

Reconnaissance (1:20,000) Fish and Fish Habitat Inventory
Helene/Augier-Pinkut Sub-units Fish Inventory - 1999
WSC's:

480-927700-23400:	Henrietta C. Watershed
480-927700-66700-96000:	Ling C. Watershed
480-927700-*****:	Small Tributaries to Taltapin, Augier and Pinkut Lakes

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March 13, 2000

Project Reference Information

FRBC Multi-Year Agreement Number	0000105	
MELP Project Number	BFP-C016-001-2000	
FRBC Activity Number	10437	
<u>FDIS Project Code:</u>		<u>FDIS Project WSC:</u>
2098		480-927700-23300
2096		480-927700-23400
2097		480-927700-23500
2101		480-927700
FRBC Region	Smithers Region	
MELP Region	06 - Skeena	
FW Management Unit	6-6	
DFO Sub-District	4D	
Forest Region	Prince Rupert	
Forest District	Lakes Forest District	
Forest Licensee and Tenure #	Babine Forest Products Company Forest Licences A-16823 and A-16825	
First Nations Claim Area	Carrier-Sekani Tribal Council	

Watershed Information

Watershed Group	BABL	
Watershed Name	Pinkut C. Watershed Tributaries (Helene and Augier-Pinkut Sub-unit Areas)	
Watershed Code	480-927700-*****	
UTM at Mouth	N/A	
Watershed Area (km²)	349	
Total of all Stream Lengths (km)	370	
Stream Order	1 to 5	
NTS Maps	93 K/5, 93 K/6	
TRIM Maps	93K.022, 93K.032, 93K.033, 93K.042, 93K.043, 93K.024, 93K.025, 93K.034, 93K.035	
BEC Zone	SBS	
Air Photos	<u>30BCC98022</u> : 30-35; 104-112	<u>30BCC97148</u> : 64-70; 81-90; 104-108; 163-174
	<u>30BCC98021</u> : 151-164	<u>30BCB90062</u> : 124-129; 201-205
	<u>30BCC97187</u> : 81-87; 98-101	<u>30BCC97147</u> : 127-145; 153-170

Sampling Design Summary

Total Number of Reaches	630
Random Sample Reaches	29
Discretionary Sample Reaches	65
Total Sample Reaches	94
% of Reaches Sampled	14.9
Field Sampling Dates	September 1 to October 21, 1999

Specific Watershed Reference Information

Sub-Unit	Project Watershed Code	Watershed Name	Subdrainage Watershed Code/ ILP	Sites	UTM at Mouth	Watershed Area (km2)	Total of all Stream Lengths (km)	Stream Order	NTS Map(s)	TRIM Maps	BEC Zone	Fish Species Present
Major Watersheds (streams 4th order or greater)												
Helene	480-927700-23400	Henrietta Creek ¹	480-927700-23400	98-133	10.355660.6016400	98	143.9	5	93 K/6	93K.024, 93K.025, 93K.034, 93K.035	SBS	KO RB
Augier-Pinkut	480-927700-66700-96000	Ling Creek	480-927700-66700-96000	173-181	10.329860.6027820	77	41.4	4	93 K/5	93K.022, 93K.032, 93K.033	SBS	LSU RB
Small Tributaries to Taltapin, Augier and Pinkut Lakes (streams 3rd order or less)												
Grouped Information				88-97, 134-172	N/A	174	184.7	1 to 3	93 K/5	93K.022, 93K.032, 93K.033, 93K.042, 93K.043, 93K.024, 93K.025, 93K.034, 93K.035	SBS	RB

Information for Small Tributaries to Taltapin, Augier and Pinkut Lakes

Sub-Unit	Project Watershed Code	Parent Waterbody	Stream Name/Alias	Subdrainage Watershed Code/ ILP	Stream Order	Fish Species Present
Helene	480-927700-23300	Taltapin Lake	Marlin C.	480-927700-23300	3	RB
	480-927700-23500			480-927700-23500	2	
Augier-Pinkut	480-927700	Augier Lake		480-927700-49000	2	
				480-927700-49700	3	
			31 1 st order tributaries			
			3 2 nd order tributaries			
		Pinkut Lake	Nellian C.	480-927700-66700-18500	3	RB
				480-927700-66700-69600	3	
				480-927700-66700-78500	2	RB
				480-927700-66700-80800	2	
			13 1 st order tributaries			
			2 2 nd order tributaries			

¹ Includes only that portion of the watershed within the Helene sub-unit. Comprises the Henrietta Creek watershed from Taltapin Lake to Hannay Lake outlet. Remainder of watershed completed in prior Reconnaissance Inventories.

Abbreviations Used in this Report

BGC	biogeoclimatic zone	MELP	Ministry of Environment, Lands and Parks
BB	burbot (<i>Lota lota</i>)	M/L	mainline
C	clear (not turbid)	MT	minnow trap
C.	creek	MW	mountain whitefish (<i>Prosopium williamsoni</i>)
CAS	prickly sculpin (<i>Cottus asper</i>)	NA	not applicable
CD	compact disc	NCD	not classified drainage
CO	coho salmon (<i>Oncorhynchus kisutch</i>)	NFC	no fish captured
Cond.	conductivity	NFP	no fish present
CPUE	catch per unit effort	NS	not sampled
CT	cutthroat trout (<i>O. clarki</i>)	NTS	National Topographic Survey
Cw	channel width	NVC	no visible channel
DFO	Department of Fisheries and Oceans	Prop	proposed
Dist.	distance	R.	river
d/s	downstream	RB	rainbow trout (<i>O. mykiss</i>)
EF	electrofishing	Rd	road
FDIS	Field Data Information System	Rip	riparian
FISS	Fisheries Information Summary System	RSS	regionally significant species
FPC	Forest Practices Code	S2 - S6	riparian classes
FRBC	Forest Renewal of British Columbia	s	seconds
FRIM	Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures (Version 1.1)	S	small size stream
Grad	slope gradient	SBS	Sub-Boreal Spruce BGC
H	high flow	SK	sockeye salmon (<i>O. nerka</i>)
Hz	Hertz	S/S/I	straight, sinuous or irregular wandering channels
ILP	Interim Locational Point	Spp.	species
I/M/T	irregular meandering, meandering or tortuous meandering channels	ST/SI/IR	straight, sinuous or irregular wandering channels
IM/ME/TM	irregular meandering, meandering or tortuous meandering channels	T	turbid
Info.	information	TRIM	Terrain Resource Information Management
km	kilometer	Turb	turbidity
KO	kokanee (<i>O. nerka</i>)	u/s	upstream
L	low flow, lightly turbid or large size stream	UTM	Universal Transverse Mercator coordinates
L.	lake	V	volts
LKC	lake chub (<i>Couesius plumbeus</i>)	Wb	bankfull depth
LSU	longnose sucker (<i>Catostomus catostomus</i>)	WSC	watershed code
LWD	Large Woody Debris	µs	microseconds
m	meter	µS	microsimens
mm	millimeter	°C	temperature
M	moderate flow, moderate turbid or medium size stream	%	slope gradient

Contractor Information

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Acknowledgments

Forest Renewal B.C provided funding for this project. We would also like to give special thanks to those people who made this project possible, tolerable and even fun. Paul Giroux, who helped throughout the project and maintained the “common sense” approach; Lynn Miers, whose quick responses to our frequent requests still amaze us and Karen Grainger for, above all else, putting up with us throughout the field portion of the project.

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List of Attachments Available at Regional MELP Office in Smithers

Attachment I Planning Document

- i) Phase Completion Report
- ii) Project budget break-down by phase
- iii) Project sampling design plan
- iv) Hardcopy and digital Reach Table
- v) Hardcopy and digital Lake Table
- vi) Hardcopy and digital copy of the random sample table
- vii) List of air photographs

Attachment II Hardcopy FISS Update Data Forms and Maps

Attachment III Photodocumentation

- i) Photodocumentation Form 1
- ii) Photo Summary Report printout from FDIS Database
- iii) Indexed Album of all negatives uniquely labeled in plastic sleeves
- iv) 1 Indexed Copy of Photo CD's with numbered images and thumbnail references in each CD jacket

Attachment IV Field Data

- i) site cards, fish collection forms, individual fish data forms and field notes
- ii) field working maps

Attachment V Digital Data

1. Introduction

1.1 Project Scope and Objectives

The objective of this project was to conduct a Reconnaissance (1:20,000) Fish and Fish Habitat Inventory in several drainages within the Babine Lake watershed group. This is a continuation of a multi-year FRBC project commenced in 1996 for Babine Forest Products Company.

These inventories have a multi-phased approach with a total of six phases required to complete the inventory. Phases I through III are known as the pre-field phases and consist of 1) existing data review, 2) classification and sampling design and, 3) project plan. Phase IV consists of field data collection where site level fish and fish habitat data is collected for pre-determined reaches. Phases V and VI embody data compilation, mapping and reporting for the project. This report encompasses Phases V and VI of this project. However, the pre-field deliverables and project-planning document (available at the MELP Regional office in Smithers) are essential references for this report.

Specific watersheds assessed within this project area include tributaries to Taltapin Lake within the Helene sub-unit and tributaries to Augier and Pinkut Lakes in the Augier-Pinkut sub-unit in the Babine Forest Products operating area (see “Watershed Reference Information” at the beginning of this report). Major watersheds within this area include Henrietta Creek (5th order) and Ling Creek (4th order). All remaining tributaries to these lakes within this area are 3rd order or smaller and have been grouped and discussed together throughout this report. No lakes were surveyed as part of this project.

1.2 Location

Watersheds within the project area are located in the Pinkut Creek watershed in the Taltapin, Augier and Pinkut Lake areas north of Burns Lake within the Lakes Forest District. All streams are within the Babine Lake (BABL) high-level watershed group. The location map (Figure 1) on the following page provides the general location of the study area.

1.2.1 Access

The predominant modes of access to reaches within the study area watersheds were by vehicle and by boat. Several Helene Lake tributaries were accessed by boat using the boat launch at the western end of the lake. Boat access was also used extensively on tributaries to Augier and Pinkut Lakes that were not accessible by vehicle. Remaining reaches were primarily accessed by vehicle from various logging roads and cutblock spur roads.

Directions to the Henrietta Creek watershed from Burns Lake is as follows:

- Drive east on Highway 16 for 21km to the Augier mainline (at the flashing yellow light)
- Turn left onto Augier road and drive to the Hannay road at the 7km board

Turn right onto the Hannay road and follow it to the 34km board at which point Hannay road crosses Henrietta Creek in reach 5

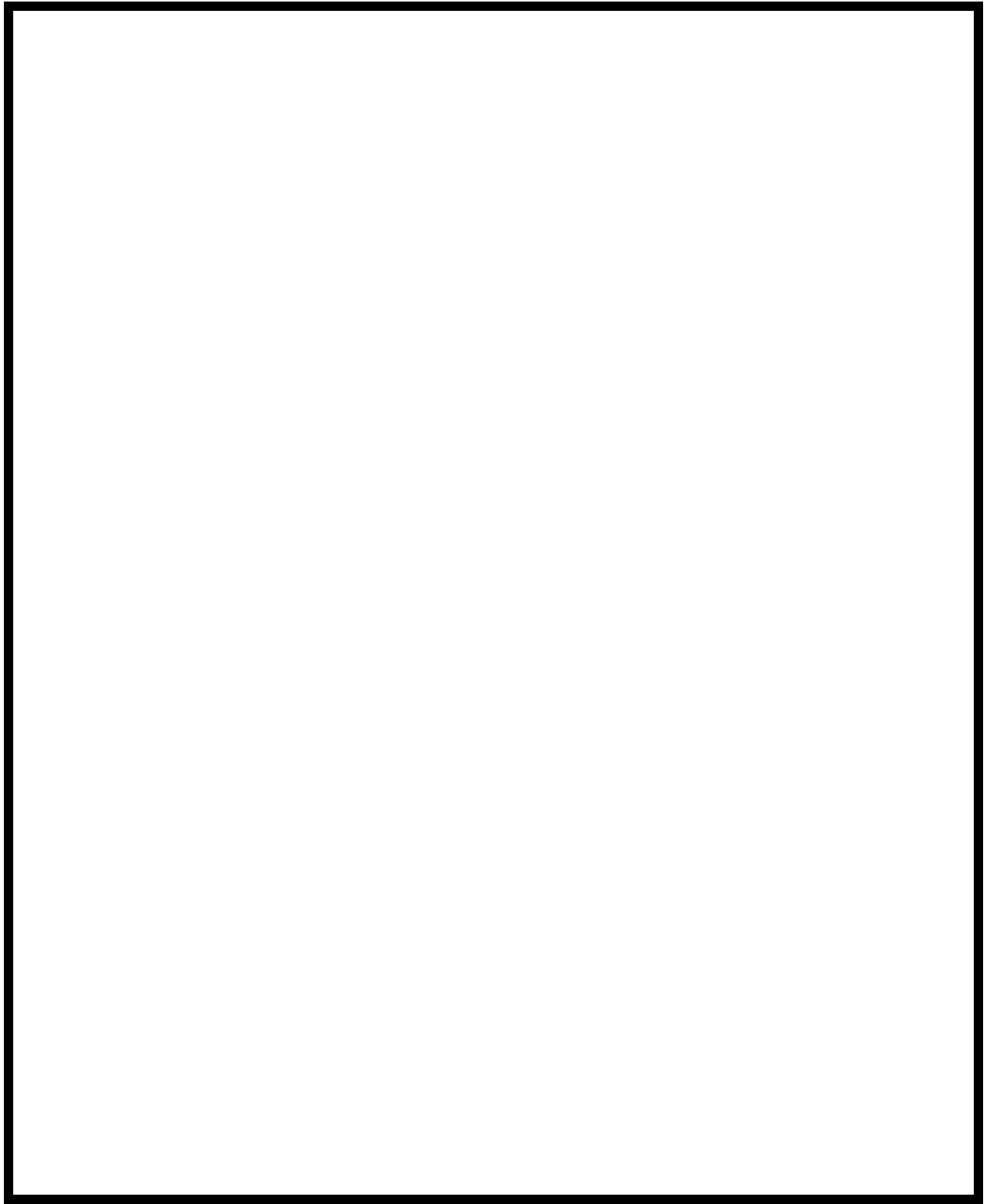


Figure 1: Location of Project Area. (Inset map shows the location within the province of British Columbia. Map scale is 1:600,000.)

Directions to the Ling Creek watershed from Burns Lake is as follows:

- Drive north on the Babine Lake road (toward landfill) to the junction with the Augier Main at km 18.4
- Turn right onto the Augier Main and drive for approximately 5km.
- This road crosses Ling C. at the 31km board. The watershed is accessible from numerous small spur roads from this location.

Remaining tributaries within the project area were located throughout the entire Taltapin, Augier and Pinkut lakes area. The area is well roaded and many of the reaches were accessed for sampling using the logging roads.

2. Resource Information

There are a variety of resources available within the watersheds selected for sampling:

1. The primary resource use within all drainages is forest management for timber extraction in Babine Forest Products operating area.
2. There are several recreation opportunities as the study area is near numerous large lakes including Taltapin, Helene, Augier, and Pinkut lakes. These lakes provide excellent sport fishing and recreation opportunities. Forest service recreation sites are located on Pinkut, Augier and Taltapin lakes.
3. The entire area is located within the Carrier-Sekani Tribal Council claim area.
4. No significant wildlife use or impacts were noted within this area.
5. Historical information regarding fish presence was collected and presented in the planning report (FINS, 1999) and the results were incorporated into the interpretive maps for this project. Table 1 below summarizes historical fish presence within the selected watersheds.

Table 1 Historical information on fish presence within the selected drainages

Stream Name	Watershed Code	Fish Species	Dates
Henrietta C.	480-927700-23400	LKC, LSU, RB	FISS – unknown
Ling C.	480-927700-66700-96000	BB, CSU, LKC, LSU, LW, RB, WSU	FISS – unknown
Nellian C.	480-927700-66700-18500	LSU, RB	FISS – unknown
Division C.	480-927700-66700-69600	CSU, LSU, RB, WSU	FISS – unknown

* FISS = Fisheries Information Summary System

3. Methods

3.1 Project Plan and Alterations

Initial work, such as review of all existing information, preparation of fisheries information maps, location of stream features and selection of sample sites was completed during Phase 1-3 by FINS (Sept, 1999). The original planning report identified 85 reaches for sampling (37 random and 48 discretionary) within 629 total reaches in the study area. Upon completion of Phase 4, the actual number of sample sites was 94 (29 random and 65 discretionary). Sampling of eight random reaches did not occur for several reasons. Four of the reaches were determined to be non fish-bearing downstream in the watershed, three of the reaches were substituted in the field with reaches that provided better opportunity to determine fish distribution in the system and one reach was inaccessible for sampling. Five of the originally chosen discretionary sites were not sampled, all due to their being inaccessible for sampling. Discretionary sample reaches were added in the field, chosen from a list of contingency sample reaches, so that all reach categories remained appropriately represented.

3.2 Reconnaissance Standards

Methodology used throughout this project was consistent with the standards and methods as defined in the “Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures (May 1998)” manual (including all errata), and all standards referenced therein.

Fish Sampling

Electrofishing and visual observation were the primary methods used for fish sampling throughout the field portion of the project. These methods were to be supplemented by the use of minnow traps, when logistically feasible, when electrofishing was not effective or potentially harmful to fish (i.e. deep wetland channels, low water temperatures) and sampling results were inconclusive, but these circumstances did not occur.

Measurements

Stream channel and wetted widths were determined using a meter stick for smaller streams and a hip chain for streams with channel widths greater than 2.0m. A minimum of six channel width measurements were made along each site at a distance of approximately one channel width apart. Stream depth measurements were determined using a meter stick. Stream gradient measurements were determined using an Abney level along several sections of the site. Site lengths were determined either by hip chain or by ground estimate. Measurements of falls were based on ground estimates or calculated using distance/ gradient while cascade heights and lengths were determined using a hip chain and Abney level. Vertical cascade height was calculated using the gradient and slope distance according to the formula:

$$\text{Height (m)} = \sin(\tan^{-1}(\text{gradient (\%)}) \times \text{slope distance (m)})$$

Stream water temperatures were determined using an alcohol thermometer while pH and conductivity measurements were made using Oakton portable meters, which were calibrated weekly using standardized solutions.

Site Numbering Convention

Site numbers for this project have been assigned in an upstream ascending order for all sampled reaches under the scope of this project. Site numbers have been included in all tables that provide specific reach sampling information and on all photographs and photodocumentation indices.

Usage of ILP Numbers

A naming convention for all ILP's has also been used in order to simplify stream referencing for this project for streams requiring watershed codes. All 5-digit ILP numbers that have been assigned are unique within the entire project area. This was done to avoid confusion in ILP referencing throughout the project and having to reference the ILP map number each time the ILP is referenced. Every ILP created uses the last two digits of its ILP map, combined with its number on the map. ILP number assignments for the 1999 project begin at **700 to avoid overlapping of ILP numbers that were assigned in the 1997 and 1998 projects. That is, the first ILP on TRIM mapsheet 93K.061 would be ILP 61700. There was no overlap of mapsheet numbers among the different TRIM map series (i.e. 93K vs. 93 L series). All streams with gazetted names will be referred to by those names in this report, while all unnamed streams will be referred to by their watershed code or ILP number.

NVC (No Visible Channel) Reaches

There were three types of situations in which site assessment in the field revealed no visible channel. They include reaches where no drainage was present, reaches that were not a stream by FPC definition, or wetland-type reaches where there was no defined channel present. These different types of NVC reaches were noted in the comments on the site cards and are summarized in the "Fish-Bearing Status" section of this report. It is expected that NVC reaches would receive a "Non Classified Drainage" (NCD) FPC classification.

Appendix I Layout - FDIS Reach/Site Summaries, Site Cards, Fish Forms and Photographs

FDIS reach site summary, site card and fish form reports, as well as representative photographs for each sampled reach and significant features, are presented in Appendix I, arranged by site number. They are arranged as reach/site summary followed by the corresponding site card and fish form. The representative photos have been reduced in size so that multiple sites can be presented on one page. The pages of photos, including an index, are placed in the appendix following the reach/site summaries, site cards and fish forms. Each photo is labelled with roll, frame, watershed code/ILP, reach and site numbers so that each photo can be easily cross-referenced in the report, the FDIS database, the negative binder or the photo CD's. All photos were scanned onto CD's with high resolution index prints enclosed in the CD's jacket (Attachment III).

Field Equipment

All sampling equipment specifications are listed below:

- 2 Smith-Root model 12B P.O.W. Backpack Electrofishers
- 50 Gee-type minnow traps
- 2 Oakton pHTestr2 pH meters (with pH 7 & 10 buffer solutions)
- 2 Oakton TDSTestr3 conductivity meters (with 1413 μ S/cm solution)
- 2 Abney Levels, alcohol thermometers, Silva compasses
- 2 Pentax Zoom 90WR cameras
- assorted other equipment including tight chains, hip chains, dip nets, fishing rods, magnifying lenses, meter sticks
- 2 4X4 trucks equipped with Level 1 First Aid kits and 4 personal First Aid kits, as per WCB requirements
- 12'6" inflatable Quicksilver boat with Mariner 20 HP jet
- Dissecting kit

4. Results and Discussion

The following sections present information for watersheds as identified in the Project Reference Information section of this report. Biophysical information for these watersheds is provided in tabular format in the Watershed Information and Specific Watershed Information sections at the beginning of this report. Each 4th order or larger watershed is discussed separately while smaller watersheds have been grouped together. This section discusses the Henrietta C. and Ling C. watersheds, in addition to the remaining small tributaries to Taltapin, Augier and Pinkut Lakes within the Helene and Augier-Pinkut sub-units. The following sections provide a brief discussion regarding fish and fish habitat information for each of the above watersheds. Summarized information for all sampled reaches is presented in tabular format in the “Fish Bearing Status section” of this report while detailed site-specific information is available in the Appendices.

4.1 Logistics

The major problem encountered throughout the course of the sampling that was common to all drainages within the project area was the effect of low water levels on sampling effectiveness. Intermittent or dry channels were common which often resulted in very limited sampling possibilities within the site due to the lack of sufficient water. However, presence and accessibility of fish habitat at higher flow conditions was considered in determining potential fish use. No other logistical problems were encountered.

4.2 Habitat and Fish Distribution

The presence of barriers to fish migration was confirmed in several streams within the project area. These are summarized in Table 2 below.

Table 2: Summary of historic and new barriers to fish migration found in the Helene/Augier-Pinkut sub-units

Stream Name	Watershed Code/ILP	TRIM Map	Reach	Site	Barrier Type	Height (m)	Length (m)	Verified in Field	Comments
Helene C.	480-927700-23400-25700	93K.025	3	114	Falls	13		Y	Impassable to all fish species. Located at the end of reach 3, 0.9km u/s from Henrietta Creek.
Coldwater C.	480-927700-23400-34400	93K.035	3	127	Cascade	1.5	2	Y	Possible obstruction to RB. Located at the start of reach 3, 1.7km u/s from Henrietta Creek.
	32728	93K.032	3	166	Cascade	8	29	Y	Impassable to all fish species. Located in reach 3, 1.5km u/s from Pinkut Lake.

4.2.1 Henrietta Creek

Fish species encountered in this watershed included kokanee and rainbow trout. Kokanee were present only in the third reach of Henrietta Creek while rainbow trout inhabited the mainstem reaches of Henrietta, Helene and Coldwater Creeks.

Good to excellent salmonid rearing and overwintering habitat is present in reach 3 and reach 8 of Henrietta Creek, primarily in very deep pool type habitat. Reach 3 also provides good spawning habitat for rainbow trout and kokanee. Frequent and abundant suitable gravel bars are present in this reach, in addition to numerous good holding pools. Kokanee were observed spawning in this reach.

Good to excellent rearing habitat for rainbow trout is present in Helene and Coldwater creeks throughout their surveyed mainstem reaches in abundant and diverse cover. Excellent rearing habitat in pool and large woody debris type cover is provided in reach 2 and 6 of Helene Creek and in reach 2.1 of Coldwater Creek. Cascade-pool and boulder type cover is the dominant rearing habitat in the third reaches of these creeks and also provides the best overwintering potential. However, the availability of better overwintering habitat in Henrietta Creek and Helene Lake likely limits overwintering use in these systems. Exceptional rainbow trout spawning habitat is present in reach 6 of Helene Creek downstream from Helene Lake. This habitat has been enhanced in the past to provide spawning habitat for the rainbow trout population that has been introduced into Helene Lake.

No physical barriers to fish distribution were encountered within the mainstem of Henrietta Creek. It is a large and low gradient stream, easily accessible to fish over its entire length within the project area. In addition, rainbow trout have been previously documented in the watershed near its headwaters above Henrietta Lake (FINS, 1997).

Fish distribution in Helene C. is limited by a 13m falls obstruction located at the end of reach 3. These falls are impassable to all fish species. However, successful stocking of Helene Lake has resulted in the establishment of an isolated rainbow trout population above the falls. A cascade is present at the end of reach 2.1 in Coldwater C. This cascade is 1.5m high and is a potential obstruction to fish migration, as suggested by the absence of any fish species in 6 sampled reaches upstream.

In the rest of the Henrietta Creek watershed, fish distribution was usually limited by lack of connectivity to fish bearing reaches, especially in the wetlands adjacent to Henrietta Creek. Most of the remaining tributaries to Henrietta Creek were small 1st and 2nd order streams that lacked sufficient water to provide fish habitat (see Section 4.5.2).

4.2.2 Ling Creek

Fish species encountered within the Ling C. watershed include longnose sucker and rainbow trout. Longnose sucker were only encountered in reach 4 of Ling Creek while rainbow trout were present throughout the mainstem reaches of Ling Creek and in the first reach of ILP 32756. Other species are historically present within this watershed (see Table 1), but none were encountered during this inventory.

Excellent rainbow trout rearing habitat is available throughout the mainstem reaches of Ling Creek within diverse and abundant cover. Pool type habitat predominated overall primarily in riffle pools, but significant cover was also present within undercut banks, overstream and instream vegetation, and boulders within the various reaches. Rearing habitat was also good in the first reach of ILP 32756, mainly in undercut banks, and areas with small woody debris and

pool-type cover. Potentially good overwintering habitat was present in deep channels within the wetlands in reach 4 and 14 of Ling Creek. Suitable pools for overwintering were present within other reaches in this watershed, but their use is likely limited by the presence of excellent overwintering habitat in the numerous lakes and wetlands in the system.

The best spawning habitat, with frequent and abundant suitable gravel sections, is present within reaches 1 and 21 of Ling Creek and in the first reach of ILP 32756. However, rainbow trout spawning likely occurs in non-wetland reaches on an opportunistic basis throughout the watershed.

There were no physical barriers found within the Ling Creek watershed that were limiting to fish distribution. No upper distribution limit for fish was determined in the mainstem of Ling C. The only reaches that were determined to be non fish-bearing in this watershed were the first reaches of ILP 32745 and ILP 32747. Both of these were small, 1st order streams that lacked any suitable rainbow trout or burbot habitat (see Section 4.5.2).

4.2.3 Small Tributaries to Taltapin, Augier and Pinkut Lakes

Rainbow trout was the only species encountered within these tributaries. Their presence was only confirmed in the Marlin C., Nellian C. and –66700-78500 systems. No fish were present in any 1st order tributaries.

4.2.3.1 Taltapin Lake Tributaries

Marlin Creek was the only stream in this area that was found to contain rainbow trout. They were present only in the mainstem reaches up to reach 7. Good to excellent rearing habitat is available in reach 3 and 7. Pool type habitat predominates and consists of cascade pools and riffle pools. Large woody debris and undercut bank type cover is also prevalent in these reaches. Good overwintering habitat is present in abundant deep pools throughout reach 3 of Marlin Creek. No significant spawning habitat was noted, however rainbow trout spawning likely occurs on an opportunistic basis in scattered gravel sections throughout the mainstem reaches.

No physical limits to fish distribution were identified in this area. Fish presence was not confirmed in the Marlin Creek system upstream from reach 7, despite the availability of excellent habitat in –23300-78300, which flows into Marlin Creek at the end of reach 9. It is suspected that a barrier is present on Marlin Creek in the unsurveyed reaches between reach 7 and 10. Fish absence was confirmed in reach 10 of Marlin Creek due to the lack of any suitable rainbow trout habitat (see Section 4.5.2).

Most remaining reaches in this area were 1st or 2nd order drainages that lacked sufficient water or channel continuity to provide fish habitat.

4.2.3.2 Augier Lake Tributaries

No fish were encountered in any of the streams within this area. The only accessible fish habitat is in –927700-49000 and in –927700-49700, however, fish use in these streams is unknown.

Fish distribution in this area is limited by an overall lack sufficient water or channel continuity to provide fish habitat. Most tributaries are 1st order streams that flow down a steep valley walls into Augier Lake. Upstream fish distribution limits for streams -927700-49000 and -927700-49700 were not determined.

4.2.3.3 Pinkut Lake Tributaries

Nellian Creek and stream -66700-78500 were the only systems in this area that were found to contain rainbow trout. They were present in both of their mainstems (reach 4 and reach 1, respectively), as well as in the first reach of ILP 32717, which is a tributary to Nellian Lake. Exceptional rearing habitat is available in reach 4 of Nellian Creek in abundant pools and boulders within cascade-pool type morphology. ILP 32717 also provides exceptional rearing habitat for rainbow trout, primarily in undercut bank and pool areas. Suitable pools for overwintering are present in reach 4 of Nellian Creek, but their use is likely limited by the presence of excellent overwintering habitat in the lakes and wetlands in the system. Pure and uniform gravels, in addition to good flow and abundant holding pools provide exceptional spawning habitat for rainbow trout in the first 100m of reach 1 of ILP 32717. Spawning habitat is also good in reach 4 of Nellian Creek in frequent and abundant gravel pockets.

No limits to fish distribution were identified within the confirmed fish-bearing streams in this area. Rainbow trout are present in the Nellian Creek system up to Nellian Lake and one of its tributaries. Rainbow trout presence in system -66700-78500 was confirmed only in reach 1. Although fish absence was confirmed in reach 6 of this stream, rainbow trout distribution between these reaches was not determined. In addition, fish absence was confirmed above the historical cascade present at the end of reach 1 of stream -66700-80800. Lack of sufficient water or channel continuity to provide fish habitat in many of the other surveyed tributaries to Pinkut Lake generally limited fish use in these streams.

4.3 Fish Stage, Size and Life History

Fork length and maturity level of all fish sampled were recorded on the individual fish data forms. The life stage (fry, juvenile, or adult) for each fish was determined in the field based on length measurements, physical characteristics, and the habitat type in which each fish was found. All captured fish appeared healthy and did not exhibit any external signs of disease. No voucher specimens or DNA samples were collected within this project area.

4.3.1 Henrietta Creek

Insufficient numbers of kokanee were sampled within this watershed to provide any meaningful interpretation of fish stage, size and life history for this species. However, this species was only captured in the mainstem of Henrietta Creek. Considering the life history of kokanee, they likely only use the lower reaches of Henrietta Creek for spawning.

A total of 37 rainbow trout were sampled within this watershed. They were most abundant in Helene Creek. All stages were represented in this sample in healthy proportion (see Figure 2).

Rainbow trout within the mainstem of Henrietta Creek are likely present as both fluvial and adfluvial populations. Abundant and diverse perennial habitat is sufficient to support a fluvial

population, while adfluvial rainbow trout from Taltapin and Hannay lakes may use the stream for spawning and rearing.

Helene Creek below the falls obstruction at the end of reach 3 may support its own fluvial population of rainbow trout and also is likely used by fluvial populations from Henrietta Creek. The Helene Creek watershed above the falls was historically barren of fish. The rainbow trout population currently present has originated as a result of the stocking of Helene Lake (1980-1983) and subsequent spawning habitat enhancement in the Helene Creek outlet. Presence of fry in this reach indicates that the population is self-sustaining.

The following table presents data for fish species encountered in this watershed. The CPUE column in the table indicates the number of fish captured per second of electrofishing. This data is extracted only from those reaches where the species were sampled.

Table 3: Summary of life stage, length and CPUE data from fish sampled within the Henrietta Creek Watershed

Stream Name	Watershed Code	Spp.	Stage	Number of Fish	Mean Length (mm)	Range of Lengths (mm)	CPUE (# of fish/sec electrofishing)
Henrietta Creek	480-927700-23400	KO	A	2	202.0	194-210	0.010
		RB	F	6	33.3	26-38	0.024
		RB	J	30	77.8	38-125	0.044
		RB	A	1	154	154	0.003

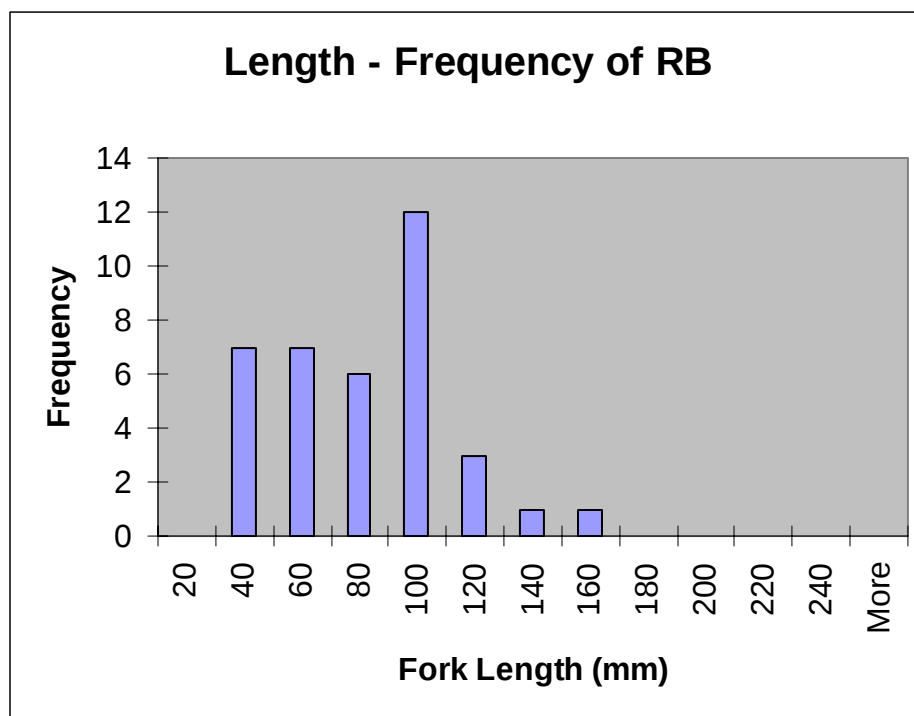


Figure 2: Length-frequency histogram of sampled rainbow trout from the Henrietta Creek Watershed, September 1 to October 21, 1999

4.3.2 Ling Creek

Insufficient numbers of longnose sucker were sampled within this watershed to provide any meaningful interpretation of fish stage, size and life history for this species. They were only captured in one wetland reach of Ling Creek. Longnose sucker likely reside in many of the numerous wetland reaches present in the Ling Creek watershed.

A total of 33 rainbow trout were sampled within the Ling Creek watershed. They were most abundant in the mainstem of Ling Creek, especially in reaches 15 and 21. Only the juvenile life stage was represented. The presence of only juveniles in the watershed suggests that an adfluvial population is present. Juveniles likely remain in the stream reaches for rearing, while adult rainbow prefer to move into the lakes. Although no fry were sampled, the presence of small juveniles within reaches 15 and 21 of Ling Creek and in the first reach of ILP 32756 indicates that spawning has likely occurred in the habitat offered by those reaches. The rainbow trout population from the lakes is most likely utilizing this habitat.

The following table presents data for fish species encountered in this watershed. The CPUE column in the table indicates the number of fish captured per second of electrofishing. This data is extracted only from those reaches where the species were sampled.

Table 4: Summary of life stage, length and CPUE data from fish sampled within the Ling Creek Watershed

Stream Name	Watershed Code	Spp.	Stage	Number of Fish	Mean Length (mm)	Range of Lengths (mm)	CPUE (# of fish/sec electrofishing)
Ling C.	480-927700-66700-96000	LSU	J	1	47	47	0.009
		RB	J	33	59.2	35-122	0.111

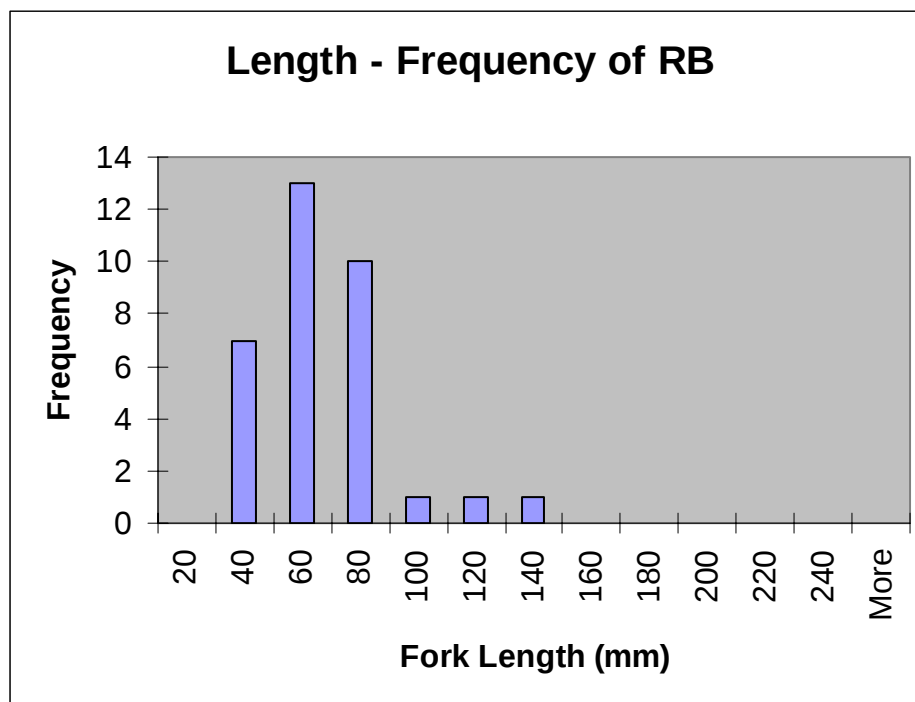


Figure 3: Length-frequency histogram of sampled rainbow trout from the Ling Creek Watershed, September 1 to October 21, 1999

4.3.3 Small Tributaries to Taltapin, Augier and Pinkut Lakes

A total of 53 rainbow trout were sampled within this area and only the juvenile life stage was represented. They were most abundant in Nellian Creek, especially in reach 4 where 37 rainbow trout were captured during 54 seconds of electroshocking. The presence of only juveniles in these watersheds suggests that adfluvial populations are present. Juveniles likely remain in the stream reaches for rearing, while adult rainbow prefer to move into the lakes. Although no fry were sampled, the presence of small juveniles within several of the reaches indicates that spawning has likely occurred in the habitat offered by those reaches. The rainbow trout populations from the lakes are most likely utilizing this habitat.

The following table presents data for fish species encountered in this watershed. The CPUE column in the table indicates the number of fish captured per second of electrofishing. This data is extracted only from those reaches where the species were sampled.

Table 5: Summary of life stage, length and CPUE data from fish sampled within Small Tributaries to Taltapin, Augier and Pinkut Lakes

Stream Name	Watershed Code	Spp.	Stage	Number of Fish	Mean Length (mm)	Range of Lengths (mm)	CPUE (# of fish/sec electrofishing)
		RB	J	53	71.2	38-137	0.049

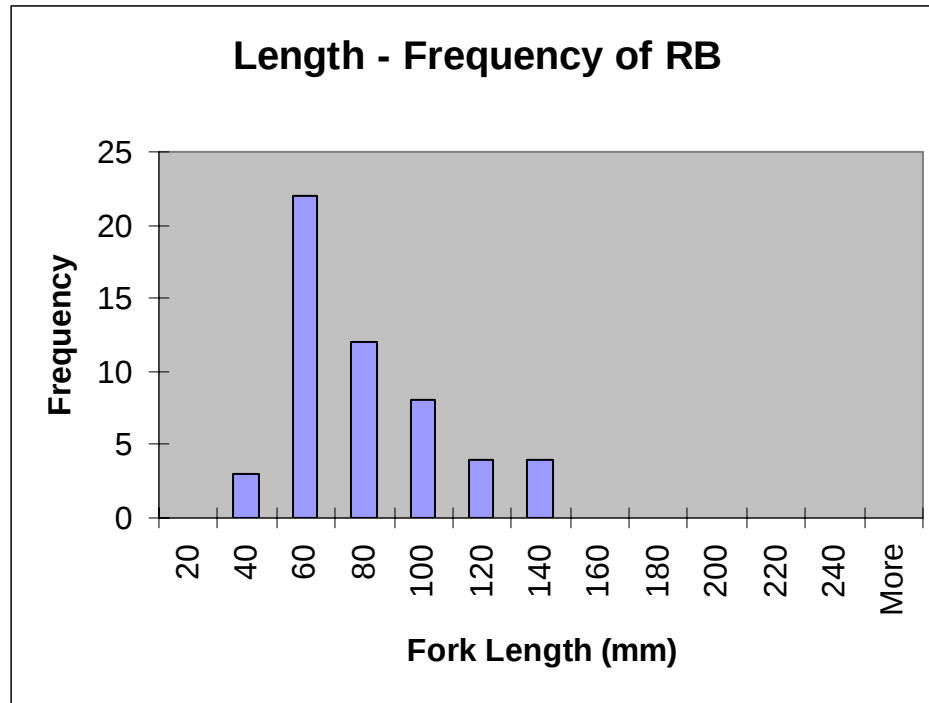


Figure 4: Length-frequency histogram of sampled rainbow trout from Small Tributaries to Taltapin, Augier and Pinkut Lakes, September 1 to October 21, 1999

4.4 Significant Features and Fisheries Observations

4.4.1 Fish and Fish Habitat

The only significant fisheries observation within this project area that was not already documented in existing publications was the identification of kokanee within the Henrietta Creek watershed. Although no specific distribution limits were obtained for this species, it was confirmed that populations of kokanee from Taltapin Lake utilize Henrietta Creek for spawning.

All streams within this area were too small to provide any significant sport fishing opportunities.

4.4.2 Habitat Protection Concerns

Two fisheries sensitive zones (FSZ) were identified within the Helene/Augier-Pinkut sub-units. Both of these were within Ling C. and were located in reach 4 and 14. They were both wetland

reaches containing numerous beaver impoundments that could provide important rearing and overwintering habitat for rainbow trout and burbot.

No other habitat protection concerns were identified in this area. No fish were captured in gradients greater than 20%, no restoration opportunities were noted and no problem culverts or unstable slopes were encountered.

4.5 Fish Bearing Status

The following three sections summarize the fish-bearing status for all surveyed reaches within the Helene and Augier-Pinkut sub-units. The first section summarizes all surveyed reaches; the second section presents information for all non fish-bearing reaches, while the third section identifies reaches where follow-up sampling should be conducted. An overview of the process used in determining fish-bearing status is presented in a flowchart in Figure 5 on the following page.

4.5.1 Summary of all Surveyed Reaches

Table 6 on the following pages summarizes all surveyed reaches in the Helene and Augier-Pinkut sub-units. In addition to confirmed fish-bearing reaches, non fish-bearing reaches and reaches requiring follow-up sampling have also been identified and summarized in this table. They are also discussed in further detail in the “Non Fish-bearing Reaches” and “Follow-up Sampling Required” sections of this report.

Stream Classification Process

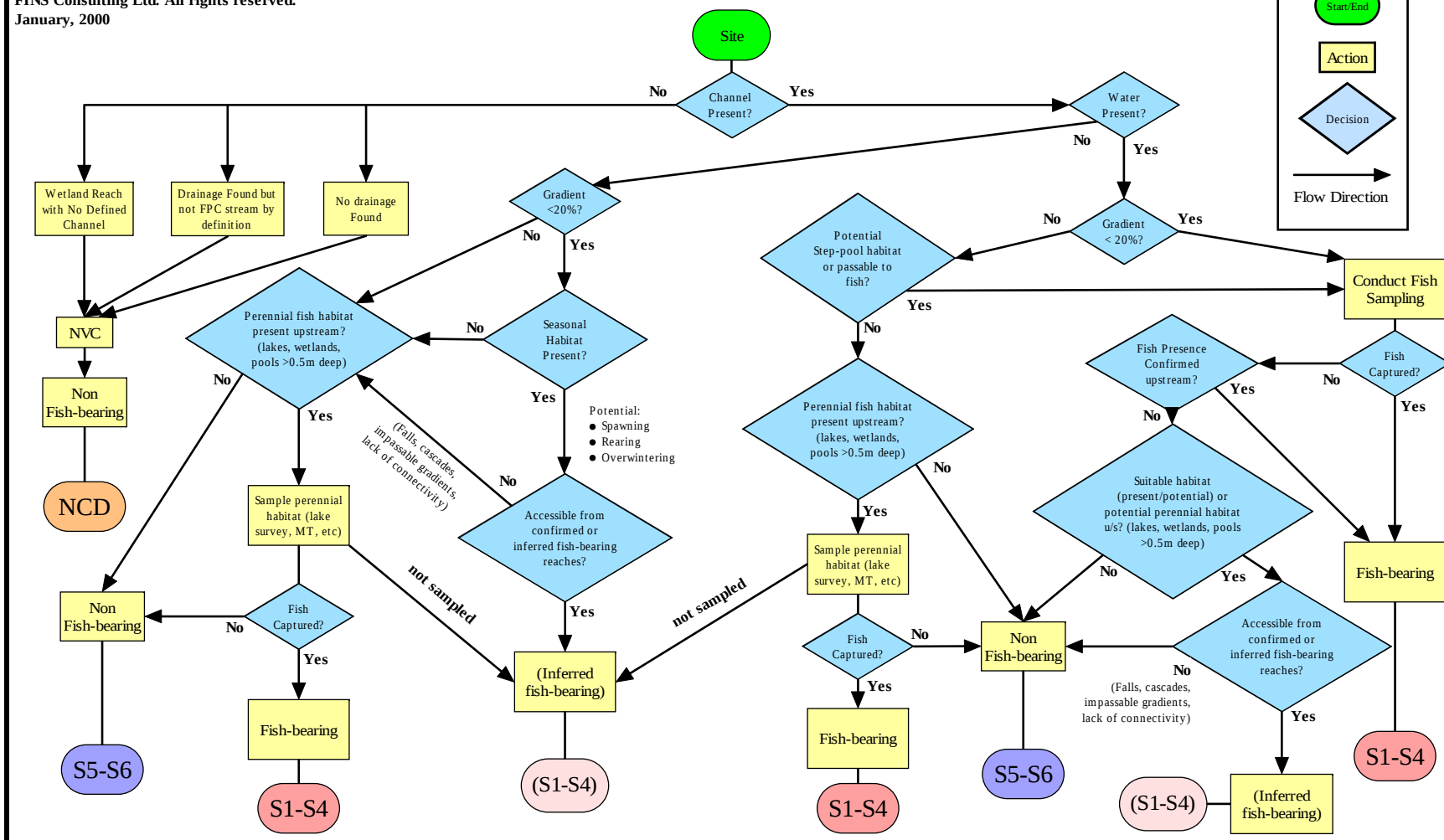
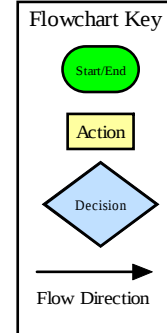


Figure 5: Flowchart of the stream classification process used in determining fish-bearing status of surveyed reaches

Table 6: Summary of data from all surveyed reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Species	Channel		Proposed Riparian Class	Follow-up Sampling ² (Y, N or blank)	Comments
						Width (m)	Grad. (%)			
Marlin C.	480-927700-23300		2	88	RB	4.80	5.0	S3		
Marlin C.	480-927700-23300		3	89	RB	4.02	6.5	S3		
Marlin C.	480-927700-23300		7	90	RB	2.15	3.5	S3		
Marlin C.	480-927700-23300		10	91	NFC	0.27	14.0	S6	N	
		24702	1	92	NFC	0.46	7.3	S4	Y	
	480-927700-23300-36300		1	93	NFC	1.76	7.3	S3	Y	
	480-927700-23300-36300		2	94	NFC	1.22	4.3	S4	Y	
		34701	2	95	NFC	0.36	7.5	S6	N	
		34713	2	96	NFC	1.35	2.5	S6	N	
	480-927700-23300-78300		1	97	NFC	1.77	6.5	S3	Y	suspect barrier d/s (between reach 7 and 10 in Marlin C.)
Henrietta C.	480-927700-23400		3	98	KO	9.20	1.5	S2		
Henrietta C.	480-927700-23400		8	99	RB	9.83	1.0	S2		
		25702	1	100		NVC		NCD	N	
		25707	1	101		NVC		NCD	N	
	480-927700-23400-14500		2	102	NFC	2.04	4.0	S3	Y	
		25711	1	103		NVC		NCD	N	
		25713	1	104		NVC		NCD	N	
	480-927700-23400-19000		2	105	NFC	2.54	3.8	S3	Y	
		25715	1	106		NVC		NCD	N	

² Blank cell indicates confirmed fish presence with no follow up sampling required

“N” indicates a non fish-bearing reach - See “Non fish-bearing reaches” section

“Y” indicates an inferred fish-bearing reach with low probability of fish use or determine upstream fish distribution limit - See “Follow-up Sampling Required” section

“Y” indicates an inferred fish-bearing reach with high probability of fish use - See “Follow-up Sampling Required” section

Table 6: Summary of data from all surveyed reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Species	Channel		Proposed Riparian Class	Follow-up Sampling ² (Y, N or blank)	Comments
						Width (m)	Grad. (%)			
		35703	1	107	NFC	0.48	3.3	S6	N	
		25718	1	108		NVC		NCD	N	
		25719	1	109	NFC	0.90	2.0	S6	N	
		25721	2	110	NFC	0.53	3.5	S4	Y	
		25726	1	111		NVC		NCD	N	
		25726	3	112		0.33	6.8	S6	N	
Helene C.	480-927700-23400-25700		2	113	RB	2.75	3.5	S3		
Helene C.	480-927700-23400-25700		3	114	RB	3.37	8.3	S3		
Helene C.	480-927700-23400-25700		6	115	RB	3.65	2.5	S3		
		25731	2	116	NFC	0.72	7.3	S6	N	
		25732	1	117		NVC		NCD	N	
		25740	1	118		NVC		NCD	N	
		25742	1	119	NFC	0.50	11.0	S6	N	
		25744	1	120		NVC		NCD	N	
		25745	1	121		NVC		NCD	N	
		25746	1	122		0.63	9.5	S6	N	
		25747	1	123		NVC		NCD	N	
		25749	2	124		NVC		NCD	N	
		35706	1	125		NVC	1.0	NCD	N	
Coldwater C.	480-927700-23400-34400		2.1	126	RB	4.68	5.5	S3		
Coldwater C.	480-927700-23400-34400		3	127	NFC	4.60	5.8	S3	Y	
Coldwater C.	480-927700-23400-34400		5	128	NFC	0.53	4.3	S4	Y	

Table 6: Summary of data from all surveyed reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Species	Channel		Proposed Riparian Class	Follow-up Sampling ² (Y, N or blank)	Comments
						Width (m)	Grad. (%)			
	480-927700-23400-34400-5670		6	129	NFC	1.18	5.0	S4	Y	
		35717	2	130	NFC	0.97	3.8	S6	N	
		35720	2	131		0.70	12.0	S6	N	
		35722	1	132		NVC	3.0	NCD	N	
		35734	2	133	NFC	0.43	6.0	S6	N	
	480-927700-23500		3	134	NFC	1.08	0.4	S4	Y	
	480-927700-23500		6	135		NVC		NCD	N	
		25757	2	136		NVC		NCD	N	
		25759	2	137		NVC		NCD	N	
		25760	1	138		NVC	18.0	NCD	N	
		33702	1	139		NVC		NCD	N	
		33707	1	140		NVC		NCD	N	
		33708	1	141		NVC		NCD	N	
		33710	1	142		NVC		NCD	N	
		33711	1	143		0.52	4.0	S6	N	
	480-927700-49000		1	144	NFC	1.97	1.5	S3	Y	
	480-927700-49700		1	145	NFC	1.68	3.0	S3	Y	
		43713	1	146		NVC		NCD	N	
		42704	1	147		NVC	13.0	NCD	N	
		42705	1	148		NVC		NCD	N	
		42707	1	149		0.95	1.8	S6	N	
		42708	1	150		NVC		NCD	N	
		42711	2	151		NVC	9.5	NCD	N	
	480-927700-66700-18500		1	152	NFC	2.00	0.5	S3		fish use confirmed u/s
	480-927700-66700-18500		4	153	RB	3.60	6.5	S3		

Table 6: Summary of data from all surveyed reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Species	Channel		Proposed Riparian Class	Follow-up Sampling ² (Y, N or blank)	Comments
						Width (m)	Grad. (%)			
		42712	1	154	NFC	1.00	0.5	S4	Y	
		42714	1	155	NFC	3.05	2.8	S4	Y	
		32704	1	156		NVC		NCD	N	
		32706	1	157		NVC	0.5	NCD	N	
		42715	1	158		0.48	20.5	S6	N	
		32714	2	159		1.00	15.8	S6	N	
		32717	1	160	RB	1.57	2.5	S3		
		42717	1	161		NVC		NCD	N	
		42718	1	162		NVC		NCD	N	
		42719	1	163		NVC		NCD	N	
		32724	1	164	NFC	0.57	2.0	S6	N	
		32725	1	165	NFC	0.73	3.5	S6	N	
		32728	3	166	NFC	1.70	13.7	S6	N	above cascade
		32731	1	167	NFC	1.42	1.1	S4	Y	
		32732	1	168	NFC	0.35	3.0	S6	N	
	480-927700-66700-78500		1	169	RB	1.87	3.3	S3		
	480-927700-66700-78500		6	170	NFC	1.08	0.3	S6	N	Presence of freshwater shrimp suggests lack of fish
	480-927700-66700-80800		2	171	NFC	1.44	1.1	S6	N	
		32741	1	172	NFC	1.40	0.6	S4	Y	inferred BB RB use
Ling C.	480-927700-66700-96000		1	173	RB	4.12	3.3	S3		
Ling C.	480-927700-66700-96000		4	174	LSU	3.50	0.3	S3		
Ling C.	480-927700-66700-96000		14	175		8.00	0.0	S3		based on channelized reaches u/s

Table 6: Summary of data from all surveyed reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Species	Channel		Proposed Riparian Class	Follow-up Sampling ² (Y, N or blank)	Comments
						Width (m)	Grad. (%)			
Ling C.	480-927700-66700-96000		15	176	RB	3.18	1.8	S3		
Ling C.	480-927700-66700-96000		21	177	RB	1.67	1.1	S3		
		32745	1	178		NVC		NCD	N	
	480-927700-66700-96000-4000		4	179	NFC	0.92	0.0	S4	Y	
		32747	1	180	NFC	0.80	0.0	S6	N	
		32756	1	181	RB	1.30	1.0	S4		

4.5.2 Non Fish-bearing Reaches

This section summarizes all surveyed reaches within this project area that have been recommended for a non fish-bearing FPC classification. This has been based on interpretations and conclusions from the synthesis of data collected during Phases I through IV of this inventory. In addition, sampling results from Reconnaissance Inventory data in similar watersheds (Babine Forest Products Co. 1997 through 1999 Reconnaissance Inventories) have also been incorporated into this section to provide comparisons between reaches with similar channel characteristics. Specifically, fish sampling results (% of reaches with fish captured) in reaches within the same size, gradient and pattern classes, as defined in FRIM. Each site has been placed into a specific gradient, channel pattern and size class (based on reach and site data) in order to compare it to the historical inventory results. This is by no means an absolute indication of fish presence, but rather a useful tool to provide a general comparison among the differing reach types. It has been used only as further supporting evidence for the non fish-bearing designation. Table 7 below summarizes this categorized information.

Table 7: Fish sampling results for categorized reach classes (from 1997 through 1999 inventory data)

Reach Gradient Class	Reach Pattern Type	Reach Size Class								
		Small (1 st order)			Medium (2 nd and 3 rd order)			Large (4 th and higher order)		
		Total # of Reaches	# of Reaches with Fish Capture	%	Total # of Reaches	# of Reaches with Fish Capture	%	Total # of Reaches	# of Reaches with Fish Capture	%
1 (≤4%)	ST/SI/IR	118	1	0.8	215	64	29.8	54	42	77.8
	IM/ME/TM	27	3	11.1	79	20	25.3	18	11	61.1
2 (>4% and ≤8%)	ST/SI/IR	93	1	1.1	125	31	24.8	19	12	63.2
	IM/ME/TM	8	0	0.0	0	0	0.0	0	0	0.0
3 (>8% and ≤20%)	ST/SI/IR	77	0	0.0	59	8	13.6	4	2	50.0
	IM/ME/TM	0	0	0.0	0	0	0.0	0	0	0.0
4 (>20% and ≤30%)	ST/SI/IR	32	0	0.0	12	0	0.0	1	0	0.0
	IM/ME/TM	0	0	0.0	0	0	0.0	0	0	0.0
5 (>30%)	ST/SI/IR	7	0	0.0	3	0	0.0	0	0	0.0
	IM/ME/TM	0	0	0.0	0	0	0.0	0	0	0.0

Determining whether or not any fish use occurs in a specific reach is a complex process, involving much more than applying fish sampling results on a site-specific basis. Specifically, in applying a non fish-bearing recommendation when fish are not captured in a sampling event, a more systematic process is required in order to provide an adequate rationale to support a conclusion of fish absence. Biological evaluation is used which factors in such considerations as known fish distributions and behavior, barriers, gradients, habitat quality, invertebrate presence, and presence/absence of headwater lakes. This process is summarized in the flowchart in Figure 5 above.

As a general rule, two conditions must usually exist in order for fish to inhabit a specific stream reach; 1) presence of fish habitat and 2) accessibility to that habitat. There are exceptions to this, such as presence of resident or adfluvial populations above barriers which otherwise block access, but these situations are considered on an individual basis when appropriate sampling can be undertaken to accurately determine fish presence under these circumstances.

Determining presence of fish habitat requires biological judgement but is based on many tangible factors. A “snapshot” method is used to determine presence of fish habitat at the time of sampling, but this is not sufficient when lack of water limits available habitat. Under these circumstances, a temporal approach is required which factors in the potential for fish habitat presence during a different flow period. In this manner, different habitat requirements for suspected fish species are also considered, such as potential seasonal use for rearing (i.e., higher flow rearing or refuge habitat) or spawning (i.e. suitable gravels, gradient and potential flow). Again, biological judgement is required to recognize this potential habitat, bearing in mind how the different flow regimes may affect the availability of this habitat. Moreover, the presence of potential overwintering or perennial habitat upstream in the watershed (i.e. lakes, wetlands, pools >0.5m deep) is also taken into account and has influence on the fish-bearing status of a specific reach. Existence of habitat or potential habitat, if present, is noted and described in the comments on the site cards.

Once presence of fish habitat has been established, it must be determined whether fish are capable of accessing this habitat. The presence of obstructions to fish in the form of falls, cascades, impassable gradients and lack of connectivity within a watershed may limit fish distribution within a watershed and must be evaluated. When questionable obstructions or soft barriers (i.e., beaver dams, wetlands, NVC reaches) are present, the process for determining the presence of fish habitat upstream must be undertaken and combined with adequate sampling in order to determine fish use.

The fish-bearing status of a specific reach is dependent on the presence of fish habitat, the accessibility to that habitat and is supported by the results of fish sampling. The above process for determining fish presence is an overview of the variables evaluated before fish-bearing status can be accurately ascertained. This entire process is always supplemented by existing fisheries information and interpretations from map and air photo analysis.

Table 8 on the following page is a summary of all surveyed reaches within this project area that have been recommended for a non fish-bearing designation. It includes relevant site-specific data, some historical information and comments that provide a brief rationale to support the interpretation. The table is simply a summary of the interpretation, and not meant to be a reiteration of the data it summarizes. This data is available in the appendices included in this report.

Once a non-fish bearing conclusion has been established for a sampled reach, all reaches located upstream from that location are considered to be non fish-bearing. This is inherent in the process used to determine the non fish-bearing status.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
Marlin C.	480-927700-23300		10	91	9/30/99	0.27	0.13	14.0	RB	S6	EF	100	146	M	5	20	C	3	S/S/I	M	13.6	No RB habitat- tiny, shallow exposed channel at moderately steep gradient. NFC in 2 sites in vicinity. No suitable gravels for RB spawning, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed. **Fish-bearing reaches in this category (8 of 59 surveyed - see Table 7) had CW>1.8m and Web>0.17m. Substrate was mainly cobbles with gravels/boulder/rock. Cover was trace to abundant and flow was permanent. Morphology was step-pool or cascade-pool.
		34701	2	95	9/30/99	0.36	0.1	7.5	RB	S6	EF	110	88	M	7	50	C	2	S/S/I	S	1.1	No RB habitat- tiny, extremely shallow. No suitable gravels for RB spawning, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 93 surveyed - see Table 7) that contained fish in this category - ILP 52002 reach 1 (site 26) in 1997 inventory (ILP 52001 report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. This reach had water, abundant cover, and gravels in the substrate, a channel width of 4.6m and Web depth of 0.55m. Water in this stream during low flow period is supplied by large wetland complex u/s n reach 2.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow (°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured		
		34713	2	96	9/30/99	1.35	0.13	2.5	RB	S6	EF	140	78	M	5	60	C	1	S/S/I	S	0.8	No RB habitat- extremely shallow channel over fines, organics. Channel dissipates through forest floor with no connectivity to lower reaches. No suitable gravels for RB spawning, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
		25702	1	100	9/30/99	NVC				NCD								2	S/S/I	S	1.1	No channel present at mapped location. Dry gully.
		25707	1	101	9/21/99	NVC				NCD								3	S/S/I	S	0	No channel present at mapped location.
		25711	1	103	10/1/99	NVC				NCD								1	S/S/I	S	0.8	No continuous channel bed - not a stream by FPC definition.
		25713	1	104	10/3/99	NVC				NCD								1	I/M/T	S	11.1	No continuous channel bed - not a stream by FPC definition.
		25715	1	106	10/3/99	NVC				NCD								1	S/S/I	S	0.8	No continuous channel bed - not a stream by FPC definition.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		35703	1	107	10/1/99	0.48	0.1	3.3	RB	S6	EF	110	104	M	6	70	C	1	S/S/I	S	0.8	No RB habitat-tiny, shallow over fines, organics. NFC in this and parent stream. No suitable gravels for RB spawning, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
		25718	1	108	10/1/99	NVC				NCD								1	S/S/I	S	0.8	No continuous channel bed - not a stream by FPC definition. Channel disperses into large willow shrub wetland at Henrietta Creek with no connectivity to fish-bearing water.
		25719	1	109	10/1/99	0.90	0.07	2.0	RB	S6	EF	100	164	M	6	70	C	1	S/S/I	S	0.8	No RB habitat- shallow, no defined connection to Henrietta Creek. Channel disperses into wetland and percolates into Henrietta Creek. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
		25726	1	111	10/2/99	NVC				NCD								1	S/S/I	M	29.8	No continuous channel bed - not a stream by FPC definition. Channel disperses into large willow shrub wetland at Henrietta Creek with no connectivity to fish-bearing water.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		25726	3	112	10/2/99	0.33	0.07	6.8	RB	S6				M	6	90	C	2	S/S/I	S	1.1	No RB habitat-extremely small and shallow with no instream cover. No channel present in reach 1 (NVC) - no connectivity from lower reaches. No suitable RB spawning habitat, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 93 surveyed - see Table 7) that contained fish in this category - ILP 52002 reach 1 (site 26) in 1997 inventory (ILP 52001 report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. This reach had water, abundant cover, and gravels in the substrate, a channel width of 4.6m and Web depth of 0.55m. Water in this stream during low flow period is supplied by large wetland complex u/s n reach 2.
		25731	2	116	10/3/99	0.72	0.1	7.3	RB	S6	EF	100	94	M	7	40	C	2	S/S/I	M	24.8	No RB habitat- moderately steep, small and shallow. Substrate is fines, mosses, cobbles. No suitable RB spawning habitat, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. **Fish-bearing reaches in this category (31 of 125 surveyed - see Table 7) had CW>1.0m and Web>0.13m. Substrate was gravels and cobbles. Cover was moderate to abundant and diverse and flow was either intermittent or permanent. Morphology was riffle-pool, step-pool or cascade-pool.
		25732	1	117	10/3/99	NVC				NCD								2	S/S/I	S	1.1	No channel present at mapped location.
		25740	1	118	10/21/99	NVC				NCD								4	S/S/I	S	0.0	No continuous channel bed. Not a stream by FPC definition.
		25742	1	119	10/21/99	0.50	0.33	11.0	RB	S6	EF	150	149	L	6	280	C	3	S/S/I	S	0	No RB habitat- flows down valley wall at moderately steep gradient into Helene Lake. No suitable RB spawning habitat, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat.
		25744	1	120	10/21/99	NVC				NCD								4	S/S/I	S	0.0	No channel present at mapped location.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		25745	1	121	10/21/99	NVC				NCD								4	S/S/I	S	0.0	Not a stream by FPC definition. No continuous channel bed, just squishy ground, moss.
		25746	1	122	10/21/99	0.63	0.43	9.5	RB	S6				L	5	200	C	3	S/S/I	S	0	No RB habitat- flows down valley wall at moderately steep gradient into Helene Lake with frequent sub flow. No suitable RB spawning habitat, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat.
		25747	1	123	10/21/99	NVC				NCD								4	S/S/I	S	0.0	Not a stream by FPC definition. Slight dip in hillside with no trace of channel - just a patch of Devil’s Club.
		25749	2	124	10/1/99	NVC				NCD								3	S/S/I	M	13.6	Not a stream by FPC definition - no continuous channel bed.
		35706	1	125	10/2/99	NVC		1.0		NCD								1	S/S/I	S	0.8	Not a stream by FPC definition - no continuous channel bed. Water disperses in shrub wetland.
		35717	2	130	10/2/99	0.97	0.1	3.8	RB	S6	EF	135	212	M	5	60	C	1	S/S/I	M	29.8	No RB habitat - channel shallow and filled with vegetation and algae. No suitable RB spawning habitat, no instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. **Fish-bearing reaches in this category (64 of 215 surveyed - see Table 7) had CW>0.8m and Web>0.17m. Substrate was either fines (in LC morphology) or gravels and cobbles. Cover was moderate to abundant and flow was either intermittent or permanent. Morphology was generally riffle-pool.
		35720	2	131	10/2/99	0.70	0.13	12.0	RB	S6				L				3	S/S/I	S	0	No RB habitat- channel totally dry. Moderately steep. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat.
		35722	1	132	10/2/99	NVC		3.0		NCD								1	S/S/I	S	0.8	Not a stream by FPC definition - no continuous channel bed. Seeps through squishy ground along gully floor.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		35734	2	133	10/2/99	0.43	0.1	6.0	RB	S6	EF	20	110	M	6	130	C	2	S/S/I	S	1.1	No RB habitat - frequent sub flow, small, exposed, extremely shallow with no instream cover. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 93 surveyed - see Table 7) that contained fish in this category - ILP 52002 reach 1 (site 26) in 1997 inventory (ILP 52001 report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. This reach had water, abundant cover, and gravels in the substrate, a channel width of 4.6m and Web depth of 0.55m. Water in this stream during low flow period is supplied by large wetland complex u/s n reach 2.
	480-927700-23500		6	135	9/21/99	NVC				NCD								1	I/M/T	M	25.3	Not a stream by FPC definition - no continuous channel bed. Bog with no defined channel - mudholes with water and salamanders!
		25757	2	136	9/21/99	NVC				NCD								3	S/S/I	S	0	Not a stream by FPC definition - no continuous channel bed.
		25759	2	137	9/21/99	NVC				NCD								3	S/S/I	S	0	Not a stream by FPC definition - no continuous channel bed
		25760	1	138	9/21/99	NVC		18.0		NCD								3	S/S/I	S	0	Not a stream by FPC definition - no continuous channel bed. Water percolates through colluvial fan.
		33702	1	139	9/28/99	NVC				NCD								2	S/S/I	M	24.8	No channel present at mapped location.
		33707	1	140	9/28/99	NVC				NCD								3	S/S/I	S	0	No channel present at mapped location.
		33708	1	141	9/28/99	NVC				NCD								2	S/S/I	M	24.8	No channel present at mapped location.
		33710	1	142	9/28/99	NVC				NCD								3	S/S/I	S	0	Not a stream by FPC definition - no continuous channel bed. Just shallow, disconnected pools in forest.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		33711	1	143	9/28/99	0.52	0.17	4.0	RB	S6				L				1	S/S/I	S	0.8	No RB habitat - channel totally dry. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
		43713	1	146	9/28/99	NVC				NCD								1	S/S/I	M	29.8	Not a stream by FPC definition - no continuous channel bed, just dry gully.
		42704	1	147	10/3/99	NVC		13.0		NCD								3	S/S/I	S	0	Not a stream by FPC definition - no continuous channel bed, just dry gully.
		42705	1	148	10/3/99	NVC				NCD								4	S/S/I	S	0.0	Not a stream by FPC definition - no continuous channel bed.
		42707	1	149	10/3/99	0.95	0.1	1.8	RB	S6	EF	100	136	M	8	70	C	1	S/S/I	S	0.8	No RB habitat - channel small, extremely shallow trickle over fines, organics. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Wb depth of 0.33m.
		42708	1	150	9/28/99	NVC				NCD								1	S/S/I	S	0.8	Not a stream by FPC definition - no continuous channel bed. Discontinuous, stagnant pools.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		42711	2	151	10/4/99	NVC		9.5		NCD								3	S/S/I	S	0	Not a stream by FPC definition - no channel present.
		32704	1	156	10/9/99	NVC				NCD								3	S/S/I	S	0	Not a stream by FPC definition. No continuous channel bed - just squishy ground in gully.
		32706	1	157	10/9/99	NVC		0.5		NCD								1	S/S/I	S	0.8	Not a stream by FPC definition. No continuous channel bed - just squishy ground in alder patch..
		42715	1	158	10/9/99	0.48	0.37	20.5		S6				L				4	S/S/I	S	0.0	No RB habitat - channel totally dry and too steep for any potential fish use. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat.
		32714	2	159	10/9/99	1.00	0.57	15.8	RB	S6				L	4	50	L	3	S/S/I	M	13.6	No RB habitat - small, steep, very shallow (unable to sample). No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. **Fish-bearing reaches in this category (8 of 59 surveyed - see Table 7) had CW>1.8m and Web>0.17m. Substrate was mainly cobbles with gravels/boulder/rock. Cover was trace to abundant and flow was permanent. Morphology was step-pool or cascade-pool.
		42717	1	161	10/3/99	NVC				NCD								4	S/S/I	S	0.0	Not a stream by FPC definition. No continuous channel bed - no banks, no water.
		42718	1	162	10/3/99	NVC				NCD								4	S/S/I	S	0.0	Not a stream by FPC definition. No continuous channel bed - slightly wet ground, moss.
		42719	1	163	10/3/99	NVC				NCD								3	S/S/I	S	0	Not a stream by FPC definition. No continuous channel bed - slightly wet ground.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		32724	1	164	10/3/99	0.57	0.07	2.0	RB	S6	EF	100	68	M	8	100	C	1	S/S/I	S	0.8	No RB habitat - tiny, very shallow, ephemeral channel over fines. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
		32725	1	165	10/3/99	0.73	0.1	3.5	RB	S6	EF	100	84	M	9	70	M	1	S/S/I	S	0.8	No RB habitat - tiny, very shallow, ephemeral channel over fines, moss, algae. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
		32728	3	166	10/9/99	1.70	0.4	13.7	RB	S6	EF	120	143	M	3	50	C	3	S/S/I	M	13.6	8m high cascade 170m d/s from upper boundary of this reach blocks fish passage. No fish populations present above the cascade. Channel dry below cascade. **Fish-bearing reaches in this category (8 of 59 surveyed - see Table 7) had CW>1.8m and Web>0.17m. Substrate was mainly cobbles with gravels/boulder/rock. Cover was trace to abundant and flow was permanent. Morphology was step-pool or cascade-pool.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow	(°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured	
		32732	1	168	10/9/99	0.35	0.1	3.0	RB	S6	EF	80	82	M	5	350	C	1	S/S/I	S	0.8	No RB habitat - tiny, very shallow and lacks instream cover for fish. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. ** Only 1 reach (of 118 surveyed - see Table 7) that contained fish in this category - ILP 12522 reach 1 (site 11) in 1998 inventory (Nechako report), which flowed directly into a confirmed fish-bearing reach where RB were abundant. However, RB were found in ILP 12522 only for the first 30m near mouth before habitat deteriorated and no fish were captured. This stream had water, abundant cover, and gravels in the substrate, a channel width of 0.7m and Web depth of 0.33m.
	480-927700-66700-78500		6	170	10/8/99	1.08	0.2	0.3	RB	S6	EF	140	157	M	4	100	C	1	I/M/T	S	11.1	No RB habitat- channel shallow and totally exposed over fines. Water stagnant, filmy. Gammaridae abundant indicating lack of fish use. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed. **Fish-bearing reaches in this category (3 of 27 surveyed - see Table 7) had CW>0.9m and Web>0.32m. Substrate was either fines (in LC morphology) or gravels. Cover was abundant and flow was permanent. These reaches flowed directly into confirmed fish-bearing reaches.
	480-927700-66700-80800		2	171	10/7/99	1.44	0.63	1.1	RB	S6	EF	150	293	M	4	70	L	1	S/S/I	M	29.8	Historical cascade barrier at end of reach 1 d/s blocks fish passage. No fish populations present above the cascade. NFC in 1998 operational inventory and in 1999 inventory above the cascade.
		32745	1	178	10/7/99	NVC				NCD								2	S/S/I	S	1.1	Not a stream by FPC definition. No channel present.

Table 8: Summary of data from surveyed non-fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Date	Cw (m)	Wb (m)	Grad (%)	Expected Species	FPC	Sampling Specs			Stream Conditions				Categorized Historical Information (1997-1999 Site Data Sampling Results)				Comments
											Method	(m)	(s)	Flow (°C)	(uS)	Turb	Grad Class	Pattern Class	Size Class	% of reaches with fish captured		
		32747	1	180	10/7/99	0.80	0.17	0.0	RB	S6	EF	100	182	M	5	80	C	1	I/M/T	S	11.1	No RB habitat - shallow channel filled with algae, mosses and organics. Flows through swamp with no suitable salmonid habitat. No suitable RB spawning habitat, lacks sufficient instream cover for potential RB rearing at higher flow. No potential overwinter habitat observed and no lakes/wetlands u/s in system to provide perennial habitat. **Fish-bearing reaches in this category (3 of 27 surveyed - see Table 7) had CW>0.9m and Web>0.32m. Substrate was either fines (in LC morphology) or gravels. Cover was abundant and flow was permanent. These reaches flowed directly into confirmed fish-bearing reaches.

4.5.3 Follow-up Sampling Required

Table 9 on the following page summarizes the need for follow-up sampling in sampled reaches where fish presence has been inferred. The table doesn't include inferred fish-bearing reaches where fish presence was confirmed in upstream reaches. A level of confidence has also been included in the table to facilitate prioritization of the follow-up sampling process. Each reach has been assigned a priority number of either 1 or 2 where,

- **Priority 1:** unlikely fish use (marginal fish habitat at any time of year or isolated by obstruction with insufficient sampling to confirm a non fish-bearing status)
- **Priority 2:** likely fish use (fish habitat available or potentially available and easily accessible from confirmed or inferred fish-bearing reaches)

The interpretive maps reflect this prioritization process. A dashed blue line has been used to indicate that fish presence has been inferred but that fish absence is suspected in that reach. Priority 1 reaches fall within this criteria. A dashed red line has been used to indicate that fish presence has been inferred and is considered likely. Priority 2 reaches fall within this criteria.

Not all inferred fish-bearing reaches have been designated for follow-up sampling. Reaches where the inferred fish-bearing designation is considered unlikely to change, regardless of the results of the follow-up sampling (i.e. habitat available and easily accessible), have not been placed in this table. Rather, the follow-up sampling is intended to focus on those streams where potential habitat exists and must be evaluated during a different time of year, and those streams where sampling conducted was considered to be insufficient to classify the reach as non-fish bearing.

It is anticipated that follow-up sampling in Priority 1 reaches will result in a confirmation of fish absence in a reach, while sampling in Priority 2 reaches have a high probability of confirming fish presence. However, some discretion should be used in the follow-up sampling process. In some reaches, sampling conditions were not conducive to the capture of fish and more successful attempts at sampling may be made in bordering reaches that weren't sampled but may offer better habitat and thus a better probability of confirming fish presence in the system.

Table 9: Follow-up sampling required for classification of inferred fish-bearing reaches in the Helene/Augier-Pinkut Sub-units

Stream Name	Watershed Code	ILP	Reach	Site	Timing	Method	Priority	Comments
		24702	1	92	June/July	EF	1	Determine rearing habitat suitability for RB and u/s distribution limit.
	480-927700-23300-36300		2	94	June/July	EF	1	Determine rearing habitat suitability for RB and u/s distribution limit.
	480-927700-23300-78300		1	97	June/July	EF	1	Determine u/s distribution limit for RB in Marlin C.. Suspect barrier d/s (between reach 7 and 10) in Marlin C. Sample reach 8.
		25721	2	110	June/July	EF	1	Determine rearing habitat suitability for RB and u/s distribution limit.
Coldwater C.	480-927700-23400-34400		3	127	June/July	EF	1	Determine u/s distribution limit for RB.
Coldwater C.	480-927700-23400-34400		5	128	June/July	EF	1	Determine u/s distribution limit for RB.
	480-927700-23400-34400-5670		6	129	June/July	EF	1	Determine u/s distribution limit for RB.
	480-927700-23500		3	134	June/July	EF	1	Determine u/s distribution limit for RB.
		42712	1	154	June/July	MT	1	Determine use by BB.
		42714	1	155	June/July	EF	1	Determine rearing habitat suitability for RB and u/s distribution limit.
		32741	1	172	June/July	EF/MT	1	Determine use by BB and RB.
	480-927700-23300-36300		1	93			2	Determine u/s distribution limit for RB.
	480-927700-23400-14500		2	102			2	Determine u/s distribution limit for RB.
	480-927700-23400-19000		2	105			2	Determine u/s distribution limit for RB.
	480-927700-49000		1	144			2	Determine u/s distribution limit for RB.
	480-927700-49700		1	145			2	Determine u/s distribution limit for RB.
		32731	1	167			2	Determine u/s distribution limit for RB.
	480-927700-66700-96000-4000		4	179			2	Determine u/s distribution limit for RB.

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6. List of Appendices

Appendix I: FDIS Reach/Site Summary, Site Card and Fish Form Reports and Representative Photographs

Appendix II: Hardcopy maps

**Reconnaissance (1:20,000) Fish and Fish Habitat
Inventory**

**Helene and Augier-Pinkut Sub-units
Fish Inventory - 1999**

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