Fish and Fish Habitat Inventory
for
Operational Areas
Fulton River Watershed

in the Tanglechain IRM Unit:
CP 439-3 and CP 439-4

Prepared by

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for

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June 1998

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	none
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	Babine River
Watershed Name	Fulton River
Watershed Code	480-6972
UTM at Mouth	9.6079110.685874
Watershed Area	3900 km^2
Stream Order	5
NTS Maps (1:250,000)	93L
TRIM Maps	93L098
BEC Zone	SBS mc^2

Sampling Design

Number of Reaches Sampled	4
Total Sample Sites	7
Field Sampling Dates	July 17 and 18, 1997
Fish Species in Watershed	CH, CO, SK, KO, CT, PK, RB, MW, LW, DV, BB, CSU, NSC, LT, CC, PMC

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Acknowledgments

This inventory project was funded by Forest Renewal B.C., and the contract was administered by Deidre Quinlan. Field work was conducted by Ron Saimoto, Mark LeRuez, Matthew Jessop, Greg Tamblyn and Todd Johnston. Data entry was completed by Todd Johnston, Mark LeRuez, Regina Saimoto and Matthew Jessop. Mark LeRuez completed the draft mapping, and digital mapping was conducted by Western Geographics Information System Inc. Draft reports were completed by Regina Saimoto, and reviewed by Ron Saimoto. Quality control checks were conducted by Mark LeRuez and Regina Saimoto. Krista Morten, Cyril Thacker, Melissa Todd, and Paul Giroux provided helpful editorial comments on the drafts of the report.

1.0 INTRODUCTION

The study area is located in the Fulton watershed of the Babine 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 439-3 and CP 439-4.

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 Tanglechain Integrated Resource Management (IRM) Unit is located in north-central British Columbia (Figure 1), and forms part of the Morice Forest District (Prince Rupert Forest Region). The main drainage in the Tanglechain IRM Unit is the Fulton River, which drains into Babine Lake. The study area for this project focused around proposed harvest in CP 439-3 and CP 439-4. Streams potentially impacted by harvest in CP 439-3 and CP 439-4 drain via Tanglechain Creek into the Fulton River, and are located in the moist-cold subzone of the sub-boreal spruce biogeoclimatic zone (SBS mc^2) (MOF 1988).

2.2 Access

All of the stream survey sites were accessed by road and on foot. No helicopter access was required. The area can be accessed from the Granisle Highway (connecting the village of Granisle to Topley), or the Babine Lake Road to 42 km. A road runs along the northern

Figure 1. 1:250,000 NTS map (93 L) indicating the general location of the study area.

shore of Fulton Lake and joins the Babine Lake Road at 42 km. This road can also be accessed from the Granisle Highway between Topley Landing and the village of Granisle.

2.3 Resource Use

The study area is utilized for Forestry purposes, with active logging being proposed for the next 2 years in the immediate study area. No Land Use Planning Document was not available at the time of writing. The study area has some recreational value, including snow mobiling, a BC Forest Service (BCFS) recreation trail and cross country skiing near the village of Granisle, a BCFS Recreation Site located at the Bear Island View Point Trail (about 6 km north of the village of Granisle), a BCFS Recreation Site located approximately 15 km north of the village of Granisle, and BCFS Recreation Sites at Tanglechain Lake, Doris Lake, and Pine Tree Lake (MOF Morice Forest District Recreation Maps 1994). No Protected Areas Strategy (PAS) sites have been identified in the Tanglechain IRM Unit. The Lake Babine Nation has "claimed" parts of the Tanglechain IRM Unit, but no settlements were in process at the time of writing. There are no mineral tenures, placer stakes or coal licences in the study area, however, a mineral tenure was noted to the southwest of the Tanglechain area inventoried. The Mineral Tenure is located on NTS map 93L/16W, Mineral Tenure "Cart 1" (240207 or old # 10006), and is located on the west side of CP 435-1 (Files at Ministry of Energy, Mines and Petroleum Resources, updated Feb. 6, 1996). CP 454-1 is located in the Fulton Range permit. Guide and outfitter territories in the study area is 608G003. Trapline territories relevant to the study is 608T012.

The B.C. Environment Water Management Branch was contacted to document water licences and water rights for the study area. Two water licences exist for the Fulton River (both for Department of Fisheries and Oceans). No community watersheds are located in the study area (Meredith pers.com.).

3.0 METHODS

3.1 Literature Review

All pertinent literature on the streams inventoried in this project were collected and summarized. Existing data pertaining to stream classification in the Fisheries Information Summary System (FISS), and rivers and lakes files at the B.C. Environment Office (Skeena Region) were summarized and mapped. The information of concern pertained primarily to fish distribution. Existing watershed codes were assigned to streams. For streams where no watershed codes exist, codes were generated following guidelines in "A guide to the hierarchical watershed coding system for British Columbia". UTMs at the mouth of each stream were determined from the watershed code dictionary or from 1:50,000 or 1:20,000 maps. Stream order was determined from 1:20,000 NTS 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. 1:16,000). The identification of reach breaks followed RIC standards (RIC 1997). Reach breaks were confirmed in the field, when feasible. Reaches are numbered from the mouth of the stream in ascending order. Where the number of reaches from the mouth was not determined, reaches were identified alphabetically in ascending order up the stream.

3.3 Stream Assessment

All sites were accessible by road and on foot; no helicopter access was required. Sections of streams in areas of development identified by HFP, with no previous indication of fish presence, were walked and reach breaks were verified. In addition, lower reaches of some systems were assessed to determine the extent of fish distribution in relevant areas. This information was required to allow interpretation of potential downstream impacts on fish and fish habitat. At representative sites, the following stream characteristics were measured: channel width, wetted width, pool depth, riffle depth, pool:riffle ratio, gradient (Suunto clinometer), temperature (ambient and water), pH (Oaktron pH.Tstr2, pHep 3), substrate composition (including D_{90}), aspect, valley:channel ratio, bank stability, bank material, and cover. Conductivity was recorded with a hand held Hanna HI 9033 conductivity meter for every reach in which electroshocking was conducted. All data were collected on MOE/DFO stream survey cards, following RIC standards, and data was entered into an MsAccess database. Fish presence was ascertained by electroshocking with a Smith-Root Model 15C backpack electroshocker. An area of approximately 100 m^2 was sampled by electroshocking, and fish captured were identified to species, measured (fork length) and released. Potential or known barriers to fish migration, sensitive sites, and critical fish habitat were identified and mapped, when possible. A photographic record was taken for sample locations, barriers to fish migration, and other points of interest. Photographs were compiled into a photodocumentation document.

3.4 Map Production

All sample sites, fish distribution and reach breaks were indicated on existing 1:20,000 maps for future 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 m 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 and sample site photographs are located in Appendix 1. A stream classification map with study site/NID numbers is 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 Tanglechain Creek Tributary

Watershed code: 480-6972-334
Date surveyed: July 17 and 18, 1997

Tanglechain Creek forms a major tributary to Fulton River, and drains into the Fulton River approximately 6.5 km upstream of Fulton Lake. Tanglechain Creek drains a series of small to moderates sized lakes. The four lower lakes are Tanglechain Lake, Doris Lake, Boomerang Lake, and Pine Lake.

The presence of cutthroat trout (*Oncorhynchus clarki*), rainbow trout (*Oncorhynchus mykiss*), mountain whitefish (*Prosopium williamsoni*), and lake whitefish (*Coregonus clupeaformis*) in Tanglechain Creek has been documented (FISS). In addition to these species, Tanglechain Lake is known to contain Dolly Varden (*Salvelinus malma*; could be bull trout (*S. confluentus*)), peamouth chub (*Mylocheilus caurinus*), largescale suckers (*Catastomus macrocheilus*), longnose suckers (*Catastomus catastomus*), and northern squawfish (*Ptychocheilus oregonensis*). Doris Lake is known to have lake whitefish, peamouth chub, rainbow trout, lake trout (*Salvelinus namyacush*), mountain whitefish, cutthroat trout, largescale suckers, longnose suckers, redside shiners (*Richardsonius balteatus*), burbot (*Lota lota*) and northern squawfish. Longnose suckers, peamouth chub, redside shiners and cutthroat trout have also been documented in Boomerang Lake. Prickly sculpin (*Cottus asper*), peamouth chub, redside shiners, northern squawfish, cutthroat trout, rainbow trout and longnose suckers have been found in Pine Lake.

No previous fisheries information for the tributary of interest could be located at BC Environment, FISS or SISS.

4.1.1 Unnamed Creek (480-6972-334-358)

Watershed Code: 480-6972-334-358
Map # / ILP #: 93L098 / N.A.
UTM (at mouth):
Length surveyed: 2350 m
Estimated number of reaches:
Number of reaches examined: 2

This stream is an unnamed tributary to Tanglechain Creek. The stream drains through the south eastern portion of CP 439-3 near its origin, and forms the western boundary of CP 439-4. Two reaches were surveyed in this system. A culvert, located in reach1, is a barrier to fish migration. Cutthroat trout captured downstream of the culvert are likely lacustrine-adfulvial, and utilize the lake (480-6972-334-358-01). Cutthroat trout captured upstream of the culvert appear to be stream resident.

Reach 1

NID # / NID Map #:	02030 / 93L098	Site #:	1
Length of Reach:	480 m	Stream Order:	2
Length surveyed:	150 m	Channel Width:	3.4 m
		Gradient:	6%

Initial sampling:	July 17, 1997
Fish presence:	cutthroat trout

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

This reach offered some excellent fish rearing habitat, and good potential spawning habitat. Two cutthroat trout (122-134 mm) were captured in 22 hours of minnow trapping (5 traps).

The culvert at the Granisle Road crossing appears to impede fish passage, and replacement with a bridge or baffled culvert is recommended.

Reach 2

NID # / NID Map #:	02031 / 93L098	Site #:	2
NID # / NID Map #:	02032 / 93L098	Site #:	3
NID # / NID Map #:	02033 / 93L098	Site #:	4
NID # / NID Map #:	02034 / 93L098	Site #:	5
Length of Reach:		Stream Order:	2
Length surveyed:	2200 m	Channel Width:	1.7 - 2.0 m
		Gradient:	3.0-9.0%

Initial sampling:	July 18, 1997
Fish presence:	cutthroat trout

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

Four sites were established in this reach, to document fish presence and fish habitat at four different road crossings. Cutthroat trout were captured at the lower three sites (sites 2, 3, and 4), but no cutthroat trout were captured at the upper site (Site 5). A total of four cutthroat trout were captured in this reach, and fork length ranged between 104 mm and 153 mm. No barriers to fish migration were identified in this reach.

The entire reach should be classified as S3 due to known fish presence, the presence of fish spawning and rearing habitat, and the lack of barriers to fish migration.

4.1.1.1 Unnamed Creek (ILP 02013)

Watershed Code:	480-6972-334-358-BB1
Map # / ILP #:	93L098 / 02013
UTM (at mouth):	9.662422.6091072
Length surveyed:	360 m
Estimated number of reaches:	2
Number of reaches examined:	2

This stream is not shown on the 1:50,000 NTS map sheet. Consequently, no watershed code exists for this stream, and one was generated for it. This stream drains in a south-easterly direction through CP 439-3.

Reach 1

NID # / NID Map #:	02037 / 93L098	Site #:	6
Length of Reach:	160 m	Stream Order:	1
Length surveyed:	160 m	Channel Width:	0.9
		Gradient:	2.5%

Initial sampling:	July 18, 1997
Fish presence:	none captured

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

Some good potential fish rearing habitat, and limited potential spawning habitat was identified in this reach. Electroshocking for 250 s. in 150 m^2 of suitable habitat did not result in the capture of any fish.

S4 classification is recommended due to known fish presence in the mainstem just downstream of this reach, and the lack of barriers to fish migration. Re-sampling is recommended for this reach.

Reach 2

NID # / NID Map #:	02036 / 93L098	Site #:	7
Length of Reach:		Stream Order:	1
Length surveyed:	200 m	Channel Width:	no well defined channel
		Gradient:	0.5%

Initial sampling: July 18, 1997
Fish presence: no fish habitat

Reach Classification: S4 default
Recommended Reach Classification: **S6**

This reach is located in a wetland within CP 439-3. No defined channel could be located upstream of the reach break. The stream consisted of a few isolated puddles which may be connected during high flows.

S6 classification is recommended due to the lack of a defined channel and fish habitat. Partial retention is recommended in this reach until fish absence in reach 1 has been confirmed.

5.0 SUMMARY OF RECOMMENDATIONS FOR STREAM RESAMPLING

5.1 CP 439-3

5.1.1 Unnamed Creek (02013)

Refer to Report Section:	4.1.1.1	Reach / Site:	1 / 6
NID #:	02037	NID map #:	93L098

Some good potential fish rearing habitat, and limited potential spawning habitat was identified in this reach, and no barrier to fish migration was observed. Re-sampling results may allow for a change in classification of this reach, and would reduce the necessity for retention in reaches located upstream.

6.0 REFERENCES

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APPENDIX 1 - SITE CARDS

Site cards for all streams inventoried in 1997 relevant to cutting permit CP 439-3 and CP 439-4.

Unnamed Creek (480-6972-334-358) - Reach 1

Plate 1. Reach 1 - sample site 1. Upstream view (above) and downstream view (below).

Unnamed Creek (480-6972-334-358) - Reach 1

Plate 2. Reach 1 - sample site 1. Culvert at Granisle Road crossing (above) and cutthroat trout captured in this reach (below).

Unnamed Creek (480-6972-334-358) - Reach 2

Plate 3. Reach 2 - sample site 2. Upstream view (above) and downstream view (below).

Unnamed Creek (480-6972-334-358) - Reach 2

Plate 4. Reach 2 - sample site 3. Upstream view (above) and downstream view (below).

Unnamed Creek (480-6972-334-358) - Reach 2

Plate 5. Reach 2 - sample site 4. Upstream view (above - left) downstream view (above - right), and cutthroat trout caught at the sample site (right).

Unnamed Creek (480-6972-334-358) - Reach 2

Plate 6. Reach 2 - sample site 5. Upstream view (above) and downstream view (below).

Unnamed Creek (ILP02013; ILP map 93L098) - Reach 1

Plate 7. Reach 1 - sample site 6. Upstream view (above) and downstream view (below).

Unnamed Creek (ILP02013; ILP map 93L098) - Reach 2

Plate 8. Reach 2 - sample site 7. Upstream view (above) and downstream view (below).

APPENDIX 2 - 1:20,000 TRIM MAPS

1 map (93L098) illustrating the reach breaks, sampling sites with NID's, ILP's and stream classification for applicable watersheds

Please note:

- draft report includes a hand sketched map of the inventoried area. The final version of the map will be appended to the report once all sites have been mapped by Western Geographics Ltd.