Sensitive Ecosystems Inventory of the Sunshine Coast and Adjacent Islands Sensitive and Terrestria Sensitive Ecosystems Ecosystems Labels AU TRAVAIL
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BASSIN DE GEORGIA Sensitive ecosystems are fragile and/or rare, or are ecologically important because of the diversity of species they support. Old Forest (OF): BANK Conifer-dominated dry to moist forest types, structural stage 7 (see table), generally >250yrs. 4042 CDFmm 5MF:co DA6 3WD:co DA6 2MF:co DG6 Texada, Island co (conifer dominated) – greater than 75% coniferous species Blubber/ Bay 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. 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): 4163 CDFmm 5WD:co DA6 3HB:hb FO2b 2MF:co DS6 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 hb (herbaceous) - central concept of the category, non-forested, less than 10% tree cover, **4268** CDFmm 6WN:sp RC5 4WN:fn MS3a generally shallow soils, often with exposed bedrock; predominantly a mix of grasses and forbs, cs (coastal berbaceous) - as hb but influenced by proximity to ocean windswept shoreline and slopes; > 20% vegetation, grasses and herbs, some rock outcrops, moss and lichen vs (vegetated shoreline) - low-lying 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 **sh** (shrub component) - > 20 % of total vegetation cover is shrub cover, with grasses and herbs 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 4389 CDFmm 4WN:sp RC5 4YF 2WN:fn MS3a water body. Structural stages 1 – 7. fl (low bench floodplain) - flooded at least every other year for moderate periods of growing **4392** CDFmm 7WN:fn SB2b 3WN:sp RC5 season; plant species adapted to extended flooding and abrasion, low or tall shrubs most 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 ff (fringe) - narrow linear communities along open water bodies (rivers, lakes and ponds) where there is no floodplain, irregular flooding 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 8WD:co DA5 2HB:hb FO2b Very steep slope, often exposed bedrock, may include steep sided sand bluffs; habitat for rare Subclasses: cc (coastal cliffs) Other Important Ecosystems 4473 CDFmm 6WD:co DA6 3MF:co DS6 1HB:hb FO2b 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. **4482** CDFmm 7WN:sp RC6 3WN:sp HS3b 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 CDFmm 8RI:ff DS6 2RI:gu RF6 Other Mapped Ecosystems 4487 CDFmm 5WN:sp RC6 4MF:co DS6 1WN:sp HS3a Other mapped ecosystems occur in mosaic with sensitive ecosystems and are not possible to delineate separately at the mapping scale. 4489 CDFmm 5WD:co DA6 4MF:co DS6 1HB:hb FO2b Young Forests (YF): Limited to areas of young forest dispersed among sensitive and other important ecosystems. \* indicates a field sample was 4511 CDFmm 7WD:co DA5 2HB:hb FO2b 1HB:vs FG2b 5 RI:ff → 1<sup>st</sup> component 3 MF:co → 2<sup>nd</sup> component **2 WN:sp** → 3<sup>rd</sup> component Some polygon labels will have class and subclass repeated up to three times. 7WD:co DA5 3HB:hb FO2b 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. **4568** CDFmm 8MF:co DA6 2MF:co RF6 The base colour represents the first ecosystem component. 4575 CDFmm 8RI:ff RF5 2RI:ff RF6 Coloured dots overlaid upon the base colour indicate a second ecosystem component. **4578** CDFmm 7HB:cs FC2a 3WD:mx DA5 Plan and implement all development activities in a manner that will Two colours of dots indicate a second and third ecosystem. 4579 CDFmm 8RI:ff DS6 2RI:gu RF6 Sensitive and Terrestrial Ecosystems Label Structural Stage<sup>1</sup> 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 092F.086 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, 7838 \* 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 Habitat Conservation Trust Fund, and the Sunshine Coast Regional 2b Graminoid-dominated Important Ecosystem classes, and one Other Ecosystem class. The Biogeoclimatic Units relatively uniform dominant vegetation. legend to the right of the map provides definitions. Ecosystem If you are 2RI:ff RF5 2nd component District. The multi agency steering committee included the above 2d Dwarf shrub 4586 CDFmm 8RI:ff DS3 2RI:gu RF3 Sensitive ecosystems are those which are fragile agencies as well as B.C. Ministry of Water, Land and Air Protection CDFmm Coastal Douglas-fir Moist Maritime Subzone classes, subclasses, the corresponding Terrestrial Ecosystem site A property owner: learn more about the natural values of your land, Substages (WLAP), Sechelt Indian Band, Sliammon First Nation. Powell River 2WD:co DC 6 \_← 3rd component 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 3 Tall shrub; 2 – 10 m. tall 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. Describing Terrestrial Ecosystems in the Field (RISC 1998) with the CWHvm1 Coastal Western Hemlock Submontane Very Wet Maritime Variant 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 092F.077 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 The example label above indicates the SEI and TEM attributes Kirkby, Jo-Anne Stacey and Peggy Ward. Generally 80 - 250 years since last disturbance; understor 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 ecomes 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 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. 092F.066 Field Crews: Louise Blight, Carmen Cadrin, Corey Erwin, Deepa 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 092F.067 092F.068 🙌 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 4625 CDFmm 6WN:sp RC6 4MF:co DS6 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. Stacey and Leah Westereng. Ecosections nutrients and pollinate our crops. To protect these areas, sensitive 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 mountain slopes, fjords and estuaries contribute to high biodiversity scale, minimum polygon size is usually ½ hectare. Minimum riparian western red-cedar - slough sedge S\* Sitka spruce - salmonberry western red-cedar - slough sedge levels, and support programs, plans and operational activity that will SOG Strait of Georgia Ecosection Douglas-fir - lodgepole pine - arbutus 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 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 - salal black cottonwood - willow Douglas-fir - western hemlock - salal 092F.057 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 Douglas-fir - western hemlock - salal to help locate and protect sensitive ecosystems. For example, western hemlock - western red-cedar - deer fern 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 western hemlock - flat moss Sunshine Coast is to identify, classify and map sensitive terrestrial • Retaining or creating vegetated buffers around sensitive Labrador tea - bog laurel - peat moss bog fescue - gumweed hardhack - sedge swamp trusts, and conservancies often provide a link between local red fescue - poverty oatgrass - Racomitrium landowners and voluntary stewardship programs. As a member of ecosystems along the coastal lowlands (including the adjacent ecosystems to isolate them from outside disturbance; lodgepole pine - Sphagnum bog western hemlock - western red-cedar - deer fern Labrador tea - bog laurel - peat moss bog ★G153 Field sample point lodgepole pine - Sphagnum sweet gale - Sitka sedge fen one of these groups, you can work cooperatively with local islands) from Howe Sound to Desolation Sound. The goal of the SEI Controlling land and water access to fragile ecosystems; northern wormwood - red fescue - gumweed HS hardhack - sedge swamp Biogeoclimatic Boundary is to encourage informed land-use decisions that will conserve governments to promote land use decisions that protect sensitive BCC984145 Flight line oceanspray - rose western red-cedar - skunk cabbage sensitive ecosystems. The SEI on Vancouver Island and Gulf Islands • Controlling invasive species; Labrador tea - bog laurel - peat moss bog western red-cedar - Sitka spruce - skunk cabbage Ecosection Boundary ○ 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. western red-cedar - Indian-plum slender sedge - white beak-rush fen western red-cedar - salmonberr fundraising, or in programs to remove invasive species. western red-cedar - snowberry western red-cedar - vanilla-leaf western red-cedar - Sitka spruce - skunk cabbage of many sites. Decision makers, consultants and non-government 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, slender sedge - white beak-rush fen western red-cedar - sword fern WP water shield - pond lily ----- 20m contours 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 spirea - sedge wetland water shield - pond lily 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 092F.077 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 VP\* water shield - pond lily

Table adapted from the Provincial Site Series and Mapcodes List (mapcodes\_jan2003.xls) available at: http://srmwww.gov.bc.ca/ecology/tem/list.html

ed to a red or blue listed natural plant community. See report for further detail

AF amabilis fir - western red-cedar - foamflower

---- Intermittent/Potential Stream

Drainage Route

UTM Projection Zone 10 NAD83, Contour Interval 20 metres