collection forms	√	
	Individual fish data forms	√	
	Field working maps	√	
	Site cards	√	
Attachment VI. Aerial photography	Purchased aerial photos	na	
	Aerial video tape	na	
Attachment VII. Fish ageing structures	Actual ageing structures	√	
	Labelled photocopies	na	
	Age data is correct	√	
Attachment VIII. Voucher and DNA samples	Table: Vouchers collected	na	
	Table: DNA collected	na	

Notes:

Notes:

na = not applicable, not required.

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 31 OUTLINE MAP CHECK – PAGE 1 OF 1

Lake name: all
Watershed code: NA **Waterbody ID:** NA

Section	Attribute	Errors	Notes
Map	"E" line is present	√	
	Sounding transects perpendicular to "E" line	na	
	Sounding transects agree with bathymetric map	√	
	Inlet/outlet streams and direction of flow agree with bathymetric map and air photo	√	
	Location of deepest point in each "major" basin	√	
	Limnological station in each "major" basin	√	
	Reach breaks and stream survey sites indicated	na	
	Significant aquatic macrophyte beds indicated	√	
	Prominent shoreline features	√	
	Benchmark location agrees with bathymetric map and air photo	na	
	Location, direction of lake features photos	√	
Map (cont.)	All symbols as outlined in 'bathymetric standards'	√	
	Fish sample sites	√	
Header block	Name of lake	√	
	Watershed code	√	
	Date of survey (month, year, day)	√	
	Legend with all symbols used on map	√	
	Bottom left-hand corner, contractor/organization producing the map	√	

No. marks (# maps * 18): 162 Max. no. errors acceptable (5%): 8.1
No. errors found: 0 Is no. errors acceptable: √ Y

Notes:

Notes:

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory
FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001
Contractor: SKR Consultants Ltd.
QA review by: Chris Schell **Review date:** March, 2001

FORM 3J ANNOTATED AIR PHOTO CHECK – PAGE 1 OF 1

Lake name: all
Watershed code: _____ **Waterbody ID:** _____

Attribute	Errors	Notes
Benchmark location agrees with bathymetric map and outline map	na	
High water mark	na	
Limnological station in each "major" basin	√	
Fish sampling sites	√	
Inlet/outlet streams and direction of flow agree with bathymetric map and outline map	√	

No. marks (# maps * 5): 27 Max. no. errors acceptable (5%): 1
No. errors found: 0 Is no. errors acceptable: √Y
❑ N

Notes:

Notes:

FISH INVENTORY QUALITY ASSURANCE CHECK FORM

Project name: Houston Forest Products Co. - 2000/2001 – Fish and Fish Habitat Inventory

FRBC project number: 000108 **MELP project number:** HFP-SKR-001-2001

Contractor: SKR Consultants Ltd.

QA review by: Chris Schell **Review date:** March, 2001

FORM 3K **WATERSHED REPORT – PAGE 1 OF 4**

Report section	Attribute	Accept. (√/x)	Notes
Title page	Proper title	x	1
	Watershed code below title	√	
	Prepared for...	√	
	Prepared by...	√	
	Signature of R.P.Bio	√	
Reference information	Project reference information	√	
	Watershed information	x	2
	Sampling design summary	x	2
	Contractor information	x	3
Disclaimer	Standard wording disclaimer	√	
Acknowledgements		√	
Table of contents	Page numbering correct	√	
	Report outline follows standard	√	
Lists	List of Tables	√	
	List of Figures	√	
	List of Attachments	√	
	List of Appendices	√	

Report section	Attribute	Accept. (√ /x)	Notes
Introduction			
Project scope, objectives	1:20 000, 1:5000, lakes, etc.	x	4
Location	Description	√	
Overview map	8.5 × 11" or 11 × 17"	√	
	Outline of study area	√	
	Inset map showing relation to BC	√	
	Sample site locations	√	
	1:20 000 map grid	√	
	Major communities	na	
	TRIM/FC aquatic features	na	
Access	Description	√	
Resource Information	First Nations	√	
	Land use, logging, recreation, etc.	√	
	Impacts and uses by wildlife	√	
	Existing water quality data	√	
	Previous fish presence	√	
Methods	Reference to RECCE standards	√	
	Reference to project plan	√	
	Deviations from RIC standards	√	
	Deviations from project plan	√	
	List of sampling equipment used	√	

Notes:

1) see note on last page

2) Incomplete for Owen Creek. See comments in report.

3) In a few of the reports, my phone number is under the ageing address.

4) list any lakes done as part of the watershed project

Notes:

Report section	Attribute	Accept. (√/x)	Notes
Results and Discussion			
Logistics	Problems encountered	√	
	Weather	√	
	Access	√	
	Water levels	√	
	How was it addressed	√	
	How did it impact the results	√	

Stream Report Format

Report section	Attribute	Accept. (√/x)	Notes
Summary of sub-basin biophysical information	Table defining each sub-drainage	x	1
	Sub-drainages not sampled but included in the planning document	√	
	Previous sampling reference	√	
Habitat and fish distribution	Characteristics of fish habitats	√	
	Pattern of fish distribution	√	
	Location of significant fish pop.s	√	
	Lakes treated as a reach of the stream	√	
	Upstream limits of fish presence	√	
	Obstructions influencing fish	√	
	Table of all barriers present	√	

Stream Report Format – cont.

Report section	Attribute	Accept. (√/x)	Notes
Fish age, size and life history	Summary of life stages, life history, etc.	√	
	Length-frequency histograms	√	
	Histograms have the same x-axis	√	
	Table: Summary of length-at-age.	x	2
	Data presented by species	√	
	Data presented by sub-drainage	√	
	Age classes appear correct	√	
Significant features and fisheries observations	Fish and fish habitat		
	Critical habitats	√	
	Special populations	√	
	Wild stocks	na	
	Rare stocks or species	√	
	High value sport fishing	x	missing
	NO management recommend.	√	
	Habitat protection concerns		
	Fisheries sensitive zones	√	
	Fish above 20% gradients	√	
	Restoration opportunities	√	
	Problem culverts	√	
	Unstable slopes	√	
Fish bearing status	Brief narrative section	√	
	Table: Summary of fish bearing reaches…	√	

Notes:
1) "UTM at mouth" is missing
2) not always present when they could be.

Notes:

Stream Report Format – cont.

Report section	Attribute	Accept. (√ /x)	Notes
Fish bearing status (cont.)	Table: Summary of non-fish bearing reaches	x	1
	Table: Follow-up sampling required	√	
References	All sources in report listed	√	
	According to CBE style manual	√	

Stream Report Appendices

Report section	Attribute	Accept (√ /x)	Notes
Appendix I. FDIS summary and photographs	In ascending order by WSC	-	
	Grouped by site	√	
	FDIS reach card printouts	x	missing
	FDIS site card printouts	√	
	Fish data collection form	√	
	Photos (min. 1, max. 4)	√	
	All photos entered in FDIS	√	
	Explanatory photo captions	√	
	Photos in colour (final only)	√	
Appendix II. Hardcopy maps – General	"E" size plots	√	
	Folded in pocket in report	√	
	UTM projection	√	
	1:20 000 map grid	√	
	1:20 000 scale	√	
	Complete title box	√	
	Complete legend box	√	
	Source information box	x	2

Notes:

1) fields listed in the Fish Stream ID guidebook: stage and turbidity.
2) to be corrected in next version of maps
3) missing for a few projects but SKR is aware of this
4) a few things I noticed are listed on the last page

Stream Report Appendices – cont.

Report section	Attribute	Accept. (√ /x)	Notes
Appendix II. Hardcopy maps – General (cont.)	Inset map box	x	missing
	Fish species box	√	
	100 m contour lines	√	
	WSCs or ILPs for all sampled streams	√	
	WSCs or ILPs for all 3rd order or higher streams	√	
	WSCs or ILPs for every other 1st and 2nd order stream	√	
	WBIDs for all lakes	x	missing
	Sample site locations	√	
Project map	All site data symbols attached to sites	√	
	Lake summary symbols	x	missing
	Reach data symbols on all reaches <30% gradient and all reaches containing sites	√	
	Features, obstructions, etc.	√	3
	Reach breaks and numbers	√	
Interpretive map	Reach summary symbols for all reaches in the project area	√	
	Features, obstructions	√	3
	Fish distribution limits	√	4
	Stream class	√	

Notes:

Stream Report Attachments

Report section	Attribute	Accept. (√/x)	Notes
Attachment I. Planning document	Budget breakdown by phase	na	1
	Project sampling design	na	1
	Process of site selection	na	1
	Reach table	na	1
	Lake table	na	1
	Random sample table	na	1
	References, contacts list	na	1
Attachment II. Field notes	Field book or facsimile	√	
	Site cards	√	
	Fish collection forms	√	
	Individual fish data forms	√	
	Field working maps	√	
Attachment III. Fish ageing structures	Actual ageing structures	√	
	Labelled photocopies	√	
	Annuli identified with red	√	
	Age data are correct	√	
Attachment IV. Voucher, DNA samples	Table: Vouchers collected	√	3
	Table: DNA collected	√	3
Attachment V. Photodocumentation	Table: Photo summary report	√	
	Colour thumbnail reference	√	
	Photo CD	√	
	CD Image #s match digital	x	2
	Negatives in plastic sleeves	√	
	Negatives labelled	√	
Attachment V. Photodocumentation (cont.)	Negative #s match digital	√	
	Prints in plastic sleeves	-	no prints
	Prints labelled	-	no prints
Attachment VI. Digital data	Budget breakdown by phase	na	1
	Project sampling design	na	1
	References, contacts list	na	1
	Table of vouchers collected	√	3
	Table of DNA collected	√	3
	Photo summary report	√	3
	Report tables, figures	√	
	Report text	√	
	FDISDAT.MDB	√	
	Mapping files (plot files)	x	
	Mapping files (metadata and map features files)	x	
Attachment VII. FISS update data	FISS data forms and maps	√	
	Copies of reference material	√	
	Data on forms match FDIS	√	
Attachment VIII. Aerial photography	Purchased aerial photos	na	
	Aerial video tape	na	

Notes:

1) submitted with phase 1-3.

2) Nadina CD#1, image # are wrong for N03 at least, Owen OW01 some negative numbers are missing from the database. You should put an insert into the Babine lake and Andrews/Ootsa sections telling the user where the negatives and digital files are. ie: in the Morrison and Tahtsa sections and CDs.

3) in FDIS

Watershed report titles: Paul G. has specifically requested that report titles describe the study area location to the casual user (ie: a person unfalliar with watershed codes or landscape units. Instead rely on well known landmarks and directions that will locate an area in a person's mind. For example, instead of "Selected inlet streams to Babine Lake" be more descriptive, "Selected tributary streams to the east shore of the northwest arm of Babine Lake". Please go over your titles and improve where possible.

Map coding comments:

93e.076	ILP60360-R1	should be FP ds of 60384
93e.055	ILP51524-R2	gradient is 20.1% you can default to NF
93e.055	ILP51522-R3	not sampled- shouldn't this be suspected FP or NF
93e.066	ILP52007-R2&3	not sampled, I think this should be suspected FP
93m.018	ILP10855 R1	fish were captured here but its coded suspected FP

June 4, 2001

Deidre Quinlan,
FRBC Co-ordinator, Houston Forest Products
Box 5000
Houston, BC, V0J 2Z0

Re: QA of Fish and Fish Habitat Inventory performed by SKR Consulting Ltd. for Houston Forest Products Co.

Deidre,

I have completed my final stage 3 quality assurance (QA) review of the deliverables produced by SKR Environmental Consulting Ltd. for the 200/2001 HFP reconnaisance aquatic inventory project. With some exceptions, the concerns I identified during my first QA review have been addressed. **As a result, I'm pleased to grant final QA approval for this project.**

A list of errors I found during my final review are listed on the next page. Correction of these is recommended. The first QA review and this letter will serve as the QA deliverables required for this phase, and should be attached to the final product. If you have any questions please contact me by e-mail (schell@bulkley.net) or by telephone (250-847-0180).

Sincerely,

Chris Schell, M.Sc. R.P.Bio

- The project title on the reports should match that on the maps
- UTMs are not on the FDIS printouts and they should be
- outstanding photodoc issues from the first review have not been addressed yet
- lake reports – it should be noted that the photodoc deliverables are associated with the watershed deliverables
- 00412BABL – bottom pH reads 17.3
- 00338BABL – LSU is missing from "species in lake"in Lake Information Section.
- 00950FRAN – ILP map# is wrong in FDIS. RB is missing from lake summary symbol on map.
- 93L.007 – 860FRAN and Belleliot Lake are misplaced on map or lake is not coloured
- 93e.064 – ILP 61783: unexplained symbol square with dot in the middle
  - ILP 51819: NFB confirmed with no justification
- 93e.094 – ILP 21131 R2: FB inferred upstream of NFB inferred
- 93e.028 – ILP 10414: FB confirmed upstream of a FB inferred?
- 93e.066 – ILP 51176 R2 and tribs: look at this whole area, there's a couple of weird codings.

Appendix 4. 1:20,000 Fisheries Project/Interpretive Maps for Sub-basins IV and V in the Babine Lake watershed.

Fisheries Project/Interpretive Maps

093M.018
093M.028

FRBC Multi-Year Agreement Number: 000108
MELP Project Number: HFP-SKR-001-2001
FRBC Activity Number: 10447
FDIS Project Codes: 06-UNRS-000001163-1999, 06-UNRS-000001154-1999, 06-UNRS-000001168-1999, 07-UNRS-0000115t-1999
06-FRAN-000001156-1999, 06-FRAN-000001157-1999, 06-FRAN-000001159-1999, 06-FRAN-000001161-1999, 06-BABL-000001172-1999
07-UNRS-00001155w-1999, 06-BABL-000001201-1999, 06-BABL-000001175-1999, 4716
Project Name: HFP phases 4-6 Combined
Project Type: reconnaissance inventory
Report Date: February 9, 2001
Proponent: Houston Forest Products
Company Conducting Inventory: SKR Consultants Ltd.
Contact Person: Regina Saimoto
Contact Phone: (250) 847-4674
Contact E-mail: rsaimoto@bulkley.net
Ministry Representative: Paul Giroux

List of Deliverables:
Phases IV-VI:

Deliverable Product	Received	Approved (QA)
50 Fisheries interpretive and project maps		
8 watershed reports and 9 lake reports (hardcopy)		
digital FDIS databases, watershed reports, lake reports, phase completion report		
digital fisheries interpretive and project maps		
226 FISS datasheets, 12 FISS maps, 7 additional FISS references		
675 original site cards, 333 original fish forms, scale samples		
9 lake forms, 9 fish forms for the lakes, 9 sounding tapes for the lakes, scale samples		
photodocumentaion binder and CD		
hardcopy phase completion report		

Activity Log:

Date:	Activity
June 20-27	set up FDIS databases, import information from WGIS
June 9 - July 4	complete reach cards for random sampling
July 17-20	FISS update
July 5-12	mark reaches to be sampled on maps
July 20	phases 1-3 completion report, prefield planning report
July 17 - Sep 1	phase 4 (stage 2) QA in field by Chris Schell
Sep. 1 & 6	meet with Paul to discuss sampling plan and progress
Sep. 7	mail ILP maps and database to Victoria for lake ILPs
July 20 - Sep 30	conduct stream and lake surveys
July 20 - Sep 30	biweekly progress reports on sampling activities e-mailed to Paul Giroux and Deidre Quinlan
October 1 - 10	compile additional sampling requirements reports
Sept 15 - Oct 26	data entry and mapping, scale aging
Oct. 5 - 30	sent maps and databases to WGIS for mapping
Dec. 10 - Jan 13	copy photo CDs
Jan 1 - 13	photodocumentation
Jan 1 - 15	FISS update
Feb. 9	phase completion report
Feb. 10	digital deliverables

Summary of work completed:

Phases I-III

Project Area Statistics (excluding Owen)

project area: 1400 square kilometers
number of TRIM map sheets: 35
largest watershed (stream) order: 6
number of 3rd order basins: 141
km stream in project area: 3551.93
number of stream reaches in project area: 5088
number of lakes in project area: 166

Actual Sampling Program

number of reach sample sites sampled: 681 (including 14 re-sample sites in Owen watershed)
number of primary lakes sampled: 0
number of secondary lakes sampled: 9
number of sites where cutblock level fish stream identification was conducted: 0

Cost summary:

phases I-III

$4,480.00 for 3 additional areas in the Morrison Landscape Unit and 3 additional areas in the Whitesail Landscape Unit

$600.00 for Owen re-sampling (14 sites)

phases IV-VI

Stream reaches (including re-sampling)

total cost for FRBC	$314,635.00
# FRBC funded sites	637
FRBC cost/site	$493.93

Secondary lake inventory:

total cost for FRBC	$40,280.00
# FRBC funded lakes	9
FRBC cost/lake	$4,883.33

Progress and Problems Summary:

Some delays with mapping were encounted due to extenuating circumstances on the part of the mapping contractor.
Due to delays in mapping, we were unable to take advantage of WGIS GIS capabilities to help analyze project wide data