Sensitive Ecosystems Inventory of the Sunshine Coast and Adjacent Islands Sensitive and Terrestria Sensitive Ecosystems WORKING TOGETHER
FOR THE
GEORGIA BASIN Ecosystems Labels AU TRAVAIL
POUR LE
BASSIN DE GEORGIA Sensitive ecosystems are fragile and/or rare, or are ecologically important because of the diversity of species they support. A PEAK Old Forest (OF): CWHxm1 10RI:gu RS5 Conifer-dominated dry to moist forest types, structural stage 7 (see table), generally >250yrs. co (conifer dominated) – greater than 75% coniferous species Woodland (WD): STONY HILL Dry open forests, generally between 10 and 30% tree cover, can be conifer dominated or mixed EASTBOURNE conifer and arbutus stands; because of open canopy, will include non-forested openings, often with shallow soils and bedrock outcroppings. 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 Herbaceous (HB): CWHxm1 6HB:cs FC2 2WD:co DC5 2WD:mx DC3 Non-forested ecosystems (less than 10% tree cover), generally with shallow soils and often with ISLAND/ bedrock outcroppings; includes large openings within forested areas, coastal headlands, shorelines vegetated with grasses and herbs, sometimes low shrubs, and moss and lichen 9 CWHxm1 6RI:gu RS5 3RI:fh SS5 1RI:ff RF6 See Sensitive Ecosystems Inventory of Bowen/Gambier Trust Areas 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, Preston Island 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 Gower vs (vegetated shoreline) - low-lying rocky shoreline, soil pockets in rock cracks and crevices; Home Island Point 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 CWHxm1 8WD:co DC5 2HB:hb FO2b Ragged **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. 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 Island King Edward fm (medium bench floodplain) - flooded every 1-6 years for short periods (10-25 days): PASLEY deciduous or mixed forest dominated by species tolerant of flooding and periodic sedimentation, 18 CWHxm1 5RI:gu RS5 3RI:gu RF5 2RI:ff RS5 ISLAND **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 Little Pasley ff (fringe) - narrow linear communities along open water bodies (rivers, lakes and ponds) where Popham Popham there is no floodplain, irregular flooding Island Island gu (gully riparian) - watercourse is within a steep sided V-shaped gully ri (river) – watercourse is large enough to represent >10% of the polygon 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. 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 Very steep slope, often exposed bedrock, may include steep sided sand bluffs; habitat for rare cc (coastal cliffs) Other Important Ecosystems Other important ecosystems have high biodiversity values. Roger Mature Forests (MF): Usually conifer-dominated, occasionally deciduous, dry to moist forest types, structural stage 6, generally >80yrs; > 25 ha. or buffering sensitive ecosystems. 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 Seasonally Flooded Agricultural Fields (FS): Annually flooded cultivated fields or hay fields; important migrating and wintering waterfowl 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 * indicates a field sample was **5 RI:ff** \longrightarrow 1st component 3 MF:co → 2nd component **2 WN:sp** → 3rd component SE Class SE subclass Some polygon labels will have class and subclass repeated up to three times. This is not an error; it reflects the variability in site units and structural stages occurring within a polygon. More than one site unit can be correlated to a SE class and subclass. Polygon labels on the map do not include the site units. The Sensitive and Terrestrial Ecosystem Labels on the left side of the map provide details about site units mapped in each polygon. **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; 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. Plan and implement all development activities in a manner that will Two colours of dots indicate a second and third ecosystem. Sensitive and Terrestrial Ecosystems Label Structural Stage¹ not adversely affect or disturb the sensitive ecosystem. The mapping methods are based on the Vancouver Island SEI project What is a Sensitive Ecosystem? Environment Canada (Canadian Wildlife Service) and the B.C. and the Resources Information Standards Committee (RISC) Consult a qualified professional to interpret the ecological inventory * indicates a field sample Ministry of Sustainable Resource Management (MSRM) jointly Polygon Number For the purpose of this study, an *ecosystem* is Standard for Terrestrial Ecosystem Mapping (TEM) in BC. Ecosystem data and work to incorporate designs that maintain the functions managed this project. Major funding came from Environment Canada Biogeoclimatic Zone, Subzone & Variant not mapped Substages considered to be a portion of the landscape with categories include six Sensitive Ecosystem (SE) classes, two and values of the natural ecosystem. and MSRM as part of the Georgia Basin Ecosystem Initiative, BC 2a Forb-dominated 6RI:ff RS 5 2b Graminoid-dominated Important Ecosystem classes, and one Other Ecosystem class. The Habitat Conservation Trust Fund, and the Sunshine Coast Regional relatively uniform dominant vegetation. Biogeoclimatic Units legend to the right of the map provides definitions. Ecosystem If you are District. The multi agency steering committee included the above 2RI:ff RF5 2nd component 2d Dwarf shrub CDFmm Coastal Douglas-fir Moist Maritime Subzone Sensitive ecosystems are those which are fragile classes, subclasses, the corresponding Terrestrial Ecosystem site A property owner: learn more about the natural values of your land, agencies as well as B.C. Ministry of Water, Land and Air Protection Substages 2WD:co DC 6 _ ◆ 3rd component (WLAP), Sechelt Indian Band, Sliammon First Nation, Powell River CWHxm1 Coastal Western Hemlock Eastern Very Dry Maritime Variant 3a Low shrub; less than 2 m. tall and/or rare, or those ecosystems which are units and structural stages, and stream and drainage corridors not including the location of any sensitive ecosystems. Find out how to Regional District, Comox-Strathcona Regional District, Fisheries and CWHdm Coastal Western Hemlock Dry Maritime Subzone included in TRIM, are mapped. Field survey protocols followed ecologically important because of the diversity protect, maintain, and enhance those values. Consider using Structural Stage Trees > 10 m. tall; typically densely stocked Oceans Canada (DFO), and Terminal Forest Products Ltd. CWHvm1 Coastal Western Hemlock Submontane Very Wet Maritime Variant Describing Terrestrial Ecosystems in the Field (RISC 1998) with the SE subclass Mapcode of species they support. conservation covenants or other measures to ensure that the Generally 40 – 80 years old depending on species and ecological 092G.032 092G.033 ← addition of a conservation evaluation form to document ecosystem natural features you value are protected in perpetuity. Co-ordination and extension: Carmen Cadrin, Judith Cullington, Jan condition and viability. Approximately 20% of the polygons were field Kirkby, Jo-Anne Stacey and Peggy Ward. The example label above indicates the SEI and TEM attributes Generally 80 - 250 years since last disturbance: understory mapped for polygon 7838. The polygon occurs in the Coastal Western Hemlock Eastern Very Dry Maritime variant; 80% of the A developer: consider a design for your project that is creative and comes well developed as canopy opens up; shade tolerant trees Ecosystem Mappers: Carmen Cadrin, Corey Erwin, Bob Fuller, flexible enough to protect and enhance sensitive ecosystems. Ecologically significant lands and important wildlife habitats are fast Claudia Schaefer, Shearwater Mapping Ltd. and Jo-Anne Stacey. disappearing throughout the lowlands surrounding the Strait of Data Limitations Treed lots and neighbourhood greenspaces can increase market structural stage 5 and 20% is site unit Western red-cedar foamflower (RF), structural stage 5. The remaining 20% of the Georgia. Intense development pressures fuelled by population and
The SEI is a tool to alert decision makers to the existence of sensitive Digitizing and Cartography: Bon Lee of Baseline Geomatics Inc. and economic growth have fragmented and degraded many terrestrial ecosystems, however when land-use changes are proposed detailed polygon is WD:co - Woodland:conifer dominated, site unit AXYS Environmental Consulting Ltd. A planner: ensure that conservation is given as high a priority as Douglas-fir - lodgepole pine - Cladina (DC), structural stage 6 ecosystems. A high proportion of these ecosystems are now site-level assessments are necessary. For sites not field checked, the Abbreviated from Standard for Terrestrial Ecosystem Mapping in British Columbia (RIC 1998) other community programs such as housing, transportation, GIS support: Tim Brierley, Steve Moslin and Mike Wolowicz (MSRM). designated as "at risk". Sensitive ecosystems typically have high accuracy of the data depends heavily on the professional judgement recreation, employment, public works, and community services. biological diversity and are a vital part of the landscape. They provide of the mapper and the availability of source data. Because the area is Field Crews: Louise Blight, Carmen Cadrin, Corey Erwin, Deepa 092G.023 092G.024 Encourage use of the many legal and planning tools available, such ecosystem services for a healthy economy and for social well being. changing rapidly, reference to the date of the information source is Spaeth Filatow, Moraia Grau, Edwin Hubert, Stephen Hureau, Marc as development permit areas, tree protection by-laws, and Johnson, Anre McIntosh, Will MacKenzie, Claudia Schaefer, Jo-Anne Terrestrial Ecosystem Map Codes and Site Unit Names They regulate climate, clean water, generate and clean soils, recycle advised. conservation covenants to protect sensitive ecosystems. nutrients and pollinate our crops. To protect these areas, sensitive Stacey and Leah Westereng. Ecosections Map Code Site Unit Name Site Unit Name COLUMBIA ecosystems must be located, identified and mapped. Along the Aerial photographs used were flown between 1994 and 1999, most A decision-maker (such as a politician or resource manager): ensure Sunshine Coast the wave-beaten shorelines, coastal plains, rugged are at 1:10,000 scale, some at 1:16,000 scale. Due to the mapping that protection of remaining sensitive ecosystems is a priority at all GEL Georgia Lowlands Ecosection western red-cedar - slough sedge
Douglas-fir - lodgepole pine - arbutus western red-cedar - slough sedge black cottonwood - willow mountain slopes, fjords and estuaries contribute to high biodiversity scale, minimum polygon size is usually ½ hectare. Minimum riparian S* Sitka spruce - salmonberry levels, and support programs, plans and operational activity that will SOG Strait of Georgia Ecosection values. Here one finds coastal temperate rainforests, dry shoreline polygon width is 20 metres regardless of the stream channel width. help protect sensitive ecosystems. Encourage and facilitate the Douglas-fir - lodgepole pine - Cladina
Douglas-fir - sword fern western red-cedar - slough sedge woodlands, herbaceous meadows and rocky coastal bluffs, wetlands Enlargement of the data beyond the source scale may result in development and implementation of biodiversity conservation OUF Outer Fiordland Ecosection Douglas-fir - western hemlock - salal Douglas-fir - salal black cottonwood - willow and riparian ecosystems. SPR Southern Pacific Ranges Ecosection unacceptable distortion and faulty registration with other data sets. dune grass - beach pea A member of an advocacy group: contribute your time and expertise fescue - gumweed fescue - gumweed What can be done to protect sensitive ecosystems? red fescue - poverty oatgrass - Racomitrium
hardhack - sedge swamp red fescue - poverty oatgrass - Racomitrium
western hemlock - western red-cedar - deer fern Douglas-fir - western hemlock - salal to help locate and protect sensitive ecosystems. For example, Map Symbols The purpose of the Sensitive Ecosystems Inventory (SEI) of the Direct and indirect impacts to these ecosystems can be avoided by: ratepayers' groups, service organizations, naturalist clubs, land juniper - hairy manzanita
 Labrador tea - bog laurel - peat moss bog western hemlock - flat moss Sunshine Coast is to identify, classify and map sensitive terrestrial • Retaining or creating vegetated buffers around sensitive trusts, and conservancies often provide a link between local fescue - gumweed hardhack - sedge swamp western hemlock - lodgepole pine - Racomitrium red fescue - poverty oatgrass - Racomitrium ecosystems along the coastal lowlands (including the adjacent landowners and voluntary stewardship programs. As a member of ecosystems to isolate them from outside disturbance; ——— Polygon Boundary lodgepole pine - Sphagnum bog western hemlock - western red-cedar - deer fern Labrador tea - bog laurel - peat moss bog ★^{G153} Field sample point S sweet gale - Sitka sedge fen
northern wormwood - red fescue - gumweed islands) from Howe Sound to Desolation Sound. The goal of the SEI lodgepole pine - Sphagnum sweet gale - Sitka sedge fen one of these groups, you can work cooperatively with local Controlling land and water access to fragile ecosystems; HS hardhack - sedge swamp Biogeoclimatic Boundary governments to promote land use decisions that protect sensitive is to encourage informed land-use decisions that will conserve BCC984145 Flight line oceanspray - rose western red-cedar - skunk cabbage sensitive ecosystems. The SEI on Vancouver Island and Gulf Islands • Controlling invasive species; Ecosection Boundary western red-cedar - Sitka spruce - skunk cabbage Labrador tea - bog laurel - peat moss bog ○ 106 Air photo centre (1993 – 1997) shows that this information can be used in a variety of • Allowing natural disturbances to occur; western red-cedar - Douglas-fir - Eurhynchium sweet gale - Sitka sedge fen western red-cedar - sword fern A volunteer: participate in educational programs, conservation Study Area Boundary land-use planning processes and can contribute to the conservation

• Maintaining water quality. slender sedge - white beak-rush fen western red-cedar - Indian-plum western red-cedar - salmonberry fundraising, or in programs to remove invasive species. western red-cedar - snowberry western red-cedar - vanilla-leaf slender sedge - white beak-rush fen western red-cedar - Sitka spruce - skunk cabbage of many sites. Decision makers, consultants and non-government Roads organizations have found the SEI to be an effective planning and If development must occur, develop carefully! A scientist: use your expertise to help identify sensitive ecosystems, western red-cedar - sword fern WP water shield - pond lily ——— 20m contours sedge marsh
spirea - sedge wetland
water shield - pond lily western red-cedar - black twinberr management tool. SEI data provides site-specific ecological define issues that need to be addressed, formulate conservation Conduct an ecological inventory to identify the existing flora and TRIM Streams slender sedge - white beak-rush fen information that can be used to flag sites of conservation concern, to plans, contribute to the development of conservation and cliff: steep vertical or overhanging rock face fauna and to locate any threatened or endangered plant and animal ----- Additional streams * Sitka spruce - Pacific crab apple

* Sitka spruce - salmonberry 092G.033 river
cultivated field, subject to agricultural practices prompt detailed field studies prior to development projects, and to management strategies and explain to other professionals and

species, plant communities, and habitat features needing

decision makers the importance of sensitive ecosystems.

provide input to Forest Stewardship Plans.

VG* white beak-rush - green sedge fen OC oce VP* water shield - pond lily PI spit orrelated to a red or blue listed natural plant community. See report for further details.

Consult with the BC Conservation Data Centre (CDC) for changes in classification since printing. http://srmapps.gov.bc.ca/apps/eswp/

Table adapted from the Provincial Site Series and Mapcodes List (mapcodes_jan2003.xls) available at: http://srmwww.gov.bc.ca/ecology/tem/list.html

AF amabilis fir - western red-cedar - foamflower

---- Intermittent/Potential Stream

Drainage Route

UTM Projection Zone 10 NAD83, Contour Interval 20 metres

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