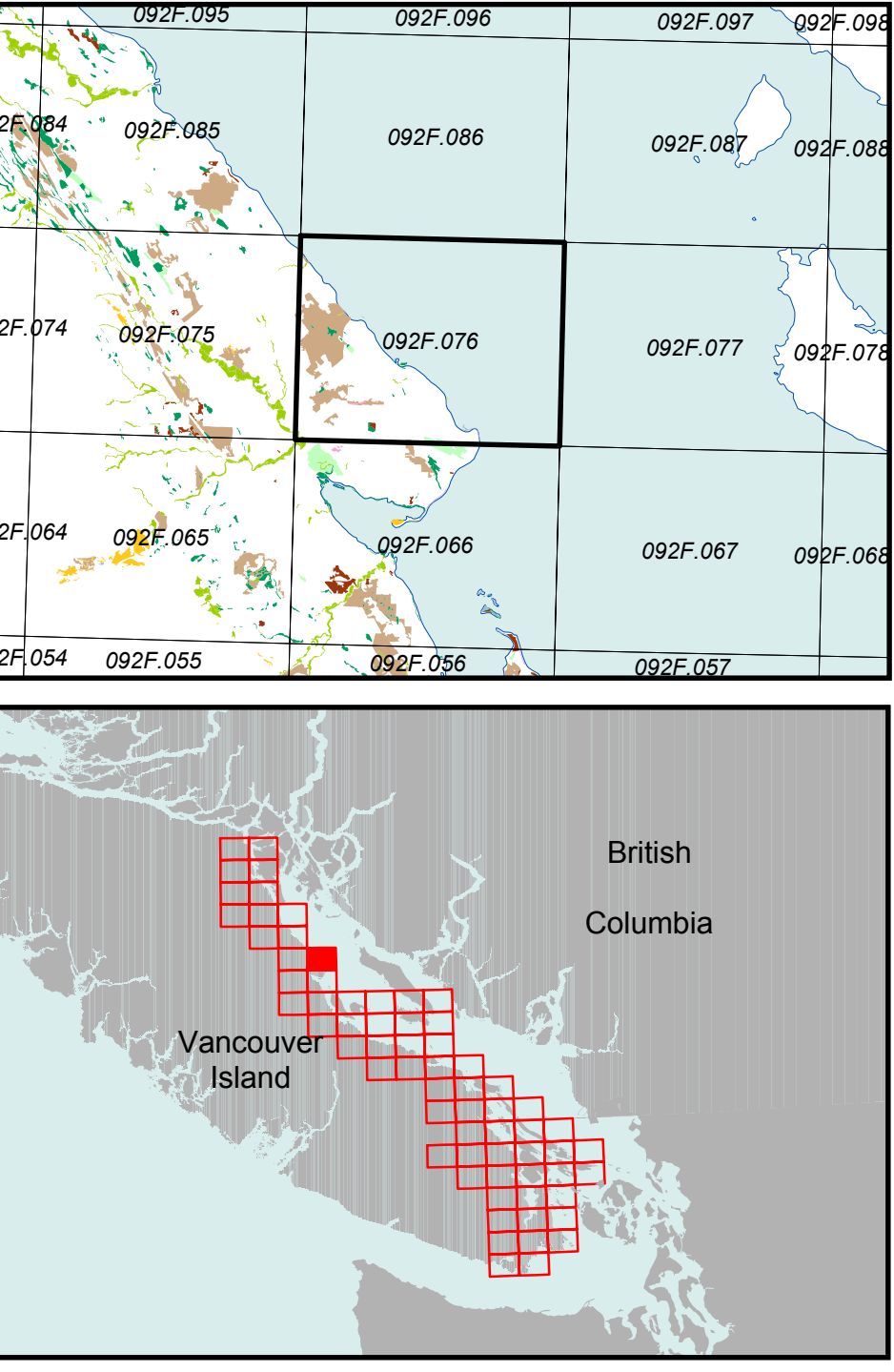
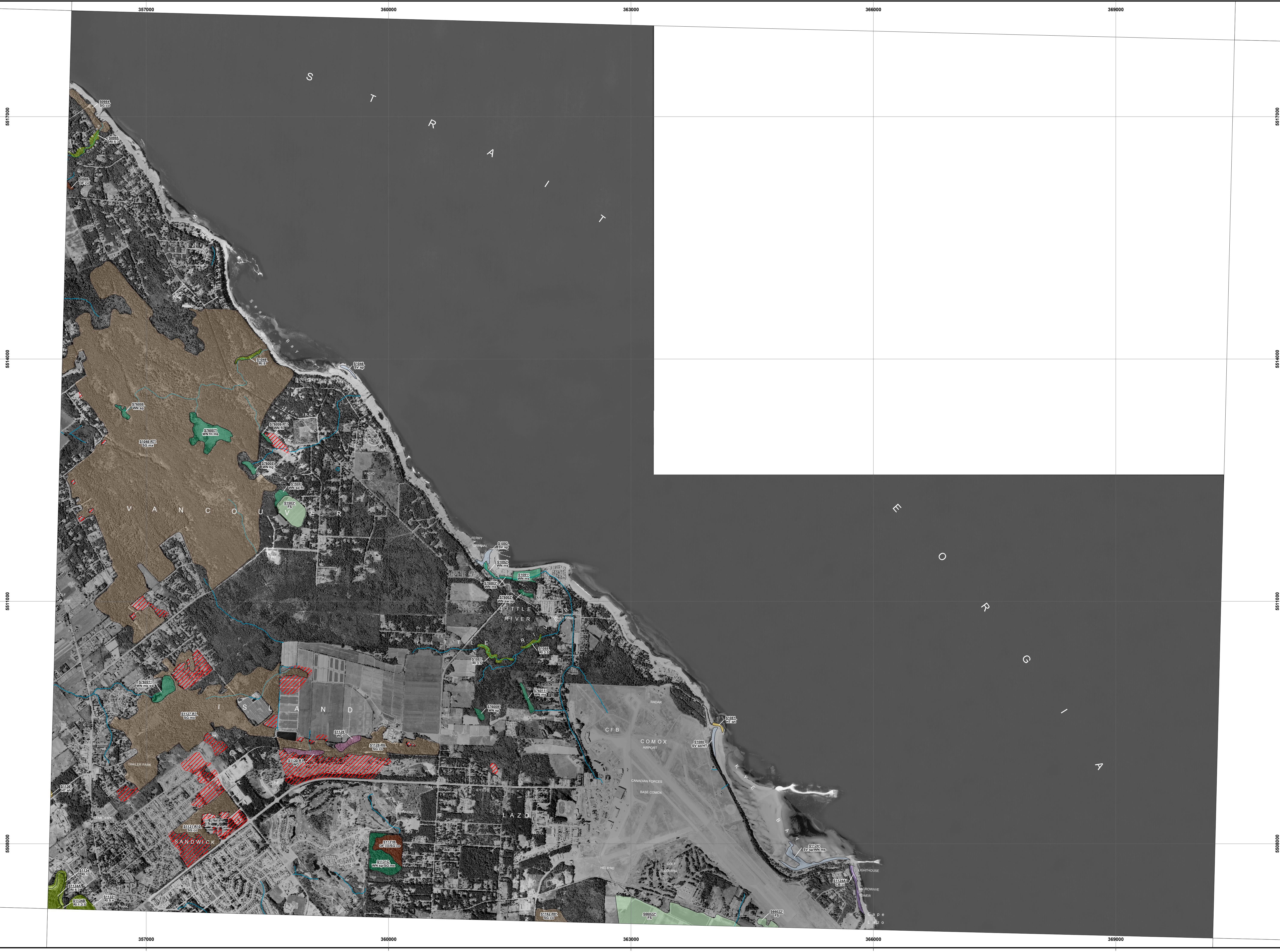


Sensitive Ecosystems Inventory of East Vancouver Island and Gulf Islands
Disturbance Mapping and Re-evaluation of Major Riparian Corridors
March 2004



Background
By the late 1980s it had become clear that ecologically significant lands and important wildlife habitats were fast disappearing throughout the lowlands surrounding the Strait of Georgia. This loss was due to intense development pressure fueled by population and economic growth. To address this concern, the joint federal/provincial Sensitive Ecosystems Inventory (SEI) of East Vancouver Island and Gulf Islands was undertaken in 1993 as a pilot project.
Seven rare and ecologically fragile sensitive ecosystems were mapped and selectively ground truthed from 1993-1997: wetland, riparian, older forest, woodland, terrestrial herbaceous, sparsely vegetated and coastal bluff ecosystems (see map legend for descriptions). These ecosystems typically have high biodiversity and are home to many rare and endangered animals, plants and plant communities. They are also a vital part of the overall landscape, providing ecosystem services that support a healthy economy and our social well-being. For example, they regulate climate, clean our fresh water, generate and clean our soils, recycle nutrients and pollinate our crops. Two other important ecosystems - although clearly altered by human use - were also mapped because of their general biodiversity values: seasonally flooded agricultural field and older second growth forest ecosystems.
A technical report (Ward et al. 1998) and Conservation Manual (McPhee et al. 2000) provide information on the values and importance of each ecosystem, management guidelines and recommendations for each ecosystem, and information about the conservation tools available to local and senior governments, landowners and other citizens.
Disturbance Mapping
This second version of the SEI maps is an update of the ones that were published in 1997. The new maps identify those portions of the original SEI polygons that have been disturbed - by logging, urban or rural use, roads, trails, recreation, agriculture or industrial use - over the past decade. The disturbed areas identified have been retained on the maps (see red hatched areas) to increase awareness of the escalating loss of natural ecosystems and to encourage conservation of those that remain.
The areas of disturbance were identified by digitally overlaying the original polygons (identified on air photos taken primarily between 1990 and 1992) on more recent photographs taken in late July and early August 2002 (AXYS 2004). In addition, the intact remnants of each altered polygon were reviewed to determine if they still qualified for inclusion in the SEI (Buechert 2004).
Results of this disturbance mapping showed that over 6,800 ha (11%) of the area occupied by the nine SEI ecosystem types in the early 1990s had been disturbed by 2002. Over 1,480 ha of disturbed area had originally been occupied by the seven sensitive ecosystems. Older forests had the highest

rate of loss at 8.6% (915 ha) followed by riparian (4.6%), woodland (2.6%) and wetland (2.0%) ecosystems. The largest area of loss was 7,360 ha (15.5%) in the older second growth forest category.
Re-evaluation of Major Riparian Corridors and Other Areas
The original SEI mapping of riparian ecosystems avoided areas showing recent human disturbance. However, the linear corridors formed by riparian ecosystems comprise a continuous ecological unit with very high conservation values overall. Major riparian corridors were re-evaluated to reflect these values and to encourage land use decisions that consider entire riparian ecosystems as well as the larger watersheds of which they are a part.
These new maps include 256 new riparian polygons in major corridors such as the Cowichan, Chemainus, Koksilah, Nanaimo, Englishman, Little Qualicum, Purtilidge, Quinsam, Oyler, Tsulium and Trent River valleys. Where riparian ecosystems were identified within an existing non-riparian polygon, the riparian ecosystem code was added.
For consistency, the new air photo interpretation was conducted at a scale of 1:10,000. Since this scale was larger than some of the original 1990s photos (many of which were between 1:15,000 and 1:20,000), more accurate interpretation was possible. However, budget and time constraints did not allow for a comprehensive re-interpretation of the entire study area at this scale.
Where previously unidentified SEI ecosystems were noticed during the riparian re-evaluation, new polygons were added. Approximately 25 non-riparian polygons were identified, representing older forests, wetlands and seasonally flooded agricultural fields. A few older second growth forest polygons were also identified where they occurred adjacent to a sensitive ecosystem.
What can be done to protect these ecosystems?
It is critical that all possible land use options be evaluated before initiating any further changes to these rare and fragile ecosystems. Direct and indirect impacts to these ecosystems can be avoided by:
Creating vegetated buffers around sensitive ecosystems to isolate the ecosystem from outside disturbance such as windthrow, invasive species colonization, and increased light and human access.
Controlling land and water access to fragile ecosystems by using appropriate management tools such as fencing, trails, elevated boardwalks, railings, seasonal restrictions, signs and livestock restrictions.
Controlling invasive species including plants, feral animals and pets by using active control methods such as hand clearing, pruning, mowing, excavation, animal fencing and planting of appropriate native species, and discouraging plantings of Scotch Broom, English Ivy, Himalayan Blackberry, Yellow Flag Iris, Purple Loosestrife and Spurge Laurel.
Allowing natural disturbances to occur because natural ecological functions are critical to the

creation and maintenance of a sensitive ecosystem; these include hydrologic and nutrient regimes, coastal erosion, sediment accretion, flooding, seasonal drawdown, groundwater recharge and discharge, stream channel movement, windthrow, tree death, fire and disease.
Preventing disturbance of nesting or breeding areas - the nesting and breeding season for most coastal wildlife occurs in spring but can extend year round. Avoid disturbance of habitat features such as dens, nest or perch trees, ground nests, roosting sites, and cavities.
Maintaining water quality - clean water is essential to the survival of a wide variety of organisms, from aquatic insects and molluscs to the birds and mammals that feed on them.
If development is the only option - develop carefully!
Before any development takes place:
Conduct an ecological inventory, ideally through the seasons over a period of a year. Identify the existing flora and fauna, and in particular identify any threatened or endangered plant and animal species, plant communities, and habitat features needing protection.
Plan and implement all development activities in a manner that will not adversely affect or disturb the sensitive ecosystem. A qualified professional can 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. Tread lightly 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 as described in the Conservation Manual (McPhee et al. 2000).
A decision-maker (such as a politician or government manager): ensure that protection of remaining sensitive ecosystems is a priority at all levels, and support plans and programs that will help protect sensitive ecosystems. Encourage and facilitate the development and implementation of local government conservation strategies.
A member of an advocacy group: contribute your time and expertise to help locate and protect sensitive ecosystems. For example, riparian 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 (such as "broom-bashing" events).
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 the importance of sensitive ecosystems.
Resources (available on the SEI website)
AXYS Environmental Consulting Ltd. 2004. Redefining of Sensitive Ecosystems Inventory Polygons to Exclude Disturbed Areas. Unpublished report submitted to the Canadian Wildlife Service, Environment Canada, Pacific and Yukon Region.
Buechert, Ron. 2004. Analysis of remnant SEI polygons. 2002. Unpublished report submitted to Canadian Wildlife Service, Environment Canada, Pacific and Yukon Region.
McPhee, M. P. Ward, J. Kirby, L. Wolfe, N. Page, K. Dunster, N. K. Dawe and I. Nykist. 2000. Sensitive Ecosystems Inventory: East Vancouver Island and Gulf Islands, 1993 - 1997. Volume 2: Conservation Manual. Technical Report Series No. 345, Canadian Wildlife Service, Pacific and Yukon Region, British Columbia, 326pp.
Ward, P., G. Bastcliffe, J. Kirby, J. Illingworth and C. Castro. 1998. Sensitive Ecosystems Inventory: East Vancouver Island and Gulf Islands, 1993 - 1997. Volume 1: Methodology, Ecological Descriptions and Results. Technical Report Series No. 320, Canadian Wildlife Service, Pacific and Yukon Region, British Columbia, 160pp.
Saving Sensitive Ecosystems a series of eight colour brochures describing sensitive ecosystems, their status (based on 1997 inventory results) and their importance. They also present management recommendations that can be used to protect each ecosystem.
PowerPoint presentations designed for four audiences: Local Government, Developers, General Public, Planners and Consultants.
Contact: For copies of these materials or more information on either the program or a specific polygon, please contact: Jan Kirby, Landscape Ecologist, Canadian Wildlife Service, Environment Canada at Jan.Kirby@ec.gc.ca or tel: 604.940.4657, ext: 250.616.3234
Website: http://srmwww.gov.bc.ca/sei/index.html
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Disturbance Mapping and Photo Generator: AXYS Environmental Consulting Ltd., Sidney, B.C.
Remnant and Riparian Assessments: Ron Buechert, Qualicum Beach, B.C.
Photo Credits: Neil K. Dawe, Tracy Chatwin, Mark Kaarman, Marlene Caskey, Nick Page, Colleen Bryden, Tim Enns.

Ecosystem Classes

CB Coastal Bluff Ecosystems
SV Sparsely Vegetated Ecosystems
HT Terrestrial Herbaceous Ecosystems
OF Older Forest Ecosystems
WD Woodland Ecosystems
WN Wetland Ecosystems
RI Riparian Ecosystems
FS Seasonally Flooded Agricultural Field Ecosystems
SG Older Second Growth Forest Ecosystems
Each class includes a description, a list of subclasses, and a representative photograph.

Disturbed SEI Ecosystems
Disturbed Areas
Polygon Label: N1477-R1\*
Field Checked: HTro / SGco
Ecosystem Class: Primary Ecosystem
Ecosystem Subclass: Secondary Ecosystem
Map Sheet: 092F.076
Scale: 1:20,000
UTM Projection, NAD83
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