

# Sunshine Coast Habitat Atlas

Sunshine Coast Regional District  
Fisheries & Oceans Canada Habitat Conservation and  
Stewardship Program

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<http://habitat.scrd.bc.ca>



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## 1 Introduction

As resource development and human populations increase, pressures for all resources and services have accelerated. Rapid growth has overwhelmed the ability of planners to manage land and preserve sensitive habitats. Fisheries and Oceans Canada (F&OC), the Ministry of Water, Land and Air Protection (MWLAP), and Municipal governments are under tremendous pressure to respond to these development demands. Development proposals are often received too late in the planning process to effectively mitigate environmental impacts. Furthermore, development proposals are often reviewed with inadequate knowledge of the location or value of sensitive resources. This has resulted in loss or degradation of habitats that once supported fisheries, wildlife, sensitive ecosystems and many other habitats are threatened.

The Georgia Basin is one of the fastest growing areas in Canada and is one of the most ecologically diverse areas of North America, containing a wide range of vegetation, fish and wildlife habitats of international significance. The coastal plain is especially known for its high Coho salmon habitat values. There is an urgent need to develop better ways of doing business to conserve and protect these habitats. One response to this need is the production of a **Habitat Atlas**.

The Sunshine Coast Regional District (SCRD), in partnership with Fisheries and Oceans Canada (F&OC) and the Ministry of Water, Land and Air Protection (WLAP) has created a **Habitat Atlas** for the Sunshine Coast. The Habitat Atlas is a series of maps, covering the land within the SCR D; from Howe Sound to Jervis Inlet. Over 40 different categories, or “layers” of information have been compiled for the Atlas. All of these layers are stored in an electronic Geographic Information System (GIS) database at the SCR D office in Sechelt and have been distributed to the public as a printed mapbook, a CD, and as an interactive mapping application over the Internet. The Habitat Atlas Mapbook contains 12 layers of information, while the Habitat Atlas mapping website contains all 40 layers and enables users to create custom maps from their own homes with their Internet web browser (Internet Explorer or Netscape) by selecting a unique combination of layers. Table 1 of this report contains a complete list of the layers available in the Habitat Atlas.

The Habitat Atlas provides comprehensive information for use by planners, developers, government agencies, non-government organisations, First Nations, local businesses, and individual property owners. The information assists these groups in making informed land use planning and stewardship decisions that will help protect, enhance, and restore sensitive habitat. The Habitat Atlas enables users to identify and locate watercourses and riparian areas and their relation to other features, including: cadastral (land parcel) information, parks and protected areas, sensitive ecosystem areas, and forest cover.

By combining resource information from a variety of sources it is hoped that the Habitat Atlas will provide a strong foundation for integrated resource management and planning in urban areas. However, it must be recognized that not all resources have been identified, and that the spatial accuracy of both resource and cadastral information will vary. It is intended primarily as a general guide that will need to be refined and updated over time. There is a detailed long-term maintenance strategy in place that will ensure that data is refined and updated as new information becomes available.

The Habitat Atlas is a *first step* in the continuous process of caring for the sensitive lands that provide water and life to a community and its living and aesthetic resources. For more detailed information, please see the Habitat Atlas website at <http://habitat.scrd.bc.ca> or the ‘Case Studies’ section of the Stewardship Canada website at <http://www.stewardshipcanada.ca/>

**Table 1. Layers of Information Contained in the Habitat Atlas**

	<b>Layer</b>	<b>Source</b>
1	Annotation	Ministry of Water, Land & Air Protection
2	Agricultural Land Reserve	BC Agricultural Land Commission
3	Aquaculture Sites (Finfish & Shellfish)	Fisheries & Oceans Canada
4	Archaeological Sites	Archaeology Branch
5	Band Lands	GIS Innovations Ltd.
6	Baseline Thematic Mapping	Ministry of Water, Land & Air Protection
7	BC Watershed Atlas Basemaps	Ministry of Sustainable Resource Management
8	BC 1:2million Basemaps	GeoGratis
9	Beach Access Points	Sunshine Coast Regional District
10	Biogeoclimatic Zones	Ministry of Water, Land & Air Protection
11	Black & White Orthophotos (1996)	Ministry of Water, Land & Air Protection
12	Civic Facilities	GIS Innovations Ltd.
13	Color Orthophotos (1999 & 1998)	Fisheries & Oceans Canada
14	Community Input Information	Various Community Organisations & Individuals
15	District Lots & Land Parcels	Sunshine Coast Regional District
16	Eelgrass Beds	Sunshine Coast Conservation Association
17	Fish Presence	Fisheries & Oceans Canada, Ministry of Water, Land & Air Protection
18	Fish Stocking	Fish Information Summary System
19	Fish Constraints, Enhancements & Obstructions	Fish Information Summary System
20	Forestry Information	Canfor, Interfor, Terminal, Western, Weyerhaeuser, Ministry of Forests
21	Geology	Ministry of Sustainable Resource Management
22	Goat Winter Range	Ministry of Sustainable Resource Management
23	Grids (5k, 20k, 50k)	Ministry of Water, Land & Air Protection
24	Lands For Nature	Federation of BC Naturalists
25	Landscape Units	Ministry of Sustainable Resource Management
26	Landuse	BC Assessment
27	Marbled Murrelet Habitat Areas	Ministry of Water, Land & Air Protection
28	Mining Information	Ministry of Energy & Mines
29	Parks and Protected Areas	Ministry of Water, Land & Air Protection, Sunshine Coast Regional District
30	Rare Element Occurrences	Conservation Data Centre
31	Recreation Features Inventory	Ministry of Forests
32	Sensitive Ecosystem Inventory	Sensitive Ecosystem Inventory Initiative
33	Sensitive Habitat Areas	Sunshine Coast Regional District
34	Sensitive Habitat Inventory & Mapping	Sunshine Coast Regional District
35	Soil Classifications	Ministry of Agriculture, Fisheries & Foods
36	Streams	Sunshine Coast Regional District
37	Sunshine Coast Planning Information	Sunshine Coast Regional District, District of Sechelt, Town of Gibsons
38	Trails	Sprockids, HMB Greenways, Sargeant's Bay Society, Al Jenkins, SCRD, Ministry of Forests, SunCoast Trails Society
39	Transportation	Sunshine Coast Regional District
40	TRIM Basemaps	Ministry of Water, Land & Air Protection
41	Urban Roads	Sunshine Coast Regional District
42	Water Licenses	Ministry of Water, Land & Air Protection
43	Watershed Boundaries	Ministry of Water, Land & Air Protection
44	Wildlife Habitat Areas	Ministry of Sustainable Resource Management
45	Development Permit Areas	Sunshine Coast Regional District

## 2 Goals and Objectives

The primary goal of the Sunshine Coast Habitat Atlas initiative was:

- To publish and distribute an easy-to-use Habitat Atlas containing an up-to-date mapping and inventory of aquatic and terrestrial habitat and fish species information for the Sunshine Coast.

In order to achieve this goal, the following objectives were met:

- To develop, strengthen and maintain partnerships with government organizations, developers, First Nations, community organizations, and local businesses.
- To compile existing data, identify gaps in information, and collect new information to fill these gaps.
- To engage in public outreach efforts to solicit input from interested parties, to generate project support from the community and to foster data sharing.
- To identify sensitive habitats.
- To provide a tool to assist preparation of local government regulations to protect and maintain fish and wildlife habitat.
- To integrate property boundaries, land parcels, and road networks with locations of sensitive resources to facilitate official community plans and development permit applications;
- To provide essential information for defining setbacks and best management practices as specified in the Land Development and Stream Stewardship Guidelines;
- To facilitate updating and exchange of information;
- To work within a Geographical Information System (GIS) that provides useful map products for analysis and effective communication.

## 3 Description of Map Layers

The Habitat Atlas Mapbook was produced at a scale of 1:20,000 and contains the following information:

- Land Parcels
- Contours (20 meter interval)
- Transportation & Power Lines
- Trails
- Streams, Lakes and Wetlands
- Fish Species Distribution
- Fish Presence and Stocking
- Eelgrass
- Sensitive Ecosystems Inventory
- Parks
- Beach Access Points
- Band Lands
- Agricultural Land Reserve
- Development Permit Areas

An extensive search was done to compile the existing information that was available for the Sunshine Coast. The information was located at numerous sites under the jurisdiction of many levels of government, and stored in a variety of projections and formats.

During the process of data compilation, missing information was documented and prioritized for future data collection. Funding proposals were submitted to several funding agencies that secured approximately \$100,000 over the 3 year duration of the project. These funds were used to conduct stream surveys to fill the gaps identified during the data compilation phase. Over 130 km's of priority streams were mapped with a high-accuracy Global Positioning System (GPS) Receiver between August, 2001 – December, 2002. Stream mapping followed the Sensitive

Habitat Inventory and Mapping (SHIM) methodology and adhered to the Provincial Resource Information Standards Committee (RISC) data standards. SHIM mapping is a standard for fish and aquatic habitat mapping in urban and rural watersheds in BC. The SHIM method is designed to ensure the collection of reliable, high quality, current and spatially accurate information.

A portion of the data collection was completed by volunteers; 21 volunteers (over 90 volunteer hours) from a variety of sources participated in the mapping. The remaining streams were completed by a professional field crew.

Once the data was collected, it was converted to a standard ESRI Shapefile format and projected to UTM Zone 10, NAD83. Additional processing was required for many of the layers and is described in the following sections.

For each layer of information, a separate metadata file was created. Metadata is simply a term for describing the data. The metadata files are available on the Habitat Atlas website under the 'Web Map' section and contain the following information:

- Source Organizations
- Title
- Description
- Warning
- Accuracy
- Source Scale
- Coordinate System
- Projection
- Datum
- Production Date
- Modified Date
- File Name
- File Format
- Feature Type
- Notes
- Contact Information

### **3.1 *Land Parcels***

The source of the Land Parcels layer is the Sunshine Coast Regional District. This layer has a source scale of 1:5,000 and was last updated in January, 2004.

### **3.2 *Contours***

The source of the contours layer is the Terrain Resource Information Management (TRIM) map series. TRIM maps are produced by the BC government at a scale of 1:20,000 using 1:60,000 aerial photographs. The contour interval is 20 meters with a horizontal positional accuracy of 10 meters.

### **3.3 *Transportation and Power Lines***

The source of the Paved Roads layer is the SCRCD. This information has a +/- 5m accuracy, and was last updated in June, 2005.

The Gravel Roads and Power Lines layers are derived from the Ministry of Forests *forest cover* database. These layers have a source scale of 1:20,000 and were last updated in 2001. The Gravel Roads are subject to frequent updates.

### **3.4 Trails**

The Trails layer is derived from the following sources:

- Gambier Island Conservancy
- GPS Trail Surveys
- Halfmoon Bay Greenways
- Input from Community Members
- Ministry of Forests Recreation Features Inventory (March, 2002)
- Ministry of Forests Trail Maps
- Sargeant Bay Society
- Sprockids
- SunCoast Trails Society
- TRIM Trails

Trails from all of the above sources were merged together into a single layer of information. The source and date were recorded for each trail so that users of the Habitat Atlas can find out when and where the data came from. The source scale for the Trails layer ranges from 1:5,000 – 1:20,000 and was last updated in June, 2005. This layer contains all of the information available for trails on the Sunshine Coast and may be incomplete.

### **3.5 Fish Species Distribution**

The fish species distribution layer consists of point features marking locations of where fish have been observed. The information is derived from the following sources:

- Fish Information Summary System
- SHIM Stream Surveys
- SCRD Official Community Plan Documents
- Fisheries & Oceans Canada
- Community Groups

The Fish Information Summary System (FISS) is a geo-referenced database of overview fish and fish habitat, macro-reach and lake classification data. It is a joint project between Fisheries & Oceans Canada and BC Fisheries. The FISS database can be accessed over the web at <http://www.bcfisheries.gov.bc.ca/fishinv/fiss.html>. This information has a source scale of 1:50,000 and dates as far back as 1979. It is important to note that this database does not have a regular maintenance schedule and may contain information that is no longer up-to-date.

SHIM stream surveys were conducted on the Sunshine Coast between 1998 and November, 2002. One component of the SHIM survey is to collect fish observations and fish habitat information. This information was collected with high-accuracy Global Positioning System (GPS) Receivers and has a +/- 10m accuracy.

Fish observations from the SCRD's Official Community Plans, the F&OC Community Advisor, community groups, and local individuals, were heads-up digitized with the use of 1:20,000 TRIM streams, 1:5,000 SHIM streams, and orthophotos.

The fish species that are found on the Sunshine Coast are:

- |                           |                       |                          |
|---------------------------|-----------------------|--------------------------|
| - Aleutian Sculpin        | - Dolly Varden        | - Rainbow Trout          |
| - Brook Trout             | - Kokanee             | - Sculpin                |
| - Bull Trout              | - Lamprey             | - Sockeye Salmon         |
| - Chinook Salmon          | - Northern Pikeminnow | - Starry Flounder        |
| - Chub                    | - Pacific Lamprey     | - Steelhead              |
| - Chum Salmon             | - Peamouth Chub       | - Winter-run Steelhead   |
| - Cutthroat Trout         | - Pink Salmon         | - Stickleback            |
| - Coastal Cutthroat Trout | - Prickly Sculpin     | - Threespine Stickleback |
| - Coho Salmon             |                       |                          |

With assistance from F&OC, the fish species information has been classified into the following 4 categories for the Habitat Atlas Mapbook:

1. Anadromous Salmonids
2. Resident Salmonids
3. Non-Salmonids

### **3.6 Fish Stocking**

The Fish Stocking information was downloaded from [bcfisheries.gov.bc.ca/fishinfobc.html](http://bcfisheries.gov.bc.ca/fishinfobc.html) into an excel spreadsheet. A point feature was manually digitized to correspond with each lake and stream that has been stocked. The table `fish_stocking_attributes.dbf` can be 'linked' to the spatial table in ArcView for viewing associated attributes including stock characteristics, number released, date and hatchery of origin.

### **3.7 Streams Classified by Fish Presence**

The Streams layer is derived from the following sources:

- TRIM Streams
- SHIM Stream Surveys
- SCRDP Official Community Plan Documents
- Gambier Island Conservancy
- District of Sechelt
- Town of Gibsons
- Input from Community Members

This layer began with the 1:20,000 TRIM streams as a base. From there, stream segments collected as part of the SHIM surveys were added to the layer, replacing the TRIM lines. Similarly, input from community members was also added to the layer, replacing the original TRIM lines. The community input information was heads-up digitized with the use of 1:20,000 TRIM contours, 1:5,000 Land Parcels, and orthophotos. The source and date were recorded for each line segment so that users of the Habitat Atlas can find out when and where the lines came from. The final step was to incorporate the fish presence information. To do this, the fish presence distribution points were layered on top of the stream lines. The stream lines were then split at the highest point on the stream where a fish distribution point intersected it. The downstream portion of the stream was then selected and the fish presence information was added.

In the Habitat Atlas Mapbook, the stream lines are color coded to show whether fish presence has been identified. Streams classified as *unknown fish presence* represent those streams that have not yet been inventoried. The stream layer was last updated in January, 2004. It is important to note that this layer is made up of the best information available and may contain information that is incorrect or not up-to-date.

### **3.8 Wetlands**

The Wetlands layer is derived from the following sources:

- Airphoto Interpretation
- Gambier Island Conservancy
- Input from Community Members
- SCRD Official Community Plans
- SHIM Stream Surveys (1:5,000)
- TRIM Wetlands (1:20,000)

Wetland areas from the sources above were merged together into a single layer of information. The source and date were recorded for each wetland area. The source scale for the wetlands layer ranges from 1:5,000 – 1:20,000 and was last updated in June, 2005. This layer contains all of the information available and may be incomplete.

### **3.9 Eelgrass**

The source of the Eelgrass beds is the Sunshine Coast Conservation Association in Partnership with SeaChange Marine Conservation Association. Polygons were interpreted from point features collected on a boat using a GPS Receiver. This was last updated in January, 2005.

### **3.10 Sensitive Ecosystems Inventory**

The source of the Sensitive Ecosystems Inventory (SEI) layer is Environment Canada (Canadian Wildlife Service) and the Ministry of Sustainable Resource Management. Inventory data was derived from aerial photography (1994 – 1999) and verified using selective field checks.

The Sunshine Coast Sensitive Ecosystems Inventory (SEI) has identified rare and fragile terrestrial ecosystems along the coastal lowlands from Howe Sound to Desolation Sound (including adjacent islands). The SEI is a “flagging” tool that identifies sensitive ecosystems and provides scientific information and support to local governments and others who are trying to maintain biodiversity.

The mild climate and long growing season of the Sunshine Coast support many rare plants, animals and plant communities - including several "at risk" species. However, rapid development along the coast is resulting in the fragmentation and degradation of terrestrial ecosystems. The SEI is a "flagging" tool that identifies sensitive ecosystems and provides scientific information and support to local governments and others who are trying to maintain biodiversity.

The SEI layer contains much information including Primary, Secondary, and Tertiary Ecosystem Class, Ecosystem Subclasses, and Biogeoclimatic Zones. For the habitat Atlas Mapbook and

website, the SEI areas have been classified by Primary Ecosystem Class. The website includes a reporting feature that displays all of the additional SEI information for each area.

Sensitive Ecosystems classifications for the Sunshine Coast are as follows:

- Cliffs (CL)
- Herbaceous (HB)
- Mature Forest (MF)
- Old Forest (OF)
- Riparian (RI)
- Sparsely Vegetated (SV)
- Seasonally Flooded Agricultural Fields (SF)
- Wetland (WN)
- Woodland (WD)

More detailed information about the SEI initiative can be found at:  
<http://srmwww.gov.bc.ca/sei/sunshine>.

### **3.11 Parks**

The source of the Parks layer is the Sunshine Coast Regional District. This layer includes Provincial, Regional Use for Recreation and the Enjoyment of the Public (UREP), and Public Access areas. This layer has been fitted to the cadastral layer and has a source scale of 1:5,000. The Parks layer was last updated in June, 2005.

### **3.12 Beach Access Points**

The source of the Beach Access Points is the SCRCD. These points represent the locations of public access to the beach. This information was last updated in March, 2003.

### **3.13 Band Lands**

The source of the Band Lands layer is the Digital Road Atlas of BC. This information was collected by GIS Innovations, Ltd., has a +/- 5m accuracy. This information was last updated in March, 2003.

### **3.14 Agricultural Land Reserve**

The Agricultural Land Reserve (ALR) is a provincial zone in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are controlled. The ALR includes private and public lands that may be farmed, forested or vacant land. The source of the ALR information is the Provincial Agricultural Land Commission. This information has been updated to match the SCRCD parcel base. The most recent updated took place in June, 2005.

### **3.15 Development Permit Areas**

Development Permit Areas (DPA) are established where there are natural hazardous conditions, to protect the environment, or to regulate the form and character of commercial development. Separate DPA's are designated for each Official Community Plan (OCP) area. The DPA's were last updated in June, 2005. For more information, please contact the SCRCD's Planning Department.

## **5 Accessing the Habitat Atlas**

The Habitat Atlas is distributed as a printed Mapbook, a CD, and an Internet website. It consists of the following components:

1. Project Report
2. Index Map
3. Context Maps
4. Mapsheets

The Habitat Atlas website is located at <http://habitat.scrd.bc.ca>. The website contains a description of the project, links to useful sites, all of the information stored in the habitat Atlas Mapbook, and an interactive mapping application called the habitat Atlas Web Map. The Web Map enables users to create and print custom maps from their own homes with their Internet web browser.

Mapbooks, Mapbook pages, and CD's are available for purchase from the SCRDR office in Sechelt.