Sensitive Ecosystems Inventory of the Sunshine Coast and Adjacent Islands

Environment Canada / Environnement Canada

BRITISH COLUMBIA

REGIONAL DISTRICT Comox-Strathcona

Sensitive and Terrestrial Ecosystems Labels

Sensitive Ecosystems

Sensitive ecosystems are fragile and/or rare, or are ecologically important because of the diversity of species they support.

Old Forest (OF):
Conifer-dominated dry to moist forest types, structural stage 7 (see table), generally >250yrs.

Subclasses:
- **co** (conifer dominated) – greater than 75% coniferous species

Woodland (WD):
Dry open forests, generally between 10 and 30% tree cover, can be conifer dominated or mixed conifer and arbutus stands; because of open canopy, will include non-forested openings, often with shallow soils and bedrock outcroppings.

Subclasses:
- **co** (conifer dominated) – greater than 75% coniferous species
- **mx** (mixed conifer and deciduous) – a minimum of 25% cover of either group is included in the total tree cover

Herbaceous (HB):
Non-forested ecosystems (less than 10% tree cover), generally with shallow soils and often with bedrock outcroppings; includes large openings within forested areas, coastal headlands, shorelines vegetated with grasses and herbs, sometimes low shrubs, and moss and lichen communities on rock outcrops.

Subclasses:
- **hb** (herbaceous) – central concept of the category, non-forested, less than 10% tree cover, generally shallow soils, often with exposed bedrock, predominantly a mix of grasses and forbs, also lichens and mosses
- **cs** (coastal herbaceous) – as **hb** but influenced by proximity to ocean, windswept shoreline and slopes, > 20% vegetation, grasses and herbs, some rock outcrops, moss and lichen communities
- **vs** (vegetated shoreline) – lowlying rocky shoreline, soil pockets in rock cracks and crevices; salt-tolerant vegetation, generally with < 20% vegetation cover
- **sp** (spit) – finger-like extension of beach, comprised of sand or gravel deposited by longshore drifting; low to moderate cover of salt-tolerant grasses and herbs
- **du** (dunes) – ridge or hill, or beach area created by windblown sand; may be more or less vegetated depending on depositional activity; beach dunes will have low cover of salt-tolerant grasses and herbs
- **sh** (shrub component) – > 20 % of total vegetation cover is shrub cover, with grasses and herbs

Riparian (RI):
Areas adjacent to water bodies (rivers, lakes, ocean, wetlands) which are influenced by factors such as erosion, sedimentation, flooding and/or subterranean irrigation due to proximity to the water body. Structural stages 1 – 7.

Subclasses:
- **fl** (low bench floodplain) – flooded at least every other year for moderate periods of growing season; plant species adapted to extended flooding and abrasion, low or tall shrubs most common
- **fm** (medium bench floodplain) – flooded every 1-6 years for short periods (10-25 days); deciduous or mixed forest dominated by species tolerant of flooding and periodic sedimentation, trees occur on elevated microsites
- **fh** (high bench floodplain) – only periodically and briefly inundated by high waters, but lengthy subsurface flow in the rooting zone; typically conifer-dominated floodplains of larger coastal rivers
- **ff** (fringe) – narrow linear communities along open water bodies (rivers, lakes and ponds) where there is no floodplain, irregular flooding
- **ri** (river) – watercourse is large enough to represent >10% of the polygon
- **gu** (gully riparian) – watercourse is within a steep sided V-shaped gully

Wetland (WN):
Areas that are saturated or inundated with water for long enough periods of time to develop vegetation and biological activity adapted to wet environments. This may result from flooding, fluctuating water tables, tidal influences or poor drainage conditions.

Subclasses:
- **bg** (bog) – nutrient poor wetland, on organic soils (sphagnum peat), water source predominantly from precipitation; may be treed or shrub dominated
- **fn** (fen) – nutrient medium wetland (sedge peat) where ground water inflow is the dominant water source, open water channels common; dominated by sedges, grasses and mosses
- **ms** (marsh) – wetland with fluctuating water table, often with shallow surface water, usually organically enriched mineral soils; dominated by rushes, reeds, grasses and sedges
- **sp** (swamp) – poor to very rich wetland on mineral soils or with an organic layer over mineral soil, with gently flowing or seasonally flooding water table; woody vegetation
- **sw** (shallow water) – standing or flowing water less than 2 m. deep, transition between deep water bodies and other wetland ecosystems (i.e. bogs, swamps, fens, etc.); often with vegetation rooted below the water surface
- **wm** (wet meadow) – periodically saturated but not inundated with water, organically enriched mineral soils; grasses, sedges, rushes and forbs dominate

Cliffs (CL):
Very steep slope, often exposed bedrock, may include steep sided sand bluffs; habitat for rare species.

Subclasses:
- **cs** (coastal cliffs)
- **ic** (inland cliffs)

Other Important Ecosystems
Other important ecosystems have high biodiversity values.

Mature Forests (MF):
Usually conifer-dominated, occasionally deciduous, dry to moist forest types, structural stage 6, generally >80yrs, > 25 ha. or buffering sensitive ecosystems.

Subclasses:
- **co** (conifer dominated) – greater than 75% coniferous species
- **mx** (mixed conifer and deciduous) – a minimum of 25% cover of either group is included in the total tree cover

Seasonally Flooded Agricultural Fields (FS):
Annually flooded cultivated fields or hay fields; important migrating and wintering waterfowl habitat.
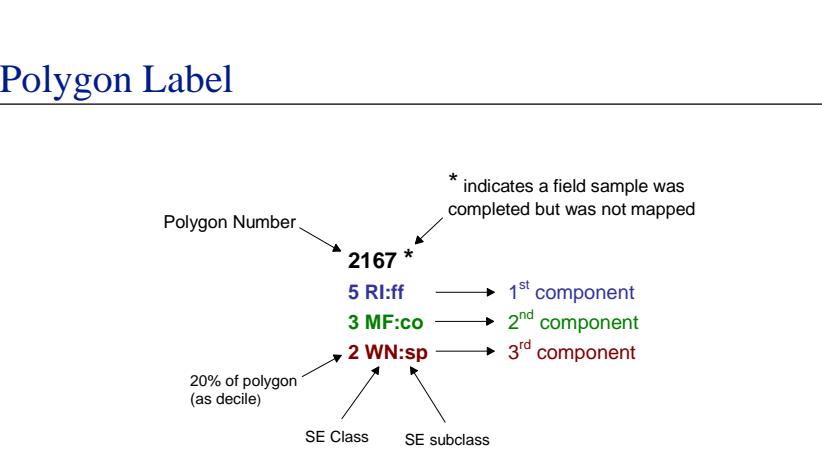
Other Mapped Ecosystems
Other mapped ecosystems occur in mosaic with sensitive ecosystems and are not possible to delineate separately at the mapping scale.

Young Forests (YF):
Limited to areas of young forest dispersed among sensitive and other important ecosystems.

Polygon Label

Ecosystem Components
This cartographic product uses Dot Density to indicate where more than one ecosystem class is mapped in a polygon. The number of dots indicates the proportion of the polygon represented by the 2nd and 3rd ecosystem class. The colour of the dots indicates the 2nd and 3rd ecosystem class.
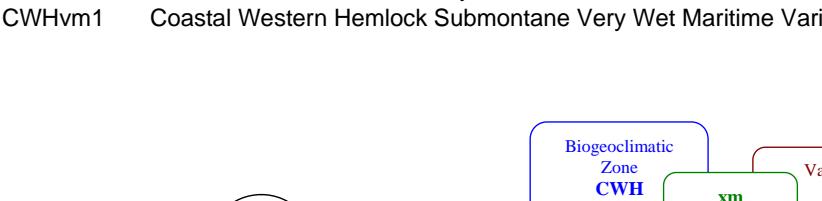
- The base colour represents the first ecosystem component.
- Coloured dots overlaid upon the base colour indicate a second ecosystem component.
- Two colours of dots indicate a second and third ecosystem.
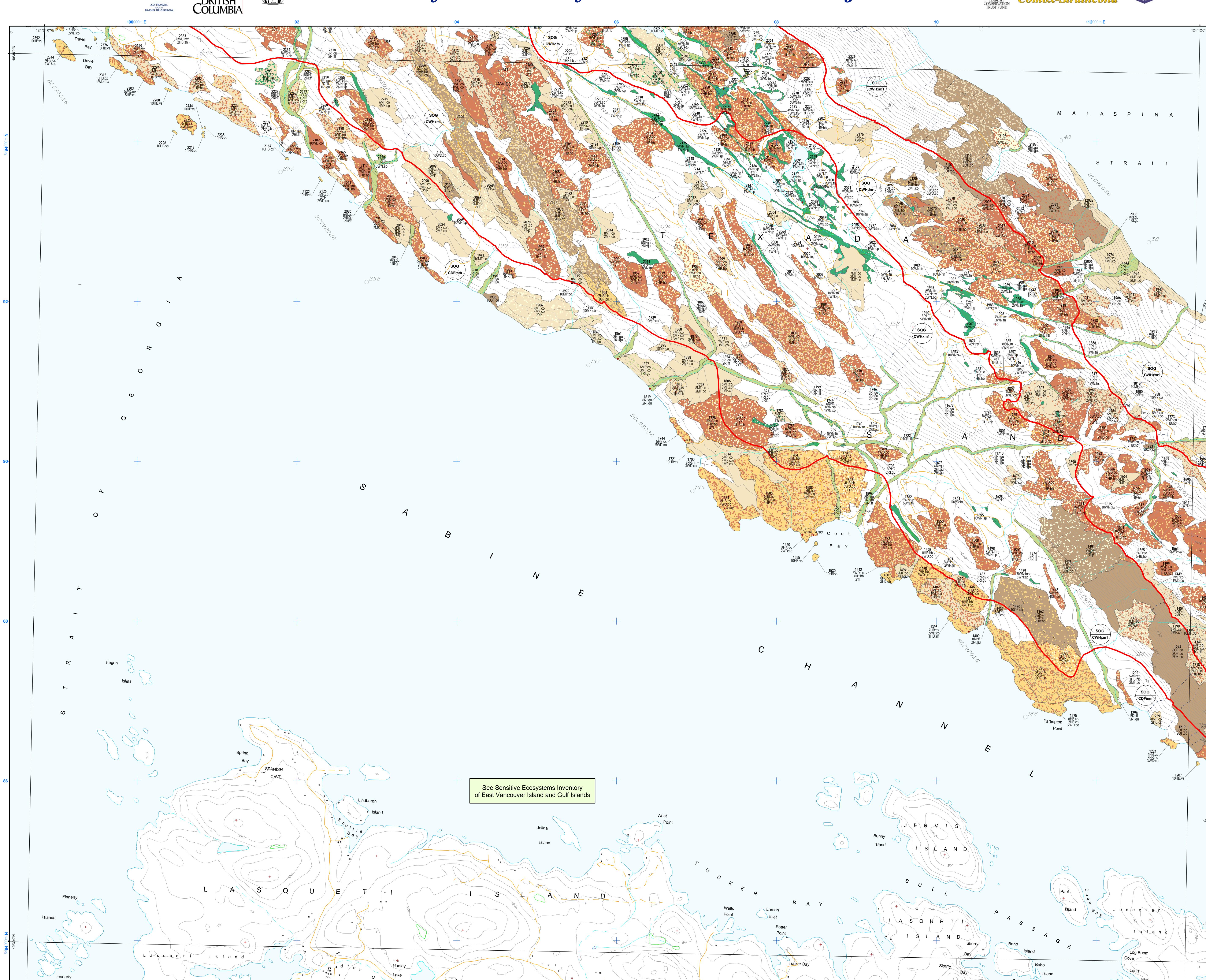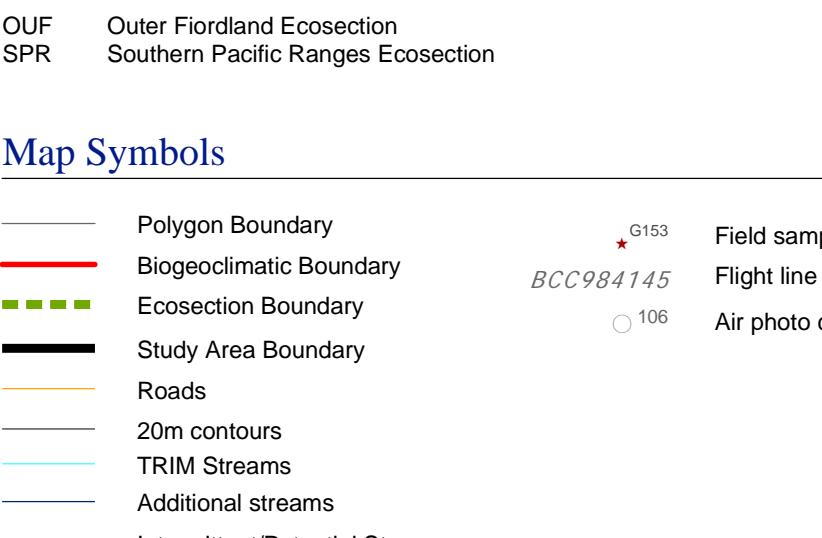
Biogeoclimatic Units
- **CDFmm** Coastal Douglas-fir Moist Maritime Subzone
- **CWHxm1** Coastal Western Hemlock Eastern Very Dry Maritime Variant
- **CWHdm** Coastal Western Hemlock Dry Maritime Subzone
- **CWHvm1** Coastal Western Hemlock Submontane Very Wet Maritime Variant

Ecosections
- **GEL** Georgia Lowlands Ecosection
- **SOG** Strait of Georgia Ecosection
- **OUF** Outer Fiordland Ecosection
- **SPR** Southern Pacific Ranges Ecosection

Map Symbols
- Polygon Boundary
- Biogeoclimatic Boundary
- Ecosection Boundary
- Study Area Boundary
- Roads
- 20m contours
- TRIM Streams
- Intermittent/Potential Stream
- Drainage Route
- Field sample point
- Flight line
- Air photo centre

What is a Sensitive Ecosystem?
For the purpose of this study, an ecosystem is considered to be a portion of the landscape with relatively uniform dominant vegetation.

Sensitive ecosystems are those which are fragile and/or rare, or those ecosystems which are ecologically important because of the diversity of species they support.

Rationale
Ecologically significant lands and important wildlife habitats are fast disappearing throughout the lowlands surrounding the Strait of Georgia. Intense development pressures fuelled by population and economic growth have fragmented and degraded many terrestrial ecosystems. A high proportion of these ecosystems are now designated as "at risk". Sensitive ecosystems typically have high biological diversity and are a vital part of the landscape. They provide ecosystem services for a healthy economy and for social well being. They regulate climate, clean water, generate and clean soils, recycle nutrients and pollinate our crops. To protect these areas, sensitive ecosystems must be located, identified and mapped. Along the Sunshine Coast the wave-beaten shorelines, coastal plains, rugged mountain slopes, fjords and estuaries contribute to high biodiversity values. Here one finds important marine rainforests, dry shoreline woodlands, herbaceous meadows and rocky coastal bluffs, wetlands and riparian ecosystems.

Purpose
The purpose of the Sensitive Ecosystems Inventory (SEI) of the Sunshine Coast is to identify, classify and map sensitive terrestrial ecosystems along the coastal lowlands (including the adjacent islands) from Howe Sound to Desolation Sound. The goal of the SEI is to encourage informed land-use decisions that will conserve sensitive ecosystems. The SEI on Vancouver Island and Gulf Islands (1993 – 1997) showed that this information can be used in a variety of land-use planning processes and can contribute to the conservation of many sites. Decision makers, consultants and non-government organizations have found the SEI to be an effective planning and management tool. SEI data provides site-specific ecological information that can be used to flag sites of conservation concern, to prompt detailed field studies prior to development projects, and to provide input to Forest Stewardship Plans.

What can be done to protect sensitive ecosystems?
Direct and indirect impacts to these ecosystems can be avoided by:
- Retaining or creating vegetated buffers around sensitive ecosystems to isolate them from outside disturbance;
- Controlling land and water access to fragile ecosystems;
- Controlling invasive species;
- Allowing natural disturbances to occur;
- Maintaining water quality.

If development must occur, develop carefully!

Conduct an ecological inventory to identify the existing flora and fauna and to locate any threatened or endangered plant and animal species, plant communities, and habitat features needing protection;

Methodology
The mapping methods are based on the Vancouver Island SEI project and the Resources Information Standards Committee (RISC) Standard for Terrestrial Ecosystem Mapping (TEM) in BC. Ecosystem categories include six Sensitive Ecosystem (SE) classes, two Important Ecosystem classes, and one Other Ecosystem class. The legend to the right of the map provides definitions. Ecosystem classes, subclasses, the corresponding Terrestrial Ecosystem site units and structural stages, and stream and drainage corridors not included in TRIM, are mapped. Field survey protocols followed Describing Terrestrial Ecosystems in the Field (RISC 1998) with the addition of a conservation evaluation form to document ecosystem condition and viability. Approximately 20% of the polygons were field checked.

Data Limitations
The SEI is a tool to alert decision makers to the existence of sensitive ecosystems, however when land-use changes are proposed detailed site-level assessments are necessary. For sites not field checked, the accuracy of the data depends heavily on the professional judgement of the mapper and the availability of source data. Because the area is changing rapidly, reference to the date of the information source is advised.

Aerial photographs used were flown between 1994 and 1999, most at 1:10,000 scale, some at 1:16,000 scale. Due to the mapping scale, minimum polygon size is usually ½ hectare. Minimum riparian polygon width is 20 metres regardless of the stream channel width. Enlargement of the data beyond the source scale may result in unacceptable distortion and faulty registration with other data sets.

Plan and implement all development activities in a manner that will not adversely affect or disturb the sensitive ecosystem.
Consult a qualified professional to interpret the ecological inventory data and work to incorporate designs that maintain the functions and values of the natural ecosystem.

If you are:
- a **property owner**: learn more about the natural values of your land, including the location of any sensitive ecosystems. Find out how to protect, maintain, and enhance those values. Consider using conservation covenants or other measures to ensure that the natural features you value are protected in perpetuity.
- a **developer**: consider a design for your project that is creative and flexible enough to protect and enhance sensitive ecosystems. Treed lots and neighbourhood greenspaces can increase market values.
- a **planner**: ensure that conservation is given as high a priority as other community programs such as housing, transportation, recreation, employment, public works, and community services. Encourage use of the many legal and planning tools available, such as development permit areas, tree protection by-laws, and conservation covenants to protect sensitive ecosystems.
- a **decision-maker** (such as a politician or resource manager): ensure that protection of remaining sensitive ecosystems is a priority at all levels, and support programs, plans and operational activity that will help protect sensitive ecosystems. Encourage and facilitate the development and implementation of biodiversity conservation strategies.
- a **member of an advocacy group**: contribute your time and expertise to help locate and protect sensitive ecosystems. For example, ratepayers' groups, service organizations, naturalist clubs, land trusts, and conservancies often provide a link between local landowners and voluntary stewardship programs. As a member of one of these groups, you can work cooperatively with local governments to promote land use decisions that protect sensitive ecosystems.
- a **volunteer**: participate in educational programs, conservation fundraising, or in programs to remove invasive species.
- a **scientist**: use your expertise to help identify sensitive ecosystems, define issues that need to be addressed, formulate conservation plans, contribute to the development of conservation and management strategies and explain to other professionals and decision makers the importance of sensitive ecosystems.

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Environment Canada (Canadian Wildlife Service) and the B.C. Ministry of Sustainable Resource Management (MSRM) jointly managed this project. Major funding came from Environment Canada and MSRM as part of the Georgia Basin Ecosystem Initiative, BC Habitat Conservation Trust Fund, and the Sunshine Coast Regional District. The multi agency steering committee included the above agencies as well as B.C. Ministry of Water, Land and Air Protection (WLAP), Sechelt Indian Band, Sliammon First Nation, Powell River Regional District, Comox-Strathcona Regional District, Fisheries and Oceans Canada (DFO), and Terminal Forest Products Ltd.

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See Sensitive Ecosystems Inventory of East Vancouver Island and Gulf Islands

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UTM Projection Zone 10 NAD83. Contour Interval 20 metres
March 2005

Scale: 1:20,000

200 0 200 400 600 800 1,000 metres