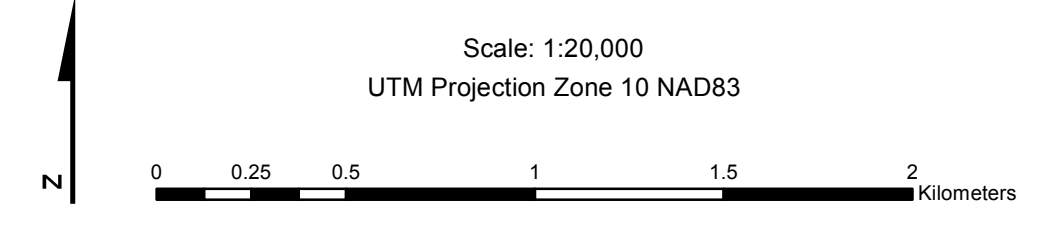
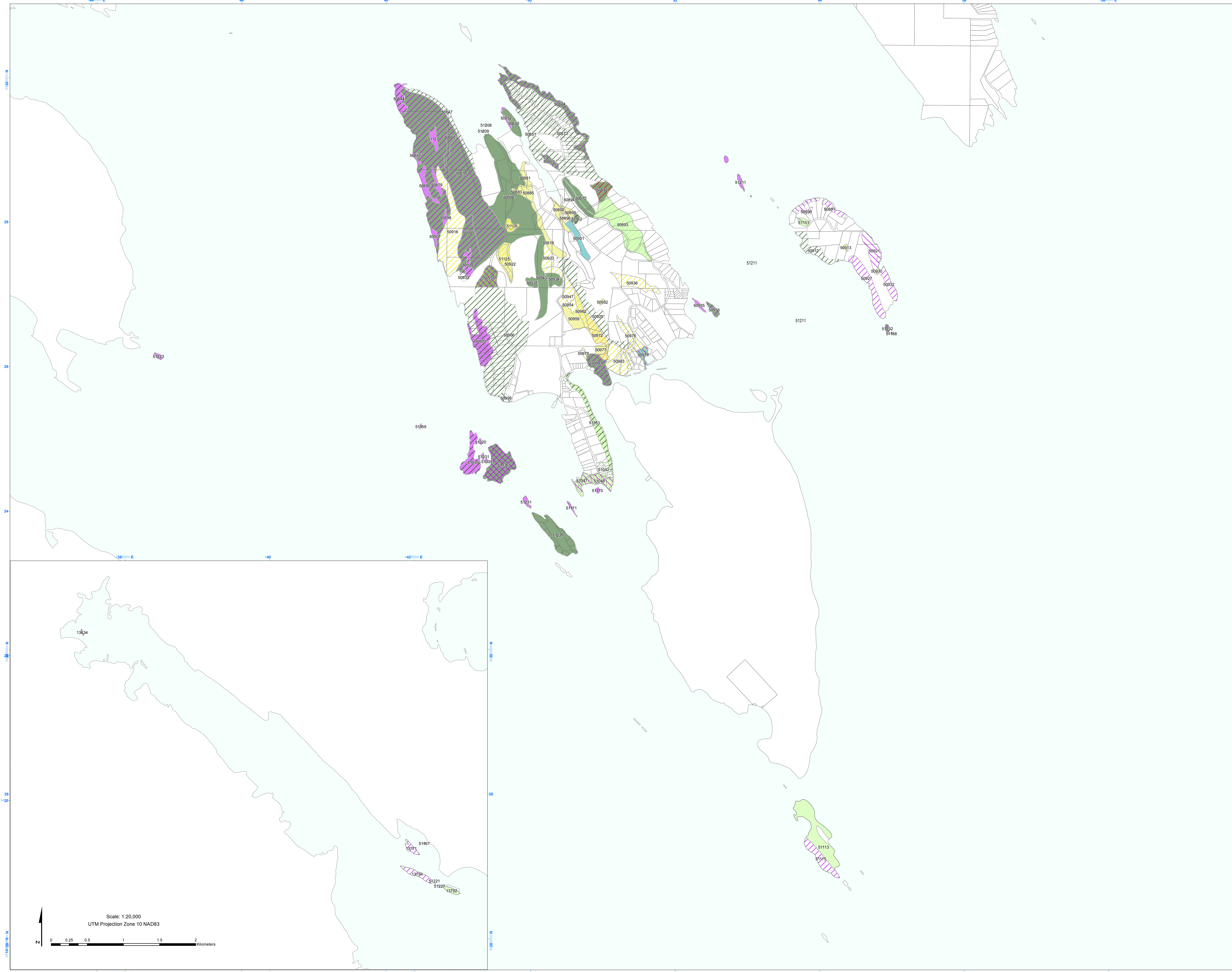


# Thetis Island Sensitive Ecosystem Mapping Airphoto - 2007



Map Code	Site Unit Name	Map Code	Site Unit Name	Map Code	Site Unit Name
13771	CFPm	13784	CFPm	13792	CFPm
50855	CFPm	50859*	CFPm	50860	CFPm
50875*	CFPm	50879	CFPm	50880	CFPm
50890	CFPm	50891	CFPm	50892	CFPm
50898*	CFPm	50901	CFPm	50902	CFPm
50916	CFPm	50918	CFPm	50921	CFPm
50929	CFPm	50930	CFPm	50932	CFPm
50937	CFPm	50943	CFPm	50947	CFPm
50959	CFPm	50962	CFPm	50966*	CFPm
50978	CFPm	50979	CFPm	50981	CFPm
51000	CFPm	51004	CFPm	51005	CFPm
51017	CFPm	51020	CFPm	51023	CFPm
51039	CFPm	51042	CFPm	51044	CFPm
51060	CFPm	51064	CFPm	51067	CFPm
51076	CFPm	51077	CFPm	51080	CFPm
51087	CFPm	51088	CFPm	51089	CFPm
51096	CFPm	51097	CFPm	51098	CFPm
51106	CFPm	51107	CFPm	51108	CFPm
51115	CFPm	51120	CFPm	51121	CFPm
51160	CFPm	51161	CFPm	51162	CFPm
51187	CFPm	51188	CFPm	51208	CFPm
51229	CFPm	51231	CFPm	51232	CFPm



### 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

Intense development pressure fueled by population and economic growth has fragmented and degraded many terrestrial ecosystems. A high proportion of those ecosystems are now designated as at risk in BC. Sensitive ecosystems typically have high biological diversity and are a vital part of the landscape. They provide ecosystem services for a healthy economy and to promote clean air, clean water, and a healthy environment. 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. From 1990 to 1999 the Provincial and Federal governments completed a Sensitive Ecosystems Inventory of East Vancouver Island and the Gulf Islands. This mapping product is an updated version of that product.

### Purpose

The purpose of this Sensitive Ecosystems map is to identify the location of sensitive ecosystems. The goal of this mapping exercise is to encourage informed land use decisions that will conserve sensitive ecosystems. This map and the accompanying data provide site-specific ecological information that can be used to flag sites of conservation concern, to promote land stewardship and to prompt detailed field surveys and consideration of ecological values before changes to the land are initiated.

### Methodology

Mapping methods are based on the Resource Information Standards Committee (RISC) Standard for Terrestrial Ecosystem Mapping (TEM), in BC. This Sensitive Ecosystems map was derived from TEM data using the RISC Standard for Mapping Ecosystems at Risk in BC. Field survey protocols followed Describing Terrestrial Ecosystems in the Field (RISC 1998).

### Data Limitations

The Sensitive Ecosystems map is a tool to alert decision makers to the existence of sensitive ecosystems. However, when land-use changes are proposed, detailed on-the-ground site assessments are necessary. For sites that were not field checked, the accuracy of the data depends heavily on the expertise, local knowledge, and professional judgment of the mapper and the quality and quantity of available source data. Because the area is changing rapidly, reference to the data sheet's cited information source is advised.

### Due to the mapping scale of the aerial photographs, the minimum polygon size is generally 1/4 hectare. Enlargement of the data beyond the source scale may result in unacceptable distortion and faulty registration with other data sets.

### What can be done to protect the sensitive ecosystems?

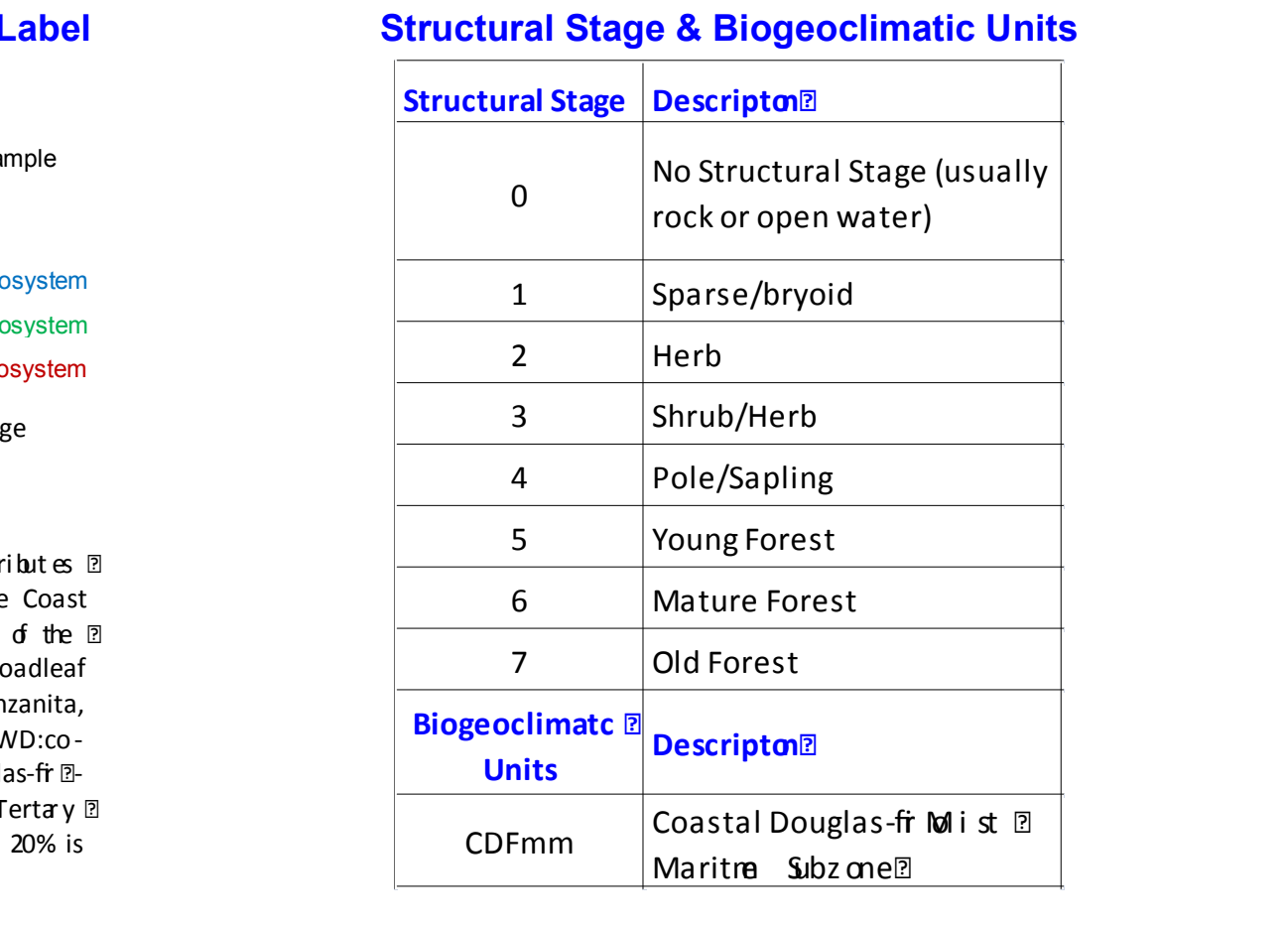
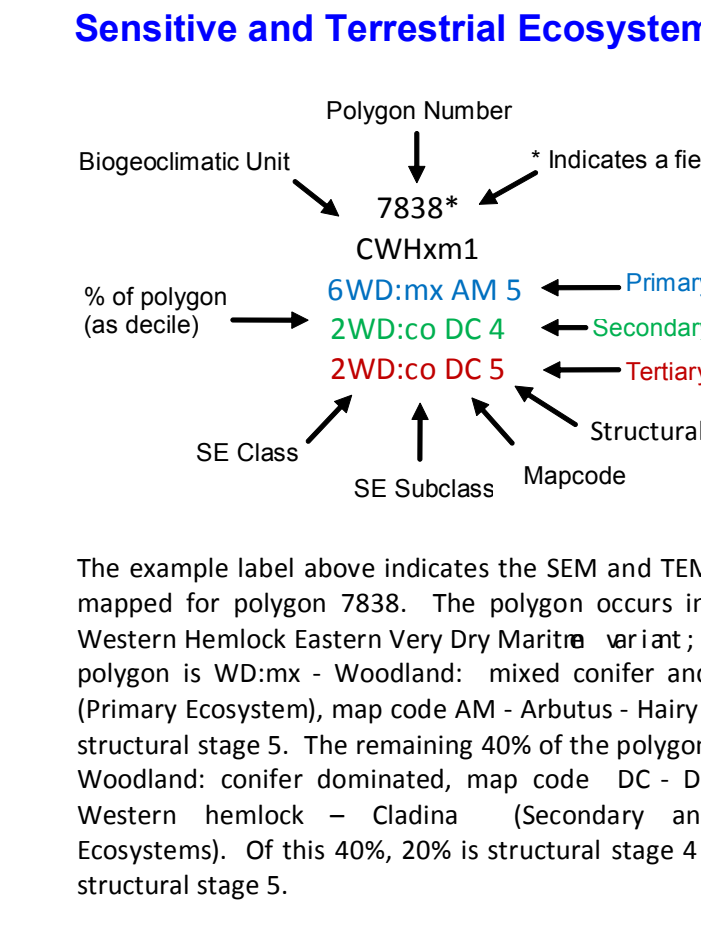
Direct and indirect impacts to these ecosystems can be avoided and:

- Retaining or creating vegetated buffers around sensitive ecosystems to isolate them from outside disturbances;
- 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!

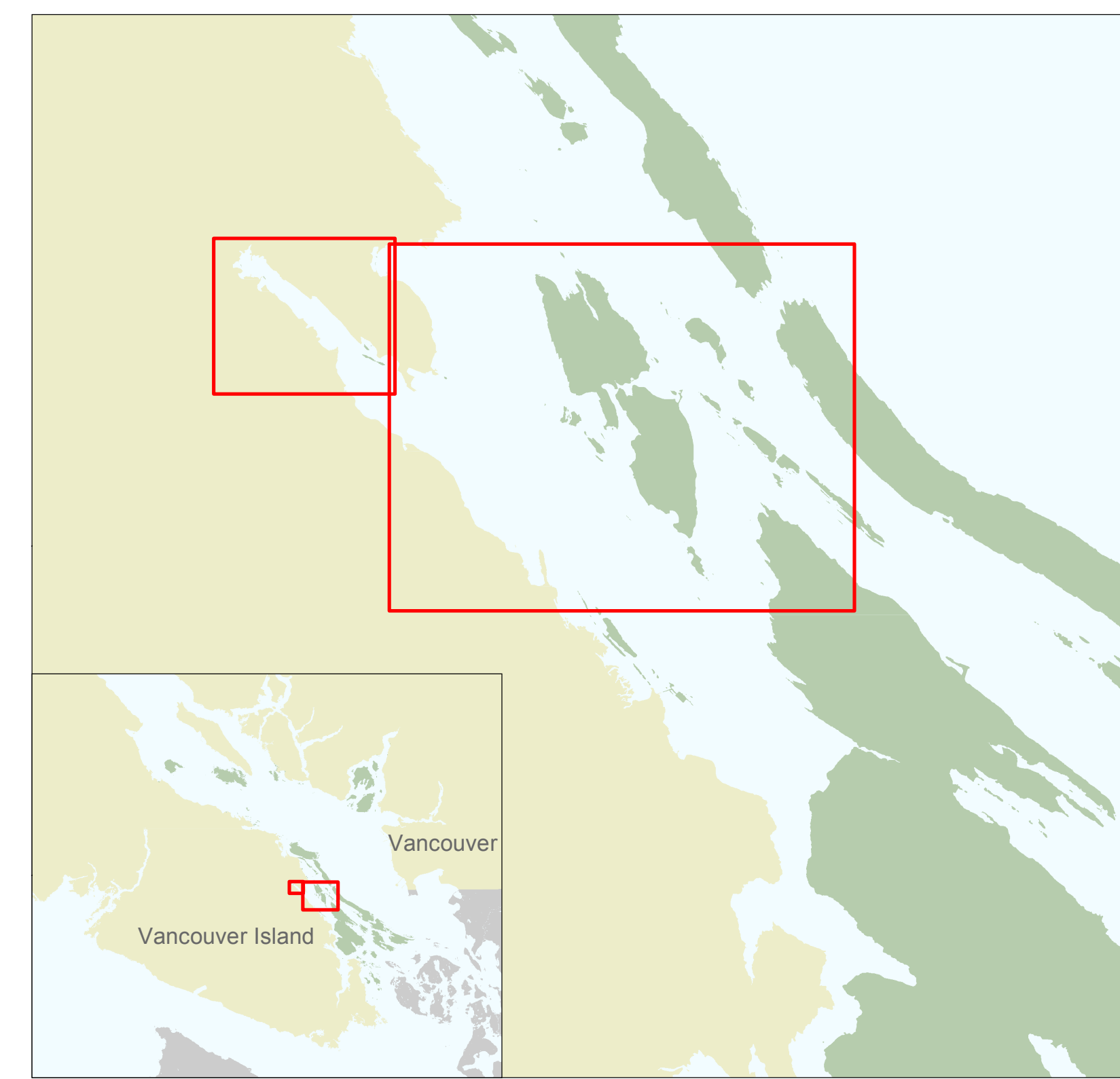
Conduct an ecological inventory to identify the existing flora and fauna and to locate any threatened or endangered plant and animal species, plant communities, and habitat features needing protection.

Plan and implement all development activities in a manner that will not adversely affect or disturb the sensitive social well-being. Their regular or periodic maintenance, the ecological inventory data and work to incorporate designs that maintain the functions and values of the natural ecosystem.



### Terrestrial Ecosystem Map Codes and Site Unit Names

Map Code	Site Unit Name	Map Code	Site Unit Name	Map Code	Site Unit Name
CFPm	Forest	CFPm	Non-Forest	CFPm	Non-Forest
W51	Sitka sedge - Peat moss fen	RE	Recreate		
CS	Western meadow - Slough sedge	W52	Sweet gale - Sitka sedge fen	RU	Rural residential
OW	Black cottonwood - willow	E503	Seaforth saltmarsh	RZ	Road surface
DA	Douglas-fir - Shore Pine - Arbutus	E505	Lynghyde sedge estuarine marsh	UR	Urban
DO	Douglas-fir - Grand Fir - Oregon Grape	FC	Ferroc - Camas	W500	Sitka sedge - Hemlock sparse marsh
DO	Douglas-fir - Oregonas	HL	Hardhack - Labrador tea	W501	Pink spirea - Sitka sedge swamp
DS	Douglas-fir - Salal	LM	Dunegrass - Beach pea	W511	Sitka willow - Pacific willow - Skunk cabbage swamp
GO	Garry oak - Oceanspray	OM	Garry oak - moss		
LS	Shore pine - Sphagnum	OR	Oceanspray - rose		
RC	Western meadow - Skunk cabbage	QB	Garry oak - Bromus (or mixed grasses)	CF	Cultivated field
RF	Western meadow - Grand Fir - Foamflower	RA	Nootka rose - Pacific crab apple	CO	Cultivated orchard
RC	Western meadow - Douglas-fir - Oregon beaked moss	SE	Clusia - Western sedge	ES	Exposed soil
RP	Western meadow - Indian plum	SL	Sedge - Western tansy	OC	Outcrops
RS	Western meadow - Sionberry	SS	Spirea - Sedge wetland	OC	Outcrops
RV	Western meadow - Vanilla leaf	W500	Labrador tea - Dog laurel - Peat moss bog	RI	Rock outcrop
				RI	Rock outcrop



## Sensitive Ecosystems

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

### Old Forest (OF):

Primary Ecosystem Secondary Tertiary

**Definition:** Conifer-dominated dry to moist forest types, structural stage 7, generally >250yrs.

**Importance:** Due to the lack of disturbance, old forest ecosystems are often associated with rich communities of plants and animals that may be dependent upon the unique environmental conditions created by these forests.

**Subclasses:**

- co (conifer-dominated) - greater than 75% coniferous species
- mc (mixed conifer and deciduous) - forests dominated with a mixture of coniferous and broadleaf trees (<75% coniferous and >25% broadleaf)

### Woodland (WD):

Primary Ecosystem Secondary Tertiary

**Definition:** 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.

**Importance:** Woodlands are nationally, provincially and regionally rare and highly fragmented. A rich assemblage of plants, insects, reptiles and birds are often to be found in these ecosystems due to the local sources, habitat and proximity to the ocean. Garry oak woodlands, for example support the highest plant species diversity of any terrestrial ecosystem in British Columbia and are especially vulnerable to rural development.

**Subclasses:**

- bd (broadleaf) - dominant broadleaf with <15% coniferous species
- mx (mixed conifer and deciduous) - mixed conifer and broadleaf with a minimum of 25% cover of either group is included in the total tree cover

### Herbaceous (HB):

Primary Ecosystem Secondary Tertiary

**Definition:** Non-forested ecosystems (less than 10% tree cover), generally with shallow soils. They include bedrock outcroppings, large openings within forested areas, spits, dunes and shorelines vegetated with grasses and herbs.

**Importance:** Terrestrial Herbaceous ecosystems are characterized by thin soils which are easily disturbed. Herbaceous plants can be easily trampled or dislodged onto bare rock where they cannot re-establish. Thus they are highly vulnerable to a range of human disturbance factors including residential development and various recreational uses.

**Subclasses:**

- hb (herbaceous) - 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
- cc (coastal herbaceous) - rocky shorelines or islet, influenced by the marine environment and characterized by less than 20% vegetation cover of grasses, forbs, mosses and lichens
- sp (spit) - finger-like extension of beach, composed of sand or gravel deposited by longshore drifting; low to moderate cover of salt-tolerant grasses and herbs
- ds (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
- ri (river) - narrow linear communities along with open water bodies (rivers, lakes and ponds) where there is no floodplain, irregular flooding
- sh (shrub) - herbaceous in wetlands with a deep slope of water, with grasses and herbs
- ro (rock) - rock outcrops not dominated by shrubs

### Riparian (RI):

Primary Ecosystem Secondary Tertiary

**Definition:** Areas adjacent to water bodies (rivers, lakes, ocean, wetlands) which are influenced by factors such as erosion, sedimentation, flooding and/or groundwater irrigation due to proximity to the water body. Structure stages 1 - 7.

**Importance:** Riparian ecosystems support a disproportionately high number of vascular plant, moss, amphibian and small mammal species for the area they occupy.

**Subclasses:**

- fl (low bench floodplain) - flooded at least every other year for moderate periods of growing season; plant species adapted to extended flooding and erosion, low or tall shrubs most common
- me (medium bench floodplain) - flooded every 1-4 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
- hi (high bench floodplain) - only periodically and briefly inundated by high waters, but lengthy submergence flow in the flooding zone, typically conifer-dominated floodplains of larger coastal rivers
- li (linear) - narrow linear communities along with 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
- sh (shrub) - shrub-dominated floodplain or lakeshore

### Wetland (WN):

Primary Ecosystem Secondary Tertiary

**Definition:** Areas that are saturated or inundated with water for long enough periods of time to develop vegetation. This may result from flooding, fluctuating water tables, tidal influences or poor drainage conditions.

**Importance:** Wetland ecosystems are sensitive and important because they exhibit early, high biodiversity, highly specialized habitat, specialized functions and connectivity.

**Subclasses:**

- bg (bog) - nutrient poor wetland, on organic soils (sphagnum peat), water source predominantly from precipitation; may be treed or shrub dominated
- de (dry) - nutrient medium wetland (sedge peat) where ground water inflow is the dominant water source, open water channels common; dominated by sedges, grasses and mosses
- ma (marsh) - wetland with fluctuating water table, often with shallow surface water, usually organically enriched mineral soils, dominated by rushes, reeds, grasses and sedges
- sw (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
- ee (shallow water) - standing or flowing water less than 2m deep, transition between deep water bodies and other wetland ecosystems (e.g. bog, marsh, fen, etc.), often with vegetation rooted below the water surface
- we (wet meadow) - periodically saturated but not inundated with water, organically enriched mineral soils, grasses, sedges, rushes and forbs dominant

### Cliff (CL):

Primary Ecosystem Secondary Tertiary

**Definition:** Very steep slope, often exposed bedrock, may include steep-sided sand hills.

**Importance:** Open ledges and horizontal fissures on cliffs are known to provide nesting sites. Cliff crevices are used for roosting bats while deep crevices are used for shelter and overwintering of snakes and lizards.

**Subclasses:**

- cc (coastal cliffs) - cliffs with a marine influence, generally near vertical bedrock with accumulation of soil limited to fissures and ledges
- in (inland cliffs) - inland cliffs typically formed as a result of erosion, catastrophic failures or mass wasting. Generally characterized by rapid drainage and the accumulation of soil that is limited to bedrock fissures and ledges

### Freshwater (FW):

Primary Ecosystem Secondary Tertiary

**Definition:** Freshwater ecosystem includes bodies of water such as lakes and ponds that usually lack flowing vegetation.

**Importance:** Freshwater ecosystems are home to numerous organisms such as, fish, amphibians, aquatic plants, and invertebrates.

**Subclasses:** Lakes and ponds play a vital role in the lifecycle of many species.

- la (lake) - a naturally occurring body of water, greater than 2m deep in some portion
- pd (pond) - a small body of water greater than 2m deep, but not large enough to be classified as a lake

## Rare Ecosystems

Other important ecosystems have high biodiversity values.

### Mature Forest (MF):

Primary Ecosystem Secondary Tertiary

**Definition:** Usually conifer dominated, occasionally deciduous, dry to moist forest types, structural stage 6, generally >80yrs.

**Importance:** Future older forests: Within 20 years, many Mature Forests that were logged only this century will become Older Forests. The biodiversity values of Mature Forests generally become higher with age. This means it will be able to sustain more and larger species of plants and animals.

**Landscap connectivity:** Mature Forest stands provide connections between other natural areas that promote the movement and dispersal of many forest-dwelling species across the landscape.

**Buffers:** Mature Forest can minimize disturbance to sensitive ecosystems that occur within or adjacent to the forest path. Where they border or adjoin wetlands, patches of older forest, or other sensitive ecosystems, the Mature Forest area serves an important role in buffering the adjacent sensitive areas.

**Subclasses:**

- co (conifer-dominated) - greater than 75% coniferous species
- mc (mixed conifer and deciduous) - a minimum of 25% cover of either group is included in the total tree cover
- bd (broadleaf) - greater than 75% broadleaf species

## Other Mapped Ecosystems

### Young Forest (YF):

**Definition:** Limited to areas of young forest dispersed amongst sensitive and important ecosystems. Forest is 40 - 80 yrs old depending on species and ecological conditions; canopy has begun to differentiate.

### Seasonally Flooded Agricultural Fields (FS):

**Definition:** Limited to areas of annually flooded cultivated fields or hay fields dispersed amongst sensitive and important ecosystems.

### Non-Sensitive (NA):

**Definition:** Limited to areas of disturbance or human impact dispersed amongst sensitive and important ecosystems.

## Ecosystem Map Symbols

Ecosystem composition is complex and often contains a dominant ecosystem with secondary and tertiary ecosystems. In this map the dominant ecosystem has a solid shading and the secondary and tertiary ecosystems are identified by cross-hatched lines.

