

**Fish and Fish Habitat Inventory
for
Operational Areas**

**Babine Lake Inlet Streams and
a Tributary to Morrison Creek**

**in the Morrison IRM Unit:
CP 533-1, CP 537-1 to 10, CP 539-2 to 6, CP 539-8 and CP 541-2**

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for

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DISCLAIMER

The Province has not accepted the contents of this product for the purposes of the Forest Practices Code, and reserves the right to dispute the validity of summarized results. The province does not necessarily agree with the classification assigned to any individual stream reach, for use in logging plans, silviculture prescriptions or any other application.

PROJECT SUMMARY SHEET

Project Reference Information

MELP Contract Number	CSK 3070
FDIS Project Number	06-BABL-0000-0220-1998
MELP Region	Skeena Region (06)
FW Management Unit	06-08
DFO Subdistrict	Prince Rupert (8)
Forest Region	Prince Rupert
Forest District	Morice
Forest Licensee	Houston Forest Products
First Nations Claim Area	Lake Babine Nation

Watershed Information

Watershed Group	Bulkley River
Watershed Name	upper Babine River (upstream of outlet of Nilkitkwa Lake)
Watershed Code	480
UTM at Mouth	09.6143177.646700
Watershed Area	6500 km ²
Stream Order	approx. 7th order
NTS Maps (1:250,000)	93M
TRIM Maps	93M008, 93M018, 93M028
BEC Zone	SBS mc ²

Sampling Design

Number of Reaches Sampled	30
Total Sample Sites	31
Field Sampling Dates	July 3, 1998 and Sept. 3-6, 1998
Fish Species in Watershed	CH, CO, SK, KO, CT, PK, RB, MW, LW, DV, BB, CSU, NSC, LT, CC

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1.0 INTRODUCTION

The study area is located in upper Babine watershed of the Skeena drainage in north-central British Columbia (Figure 1). Selected streams in the area were inventoried for Forest Practice Code (FPC) stream classification and evaluation of requirements for appropriate management of stream/wetland riparian zones related to cutting permits CP 533-1, CP 537-1 to 10, CP 539-2 to 6, CP 539-8 and CP 541-2.

The main objectives of this project were:

- to complete a detailed literature review of historical fisheries information for related areas,
- to conduct field visits and appropriate fish sampling at representative sites to determine fish species distribution and relative abundance in the related watershed(s),
- to recommend FPC stream classification for all stream reaches in contact with planned forest harvest,
- to describe management concerns for stream/wetland and lake riparian zones in the relevant areas planned for forest harvest,
- to provide recommendations for more conservative protection of stream riparian zones that are not adequately protected by the minimum standards of the FPC, and
- to provide recommendations for appropriate structures, designs, and installation of planned road/stream crossings with regard to concerns for fish, fish migration, and fish habitat.

2.0 STUDY AREA

2.1 Location

The Morrison Integrated Resource Management (IRM) Unit is located in the Morice Forest District (Prince Rupert Forest Region). The main drainages in the Morrison IRM Unit are Morrison Creek and small inlet streams along the northeast shore of Babine Lake. The specific study areas for this project focused around proposed harvest in CP 533-1, CP 537-1 to 10, CP 539-2 to 6, CP 539-8 and CP 541-2. The area is located in the moist-cold subzone of the sub-boreal spruce biogeoclimatic zone (MoF 1988).

2.2 Access

The streams survey sites were accessed using a combination of road, foot and boat access. The area can be accessed via a private barge crossing (HFP) near the village of Granisle, and then proceeding along the Jinx, Hagan, and Morrison Main Forest Service Roads. A permit is required to utilize the private barge near the village of Granisle.

Figure 1. 1:250,000 Map (93M) showing the general area of fish inventory and stream classification for CP 533-1, CP 537-1 to 10, CP 539-2 to 6, CP 539-8 and CP 541-2.

2.3 Resource Use

The study area is utilized for Forestry purposes, with active logging being proposed to the year 2000 in the immediate study area. No range use plans or range permits were noted for the study area, and a Land Use Planning Document was not available at the time of writing. The study area has little recreational value, with no recreational sites or trails indicated on the Ministry of Forests Morice Forest District Map (1994). No Protected Areas Strategy (PAS) sites have been identified for the Morrison IRM unit. The Lake Babine Nation has “claimed” parts of the Morrison IRM unit, and is currently in stage 3 of the treaty process negotiations (B.C. Treaty Commission, pers. comm.). There are no mineral tenures, placer stakes, or coal licenses in the study area. The guide and outfitter territory in the study area is 608G003, and the trapline territories are 608T023, 608T024 and 608T025.

The BC Environment Water Management Branch was contacted to document water licences and water rights for the study area. Several water licences have been recorded for Babine Lake (SKR 1997). No community watersheds are located in the study area (Meredith, pers. comm.).

3.0 METHODS

3.1 Literature Review

All pertinent literature on the streams inventoried in this project was collected and summarized. Existing data pertaining to stream classification in the Fisheries Information Summary System (FISS), and in the rivers and lakes files at the BC Environment Skeena Region office were summarized and mapped. Known fish distribution in the study area watersheds were mapped. In addition, existing watershed codes were assigned to streams. An interim locational point (ILP) was assigned to each stream for which no watershed code existed. UTM co-ordinates at the confluence of each stream were determined from the BC Environment watershed code dictionary or digitally from 1:20,000 TRIM maps by Western GIS Inc.. Stream order was determined from 1:20,000 TRIM map sheets.

3.2 Reach Break Identification

Reach breaks were tentatively identified and mapped by examining 1:20,000 TRIM map sheets and air photographs (approx. 1:15,000 scale). The identification of reach breaks followed RIC standards (RIC 1996 Fish and Fish Habitat Inventory). Reaches were numbered from the confluence of the stream in ascending order, and, when feasible reach breaks were confirmed in the field.

3.3 Stream Assessment

Stream sites were accessed using a combination of 4X4 truck, boat and foot. Sections of streams in areas of development identified by HFP, with no previous indication of fish presence were walked. At representative sites, the following stream characteristics were

measured: channel width, wetted width, residual pool depth or pool depth, gradient (Suunto clinometer/Abney Level), temperature, pH (pHep 3 and Oaktron pHTestr2), substrate composition (including D₉₀), bank material, and cover. Conductivity was recorded with a hand held Hanna HI9033 conductivity meter for all sites in which electroshocking was conducted. Reach breaks were verified in the field. All data were collected on MoE/DFO stream survey cards, following RIC standards, and data was entered into pertinent databases. Fish presence was ascertained by electroshocking with a Smith-Root Model 15C backpack electroshocker. At each site, when possible, an area of approximately 100 m² was sampled by electroshocking. Fish captured were identified to species, measured (fork length) and released. In addition to identifying fish presence, potential or known barriers to fish migration, sensitive sites, and critical fish habitat were identified and mapped, when possible. Photographs were taken of sample locations, barriers, and other points of interest. Photographs were compiled in a photodocumentation document.

3.4 Map Production

All sample sites, fish distribution and reach breaks were hand drawn onto existing 1:20,000 maps for future digital mapping by Western Geographic Ltd. The following is indicated on all maps: watershed codes, reach breaks and reach numbers, sample sites, stream classifications, and fish distribution. Codes for fish species present follow those outlined in FISS, and are indicated on applicable maps.

4.0 RESULTS AND DISCUSSION

The results section describes the streams surveyed to the reach level. General information for relevant mainstems and tributaries are summarized, followed by a more detailed description for each reach inventoried. Reach descriptions include recommended stream, wetland and/or lake classifications (identified following the FPC standards), comments describing fish habitat types and fish captured at the sites sampled, and recommendations for proposed stream/road crossings and riparian management. Recommendations for riparian management generally fall into one of three types:

1. No additional recommendations are made in cases when FPC standards for riparian management are expected to provide adequate protection to fish and fish habitat.
2. Recommendations for riparian management are provided in cases where FPC standards appear to provide insufficient protection of fish habitat based on
 - reach characteristics, including stream gradient, stream substrate, bank material, and surrounding topography (e.g. wetland, sideslope, valley:channel ratio),
 - fisheries resources in immediate and downstream reaches and/or mainstems,
 - influences of riparian vegetation on fish habitat (e.g. nutrients, LOD, stream temperature, bank stability),
 - potential flood conditions, and

- forest type and values within riparian reserve and management zones.
3. Recommendations with explanations for S6 classification of streams with S4 default classification under FPC standards. This is exemplified at reaches where:
- a definite barrier to fish migration exists with no available habitat for resident fish populations upstream (e.g. no potential spawning habitat above barrier or channel width of less than 1.5 meters in the Central Interior Region), or
 - a single season's sampling in good fish habitats, and good sampling conditions confirms fish absence above definite barriers to fish migration, or
 - a single season's sampling in available habitat confirms fish absence above a potential barrier in a reach that contains limited fish habitat, or
 - no potential fish habitat was identified in the reach, and no valuable fish habitat is present upstream (e.g. no well defined channel).

Note: various levels of forest retention in riparian management zones are commonly recommended for these S6 streams to protect downstream fisheries values.

Completed stream survey cards, site cards and sample site photographs are located in Appendix 1. Two stream classification maps with study site/NID numbers are included in Appendix 2.

Note: Only fisheries values are taken into consideration when recommending special riparian reserve management zones. Other ecological contexts or wildlife values were not considered in this study, and are thus not reflected on in the results, discussions, or recommendations.

4.1 Babine Lake Inlet Streams

Watershed code: 480-02
Date surveyed: July 3, September 3-6 1997

One inlet stream system, entering the eastern shore of Babine Lake across from the Tsak Indian Reserve (IR9, NTS map sheet 93M02) was inventoried for this project. In addition, four inlet streams to the northern shore of Babine Lake just west of Morrison Arm, and east of Smithers Landing were inventoried. No specific information was available for these systems at the time of survey. A cursory summary of known fisheries information for the Babine River is presented in this section to place the new information for the tributary stream examined into context.

Babine Lake is a large lake at the headwaters of the Babine River. Chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), sockeye salmon and kokanee (*O. nerka*), cutthroat trout (*O. clarki*), rainbow trout (*O. mykiss*), pink salmon (*O. gorbusha*), mountain whitefish (*Prosopium williamsoni*), Dolly Varden char (*Salvelinus malma*) lake whitefish (*Coregonus clupeaformis*), burbot (*Lota lota*), largescale sucker (*Catostomus macrocheilus*), northern squawfish (*Ptychocheilus oregonensis*), lake trout (*S. namaycush*) and sculpins (*Cottus sp.*) are known to utilize Babine Lake (FISS). Two spawning channels were installed on Babine Lake in 1969 (SISS), one on the Fulton River, and one on the Pinkut River, in an effort to enhance sockeye salmon stocks. Annual enumeration of adult salmon at the Department of Fisheries and Oceans Babine River fish weir are being conducted. Enumeration of emigrating sockeye smolts are completed annually in the spring. The number of steelhead spawners (*O. mykiss*) have been estimated at the weir since the spring of 1994. Extensive studies have been conducted to evaluate the effectiveness of the sockeye enhancement projects at Babine Lake.

Fish captured in the four inlet stream on the northern shore of Babine Lake likely exhibit a lacustrine-adfluvial life history, as indicated by the proximity of the reaches sampled to Babine Lake.

4.1.1 Unnamed Creek (480-505600)

Watershed Code: 480-505600
ILP # / ILP map #: N.A. / 93M018
UTM (at mouth): 9.6112157.655053
Estimated number of reaches: not determined
Number of reaches examined: 2

This stream is a second order tributary to Babine Lake, and drains into the eastern shore of Babine Lake at a point located across the lake from the Tsak Indian Reserve (IR 9), and 13.5 km southeast of Williams Creek, a gazetted inlet to the western shore of Babine

Lake. The second reach of the system drains along the northern boundary of CP 541-2. This stream is referred to as stream "B" in the Silviculture Prescription map for CP 541-2

Reach 1

NID # / NID Map #:	00656 / 93M018	Site #:	1
Length of Reach:	200 m	Stream Order:	2
Length Surveyed:	200 m	Channel Width:	1.6 m
		Gradient:	4.0 %
Date of Sampling:	July 3, 1997		
Fish Presence:	no fish captured		

Reach Classification:	S3 default
Recommended Reach Classification:	S3 default

The lower reach of this system was sampled from the inlet to 150 meters upstream of Babine Lake. No fish were captured in 300 seconds of electroshocking (140 linear meters). Fish rearing and spawning habitat is very limited in this reach, and the reach is likely not fish bearing.

S3 classification is recommended until re-sampling in a second season confirms the lack of fish utilization of the system. Re-sampling may allow for a change in stream classification in this reach, and will allow better evaluation of potential for downstream impacts from planned harvest along reach 2 (CP 541-2).

Reach 2 (CP 541-2)

NID # / NID Map #:	00657 / 93M018	Site #:	2
Length of Reach:		Stream Order:	1
Length Surveyed:	2400 m	Channel Width:	1.3 m
		Gradient:	8.0 %
Date of sampling:	July 3, 1997		
Fish Presence:	limited fish habitat and access		

Reach Classification:	S4 default
Recommended Reach Classification:	S6

The entire reach was walked from the lower extent of the reach to 2400 meters upstream. The reach consisted of a series of shallow step pools and short sections of underground flow, which presented definite barriers to fish migration. Only limited potential fish habitat was identified in this reach.

The potential for downstream impacts is limited due to limited fish habitat in the entire system. S6 stream classification is recommended since fish access is restricted, and fish habitat is of low quality and abundance.

4.1.1.1 Unnamed Creek (ILP 00512)

Watershed Code: 480-5056-bb1
ILP # / ILP Map #: 00512 / 93M018
UTM (at mouth): 9.657159.6112696
Estimated number of reaches: 1
Number of reaches examined: 1

This first order tributary drains into Unnamed Creek 480-505600 approximately 1800 meters upstream of Babine Lake. This unnamed stream is located along the southern and western boundary of CP 541-2. The stream is referred to as stream "C" on the Silviculture Prescription map for CP 541-2.

Reach 1 (CP 541-2)

NID # / NID Map #:	00659 / 93M018	Site #:	3
Length of Reach:	1000 m	Stream Order:	1
Length Surveyed:	450 m	Channel Width:	1.1 m
		Gradient:	3.0 %
Date of Sampling:	July 3, 1997		
Fish Presence:	no fish habitat		

Reach Classification: S4 default
Recommended Reach Classification: S6

This reach consisted of isolated pools with no interconnecting flow. A defined channel was present. Downstream barriers to fish migration (step - pools and underground flow in reach 2 of the Unnamed Creek (480-505600), and the lack of fish habitat in this reach indicate that the stream is not fish bearing. No electroshocking was conducted due to the lack of suitable habitat.

S6 classification is recommended for this reach, as fish access to the mainstem is not possible (barriers in reach 2 of the mainstem), and only limited fish habitat is present in this reach.

4.1.2 Unnamed Creek (480-541300)

Watershed Code: 480-541300
ILP # / ILP map #: N.A. / 93M008
UTM (at mouth): 9.6104098.658885
Estimated number of reaches: not determined
Number of reaches examined: 4

This second order stream drains into the northern shore of Babine Lake across from Smithers Landing. The fourth reach of this stream flows along the northern boundary of CP 539-6, and is located within the boundaries of CP 539-5.

Reach 1

NID # / NID Map #:	00654 / 93M008	Site #:	1
Length of Reach:	200 m	Stream Order:	2
Length Surveyed:	150 m	Channel Width:	4.2 m
		Gradient:	3 %
Date of Sampling:	September 4, 1997		
Fish Presence:	coho, rainbow, sculpins		

Reach Classification: S3
 Recommended Reach Classification: S3

This reach was sampled approximately 25 meters upstream of Babine Lake. One rainbow trout and 22 coho were captured in 305 seconds of electroshocking (70 m² habitat). Coho ranged in fork length between 53 and 90 mm (Figure 2). Numerous other fish were observed, including two sculpins (not identified to species). Excellent fish rearing and spawning habitat was identified in this reach.

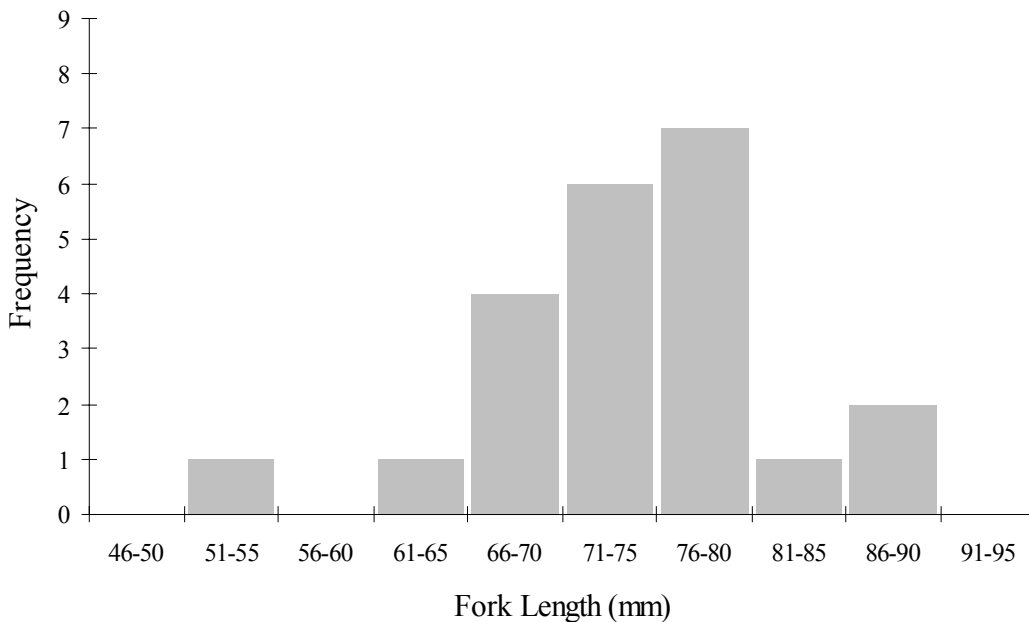


Figure 2. Size - frequency histogram of coho captured in Reach 1 of Unnamed Creek 480-5413.

Reach 2

NID # / NID Map #:	00634 / 93M008	Site #:	2
Length of Reach:	800 m	Stream Order:	2
Length Surveyed:	800 m	Channel Width:	2.5 m
		Gradient:	1.6 %
Date of Sampling:	September 4, 1997		
Fish Presence:	coho, rainbow, sculpin downstream; fish observed		

Reach Classification:	S3
Recommended Reach Classification:	S3

This reach was surveyed approximately 250 meters upstream of Babine Lake. Very good fish habitat and good potential spawning habitat was identified in this reach. Several fish were observed. No electroshocking was conducted due to fish presence downstream (Reach 1). The creek was dry approximately 790 meters upstream of Babine Lake.

Reach 3

NID # / NID Map #:	00635 / 93M008	Site #:	3
Length of Reach:	1100 m	Stream Order:	2
Length Surveyed:	150 m	Channel Width:	2.8 m
		Gradient:	4.0 %
Date of Sampling:	September 4, 1997		
Fish Presence:	dry channel; fish captured upstream (Reach 5)		

Reach Classification:	S3
Recommended Reach Classification:	S3

This reach was sampled approximately 1050 meters upstream of Babine Lake. This ephemeral reach was dry at the time of survey. No electroshocking was conducted due to the lack of shockable areas. Good potential fish rearing and some potential spawning habitat during higher water levels was identified in this creek.

Reach 4 (CP 539-6, CP 539-4)

NID # / NID Map #:	00636 / 93M008	Site #:	4
NID # / NID Map #:	00637 / 93M008	Site #:	5
Length of Reach:	1600 m	Stream Order:	2
Length Surveyed:	700 m	Channel Width:	2.6 - 3.4 m
		Gradient:	3.5 - 4.0 %
Date of Sampling:	September 5, 1997		
Fish Presence:	rainbow trout		

Reach Classification: S3
Recommended Reach Classification: **S3**

This reach is located in a gully. Two sample sites were established in this reach. Excellent potential fish rearing and spawning habitat was identified at both sites. Electroshocking for 156 seconds (15 m²) resulted in the captured of five rainbow trout (43-72 mm).

Air photo interpretation and ground truthing indicate that this reach is located in a steep sided gully. The reach drains through CP 539-5, and forms the northern boundary of CP 539-6. The potential for downstream impacts is relatively high due to the steep gradient, the lack of slow moving water in the reach, and the steep gully in which this reach is located. It is recommended that the riparian reserve zone should extend from the top of the gully, with partial retention in the riparian management zone to minimize potential windfall. A temporary bridge is recommended for the planned access road to the western portion of CP 539-7 and 8.

4.1.2.1 Unnamed Creek (ILP 00508)

Watershed Code: not available
ILP # / ILP map #: 00508 / 93M008
UTM (at mouth): 9.659157.6105136
Estimated number of reaches: not determined
Number of reaches examined: 1

This stream is a small, first order tributary to Unnamed Creek 480-5413. The confluence of this stream with Unnamed Creek 480-541300 is located approximately 700 meters upstream of Babine Lake, in Reach 2 of the mainstem. The stream is not indicated on 1:20,000 TRIM maps, but has been added to the TRIM map produced for this project.

Reach 1

NID # / NID Map #:	00651 / 93M008	Site #:	1
Length of Reach:		Stream Order:	1
Length Surveyed:	100 m	Channel Width:	1.0 m
		Gradient:	3.0 %
Date of Sampling:	September 4, 1997		
Fish Presence:	no fish present in one season		

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

This stream was sampled approximately 50 meters upstream of the confluence with the mainstem. Large areas of underground flow, which may form barriers to fish migration, were noted in this reach. No electroshocking was conducted since the water level was

low, and there was very limited fish habitat suitable for shocking. Only limited potential rearing habitat, and no potential spawning habitat was noted at this site.

S4 classification is recommended for this site until re-sampling in a different season allows for a change in stream classification. No harvest has been proposed near this stream.

4.1.3 Unnamed Creek (480-545800)

Watershed Code: 480-545800
ILP # / ILP map #: N.A. / 93M008
UTM (at mouth): 9.6103947.659954
Estimated number of reaches: not determined
Number of reaches examined: 2

This second order inlet stream to Babine Lake drains into the northern shore of the lake approximately 12 km west of Morrison Arm. The upper extent of this stream is located along the western boundary of CP 539-1 & 2, and along the eastern boundary of CP 539-4.

Reach 1

NID # / NID Map #:	00638 / 93M008	Site #:	1
Length of Reach:	500 m	Stream Order:	2
Length Surveyed:	500 m	Channel Width:	1.4 m
		Gradient:	6.5 %
Date of Sampling:	September 4, 1997		
Fish Presence:	none caught		

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

This reach was sampled approximately 100 meters upstream of Babine Lake. Good potential fish rearing habitat, and some potential fish spawning habitat was identified in this reach. Electroshocking for 200 seconds (100 m²) in all available habitat within the initial 100 meters of the stream did not result in the capture or observation of any fish. The water level in the creek was very low at the time of survey, and the reach exhibited sections of underground seepage.

S4 default classification is recommended for this reach. Re-sampling in a second season may result in the change of stream classification from S4 to S6. No harvest has been proposed adjacent to this reach.

Reach 2 (CP 539-1, CP 539-2, CP 539-4, road access)

NID # / NID Map #:	00670 / 93M008	Site #:	2
Length of Reach:	2500 m	Stream Order:	1
Length Surveyed:	100 m	Channel Width:	0.3 m
		Gradient:	30 %
Date of Sampling:	September 4, 1997		
Fish Presence:	channel dry, gradient barrier		

Reach Classification:	S6
Recommended Reach Classification:	S6

This sample site, surveyed at the lower extent of the reach, is representative of a short section of stream where the mainstem on the 1:50,000 NTS map is misdrawn. The main channel of this stream is actually Unnamed tributary ILP 00509. A 15 meter long steep gradient section (up to 50%) at the lower extent of the reach (NID 00580) has been identified as a barrier to fish migration, where the reach flows into the gully of the actual mainstem (ILP 00509). This section of defined channel was dry at the time of survey. Upstream of the gully wall, the stream lacked a defined channel.

S6 classification is recommended for this reach due to the presence of a barrier to fish migration, lack of suitable fish habitat upstream, but potential for a defined channel in higher gradient sections of the stream not surveyed.

NID # / NID Map #:	00640 / 93M008	Site #:	3
Length of Reach:	2500 m	Stream Order:	1
Length Surveyed:	600 m	Channel Width:	not defined
		Gradient:	2 %
Date of Sampling:	September 5, 1997		
Fish Presence:	no stream identified		

Reach Classification:	no stream identified
Recommended Reach Classification:	no stream identified

This site was sampled at the upper extent of the reach. No defined channel could be located in the area, and no evidence of a stream was found.

This section of stream on the TRIM map does not require stream classification. A culvert is recommended for the proposed road crossing to ensure adequate drainage.

4.1.3.1 Unnamed Creek (ILP 00509)

Watershed Code: not available
ILP # / ILP map #: 00509 / 93M008
UTM (at mouth): 9.659988.6104836
Estimated number of reaches: 3
Number of reaches examined: 2

This first order tributary drains into Unnamed Creek 480-545800 approximately 550 meters upstream of Babine Lake. This stream is actually the main channel in this system (see section 4.1.3, reach 2). The third reach of this tributary is located to the immediate south of CP 539-6, and drains in a southerly direction to Babine Lake.

Reach 2

NID # / NID Map #:	00639 / 93M008	Site #:	1
Length of Reach:	1000 m	Stream Order:	1
Length Surveyed:	220 m	Channel Width:	1.3 m
		Gradient:	9.0 %
Date of Sampling:	September 4, 1997		
Fish Presence:	channel dry		

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

This reach was sampled approximately 770 meters upstream of Babine Lake. The reach was dry at the time of survey. Good potential fish rearing and spawning habitat was identified in the reach during higher flows. A 1 meter high water fall was identified as a potential barrier to fish migration (NID 00581).

S4 default classification is recommended for this reach. Re-sampling in a different season may result in a change in stream classification.

Reach 3 (CP 539-6)

NID # / NID Map #:	00652 / 93M008	Site #:	2
Length of Reach:	500 m	Stream Order:	1
Length Surveyed:	300 m	Channel Width:	not defined
		Gradient:	3.5 %
Date of Sampling:	September 5, 1997		
Fish Presence:	no defined channel		

Reach Classification: no stream identified
Recommended Reach Classification: **no stream identified**

This reach was sampled approximately 2 km upstream of Babine Lake. No defined channel or evidence of stream could be located in the area. No stream classification is required for this reach.

4.1.4 Unnamed Creek (480-549400)

Watershed Code: 480-549400
ILP # / ILP map #: N.A. / 93M008
UTM (at mouth): 9.6103729.660869
Estimated number of reaches: 3
Number of reaches examined: 3

This second order inlet stream to Babine Lake drains into the northern shore of the lake in a bay located approximately 11 km west of Morrison Arm. CP 537-2, CP 537-4 and CP 537-5 are located at the headwaters of this stream. The access road to CP 537 is planned to cross the third reach of this system.

Reach 1

NID # / NID Map #:	0641 / 93M008	Site #:	1
Length of Reach:	500 m	Stream Order:	2
Length Surveyed:	500 m	Channel Width:	2.1 m
		Gradient:	2.0 %
Date of Sampling:	September 4, 1997		
Fish Presence:	coho, prickly sculpin		

Reach Classification: S3
Recommended Reach Classification: **S3**

This reach was sampled to approximately 200 meters upstream of Babine Lake. The reach consisted of isolated puddles at the time of survey. Very good potential fish rearing and spawning habitat during higher flows were noted in the reach. Electroshocking for 170 seconds in all available habitat resulted in the capture of three coho (67-76 mm) and one prickly sculpin (47 mm). A 1.2 meter waterfall created by sediment deposition behind a log jam was identified as a potential, non-permanent barrier to fish migration, approximately 120 meters upstream of the lake (NID 00579). Fish sampling for this reach was conducted downstream of the potential barrier.

Reach 2

NID # / NID Map #:	00642 / 93M008	Site #:	2
Length of Reach:	1300 m	Stream Order:	2
Length Surveyed:	100 m	Channel Width:	1.9 m
		Gradient:	11 %

Date of Sampling: September 4, 1997
Fish Presence: channel dry

Reach Classification: S3 default
Recommended Reach Classification: **S3 default**

The reach was sampled approximately 520 meters upstream of Babine Lake. The reach was dry at the time of survey. Good potential fish rearing and spawning habitat during higher flows was identified in this ephemeral reach.

Reach 3 (CP 537-2, CP 537-3, CP 537-5, road access)

NID # / NID Map #:	00643 / 93M008	Site #:	3
Length of Reach:	3400 m	Stream Order:	1
Length Surveyed:	800 m	Channel Width:	0.9 m
		Gradient:	2.5 %

Date of Sampling: September 4, 1997
Fish Presence: channel dry

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

This reach was sampled approximately 4000 meters upstream of Babine Lake. The stream was dry at the time of survey, with the exception of small, isolated puddles in some locations. This well defined channel shows signs of seasonal flow. Some seasonal fish habitat was identified at the site. No electroshocking was conducted due to the dry nature of the channel at the time of survey.

S4 default classification is recommended for this reach. Re-sampling in a second season may result in a change in stream classification. A culvert is recommended for the proposed road crossing to ensure adequate drainage.

4.1.4.1 Unnamed Creek (ILP 00511)

Watershed Code:	not available
ILP # / ILP map #:	00511 / 93M008
UTM (at mouth):	9.661201.6104403
Estimated number of reaches:	not determined
Number of reaches examined:	1

This first order tributary to Unnamed Creek 480-5494 drains into Unnamed Creek 480-5494 approximately 400 meters upstream of Babine Lake. No harvest has been proposed for this tributary.

Reach 1

NID # / NID Map #:	00655 / 93M008	Site #:	1
Length of Reach:		Stream Order:	1
Length Surveyed:	250 m	Channel Width:	1.0 m
		Gradient:	10 %
Date of Sampling:	September 4, 1997		
Fish Presence:	channel dry		

Reach Classification:	S4 default
Recommended Reach Classification:	S4 default

The reach was sampled approximately 150 meters upstream of this tributary's confluence with Unnamed Creek 480-5494. This ephemeral reach was dry at the time of survey. Some potential fish rearing habitat, and limited potential fish spawning habitat during higher flows was noted at the site.

S4 default classification is recommended for this reach. Re-sampling in a different season may result in a change in stream classification to S6.

4.1.5 Unnamed Creek (480-559500)

Watershed Code:	480-559500
ILP # / ILP map #:	N.A. / 93M008
UTM (at mouth):	9.6102899.663328
Estimated number of reaches:	not determined
Number of reaches examined:	3

This fourth order inlet to Babine Lake drains into the northern shore of the lake approximately 9 km west of Morrison Arm. The lower reach of this stream is mapped differently on the 1:20,000 TRIM map than on the 1:50,000 NTS map where watershed codes were derived. The TRIM map only shows three distributaries (ILP 00519, ILP 00510, ILP 00524) of the mainstem (mainstem is omitted). The lower three reaches of the mainstem (NTS map) and two of the distributaries (ILP 00519 and ILP 00510), as well as one tributary were inventoried. CP 537-10 is located to the immediate north of a tributary to this system.

Reach 1

NID # / NID Map #:	00646 / 93M008	Site #:	1
NID # / NID Map #:	00647 / 93M008	Site #:	2
NID # / NID Map #:	00648 / 93M008	Site #:	3
Length of Reach:	2000 m	Stream Order:	4
Length Surveyed:	1950 m	Channel Width:	1.4-2.2 m
		Gradient:	0.5-2.5 %

Date of Sampling: September 3, 1997
Fish Presence: coho, prickly sculpin

Reach Classification: S3
Recommended Reach Classification: **S3**

Three sites distributed over the entire length of the reach were sampled. This reach was sampled approximately 100 meters upstream of Babine Lake. Three coho (81-91 mm) and two prickly sculpin (49-50 mm) were captured in 445 seconds of electroshocking (100 m² habitat) 100 meters upstream of Babine Lake. A 1200 meter long dry section of channel was found at site two, located approximately 300 meters upstream of Babine Lake. Electroshocking for 85 seconds at the upper extent of reach 1 did not result in the capture of any fish. However, fish presence was documented in reach 2. Good fish rearing and no potential spawning habitat was identified in this reach.

S3 classification is recommended for this reach, despite the presence of a dry channel. Seasonal fish use of this channel is likely, indicated by the presence of FPC listed species upstream and downstream of the dry section of channel.

Reach 2

NID # / NID Map #:	00649 / 93M008	Site #:	4
Length of Reach:	160 m	Stream Order:	4
Length Surveyed:	160 m	Channel Width:	5.6 m
		Gradient:	3.5 %

Date of Sampling: September 3, 1997
Fish Presence: coho, rainbow

Reach Classification: S2
Recommended Reach Classification: **S2**

This reach is located just upstream of the origin of the distributaries present in this system. Excellent fish rearing, and good potential spawning habitat was identified in this reach. One coho and 25 rainbow trout were captured in 496 seconds of electroshocking (102 m² habitat). Eight more fish were observed, but not captured. The fork length of rainbow trout sampled by electroshocking ranged between 49 and 122 mm (Figure 3), and three distinct age classes appear to be present.

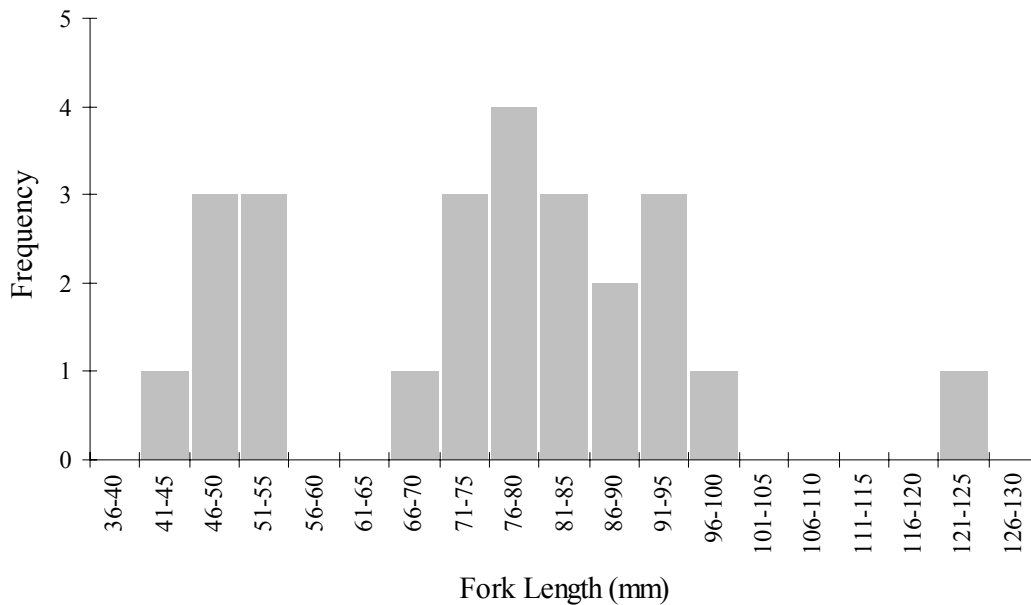


Figure 3. Size - frequency histogram of rainbow captured in Reach 2 of Unnamed Creek 480-5595.

Reach 3

NID # / NID Map #:	00650 / 93M008	Site #:	5
Length of Reach:		Stream Order:	4
Length Surveyed:	650 m	Channel Width:	5.1 m
		Gradient:	4.0 %
Date of Sampling:	September 3, 1997		
Fish Presence:	unknown species present		
Reach Classification:	S2		
Recommended Reach Classification:	S2		

This reach was sampled at the confluence with Unnamed tributary 480-559500-22600, approximately 2250 meters upstream of Babine Lake. Abundant fish rearing habitat, and good potential spawning habitat was observed in this reach. No electroshocking was conducted in this reach due to the presence of FPC listed species in reach 2 downstream, and the lack of barriers between this site and downstream fish presence. In addition, numerous fish were observed in this reach during the site survey.

4.1.5.1 Distributary to Unnamed Creek 480-559500 (ILP 00524)

Watershed Code: not available
ILP # / ILP map #: 00524 / 93M008
UTM (at mouth): 9.6629912.6103549
Estimated number of reaches: not determined
Number of reaches examined: 1

This channel is a distributary of Unnamed Creek 480-559500. No sample site was established on this channel. It is the eastern most distributary of the three channels found in addition to the channel mapped on 1:50,000 NTS scale. This channel does not appear to carry the majority of discharge for the system.

Reach 1

NID # / NID Map #:	- / 93M008	Site #:	-
Length of Reach:	1050 m	Stream Order:	4
Length Surveyed:	-	Channel Width:	< 1.5 m
		Gradient:	unknown
Date of Sampling:	September 3, 1997		
Fish Presence:	unknown		

Reach Classification: S4
Recommended Reach Classification: S4

This channel was crossed on foot approximately 600 meters upstream of Babine Lake. cursory observations indicate that the channel is less than 1.5 meters wide, and that some discharge was present at the time of survey.

4.1.5.2 Distributary to Unnamed Creek 480-559500 (ILP00510)

Watershed Code: not available
ILP # / ILP map #: 00510 / 93M008
UTM (at mouth): 9.662685.6103586
Estimated number of reaches: not determined
Number of reaches examined: 1

This distributary of Unnamed Creek 480-559500 appears to carry the majority of flow from the system, as the flow diverts from Reach 2 of Unnamed Creek 480-559500 to the west into distributary ILP 00519, and then to the east to distributary ILP 00510. No sample site was established on this distributary.

Reach 1

NID # / NID Map #:	- / 93M008	Site #:	-
Length of Reach:	1050 m	Stream Order:	4
Length Surveyed:	-	Channel Width:	2-3 m
		Gradient:	unknown
Date of Sampling:	September 3, 1997		
Fish Presence:	unknown		
Reach Classification:	S3		
Recommended Reach Classification:	S3		

No sample site was established in this reach. cursory observations at this distributary indicate that a log jam and built up of sediment (NID 00674) near the upper extent of the distributary is diverting flow from distributary ILP 00519 into this channel. The channel is approximately 2-3 meters wide, and appears to carry the majority of water for the system.

4.1.5.3 Distributary to Unnamed Creek 480-559500 (ILP00519)

Watershed Code:	not available
ILP # / ILP map #:	00519 / 93M008
UTM (at mouth):	9.662341.6103957
Estimated number of reaches:	not determined
Number of reaches examined:	1

This distributary to Unnamed Creek 480-559500 is the western most channel of the four channels draining into Babine Lake. The majority of flow from Unnamed Creek 480-559500 is diverted into this distributary for a short section (the upper 300 m) prior to draining into ILP 00510. One sample site upstream of ILP 00510 was established for this channel

Reach 1

NID # / NID Map #:	00653 / 93M008	Site #:	6
Length of Reach:	1250 m	Stream Order:	4
Length Surveyed:	250 m	Channel Width:	4.8 m
		Gradient:	2.0 %
Date of Sampling:	September 3, 1997		
Fish Presence:	unknown species present		
Reach Classification:	S3		
Recommended Reach Classification:	S3		

The sample site surveyed was located at the upper extent of this distributary. This section of stream drains the majority of flow from Reach 2 of Unnamed Creek 480-559500 to ILP

00510. A log jam with sediment build (NID 00674) up is located at the lower extent of the sample site, and appears to divert the water into ILP 00510. A small amount of flow is present in ILP 00519 downstream of ILP 00510.

Good potential fish rearing and good potential fish spawning habitat was identified in the upper extent of this reach. No fish sampling was conducted due to known fish presence upstream. Observations conducted during the survey indicate that several juvenile (unknown species) utilize this reach for rearing.

4.1.5.4 Tributary to Unnamed Creek 480-559500 (480-559500-22600)

Watershed Code: 480-559500-22600
 ILP # / ILP map #: N.A. / 93M008
 UTM (at mouth): 9.6105512.662927
 Estimated number of reaches: not determined
 Number of reaches examined: 1

This first order tributary to Unnamed Creek 480-559500 is located approximately 2350 meters upstream of Babine Lake and upstream of the distributaries to the system.

Reach 1 (CP 537-10)

NID # / NID Map #:	00644 / 93M008	Site #:	1
Length of Reach:		Stream Order:	1
Length Surveyed:	100 m	Channel Width:	1.8 m
		Gradient:	12.0 %
Date of Sampling:	September 3, 1997		
Fish Presence:	dry channel		

Reach Classification: S3 default
 Recommended Reach Classification: **S3 default**

The sample site for this ephemeral reach was located 100 meters upstream from the confluence with Unnamed Creek 480-5595. The channel was dry at the time of survey, but some potential fish rearing habitat and spawning habitat during higher flows were noted.

S3 default classification is recommended for this reach. Re-sampling in a second season may result in a change in stream classification to S6.

NID # / NID Map #:	00645 / 93M008	Site #:	2
Length of Reach:		Stream Order:	1
Length Surveyed:	600 m	Channel Width:	no defined channel
		Gradient:	1.0 %
Date of Sampling:	September 4, 1997		

Fish Presence: no defined channel

Reach Classification: no stream identified
Recommended Reach Classification: **no stream identified**

A second site in this reach was surveyed approximately 3000 meters upstream of the confluence with Unnamed Creek 480-559500. No defined channel was found in a wet depression where map and air photo interpretation indicated the location of the stream.

No stream classification is recommended for the sample site, since the area sampled does not constitute at stream. However, wetland classification may be required. Road crossings of this section of stream should include a culvert to allow adequate drainage.

4.2 Morrison Creek

Watershed code: 480-598800
Date sampled: September 3, 1997

One tributary to Morrison Creek was inventoried for this project. This tributary drains portions of the western half of the Morrison Creek watershed. The creek flows into the western shore of Morrison Creek approximately 1500 meters upstream of Babine Lake. Some information is available for this tributary. In addition, information for Morrison Creek is presented to place the results of inventory from the tributary into context.

The presence of chinook (*Oncorhynchus tsawytscha*), coho (*O. kisutch*), cutthroat trout (*O. clarki*), pink salmon (*O. gorbusha*), sockeye and kokanee (*O. nerka*), lake whitefish (*Coregonus clupeaformis*), rainbow trout (*O. mykiss*), burbot (*Lota lota*), and lake trout (*Salvelinus namaycush*) in Morrison Creek and Morrison Lake have been documented (FISS). Mountain whitefish (*Prosopium williamsoni*) have been documented in Tahlo Creek (FISS), as have Dolly Varden (*Salvelinus malma*, possibly bull trout (*Salvelinus confluentus*)) (McElhanney 1995).

4.2.1 Unnamed Creek (480-5988-100)

Watershed Code: 480-598800-10000
ILP # / ILP Map #: N.A. / 93M018
UTM (at mouth): 9.672449.6115443
Estimated number of reaches: not determined
Number of reaches examined: 1

This stream drains portions of the western half of the Morrison Creek drainage basin, and joins Morrison Creek approximately 1500 meters upstream of Babine Lake. Rainbow trout have been sampled in the Unnamed Creek (480-598800-10000) at a point approximately 8 km upstream of Morrison Creek, and a water fall has been identified approximately 500 meters downstream of the first lake in the system (alias "Large

Softfish” Lake; 480-598800-10000-01) (FISS). The mainstem of this stream was inventoried upstream of the falls to evaluate fish distribution and potential impacts on fish and fish habitat from harvesting in CP 555. Rainbow trout and cutthroat trout were captured upstream of this site in 1996 (SKR 1997), indicating fish presence in “Large Softfish” Lake above the 5 meter waterfall. These trout populations are probably lacustrine-adfluvial in nature, as indicated by the lake in the system upstream of the barrier to fish migration. Alternatively, these populations may be stream resident.

4.2.1.1 Unnamed Creek (480-598800-10000-83100)

Watershed Code: 480-598800-10000-83100
 ILP # / ILP map #: N.A. / 93M018
 UTM (at mouth): 9.6116765.662358
 Estimated number of reaches:
 Number of reaches examined: 2

This unnamed inlet drains into the western shore of “Large Softfish” Lake (480-598800-10000-01). The creek flows along the eastern boundary of CP 533-1.

Reach 1 (CP 533-1)

NID # / NID Map #:	00629 / 93M018	Site #:	202
Length of Reach:	300 m	Stream Order:	1
Length Surveyed:	287 m	Channel Width:	not well defined
		Gradient:	0.5%
Initial Sampling:	September 3, 1997		
Fish Presence:	none caught		

Reach Classification: S4 default
 Recommended Reach Classification: **S4 default**

This reach is heavily braided, and is located in a 35-60 meter wide wetland area. The channel is not well defined. Limited potential fish habitat was identified in the reach. Electroshocking for 400 seconds (100 m²) did not result in the capture or observation of any fish. Near the upper extent of the reach, the channel is poorly defined, and consists of pools connected by areas of seepage flow.

S4 classification is recommended for this reach since fish presence in “Large Softfish” Lake downstream is likely. Re-sampling in a different season may result in a change in stream classification to S6.

Reach 2 (CP 533-1)

NID # / NID Map #:	00627 / 93M018	Site #:	201
Length of Reach:		Stream Order:	1
Length Surveyed:	300 m	Channel Width:	1.1 m

Date of Sampling: September 3, 1997
Fish Presence: none caught

Gradient: 2.5 %

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

Several sections of underground flow, and abundant large organic debris (LOD) characterized this reach. Only limited potential fish rearing and spawning habitat was noted at the site. Electroshocking for 645 seconds of all available habitat (80 m²) did not result in the capture or observation of any fish at the site.

Re-sampling in a different season may allow for a change in stream classification from S4 to S6. The potential for downstream impacts is limited due to the poorly defined channel present in reach 1 downstream. A culvert is recommended for the proposed road crossing to ensure adequate drainage and potential fish passage.

4.2.1.2 Unnamed Creek (ILP 00525)

Watershed Code: not available
ILP # / ILP Map #: 00525 / 93M018
UTM (at mouth): 9.661779.6116898
Estimated number of reaches:
Number of reaches examined: 0

This stream is located within CP 533-1. This drainage is not shown on 1:20,000 TRIM maps or Forest Cover Maps, but is indicated in the Silviculture Prescription map for CP 533-1. It is likely that this stream drains directly into "Large Softfish" Lake (480-5988-100-01), although the drainage pattern of the stream has not been confirmed. No sample site was established.

Cursory observations of this system indicate that the stream should be classified S4. Partial retention is recommended until fish sampling is conducted to determine the fisheries value of this drainage. A culvert is recommended for the proposed road crossing to ensure adequate drainage and potential fish passage.

4.2.1.3 Unnamed Creek (480-598800-10000-84400)

Watershed Code: 480-598800-10000-84400
ILP # / ILP Map #: N.A. / 93M018
UTM (at mouth): 9.6116876.662201
Estimated number of reaches: 3
Number of reaches examined: 3

This first order stream drains into the western shore of “Large Softfish” Lake. Ground truthing and air photo interpretation indicated that the stream can be divided into three reaches. The majority of the third reach of this stream is located within CP 533-1. All three reaches were inventoried for this project.

Reach 1

NID # / NID Map #:	00630 / 93M018	Site #:	203
Length of Reach:	220 m	Stream Order:	1
Length Surveyed:	220 m	Channel Width:	0.8 m
		Gradient:	1 %
Date of Sampling:	September 3, 1997		
Fish Presence:	none caught		

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

The entire reach, from “Large Softfish” Lake to the reach break 220 meters upstream of the lake, was surveyed. Good potential fish rearing habitat, and good potential spawning habitat was identified in the reach, but no fish were captured or observed in 740 seconds of electroshocking (100 m²).

S4 classification is recommended for this reach. Re-sampling in a different season may allow for a change in stream classification to S6.

Reach 2

NID # / NID Map #:	00631 / 93M018	Site #:	204
Length of Reach:	140 m	Stream Order:	1
Length Surveyed:	140 m	Channel Width:	not well defined
		Gradient:	0.5 %
Date of Sampling:	September 3, 1997		
Fish Presence:	none caught		

Reach Classification: S4 default
Recommended Reach Classification: **S4 default**

This braided reach did not exhibit a well defined channel. Only limited potential fish rearing and no potential fish spawning habitat was identified in this reach. Electroshocking for 600 seconds (100 m² habitat) did not result in the capture or observation of any fish.

S4 default classification is recommended for this reach. Spring re-sampling may allow for a change in stream classification to S6.

Reach 3 (CP 533-1)

NID # / NID Map #:	00632 / 93M018	Site #:	205
Length of Reach:		Stream Order:	1
Length Surveyed:	370 m	Channel Width:	1.0 m
		Gradient:	2.5 %
Date of Sampling:	September 3, 1997		
Fish Presence:	none caught		

Reach Classification:	S4 default
Recommended Reach Classification:	S6

This intermittent reach consists of a relatively well defined channel with some areas of underground flow. Limited potential fish rearing habitat and no potential fish spawning habitat was identified in this reach. No fish were captured or observed in 700 seconds of electroshocking (110 m² habitat).

S6 classification is recommended due to the intermittent nature of the stream, and the lack of fish habitat. The potential for downstream impacts is limited due to the low gradient of the system, and the poorly defined channel in reach 2.

4.2.1.4 Unnamed Creek (ILP 00506)

Watershed Code:	480-5988-100-aa2
ILP # / ILP Map #:	00506 / 93M018
UTM (at mouth):	9.661301.6116254
Estimated number of reaches:	2
Number of reaches examined:	1

This stream drains into “Small Softfish” Lake (480-598800-10000-02). Ground truthing and air photo interpretation indicated that the stream can be divided into two reaches. This stream is located along the western boundary of CP 533-1.

Reach 1 (CP 533-1)

NID # / NID Map #:	00633 / 93M018	Site #:	206
Length of Reach:	220 m	Stream Order:	1
Length Surveyed:	200 m	Channel Width:	no defined channel
		Gradient:	0.5 %
Date of Sampling:	September 3, 1997		
Fish Presence:	no defined channel		

Reach Classification: S4 default
Recommended Reach Classification: S6 / W1

This reach is located in a wetland associated with “Small Softfish” Lake. No defined channel could be located in this reach, and no electroshocking was conducted. The stream consists of moist patches of mud and soil in a wetland. No potential fish habitat was noted in this reach.

S6 classification is recommended for this reach due to the potential presence of a more defined channel upstream of the wetland. Wetland classification is recommended for reach 1.

Reach 2 (CP 533-1)

NID # / NID Map #:	- / 93M018	Site #:	no stream card
Length of Reach:	420 m	Stream Order:	1
Length Surveyed:		Channel Width:	unknown
		Gradient:	
Date of Sampling:	not surveyed		
Fish Presence:	no defined channel downstream		

Reach Classification: S4 default
Recommended Reach Classification: S6

The area in which this reach was located was walked repeatedly just upstream of the wetland (reach 1). However, no defined channel could be located.

S6 classification is recommended for this reach. Sections of stream with a defined channel upstream can be classified S6, and no stream classification is required if no defined channel is confirmed during block layout. Wetland classification may be required.

5.0 SUMMARY OF RECOMMENDATIONS FOR STREAM RESAMPLING

5.1 CP 541-2

5.1.1 Unnamed Creek (480-5056)

Refer to Report Section:	4.1.1	Reach / Site:	1 / 1
NID #:	00656	NID map #:	93M018

This reach was sampled approximately 150 meters upstream of the mainstem. Only limited fish habitat was observed in the reach, and no fish were captured while electroshocking. Re-sampling in the spring may allow for a change in stream classification to S6, but will not be required if 100% retention to the top of the gully (reach 2) is planned along CP 541-2.

Note: Additional re-sampling recommendations for other sites not near planned harvest areas indicated by Houston Forest Products Ltd. are discussed throughout the text.

6.0 REFERENCES

- BC Environment. Environmental Protection Branch. 1996. Pers. comm. Water quality information.
- BC Environment. Fish and Wildlife Branch. 1996. Pers. comm. Guide outfitters, trap line operators, stream and lake files.
- BC Environment and Department of Fisheries and Oceans. 1996. Fisheries Inventory Summary System (FISS). Maps located at BC Environment office, Skeena Region, Smithers, B.C..
- BC Ministry of Forests and BC Environment. 1995. Forest Practices Code of British Columbia: Fish-Stream Identification Guidebook.
- BC Ministry of Forests and BC Environment. 1995. Forest Practices Code of British Columbia: Riparian Management Area Guidebook.
- Department of Fisheries and Oceans. 1996. Pers. comm. Salmon Escapement data for streams in the Babine watershed.
- Fisheries Inventory Summary System. Maps located at B.C. Environment office, Skeena Region, Smithers, B.C.. (cited as FISS).
- McElhane Engineering Ltd. 1995. Letter summarizing stream sampling results for Houston Forest Products in the Tahlo Creek Area. Terrace, B.C..
- Meredith, D. pers. comm. 1996. BC Environment. Water Management Branch. Water licence and community watershed information.
- Ministry of Employment and Investment, Energy and Mines Division. 1996. Coal licence, placer stakes and mineral tenure files.
- Ministry of Forests. 1994. Morice Forest District Recreation Map.
- Ministry of Forests. 1988. Biogeoclimatic and ecoregion units of the Prince Rupert Forest Region.
- Resource Inventory Committee. 1996. Reconnaissance Fish and Fish Habitat Inventory.
- SKR Consultants Ltd. 1997. Aquatic Stream Inventory: Operational Stream Inventory in the Morrison IRM Unit 1996. Unpubl. Mscrpt. prepared for Houston Forest Products.

APPENDIX 1 - Site Cards and Fish Collection Forms

Site cards for all streams inventoried in 1997 relevant to cutting permits CP 541-2, CP 537-1 to 10, CP 539-2 to 6, CP 539-8 and CP 533-1.

APPENDIX 2 - 1:20 000 TRIM Maps

2 maps illustrating reach breaks, sampling sites with NIDs, ILPs and stream classification for applicable watersheds including excerpts from:

93 M 008

93 M 018