

Wild, Threatened, Endangered, and Lost Streams of the Lower Fraser Valley Summary Report 1997

Lower Fraser Valley Stream Review, Vol. 3

Prepared for:

Fraser River Action Plan

Habitat and Enhancement Branch
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PREFACE

This study was conducted to evaluate the condition of the streams of the Lower Fraser Valley. The **Wild, Threatened, Endangered and Lost Streams of the Lower Fraser Valley – Summary Report** provides a classification that indicates the health of a stream, based on a number of criteria. The watersheds in the Lower Fraser Valley (LFV) have been subjected to intense urban and rural development pressures for many decades. The great majority of pre-settlement streams in the Vancouver area have been buried or culverted, and many are effectively lost (Lost Streams map poster, DFO, 1995). This report reviews the condition of many of the remaining streams in the Lower Fraser Valley, and classifies them as lost, endangered, threatened, or wild, based on the number and types of impacts on the stream, including channelization, water diversion, removal or alteration of riparian vegetation, and pollution. This information can be used at a strategic level when determining needs for habitat protection and restoration for endangered and threatened streams which still have the potential to produce viable populations of salmon and other species of fish.

It is hoped that this document (and its companion publications) will be used by all potential partners to better steward this valuable public resource, and direct development away from environmentally sensitive aquatic areas. To assist stewardship efforts, the Fraser River Action Plan, Fisheries and Oceans Canada (DFO) has produced this document, which is part of a three volume package of information on streams of the Lower Fraser Valley. The three volumes in the **Lower Fraser Valley Stream Review** series include:

Volume 1: Lower Fraser Valley Streams Strategic Review, 1997 (1998)*

A comprehensive 450 page review of salmon bearing streams in the Lower Fraser Valley. Contains maps and appendices (watershed codes, escapement data, stream hydrographs).

Volume 2: Lower Fraser River Stream Inventory Atlas (First edition, September 1996; Second edition, with Stream Name Maps, March 1998*)

Contains 47 orthophoto maps (and accompanying stream name index maps) with TRIM overlay, showing fish presence/absence. *The atlas or individual maps can be purchased from: Archetype Print Ltd., #459-409 Granville Street, Vancouver, B.C., V6C 1T2, ph: 604-602-0282; fax: 604-602-0283.*

Volume 3: Wild, Endangered, Threatened and Lost Streams of the Lower Fraser Valley –Summary Report, 1997 (1998)

A 40 page report on the classification of 662 streams in the Lower Fraser Valley as lost, endangered, threatened or wild. Includes classified streams map of the Lower Fraser Valley.

Volumes 1 and 3 are available from Fisheries and Oceans Canada at the address below.

For further information please contact:
Habitat and Enhancement Branch
Fisheries and Oceans Canada
360 - 555 W. Hastings St.
Vancouver, B.C. V6B 5G3
fax: 604-666-0417

***Note:** For more information about fish distribution, stream mapping, the Streamkeepers database and Urban Salmon Initiative, a Community Directory and Stream Survey Tracking System, see the Fish Habitat Inventory and Information Program on the Fisheries and Oceans Canada (Pacific Region) Internet site, at <<http://habitat.pac.dfo.ca>>.

USE OF THIS REPORT

Classification Process

The *Wild, Threatened, Endangered and Lost Streams of the Lower Fraser Valley – Summary Report* was intended to provide a snapshot in time of the overall condition of a stream using a number of stream health indicators. These indicators were used to assign stream classifications, which were determined through interviews, literature and map reviews, and consensus based assessments. Both quantitative (impact criteria) and qualitative (field knowledge of the area) measures were used. Neither the report nor the map are intended to be used for specific stream inventory needs.

A significant number of streams have been classified; however, this exercise could not be as thoroughly comprehensive as DFO and the authors felt it could be due to limitations of time and resources. In addition, since conditions are constantly changing, especially in the settlement areas of the Lower Fraser Valley, stream conditions may have changed since the time of this study - in either a positive or negative direction.

Classified Streams Draft Map

The map accompanying this report is a Draft Map, showing the results of the classification process. It is not considered a final product due to the limitations in time and resources for this project (as noted above). The map is a digital product and provides general graphic representation of the streams and rivers in the Lower Fraser Valley. The map base is the 1:50,000 BC Watershed Atlas. As a result, many small watercourses have not been captured, and not all of the streams in the database could be shown (i.e. those that do not have watershed codes). Since watershed codes have been used stream classification digitization process, a record of an impact under the criteria used to assess the stream triggers colour coding of the entire stream. (For some of the larger systems, this automatic process has been modified).

Use of the Report and Map

While the classification analysis and the stream map do show certain trends in stream health according to area, agencies, groups or individuals wishing to address management concerns regarding a given stream system should not use this document or map as an exclusive source of information. On-the-ground reconnaissance, interviews with agencies and individuals knowledgeable about the system, review of maps, etc., should be conducted. Resources for current information include Fisheries and Oceans Canada staff (such as Community Advisors), Ministry of Environment, Lands and Parks (MELP) staff, local community stream stewardship groups (e.g. Streamkeepers group), DFO and MELP Internet inventory and mapping resources (described in text), and municipal planning offices.

ACKNOWLEDGEMENTS

The **Wild, Threatened, Endangered and Lost Streams of the Lower Fraser Valley –Summary Report** was funded and produced by the Fraser River Action Plan (FRAP), Fisheries and Oceans Canada (DFO), under the federal Green Plan; the Habitat Restoration and Salmon Enhancement Program (DFO) also assisted with funding. The BC Ministry of Environment, Lands and Parks (Surrey Region) provided technical support throughout the project. This document is Volume 3 of the Lower Fraser Valley Stream Review series.

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Lost Streams coverage for Township of Langley: Langley Environmental Partners Society

Workshop participants and individuals who contributed to the stream classification exercise are included in Appendix E.

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1. INTRODUCTION

The watersheds in the Lower Fraser Valley (LFV) have been subjected to intense urban and rural development pressures for many decades. The great majority of pre-settlement streams in the Vancouver area have been buried or culverted, and many are effectively lost (Lost Streams of the Lower Fraser River map poster, DFO, 1995). Most of the remaining streams in the Lower Fraser Valley have been altered in one or more ways, including channelization, diversion, removal or alteration of riparian vegetation, and by pollution. This project was designed to expand the scope and study area covered by the original Lost Streams map poster (DFO, 1995), which focused on the area from Vancouver to Pitt Meadows. The objectives of the current project are to 1) identify lost streams, and to 2) evaluate the condition of the streams that remain, for the entire Lower Fraser Valley (LFV). Both projects were conducted by the Fraser River Action Plan, Fisheries and Oceans Canada (DFO).

The LFV study area includes all the streams from the Strait of Georgia east to the Coquihalla Watershed (Hope), and from the north shore mountains to the United States border. A second analysis of streams most directly influenced by settlement was also conducted. Streams that are outside of the major settlement areas (i.e. upper Stave, Pitt, Coquitlam Rivers etc.) were not included in this analysis (see Figure 1 for delineation of settlement area). In addition, the mainstem of the Fraser River and the estuary area were not included in this review.

The results of this research have been plotted on a 1:50,000 basemap (Watershed Atlas), and recorded in the DFO Geographic Information Systems (GIS) database. This report provides details of the methodology used for the study, and summarizes the results of the review of the condition of streams in the Lower Fraser Valley.

2. APPROACH AND METHODOLOGY

The results of this study are a compilation of information from many sources –maps, airphotos, reports, and various databases. In addition, a series of workshops attended by individuals who work closely with streams in the area yielded a wealth of data based on many years of field experience.

2.1 Lost Stream Inventory

Historical maps and surveyor field notes of the study area, circa the 1860s, were obtained from the Office of the Surveyor General, Ministry of the Environment, Lands, and Parks (MELP). The map references are provided in Appendix C. The historical maps were compared with contemporary National Topographic System (NTS) maps (1:20,000 and 1:50,000) and the 1:50,000 BC Watershed Atlas in order to identify streams that are no longer present in the area. These lost streams were highlighted on photocopies of the historical maps. The lost streams were digitized and incorporated into the DFO GIS database.

Figure 1 - Map of Study Area

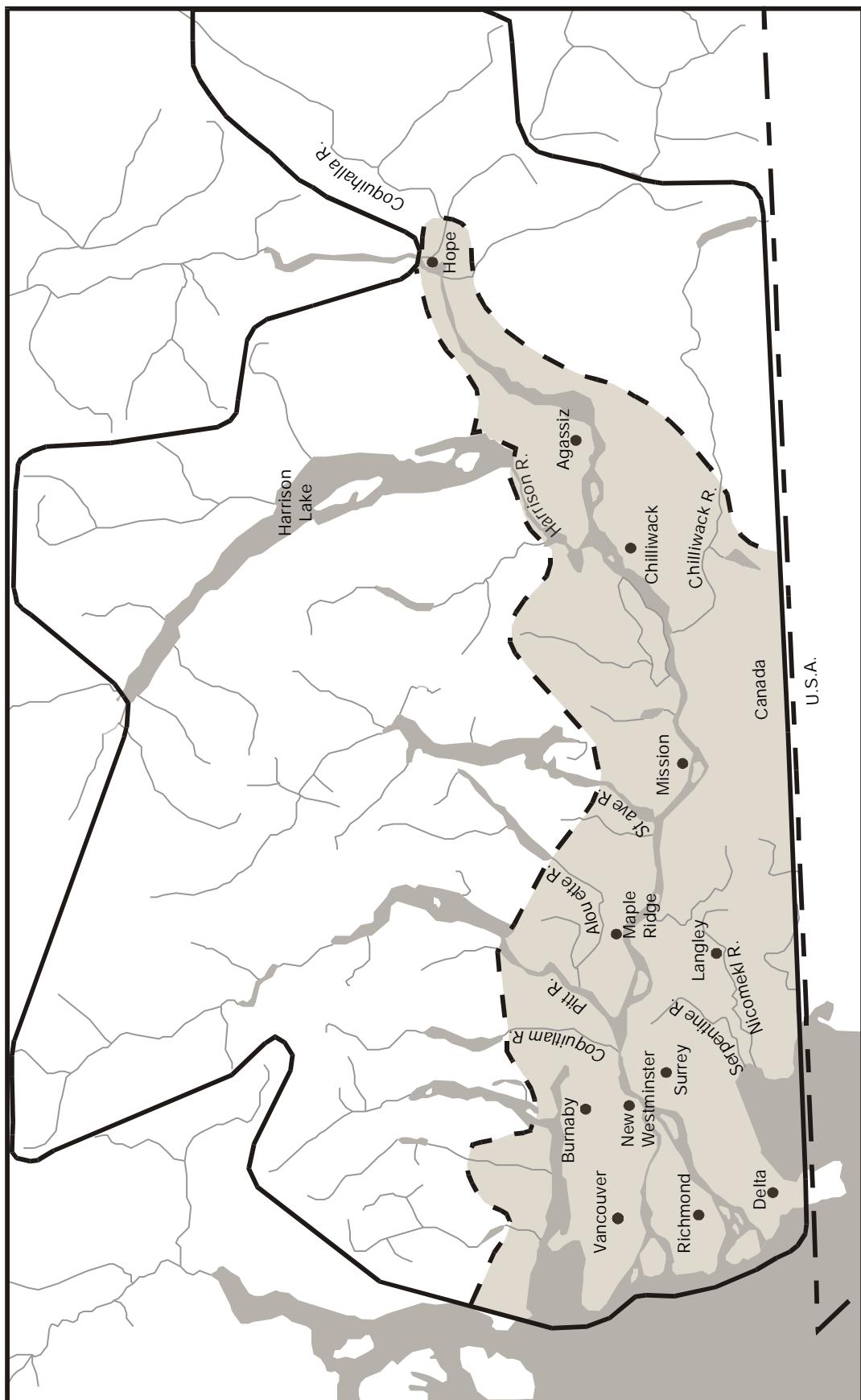


Figure 1. The Lower Fraser Valley Study Area.

The Lower Fraser Valley Assessed Streams Area.
 The Lower Fraser Valley Settlement Area Streams.

2.2 Assessment of Existing Streams

2.2.1 Classification

Streams are classified as **lost** if they have been culverted, paved over, drained or filled, and generally no longer exist as a surface waterway.

The remaining streams have been classified as **endangered**, **threatened**, or **wild**. To classify streams into these categories, a set of impact criteria were developed to evaluate the status of each stream in the study area. The impact criteria are as follows:

- significant loss of riparian vegetation along more than 50% of the fish frequented length of the stream,
- channelization, armourization, or dyking of over 50% of the fish frequented length of the stream,
- effective impermeable area (EIA) covering approximately 10%, or greater, of the stream's watershed¹,
- greater than 50% diversion of stream flow (i.e. diversion out of the system), or significant manipulation of flow,
- significant water quality problems, i.e. temperature, water chemistry (including urban impacts; not including impacts from logging),
- logging has been extensive in the watershed, and impacts (direct or related) have been obvious,
- urbanization - settlement in the watershed has significantly altered the stream basin
- other impacts (i.e. agricultural/urban impacts, anthropogenic barriers, and cumulative effects of these impacts).

Streams that meet one criterion are considered **threatened**; those that meet more than one criterion are classified as **endangered**. If a stream is not significantly impacted by any of these criteria, it is classified as **wild**. It must be emphasized that wild streams are not necessarily in a pristine state in that many of them may have been logged historically or subjected to other modifications and alterations; however, they are considered to be in relatively good condition or at a higher level of recovery. Streams that are impacted by several factors, but to a lesser extent than stipulated by the criteria, are considered **threatened** by proximity (i.e. by proximity to urbanization). The category of 'other' identifies additional specific impacts (i.e. agricultural and/or urban impacts, barriers, and their cumulative effects). (See Appendix A for the list of streams and their classifications. Appendix B lists the total number of streams fulfilling each criterion within the categories of endangered, threatened, and wild.)

¹ Effective impervious area (EIA) is a measure of the total area where water does not infiltrate into the soil and that is connected directly to the drainage network. EIA is a useful indicator of development activity, and provides a simple but effective method to predict the future quality of streams, based on measurable land use change. Research shows that once a watershed is covered by more than 10% EIA, irreversible changes in hydrology and channel morphology occur, causing a significant loss of fish habitat features.

The mainstem and lateral channels of the Fraser River have not been included in this review.

2.2.2 Reports, Interviews and Orthophoto Examination

Relevant reports from the study area were compiled, reviewed, and the streams identified in these reports were evaluated against the criteria. The reports that were reviewed and the individuals who were interviewed are listed in Appendix D. Where there was little published data available on a stream's condition, colour digital orthophotos (1995) on CD (one metre pixel) were examined to provide additional information (Appendix C).

2.2.3 Development of Database

Digital files from the Fish Habitat Inventory and Information Program Database, Department of Fisheries and Oceans (<http://habitat.pac.dfo.ca>), and from the Fisheries Inventory Section Database, Ministry of Environment, Lands, and Parks' Resource Inventory Branch (<http://www.env.gov.bc.ca/fsh/ids/dman/>), were integrated to create a Microsoft Excel file that includes all the streams within the study area for which watershed codes were available. Gazetted names were added for reference. Other streams were later added to the file through input from community members and agency staff. The information from the literature review and orthophoto examination were incorporated into the digital file.

2.2.4 Supplementary Stream Information Workshops

Four Stream Information Workshops (winter, 1997) were conducted to confirm and to supplement the information in the database. (Workshop participants are listed in Appendix E). The study area was divided into four areas, each of which was the focus of a workshop. The workshops were attended by individuals from the Department of Fisheries and Oceans, Ministry of Environment, Lands and Parks, local municipalities, community group representatives and consulting companies. Area 1 covers the area south of the Fraser River from the Georgia Strait to Langley. Area 2 extends along the south side of the Fraser River from Abbotsford to Hope. The north side of the Fraser River from Hope to the Stave River is covered in Area 3. The final workshop (Area 4) included the streams along the north shore of the Fraser River from the Stave River to Musqueam Creek, and tributaries to Burrard Inlet extending west to Nelson Creek in West Vancouver. (Major watersheds associated with each area are listed in Appendix F.)

Time constraints at the workshops limited the amount of discussion possible for each stream. Often, once two criteria were identified for a particular stream it was classified as endangered; only when time permitted were additional criteria assessed. (Many endangered streams would have fulfilled additional criteria had there been time and resources to extend the review.) The information from the workshops was added into the database, supplementing and updating information from written reports and orthophotos.

2.2.5 Map Product (Draft Map)

The watershed codes and stream status information in the database were integrated into the DFO GIS database. A colour coded map showing the condition of these streams – lost, endangered, threatened, or wild – is attached to this report. This is considered a draft map and not a final product, due to the limitations of time and resources. It should be noted that because of the scale (1:180,000, produced on a 1:50,000 Watershed Atlas

basemap), many small streams of the Lower Fraser Valley are not shown, and not all streams that are in the database could be represented on this map. Since classification is tied to a stream's watershed code, a record of an impact triggers the classification of the entire stream (this has been modified for some of the larger systems in the digital file of the map).

3. RESULTS

3.1 Database Organization

The original database –**LFV Streams** – includes 1,202 streams, most with watershed codes, within the study area. All gazetted streams and many unnamed streams are included in this database. The second database –**LFV Assessed Streams** – lists the criteria fulfilled by, and status of, 662 streams. Unnamed streams/streams without a watershed code/minor tributaries unknown to workshop participants/not referenced in any of the review literature – were excluded from this second database. At the same time, some new streams, which have no watershed codes, but are known to agency staff or community groups, were added to database. A third database –**LFV Settlement Area Streams** – was created to assess the condition of streams in areas of settlement influence. It excludes streams outside the areas of significant settlement influence, including the watercourses located upstream of impassable dams on the Stave, Alouette, Coquitlam, and Capilano Rivers. It also excludes Indian Arm and tributaries; upper Lynn Creek and Seymour River tributaries; Pitt, Harrison and Chilliwack Lakes and tributaries; and other watercourses which are beyond significant settlement influences. These exclusions created the LFV Settlement Area Streams database, which contains 478 streams. A summary of the data from each of the databases is provided in Table 1.

	Wild	Threatened	Endangered	Total (existing)	Lost*	Total (including lost)
LFV Assessed Streams Database						
Area 1 - Steveston to Langley	0	8	95	103	45	148
Area 2 - Abbotsford to Hope	27	58	142	227	6	233
Area 3 - Stave River to Hope	22	72	36	130	6	136
Area 4 - West Vancouver to Stave River	57	43	102	202	60	262
Total	106	181	375	662	117	779
Percent of total not including lost streams	16%	27%	57%	100%	n/a	n/a
Percent of total including lost streams	14%	23%	48%	n/a	15%	100%
LFV Settlement Area Streams Database						
Area 1 - Steveston to Langley	0	8	95	103	45	148
Area 2 - Abbotsford to Hope	8	17	142	167	6	173
Area 3 - Stave River to Hope	4	34	35	73	6	79
Area 4 - West Vancouver to Stave River	17	16	102	135	60	195
Total	29	75	374	478	117	595
Percent of total not including lost streams	6%	16%	78%	100%	n/a	n/a
Percent of total including lost streams	5%	13%	63%	n/a	20%	100%

Table 1. Summary of the existing stream status data for each area.

***Note:** The number of historic streams lost is estimated above and in Figures 2 and 6, but due to the difficulties with registering historic and existing map bases, an element of uncertainty is introduced in identifying lost streams. For this reason, lost streams are not included in the Wild, Threatened, and Endangered Streams Database.

3.2 Lost Streams of the Lower Fraser Valley

Over the past one hundred years of settlement in the Lower Fraser Valley, many streams have been lost – culverted, paved over, filled in. At times it is difficult to determine the exact cause of their disappearance since streams have also been channelized, redirected into other watersheds, or cut off from their tributaries. The lost streams coverage is derived from three sources: the Lost Streams map poster (1995), the Langley Environmental Partners Society (for the Langley area), and a mapping exercise for this project, which identified a number of lost streams in the eastern Fraser Valley. The combination of this research shows that approximately 117 streams, many of them salmon bearing, appear to have been physically lost in the Lower Fraser Valley since records first started to be kept. Lost streams include those that no longer exist, or have been severely altered with much of their length now underground. It should be noted that this lost streams total represents a conservative count; further research (beyond the comparison of existing and available historic maps) would be needed in order to determine a more exact figure. Also, it must be appreciated that many other streams have been converted into ditches and much of their fish habitat value lost. However, for the purposes of this study, these latter streams are placed in the endangered category.

3.3 Lower Fraser Valley Assessed Streams

The majority of streams within the LFV Assessed Streams study area are classified as either threatened or endangered (Figure 2). Area 1 (Steveston to Langley) includes several highly developed urban areas. The degradation of streams in this area of flat terrain is greater than elsewhere in the study area (Figure 3). Agricultural impacts endanger many streams in Area 2 (Abbotsford to Hope). The number of wild streams doubles from Areas 1 and 2 to Areas 3 and 4. Area 3 (Stave River to Hope) is less developed than the other areas, and therefore less impacted. The majority of the wild streams in Area 4 (West Vancouver to Stave River) are very small high gradient streams in the north shore mountains that provide minimal direct fish habitat. Many of the ‘wild’ streams in this database are located above dams or lakes and/or in undeveloped areas well removed from settlement influences.

LFV Assessed Streams Database - Wild, Threatened, Endangered & Lost Streams

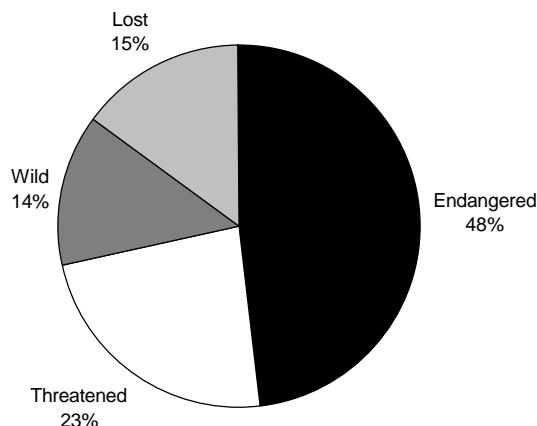
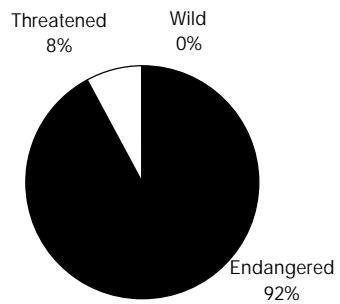


Figure 2. Percentage of streams classified as wild, threatened, endangered, or lost within the entire LFV Assessed Streams study area. **Note:** Many of the ‘wild’ streams in the Lower Fraser Valley are located above dams or lakes and/or in undeveloped

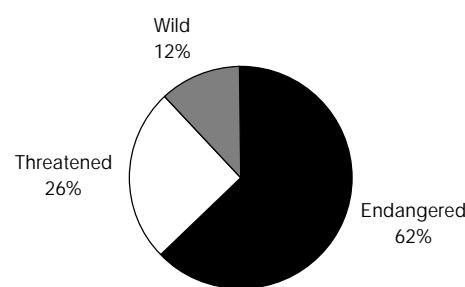
areas well removed from settlement influences.

LFV Assessed Streams Database Analysis

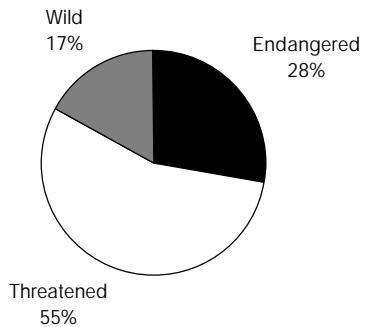
Area 1: Steveston to Langley



Area 2: Abbotsford to Hope



Area 3: Stave River to Hope



Area 4: West Vancouver to Stave River

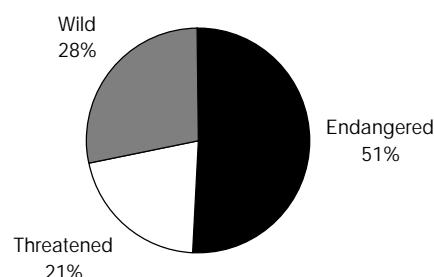


Figure 3. The percentage of existing streams classified as wild, threatened, and endangered for each of the areas included in the LFV Assessed Streams study area.

Note: Lost streams are not included.

Threatened Streams

Threatened streams account for only 8% of the streams included in Area 1. The main source of degradation in the 73% of streams that are threatened in Area 2 is logging (Figure 4). Logging, urban, and agricultural (other) impacts, are the main reasons that 88% of the streams in Area 3 are considered threatened. The 21% of streams in Area 4 that are considered threatened are primarily affected by urban impacts and logging. The percentage of 'threatened' streams that fulfill each criteria in each area is illustrated in Figure 4.

LFV Assessed Streams Database—Threatened Streams Analysis

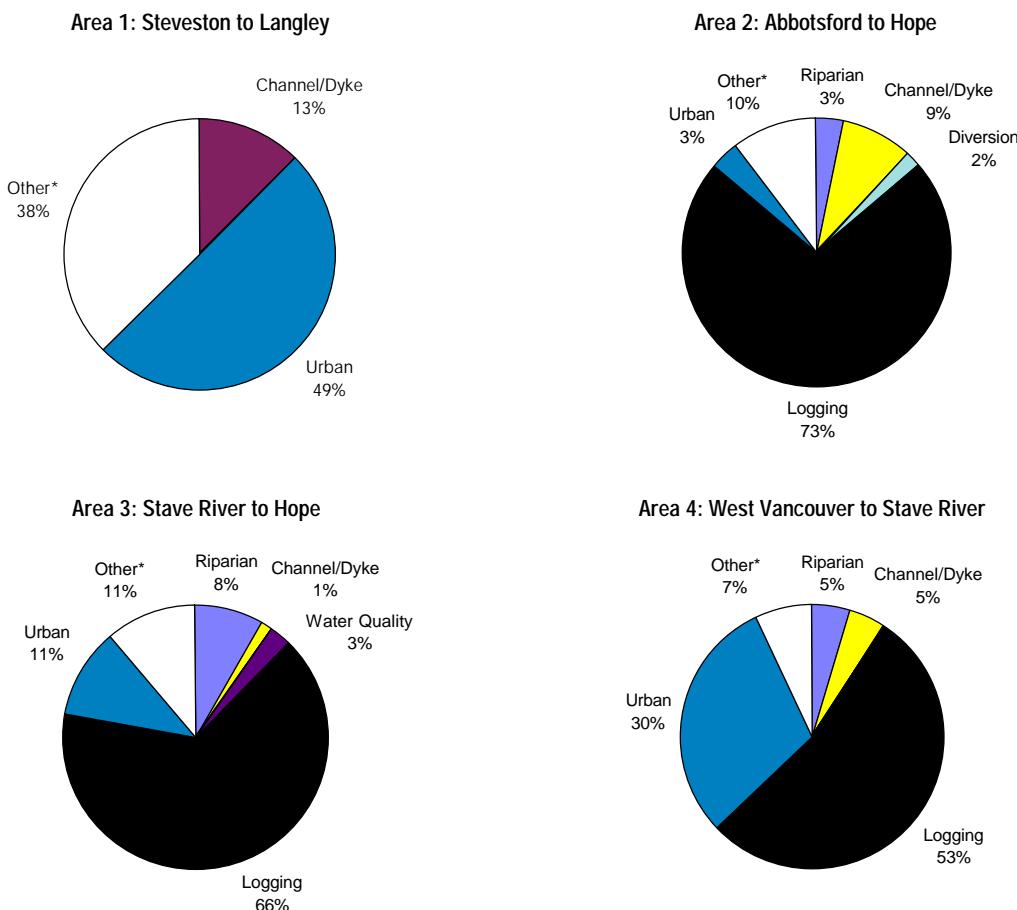
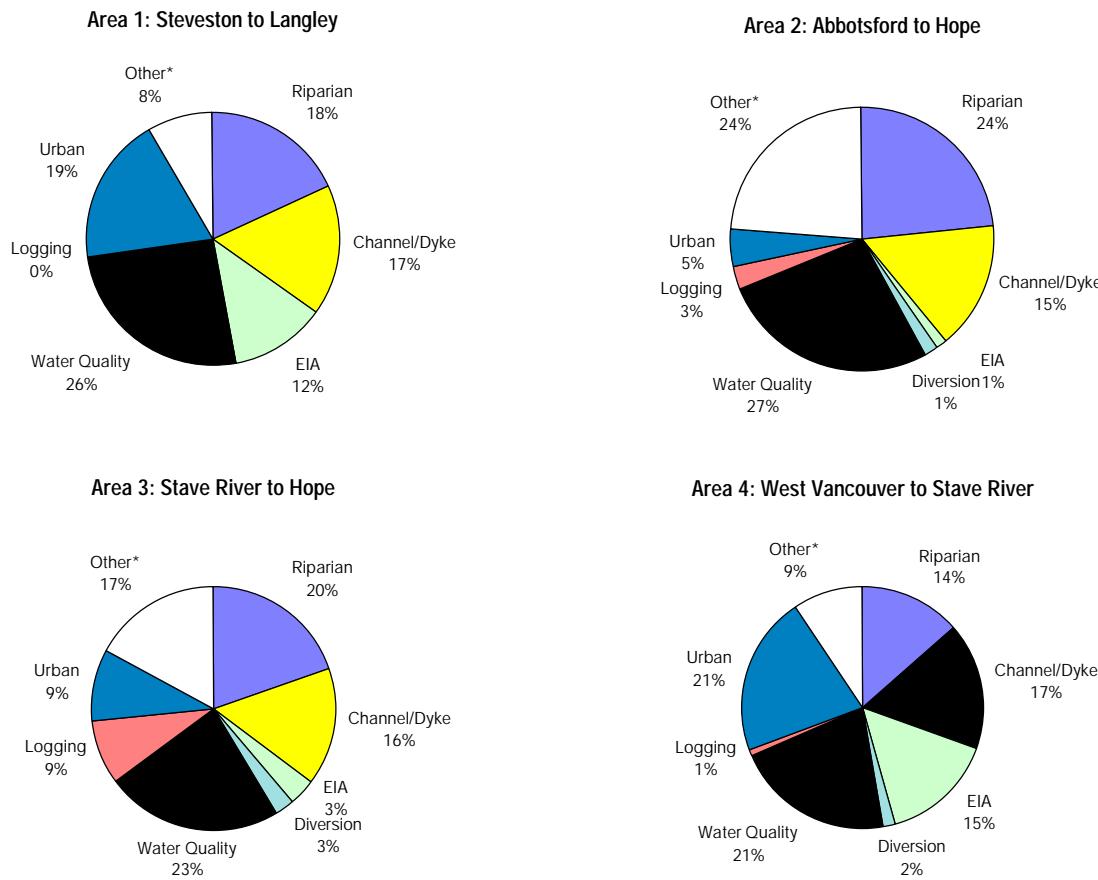


Figure 4. The impact criteria associated with threatened streams in the LFV Assessed Streams study area summarized by location.

Endangered Streams

The following pie charts (Figure 5) summarize the endangered streams data for each area of the LFV Assessed Streams study area. Since all but two endangered streams are also located in the Settlement Area, Figure 5 also provides an analysis of Endangered Streams for the the Settlement Area database.

LFV Assessed Streams Database—Endangered Streams Analysis



*Other: agricultural/urban impacts, barriers, and cumulative effects of these impacts.

Figure 5. The percentage of endangered streams in each area of the LFV Assessed Streams study area that fulfill each criterion.

Endangered streams account for 92% of the streams included in Area 1; many of the impacts are associated with urbanization: riparian removal, channelization, high impervious surface area, and water quality problems. The main impacts on the 62% of streams that are classified as endangered in Area 2 are riparian removal, channelization/dyking, agricultural activities, and water quality problems. Riparian removal, channelization/dyking and water quality account for 59% of the impacts on streams in Area 3. The 51% of streams considered endangered in Area 4 are affected by a variety of impacts, including riparian removal, channelization, and extensively urbanized watersheds.

3.4 Lower Fraser Valley Settlement Area Streams

In order to develop a picture of the condition of streams within the area of settlement influence, streams outside the settlement area were sorted out of the database. The resulting breakdown of the condition of the streams in the area of settlement influence, including lost streams, is shown in Figure 6.

LFV Settlement Area Database - Wild, Threatened, Endangered & Lost Streams

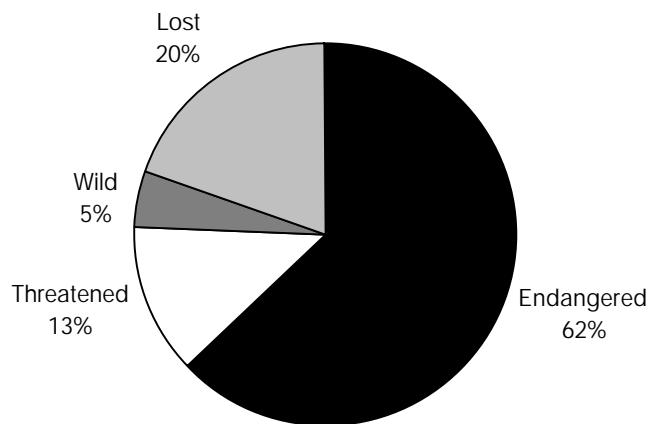


Figure 6. The percentage of streams classified as wild, threatened, endangered, or lost within the LFV Settlement Area.

To create the LFV Settlement Area Streams database, a number of streams have been removed from the LFV Assessed Streams database: the watercourses upstream of impassable dams on the Stave, Alouette, Coquitlam, and Capilano Rivers; tributaries to the upper Lynn and Seymour River watersheds; Indian Arm and tributaries; Pitt, Harrison and Chilliwack Lakes and tributaries; and other tributaries which are beyond significant settlement influences. The narrowing of the study area reduces the database from 662 to 478 entries. All of the excluded watercourses fall within Areas 2, 3 and 4. As a result of excluding the streams outside of the settlement area from the LFV Assessed Streams database, the percentage of wild streams drops from 14% to 5%; the percentage of streams rated as endangered increases from 48% to 62%; and the percentage of threatened streams decreases from 23% to 13% (Figure 7).

Area 1

Area 1 (Steveston to Langley) is not affected by changing the database to cover settlement areas only.

Area 2

The elimination of streams beyond settlement areas of influence in Area 2 (Abbotsford to Hope) reduces the percentage of wild streams in this area by 9% (Figures 3, 8). The database identifies eight wild streams in the settlement range of Area 2 (all are tributaries to Cultus Lake). For the settlement area, the number of threatened streams decreases by 10%, and the number of endangered streams increases by 14%.

Area 3

The percentage of wild streams in Area 3 (Stave River to Hope) is reduced from 17% to only 4% when streams outside settlement areas are excluded (Figures 3, 8). The reduction is due to the exclusion of streams above the Stave River dam and tributaries to Harrison Lake. The streams that are excluded include 37 threatened streams. Most of the threatened streams removed from the database have been impacted by riparian loss or logging. Water quality and riparian removal have impacted most of the endangered streams that have been excluded. When streams outside settlement areas are excluded from the database, the overall percentage of endangered streams in this area increases by 20%, while the percentage of threatened streams decreases by 7% (Figures 3, 8).

Area 4

The exclusion of streams beyond settlement area influences reduces the percentage of wild streams in Area 4 (West Vancouver to Stave River) from 28% to 12% (Figures 3, 8). The wild streams remaining in Area 4 are located in the upper Lynn Creek watershed, on the east side of the Coquitlam River, the west side of the Pitt River (near Widgeon Creek), on the north branch of the Alouette River, and on Cultus Lake. Twenty-seven threatened streams are excluded from this area in the LFV Settlement Area Streams database; most have been impacted by logging. The percentage of streams rated as endangered in this area increases from 51% to 75%, while the percentage of threatened streams drops by 9% as a result of excluding streams considered to be beyond significant settlement influence. Figure 7 compares the percentage of streams falling under each classification for the Assessed Streams and Settlement Area Streams databases.

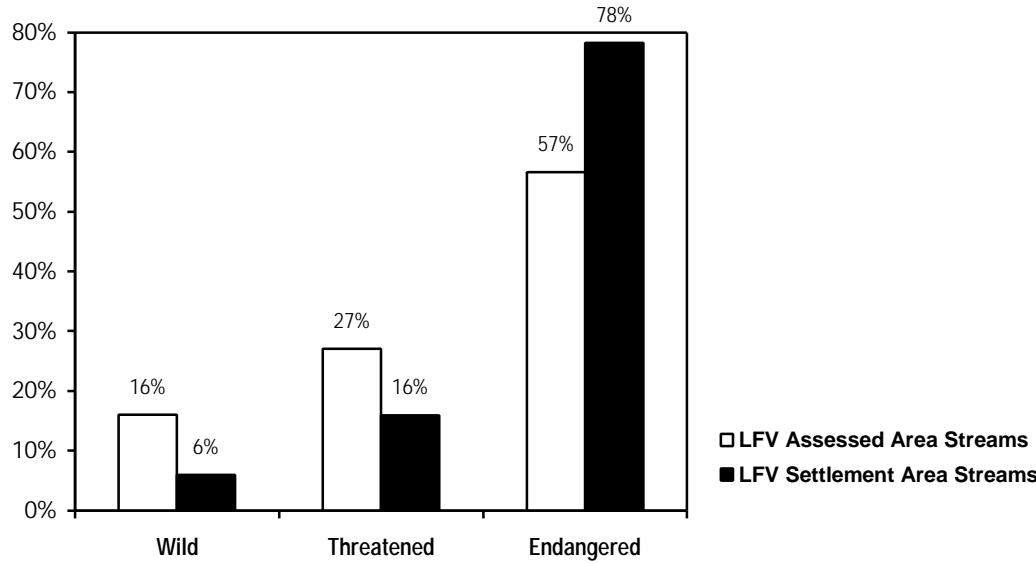


Figure 7. The overall percentage of existing streams (all four areas) classified as wild, threatened and endangered in both the LFV Assessed Streams and Settlement Area Streams databases.

LFV Settlement Area Streams Database Analysis

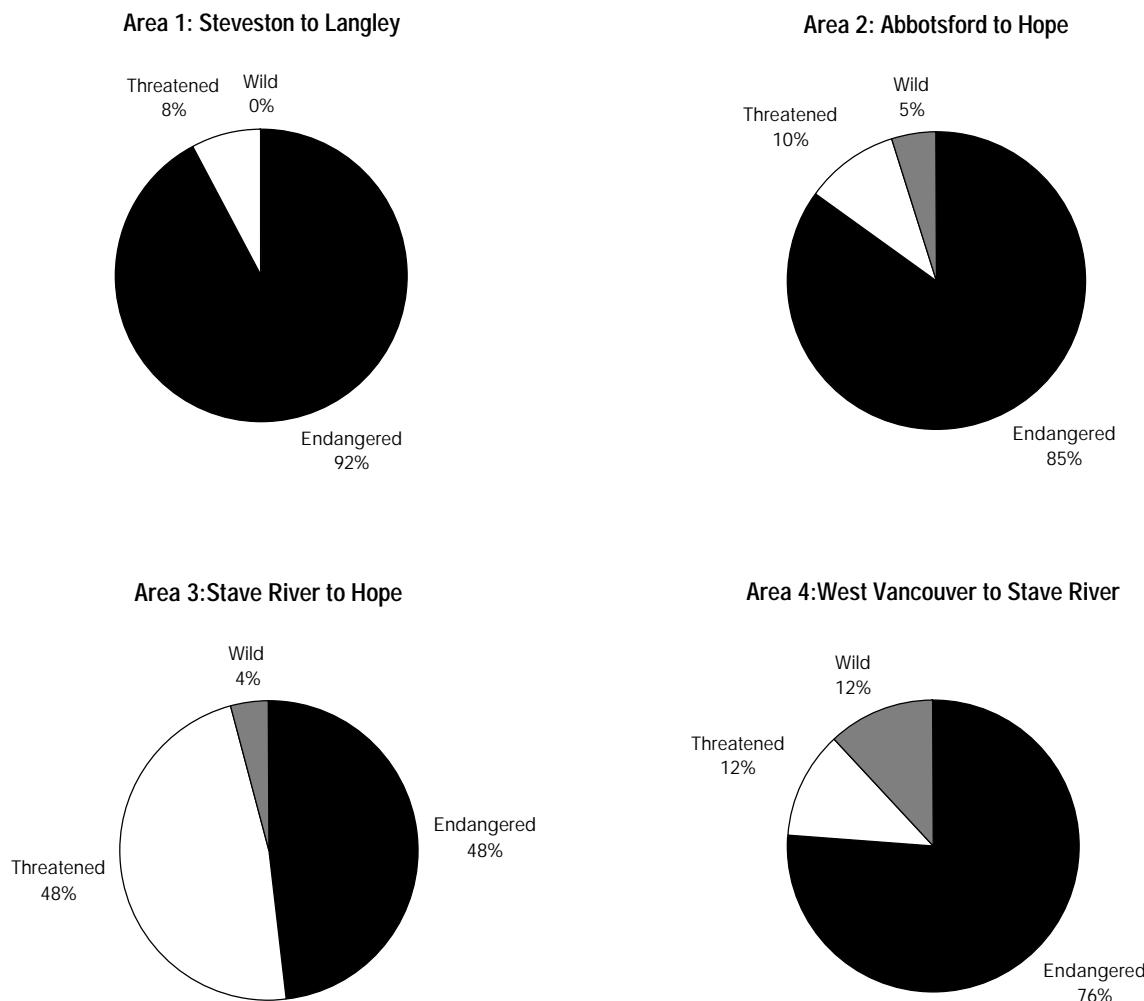
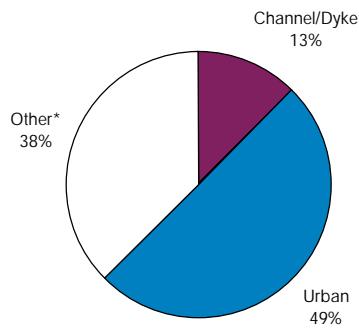


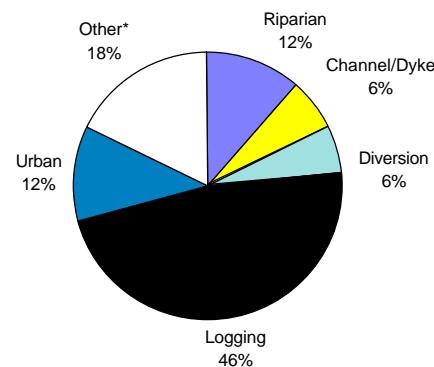
Figure 8. The percentage of existing streams classified as wild, threatened, and endangered in each of the areas included in the LFV Settlement Area Streams database.

LFV Settlement Area Streams Database—Threatened Streams Analysis

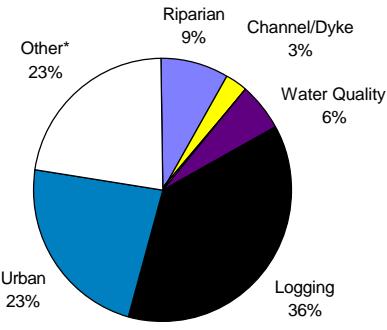
Area 1: Steveston to Langley



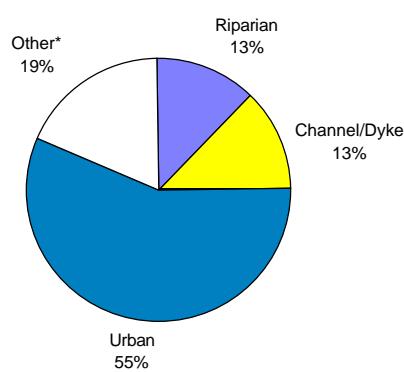
Area 2: Abbotsford to Hope



Area 3: Stave River to Hope



Area 4: West Vancouver to Stave River



*Other: agricultural/urban impacts, barriers, and cumulative effects of these impacts.

Figure 9. The impact criteria associated with threatened streams, summarized by area for the LFV Settlement Area Streams database.

LFV Settlement Area Database—Wild Streams

Area	Watershed	Stream Name
Area #1	none	
Area #2	Sumas River/Lower Chilliwack River (to Tamihi Creek) (all are Cultus Lake tributaries)	Amadis Creek Ascaphus Creek Clear Creek Fin Creek Teapot Creek Unnamed Creek Wells Creek Windfall Creek
Area #3	Fraser River Harrison Lake	Mahood (Gallagher) Creek Sasquatch Creek Thunderbird Creek Trout Lake Creek
Area #4	Alouette River (North) Coquitlam River Lynn Creek Pitt River (excluding tributaries above and to Pitt Lake)	Donegani Creek Gwendoline Creek Jacobs Creek Loon Creek Mayfly Creek Mirror Lake Creek Spring Creek Coho Creek Pritchett (Crystal Creek) Steelhead Creek Kennedy Creek Deiner Creek MacIntyre Creek Munro Creek Stuart Creek

		Widgeon Creek Widgeon Lake Creek
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Table 2. List of streams classified as wild in the LFV Settlement Area Streams database.

Wild Streams Discussion

There are very few wild streams remaining in the Lower Fraser Valley. When considering streams in the area of settlement influence, the number of wild streams decreases from 106 (in the LFV Assessed Streams database) to 29 (in the LFV Settlement Area Streams database). The majority of the remaining wild streams in the LFV Settlement Area Streams database are located in the upper Lynn Creek watershed, on the mid reaches of the Seymour River, on the east side of the mid reaches of the Coquitlam River, on the west side of the Pitt River near Pitt Lake, on the north branch of the Alouette River, and on Cultus Lake (lower reaches of the Chilliwack River). The other wild streams in the LFV Settlement Area Streams database are located in forested areas, with settlement impacts limited to linear development, or proximity to urban areas; they are located on the southeast side of Harrison Lake, and on the north side of the Fraser River west of Hope.

4. CONCLUSIONS

Streams in the Lower Fraser Valley where the land base has been converted from forests to agriculture, industry, and housing have sustained the greatest impacts. The development footprint in the Lower Fraser Valley has left a devastating impact on most streams, many of which historically supported, and some of which still support, viable salmon populations. This survey examined the condition of 779 of the large, medium and small streams in the Lower Fraser Valley. Of these, approximately 117 streams have been lost (no longer exist) in the period between 1860 and the present. Most of the remaining 662 streams are under significant stress due to landscape alterations in watersheds, riparian zone degradation, and pollution, and are classified as threatened or endangered. A few streams remain in a relatively wild state. Most often the fish habitat values in these wild streams are low due to the fact that they are high gradient mountain streams which have significant portions that are inaccessible to fish. These areas are also relatively undevelopable.

This review is intended to identify streams that are in a natural state or under stress. It is hoped that this information can be used at a strategic level when determining needs for habitat protection and restoration for endangered and threatened streams which still have the potential to produce viable populations of salmon and other species of fish.

Appendix A is in a separate document.

APPENDIX B TOTAL STREAMS FULFILLING EACH CRITERIA

STATUS	CRITERIA	Area 1: Steveston to Langley	Area 2: Abbotsford to Hope	Area 3: Stave River to Hope	Area 4: West Vancouver to Stave River	All Areas
ENDANGERED		LFV ASSESSED AREA STREAMS				
	Riparian Removal	64	113	23	49	249
	Channelization/Dyking	59	72	19	61	211
	EIA	42	7	4	54	107
	Water Diversion	0	7	3	6	16
	Water Quality	89	128	27	75	319
	Logging	0	13	11	3	27
	Urbanization	68	22	11	77	178
	Other	29	114	20	34	197
		LFV SETTLEMENT AREA STREAMS				
	Riparian Removal	64	113	23	49	249
	Channelization/Dyking	59	72	18	61	210
	EIA	42	7	4	54	107
	Water Diversion	0	7	3	6	16
	Water Quality	89	128	27	75	319
	Logging	0	13	10	3	26
	Urbanization	68	22	11	77	178
	Other	29	114	20	34	197

STATUS	CRITERIA	Area 1: Steveston to Langley	Area 2: Abbotsford to Hope	Area 3: Stave River to Hope	Area 4: West Vancouver to Stave River	All Areas
THREATENED		LFV ASSESSED AREA STREAMS				
	Riparian Removal	0	2	6	2	10
	Channelization/Dyking	1	5	1	2	9
	EIA	0	0	0	0	0
	Water Diversion	0	1	0	0	1
	Water Quality	0	0	2	0	2
	Logging	0	42	46	23	111
	Urbanization	4	2	8	13	27
	Other	3	6	8	3	20
		LFV SETTLEMENT AREA STREAMS				
	Riparian Removal	0	2	3	2	7
	Channelization/Dyking	1	1	1	2	5
	EIA	0	0	0	0	0
	Water Diversion	0	1	0	0	1
	Water Quality	0	0	2	0	2
	Logging	0	8	12	0	20
	Urbanization	4	2	8	9	23
	Other	3	3	8	3	17

STATUS		Area 1: Steveston to Langley	Area 2: Abbotsford to Hope	Area 3: Stave River to Hope	Area 4: West Vancouver to Stave River	All Areas	
WILD							
	LFV ASSESSED AREA STREAMS	0	27	22	57	106	
	LFV SETTLEMENT AREA STREAMS	0	8	4	17	29	

STATUS	CRITERIA	Area 1: Steveston to Langley	Area 2: Abbotsford to Hope	Area 3: Stave River to Hope	Area 4: West Vancouver to Stave River	All Areas	
ENDANGERED AND THREATENED		LFV ASSESSED AREA STREAMS					
	Total Riparian Removal	64	115	29	51	259	
	Total Channelization/Dyking	60	77	20	63	220	
	Total EIA	42	7	4	54	107	
	Total Water Diversion	0	8	3	6	17	
	Total Water Quality	89	128	29	75	321	
	Total Logging	0	55	57	26	138	
	Total Urbanization	72	24	19	90	205	
	Total Other	32	120	28	37	217	

APPENDIX C MAPS

The maps reviewed for this study included: archival maps (A), Land Registration Maps (B-D), and NTS maps (E).

A. Archival Maps

1. Roads and Trails Map (Pre 1876)
Route adopted by the Government between New Westminster and Yale
Scale: Unconfirmed
Archival Map # : 12 T 1
2. Roads and Trails Map (Pre 1876)
Plan 3, Burrard Inlet to Hope
Scale: Unconfirmed
Archival Map # : 11 T 3
3. Roads and Trails Map (Pre 1876)
Gulf of Georgia to Kootanie Lake
Scale: 1in = 10 miles
Archival Map # : 31 T 3
4. Original Plan of New Westminster (Pre 1876)
Plan No. 5 (Drawn by Colonel Moody)
Scale: 1ft = 1 Statute Mile
5. Gold Region on the Fraser River (Undated)
Compiled from the Original Notes of Alexander C. Anderson
Scale: $\frac{5}{8}$ in = 10 miles
Range (Gulf of Georgia to Fort Kamloops)
Archival Map # : 1 T 2
6. Map of Part New Westminster District (Pre Development of Point Grey Peninsula)
Scale: 1 in = 1 mile
Archival Map # : 10 T 1
7. New Westminster District (1876)
Scale: $\frac{1}{2}$ inch = 1mile
Range (English Bay to the West end of Seabird Island down to the 49th parallel)
Archival Map # : 56 T 1
8. New Westminster District (1886)
Scale: $\frac{1}{2}$ inch = 1mile
Range (English Bay to the West end of Seabird Island down to the 49th parallel)
Archival Map # : (Unknown)
9. New Westminster District / Matsqui Indian Reserves
Surveyed and Drawn by W.S. Semmelt 1880, 81, 82. Completed on 30th May 1882
Approved March 19th 1892
Scale: In Chains
Archival Map # : W 8

10. New Westminster District / Lakahahmen Indian Reserves
Surveyed and Drawn by W.S. Semmelt 1880, 81, 82. Completed on 30th May 1882
Approved March 19th 1892
Scale: In Chains
Archival Map # : W 9
11. New Westminster District / Sumass Indian Reserves
Surveyed and Drawn by W.S. Semmelt 1880, 81, 82. Completed on 30th May 1882
Approved March 19th 1892
Scale: In Chains
Archival Map # : W 10
12. New Westminster District / Chillukweyuk Indian Reserves
Surveyed and Drawn by W.S. Semmelt 1880, 81, 82. Completed on 30th May 1882
Approved March 19th 1892
Scale: In Chains
Archival Map # : W 11
13. New Westminster District / Chillukweyuk Indian Reserves
Surveyed and Drawn by W.S. Semmelt 1880, 81, 82. Completed on 30th May 1882
Approved May 1st 1886
Scale: In Chains
Archival Map # : W 12
14. Map of the South Western Part of British Columbia (1903)
Compiled by Direction of the Honorable W.C. Wells(Chief Commissioner Lands & Works)
Scale: 1in = 10 miles
Archival Map # : 34 T 1

B. Land Registration Maps (1922)

1. Map # : 92G/NE
Scale: (Unknown)
Range: Harrison Lake and Lillooet River

C. Land Registration Maps (1955)

1. Map # : 86
Scale: 1 inch = 1 mile
Range: West end of Chilliwack to Hope, North of Chehalis River to the 49th parallel
2. Map # : 5D
Scale: 1 inch = 1 mile
Range: West end of Crescent Island to Chilliwack creek, North of Stave Lake to the 49th parallel
3. Map # : 5A
Scale: 1 inch = 1 mile

Range: Douglas Island to Crescent Island North of Pitt Lake to the
49th parallel

D. Land Registration Maps (1964)

1. Map #: 92H/4 a,b
Scale: 1 inch = $\frac{1}{4}$ mile
Range: Chilliwack River to the Border

E. National Topographic System (NTS) Maps

Scale 1:50,000:

1. Name: Mission
Map #: 92 G/1
Last Update: 1989
Last Published: 1992
2. Name: New Westminster
Map #: 92 G/2
Last Update: 1986
Last Published: 1989
3. Name: Lulu Island
Map #: 92 G/3
Last Update: 1974
Last Published: 1978
4. Name: Port Coquitlam
Map #: 92 G/7
Last Update: 1978
Last Published: 1981
5. Name: Stave Lake
Map #: 92 G/8
Last Update: 1988
Last Published: 1992
6. Name: Chilliwack
Map #: 92 H/4
Last Update: 1988
Last Published: 1992
7. Name: Harrison Lake
Map #: 92 H/5
Last Update: 1988
Last Published: 1992
8. Name: Hope
Map #: 92 H/6
Last Update: 1974
Last Published: 1976

APPENDIX D REFERENCES

The following reports and individuals provided information on streams in the database.

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Rood, Kenneth M., Roy E. Hamilton. 1995. *Hydrology and Water Use for Salmon Streams in the Harrison Habitat Management Area, British Columbia*. Fraser River Action Plan, Fisheries and Oceans Canada, Vancouver, B.C. Canadian Manuscript Report of Fisheries & Aquatic Sciences No. 2293.

Rood, Kenneth M., Roy E. Hamilton. 1995. *Hydrology and Water Use for Salmon Streams in the Pitt/Stave Habitat Management Area, British Columbia*. Fraser River Action Plan, Fisheries and Oceans Canada, Vancouver, B.C. Canadian Manuscript Report of Fisheries & Aquatic Sciences No. 2289.

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Stoddard, Erin. 1996. Pers. Comm. Ministry of Environment Lands & Parks, Surrey, B.C.

Swiatkiewicz, Vic. 1996. Pers. Comm. Ministry of Environment, Lands & Parks, Surrey, B.C.

Zevit, Pamela. 1996. Pers. Comm. Fisheries Technician. Ministry of Environment Lands & Parks, Surrey, B.C.

Telephone Interviews were conducted with the following individuals:

Collier, Mike. Vancouver Salmon Stream Society
Coulter-Boisvert, Maurice. Community Advisor, DFO
Croy Vanwely, Marcia. DFO Library
Day, Joanne. Information Coordinator, Community Involvement, DFO
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Edwards, Cameron. Independent
Elliot, Jim. Habitat Biologist, Land Use, DFO
Hutton, Karen. Water Quality, DFO
Johansen, Kon. Habitat Technician, Land Use, DFO
Lompart, Al. Survey Plans Vault. Ministry of Environment Lands and Parks, Victoria, B.C.
Morton, Zoann. Pacific Streamkeepers Federation
Outdoor Recreation Council of B.C.
Payette, Krista. Ministry of Environment Lands & Parks, Surrey, B.C.
Reid, Bruce. Head, Land Use, Fraser River Division, DFO
Stoddard, Erin. Ministry of Environment Lands & Parks, Surrey, B.C.
Swiatkiewicz, Vic. Ministry of Environment, Lands & Parks, Surrey, B.C.
Taccogna, Gary. Community Involvement Division, DFO
Zevit, Pamela. Ministry of Environment Lands & Parks, Surrey, B.C.

Other sources of information:

Fisheries Inventory Section Database, Ministry of Environment, Lands, and Parks' Resource Inventory Branch (<http://www.env.gov.bc.ca/fsh/ids/dman/>)

Fish Habitat Inventory and Information Program Database, Department of Fisheries and Oceans (<http://habitat.pac.dfo.ca>)

FISS Database, Habitat and Enhancement Branch, Fisheries and Oceans Canada, Vancouver, B.C.

Fraser River Estuary Management Program (fremp@mindlink.bc.ca)

Watershed Management, Forestry and the Watershed, Forest Renewal Coordination Office. www.env.gov.bc.ca:80/main/water/watershed_management.html

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The authors of this report would like to acknowledge the valuable watershed code and stream information contributions made by Pamela Zevit, Ministry of Environment Land and Parks; her knowledge and accurate information were instrumental to the completion of this undertaking.

APPENDIX F THE MAJOR WATERSHEDS ASSOCIATED WITH EACH AREA

Area 1 South Shore of the Fraser River from Steveston to Langley

Campbell River and Tributaries
Serpentine River and Tributaries
Streams South of Lulu Island
Nicomekl River and Tributaries
Nooksack River Tributaries
Tributaries of the Lower Fraser River (South Shore) to Langley

Area 2 South Shore of the Fraser River from Abbotsford to Hope

Tributaries of the Lower Fraser River (South Shore) from Langley to Hope
Matsqui Prairie
Sumas Mountain and Prairie
Vedder Canal and Tributaries
Chilliwack River and Tributaries
Silverhope River and Tributaries
Coquihalla River and Tributaries

Area 3 North Shore of the Fraser River from the Stave River to Hope

Tributaries of the Lower Fraser River (North Shore) from Stave River to Hope
Stave River and Tributaries
Hatzic Slough and Tributaries
Chehalis River and Tributaries
Nicomex Slough and Tributaries
Harrison River
Harrison Lake
Agassiz's Flatland

Area 4 North Shore of the Fraser River from West Vancouver to the Stave River

Tributaries of the Lower Fraser River (North Shore) from Whonnock Creek to Nelson Creek (West Vancouver)
Burrard Inlet and Tributaries
Capilano River and Tributaries
Mackay Creek and Tributaries
Mosquito Creek and Tributaries
Lynn Creek and Tributaries
Seymour River and Tributaries
Indian Arm Tributaries
Port Moody Area Tributaries
Brunette River and Tributaries
Byrne Creek and Tributaries
Coquitlam River and Tributaries

Pitt River and Tributaries
Alouette River and Tributaries
Kanaka Creek and Tributaries

APPENDIX A CLASSIFIED STREAMS DATABASE

LEGEND

R	Riparian Removal	Significant loss of riparian vegetation along more than 50% of the fish frequented length of the stream. ²
C	Channelization / Dyking	Channelization, armourization, or dyking of over 50% of the fish frequented length of the stream.
E	EIA	Effective impermeable area (EIA) covering approximately 10%, or greater, of the stream's watershed.
D	Water Diversion	Greater than 50% of stream flow (i.e. diversion out of the system), or significant manipulation of flow.
Q	Water Quality	Significant water quality problems i.e. temperature, water chemistry (e.g. pH, BOD, nutrients) (including urban impacts; not including impacts from logging).
L	Logging	Logging has been extensive in the watershed, and impacts (direct or related) have been obvious. ³
U	Urbanization	Settlement in the watershed has significantly affected the stream basin.
O	Other	Other impacts (i.e. agricultural/urban impacts, anthropogenic barriers, and cumulative effects of these impacts; includes urban features such as linear and industrial development).
	Settlement Area	A "Y" indicates that the stream is in the Settlement Area Database. A blank indicates that the stream is in the Non-Settlement Area Database.

Status The rating under "Status" is one of the three ratings described below.

Status	Description	Colour Code (Map)
Wild	There are no significant threats to the stream.	Green
Threatened	The stream is affected by one of the above impacts, and is classified as threatened.	Purple
Endangered⁴	The stream is affected by more than one of the above impacts, and is classified as endangered.	Orange
Lost	The stream has been culverted, paved over, drained or filled, and generally no longer exists as a surface waterway (not included in this database.)	Red

¹ Generally, a record of an impact under these criteria will trigger colour coding of the entire stream length, since the classification database is linked to watershed codes.

² The fish frequented length of the stream may be a small proportion of the stream's length; however, a record of an impact under these criteria will trigger colour coding of the entire stream (see first footnote).

³ Logging can have multiple impacts, such as sedimentation (water quality), riparian removal, etc.

⁴ Due to constraints in time and resources, not all impacts that may be present on the stream could be recorded.

³ Logging can have multiple impacts, such as sedimentation (water quality), riparian removal, etc.

⁴ Due to constraints in time and resources, not all impacts that may be present on the stream could be recorded.

Unnamed Creeks (in watershed code order)

AREA 2 - LANGLEY TO HOPE

Creek Name	Code	Count	Count	Count	Count	Status	Notes
Airplane Creek	100-0657-097-458-199-000-000-000-000-000-000-000-000				1	Threatened	
Alexander Creek	100-1154-092-000-000-000-000-000-000-000-000-000-000					Wild	
Amadis Creek	100-0657-097-133-913-259-000-000-000-000-000-000-000					Wild	
Anderson Creek	100-0894-000-000-000-000-000-000-000-000-000-000-000	1		1	1	Endangered	Y
Angus Creek	100-1154-387-595-000-000-000-000-000-000-000-000-000				1	Threatened	
Arnold Slough	100-0657-483-404-000-000-000-000-000-000-000-000-000	1		1	1	Endangered	Y
Ascaphus Creek	100-0657-097-133-574-000-000-000-000-000-000-000-000					Wild	Y
Atchelitz Creek	100-0718-163-000-000-000-000-000-000-000-000-000-000	1		1	1	Endangered	Y
Barrett Creek	100-0657-097-unavailable Lower Chilliwack R. trib.	1	1			1	Endangered
Bear Creek	100-0657-097-unavailable Upper Chilliwack R. trib.					Wild	
Bell Slough	100-0781-000-000-000-000-000-000-000-000-000-000-000	1	1		1	1	Endangered
Berkey Creek	100-1154-126-345-000-000-000-000-000-000-000-000-000					Wild	
Borden Creek	100-0657-097-357-000-000-000-000-000-000-000-000-000				1	Threatened	
Boston Bar Creek	100-1154-540-000-000-000-000-000-000-000-000-000-000					1	Threatened
Boulder Creek	100-1018-552-000-000-000-000-000-000-000-000-000-000	1			1	Endangered	Y
Bridal (Popkum) Creek	100-0894-071-891-000-000-000-000-000-000-000-000-000	1	1		1	1	Endangered
Brush Creek	100-0657-097-unavailable Upper Chilliwack R. trib.					Wild	
Bushby Creek	100-1154-387-591-000-000-000-000-000-000-000-000-000				1	Threatened	
Buxton Creek	100-0657-097-380-025-000-000-000-000-000-000-000-000					Wild	
Caleb Creek	100-0543-unavailable Matsqui Slough trib.	1		1		Endangered	Y
Calkins Creek	100-0718-701-993-000-000-000-000-000-000-000-000-000	1		1	1	Endangered	Y
Camp Slough	100-0741-287-504-000-000-000-000-000-000-000-000-000	1	1		1	1	Endangered
Camson Creek	100-0497-000-000-000-000-000-000-000-000-000-000-000	1		1		1	Endangered
Carry Creek	100-1154-615-000-000-000-000-000-000-000-000-000-000				1	Threatened	

Unnamed Creeks (in watershed code order)

AREA 3 - STAVE RIVER TO HOPE

Gazetted/Local Name (in alphabetical order)	Watershed Code (Old)								Status	SA	
		R	C	E	D	Q	L	U	O		
Deroche (Crazy) Creek	100-0702-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1								Threatened	Y
D'Herbomez Creek	100-0567-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000		1	1	1	1	1	1		Endangered	Y
Dickson Creek	100-0640-736-000-000-000-000-000-000-000-000-000-000-000-000-000-000								1	Threatened	Y
Donatelli Creek	100-unavailable Fraser River tributary	1				1	1	1		Endangered	Y
Draper Creek	100-0585-343-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Duncan Slough	110-0710-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1			1	1	1	1		Endangered	Y
Durieux Creek	100-0585-847-234-206-081-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Eagle Creek	110-0902-807-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1			Threatened	Y
East Creek	110-1492-unavailable Morris Creek tributary						1			Threatened	Y
Elbow Creek	110-0762-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000					1	1			Endangered	Y
Evans Creek	110-1492-854-unavailable Weaver Creek tributary						1			Threatened	Y
Garnet Creek	100-1047-366-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1			Threatened	Y
Gaudin Creek	100-0519-647-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Gerry Creek	110-0902-624-385-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Glacier Creek	100-0471-378-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Hairsine Creek	100-0471-043-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Hale Creek	110-4430-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Harrison River, Lower	110-0000-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000								1	Threatened	Y
Harrison River, Upper	110-0000-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Hatzic Slough	100-0585-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1		1	1	1	1		Endangered	Y
Hicks (Kamp Slough) Creek	100-0916-613-000-000-000-000-000-000-000-000-000-000-000-000-000-000		1							Threatened	Y
Holatchten Creek	110-0369-865-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Hoover Lake Creek	100-0471-155-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Horne Creek	100-0532-421-000-000-000-000-000-000-000-000-000-000-000-000-000-000			1	1	1	1			Endangered	Y
Hornet Creek	110-5990-086-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Hot Springs Slough	110-2321-unavailable Miami Creek tributary	1	1		1	1	1	1		Endangered	Y
Isle Slough	100-0471-171-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Johnsons Slough	100-1019-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Kearsley Creek	100-0471-185-000-000-000-000-000-000-000-000-000-000-000-000-000-000								1	Threatened	Y
Kenworthy Creek	100-0585-840-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	Y
Kenyon Lake Creek	100-0471-311-257-392-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	
Kirkland Creek	110-6671-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Lagace Creek	100-0585-847-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1			1	1	1	1		Endangered	Y
Lake Errock	110-0369-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000					1	1	1	1	Endangered	Y
Lookout Creek	110-5819-162-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	
Lost Creek	100-0471-251-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	
MacNab Creek	100-0585-847-866-000-000-000-000-000-000-000-000-000-000-000-000-000	1								Threatened	Y
Madill Creek	100-0585-469-303-000-000-000-000-000-000-000-000-000-000-000-000-000	1			1	1	1	1		Endangered	Y
Mahood (Gallagher, Johnson) Creek	100-1019-792-000-000-000-000-000-000-000-000-000-000-000-000-000-000									Wild	Y
Maisal Creek	110-0902-429-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	
Mandale (Lane Creek) Slough	100-0532-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1		1	1	1	1		Endangered	Y
Margaret Creek	110-0902-293-183-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	
Maria Slough	100-0916-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1			1	1	1		Endangered	Y
McCallum Ditch	100-0836-681-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1			1	1	1		Endangered	Y
Miami Creek	110-2321-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1		1	1	1	1		Endangered	Y
Middle Creek	110-0902-624-066-000-000-000-000-000-000-000-000-000-000-000-000-000							1		Threatened	

Gazetted/Local Name (in alphabetical order)	Watershed Code (Old)								Status	SA
		R	C	E	D	Q	L	U	O	
Morris Creek	110-1492-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Morton Creek	100-0702-195-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1	1	Threatened	Y
Mountain Slough	100-0836-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1			1	1		Endangered	Y
Mud Slough	100-0636-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000		1			1		1	Endangered	Y
Mystery Creek	110-5819-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Nicomen Creek, North	100-unavailable Nicomen Slough tributary	1	1			1			Endangered	Y
Nicomen Slough	100-unavailable Fraser River tributary	1	1			1		1	Endangered	Y
Norrish (Suicide) Creek	100-0640-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000		1		1				Endangered	Y
Norrish Creek, West	100-0640-698-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Oru Creek	100-0585-847-234-000-000-000-000-000-000-000-000-000-000-000-000-000							1	Threatened	Y
Papp Creek	100-0471-472-000-000-000-000-000-000-000-000-000-000-000-000-000-000								Wild	
Pattison Creek	100-0585-847-483-000-000-000-000-000-000-000-000-000-000-000-000-000	1	1			1			Endangered	Y
Pretty Creek	110-0902-050-000-000-000-000-000-000-000-000-000-000-000-000-000-000		1			1			Endangered	
Proud Creek	100-0519-611-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Pye Creek	100-0720-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Quaamitch Slough	100-0688-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000		1			1		1	Endangered	Y
Rolley Creek	100-0471-124-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1							Threatened	
Rose Creek	100-0640-396-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Ruby Creek	100-1047-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Sakwi Creek	110-1492-854-356-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Salsbury Creek	100-0471-311-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Sasin Creek	110-0415-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Sasquatch Creek	110-2457-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000								Wild	Y
Sayers Lake Creek	100-0471-206-000-000-000-000-000-000-000-000-000-000-000-000-000-000								Wild	
Schkam Creek	100-1151-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Scorey (Rouleau) Creek	100-0585-584-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1			1	1	1	1	Endangered	Y
Settler Creek	110-5351-361-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Seux Creek	100-0585-847-234-206-168-000-000-000-000-000-000-000-000-000-000-000						1	1	Threatened	Y
Seventynine Creek	100-0471-166-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Siddle (Bell, Tatham) Creek	100-0728-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Silverdale (Silver) Creek	100-0519-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Simms Creek	110-4073-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000								Wild	
Skwawolt Creek	100-1054-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Skwellepil Creek	110-0902-624-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Slollicum Creek	110-3277-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000								Wild	
Span Creek	110-0902-293-122-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Squakum Creek	110-0369-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Statlu Creek	110-0902-293-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Statlu Creek, South	110-0902-293-469-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Stave River, Lower	100-0471-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000	1			1		1	1	Endangered	Y
Stave River, Upper	100-0471-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Steelhead Creek	100-0471-091-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	Y
Stockholm Creek	100-1145-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000							1	Threatened	Y
Stokke Creek	110-8600-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Talc Creek	110-5351-071-000-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Terepocki Creek	100-0471-311-257-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Tessaro Creek	110-0902-293-796-000-000-000-000-000-000-000-000-000-000-000-000-000						1		Threatened	
Thunderbird Creek	110-2506-000-000-000-000-000-000-000-000-000-000-000-000-000-000-000								Wild	Y

AREA 4 - WEST VANCOUVER TO STAVE RIVER

Unnamed Creeks (in watershed code order)

FRASER RIVER LATERAL CHANNELS

Greyell Slough Wahleach Slough	Fraser River lateral channel Fraser River lateral channel	1	1	Endangered Wild	Y Y
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CLASSIFICATION EXPLANATIONS FOR SELECTED STREAMS

In the Stream Classification workshops, participants identified a number of streams that had impacts which did not match resulting classifications.

Gazetted/Local Name (in alphabetical order)	Watershed Code (Old)								Status	SA
		R	C	E	D	Q	L	U	O	
These exceptions are listed below.										
*1 Chilliwack R., upper (Area 2)	Workshop participants wanted the upper Chilliwack River to be classified as wild, despite having a few impacts.				1	1			Wild	
*2 Dewdney Ck. (Area 2) Houlgate Ck. (Area 4) Ladner Ck. (Area 2)	Workshop participants felt these three creeks should be listed as threatened even though they had two significant impacts.		1		1	1	1	1	Threatened Threatened Threatened	
*3 Peers Ck. (Area 2)	There was a gravel pit on this creek that caused considerable damage. It is closed now and workshop participants felt that, as a result, the creek was in a transition from being endangered to threatened, and that its status rating should reflect this.					1	1	1	Threatened	
*4 Munro Ck. (Area 4)	While the lower reaches of Munro Creek, below Quarry Road are channelized, the upper reaches are relatively untouched; therefore workshop participants wanted this stream to be considered wild.	1							Wild	
*5 Widgeon Ck. (Area 4)	Workshop participants wanted this creek to be rated wild, because now that it is in a park, it is protected.							1	Wild	
*6 Williams Ck. (Area 4)	Workshop participants wanted this creek to be rated threatened because now that it is in a park, it is protected.					1	1	1	Wild	