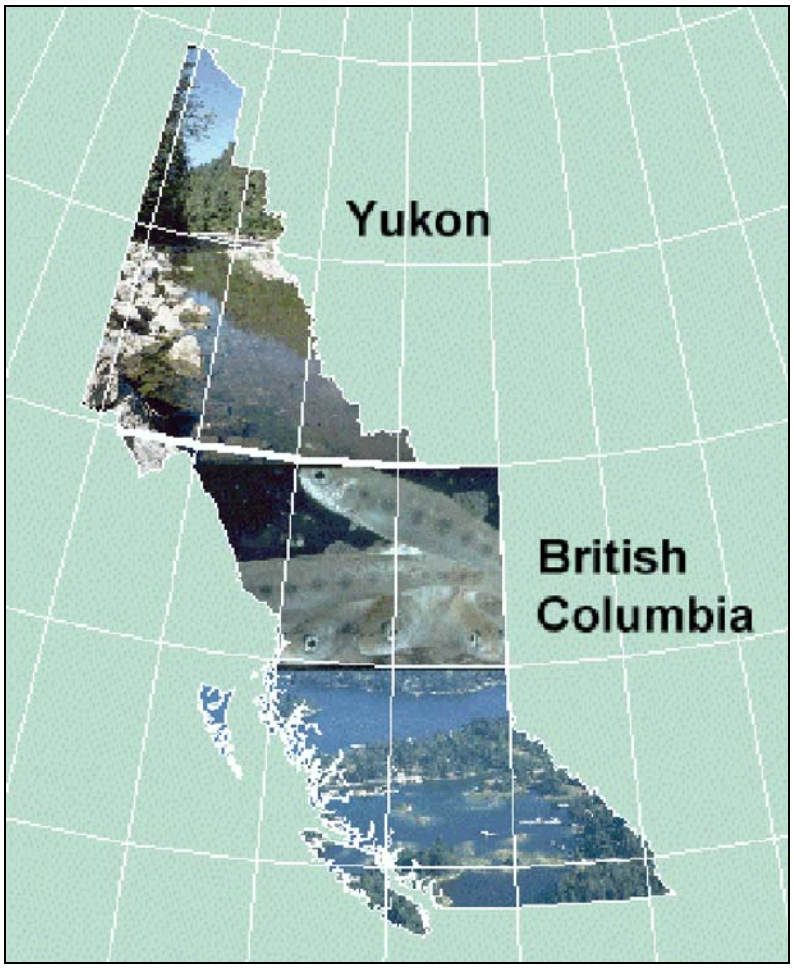
FISHERIES INFORMATION SUMMARY SYSTEM (FISS)

DATA COMPILATION AND MAPPING PROCEDURES

DRAFT 3



October 1997

Fisheries and Oceans Pêches et Océans

BRITISH COLUMBIA

Fish Habitat Inventory and Information Program

FISHERIES INFORMATION SUMMARY SYSTEM (FISS)

Data Compilation and Mapping Procedures

DRAFT 3
October 1997

Prepared for

British Columbia Ministry of Environment, Lands and Parks
Resources Inventory Branch
Victoria, B.C.

and

Fisheries and Oceans Canada
Regional Headquarters
400 - 555 West Hastings
Vancouver, B.C.

Government Representatives

Gordon Oliphant - MELP
Brad Mason - DFO

Prepared by

Barb Desrochers, Enviro-Links
430 Stevens Drive
West Vancouver, B.C.
V7S 1C6

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Introduction

Introduction

The Department of Fisheries and Oceans (DFO) and the Ministry of Environment Lands and Parks (MELP) have participated in a joint federal/provincial Fish Habitat Inventory and Information Program (FHIIP) since 1984. The Program was initiated as a result of a recommendation from the Pearse Royal Commission on Pacific Fisheries Policy (Turning the Tide, 1982). The primary goal of FHIIP is to compile a comprehensive inventory of quality, quantity, and productive capability of fish habitats in freshwater, estuarine, and marine systems in British Columbia.

To accomplish this goal a Stream Information Summary System (SISS) was developed. Through SISS, summary level fish habitat information and reference sources for streams in the province of British Columbia and the Yukon Territory were compiled. This information however, was not comprehensive and quickly became outdated.

To address these shortcomings, in 1992, the federal/provincial Resources Inventory Committee (RIC) Aquatic Inventory Task Force was established. The purpose of this task force was to a) determine what information was needed to define and monitor conservation levels for wild fish populations, and b) to protect fish habitat in stream, lake, and foreshore environments. In addition to RIC, other programs such as Forest Renewal BC, the Forest Practices Code, the Corporate Resource Initiative, the DFO Habitat Action Plan and the Fraser River Action Plan indicated that there was a growing need for a comprehensive overview fisheries database. As a result of these initiatives the Fisheries Information Summary System (FISS) was developed.

The FISS database is comprehensive, easily updated and accessible. It provides georeferenced summary level fish and fish habitat data for waterbodies throughout the province of British Columbia and the Yukon Territory. Georeferenced information is digitized and linked to a 1:50,000 digital watershed atlas for use in Geographical Information Systems (GIS). FISS incorporates a number of new design concepts such as thematic segments, waterbody identifiers, and combines stream and lake information into one system.

A large part of the information contained in FISS was compiled from updated and edited SISS data, and various detailed and overview fisheries databases. Fisheries databases incorporated into FISS include the provincial Release Records database, Angling Guide Management System, and Steelhead Harvest Analysis. Federal data was obtained from the Salmon Escapement Database (SEDS), the Salmonid Enhancement Program Mark Recovery database, and the Water Survey of Canada monitoring program.

FISS was designed to assist with federal and provincial planning, project reviews, requests for information and research. The information contained in the FISS

database allows DFO and MELP to more effectively manage fish stocks and fish habitats. FISS information is also proving useful to private industry and public organizations.

This manual provides instructions for compiling new information that builds on the existing FISS database; it consists of five basic tasks:

1. Compile new fish and fish habitat information.
2. Map and georeference fish and fish habitat information.
3. Complete Stream Data Entry Form.
4. Complete Lake Data Entry Form.
5. Complete a bibliography.

Chapter 2.
Compile New Fish and Fish Habitat Information

Compile New Fish and Fish Habitat Information

To compile new fish and fish habitat information:

- Collect historic data which are not already in the system. Record pertinent information onto FISS maps and Data Entry Forms.

  Historic data may be obtained from the literature, consultant reports, government reports, surveys, or interviews with knowledgeable staff and/or First Nations representatives. To determine if historic data is already in the system:

  - Obtain existing FISS maps from Archetype Print (see Appendix 1 for
  - contact information).
  - Obtain existing FISS bibliography from the DFO or MELP web sites (see Appendix 1 for contact information).

- Record information from all new contract work on FISS Data Entry Forms.

Information recorded on Data Entry Forms should be referenced. See “Complete a Bibliography” section of this manual for the proper methods of referencing information sources.

Chapter 3.
Map and Georeference Fish and Fish Habitat Information

3.1 MAP AND GEOREFERENCE FISH AND FISH HABITAT INFORMATION

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Fish and fish habitat information includes parameters such as fish distributions, critical spawning habitats, obstructions, and enhancement and management activities. This information needs to be mapped onto 1:50,000 NTS mapsheets and then georeferenced to detailed descriptions contained in Data Entry Forms.

3.2 MAP FISH AND FISH HABITAT INFORMATION

Map fish and fish habitat information onto 1:50,000 NTS mapsheets. Use a single point if the information is from a discrete location such as a fish hatchery. Use two points to define a zone of interest if the information pertains to a larger area such as a fish's distribution. Once these points or zones are drawn, the map is known as a FISS map. Appendix 2 gives an example of a FISS map.

To create a FISS map:

- Obtain the most recent 1:50,000 NTS mapsheet which includes the waterbody of interest. DO NOT FOLD MAPS.

- Draw the point or zone of interest at the appropriate location(s) on the NTS mapsheet.

- Write the appropriate FISS map symbol beside the point or zone of interest to indicate what fish or fish habitat information the point or zone represents. FISS map symbols are provided in Appendix 3. If there is no appropriate map symbol for a given point or zone of interest, write only the point identifier (see bullet below). If the FISS information pertains to the entire waterbody, record the Watershed Code and the appropriate FISS map symbol at the mouth of the stream, followed by a list of the fish species present.

- Write a unique point identifier (ID) beside the point or zone of interest to distinguish it from all other points or zones on the same mapsheet. Each ID consists of a four-digit number (e.g. 0001, 0234, 9999). All IDs MUST contain four digits. Give each point one point identifier. Give each zone of interest two point identifiers; the first for the upstream point and the second for the downstream point. If the downstream point of the zone is the mouth of the stream, there is no need to record the second point identifier.

3.3 GEOREFERENCE FISH AND FISH HABITAT INFORMATION

In addition to being mapped, fish and fish habitat information must be recorded on either a Stream Data Entry Form (Appendix 4) or a Lake Data Entry Form (Appendix 5). It is critically important that the points or zones mapped on the FISS map and the data contained in the Data Entry Forms are linked through georeferencing fields as outlined below.

- Record the 1:50,000 NTS mapsheet number on which the fish and fish habitat information was mapped in the "Map No." field of the Data Entry Form. This mapsheet code MUST contain six characters. Use a zero prefix where required and always follow the letter with a zero where the map sheets are numbered 1 through 9 (e.g. 092B01, 104G08, 082M16).

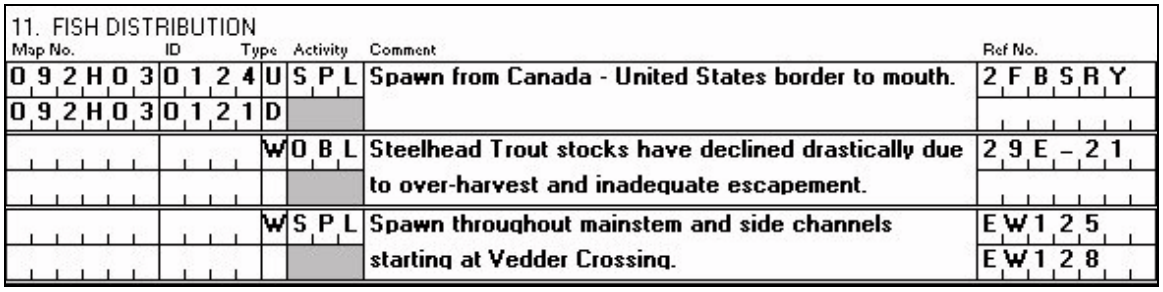
- Record the pertinent point identifier in the "ID" field of the Data Entry Form. This number MUST be four digits and MUST be identical to the ID recorded on the 1:50,000 NTS mapsheet.

  A single point identifier may refer to one or more fish or fish habitat parameters. An example where this occurs is a fish migration barrier which affects several species. The barrier must first be recorded in the obstruction section of the form with each species affected listed in the "Species Blocked" field. In addition, this same point identifier must be used in the fish distribution section of the form for each affected species to define the distribution limits of each of those species.

- Record the type of point in the "Type" field of the Data Entry Form. Most users of this manual will define the type of point as either "P" (point), "U" (upper zone limit; main channel), "S" (upper zone limit; secondary channel or side channel), "D" (lower zone limit), or "W" (whole waterbody). There are several rules for coding point types, depending on the location of the point and the area it is meant to encompass. Table 1 describes these special instances and Rules 1 through 8 elaborate on how to approach these situations (see "Additional Rules for Georeferencing by Point Type").

  In addition to these five point types there are THREE POINT TYPES TO BE USED BY MELP OR DFO REGIONAL BIOLOGISTS ONLY: "F" (implied whole waterbody), "I" (implied upper zone limit) and "M" (mouth is downstream limit of implied distribution). If the mouth is not the downstream limit of the implied fish distribution, record "D" and use the highest known point for the upstream limits of the species from existing FISS data (i.e. either "U" or "P"). These additional point types allow regional biologists to elaborate on the information contained on the first production fish distribution maps without jeopardizing the integrity of the balance of the data. Whenever these implied codes are used the author(s) of the reference will be the regional biologist(s), reference type will be personal information/communication and publishing date will be the date the edits were performed (see "Complete a Bibliography" for details on referencing information).

Each record on the Data Entry Form consists of two lines that allow either point or zone information to be recorded (Figure 1). Point information requires one line to be completed on the Data Entry Form whereas a zone requires two lines. If no points are given the fish and fish habitat information is attributed to the stream or lake as a whole and a "W" should be recorded for point "Type". For a zone, record the point Type as "U" or "S" (or "I" for MELP regional biologists ONLY) on the first line to indicate the upper limit of the zone. Record the point Type as "D" (or "M" for MELP regional biologists ONLY) on the second line to indicate the lower limit of the zone.



11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.
092H03	0124	U	SPL	Spawn from Canada - United States border to mouth.	2FBSRY
092H03	0121	D			
		W	OBL	Steelhead Trout stocks have declined drastically due	29E-21
				to over-harvest and inadequate escapement.	
		W	SPL	Spawn throughout mainstem and side channels	EW125
				starting at Vedder Crossing.	EW128

Figure 1. Example of a completed "Fish Distribution" section of a Stream Data Entry Form.

A new 10-character field called MAPNID consists of the the six-character "Map No." followed by the four-number "ID" (e.g. 092F010001, 082M160123, 104G089999). MAPNID is also known as the unique identifier because each point representing a single parameter in this new MAPNID field will be uniquely identified throughout the province. The MAPNID field will be used as the primary key for linking the FISS attribute data contained on Data Entry Forms to the Watershed Atlas.

3.4 ADDITIONAL RULES FOR GEOREFERENCING BY POINT TYPE

Table 1. Special situations affecting the recording of point "Type" and the rules used to address these situations.

Point(s) represent:	Rules
Data tied to the water body as a whole (i.e. point type "W").	See rule 1
A point site location (i.e. point type "P").	See rules 2 and 3
A zone of interest covering that portion of a main channel bounded by the upstream point "U" and the mouth of the main channel.	See rule 4
A zone of interest covering that portion of a main channel bounded by the upstream point "U" and the downstream point "D".	See rules 5 and 6
A zone of interest covering that portion of a secondary channel bounded by the upstream point "S" and the mouth or outlet of the secondary channel (i.e. the point where a side channel re-enters a parent stream).	See rule 7
A zone of interest covering that portion of a secondary channel bounded by the upstream point "S" and the downstream point "D".	See rule 8

Rule 1: Use point type "W" if data about a specific location or zone of interest is not appropriate or unknown. Leave the "Map No." and "ID" fields blank on the Data Entry Form. The information will be georeferenced by default via the watershed code to either the stream mouth representing the entire stream or the lake outlet representing the entire lake.

Rule 2: If you are recording information for an entire lake do NOT code individual points, use point type "W" (see Rule 1). Spatial

information related to lakes, such as a shore spawning point, must be recorded on the Lake Data Entry Form.

Rule 3: If you are referring to a specific location do NOT code points at stream mouths. If a point is at the mouth of a tributary stream, place the point on the tributary, NOT the parent stream (see Figure 2).

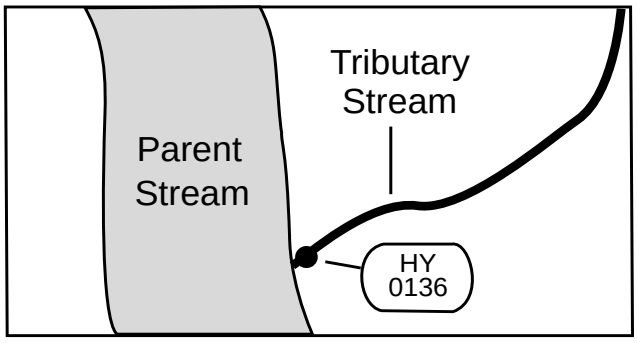


Figure 2. Proper location of points near tributary stream mouths.

Rule 4: If the downstream boundary of the zone of interest is the stream mouth do NOT code a downstream point (i.e. "D") on the stream or the form. The GIS software will display the zone of interest as extending from the upstream point to the mouth.

When a stream enters a lake as part of the mainstem flow through the lake, code a downstream point at the lake inlet confluence ONLY if the zone of interest is to terminate at the lake inlet. If a downstream point is not coded at the lake inlet confluence then the zone will continue downstream through the lake to either the mainstem stream mouth or a downstream point as otherwise placed.

Rule 5: Zones are only applicable to a single waterbody such as a stream. If a zone of interest covers two streams, such as a main channel plus a tributary, two zones must be properly coded; one for the main channel portion and one for the tributary portion.

Rule 6: Where a zone of interest includes lakes, code upstream points in lake tributary streams where necessary but do NOT code a downstream point "D" at the mouth of tributaries (reasons are given in Rule 4).

Where a zone of interest begins just downstream of a lake, code a “U” point at the lake outlet, and a “D” point at the lower limit of the

zone (unless the downstream limit is the stream mouth or another lake).

Rule 7: If the downstream boundary of the zone of interest occurs at the mouth or outlet of the secondary channel do NOT code a downstream point (i.e. "D") on the secondary channel. In the case of side channels or distributaries, the software will display the distribution zone extending downstream to the outlet.

Rule 8: If the downstream boundary of a zone of interest occurs upstream of the mouth of the secondary channel, place a numbered point on the map at that location and record that point number on the Stream Data Entry Form.

3.5 TRANSFER INFO BETWEEN 1:50,000 AND 1:20,000 MAPS

For selected urban areas all existing and new information collected on 1:20,000 Terrain Resource Information Management (TRIM) maps, or other large scale maps such as 1:5,000 or 1:10,000, must be copied onto 1:50,000 FISS maps. THE 1:50,000 UNIQUE IDENTIFIERS AND MAP SYMBOL PROTOCOLS MUST BE USED WHEN TRANSCRIBING INFORMATION FROM THE LARGER SCALE MAPS.

IT IS ESSENTIAL THAT BOTH THE MAP NUMBER AND POINT IDENTIFIER BE GENERATED FROM THE 1:50,000 MAP BASE. It may be necessary to summarize 1:20,000 information prior to transcribing it to the 1:50,000 map base. For example, when information has been collected for a small stream that exists on TRIM but not on a 1:50,000 map, the information must be summarized as only one point. This point must be placed at the confluence of the small stream with an existing stream on the 1:50,000 map. The point would need a unique identifier which would be generated from the 1:50,000 base. It is not necessary to capture the line work of the stream or ditch, only the point of confluence with any stream on a 1:50,000 map base.

Entries should be qualified by comments in the “Comment” field.

Chapter 4.
Complete Stream Data Entry Form

4.1 COMPLETE STREAM DATA ENTRY FORM

Once information has been compiled and mapped, a Stream Data Entry Form must be completed, one form for each stream. A blank Stream Data Entry Form is provided in Appendix 4. Photocopy this form and record information on the copy, or obtain a clean blank form for photocopying from MELP or print forms from the DFO web site (see Appendix 1 for contact information).

STREAM DATA ENTRY FORMS MUST BE COMPLETED FOR ALL WORK PERTAINING TO FISH AND FISH HABITATS.

The Stream Data Entry Form consists of 14 sections. Sections 4.2 through 4.10 pertain to the stream and include referencing information, stream information, provincial fisheries management objectives, enhancement and management activities, resource use information, fisheries potential and constraints, obstructions, land use and value/sensitivity. Sections 4.11 through 4.15 pertain to individual species or stocks of fish and include species/stock identification, fish distribution, harvest and use, escapement and life history and timing. Sections 4.11 through 4.15 must be completed for each species or stock present in any given stream. Detailed descriptions on how to complete each section are provided in the following pages.

Numerous FISS codes are required to properly complete the Stream Data Entry Form. Codes are introduced and explained in the pages that follow. For easy reference, all FISS codes are listed in alphabetical order in Appendix 6.

4.2 REFERENCING INFORMATION

Referencing Information provides basic data about the stream as a whole. Descriptions of the data which should be included in section 4.2 fields are given below. An example of a completed Referencing Information section is given in Figure 3. Please note that Figure 3 is for example purposes only. Not all fields will be completed on any given form. For example, only the 37-digit watershed code OR the 45-digit watershed code OR the SISS/RAB code need be filled-in. The 37-digit watershed code is preferred. The SISS/RAB code should only be used if the 37-digit watershed code can not be determined. If one of these codes is completed the last two lines concerning confluence and ILPs will be left blank. Conversely, if the watershed or SISS/RAB codes do not exist, either the confluence information OR the ILP information must be completed.

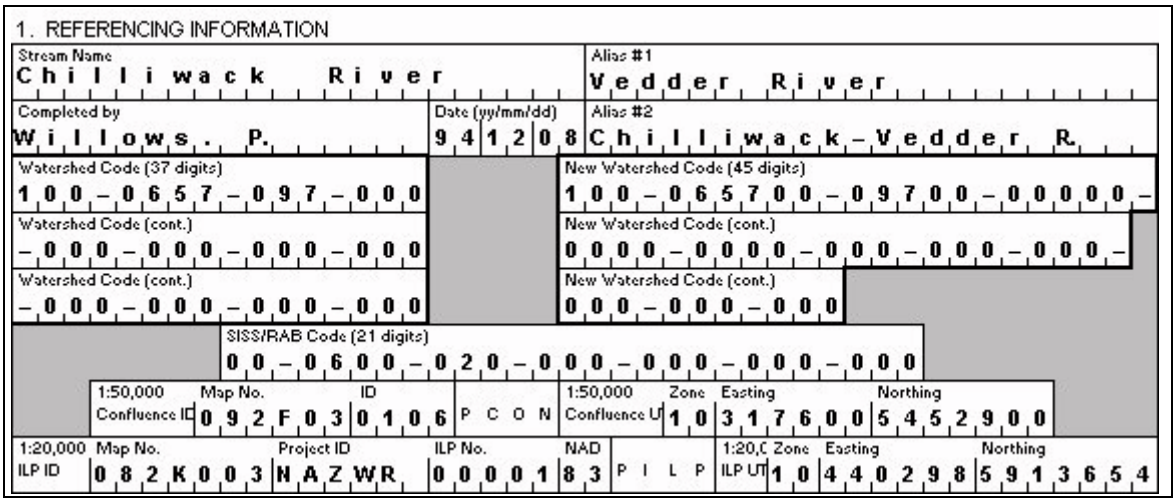


Figure 3. Example of a completed section 4.2. Referencing Information

Stream Name: Gazetted name of the stream as listed in the Gazetteer of Canada or as printed on 1:50,000 NTS map.

Alias 1: The most common local name or alias of the stream.

Alias 2: Alternate local name or alias of the stream.

Completed By: Last name, then a space, plus first initial of person compiling and/or updating the data forms and map.

Date: Date of completion of form or update of form. Record as yy/mm/dd.

Watershed Code: The 37-digit Hierarchical Watershed Code (HWC) from the 1:50,000 Watershed Atlas. MUST RECORD A WATERSHED CODE FOR ALL FISS INFORMATION. This code is presently the standard. This code may be obtained from several sources (Appendix 1).

New Watershed Code: A 45-digit code which is an extended version of the HWC. MUST RECORD A WATERSHED CODE FOR ALL FISS INFORMATION. This code will be the standard in the future; the 37-digit watershed code is presently the standard. The 45-digit watershed code may be obtained from several sources (Appendix 1).

SISS/RAB Code: A 21-digit watershed code currently recorded in the SISS catalogues. This code may be obtained from several sources (Appendix 1).

1:50,000 Confluence ID: FOR STREAMS THAT DO NOT HAVE A WATERSHED CODE (i.e. streams which are not on 1:50,000 maps or are not listed in the Watershed Atlas), the "Confluence ID" represents a unique spatial identifier located at the unidentified stream's confluence with the parent stream. If there is no confluence (e.g. the stream goes underground immediately before entering the parent stream), locate the point on the stream nearest the parent stream. The "Confluence ID" consists of the georeference information fields "Map No." and "ID". See the "Map and Georeference Fish and Fish Habitat Information" section of the manual for instructions on how to complete these fields. The "Confluence ID" field also consists of a box which always contains "P" for point type and "CON" for confluence.

In addition to coding the confluence ID point, enter the Watershed Code for the parent stream, with "AA1" as the next level of digits. Additional uncoded streams on the same parent stream are given sequential numbers (AA1, AA2, AA3, etc.).

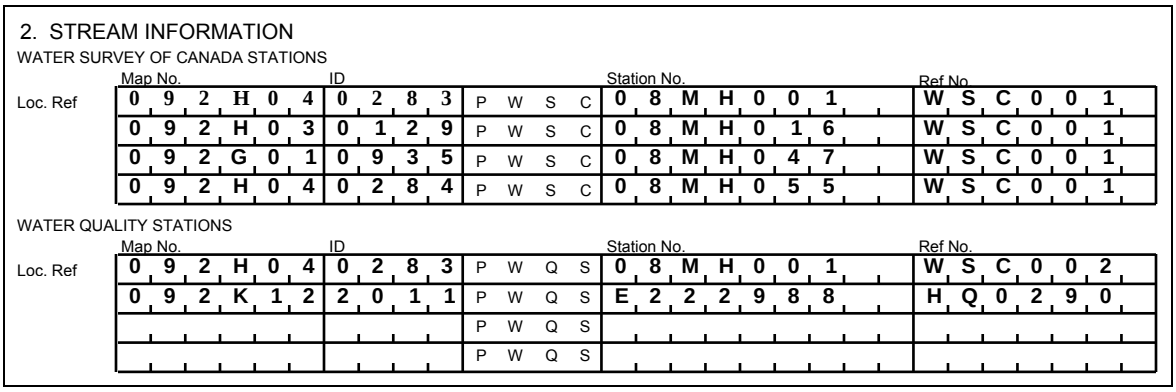
Confluence UTM: **"**Zone", **"**Easting" and "Northing" values of the stream confluence or nearest point. Only record confluence UTM for streams with no watershed code.

1:20,000 ILP ID: The Interim Locational Identifier (ILP) is a temporary code applied to an unidentified waterbody on 1:20,000 maps. For each ILP, record the "Map No." on which the ILP was drawn, a unique "Project ID" and "ILP No." and the appropriate map datum (i.e. "NAD"). Details on how to use and record ILPs are given in Appendix 7.
The ILP ID also consists of a box which always contains "P" for point type and "ILP" for Interim Locational Identifier.

1:20,000 ILP UTM: For each ILP record the "Zone", "Easting" and "Northing" values. Only record ILP UTM for streams with no watershed code, and if the data is not being referenced on a map.

4.3. STREAM INFORMATION

Stream Information provides basic data about individual streams, but does not include information about its tributaries. A separate Data Entry Form must therefore be completed for every stream or creek, regardless of how small it may be. Descriptions of the data which should be included in section 4.3 fields are given below. An example of a completed Stream Information section is given in Figure 4.



2. STREAM INFORMATION

WATER SURVEY OF CANADA STATIONS

Loc. Ref	Map No.	ID		Station No.	Ref No.
	092H04	0283	P W S C	08MH001	WSC001
	092H03	0129	P W S C	08MH016	WSC001
	092G01	0935	P W S C	08MH047	WSC001
	092H04	0284	P W S C	08MH055	WSC001

WATER QUALITY STATIONS

Loc. Ref	Map No.	ID		Station No.	Ref No.
	092H04	0283	P W Q S	08MH001	WSC002
	092K12	2011	P W Q S	E2229888	HQ0290
			P W Q S		
			P W Q S		

Figure 4. Example of a completed section 4.3. Stream Information.

WATER SURVEY OF CANADA STATIONS

Georeference Information: Consists of three fields: “Map No.”, “ID”, and “Type”. These fields are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual. Point “Type” is always “P” and has already been coded on the Data Entry Form in the shaded box. This box also contains the code “WSC” signifying Water Survey of Canada.

Station No.: Record the WSC station number.

Ref No.: Record bibliographic reference number(s) for any references pertaining to WSC station information.

Note: Actual WSC data will be accessed as digital data.

WATER QUALITY STATIONS

Contains information for all permanent sites used to access water quality, including SEAM (System for Environmental Assessment and Management) and EMS (Environmental Monitoring System) sites.

Georeference Information: Consists of three fields: "Map No.", "ID", and "Type". These fields are described in detail in the "Georeference Fish and Fish Habitat Information" section of this manual. Point "Type" is always "P" and has already been coded on the Data Entry Form in a separate box. This box also contains the code "WQS" signifying Water Quality Station.

Station No.: Record the water quality station number for *permanent* stations. For *non-permanent* water quality stations only record a reference number.

Ref No.: Record bibliographic reference number(s) for water quality information, including information pertaining to non-permanent water quality stations. Also include references that pertain to water quality objectives.

Note: This data may be available in electronic format through water management agency offices.

4.4. PROVINCIAL FISHERIES MANAGEMENT OBJECTIVES

Provincial Fisheries Management Objectives provides information about the overall fisheries management objectives of MELP for the stream as a whole. It does not provide information about the management objectives for individual fish species. Descriptions of the data which should be included in section 4.4 fields are given below. An example of a completed Provincial Fisheries Management Objectives section is given in Figure 5.

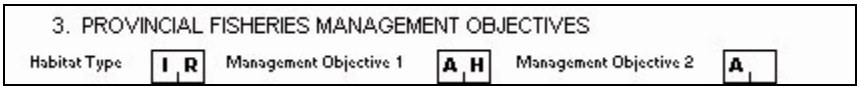


Figure 5. Example of a completed section 4.4. Provincial Fisheries Management Objectives.

Habitat Type: Record the habitat type as either an anadromous river or an inland river. An anadromous river contains anadromous fish. An inland river contains no anadromous fish.

Anadromous River	=	AR
Inland River	=	IR

Management Objective 1: Record the first level of management objectives as they relate to the status of sport fisheries or various efforts to preserve fish. No standardized accepted system exists at this time. A system applicable to small lakes management objectives has been proposed as follows:

Angler Use	=	A
Angler Use Low	=	AL
Angler Use Medium	=	AM
Angler Use High	=	AH
Preservation	=	P
Preservation / Broodstock	=	PB
Preservation / Genetic Refugia	=	PG
Preservation / Research	=	PR

This system should be used if possible. Other regional systems may exist that have yet to be translated into this system. In this case enter a code of up to two letters, which has meaning for the system currently in use (e.g. Quality = L, Quantity = Q, Trophy = T, Wilderness = W).

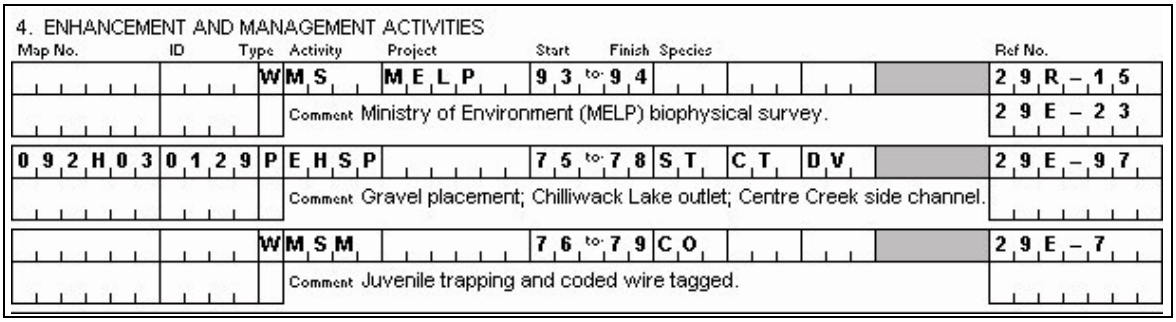
Management Objective 2: Record the second level of management objectives as it relates to the origin of fish in the river. Use one of the following codes:

Augmented *	=	A
Hatchery **	=	H
Wild	=	W
Wild Indigenous	=	WI
Wild Naturalized	=	WN

* Stocked with hatchery fish, but not dependent on hatchery for total production.
** Fishery is totally dependent on hatchery production.

4.5. ENHANCEMENT AND MANAGEMENT ACTIVITIES

Enhancement and management Activities provides information about the actions taken to enhance and manage fish habitats. Descriptions of the data which should be included in section 4.5 fields are given below. An example of a completed Enhancement and Management Activities section is given in Figure 6.



4. ENHANCEMENT AND MANAGEMENT ACTIVITIES

Map No.	ID	Type	Activity	Project	Start	Finish	Species				Ref No.
		W	MS	MELP	93	94					29R-15
			Comment	Ministry of Environment (MELP) biophysical survey.							29E-23
092H03	0129	P	EHSP		75	78	ST	CT	DV		29E-97
			Comment	Gravel placement; Chilliwack Lake outlet; Centre Creek side channel.							
		W	MSM		76	79	CO				29E-7
			Comment	Juvenile trapping and coded wire tagged.							

Figure 6. Example of a completed section 4.5. Enhancement and Management Activities.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Activity: Up to a four character code indicating habitat enhancement or management activity. Codes are listed in Appendix 8.

Project: Up to a six-character code which references external data sources. Examples of external data sources include the HCF database or the SEP database. These letter codes are combined with number codes to distinguish each project (e.g. HCF237).

Start to Finish: Years in which the project was or is active. If the project is still active leave the “Finish” field blank. Record the last two digits of the year.

Species: Record the species codes for target species for enhancement/management activities if applicable. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Ref No.: Record bibliographic reference number(s).

Note: many of these activities will be linked to external databases. These external dataset linkages will provide additional summary information as needed. Examples of datasets that will be directly linked include:

- stocking records from the provincial release records database (RRDB)
- angling regulations synopsis (in future)

Comment: Record any pertinent information which is not accounted for in other fields.

4.6. RESOURCE USE INFORMATION

Resource Use Information provides information about the type of activities occurring on the stream as a whole. Individual species records should be entered in section 4.13. Harvest and Use. Descriptions of the data which should be included in section 4.6 fields are given below. An example of a completed Resource Use Information section is given in Figure 7.

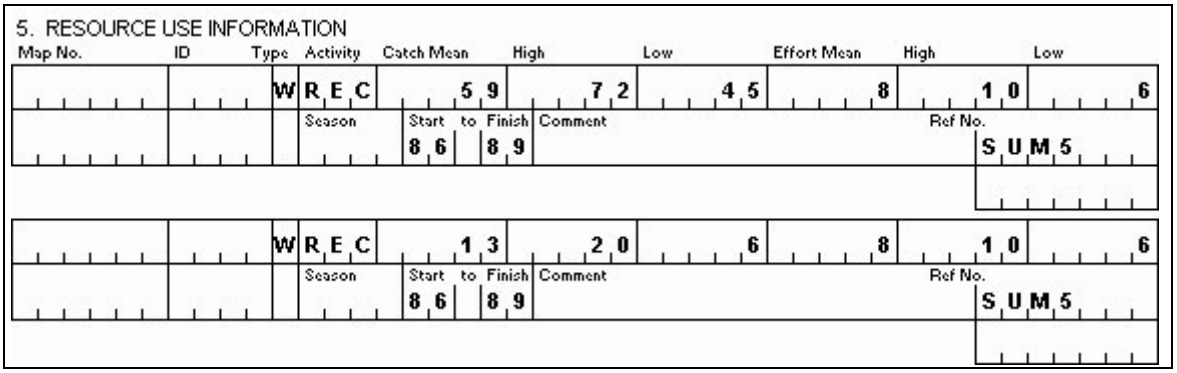


Figure 7. Example of a completed section 4.6. Resource Use Information.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Activity: A code of up to three characters indicating the type of resource use. Record the most appropriate code from the list below.

Guides	=	AGU
Commercial	=	COM
Domestic	=	DOM
Fishing Lodge	=	FLG
Native	=	NAT
Recreational	=	REC
Viewing	=	VUE

Catch: Record mean, high and low catch figures based on annual catch data. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form. These data will be accessed electronically.

Effort: Record mean, high and low effort figures based on annual effort data. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form. These data will be accessed electronically.

Season: Season of use; largely for angling. Record one to four of the codes listed below.

Winter	=	A
Spring	=	B
Summer	=	C
Fall	=	D

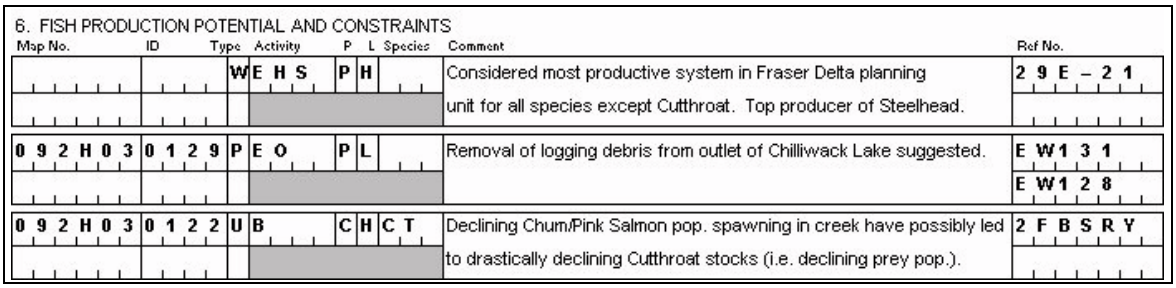
Start To Finish: Years in which the project was or is active. If the project is still active leave the "Finish" field blank. Record the last two digits of the year.

Comment: Record any pertinent information which is not accounted for in other fields.

Ref No. Record bibliographic reference number(s).

4.7. FISH PRODUCTION POTENTIAL AND CONSTRAINTS

Fish Production Potential and Constraints provides information about activities which affect fisheries production. Land uses may only be referred to in this section if they have been documented as constraints. Otherwise, they should be recorded in section 4.9. Land Use. Descriptions of the data which should be included in section 4.7 fields are given below. An example of a completed Fish Production Potential and Constraints section is given in Figure 8.



6. FISH PRODUCTION POTENTIAL AND CONSTRAINTS

Map No.	ID	Type	Activity	P	L	Species	Comment	Ref No.
		W	E H S	P	H		Considered most productive system in Fraser Delta planning unit for all species except Cutthroat. Top producer of Steelhead.	2 9 E – 2 1
0 9 2 H 0 3	0 1 2 9	P	E O	P	L		Removal of logging debris from outlet of Chilliwack Lake suggested.	E W1 3 1 E W1 2 8
0 9 2 H 0 3	0 1 2 2	U	B	C	H	C T	Declining Chum/Pink Salmon pop. spawning in creek have possibly led to drastically declining Cutthroat stocks (i.e. declining prey pop.).	2 F B S R Y

Figure 8. Example of a completed section 4.7. Fish Production Potential and Constraints.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Activity: Activities with the potential to increase fish production are represented by codes of up to four letters. They consist of the Enhancement and Management Activities Codes listed in Appendix 8. Record the most appropriate code.

General information and activities causing constraints on fish production are represented by codes of up to four letters. These codes are listed in Appendix 10. Record the most appropriate code.

P: Record one of the single-letter codes below to indicate the nature of the activity.

Potential for increasing fisheries production	=	P
Constraint on fisheries production	=	C
General information that has not been identified as		

	either a potential or constraint to fisheries production	=	G

L: This is the value judgment of potential or constraint. Record one of the following options:

Low Potential/Constraint	=	L
Average Potential/Constraint	=	M
High Potential/Constraint	=	H

Species: Record the code of the species which has the potential to experience increased production, or the species which is influenced by the constraint. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Comment: For all entries, record additional information which qualifies data contained in other fields.

Ref No.: Record bibliographic reference number(s).

4.8. OBSTRUCTIONS

Obstructions provides information about obstructions in the stream which affect fish, and lists the fish species which are affected. Do not enter information about an obstruction which has been removed either through natural causes or stream enhancement efforts. Descriptions of the data which should be included in section 4.8 fields are given below. An example of a completed Obstructions section is given in Figure 9.

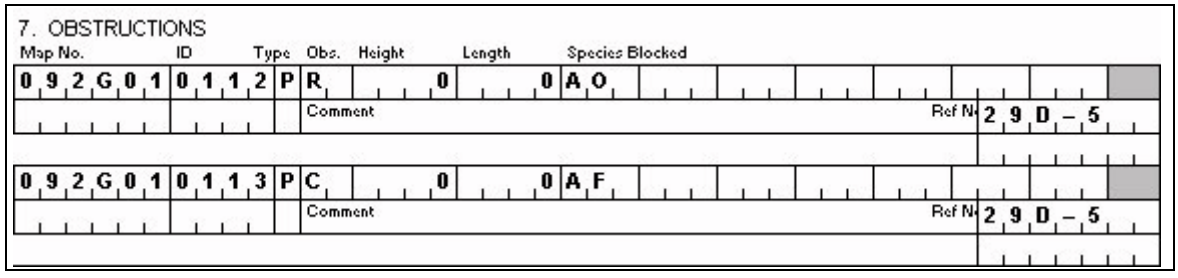


Figure 9. Example of a completed section 4.8. Obstructions.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Obstruction: Types of obstructions which affect fish movements. Record the appropriate one or two-letter code from the list below.

Beaver Dam	=	BD
Cascade	=	C
Canyon	=	CN
Culvert	=	CV
Dam	=	D
Falls	=	F
Hydro Dam	=	HD
Persistent Debris *	=	PD
Pump	=	PU
Rock	=	R
Log Jam	=	X
Velocity Barrier	=	VB

* Debris present for several years.

Height: Height of the obstruction in metres.

Length: Length of the obstruction in metres.

Species Blocked: Record the code of the species which have been blocked by the obstruction. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

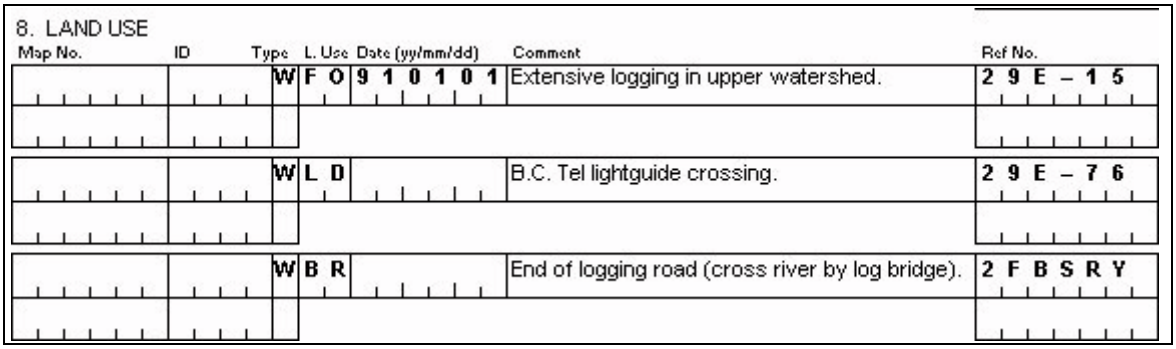
Comment: Record any additional information which will help define the obstruction more clearly.

Ref No.: Record bibliographic reference number(s).

4.9. LAND USE

Land Use provides information about the types of land uses occurring in the vicinity of the stream. Descriptions of the data which should be included in

section 4.9 fields are given below. An example of a completed Land Use section is given in Figure 10.



8. LAND USE

Map No.	ID	Type	L. Use	Date (yy/mm/dd)	Comment	Ref No.
		W	F O	9 1 0 1 0 1	Extensive logging in upper watershed.	2 9 E – 1 5
		W	L D		B.C. Tel lightguide crossing.	2 9 E – 7 6
		W	B R		End of logging road (cross river by log bridge).	2 F B S R Y

Figure 10. Example of a completed section 4.9. Land Use.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Land Use: Types of land uses in the vicinity of the stream. Record the appropriate two-letter code from the list below.

Land Use *	=	LU
Agriculture	=	AG
Bridge	=	BR
Forestry	=	FO
Industrial Processing	=	IP
Linear Development	=	LD
Mining	=	MI
Pipeline Crossing	=	PL
Placer Mining	=	PM
Parks	=	PR
Powerline Crossing	=	PX
Road	=	RD
Reserves	=	RE
Urban Development	=	UD

* General/unspecified land use.

Date: The date the land use was observed. Record as yy/mm/dd.

Comment: Record a brief description of the type of land use.

Ref No.: Record bibliographic reference number(s).

4.10 . VALUE AND SENSITIVITY

Value and Sensitivity provides information about the type of value placed on the stream and the sensitivity of the fish habitats/stocks of that stream. This information helps to flag significant attributes of waterbodies such as potential for angling, recreation and aesthetic considerations. Descriptions of the data which should be included in section 4.10 fields are given below. An example of a completed Value and Sensitivity section is given in Figure 11.

9. VALUE AND SENSITIVITY					
Map No.	ID	Type	Code	Value Comment	Ref No.
		W	R E C	Most important waterway in province for river based	2 F B S R Y
				recreation; angling, rafting, kayaking, and canoeing.	
Map No.	ID	Type	Code	Sensitivity Comment	Ref No.
		W	F I S	Wild Steelhead Trout stocks decreased due to over harvest;	2 F B S R Y
				regulations and hatchery stocking imposed to combat the problem.	

Figure 11. Example of a completed section 4.10. Value and Sensitivity.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Value Codes: The type of value attributed to a stream. Record the appropriate code from the list below.

Angling Sites	=	ANG
Viewing Sites	=	VUE
High Aesthetic Values	=	SEE
Recreational Values	=	REC

Note: These codes can be generated by field staff to meet the specific needs of local area planning. They are meant to be quite generic, with further information presented in the “Comment” field as required.

Value Comment: Emphasize values where they are not adequately covered by the data.

Ref No.: Record bibliographic reference number(s).

Sensitivity Codes: The main component of a stream which is sensitive and most vulnerable to negative impacts. Record the appropriate code from the list below.

Sensitive Fish Stock	=	FIS
Sensitive Habitat	=	HAB

Note: These codes can be generated by field staff to meet the specific needs of local area planning. They are meant to be quite generic, with further information presented in the "Comment" field as required.

Sensitivity Comment: Emphasize sensitivities where they are not adequately covered by the data.

Ref No.: Record bibliographic reference number(s).

4.11. . SPECIES AND STOCK IDENTIFICATION

Species and Stock Identification begins the information records related to individual species and stocks. As multiple species and stocks likely occur in each stream, many records will need to be completed. As a result, additional pages of sections 4.11 through 4.15 may be required. Descriptions of the data which should be included in section 4.11 fields are given below. An example of a completed Species and Stock Identification section is given in Figure 12.

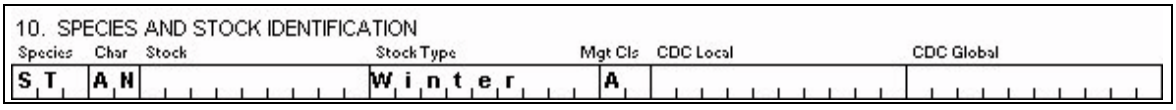


Figure 12. Example of a completed section 4.11. Species and Stock Identification.

Species: Record the codes of ALL fish species found in the stream. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Stock Characteristics: The characteristic residence and movement patterns of the fish stock. Record the appropriate code from the list below.

Adfluvial *	=	AD
Anadromous **	=	AN
Fluvial ***	=	FL
Resident ****	=	RS
Not Specified *****	=	NS

* Spends part of life in lake and part in river.
** Spawn in river, migrate to ocean.
*** Resident in river for entire life.
**** Resident in lake for entire life.
***** Unknown.

Stock: Distinguishes between fish of the same species which occupy more than one waterbody (e.g. *Nanoose* cutthroat). Record up to nine characters. Only complete this field if the stock is known.

Stock Type: Distinguishes between fish of the same stock based on the timing of migrations (e.g. *odd*/*even* pinks, *summer*/*winter* steelhead, *early/late* chinook). Record up to nine characters.

Stock Management Classification: Identifies the nature of the stock and the degree of human intervention. Record the appropriate code from the list below.

Augmented *	=	A
Hatchery **	=	H
Wild Indigenous	=	WI
Wild Naturalized	=	WN

* Stocked with hatchery fish, but not dependent on hatchery for total production.
** Fishery is totally dependent on hatchery production.

Stock Status: Record stock status using the Conservation Data Centre's (CDC) global and local rankings. The CDC fields will not be required for many lake or stream systems. General CDC rankings are given below.

CDC Local - S1, S2, S3, S4, S5

CDC Global - G1, G2, G3, G4, G5

In addition to these rankings there are a number of variations and combinations.

Rankings are available on CDC tracking lists. Stock information is also available from the American Fisheries Society's Stock Status report (Nehlsen et al.). Known locations of rare fish are presented in the rare fish of B.C. draft.

4. 12. FISH DISTRIBUTION

Fish Distribution indicates the presence of a fish species and describes the major activity of those fish. Complete one section 4.12 for each section 4.11 completed above. Descriptions of the data which should be included in section 4.12 fields are given below. An example of a completed Fish Distribution section is given in Figure 13.

11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.
092HO3	0124	U	SPL	Spawn from Canada - United States border to mouth.	2FBSRY
092HO3	0121	D			
		W	OBL	Steelhead Trout stocks have declined drastically due	29E-21
				to over-harvest and inadequate escapement.	
		W	SPL	Spawn throughout mainstem and side channels	EW125
				starting at Vedder Crossing.	EW128

Figure 13. Example of a completed section 4.12. Fish Distribution.

Georeference Information: Consists of three components: "Map No.", "ID", and "Type". These items are described in detail in the "Georeference Fish and Fish Habitat Information" section of this manual.

Activity: Describes the presence of fish and the major activity of those fish. Record the most appropriate code from the list below.

Holding or Staging Location	=	HOL
No Fish Caught	=	NFC
No Fish Observed (YUKON ONLY)	=	NFO
No Fish Present *	=	NFP
Fish Observed at this Point or Zone	=	OBL
Rearing Location	=	REA
Spawning in Estuary	=	SPE
Spawning Location **	=	SPL
Major Spawning Location	=	SPM
Unconfirmed Siting (YUKON ONLY)	=	UNC

* Record NFP for areas that have been sampled according to Forest Practices Code methods and found to be barren of fish. Do not confuse *no fish present* (NFP) with *no fish caught* (NFC).

** In YUKON, all Salmon observed can be assumed to be spawning anywhere up to that point.

Comment: Add details of distribution such as unique spawning location or heavy spawning.

Ref No.: Record bibliographic reference number(s).

4.13. HARVEST AND USE

Harvest and Use indicates the harvest and use of individual species and stocks of fish. This is in contrast to section 4.6. Resource Use Information which relates to information about the whole stream. Much of this information will be obtained through electronic links with existing databases such as the Steelhead Harvest Analysis and SLIM. In this situation, do not record information on the Stream Data Entry Form. For non-linked information sources complete one section 4.13 for each section 4.11 completed above. Descriptions of the data which should be included in section 4.13 fields are given below. An example of a completed Harvest and Use section is given in Figure 14.

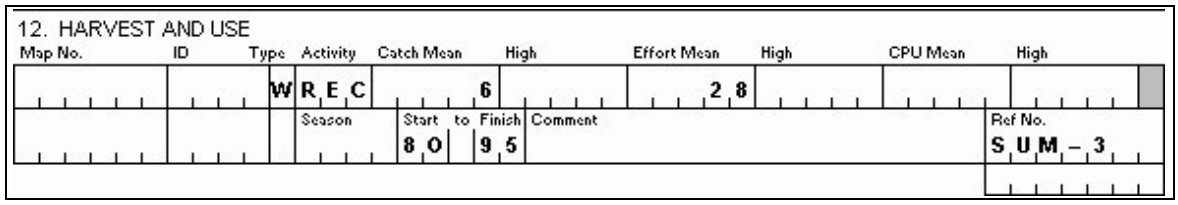


Figure 14. Example of a completed section 4.13. Harvest and Use.

Georeference

Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Activity: Describes the type of use for individual species and stocks. Record the appropriate code from the list below.

Guides	=	AGU
Commercial	=	COM
Domestic	=	DOM
Fishing Lodge	=	FLG
Native	=	NAT
Recreational	=	REC
Viewing	=	VUE

Catch: Mean and high annual catch figures from reports. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form.

Effort: Mean and high annual effort figures from reports. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form.

CPUE: Mean and high catch per unit effort (CPUE) figures from reports. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form.

Season: Season of use; largely for angling. Record one to four of the codes listed below.

Winter	=	A
Spring	=	B
Summer	=	C
Fall	=	D

Start to Finish: Years in which the project was or is active. If the project is still active leave the “Finish” field blank. Record the last two digits of the year.

Comment: Record any pertinent information which is not accounted for in other fields.

Ref No.: Record bibliographic reference number(s).

4.14 ESCAPEMENT

Escapement data need be recorded for non-salmon species only because salmon escapements are available from the SEDS database. Descriptions of the data which should be included in section 4.14 fields are given below. An example of a completed Escapement and Population Numbers section is given in Figure 15.

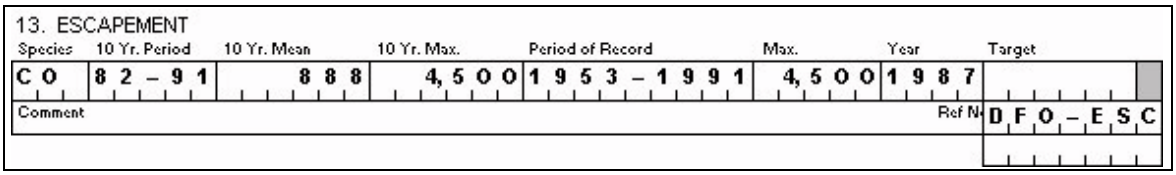


Figure 15. Example of a completed section 4.14. Escapement.

Species: Record the code of the fish species being described. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

10 Yr Period: 10-year period for which the mean and maximum values are provided (SEDS will refer to the last 10-year period). Record the last two numbers of the initial year and the last two numbers of the year 10 years later.

10 Yr Mean: Mean escapement over the 10-year period recorded above (SEDS will refer to the last 10-year period).

10 Yr Maximum: Maximum recorded escapement within the 10-year period recorded above (SEDS will refer to the last 10-year period).

Period of Record: The complete range of years for which data is available. Record all four numbers for the initial year and the final year.

Historic Maximum: Maximum recorded escapement over the complete period of record.

Year: Year in which historic maximum escapement was recorded.

Target: Management escapement targets, if available.

Comment: Record any pertinent information which is not accounted for in other fields.

Ref No.: Record bibliographic reference number(s).

4.15 LIFE HISTORY AND TIMING

Life History and Timing indicates when various life history activities occur for each fish species. Descriptions of the data which should be included in section 4.15 fields are given below. An example of a completed Life History and Timing section is given in Figure 16.

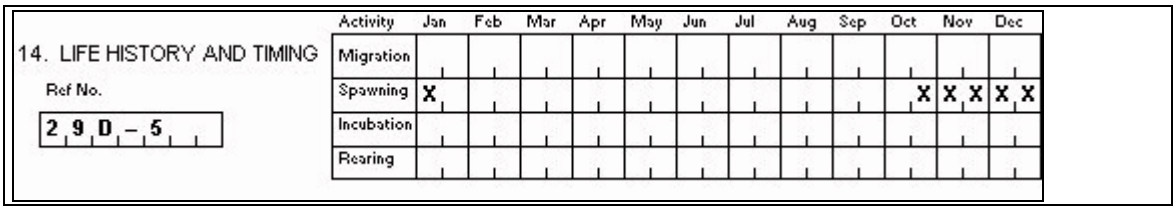


Figure 16. Example of a completed section 4.15. Life History and Timing.

Ref No.: Record a bibliographic reference number.

Table: For each species and activity, mark with an “X” the half months in which the life history stage occurs. THIS SHOULD ONLY BE DONE WHERE SPECIFIC INFORMATION EXISTS; GENERAL LIFE HISTORY AND TIMING KNOWLEDGE SHOULD NOT BE INDICATED ON THIS TABLE.

Where life history information exists from FISS, overwrite the "X"s recorded above with one of the following codes:

Fish Presence in Estuary	=	E
Fish Presence in Lower River	=	L
Peak	=	P

Chapter 5.
Complete Lake Data Entry Form

5.1 COMPLETE LAKE DATA ENTRY FORM

The Lake Data Entry Form is very similar to the Stream Data Entry Form. One form should be completed for each lake once information has been compiled and mapped. A blank Lake Data Entry Form is provided in Appendix 5. Photocopy this form and record information on the copy, or obtain a clean blank form for photocopying from MELP or print forms from the DFO web site (see Appendix 1 for contact information).

LAKE DATA ENTRY FORMS MUST BE COMPLETED FOR ALL WORK PERTAINING TO FISH AND FISH HABITATS.

The Lake Data Entry Form consists of 13 sections. Sections 5.2 through 5.10 pertain to the lake and include referencing information, lake information, provincial fisheries management objectives, enhancement and management activities, resource use information, fisheries potential and constraints, obstructions, land use and value/sensitivity. Sections 5.11 through 5.14 pertain to individual species or stocks of fish and include species/stock identification, fish distribution, harvest and use, and life history and timing. Sections 5.11 through 5.14 must be completed for each species or stock present in any given lake. Detailed descriptions on how to complete each section are provided in the following pages.

Numerous FISS codes are required to properly complete the Lake Data Entry Form. Codes are introduced and explained in the pages that follow. For easy reference, all FISS codes are listed in alphabetical order in Appendix 6.

5.2 REFERENCING INFORMATION

Referencing Information provides basic data about the lake as a whole. Descriptions of the data which should be included in section 5.2 fields are given below. An example of a completed Referencing Information section is given in Figure 17. Please note that Figure 17 is for example purposes only. Not all of the fields will be completed on any given form. For example, only the 37-digit watershed code OR the 45-digit watershed code need be filled-in. The 37-digit watershed code is preferred. If one of these codes is completed the last two lines concerning confluence and ILPs will be left blank. Conversely, if the watershed codes do not exist, either the confluence information OR the ILP information must be completed.

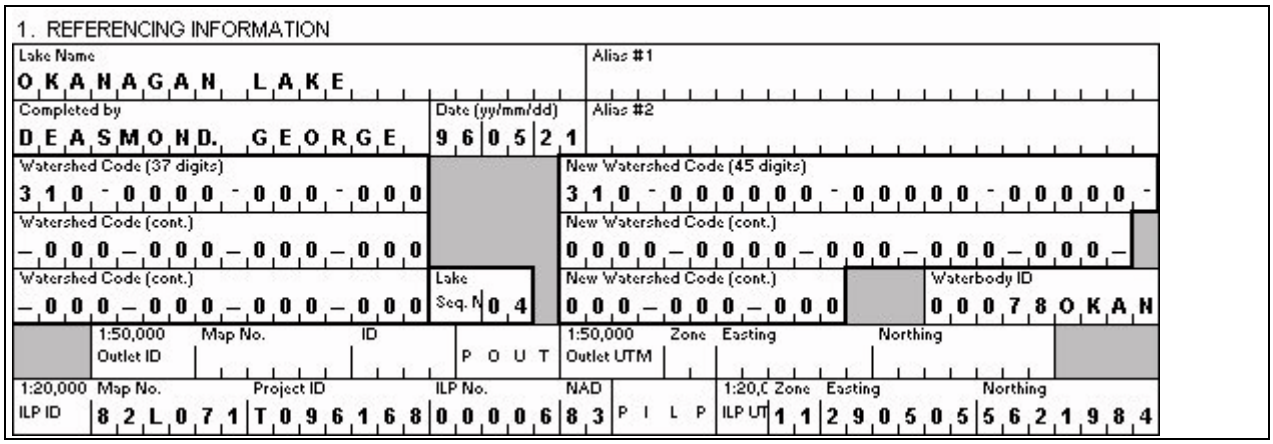


Figure 17. Example of a completed section 5.2. Referencing Information.

Lake Name: Gazetted name of the lake as listed in the Gazetteer of Canada or as printed on 1:50,000 NTS map.

Alias 1: The most common local name or alias of the lake.

Alias 2: Alternate local name or alias of the lake.

Completed By: Last name, then a space, plus first initial of person compiling and/or updating the data forms and map.

Date: Date of completion of form or update of form. Record as yy/mm/dd.

Watershed Code: The 37-digit Hierarchical Watershed Code (HWC) from the 1:50,000 Watershed Atlas. MUST RECORD A WATERSHED CODE FOR ALL FISS INFORMATION. This code is presently the standard. This code may be obtained from several sources (Appendix 1).

Lake Seq. No.: The 2-digit lake sequence number indicates the order of lakes relative to the river mouth. The lake closest to the river mouth would be number 1, the next closest lake would be number 2, etc. Obtain lake sequence numbers from the Watershed Atlas (Appendix 1) and record on the Data Entry Form.

New Watershed Code: A 45-digit code which is an extended version of the HWC. MUST RECORD A WATERSHED CODE FOR ALL FISS INFORMATION. This code will be the standard in the future; the 37-digit watershed code is presently the standard. The 45-digit watershed code may be obtained from several sources (Appendix 1).

Waterbody ID: A 9-digit code which uniquely identifies a lake. The first five digits are a unique combination of numbers, the last four digits are letters constituting an acronym for the watershed within which the waterbody is found (e.g. 00708HORS). Waterbody Identifiers may be obtained from several sources (Appendix 1).

1:50,000 Outlet ID: FOR LAKES WHICH DO NOT HAVE A WATERSHED CODE (i.e. lakes which are not on 1:50,000 maps or are not listed in the Watershed Atlas), the "Outlet ID" represents a unique spatial identifier located where the unidentified lake empties into the parent stream (i.e. its outlet). If the lake has no outlet, use the centre point of the lake as the "Outlet ID" point. The "Outlet ID" consists of the georeference information fields "Map No." and "ID". See the "Map and Georeference Fish and Fish Habitat Information" section of the manual for instructions on how to complete these fields. The "Outlet ID" field also consists of a box which always contains "P" for point type and "OUT" for outlet.

In addition to coding the confluence ID point, enter the Watershed Code for the parent stream, with "AA1" as the next level of digits. Additional uncoded lakes on the same parent stream are given sequential numbers (AA1, AA2, AA3, etc.).

Outlet UTM: **"**Zone", "Easting" and "Northing" values of the lake outlet or nearest point. Only record Outlet UTM for lakes with no watershed code.

1:20,000 ILP ID: The Interim Locational Identifier (ILP) is a temporary code applied to an unidentified waterbody on 1:20,000 maps. For each ILP, record the "Map No." on which the ILP was drawn, a unique "Project ID" and "ILP No." and the appropriate map datum (i.e. "NAD"). Details on how to use and record ILPs are given in Appendix 7.

The ILP ID also consists of a box which always contains "P" for point type and "ILP" for Interim Locational Identifier.

1:20,000 ILP UTM: For each ILP record the "Zone", "Easting" and "Northing" values. Only record ILP UTM for lakes with no watershed code, and if the data is not being referenced on a map.

5.3 LAKE INFORMATION

Lake Information provides basic data about the lake as a whole. Descriptions of the data which should be included in section 5.3 fields are given below. An example of a completed Lake Information section is given in Figure 18.

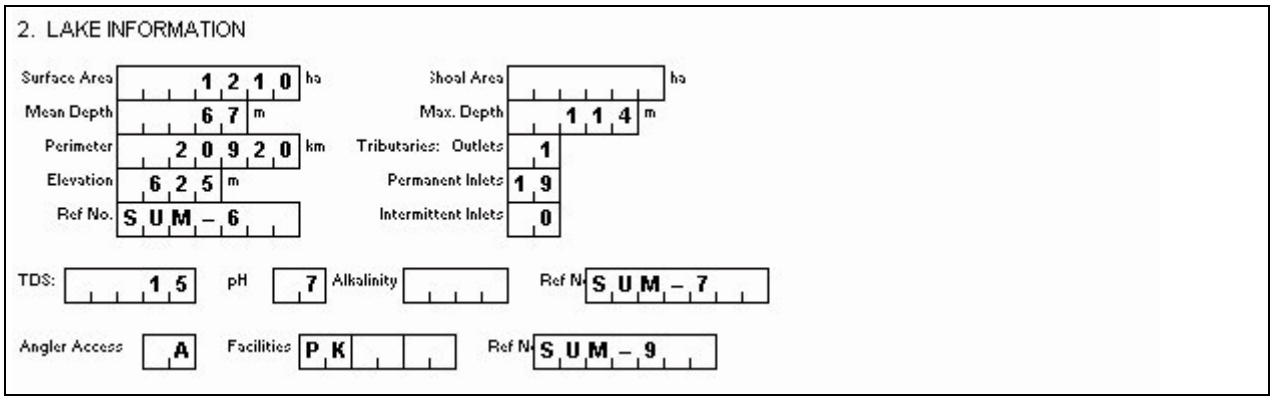


Figure 18. Example of a completed section 5.3. Lake Information.

Surface Area: In hectares.

Shoal (littoral) Area: In hectares.

Mean Depth: In metres.

Max. Depth: In metres.

Perimeter: In kilometers (to two decimal places).

Elevation: In metres.

Tributaries: Record the number of outlets, permanent inlets and intermittent inlets.

Ref No.: Reference number for physical lake survey information.

TDS: Surface measurement of total dissolved solids.

pH: Surface measurement.

Alkalinity: Surface measurement.

Ref No.: Reference number for water chemistry information.

Angler Access: The method by which anglers access the lake. Record the most appropriate code from those listed below.

Accessible by Air	=	I
Accessible by Road	=	A
Accessible by Water	=	M
Restricted/Controlled Access	=	AR
Road to Near Lake then Walk	=	AW
Wilderness, No Road Access	=	W

Facilities: Note what significant facilities exist on the lake. Record up to three codes from those listed below.

Fishing Lodge/Resort	=	FL
MOF Recreation Site	=	MF
Park	=	PK

Ref No.: Reference number for facilities and access information.

5.4 PROVINCIAL FISHERIES MANAGEMENT OBJECTIVES

Provincial Fisheries Management Objectives provides information about the overall fisheries management objectives of MELP for the lake as a whole. It does not provide information about the management objectives for individual fish species. Descriptions of the data which should be included in section 5.4 fields are given below. An example of a completed Provincial Fisheries Management Objectives section is given in Figure 19.

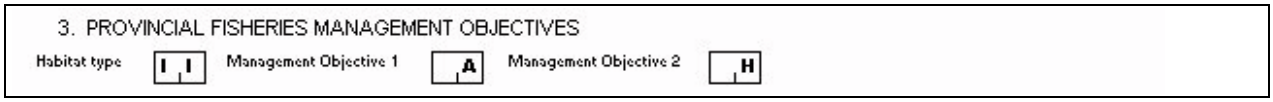


Figure 19. Example of a completed section 5.4. Provincial Fisheries Management Objectives.

Habitat Type: Record the habitat type as either a small or large lake.

Small Lake (<400 ha)	=	SL
Large Lake (≥400 ha)	=	LL

Management Objective 1: Record the first level of management objectives as they relate to the status of sport fisheries or various efforts to preserve fish. No standardized accepted system exists at this time. A system applicable to small lakes management objectives has been proposed as follows:

Angler Use	=	A
Angler Use Low	=	AL
Angler Use Medium	=	AM
Angler Use High	=	AH
Maintain Walk In Status	=	MW
Preservation	=	P
Preservation / Broodstock	=	PB
Preservation / Genetic Refugia	=	PG
Preservation / Research	=	PR

This system should be used if possible. Other regional systems may exist that have yet to be translated into this system. In this case enter a code of up to two letters, which has meaning for the system currently in use (e.g.
Quality = L, Quantity = Q, Trophy = T, Wilderness = W).

Management Objective 2: A second level of objective is related to the origin of fish and appropriate management. Record one of the following codes which are used for anadromous rivers:

Augmented *	=	A
Hatchery **	=	H
Wild	=	W
Wild Indigenous	=	WI
Wild Naturalized	=	WN

* Stocked with hatchery fish, but not dependent on hatchery for total production.
** Fishery is totally dependent on hatchery production.

5.5 ENHANCEMENT AND MANAGEMENT ACTIVITIES

Enhancement and Management Activities provides information about the actions taken to enhance and manage fish habitats. Descriptions of the data which should be included in section 5.5 fields are given below. An example of a completed Enhancement and Management Activities section is given in Figure 20.

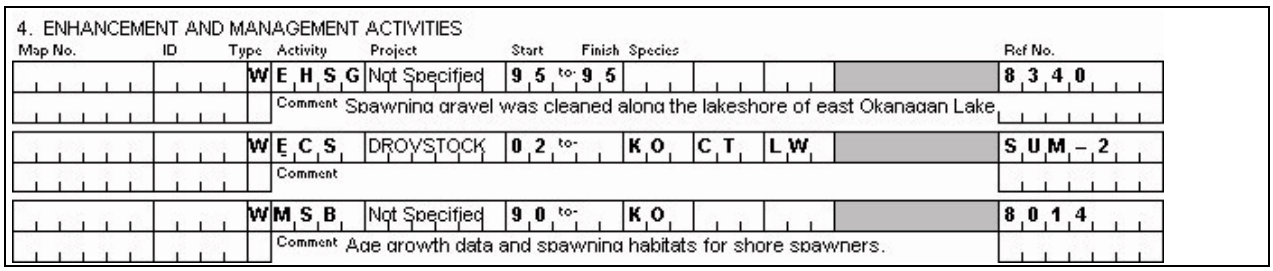


Figure 20. Example of a completed section 5.5. Enhancement and Management Activities.

Georeference Information: Consists of three components: "Map No.", "ID", and "Type". These items are described in detail in the "Georeference Fish and Fish Habitat Information" section of this manual.

Zones of interest in lakes can be associated with shorelines, including islands. Because the direction of flow in lakes is from the inlets towards the outlet, the downstream end of a zone will be nearest the outlet. If no map number and point ID are provided the information is tied by default to the whole lake, however a "W" must be recorded as the point type.

Activity: Up to a four character code indicating habitat enhancement or management activity. Codes are listed in Appendix 8.

Project: Up to a six-character code which references external data sources. Examples of external data sources include the HCF database or the SEP database. These letter codes are combined with number codes to distinguish each project (e.g. HCF237).

Start to Finish: Years in which the project was or is active. If the project is still active leave the "Finish" field blank. Record the last two digits of the year.

Species: Record the species codes for target species for enhancement/management activities if applicable. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Ref No.: Record bibliographic reference number(s).

Note: Many of these activities will be linked to external databases. These external dataset linkages will provide additional summary information as needed. Examples of datasets that will be directly linked include:

- stocking records from the provincial release records database (RRDB)
- angling regulations synopsis (in future)

Comment: Record any pertinent information which is not accounted for in other fields.

5.6 RESOURCE USE INFORMATION

Resource Use Information provides information about the type of activities occurring on the lake as a whole. Individual species records should be entered in section 5.13. Harvest and Use. Descriptions of the data which should be included in section 5.6 fields are given below. An example of a completed Resource Use Information section is given in Figure 21.

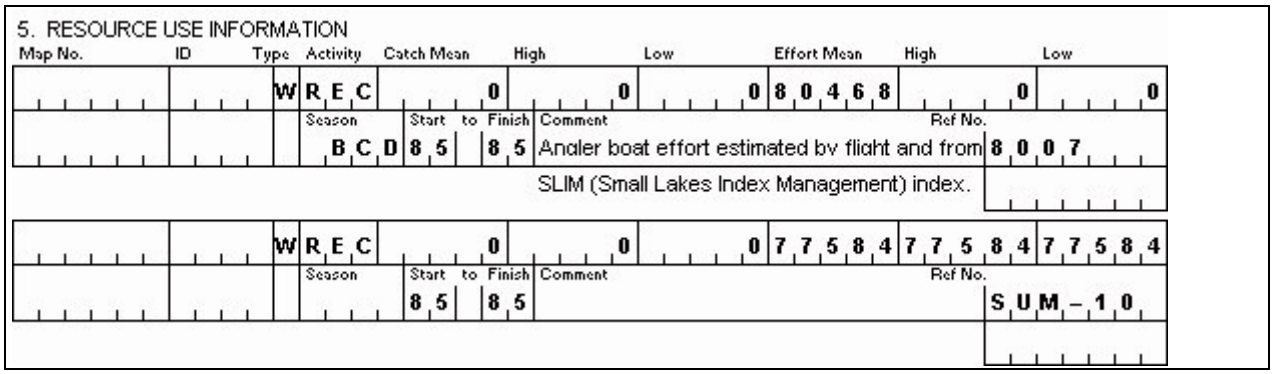


Figure 21. Example of a completed section 5.6. Resource Use Information.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual. Much of this data will be applicable to the whole lake or stream.

Activity: A code of up to three characters indicating the type of resource use. Record the most appropriate code from the list below.

Guides = AGU

Commercial	=	COM
Domestic	=	DOM
Fishing Lodge	=	FLG
Native	=	NAT
Recreational	=	REC
Viewing	=	VUE

Catch: Record mean, high and low catch figures based on annual catch data. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form. These data will be accessed electronically.

Effort: Record mean, high and low effort figures based on annual effort data. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form. These data will be accessed electronically.

Season: Season of use; largely for angling. Record one to four of the codes listed below.

Winter	=	A
Spring	=	B
Summer	=	C
Fall	=	D

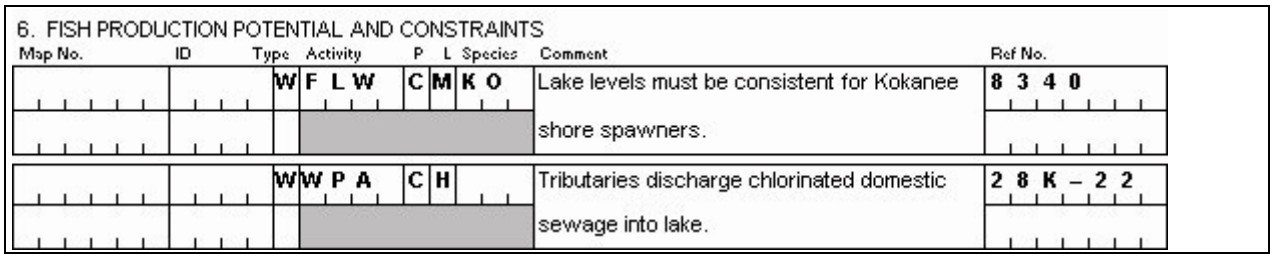
Start To Finish: Years in which the project was or is active. If the project is still active leave the "Finish" field blank. Record the last two digits of the year.

Comment: Record any pertinent information which is not accounted for in other fields.

Ref No. Record bibliographic reference number(s).

5.7 FISH PRODUCTION POTENTIAL AND CONSTRAINTS

Fish Production Potential and Constraints provides information about activities which affect fisheries production. Land uses may only be referred to in this section if they have been documented as constraints. Otherwise, they should be recorded in section 5.9. Land Use. Descriptions of the data which should be included in section 5.7 fields are given below. An example of a completed Fish Production Potential and Constraints section is given in Figure 22.



6. FISH PRODUCTION POTENTIAL AND CONSTRAINTS

Map No.	ID	Type	Activity	P	L	Species	Comment	Ref No.
		W	F L W	C	M	K O	Lake levels must be consistent for Kokanee shore spawners.	8 3 4 0
		W	W P A	C	H		Tributaries discharge chlorinated domestic sewage into lake.	2 8 K – 2 2

Figure 22. Example of a completed section 5.7. Fish Production Potential and Constraints.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Activity: Activities with the potential to increase fish production are represented by codes of up to four letters. They consist of the Enhancement and Management Activities Codes listed in Appendix 8. Record the most appropriate code.

General information and activities causing constraints on fish production are represented by codes of up to four letters. These codes are listed in Appendix 10. Record the most appropriate code.

P: Record one of the single-letter codes below to indicate the nature of the activity.

Potential for increasing fisheries production	=	P
Constraint on fisheries production	=	C
General information that has not been identified as either a potential or constraint to fisheries production	=	G

L: This is the value judgment of potential or constraint. Record one of the following options:

Low Potential/Constraint	=	L
Average Potential/Constraint	=	M

High Potential/Constraint = H

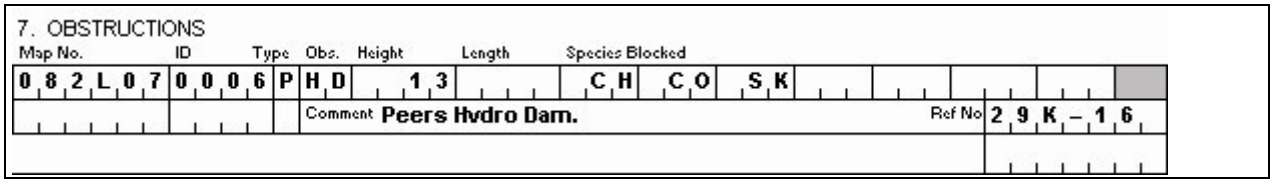
Species: Record the code of the species which has the potential to experience increased production, or the species which is influenced by the constraint. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Comment: For all entries, record additional information which qualifies data contained in other fields.

Ref No.: Record bibliographic reference number(s).

5.8 OBSTRUCTIONS

Obstructions provides information about obstructions in the lake which affect fish, and lists the fish species which are affected. Do not enter information about an obstruction which has been removed either through natural causes or lake enhancement efforts. Descriptions of the data which should be included in section 5.8 fields are given below. An example of a completed Obstructions section is given in Figure 23.


7. OBSTRUCTIONS

Map No.	ID	Type	Obs.	Height	Length	Species Blocked					
082L07	0006	P	HD	13		CH	CO	SK			

Comment: Peers Hydro Dam. Ref No: 29K-16

Figure 23. Example of a completed section 5.8. Obstructions.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Obstruction: Types of obstructions which affect fish movements. Record the appropriate one or two-letter code from the list below.

Beaver Dam	=	BD
Dam	=	D
Hydro Dam	=	HD
Persistent Debris *	=	PD
Pump	=	PU

* Debris present for several years.

Height: Height of the obstruction in metres.

Length: Length of the obstruction in metres.

Species Blocked: Record the code of the species which have been blocked by the obstruction. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Comment: Record any additional information which will help define the obstruction more clearly.

Ref No.: Record bibliographic reference number(s).

5.9 LAND USE

Land Use provides information about the types of land uses occurring in the vicinity of the lake. Descriptions of the data which should be included in section 5.9 fields are given below. An example of a completed Land Use section is given in Figure 24.

8. LAND USE

Map No.	ID	Type	L. Use	Date (yy/mm/dd)	Comment	Ref No.
		W	U D	9 6 0 1 0 1	Many communities are based on the shores of Okanagan Lake.	8 3 4 0
		W	F O	9 6 0 1 0 1	Forestry in the area affecting the stream flows into Okanagan Lake.	8 3 4 0
		W	A G	9 6 0 1 0 1	Many orchards exist along Okanagan Lake.	8 3 4 0

Figure 24. Example of a completed section 5.9. Land Use.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Land Use: Types of land uses in the vicinity of the lake. Record the appropriate two-letter code from the list below.

Land Use *	=	LU

Agriculture	=	AG
Bridge	=	BR
Forestry	=	FO
Industrial Processing	=	IP
Linear Development	=	LD
Mining	=	MI
Pipeline Crossing	=	PL
Placer Mining	=	PM
Parks	=	PR
Powerline Crossing	=	PX
Road	=	RD
Reserves	=	RE
Urban Development	=	UD

* General/unspecified land use.

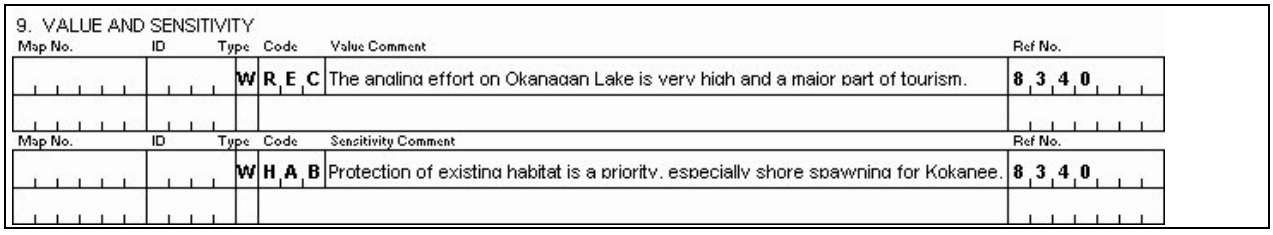
Date: The date the land use was observed. Record as yy/mm/dd.

Comment: Record a brief description of the type of land use.

Ref No.: Record bibliographic reference number(s).

5.10 VALUE AND SENSITIVITY

Value and Sensitivity provides information about the type of value placed on the lake and the sensitivity of the fish habitats/stocks of that lake. This information helps to flag significant attributes of waterbodies such as potential for angling, recreation and aesthetic considerations. Descriptions of the data which should be included in section 5.10 fields are given below. An example of a completed Value and Sensitivity section is given in Figure 25.


9. VALUE AND SENSITIVITY

Map No.	ID	Type	Code	Value Comment	Ref No.
		W	R E C	The angling effort on Okanagan Lake is very high and a major part of tourism.	8 3 4 0

Map No.	ID	Type	Code	Sensitivity Comment	Ref No.
		W	H A B	Protection of existing habitat is a priority, especially shore spawning for Kokanee.	8 3 4 0

Figure 25. Example of a completed section 5.10. Value and Sensitivity.

Georeference

Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Value Codes: The type of value attributed to a lake. Record the appropriate code from the list below.

Angling Sites	=	ANG
Viewing Sites	=	VUE
High Aesthetic Values	=	SEE
Recreational Values	=	REC

Note: These codes can be generated by field staff to meet the specific needs of local area planning. They are meant to be quite generic, with further information presented in the “Comment” field as required.

Value Comment: Emphasize values where they are not adequately covered by the data.

Ref No.: Record bibliographic reference number(s).

Sensitivity Codes: The main component of a lake which is sensitive and most vulnerable to negative impacts. Record the appropriate code from the list below.

Sensitive Fish Stock	=	FIS
Sensitive Habitat	=	HAB

Note: These codes can be generated by field staff to meet the specific needs of local area planning. They are meant to be quite generic, with further information presented in the “Comment” field as required.

Sensitivity Comment: Emphasize sensitivities where they are not adequately covered by the data.

Ref No.: Record bibliographic reference number(s).

5.11 SPECIES AND STOCK IDENTIFICATION

Species and Stock Identification begins the information records related to individual species and stocks. As multiple species and stocks likely occur in each lake, many

records will need to be completed. As a result, additional pages of sections 5.11 through 5.14 may be required. Descriptions of the data which should be included in section 5.11 fields are given below. An example of a completed Species and Stock Identification section is given in Figure 26.

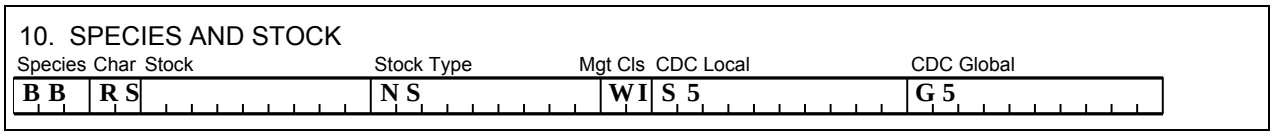


Figure 26. Example of a completed section 5.11. Species and Stock Identification.

Species: Record the codes of ALL fish species found in the lake. B.C. fish species and their codes are listed by taxonomic groupings in Appendix 9A, alphabetical order by common names in Appendix 9B and alphabetical order by codes in Appendix 9C.

Stock Characteristics: The characteristic residence and movement patterns of the fish stock. Record the appropriate code from the list below.

Adfluvial *	=	AD
Anadromous **	=	AN
Fluvial ***	=	FL
Resident ****	=	RS
Not Specified *****	=	NS

* Spends part of life in lake and part in river.
** Spawn in river, migrate to ocean.
*** Resident in river for entire life.
**** Resident in lake for entire life.
***** Unknown.

Stock: Distinguishes between fish of the same species which occupy more than one waterbody (e.g. *Nanoose* cutthroat). Record up to nine characters. Only complete this field if the stock is known.

Stock Type: Distinguishes between fish of the same stock based on the timing of migrations (e.g. *odd*/*even* pinks, *summer*/*winter* steelhead, *early/late* chinook). Record up to nine characters.

Stock Management Classification: Identifies the nature of the stock and the degree of human intervention. Record the appropriate code from the list below.

Augmented *	=	A
Hatchery **	=	H
Wild Indigenous	=	WI
Wild Naturalized	=	WN

* Stocked with hatchery fish, but not dependent on hatchery for total production.
** Fishery is totally dependent on hatchery production.

Stock Status: Record stock status using the Conservation Data Centre's (CDC) global and local rankings. The CDC fields will not be required for many lake or stream systems. General CDC rankings are given below.

CDC Local - S1, S2, S3, S4, S5
CDC Global - G1, G2, G3, G4, G5

In addition to these rankings there are a number of variations and combinations.

Rankings are available on CDC tracking lists. Stock information is also available from the American Fisheries Society's Stock Status report (Nehlsen et al.). Known locations of rare fish are presented in the rare fish of B.C. draft.

5.12 FISH DISTRIBUTION

Fish Distribution indicates the presence of a fish species and describes the major activity of those fish. Complete one section 5.12 for each section 5.11 completed above. Descriptions of the data which should be included in section 5.12 fields are given below. An example of a completed Fish Distribution section is given in Figure 27.

11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.
		W	O B L	Burbot are a sport fishery in Okanagan Lake.	8 0 0 2

Figure 27. Example of a completed section 5.12. Fish Distribution.

Georeference

Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

In most cases the fish species’ distribution will include the whole lake, and distribution information will be tied by default as an attribute to the whole lake. Actual distribution information might be included to indicate information such as Kokanee or sockeye shore spawning locations, and known lake char spawning shoals.

Activity: Describes the presence of fish and the major activity of those fish. Record the most appropriate code from the list below.

Holding or Staging Location	=	HOL
No Fish Caught	=	NFC
No Fish Observed (YUKON ONLY)	=	NFO
No Fish Present *	=	NFP
Fish Observed at this Point or Zone	=	OBL
Rearing Location	=	REA
Spawning in Estuary	=	SPE
Spawning Location **	=	SPL
Major Spawning Location	=	SPM
Unconfirmed Siting (YUKON ONLY)	=	UNC

* Record NFP for areas that have been sampled according to Forest Practices Code methods and found to be barren of fish. Do not confuse *no fish present* (NFP) with *no fish caught* (NFC).

** In YUKON, all Salmon observed can be assumed to be spawning anywhere up to that point.

Comment: Add details of distribution such as unique spawning location or heavy spawning.

Ref No.: Record bibliographic reference number(s).

5.13 HARVEST AND USE

Harvest and Use indicates the harvest and use of individual species and stocks of fish. This is in contrast to section 5.6. Resource Use Information which relates to information about the whole lake. Much of this information will be obtained through electronic links with existing databases such as the Steelhead Harvest Analysis and SLIM. In this situation, do not record information on the Lake Data Entry Form. For non-linked information sources complete one section 5.13 for each section 5.11 completed above. Descriptions of the data which should be included in section 5.13 fields are given below. An example of a completed Harvest and Use section is given in Figure 28.

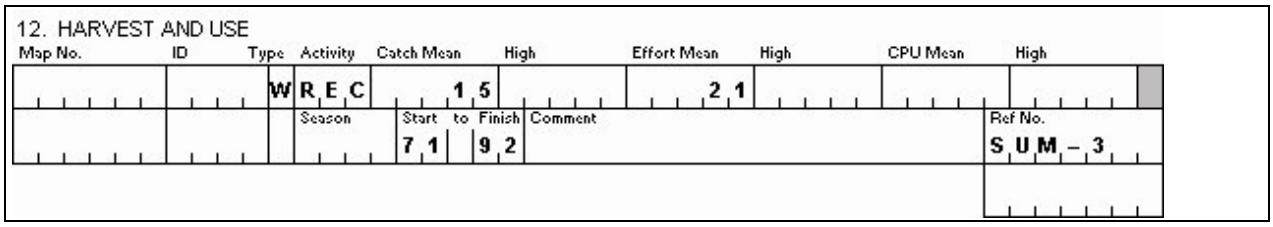


Figure 28. Example of a completed section 5.13. Harvest and Use.

Georeference Information: Consists of three components: “Map No.”, “ID”, and “Type”. These items are described in detail in the “Georeference Fish and Fish Habitat Information” section of this manual.

Activity: Describes the type of use for individual species and stocks. Record the appropriate code from the list below.

Guides	=	AGU
Commercial	=	COM
Domestic	=	DOM
Fishing Lodge	=	FLG
Native	=	NAT
Recreational	=	REC
Viewing	=	VUE

Catch: Mean and high annual catch figures from reports. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form.

Effort: Mean and high annual effort figures from reports. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form.

CPUE: Mean and high catch per unit effort (CPUE) figures from reports. Where data is available in the Steelhead Harvest Analysis, SLIM or other external dataset, do not record information on this form.

Season: Season of use; largely for angling. Record one to four of the codes listed below.

Winter	=	A
Spring	=	B

Summer = C
Fall = D

Start to Finish: Years in which the project was or is active. If the project is still active leave the "Finish" field blank. Record the last two digits of the year.

Comment: Record any pertinent information which is not accounted for in other fields.

Ref No.: Record bibliographic reference number(s).

5.14 LIFE HISTORY AND TIMING

Life History and Timing indicates when various life history activities occur for each fish species. Descriptions of the data which should be included in section 5.14 fields are given below. An example of a completed Life History and Timing section is given in Figure 29.

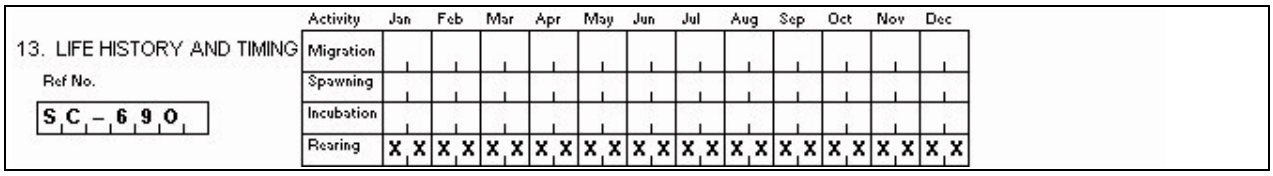


Figure 29. Example of a completed section 5.14. Life History and Timing.

Ref No.: Record a bibliographic reference number.

Table: For each species and activity, mark with an "X" the half months in which the life history stage occurs. THIS SHOULD ONLY BE DONE WHERE SPECIFIC INFORMATION EXISTS; GENERAL LIFE HISTORY AND TIMING KNOWLEDGE SHOULD NOT BE INDICATED ON THIS TABLE.

Where life history information exists from FISS, overwrite the "X"s recorded above with one of the following codes:

Fish Presence in Estuary = E
Fish Presence in Lower River = L
Peak = P

Chapter 6.
Complete a Bibliography

Complete a Bibliography

A bibliography provides a complete listing of all reference materials referred to in the main body of a document. On Data Entry Forms, bibliographic information is recorded using a reference number under the headings “Ref No.”. These reference numbers are unique for each different reference. This coding system allows attribute information recorded on the Data Entry Forms to be linked to a bibliographic reference (Figure 30). The bibliographic reference in turn allows the original referenced information source to be found.

Reference No.:	Reference Type:	Reference Year:
A19511	16	1995
Author(s): McPhail, D.		Author Type: I
Title: Records of fish caught in freshwater on the QCI / Haida Gwaii		
Description: 5pp. Prepared by the Fisheries Centre, University of B.C.		
Location: Fisheries Centre, UBC, Vancouver		

Figure 30. Example of a completed bibliographic reference.

Unique reference numbers for those references not already included in FISS must be generated. One copy of each new reference cited MUST be delivered to MELP with reference numbers clearly marked on the front cover.

Follow the instructions below when completing bibliographic references. Refer to Appendix 11 for detailed standards used for bibliographic data compilation in FISS.

Reference No.: Record the unique bibliographic reference number of the reference. If a reference covers more than one location it should be assigned a reference number only once. To view a listing of existing codes access the MELP or DFO home pages (see Appendix 1). To obtain

appropriate new codes contact Gordon Oliphant at MELP in Victoria (see Appendix 1 for contact information).

Reference Type: The nature of the reference. Record the appropriate code from Table 2.

Reference Year: Record the year the reference was published.

Author(s): List the name(s) of the author(s) of the reference (see Appendix 11).

Author Type: Indicates if the reference was written by an individual or an organization. Record one of the codes below.

Individual = I
Organization = O

Title: Record the complete title of the reference, including subtitles (see Appendix 11).

Description: Record the balance of the citation including name and location of publisher or name, volume and issue of journal, and number of pages (see Appendix 11).

Location: Record the physical location where the reference can be found.

Table 2. Codes for different types of references.

REFERENCE TYPE	CODE
Government Report	1
Unpublished Government Report	2
Unpublished Government Record	3
Consultant Report	4
Personal Information/ Communication	5
Letter	6
Proceeding	7
Regulation Synopsis	8
Published Book (private)	9
Thesis	10
Map	11
Newspaper Article	12

Aerial Photograph	13
Photographs	14
Journal/Magazine Article	15
University Study (non-thesis)	16
Company (e.g. Alcan)	17
Summarization from Non-FISS Government Database	18

Appendix 1.
Contacts for Information Resources

General Inquiries

- Gordon Oliphant
  Ministry of Fisheries, Fisheries Inventory Section
  Mailing Address: P.O. Box 9359 Stn. Prov. Govt.
  Street Address: 1 - 780 Blanshard Street
  Victoria BC V8W 9M2
  phone: (250) 356-9938
  fax: (250) 356-1202
  email: goliphan@fwhdept.env.gov.bc.ca

- Brad Mason
  DFO, Habitat Management Division
  327 - 555 West Hastings Street
  Vancouver BC V6B 5G3
  phone: (604) 666-7015
  fax: (604) 666-8874
  email: MASONB%AM%VANHQ4@MR.PBS.DFO.CA

Existing FISS Maps

Digitization of maps is an ongoing process and will not be complete for some time to come. In the meantime current hardcopies of all BC 1:50,000 FISS maps are available from:

- Archetype Print
  459 - 409 Granville Street
  Vancouver BC V6C 1T2
  phone: (604) 602-0282
  fax: (604) 602-0283

Maps must be requested by the NTS map number (e.g. 92G07). Each map costs $3 plus tax and shipping.

Please note that Archetype Print carry FISS maps as a service to MELP and DFO and do not keep track of what data is on the maps. If they do not have a copy of a map, there probably is no point information on that map. This, however, should be confirmed by contacting Gordon Oliphant at MELP headquarters in Victoria (see “General Inquiries”).

Existing FISS Bibliography

In the near future the existing FISS bibliography may be viewed on:

- MELP home page at: http:\\www.env.gov.bc.ca

- DFO home page at: http:\\habitat.pac.dfo.ca

Blank Data Entry Forms

Blank Stream and Lake Data Entry Forms may presently be obtained from:

- Gordon Oliphant at MELP headquarters in Victoria (see “General Inquiries”). One copy of each form will be provided for photocopying purposes.

In the near future these forms will be available for downloading from:

- DFO home page at: http:\\habitat.pac.dfo.ca

Watershed Codes

Watershed codes may be obtained from any of three sources:

- BC Watershed Atlas. Must have access to a GIS or Map Browser and the Internet. The Watershed Atlas is available for viewing at the DFO home page: http://habitat.pac.dfo.ca. The first screen up is the Fisheries Habitat Inventory and Information Program (FHIIP) screen. Select the hypertext: “Interactive Fish Habitat Maps” and follow the instructions provided.

- MELP home page . Must have access to the Internet.
  Enter the URL: http://www.env.gov.bc.ca/fsh/ids/dman/
  Select the hypertext : “Find the Watershed Codes of Waterbodies”.
  Enter criteria to be used for the query and click on the “submit” button.
  A table will appear listing the Watershed Code, Sequence Number, Type, Primary Map, UTM Zone, UTM Northing, UTM Easting, Gazetted Name and Alias.

- Gordon Oliphant at MELP headquarters in Victoria (see “General Inquiries”). Please note that the Internet is the standard for providing watershed codes and assistance will be given regarding how to use the web sites.

Waterbody Identifiers

Waterbody Identifiers may be obtained from:

- BC Watershed Atlas. Follow the instructions given under “Watershed Codes”.

- Gordon Oliphant at MELP headquarters in Victoria (see “General Inquiries”).

SISS/RAB Codes

SISS/RAB Codes for streams or watersheds may be obtained from the locations listed below. Please note that SISS/RAB codes do not exist for all streams in B.C. and exist for only a few lakes.

- MELP home page . Must have access to the Internet.
  Enter the URL: http://www.env.gov.bc.ca/fsh/ids/dman/
  Select the hypertext : "Stream Query (includes RAB codes)".
  Enter criteria to be used for the query and click on the "submit" button.
  A table will appear listing the Watershed Code, RAB Code, Stream Length, Gazetted Name and Alias.

- Gordon Oliphant at MELP headquarters in Victoria (see "General Inquiries").

Lake Sequence Number

Lake Sequence Numbers may be obtained from:

- BC Watershed Atlas. Follow the instructions given under "Watershed Codes".

Reference Numbers

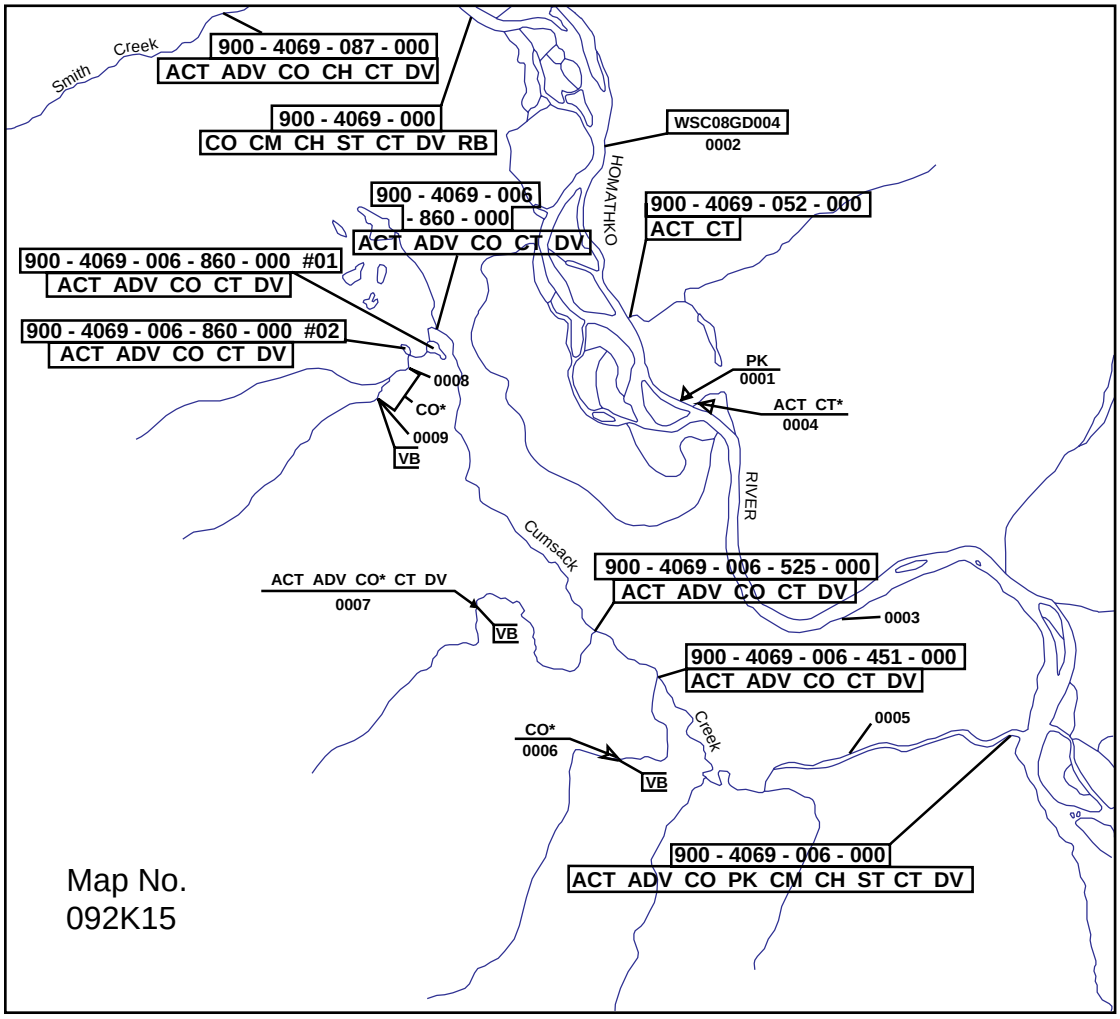
To obtain appropriate new reference numbers contact:

- Gordon Oliphant at MELP headquarters in Victoria (see "General Inquiries").

Appendix 2.
Example of a FISS Map

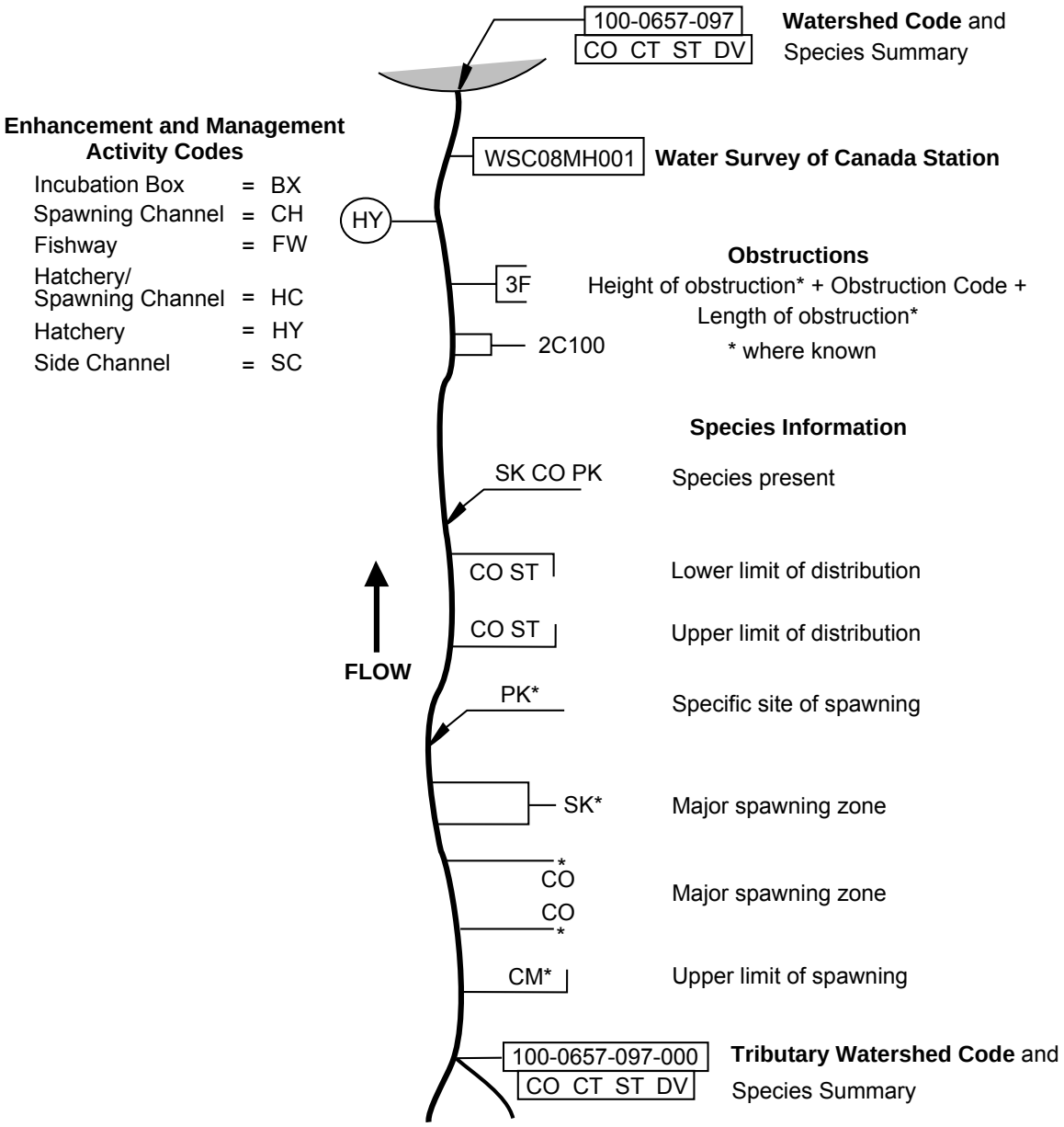
Example of a FISS Map

While the map below is representative of a FISS map it is not a true FISS map. For demonstration purposes roads and contour lines have been omitted.



Appendix 3.
FISS Map Symbols

FISS Map Symbols



Appendix 4.
Stream Data Entry Form

STREAM DATA ENTRY FORM

1. REFERENCING INFORMATION

Stream Name		Alias #1
Completed by	Date (yy/mm/dd)	Alias #2

Watershed Code (37 digits)	New Watershed Code (45 digits)
Watershed Code (cont.)	New Watershed Code (cont.)
Watershed Code (cont.)	New Watershed Code (cont.)

SISS/RAB Code (21 digits)

1:50,000 Map No.	ID		1:50,000 Zone	Easting	Northing
1:20,000 Map No.	Project ID	ILP No.	NAD	1:20,0 Zone	Easting	Northing

2. STREAM INFORMATION

WATER SURVEY OF CANADA STATIONS

	Map No.	ID		Station No.	Ref No.
Loc. Ref			P W S C		
			P W S C		
			P W S C		
			P W S C		

WATER QUALITY STATIONS

	Map No.	ID		Station No.	Ref No.
Loc. Ref			P W Q S		
			P W Q S		
			P W Q S		
			P W Q S		

3. PROVINCIAL FISHERIES MANAGEMENT OBJECTIVES

Habitat Type | Management Objective 1 | Management Objective 2

4. ENHANCEMENT AND MANAGEMENT ACTIVITIES

Map No.	ID	Type	Activity	Project	Start	Finish	Species	Ref No.
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					

STREAM DATA ENTRY FORM

Stream Name ______________________

5. RESOURCE USE INFORMATION

Map No. | ID | Type | Activity | Catch Mean | High | Low | Effort Mean | High | Low

Season | Start to Finish | Comment | Ref No.

Season | Start to Finish | Comment | Ref No.

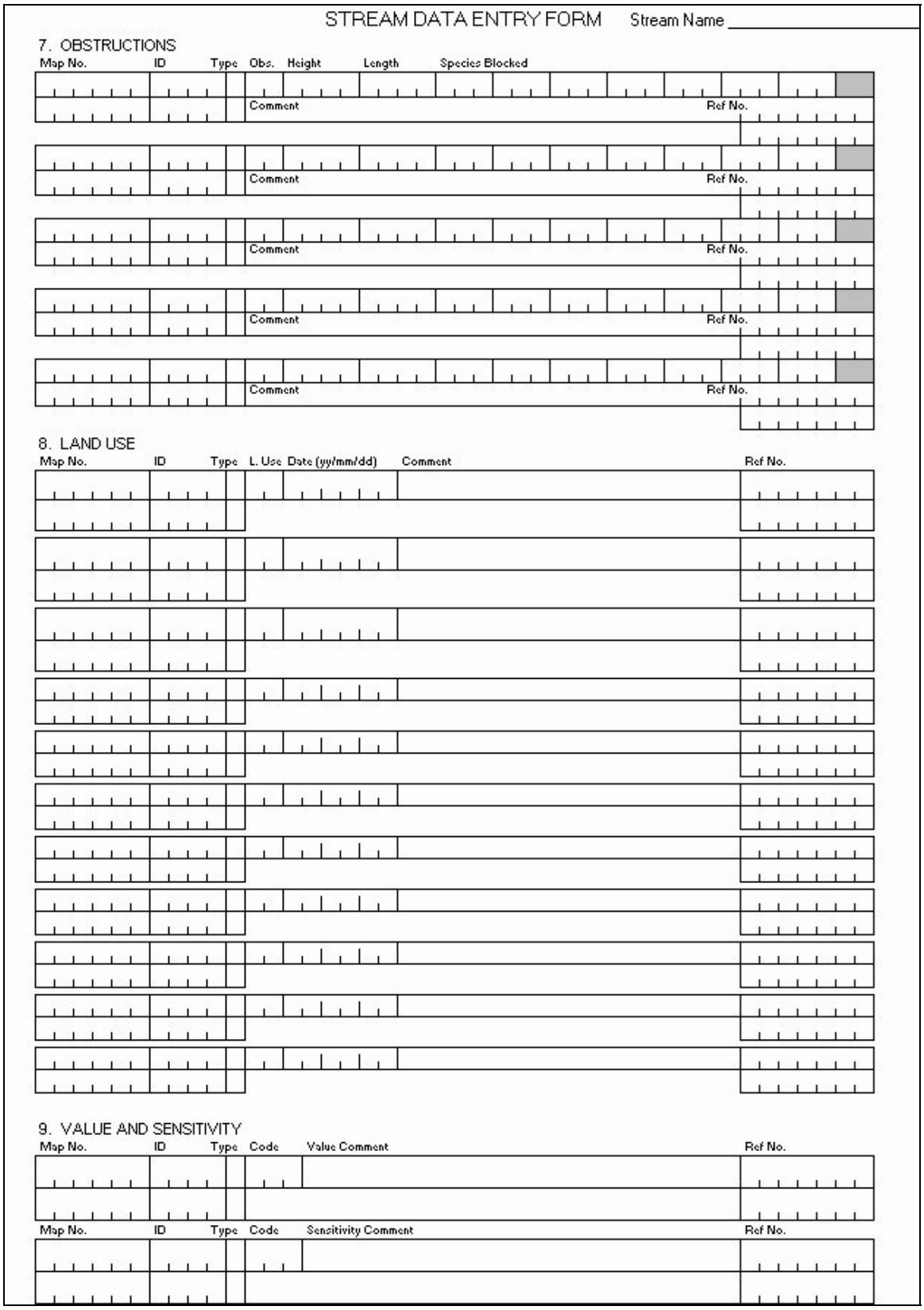
Season | Start to Finish | Comment | Ref No.

Season | Start to Finish | Comment | Ref No.

Season | Start to Finish | Comment | Ref No.

6. FISH PRODUCTION POTENTIAL AND CONSTRAINTS

Map No. | ID | Type | Activity | P | L | Species | Comment | Ref No.



STREAM DATA ENTRY FORM Stream Name _____

7. OBSTRUCTIONS

Map No.	ID	Type	Obs.	Height	Length	Species Blocked	
Comment						Ref No.	
Comment						Ref No.	
Comment						Ref No.	
Comment						Ref No.	
Comment						Ref No.	

8. LAND USE

Map No.	ID	Type	L. Use	Date (yy/mm/dd)	Comment	Ref No.

9. VALUE AND SENSITIVITY

Map No.	ID	Type	Code	Value Comment	Ref No.
Map No.	ID	Type	Code	Sensitivity Comment	Ref No.

STREAM DATA ENTRY FORM Stream Name _____

10. SPECIES AND STOCK IDENTIFICATION

Species	Char	Stock	Stock Type	Mgt Cls	CDC Local	CDC Global

11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.

12. HARVEST AND USE

Map No.	ID	Type	Activity	Catch Mean	High	Effort Mean	High	CPU Mean	High

Season	Start to Finish	Comment	Ref No.

13. ESCAPEMENT

Species	10 Yr. Period	10 Yr. Mean	10 Yr. Max.	Period of Record	Max.	Year	Target

Comment	Ref No.

14. LIFE HISTORY AND TI

Ref No.

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Migration												
Spawning												
Incubation												
Rearing												

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10. SPECIES AND STOCK IDENTIFICATION

Species	Char	Stock	Stock Type	Mgt Cls	CDC Local	CDC Global

11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.

12. HARVEST AND USE

Map No.	ID	Type	Activity	Catch Mean	High	Effort Mean	High	CPU Mean	High

Season	Start to Finish	Comment	Ref No.

13. ESCAPEMENT

Species	10 Yr. Period	10 Yr. Mean	10 Yr. Max.	Period of Record	Max.	Year	Target
	—			—			

Comment	Ref No.

14. LIFE HISTORY TIMING

Ref No.

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Migration												
Spawning												
Incubation												
Rearing												

Appendix 5.
Lake Data Entry Form

LAKE DATA ENTRY FORM

1. REFERENCING INFORMATION

Lake Name		Alias #1
Completed by	Date (yy/mm/dd)	Alias #2
Watershed Code (37 digits)		New Watershed Code (45 digits)
Watershed Code (cont.)		New Watershed Code (cont.)
Watershed Code (cont.)	Lake	New Watershed Code (cont.) / Waterbody ID
1:50,000 Outlet ID / Map No. / ID	P O U T	1:50,000 Outlet UTM / Zone / Easting / Northing
1:20,000 Map No. / Project ID	ILP No.	NAD / 1:20,0 Zone / Easting / Northing

2. LAKE INFORMATION

Surface Area	ha	Shoal Area	ha
Mean Depth	m	Max. Depth	m
Perimeter	km	Tributaries: Outlets	
Elevation	m	Permanent Inlets	
Ref No.		Intermittent Inlets	

TDS: pH Alkalinity Ref No.

Angler Access Facilities Ref No.

3. PROVINCIAL FISHERIES MANAGEMENT OBJECTIVES

Habitat type Management Objective 1 Management Objective 2

4. ENHANCEMENT AND MANAGEMENT ACTIVITIES

Map No.	ID	Type	Activity	Project	Start	Finish	Species	Ref No.
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					
					to-			
			Comment					

LAKE DATA ENTRY FORM

Lake Name ____________

5. RESOURCE USE INFORMATION

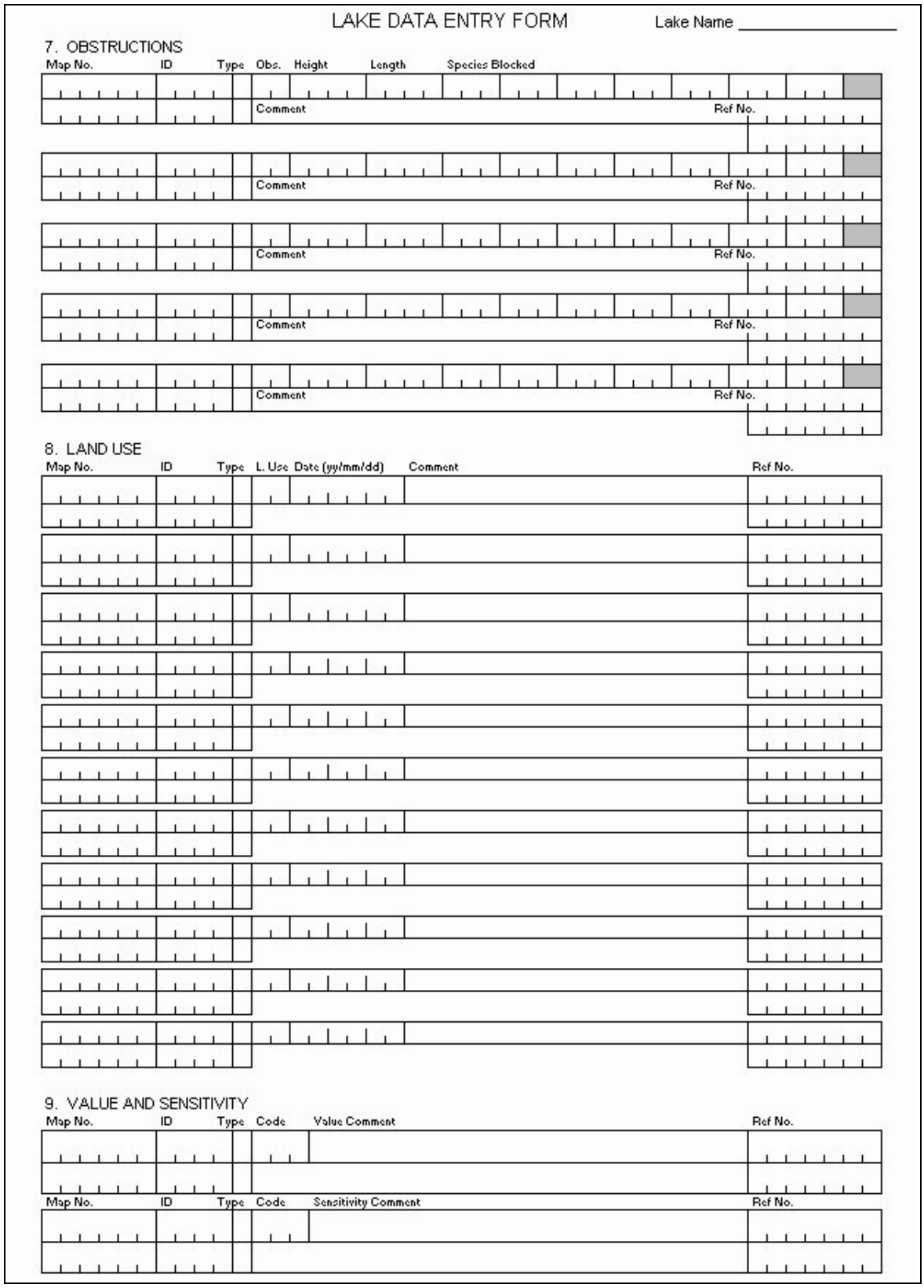
Map No.	ID	Type	Activity	Catch Mean	High	Low	Effort Mean	High	Low

Season	Start to Finish	Comment	Ref No.

(Form rows repeated five times, each with Season, Start to Finish, Comment and Ref No. fields.)

6. FISH PRODUCTION POTENTIAL AND CONSTRAINTS

Map No.	ID	Type	Activity	P	L	Species	Comment	Ref No.



LAKE DATA ENTRY FORM Lake Name _____

7. OBSTRUCTIONS

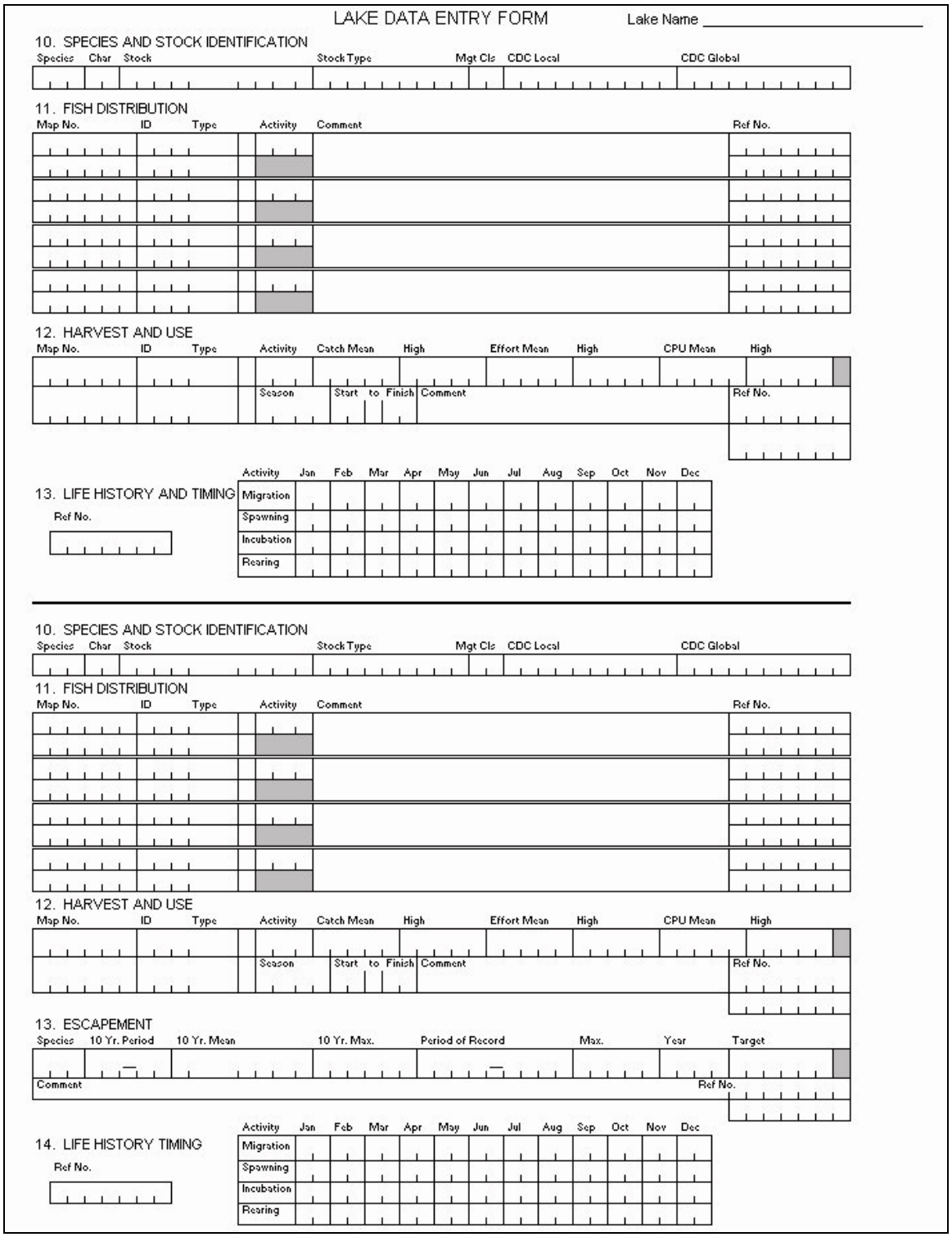
Map No.	ID	Type	Obs.	Height	Length	Species Blocked
Comment					Ref No.	
Comment					Ref No.	
Comment					Ref No.	
Comment					Ref No.	
Comment					Ref No.	

8. LAND USE

Map No.	ID	Type	L. Use	Date (yy/mm/dd)	Comment	Ref No.

9. VALUE AND SENSITIVITY

Map No.	ID	Type	Code	Value Comment	Ref No.
Map No.	ID	Type	Code	Sensitivity Comment	Ref No.



LAKE DATA ENTRY FORM Lake Name _____

10. SPECIES AND STOCK IDENTIFICATION

Species	Char	Stock	Stock Type	Mgt Cls	CDC Local	CDC Global

11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.

12. HARVEST AND USE

Map No.	ID	Type	Activity	Catch Mean	High	Effort Mean	High	CPU Mean	High

Season	Start	to	Finish	Comment	Ref No.

13. LIFE HISTORY AND TIMING

Ref No.

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Migration												
Spawning												
Incubation												
Rearing												

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10. SPECIES AND STOCK IDENTIFICATION

Species	Char	Stock	Stock Type	Mgt Cls	CDC Local	CDC Global

11. FISH DISTRIBUTION

Map No.	ID	Type	Activity	Comment	Ref No.

12. HARVEST AND USE

Map No.	ID	Type	Activity	Catch Mean	High	Effort Mean	High	CPU Mean	High

Season	Start	to	Finish	Comment	Ref No.

13. ESCAPEMENT

Species	10 Yr. Period	10 Yr. Mean	10 Yr. Max.	Period of Record	Max.	Year	Target
	—			—			

Comment Ref No.

14. LIFE HISTORY TIMING

Ref No.

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Migration												
Spawning												
Incubation												
Rearing												

Appendix 6.
FISS Codes

FISS Codes: Alphabetical

CODES	ACTIVITY	"SECTION"
A	Accessible by Road	Lake Info.
A	Angler Use	Management Objective 1
A	Augmented	Management Objective 2; Species/Stock ID
A	Winter	Season
AD	Adfluvial	Species/Stock ID
AG	Agriculture	Land Use
AGU	Guides	Resource Use Info.; Harvest and Use
AH	Angler Use High	Management Objective 1
AL	Angler Use Low	Management Objective 1
AM	Angler Use Medium	Management Objective 1
AN	Anadromous	Species/Stock ID
ANG	Angling Sites	Value and Sensitivity
AR	Anadromous River	Habitat Type
AR	Restricted/Controlled Access	Lake Info.
AW	Road to Near Lake, then Walk	Lake Info.
B	Biotic Interactions	Fish Production Constraint or General Info.
B	Spring	Season
BC	Competition/Predation	Fish Production Constraint or General Info.
BCC	Competitive Species	Fish Production Constraint or General Info.
BCP	Predatory Species	Fish Production Constraint or General Info.
BD	Beaver Dam	Obstruction
BD	Disease/Parasitism	Fish Production Constraint or General Info.
BDD	Diseased Stocks	Fish Production Constraint or General Info.
BDP	Parasitized Stocks	Fish Production Constraint or General Info.
BR	Bridge	Land Use
C	Cascade	Obstruction
C	Constraint	Fish Production Potential Constraint
C	Summer	Season
CN	Canyon	Obstruction
COM	Commercial	Resource Use Info.; Harvest and Use

CV	Culvert	Obstruction
D	Dam	Obstruction
D	Fall	Season
DOM	Domestic	Resource Use Info.; Harvest and Use
E	Fish Presence in Estuary	Life History and Timing
E	Enhancement Activities; unspecified	Enhancement and Management
EB	Biological Enhancement; unspecified	Enhancement and Management
EBB	Fish Barrier; international	Enhancement and Management
EBE	Exclusion Fencing	Enhancement and Management
EBI	Invertebrate Introduction	Enhancement and Management
EBL	Lake Rehabilitation; chemical	Enhancement and Management
EBR	Riparian	Fish Production Potential; Enhancement and Management
EC	Fish Culture Activities	Enhancement and Management
ECA	Artificial Production; unspecified	Enhancement and Management
ECAC	Spawning Channel	Enhancement and Management
ECAH	Hatchery	Enhancement and Management
ECAL	Hatchery on Lake	Enhancement and Management
ECAO	Off Channel Ponds	Enhancement and Management
ECAP	Rearing Pens	Enhancement and Management
ECN	Seminatural Production	Enhancement and Management
ECNB	Hatchery Broodstock	Enhancement and Management
ECNJ	Japanese Hatchery	Enhancement and Management
ECNX	Incubation Box	Enhancement and Management
ECS	Colonization/Stocking	Fish Production Potential; Enhancement and Management
ECSC	Colonization; species not present	Enhancement and Management
ECSJ	Juvenile Outplant; species present	Enhancement and Management
ECSP	Transplant	Enhancement and Management
ECST	Trap/Truck	Enhancement and Management
EF	Water Volume/Flow Regime	Fish Production Potential
EH	Habitat Enhancement; unspecified	Enhancement and Management
EHB	Bank Stabilization	Enhancement and Management
EHBF	Riparian Zone Fencing	Enhancement and Management
EHBP	Planting	Enhancement and Management
EHBR	Rip Rap/Rock Work	Enhancement and Management
EHC	Stream Cleaning	Enhancement and Management
EHF	Fertilization	Enhancement and Management
EHM	Man Made Reef	Enhancement and Management
EHR	Rearing Habitat	Fish Production Potential
EHR	Rearing Habitat Enhancement	Enhancement and Management
EHRE	Improve Estuary	Enhancement and Management
EHRI	Instream Structure Placement	Enhancement and Management

EHRL	LOD Placement	Enhancement and Management
EHRM	Marsh Create/Planting	Enhancement and Management
EHRR	Rock/Boulder Placement	Enhancement and Management
EHRS	Side Channel / Pool	Enhancement and Management
EHS	Spawning Habitat	Fish Production Potential
EHS	Spawning Habitat Enhancement	Enhancement and Management
EHSD	Destroy Spawning Habitat	Enhancement and Management
EHSG	Gravel Cleaning	Enhancement and Management
EHSP	Spawning Gravel Placement	Enhancement and Management
EHSS	Spawning Platforms	Enhancement and Management
EHST	Sediment Trap Construction/ Cleanout	Enhancement and Management
EO	Obstruction Removal	Fish Production Potential
EO	Barrier Modification/Obstruction Removal; unspecified	Enhancement and Management
EOB	Beaver Dam Removal	Enhancement and Management
EOC	Baffle Culvert	Enhancement and Management
EOF	Fishway	Enhancement and Management
EOL	Log Jam Removal	Enhancement and Management
EOP	Tailwater or Resting Pools	Enhancement and Management
EOS	Fish Screens at Outlets/Diversions	Enhancement and Management
EW	Water Quality and Quantity	Enhancement and Management
EW	Water Quality Improvement	Fish Production Potential
EWA	Aeration	Enhancement and Management
EWC	Cold Water Release Structure	Enhancement and Management
EWD	Dam to Increase Water Level	Enhancement and Management
EWF	Flow Control	Enhancement and Management
EWS	Stream Diversion	Enhancement and Management
EWW	Warm Water Release	Enhancement and Management
F	Falls	Obstruction
F	Flow Regime	Fish Production Constraint or General Info.
FA	Lake Access	Fish Production Constraint or General Info.
FAB	Stream Braided at Low Flow	Fish Production Constraint or General Info.
FAI	Intermittently Accessible	Fish Production Constraint or General Info.
FAN	Not Accessible	Fish Production Constraint or General Info.
FAS	Seasonally Accessible	Fish Production Constraint or General Info.
FF	Flow Fluctuations	Fish Production Constraint or General Info.
FFF	Flashy Flows	Fish Production Constraint or General Info.

FG	Groundwater Fed	Fish Production Constraint or General Info.
FIS	Sensitive Fish Stock	Value and Sensitivity
FL	Fishing Lodge/Resort	Lake Info.
FL	Fluvial	Species/Stock ID
FL	Low Flows	Fish Production Constraint or General Info.
FLD	Dewatering	Fish Production Constraint or General Info.
FLF	Seasonal Flow	Fish Production Constraint or General Info.
FLG	Fishing Lodge	Resource Use Info.; Harvest and Use
FLI	Intermittent Stream	Fish Production Constraint or General Info.
FLP	Permanent Flow	Fish Production Constraint or General Info.
FLS	Summer Low Flows	Fish Production Constraint or General Info.
FLW	Winter Low Flows	Fish Production Constraint or General Info.
FO	Forestry	Land Use
FP	Peak Flows; flooding	Fish Production Constraint or General Info.
FPA	Floods Banks Annually	Fish Production Constraint or General Info.
FPF	Floods Banks Several Times Per Year	Fish Production Constraint or General Info.
FPR	Floods Banks Every Several Years	Fish Production Constraint or General Info.
FRC	Diversion Channel	Fish Production Constraint or General Info.
FRD	Reservoir Drawdown	Fish Production Constraint or General Info.
FRI	Irrigation Ditch	Fish Production Constraint or General Info.
FRP	Placer Lease and Claim	Fish Production Constraint or General Info.
FU	Water Use/Diversion	Fish Production Constraint or General Info.
FUF	Fully Subscribed With Licenses	Fish Production Constraint or General Info.
FUP	Pump Intake	Fish Production Constraint or General Info.
FUS	Water Storage Reservoir	Fish Production Constraint or General Info.

G	General Information	Fish Production Potential/Constraint
H	Habitat Quality	Fish Production Constraint or General Info.
H	Hatchery	Management Objective 2; Species/Stock ID
H	High Potential/Constraint	Fish Production Potential/Constraint
HA	Alienated Habitat	Fish Production Constraint or General Info.
HAB	Sensitive Habitat	Value and Sensitivity
HB	Bed/Bank Characterization	Fish Production Constraint or General Info.
HBB	Bank/Bar Composition	Fish Production Constraint or General Info.
HBBC	Cobble Bank/Bar Composition	Fish Production Constraint or General Info.
HBBG	Gravel Bank/Bar Composition	Fish Production Constraint or General Info.
HBBM	Mud Bank/Bar Composition	Fish Production Constraint or General Info.
HBBS	Sand Bank/Bar Composition	Fish Production Constraint or General Info.
HBD	Developed Bed/Bank	Fish Production Constraint or General Info.
HBDB	Booms/Booming Ground	Fish Production Constraint or General Info.
HBDD	Dredging	Fish Production Constraint or General Info.
HBDG	Gravel Extraction / Scalping	Fish Production Constraint or General Info.
HBDP	Pier	Fish Production Constraint or General Info.
HBDR	Rip Rap	Fish Production Constraint or General Info.
HBR	Riverbed Substrate	Fish Production Constraint or General Info.
HBRC	Cobble Riverbed Substrate	Fish Production Constraint or General Info.
HBRG	Gravel Riverbed Substrate	Fish Production Constraint or General Info.
HBRM	Mud Riverbed Substrate	Fish Production Constraint or General Info.
HBRS	Sand Riverbed Substrate	Fish Production Constraint or General Info.
HBV	Aquatic Vegetation	Fish Production Constraint or

		General Info.
HBVE	Emergent Aquatic Vegetation	Fish Production Constraint or General Info.
HBVS	Submergent Aquatic Vegetation	Fish Production Constraint or General Info.
HC	Channel Stability	Fish Production Constraint or General Info.
HCE	Erosion / Sedimentation	Fish Production Constraint or General Info.
HCEB	Lateral Stream/Bank Erosion	Fish Production Constraint or General Info.
HCEI	Streambed Incision	Fish Production Constraint or General Info.
HCES	Streambed Sedimentation	Fish Production Constraint or General Info.
HD	Habitat Diversity	Constraints or General Info.
HD	Hydro Dam	Obstruction
HDH	High Diversity of Habitat	Fish Production Constraint or General Info.
HDL	Low Diversity of Habitat	Fish Production Constraint or General Info.
HDM	Medium Diversity of Habitat	Fish Production Constraint or General Info.
HM	Waterbody Morphology	Fish Production Constraint or General Info.
HMW	Wetlands	Fish Production Constraint or General Info.
HMWI	Intermittently Flooded Wetlands	Fish Production Constraint or General Info.
HMWP	Permanently Flooded Wetlands	Fish Production Constraint or General Info.
HMWS	Seasonally Flooded Wetlands	Fish Production Constraint or General Info.
HMWT	Tidal Wetlands	Fish Production Constraint or General Info.
HOL	Holding or Staging Location	Fish Distribution
HR	Rearing Habitat	Fish Production Constraint or General Info.
HRA	Quantity/Amount of Rearing Habitat	Fish Production Constraint or General Info.
HRAH	High Quantity Rearing Habitat	Fish Production Constraint or General Info.
HRAL	Low Quantity Rearing Habitat	Fish Production Constraint or General Info.
HRAM	Medium Quantity Rearing Habitat	Fish Production Constraint or General Info.

HRF	Food Production	Fish Production Constraint or General Info.
HRQ	Quality of Rearing Habitat	Fish Production Constraint or General Info.
HRQH	High Quality Rearing Habitat	Fish Production Constraint or General Info.
HRQL	Low Quality Rearing Habitat	Fish Production Constraint or General Info.
HRQM	Medium Quality Rearing Habitat	Fish Production Constraint or General Info.
HS	Spawning Habitat	Fish Production Constraint or General Info.
HSA	Quantity/Amount of Spawning	Fish Production Constraint or General Info.
HSAH	High Quantity of Spawning Habitat	Fish Production Constraint or General Info.
HSAL	Low Quantity of Spawning Habitat	Fish Production Constraint or General Info.
HSAM	Medium Quantity of Spawning Habitat	Fish Production Constraint or General Info.
HSG	Groundwater Influence on Spawning Habitat	Fish Production Constraint or General Info.
HSQ	Quality of Spawning Habitat	Fish Production Constraint or General Info.
HSQH	High Gravel Quality of Spawning Habitat	Fish Production Constraint or General Info.
HSQL	Low Gravel Quality of Spawning Habitat	Fish Production Constraint or General Info.
HSQM	Medium Gravel Quality of Spawning Habitat	Fish Production Constraint or General Info.
HZ	Riparian Zone	Fish Production Constraint or General Info.
HZF	Exclusion Fencing	Fish Production Constraint or General Info.
HZV	Vegetation	Fish Production Constraint or General Info.
HZVA	Riparian Vegetation Cover 0-20%	Fish Production Constraint or General Info.
HZVB	Riparian Vegetation Cover 20-40%	Fish Production Constraint or General Info.
HZVC	Riparian Vegetation Cover 40-60%	Fish Production Constraint or General Info.
HZVD	Riparian Vegetation Cover 60-80%	Fish Production Constraint or General Info.
HZVE	Riparian Vegetation Cover 80-100%	Fish Production Constraint or General Info.

I	Accessible by Air	Lake Info.
IP	Industrial Processing	Land Use
IR	Inland River	Habitat Type
L	Fish Presence in Lower River	Life History and Timing
L	Low Potential/Constraint	Fish Production Potential/Constraint
LD	Linear Development	Land Use
LL	Large Lake; ≥400 ha	Habitat Type
LU	Land Use; unspecified	Land Use
M	Accessible by Water	Lake Info.
M	Average Potential/Constraint	Fish Production Potential/Constraint
M	Management Activities; unspecified	Enhancement and Management
MA	Special Agreements With Other Agency or Concern	Enhancement and Management
ME	Environmentally Sensitive Area	Enhancement and Management
MF	MOF Recreation Site	Lake Info.
MI	Mining	Land Use
MP	Management Plan	Enhancement and Management
MR	Water Specific Angling Regulation	Enhancement and Management
MS	Biophysical Surveys; unspecified	Enhancement and Management
MSB	Biophysical Inventory/Assessment	Enhancement and Management
MSC	Creel Census	Enhancement and Management
MSF	Counting Fence	Enhancement and Management
MSM	Mark Recovery	Enhancement and Management
MSS	Fish Sampling	Enhancement and Management
MW	Maintain Walk In Status	Management Objective 1
NAT	Native	Resource Use Info.; Harvest and Use
NFC	No Fish Caught	Fish Distribution
NFO	No Fish Observed; YUKON ONLY	Fish Distribution
NFP	No Fish Present	Fish Distribution
NS	Not Specified	Species/Stock ID
OBL	Fish Observed at this Point or Zone	Fish Distribution
P	Peak	Life History and Timing
P	Potential	Fish Production Potential/Constraint
P	Preservation	Management Objective 1
PB	Preservation/Broodstock	Management Objective 1
PD	Persistent Debris	Obstruction
PG	Preservation/Genetic Refugia	Management Objective 1
PK	Park	Lake Info.
PL	Pipeline Crossing	Land Use
PM	Placer Mining	Land Use

PR	Parks	Land Use
PR	Preservation/Research	Management Objective 1
PU	Pump	Obstruction
PX	Powerline Crossing	Land Use
R	Rock	Obstruction
RD	Road	Land Use
RE	Reserves	Land Use
REA	Rearing Location	Fish Distribution
REC	Recreational	Resource Use Info.; Value and Sensitivity; Harvest and Use
RS	Resident	Species/Stock ID
SEE	High Aesthetic Values	Value and Sensitivity
SL	Small Lake; <400 ha	Habitat Type
SPE	Spawning in Estuary	Fish Distribution
SPL	Spawning Location	Fish Distribution
SPM	Major Spawning Location	Fish Distribution
UD	Urban Development	Land Use
UNC	Unconfirmed Siting; YUKON ONLY	Fish Distribution
VB	Velocity Barrier	Obstruction
VUE	Viewing	Resource Use Info.; Value and Sensitivity; Harvest and Use
W	Water Quality	Fish Production Constraint or General Info.
W	Wild	Management Objective 2; Species/Stock ID
W	Wilderness, no Road Access	Lake Info.
WA	Acidity	Fish Production Constraint or General Info.
WAH	Acidic; pH < 5.5	Fish Production Constraint or General Info.
WAL	Alkaline; pH > 8.5	Fish Production Constraint or General Info.
WAM	Medium; 5.5 < pH < 8.5	Fish Production Constraint or General Info.
WC	Turbidity/Colour	Fish Production Constraint or General Info.
WCG	Glacial Silt	Fish Production Constraint or General Info.
WCH	Humic Stained	Fish Production Constraint or General Info.
WCS	Suspended Sediments	Fish Production Constraint or General Info.
WCSL	Suspended Sediments; land use	Fish Production Constraint or General Info.
WCSN	Suspended Sediments; natural	Fish Production Constraint or

		General Info.
WD	Disturbance	Fish Production Constraint or General Info.
WDC	Cattle Crossing/Watering	Fish Production Constraint or General Info.
WDF	Forest Fire	Fish Production Constraint or General Info.
WDP	Placer Mining	Fish Production Constraint or General Info.
WDR	Cattle Range	Fish Production Constraint or General Info.
WF	Fish Contamination	Fish Production Constraint or General Info.
WFA	Consumption Advisory	Fish Production Constraint or General Info.
WFB	Bioassay Information	Fish Production Constraint or General Info.
WFC	Fishery Closure	Fish Production Constraint or General Info.
WI	Wild Indigenous	Management Objective 2; Species/Stock ID
WN	Nutrients	Fish Production Constraint or General Info.
WN	Wild Naturalized	Management Objective 2; Species/Stock ID
WNE	Eutrophic	Fish Production Constraint or General Info.
		General Info.
WNM	Mesotrophic	Fish Production Constraint or General Info.
WNO	Oligotrophic	Fish Production Constraint or General Info.
WO	Dissolved Oxygen	Fish Production Constraint or General Info.
WOB	BOD	Fish Production Constraint or General Info.
WOL	Summerkills	Fish Production Constraint or General Info.
WOS	Gas Supersaturation	Fish Production Constraint or General Info.
WOW	Winterkills	Fish Production Constraint or General Info.
WP	Pollutants	Fish Production Constraint or General Info.
WPA	Agricultural Runoff	Fish Production Constraint or General Info.

WPD	Storm Drain	Fish Production Constraint or General Info.
WPF	Fish Kills Caused by Pollution	Fish Production Constraint or General Info.
WPG	Groundwater Contamination	Fish Production Constraint or General Info.
WPL	Spills	Fish Production Constraint or General Info.
WPM	Municipal Effluent	Fish Production Constraint or General Info.
WPMD	Domestic Sewage Outfall	Fish Production Constraint or General Info.
WPML	Landfill Leachates	Fish Production Constraint or General Info
WPMP	Septic System Inputs	Fish Production Constraint or General Info
WPMS	Storm Sewer Outfall	Fish Production Constraint or General Info
WPMU	Underground Storage Tanks	Fish Production Constraint or General Info
WPP	Pulp Mill / Industrial Effluent	Fish Production Constraint or General Info
WPR	Runoff Contamination	Fish Production Constraint or General Info
WPS	Sediment Contamination	Fish Production Constraint or General Info
WPT	Toxic Waste Site	Fish Production Constraint or General Info
WT	Temperature	Fish Production Constraint or General Info
WTH	High Temperature	Fish Production Constraint or General Info
WTL	Low Temperature	Fish Production Constraint or General Info
X	Log Jam	Obstruction

Appendix 7.
Use of Interim Locational Identifiers

Use of Interim Locational Identifiers

The following information on how to use Interim Locational Identifiers (ILP) was taken from the 1997 B.C. Ministry of Environment, Lands and Parks Fisheries Branch report entitled "User's Guide to the British Columbia Watershed/Waterbody Identifier System". The use of ILP is a three-step process:

- Create watershed/waterbody ILP.
- Request final watershed code / waterbody identifier from Ministry of Environment, Lands and Parks Fisheries Branch.
- Replace ILP with proper code / identifier in database.

Create Watershed/Waterbody ILP

Create Interim Locational Identifiers (ILP) for watersheds and/or waterbodies for which proper codes are unknown. The following guidelines should be followed when creating ILPs.

- IDENTIFY THE WHOLE WATERSHED (i.e. complete stream network). Provide UTMs or Locational Points (see Tables 3 and 4) for all watersheds tributary to those with an existing Watershed code. Start with the stream directly tributary to the last coded system and then add locational points for any further subsystems to this. In those situations where the map does not provide a clear indication of start and end points, such as the locations of headwaters, mouth, and lake outlets, additional information should be provided. This could include comments, map notations or additional Locational Points.

- IDENTIFY INDIVIDUAL WATERBODIES. Provide UTMs of Locational Points (see Tables 3 and 4) for all individual waterbodies, such as lakes and wetlands, requiring identification.

- CREATE AND MAINTAIN A MAP THAT ACCURATELY DEPICTS LOCATIONAL POINTS.

- ENSURE ANY INTERNAL IDENTIFICATION SYSTEM USED PROVIDES UNIQUE IDENTIFIERS WITHIN A PROJECT.

- ENSURE UNIQUENESS BETWEEN PROJECTS. Use interim identifiers such as PRJA and PRJB to distinguish between data from project "A" and data from project "B", to allow data to be managed more effectively.

There will be many situations where the “location” of the locational point or the stream which an existing code refers to may not be obvious. The most frequently encountered situations are given below and are illustrated in Figure 31.

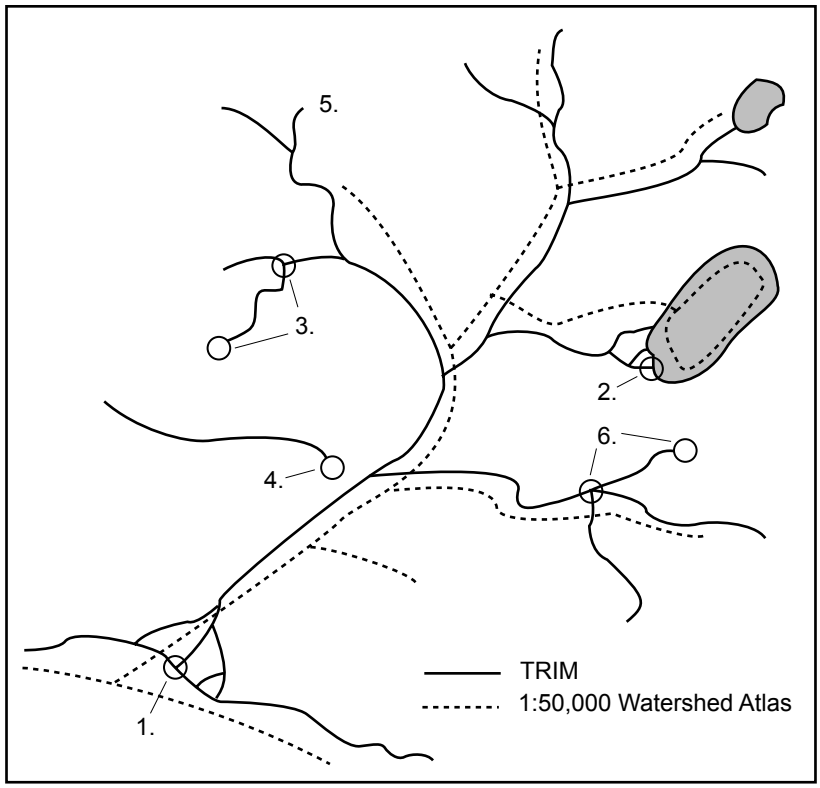

Figure 31. Example scenarios for mapping locational points.

1. Stream breaks up into many channels (e.g. delta or estuary). Place point at mouth of channel appearing to carry bulk of flow.

2. Lake has more than one outlet. Place point at channel outlet which appears to carry bulk of flow and clarify which outlet was labeled in the “Comments” column of the Watershed/Waterbody Description Datasheet. If required, provide locational point for each channel.

3. Tributary to a stream not in Watershed Atlas. Place one locational point at the confluence and a second locational point at the upstream end of the stream in question. Comment accordingly on Datasheet.

4. Stream disappears underground. Place locational point where stream disappears and comment accordingly on Datasheet.

5. The stream in question forks upstream of the end of a stream in the Watershed Atlas. Assume the channel carrying the bulk of flow is the main (i.e., parent) channel and the other channel is the tributary.

6. Two tributary streams enter parent stream at same point. Place one locational point at the mouth and a second locational point at the upstream end of the stream in question. Comment accordingly on Datasheet.

Request Final Watershed Code/Waterbody Identifier from MELP

While the use of IDPs should not delay the field data collection phase of your project, this identifier must be replaced with a final one before the information is made available to other users within the province.

To request a final identifier, a Watershed/Waterbody Description Datasheet must be completed for each waterbody that requires an interim identifier. Table 3 lists the information required to complete this datasheet. Table 4 provides an example of a completed Datasheet. It is requested that all of the fields listed in the Datasheet be completed as thoroughly as possible.

Once complete, Datasheets must be sent to the Fisheries Branch of the Ministry of Environment, Lands and Parks as soon as possible to give the Ministry sufficient time to issue the final identifiers. Both hardcopy and digital (EXCEL or compatible) versions should be submitted. Fisheries Branch will generate a watershed code / waterbody identifier for each locational point and add a column with this information to the spreadsheet. It will then be returned to the contractor. Anticipate up to a 2 - 3 month turn-around time for large requests.

Replace ILP with Proper Code/Identifier in Database

After receiving the Watershed/Waterbody Description Datasheets, MELP Fisheries Branch will analyze the information and reply with a list of actual waterbody identifiers. These will be sent to all users who created interim identifiers for those waterbodies. Once each survey team replaces the interim identifiers in their own databases, any data that was gathered about those waterbodies can be linked via this common identifier.

Table 3. Guidelines for completing the Watershed/Waterbody Description Datasheet.

Locational Point	:	For a watershed, stream or river the locational point is the mouth of the stream or river. For a lake or reservoir the locational point is the outlet of the lake or reservoir, where available. For a lake with no outlet (i.e. isolated lake), the locational point is the center of the lake. For a stream reach the locational point is the upstream reach break.
Map No.	:	Enter the 1:20,000 BCGS map number of the locational point. Use the standard BCGS grid index numbers (e.g. 92F.097).
Project ID / Locational Pt. No.	:	Record Project Identifier and a 5-digit number for the locational point being described.
NAD/UTM	:	Record Datum (NAD27 or NAD83), UTM Zone and UTM coordinates (6-digit Easting, 7-digit Northing, round to 10m). DO NOT submit coordinates from other systems such as latitude/longitude.
UTM Source	:	Record the source of the UTM coordinates provided. If from GPS, provide the name of the GPS system used. If from a map, define (e.g. TRIM, Forest Cover). If the point came from another source, record "Other" and name the source.
TRIM Map	:	Indicate if the feature is shown correctly on the TRIM map. Record "Y" if shown correctly, "I" if shown incorrectly, or "N" if not shown.
High Level Code	:	Record the first three digits of the Watershed code or the Waterbody Identifier. For example, western Vancouver island is 930, and the North Thompson drainage is 129.
Detailed Code	:	Record the full 45-digit Watershed Code of parent if known.
Gazetted Name	:	Record the gazetted name of the stream, river, lake or reservoir. If unnamed enter "none" on the form.
Alias	:	Record the alias or local name of the feature.
Gazetted Name Downstream	:	If the locational point is on a stream or lake which is unnamed, record the next gazetted downstream stream or waterbody (or the ocean). If the locational point is the mouth of an unnamed creek which flows into another unnamed creek which flows into a named stream or waterbody, use the name of the named stream.
Comments	:	Record any other information which could help locate the point (optional).

Table 4. Example of a Completed Watershed/Waterbody Description Datasheet.

MAP #	PROJECT ID	LOCATN'L POINT #	NAD	UTM ZONE	EASTING	NORTH.	UTM	TRIM FEAT.	HIGH LEVEL W'SHED CODE	DETAILED CODE OF PARENT	GAZ. NAME	ALIAS	GAZ. NAME DOWN-STREAM	COMMENTS
082K.003	NAZ/WR	00001	83	10	440298	5913654	TRIM	Y	170	170-123456-63500-00000	Fly C.	Fish C.	Rainbow Lake	Stream in 3 channels at this point
103P.088	KISP/MB	23456	83	9	123456	1234567	GPS	N	470	unknown	Blue Lk.	unk.	Kispiox River	Lake has 2 outlets. Point refers to most easterly one.

Appendix 8.
Enhancement and Management Activity Codes

Enhancement and Management Activity Codes

ACTIVITY	CODES
Enhancement Activities (unspecified)	E
Biological Enhancement (unspecified)	EB
Fish Barrier (international)	EBB
Exclusion Fencing	EBE
Invertebrate Introduction (e.g. gammarus)	EBI
Lake Rehabilitation (chemical)	EBL
Riparian	EBR
Fish Culture Activities	EC
Artificial Production (unspecified)	ECA
Spawning Channel	ECAC
Hatchery	ECAH
Hatchery On Lake	ECAL
Off Channel Ponds	ECAO
Rearing Pens	ECAP
Seminatural Production	ECN
Hatchery Broodstock	ECNB
Japanese Hatchery	ECNJ
Incubation Box	ECNX
Colonization / Stocking	ECS
Colonization (species not present)	ECSC
Juvenile Outplant (species present)	ECSJ
Transplant	ECSP
Trap / Truck	ECST
Habitat Enhancement (unspecified)	EH
Bank Stabilization	EHB
Riparian Zone Fencing	EHBF
Planting	EHBP
Rip Rap / Rock Work	EHBR
Stream Cleaning	EHC
Fertilization	EHF
Man Made Reef	EHM
Rearing Habitat Enhancement	EHR
Improve Estuary	EHRE
Instream Structure Placement	EHRI
LOD Placement	EHRL
Marsh Create / Planting	EHRM
Rock/Boulder Placement	EHRR
Side Channel / Pool	EHRS

Spawning Habitat Enhancement	EHS
Destroy Spawning Habitat	EHSD
Gravel Cleaning	EHSG
Spawning Gravel Placement	EHSP
Spawning Platforms	EHSS
Sediment Trap Construction/Cleanout	EHST
Barrier Modification / Obstruction Removal (unspecified)	EO
Beaver Dam Removal	EOB
Baffle Culvert	EOC
Fishway	EOF
Log Jam Removal	EOL
Tailwater or Resting Pools	EOP
Fish Screens at Outlets/Diversions	EOS
Water Quality and Quantity	EW
Aeration	EWA
Cold Water Release Structure	EWC
Dam to Increase Water Level	EWD
Flow Control	EWF
Stream Diversion	EWS
Warm Water Release	EWW
Management Activities (unspecified)	M
Special Agreements With Other Agency or Concern	MA
Environmentally Sensitive Area	ME
Management Plan	MP
Water Specific Angling Regulation	MR
Biophysical Surveys (unspecified)	MS
Biophysical Inventory/Assessment	MSB
Creel Census	MSC
Counting Fence	MSF
Mark Recovery	MSM
Fish Sampling	MSS

Appendix 9A.
B.C. Fish Species Codes: Taxonomic Groupings

B.C. Fish Species Codes: Taxonomic Groupings

CODE	COMMON NAME	LATIN NAME
	Fish (General)	
AF	All Species	
SP	Species Present, not identified	
NFP	No Fish Present	
	Salmonids (Salmon, Trout, Char)	
SA	Salmon (General)	*Oncorhynchus* spp., *Salmo salar*
AO	All Salmon	*Oncorhynchus* spp., *Salmo salar*
PK	Pink Salmon, Humpback Salmon	*Oncorhynchus gorbuscha*
CM	Chum Salmon, Dog Salmon	*Oncorhynchus keta*
CO	Coho Salmon	*Oncorhynchus kisutch*
SK	Sockeye Salmon	*Oncorhynchus nerka*
KO	Kokanee	*Oncorhynchus nerka*
CH	Chinook Salmon, Spring Salmon, King Salmon, Tyee	*Oncorhynchus tshawytscha*
TR	Trout (General)	*Oncorhynchus* sp
CT	Cutthroat Trout (General)	*Oncorhynchus clarki* (formerly *Salmo clarki*)
ACT	Anadromous Cutthroat Trout	*Oncorhynchus clarki* (formerly *Salmo clarki*)
CCT	Coastal Cutthroat Trout	*Oncorhynchus clarki clarki* (formerly *Salmo clarki clarki*)
WCT	Westslope Cutthroat Trout (preferred) Yellowstone Cutthroat Trout	*Oncorhynchus clarki lewisi* (formerly *Salmo clarki lewisi*)
RB	Rainbow Trout, Kamloops Trout	*Oncorhynchus mykiss* (formerly *Salmo gairdneri*)
ST	Steelhead	*Oncorhynchus mykiss* (formerly *Salmo gairdneri*)
SST	Steelhead (Summer-run)	*Oncorhynchus mykiss*
WST	Steelhead (Winter-run)	*Oncorhynchus mykiss*
AS	Atlantic Salmon	*Salmo salar*
GB	Brown Trout, German Brown Trout	*Salmo trutta*

AGB	Anadromous Brown Trout, Anadromous German Brown Trout	*Salmo trutta*
AC	Arctic Char	*Salvelinus alpinus*
BT	Bull Trout	*Salvelinus confluentus*
EB	Brook Trout, Eastern Brook Trout	*Salvelinus fontinalis*
AEB	Anadromous Eastern Brook Trout	*Salvelinus fontinalis*
SPK	Splake	*Salvelinus fontinalis x Salvelinus namaycush*
DV	Dolly Varden, Dolly Varden Char	*Salvelinus malma*
ADV	Anadromous Dolly Varden, Anadromous Dolly Varden Char	*Salvelinus malma*
LT	Lake Trout, Lake Char	*Salvelinus namaycush*
	Sturgeon	
SG	Sturgeons (General)	*Acipenser* spp.
GSG	Green Sturgeon	*Acipenser medirostris*
WSG	White Sturgeon	*Acipenser transmontanus*
WSK	White Sturgeon (Kootenay River Pop)	*Acipenser transmontanus* Pop 1
	Cod	
BB	Burbot, Freshwater Ling Cod, Ling, Loche, Lawyer	*Lota lota*
	Whitefish	
WF	Whitefish (General)	*Prosopium* spp., *Coregonus* spp., *Stenodus* sp.
PW	Pygmy Whitefish, Coulter's Whitefish	*Prosopium coulteri*
GPW	Giant Pygmy Whitefish	*Prosopium* sp., poss. subspecies of *Prosopium coulteri*
RW	Round Whitefish	*Prosopium cylindraceum*
MW	Mountain Whitefish, Rocky Mountain Whitefish	*Prosopium williamsoni*
DLW	Dragon Lake Whitefish	*Coregonus* Sp 1
LW	Lake Whitefish, Common Whitefish, Humpback Whitefish	*Coregonus clupeaformis*
BW	Broad Whitefish, Round-nosed Whitefish, Sheep-nose Whitefish	*Coregonus nasus*

SQ	Squanga	*Coregonus* sp.
CL	Lake Cisco	*Coregonus artedii*
CA	Arctic Cisco	*Coregonus autumnalis*
CS	Least Cisco	*Coregonus sardinella*
CB	Bering Cisco	*Coregonus laurettae*
IN	Inconnu, Sheefish, "Conny"	*Stenodus leucichthys*
	Lampreys	
L	Lampreys (General)	*Lampetra* spp.
AL	Arctic Lamprey	*Lampetra japonica*
RL	River Lamprey, Western Lamprey	*Lampetra ayresi*
LL	Lake Lamprey, Cowichan Lamprey	*Lampetra macrostoma*
BL	Western Brook Lamprey	*Lampetra richardsoni*
MCL	Morrison Creek Lamprey	*Lampetra richardsoni marifaga*
PL	Pacific Lamprey, Sea Lamprey	*Lampetra tridentata*
	Grayling	
GR	Arctic Grayling	*Thymallus arcticus*
	Goldeyes	
GE	Goldeye	*Hiodon alosoides*
	Herrings	
SH	American Shad	*Alosa sapidissima*
	Minnows	
C	Minnows (General)	many, all cyprinids
CP	Carp	*Cyprinus carpio*
GC	Goldfish	*Carassius auratus*
TC	Tench	*Tinca tinca*
ESC	Emerald Shiner	*Notropis atherinoides*
STC	Spottail Shiner	*Notropis hudsonius*
RSC	Redside Shiner	*Richardsonius balteatus*
CBC	Chub, General	
FHC	Flathead Chub	*Platygobio gracilis*

LKC	Lake Chub	*Couesius plumbeus*
PCC	Peamouth Chub, Peamouth	*Mylocheilus caurinus*
NSC	Northern Squawfish	*Ptycheilus oregonensis*
CMC	Chiselmouth	*Acrocheilus alutaceus*
BMC	Brassy Minnow	*Hybognathus hankinsoni*
DC	Dace, General	*Rhinichthys* spp., *Phoxinus* spp.
NDC	Nooksack Dace, Nooky Dace	*Rhinichthys* sp.
LNC	Longnose Dace	*Rhinichthys cataractae*
LDC	Leopard Dace	*Rhinichthys falcatus*
SDC	Speckled Dace	*Rhinichthys osculus*
UDC	Umatilla Dace	*Rhinichthys umatilla*
FDC	Finescale Dace	*Phoxinus neogaeus* (formerly *Pfrille neogaea* and *Chrosomus neogaeus*)
RDC	Northern Redbelly Dace	*Phoxinus eos* (formerly *Chrosomus eos*)
XDC	Northern Redbelly Dace x Finescale Dace	*Phoxinus eos* (Cope) *x Phoxinus neogaeus* (Cope)
PDC	Pearl Dace, Northern Pearl Dace	*Margariscus margarita* (formerly *Semotilus margarita*)
FM	Fathead Minnow	*Pimephales promelas*
	Suckers	
SU	Suckers, General	*Catostomus* sp.
SSU	Salish Sucker	*Catostomus* sp.
LSU	Longnose Sucker, Fine-scaled Sucker, Northern Sucker	*Catostomus catostomus*
BSU	Bridgelip Sucker, Columbia Small-scaled Sucker	*Catostomus columbianus*
WSU	White Sucker	*Catostomus commersoni*
CSU	Largescale Sucker, Coarsescale Sucker	*Catostomus macrocheilus*
MSU	Mountain Sucker, Northern/Plains Mountain Sucker	*Catostomus platyrhyncus* (formerly *Pantosteus jordani*)
	Catfish	
BH	Catfish, General (pref.), Bullheads	

BNH	Brown Bullhead, Brown Catfish	*Ameiurus nebulosus* (formerly *Ictalurus nebulosus*)
BKH	Black Bullhead, Black Catfish	*Ameiurus melas* (formerly *Ictalurus melas*)
	Pike	
NP	Northern Pike, Jackfish, Jack	*Esox lucius*
	Smelts	
SM	Smelts, General	
RSM	Rainbow Smelt	*Osmerus mordax*
EU	Eulachon, Candlefish	*Thaleichthys pacificus*
PLS	Pygmy Longfin Smelt	*Spirinchus* spp.
LSM	Longfin Smelt	*Spirincus thaleichthys*
SSM	Surf Smelt	*Hypomesus pretiosus*
	Sticklebacks	
SB	Sticklebacks, General	
CSB	Unarmoured Stickleback	*Gasterosteus* sp.
SB3	Charlotte Unarmoured Stickleback	*Gasterosteus* sp.
SB11	Lake Sticklebacks	*Gasterosteus* sp.
SB1	Balkwill Lake Benthic Stickleback	*Gasterosteus* sp.
SB2	Balkwill Lake Limnetic Sticleback	*Gasterosteus* sp.
SB4	Emily Lake Benthic Stickleback	*Gasterosteus* sp.
SB5	Emily Lake Limnetic Stickleback	*Gasterosteus* sp.
SB6	Enos Lake Benthic Stickleback	*Gasterosteus* sp.
SB7	Enos Lake Limnetic Stickleback	*Gasterosteus* sp.
SB9	Hadley Lake Benthic Stickleback	*Gasterosteus* sp.
SB10	Hadley Lake Limnetic Stickleback	*Gasterosteus* sp.
SB12	Paxton Lake Benthic Stickleback	*Gasterosteus* sp.
SB13	Paxton Lake Limnetic Stickleback	*Gasterosteus* sp.
SBB	Priest Lake Benthic Stickleback	*Gasterosteus* sp.
SBP	Priest Lake Limnetic Stickleback	*Gasterosteus* sp.
GSB	Giant Black	*Gasterosteus* sp.
SB8	Giant Stickleback	*Gasterosteus* sp.

TSB	Threespine Stickleback	*Gasterosteus aculeatus*
BSB	Brook Stickleback	*Culea inconstans*
NSB	Ninespine Stickleback	*Pungitius pungitius*
	Sculpins	
CC	Sculpins, General (pref.), Bullheads	Primarily *Cottus* spp.
CCA	Sharpnose Sculpin	*Clinocottus acuticeps*
COM	Tidepool Sculpin	*Oligocottus maculosus*
CLA	Pacific Staghorn Sculpin, Staghorn Sculpin	*Leptocottus armatus*
CMT	Deepwater Sculpin	*Myoxocephalus quadricornis*
CCL	Cultus Lake Sculpin	*Cottus* sp.
CAL	Coastrange Sculpin, Aleutian Sculpin	*Cottus aleuticus*
CAS	Prickly Sculpin	*Cottus asper*
CBA	Mottled Sculpin	*Cottus bairdi*
CCG	Slimy Sculpin	*Cottus cognatus*
CCN	Shorthead Sculpin	*Cottus confusus*
CRH	Torrent Sculpin	*Cottus rhotheus*
CRI	Spoonhead Sculpin, Spoonhead Muddler	*Cottus ricei*
	Sunfish/Bass	
BS	Bass / Sunfish, General	*Micropterus* spp., *Lepomis* sp., *Pomoxis* sp.
SMB	Smallmouth Bass, Smallmouth Black Bass	*Micropterus dolomieui*
LMB	Largemouth Bass, Largemouth Black Bass	*Micropterus salmoides*
PMB	Pumpkinseed, Sunfish, Pumpkinseed Sunfish	*Lepomis gibbosus*
BCB	Black Crappie, Calico Bass	*Pomoxis nigromaculatus*
	Perches	
P	Perch, General	*Perca* sp., *Stizostedion* sp.
WP	Walleye, Pike-perch, Pickerel, Dore, many others	*Stizostedion vitreum*
YP	Yellow Perch, American Yellow Perch, many others	*Perca flavescens*

	Flounders	
SFL	Starry Flounder	*Platichthys stellatus*
	Troutperch	
TP	Troutperch	*Percopis omiscomaycus*
	Mosquitofish	
GAM	Mosquitofish, Gambusia	*Gambusia* sp.

Appendix 9B.
B.C. Fish Species Codes: Alphabetical by Common Names

B.C. Fish Species Codes: Alphabetical by Common Names

CODE	COMMON NAME	LATIN NAME
AD	All Anadromous Species	
AO	All Salmon	*Oncorhynchus* spp., *Salmo salar*
AF	All Species	
SH	American Shad	*Alosa sapidissima*
AGB	Anadromous Brown Trout, Anadromous German Brown Trout	*Salmo trutta*
ACT	Anadromous Cutthroat Trout	*Oncorhynchus clarki* (formerly *Salmo clarki*)
ADV	Anadromous Dolly Varden, Anadromous Dolly Varden Char	*Salvelinus malma*
AEB	Anadromous Eastern Brook Trout	*Salvelinus fontinalis*
AC	Arctic Char	*Salvelinus alpinus*
CA	Arctic Cisco	*Coregonus autumnalis*
GR	Arctic Grayling	*Thymallus arcticus*
AL	Arctic Lamprey	*Lampetra japonica*
AS	Atlantic Salmon	*Salmo salar*
SB1	Balkwill Lake Benthic Stickleback	*Gasterosteus* sp.
SB2	Balkwill Lake Limnetic Sticleback	*Gasterosteus* sp.
BS	Bass / Sunfish, General	*Micropterus* spp., *Lepomis* sp., *Pomoxis* sp.
CB	Bering Cisco	*Coregonus laurettae*
BKH	Black Bullhead, Black Catfish	*Ameiurus melas* (formerly *Ictalurus melas*)
BCB	Black Crappie, Calico Bass	*Pomoxis nigromaculatus*
BMC	Brassy Minnow	*Hybognathus hankinsoni*
BSU	Bridgelip Sucker, Columbia Small-scaled Sucker	*Catostomus columbianus*
BW	Broad Whitefish, Round-nosed Whitefish, Sheep-nose Whitefish	*Coregonus nasus*
BSB	Brook Stickleback	*Culea inconstans*
EB	Brook Trout, Eastern Brook Trout	*Salvelinus fontinalis*

BNH	Brown Bullhead, Brown Catfish	*Ameiurus nebulosus* (formerly *Ictalurus nebulosus*)
GB	Brown Trout, German Brown Trout	*Salmo trutta*
BT	Bull Trout	*Salvelinus confluentus*
BB	Burbot, Freshwater Ling Cod, Ling, Loche, Lawyer	*Lota lota*
CP	Carp	*Cyprinus carpio*
BH	Catfish, General (pref.), Bullheads	
SB3	Charlotte Unarmoured Stickleback	*Gasterosteus* sp.
CH	Chinook Salmon, Spring Salmon, King Salmon, Tyee	*Oncorhynchus tshawytscha*
CMC	Chiselmouth	*Acrocheilus alutaceus*
CBC	Chub, General	
CM	Chum Salmon, Dog Salmon	*Oncorhynchus keta*
CCT	Coastal Cutthroat Trout	*Oncorhynchus clarki clarki* (formerly *Salmo clarki clarki*)
CAL	Coastrange Sculpin, Aleutian Sculpin	*Cottus aleuticus*
CO	Coho Salmon	*Oncorhynchus kisutch*
CCL	Cultus Lake Sculpin	*Cottus* sp.
CT	Cutthroat Trout (General)	*Oncorhynchus clarki* (formerly *Salmo clarki*)
DC	Dace, General	*Rhinichthys* spp., *Phoxinus* spp.
CMT	Deepwater Sculpin	*Myoxocephalus quadricornis*
DV	Dolly Varden, Dolly Varden Char	*Salvelinus malma*
DLW	Dragon Lake Whitefish	*Coregonus* Sp 1
ESC	Emerald Shiner	*Notropis atherinoides*
SB4	Emily Lake Benthic Stickleback	*Gasterosteus* sp.
SB5	Emily Lake Limnetic Stickleback	*Gasterosteus* sp.
SB6	Enos Lake Benthic Stickleback	*Gasterosteus* sp.
SB7	Enos Lake Limnetic Stickleback	*Gasterosteus* sp.
EU	Eulachon, Candlefish	*Thaleichthys pacificus*
FM	Fathead Minnow	*Pimephales promelas*

FDC	Finescale Dace	*Phoxinus neogaeus* (formerly *Pfrille neogaea* and *Chrosomus neogaeus*)
FHC	Flathead Chub	*Platygobio gracilis*
GSB	Giant Black	*Gasterosteus* sp.
GPW	Giant Pygmy Whitefish	*Prosopium* sp., poss. subspecies of *Prosopium coulteri*
SB8	Giant Stickleback	*Gasterosteus* sp.
GE	Goldeye	*Hiodon alosoides*
GC	Goldfish	*Carassius auratus*
GSG	Green Sturgeon	*Acipenser medirostris*
SB9	Hadley Lake Benthic Stickleback	*Gasterosteus* sp.
SB10	Hadley Lake Limnetic Stickleback	*Gasterosteus* sp.
IN	Inconnu, Sheefish, "Conny"	*Stenodus leucichthys*
KO	Kokanee	*Oncorhynchus nerka*
LKC	Lake Chub	*Couesius plumbeus*
CL	Lake Cisco	*Coregonus artedii*
LL	Lake Lamprey, Cowichan Lamprey	*Lampetra macrostoma*
SB11	Lake Sticklebacks	*Gasterosteus* sp.
LT	Lake Trout, Lake Char	*Salvelinus namaycush*
LW	Lake Whitefish, Common Whitefish, Humpback Whitefish	*Coregonus clupeaformis*
L	Lampreys (General)	*Lampetra* spp.
LMB	Largemouth Bass, Largemouth Black Bass	*Micropterus salmoides*
CSU	Largescale Sucker, Coarsescale Sucker	*Catostomus macrocheilus*
CS	Least Cisco	*Coregonus sardinella*
LDC	Leopard Dace	*Rhinichthys falcatus*
LSM	Longfin Smelt	*Spirincus thaleichthys*
LNC	Longnose Dace	*Rhinichthys cataractae*
LSU	Longnose Sucker, Fine-scaled Sucker, Northern Sucker	*Catostomus catostomus*
C	Minnows (General)	many, all cyprinids

MCL	Morrison Creek Lamprey	*Lampetra richardsoni marifaga*
GAM	Mosquitofish, Gambusia	*Gambusia* sp.
CBA	Mottled Sculpin	*Cottus bairdi*
MSU	Mountain Sucker, Northern/Plains Mountain Sucker	*Catostomus platyrhyncus* (formerly *Pantosteus jordani*)
MW	Mountain Whitefish, Rocky Mountain Whitefish	*Prosopium williamsoni*
NSB	Ninespine Stickleback	*Pungitius pungitius*
NFP	No Fish Present	
NDC	Nooksack Dace, Nooky Dace	*Rhinichthys* sp.
NP	Northern Pike, Jackfish, Jack	*Esox lucius*
RDC	Northern Redbelly Dace	*Phoxinus eos* (formerly *Chrosomus eos*)
XDC	Northern Redbelly Dace x Finescale Dace	*Phoxinus eos* (Cope) *x Phoxinus neogaeus* (Cope)
NSC	Northern Squawfish	*Ptycheilus oregonensis*
PL	Pacific Lamprey, Sea Lamprey	*Lampetra tridentata*
CLA	Pacific Staghorn Sculpin, Staghorn Sculpin	*Leptocottus armatus*
SB12	Paxton Lake Benthic Stickleback	*Gasterosteus* sp.
SB13	Paxton Lake Limnetic Stickleback	*Gasterosteus* sp.
PCC	Peamouth Chub, Peamouth	*Mylocheilus caurinus*
PDC	Pearl Dace, Northern Pearl Dace	*Margariscus margarita* (formerly *Semotilus margarita*)
P	Perch, General	*Perca* sp., *Stizostedion* sp.
PK	Pink Salmon, Humpback Salmon	*Oncorhynchus gorbuscha*
CAS	Prickly Sculpin	*Cottus asper*
SBB	Priest Lake Benthic Stickleback	*Gasterosteus* sp.
SBP	Priest Lake Limnetic Stickleback	*Gasterosteus* sp.
PMB	Pumpkinseed, Sunfish, Pumpkinseed Sunfish	*Lepomis gibbosus*
PLS	Pygmy Longfin Smelt	*Spirinchus* spp.
PW	Pygmy Whitefish, Coulter's Whitefish	*Prosopium coulteri*
RSM	Rainbow Smelt	*Osmerus mordax*

RB	Rainbow Trout, Kamloops Trout	*Oncorhynchus mykiss* (formerly *Salmo gairdneri*)
RSC	Redside Shiner	*Richardsonius balteatus*
RL	River Lamprey, Western Lamprey	*Lampetra ayresi*
RW	Round Whitefish	*Prosopium cylindraceum*
SSU	Salish Sucker	*Catostomus* sp.
SA	Salmon (General)	*Oncorhynchus* spp., *Salmo salar*
CC	Sculpins, General (pref.), Bullheads	Primarily *Cottus* spp.
CCA	Sharpnose Sculpin	*Clinocottus acuticeps*
CCN	Shorthead Sculpin	*Cottus confusus*
CCG	Slimy Sculpin	*Cottus cognatus*
SMB	Smallmouth Bass, Smallmouth Black Bass	*Micropterus dolomieui*
SM	Smelts, General	
SK	Sockeye Salmon	*Oncorhynchus nerka*
SP	Species Present, not identified	
SDC	Speckled Dace	*Rhinichthys osculus*
SPK	Splake	*Salvelinus fontinalis x Salvelinus namaycush*
CRI	Spoonhead Sculpin, Spoonhead Muddler	*Cottus ricei*
STC	Spottail Shiner	*Notropis hudsonius*
SQ	Squanga	*Coregonus* sp.
SFL	Starry Flounder	*Platichthys stellatus*
ST	Steelhead	*Oncorhynchus mykiss* (formerly *Salmo gairdneri*)
SST	Steelhead (Summer-run)	*Oncorhynchus mykiss*
WST	Steelhead (Winter-run)	*Oncorhynchus mykiss*
SB	Sticklebacks, General	
SG	Sturgeons (General)	*Acipenser* spp.
SU	Suckers, General	*Catostomus* sp.
SSM	Surf Smelt	*Hypomesus pretiosus*
TC	Tench	*Tinca tinca*
TSB	Threespine Stickleback	*Gasterosteus aculeatus*
COM	Tidepool Sculpin	*Oligocottus maculosus*

CRH	Torrent Sculpin	*Cottus rhotheus*
TR	Trout (General)	*Oncorhynchus* sp
TP	Troutperch	*Percopis omiscomaycus*
UDC	Umatilla Dace	*Rhinichthys umatilla*
CSB	Unarmoured Stickleback	*Gasterosteus* sp.
WP	Walleye, Pike-perch, Pickerel, Dore, many others	*Stizostedion vitreum*
BL	Western Brook Lamprey	*Lampetra richardsoni*
WCT	Westslope Cutthroat Trout (preferred) Yellowstone Cutthroat Trout	*Oncorhynchus clarki lewisi* (formerly *Salmo clarki lewisi*)
WF	Whitefish (General)	*Prosopium* spp., *Coregonus* spp., *Stenodus* sp.
WSG	White Sturgeon	*Acipenser transmontanus*
WSK	White Sturgeon (Kootenay River Pop)	*Acipenser transmontanus* Pop 1
WSU	White Sucker	*Catostomus commersoni*
YP	Yellow Perch, american Yellow Perch, many others	*Perca flavescens*

Appendix 9C.
B.C. Fish Species Codes: Alphabetical by Codes

B.C. Fish Species Codes: Alphabetical by Codes

CODE	COMMON NAME	LATIN NAME
AC	Arctic Char	*Salvelinus alpinus*
ACT	Anadromous Cutthroat Trout	*Oncorhynchus clarki* (formerly *Salmo clarki*)
AD	All Anadromous Species	
ADV	Anadromous Dolly Varden, Anadromous Dolly Varden Char	*Salvelinus malma*
AEB	Anadromous Eastern Brook Trout	*Salvelinus fontinalis*
AF	All Species	
AGB	Anadromous Brown Trout, Anadromous German Brown Trout	*Salmo trutta*
AL	Arctic Lamprey	*Lampetra japonica*
AO	All Salmon	*Oncorhynchus* spp., *Salmo salar*
AS	Atlantic Salmon	*Salmo salar*
BB	Burbot, Freshwater Ling Cod, Ling, Loche, Lawyer	*Lota lota*
BCB	Black Crappie, Calico Bass	*Pomoxis nigromaculatus*
BH	Catfish, General (pref.), Bullheads	
BKH	Black Bullhead, Black Catfish	*Ameiurus melas* (formerly *Ictalurus melas*)
BL	Western Brook Lamprey	*Lampetra richardsoni*
BMC	Brassy Minnow	*Hybognathus hankinsoni*
BNH	Brown Bullhead, Brown Catfish	*Ameiurus nebulosus* (formerly *Ictalurus nebulosus*)
BS	Bass / Sunfish, General	*Micropterus* spp., *Lepomis* sp., *Pomoxis* sp.
BSB	Brook Stickleback	*Culea inconstans*
BSU	Bridgelip Sucker, Columbia Small-scaled Sucker	*Catostomus columbianus*
BT	Bull Trout	*Salvelinus confluentus*
BW	Broad Whitefish, Round-nosed Whitefish, Sheep-nose Whitefish	*Coregonus nasus*

C	Minnows (General)	many, all cyprinids
CA	Arctic Cisco	*Coregonus autumnalis*
CAL	Coastrange Sculpin, Aleutian Sculpin	*Cottus aleuticus*
CAS	Prickly Sculpin	*Cottus asper*
CB	Bering Cisco	*Coregonus laurettae*
CBA	Mottled Sculpin	*Cottus bairdi*
CBC	Chub, General	
CC	Sculpins, General (pref.), Bullheads	Primarily *Cottus* spp.
CCA	Sharpnose Sculpin	*Clinocottus acuticeps*
CCG	Slimy Sculpin	*Cottus cognatus*
CCL	Cultus Lake Sculpin	*Cottus* sp.
CCN	Shorthead Sculpin	*Cottus confusus*
CCT	Coastal Cutthroat Trout	*Oncorhynchus clarki clarki* (formerly *Salmo clarki clarki*)
CH	Chinook Salmon, Spring Salmon, King Salmon, Tyee	*Oncorhynchus tshawytscha*
CL	Lake Cisco	*Coregonus artedii*
CLA	Pacific Staghorn Sculpin, Staghorn Sculpin	*Leptocottus armatus*
CM	Chum Salmon, Dog Salmon	*Oncorhynchus keta*
CMC	Chiselmouth	*Acrocheilus alutaceus*
CMT	Deepwater Sculpin	*Myoxocephalus quadricornis*
CO	Coho Salmon	*Oncorhynchus kisutch*
COM	Tidepool Sculpin	*Oligocottus maculosus*
CP	Carp	*Cyprinus carpio*
CRH	Torrent Sculpin	*Cottus rhotheus*
CRI	Spoonhead Sculpin, Spoonhead Muddler	*Cottus ricei*
CS	Least Cisco	*Coregonus sardinella*
CSB	Unarmoured Stickleback	*Gasterosteus* sp.
CSU	Largescale Sucker, Coarsescale Sucker	*Catostomus macrocheilus*
CT	Cutthroat Trout (General)	*Oncorhynchus clarki* (formerly *Salmo clarki*)
DC	Dace, General	*Rhinichthys* spp., *Phoxinus* spp.

DLW	Dragon Lake Whitefish	*Coregonus* Sp 1
DV	Dolly Varden, Dolly Varden Char	*Salvelinus malma*
EB	Brook Trout, Eastern Brook Trout	*Salvelinus fontinalis*
ESC	Emerald Shiner	*Notropis atherinoides*
EU	Eulachon, Candlefish	*Thaleichthys pacificus*
FDC	Finescale Dace	*Phoxinus neogaeus* (formerly *Pfrille neogaea* and *Chrosomus neogaeus*)
FHC	Flathead Chub	*Platygobio gracilis*
FM	Fathead Minnow	*Pimephales promelas*
GAM	Mosquitofish, Gambusia	*Gambusia* sp.
GB	Brown Trout, German Brown Trout	*Salmo trutta*
GC	Goldfish	*Carassius auratus*
GE	Goldeye	*Hiodon alosoides*
GPW	Giant Pygmy Whitefish	*Prosopium* sp., poss. subspecies of *Prosopium coulteri*
GR	Arctic Grayling	*Thymallus arcticus*
GSB	Giant Black	*Gasterosteus* sp.
GSG	Green Sturgeon	*Acipenser medirostris*
IN	Inconnu, Sheefish, "Conny"	*Stenodus leucichthys*
KO	Kokanee	*Oncorhynchus nerka*
L	Lampreys (General)	*Lampetra* spp.
LDC	Leopard Dace	*Rhinichthys falcatus*
LKC	Lake Chub	*Couesius plumbeus*
LL	Lake Lamprey, Cowichan Lamprey	*Lampetra macrostoma*
LMB	Largemouth Bass, Largemouth Black Bass	*Micropterus salmoides*
LNC	Longnose Dace	*Rhinichthys cataractae*
LSM	Longfin Smelt	*Spirincus thaleichthys*
LSU	Longnose Sucker, Fine-scaled Sucker, Northern Sucker	*Catostomus catostomus*
LT	Lake Trout, Lake Char	*Salvelinus namaycush*

LW	Lake Whitefish, Common Whitefish, Humpback Whitefish	*Coregonus clupeaformis*
MCL	Morrison Creek Lamprey	*Lampetra richardsoni marifaga*
MSU	Mountain Sucker, Northern/Plains Mountain Sucker	*Catostomus platyrhyncus* (formerly *Pantosteus jordani*)
MW	Mountain Whitefish, Rocky Mountain Whitefish	*Prosopium williamsoni*
NDC	Nooksack Dace, Nooky Dace	*Rhinichthys* sp.
NFP	No Fish Present	
NP	Northern Pike, Jackfish, Jack	*Esox lucius*
NSB	Ninespine Stickleback	*Pungitius pungitius*
NSC	Northern Squawfish	*Ptycheilus oregonensis*
P	Perch, General	*Perca* sp., *Stizostedion* sp.
PCC	Peamouth Chub, Peamouth	*Mylocheilus caurinus*
PDC	Pearl Dace, Northern Pearl Dace	*Margariscus margarita* (formerly *Semotilus margarita*)
PK	Pink Salmon, Humpback Salmon	*Oncorhynchus gorbuscha*
PL	Pacific Lamprey, Sea Lamprey	*Lampetra tridentata*
PLS	Pygmy Longfin Smelt	*Spirinchus* spp.
PMB	Pumpkinseed, Sunfish, Pumpkinseed Sunfish	*Lepomis gibbosus*
PW	Pygmy Whitefish, Coulter's Whitefish	*Prosopium coulteri*
RB	Rainbow Trout, Kamloops Trout	*Oncorhynchus mykiss* (formerly *Salmo gairdneri*)
RDC	Northern Redbelly Dace	*Phoxinus eos* (formerly *Chrosomus eos*)
RL	River Lamprey, Western Lamprey	*Lampetra ayresi*
RSC	Redside Shiner	*Richardsonius balteatus*
RSM	Rainbow Smelt	*Osmerus mordax*
RW	Round Whitefish	*Prosopium cylindraceum*
SA	Salmon (General)	*Oncorhynchus* spp., *Salmo salar*
SB	Sticklebacks, General	
SB1	Balkwill Lake Benthic Stickleback	*Gasterosteus* sp.
SB2	Balkwill Lake Limnetic Sticleback	*Gasterosteus* sp.

SB3	Charlotte Unarmoured Stickleback	*Gasterosteus* sp.
SB4	Emily Lake Benthic Stickleback	*Gasterosteus* sp.
SB5	Emily Lake Limnetic Stickleback	*Gasterosteus* sp.
SB6	Enos Lake Benthic Stickleback	*Gasterosteus* sp.
SB7	Enos Lake Limnetic Stickleback	*Gasterosteus* sp.
SB8	Giant Stickleback	*Gasterosteus* sp.
SB9	Hadley Lake Benthic Stickleback	*Gasterosteus* sp.
SB10	Hadley Lake Limnetic Stickleback	*Gasterosteus* sp.
SB11	Lake Sticklebacks	*Gasterosteus* sp.
SB12	Paxton Lake Benthic Stickleback	*Gasterosteus* sp.
SB13	Paxton Lake Limnetic Stickleback	*Gasterosteus* sp.
SBB	Priest Lake Benthic Stickleback	*Gasterosteus* sp.
SBP	Priest Lake Limnetic Stickleback	*Gasterosteus* sp.
SDC	Speckled Dace	*Rhinichthys osculus*
SFL	Starry Flounder	*Platichthys stellatus*
SG	Sturgeons (General)	*Acipenser* spp.
SH	American Shad	*Alosa sapidissima*
SK	Sockeye Salmon	*Oncorhynchus nerka*
SM	Smelts, General	
SMB	Smallmouth Bass, Smallmouth Black Bass	*Micropterus dolomieui*
SP	Species Present, not identified	
SPK	Splake	*Salvelinus fontinalis x Salvelinus namaycush*
SQ	Squanga	*Coregonus* sp.
SSM	Surf Smelt	*Hypomesus pretiosus*
SST	Steelhead (Summer-run)	*Oncorhynchus mykiss*
SSU	Salish Sucker	*Catostomus* sp.
ST	Steelhead	*Oncorhynchus mykiss* (formerly *Salmo gairdneri*)
STC	Spottail Shiner	*Notropis hudsonius*
SU	Suckers, General	*Catostomus* sp.
TC	Tench	*Tinca tinca*
TP	Troutperch	*Percopis omiscomaycus*

TR	Trout (General)	*Oncorhynchus* sp
TSB	Threespine Stickleback	*Gasterosteus aculeatus*
UDC	Umatilla Dace	*Rhinichthys umatilla*
WCT	Westslope Cutthroat Trout (preferred) Yellowstone Cutthroat Trout	*Oncorhynchus clarki lewisi* (formerly *Salmo clarki lewisi*)
WF	Whitefish (General)	*Prosopium* spp., *Coregonus* spp., *Stenodus* sp.
WP	Walleye, Pike-perch, Pickerel, Dore, many others	*Stizostedion vitreum*
WSG	White Sturgeon	*Acipenser transmontanus*
WSK	White Sturgeon (Kootenay River Pop)	*Acipenser transmontanus* Pop 1
WST	Steelhead (Winter-run)	*Oncorhynchus mykiss*
WSU	White Sucker	*Catostomus commersoni*
XDC	Northern Redbelly Dace x Finescale Dace	*Phoxinus eos* (Cope) *x Phoxinus neogaeus* (Cope)
YP	Yellow Perch, american Yellow Perch, many others	*Perca flavescens*

Appendix 10.
Activity Codes for Constraints of Fish Production or General Information

Activity Codes for Constraints on Fish Production or General Information

ACTIVITY	CODES
Biotic Interactions	B
Competition / Predation	BC
Competitive Species	BCC
Predatory Species	BCP
Disease / Parasitism	BD
Diseased Stocks	BDD
Parasitized Stocks	BDP
Flow Regime	F
Lake Access (for migratory fish see "Obstructions")	FA
Intermittently Accessible	FAI
Not Accessible	FAN
Seasonally Accessible	FAS
Flow Fluctuations	FF
Flashy Flows	FFF
Groundwater Fed	FG
Low Flows	FL
Dewatering	FLD
Seasonal Flow	FLF
Intermittent Stream	FLI
Permanent Flow	FLP
Summer Low Flows	FLS
Winter Low Flows	FLW
Peak Flows (flooding)	FP
Floods Banks Annually	FPA
Floods Banks Several Times Per Year	FPF
Floods Banks Every Several Years	FPR
Water Use/Diversion (change with 50K)	FU
Stream Braided at Low Flow	FAB
Diversion Channel	FRC
Reservoir Drawdown	FRD
Irrigation Ditch	FRI
Placer Lease/Claim	FRP
Fully Subscribed With Licenses	FUF
Pump Intake	FUP
Water Storage Reservoir	FUS

Habitat Quality	H
Alienated Habitat	HA
Bed/Bank Characterization	HB
Bank/Bar Composition	HBB
Cobble	HBBC
Gravel	HBBG
Mud	HBBM
Sand	HBBS
Developed	HBD
Booms / Booming Ground	HBDB
Dredging	HBDD
Gravel Extraction / Scalping	HBDG
Pier	HBDP
Rip Rap	HBDR
Riverbed Substrate	HBR
Cobble	HBRC
Gravel	HBRG
Mud	HBRM
Sand	HBRS
Aquatic Vegetation	HBV
Emergent	HBVE
Submergent	HBVS
Channel Stability	HC
Erosion / Sedimentation	HCE
Lateral Stream/Bank Erosion	HCEB
Streambed Incision	HCEI
Streambed Sedimentation	HCES
Habitat Diversity (pool, riffle, woody debris)	HD
High Diversity	HDH
Low Diversity	HDL
Medium Diversity	HDM
Waterbody Morphology	HM
Wetlands (bog, slough, marsh, swamp)	HMW
Intermittently Flooded	HMWI
Permanently Flooded	HMWP
Seasonally Flooded	HMWS
Tidal	HMWT
Rearing Habitat	HR
Quantity / Amount	HRA
High	HRAH
Low	HRAL
Medium	HRAM

Food Production	HRF
Quality	HRQ
High	HRQH
Low	HRQL
Medium	HRQM
Spawning Habitat	HS
Quantity / Amount	HSA
High	HSAH
Low	HSAL
Medium	HSAM
Groundwater Influence	HSG
Quality	HSQ
High Gravel Quality	HSQH
Low Gravel Quality	HSQL
Medium Gravel Quality	HSQM
Riparian Zone	HZ
Exclusion Fencing	HZF
Vegetation	HZV
Riparian Vegetation Cover 0-20%	HZVA
Riparian Vegetation Cover 20-40%	HZVB
Riparian Vegetation Cover 40-60%	HZVC
Riparian Vegetation Cover 60-80%	HZVD
Riparian Vegetation Cover 80-100%	HZVE
Water Quality	W
Acidity	WA
Acidic (pH < 5.5)	WAH
Alkaline (pH > 8.5)	WAL
Medium (5.5 < pH > 8.5)	WAM
Turbidity / Colour	WC
Glacial Silt	WCG
Humic Stained	WCH
Suspended Sediments	WCS
Suspended Sediment (land use)	WCSL
Suspended Sediments (natural)	WCSN
Disturbance	WD
Cattle Crossing/Watering	WDC
Forest Fire	WDF
Placer Mining	WDP
Cattle Range	WDR

Fish Contamination	WF
Consumption Advisory	WFA
Bioassay Information	WFB
Fishery Closure	WFC
Nutrients	WN
Eutrophic	WNE
Mesotrophic	WNM
Oligotrophic	WNO
Dissolved Oxygen	WO
BOD	WOB
Summerkills	WOL
Gas Supersaturation	WOS
Winterkills	WOW
Pollutants	WP
Agricultural Runoff	WPA
Storm Drain	WPD
Fish Kills Caused by Pollution	WPF
Groundwater Contamination	WPG
Spills	WPL
Municipal Effluent	WPM
Domestic Sewage Outfall	WPMD
Landfill Leachates	WPML
Septic System Inputs	WPMP
Storm Sewer Outfall	WPMS
Underground Storage Tanks	WPMU
Pulp Mill / Industrial Effluent	WPP
Runoff Contamination	WPR
Sediment Contamination	WPS
Toxic Waste Site	WPT
Temperature	WT
High Temperature	WTH
Low Temperature	WTL

Appendix 11.
Standards for Referencing Information Sources

Standards for Referencing Information Sources

A proper reference or citation contains sufficient information to establish that the reference is unique and to enable the reader to access that reference. The general format is:

Author (s) / Editors (s) / Corporation (s) / Institution (s) / Agency (ies). Year. Title. Auxiliary information. Name and location of publisher or name, volume, and issue of journal. Number of pages.

There will be departures from this format. In some cases, such as memoranda, additional information can be provided. Details regarding formats are given below and are followed by a section of examples.

AUTHOR(S) / EDITOR(S) / CORPORATION(S) / INSTITUTION(S) / AGENCY(IES)

The primary reference is to the author(s) of publications, reports, memoranda, etc. The first author's last name is written first, followed by his/her initials and the initials and last names of all additional authors. Use the name(s) of author(s) of government, consultant and other reports when these are indicated on the reports. When the author(s) name(s) is/are not given use the name of the institute or agency responsible for the report. If a document was written by an unknown author which was not associated with a government or consulting office, write “Anonymous”.

If the referenced document, such as a paper or chapter, is contained within a larger document, such as a symposium or book, the name(s) of the author(s) is/are written first, followed by the date of publication, the title and the page numbers of the document. The name(s) of the editor(s) of the larger document within which the referenced document is contained are then written after the underlined word In (see “Books and Parts of Books” in the section of examples).

The name(s) of author(s) / editor(s) / corporation(s) / insitution(s) / agency(ies) are followed by a period.

YEAR

The year of publication follows the name of the author or institution. If the date is not given, the title of the publication follows the name of the author or institution. If the document has not yet been published or released, the abbreviation "In prep" is placed in parentheses after the title.

TITLE

The title of the referenced document is written in lower case letters except for the first word and proper nouns. Scientific Latin names are italisized.

The title of books or other documents within which the reference document is contained are written with the same rules as for the referenced document. These titles are written after the underlined word In and the name(s) of the publications editor(s).

NAME AND LOCATION OF PUBLISHER OR NAME, VOLUME, AND ISSUE OF JOURNAL

For documents printed by a publisher, write the name of the publisher, the city of publication and the province, state or country of publication. If the city of publication is well-known the province, state or country of publication can be omitted.

For journals, write the abbreviations listed in the World List of Periodicals. If a journal has both a volume and an issue number, cite both.

The reference must include the catalogue or call number of the publication if this is normally used by the government agency or institute issuing the publication (see “Occasional Publications” in the section of examples).

For citations of consultant reports write “Prepared by”, the name of the consulting firm, the word “for” and the client for whom the report was prepared (see “Consultant Reports” in the section of examples).

NUMBER OF PAGES

At the end of the citation indicate the number of pages of the reference by writing the numerical value followed by “pp.”. If the reference is found within a larger document indicate the page numbers of the reference by writing “pp.” and then the range of pages. Write this information immediately following the title of the reference (see “Books and Parts of Books” in the section of examples).

Examples of Referencing Formats

JOURNALS

a) Fisher, D.O., and G.S. Davies. 1973. An approach to assessing environmental impacts. J. Env. Mgmt. 1:207-227.

b) Stewart, R.W., and J.R. Bider. 1974. Reproduction and survival of ditch-dwelling muskrats in southern Quebec. Can. Field Nat. 88(4):420-436.

BOOKS AND PARTS OF BOOKS

a) Williams, E.J. 1959. Regression analysis. John Wiley and Sons Inc., New York. 214 pp.

b) Munn, R.E. (ed.). 1975. Environmental impact assessment: principles and procedures. SCOPE Report 5. SCOPE Secretariat, Paris. 160 pp.

c) Widman, G.L. 1977. Environmental law and mining. Pp. 97-100 In J.L. Thames (ed.). Reclamation and use of disturbed land in the southwest. Univ. Arizona Press, Tucson. 682 pp.

d) Anonymous. 1977. The milepost (All-the north travel guide). Alaska Northwest Publ. Co., Anchorage. 498 pp.

OCCASIONAL PUBLICATIONS

a) Walters, C.J., R. Hilborn, E. Ogus, R.M. Pererman, and J.M. Stander. 1974. Development of a simulation model of mallard duck populations. Canadian Wildlife Service Occ. Paper No. 20. Information Canada Cat. CW69-1/20. 34 pp.

b) Canadian Wildlife Service. 1973. Red Fox. Hinterland Who's Who Services. Information Canada Cat. CW69-4/5.

c) Ross, J.H. 1974. Quantitative aids to environmental assessment. Lands Directorate, Environment Canada Occ. Paper No. 3. 31 pp.

GOVERNMENT REPORTS

a) Lysyk, K.M., Edith E. Bohmer, and W.L. Phelps. 1977. Alaska Highway pipeline inquiry. Supply and Services Canada, Ottawa. 171 pp.

b) British Columbia Resource Analysis Branch. 1977. Aquatic system inventory and analysis. Victoria. 53 pp.

c) Water Survey of Canada. 1974. Historical streamflow summary, British Columbia: to 1973. Ottawa. 694 pp.

d) Water Quality Branch, Environment Canada. 1974. Water quality data, British Columbia: 1961-1971. Ottawa.

e) Smith, I. 1969. The effects of the Libby Dam upon wildlife resources of the east and west Kootenay. Wildl. Mgmt. Div. Rep., British Columbia Fish and Wildlife Branch, Victoria.

f) Linzon, S.N. 1973. How air pollution affects vegetation. Ontario Ministry of Environment, Toronto. 14 pp.

CONSULTANT REPORTS

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